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Australian Construction Industry Futures

A review of dominant visions

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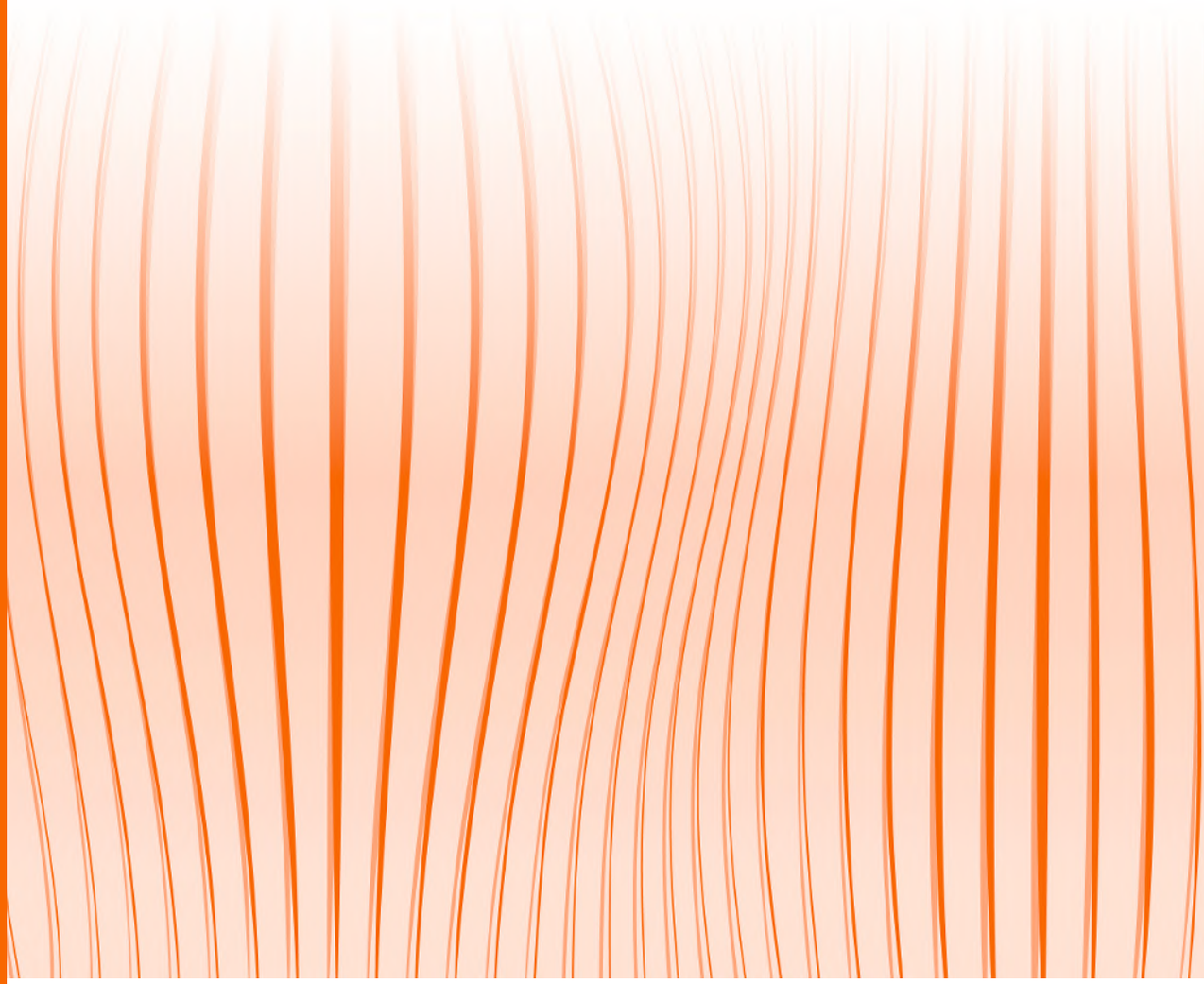

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Abstract

Keywords
Construction futures, sustainability, workforce, climate change, net-zero

This report examines how dominant industry, consultancy, government and policy reports present the future of the Australian construction industry, and identifies and synthesises the key emerging trends that their visions claim are shaping the sector's medium- to long-term trajectories from 2030 to 2050. The findings are drawn from a qualitative content analysis of 47 reports published between 2014 and 2025.

We found that four interconnected domains were represented in the reports reviewed: *Markets and Customers, Sustainability and Resilience, Emerging Technologies and Regulation, and People and Skills.* These were intersected with a set of key trends which include: population growth, urbanisation, the rising demand for transport infrastructure, the impacts of climate change, the global transition to net-zero emissions, skills shortages in energy-related occupations, and the increasing role of regulation and imported components in construction processes. By mapping these dominant and existing visions of the industry's future, we deliver an overview of how the construction sector is responding to and envisaged to respond to shifting demographic, environmental, technological, and regulatory landscapes.

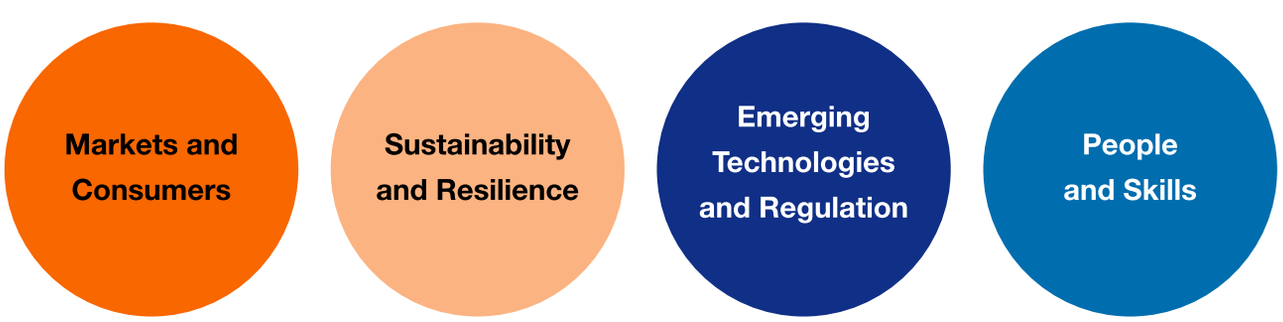
However we note that these visions consistently do not account for the way people and their practices and values will shape possible futures. Drawing on social science insight, we highlight how attention to future ways and life and priorities will complicate the visions represented in the reports reviewed, and we suggest possible alternatives.

Contents

Executive Summary

This report examines how dominant industry, consultancy, government and policy reports represent the future trends shaping Australia's construction industry. The review draws on a qualitative content analysis of 47 industry reports published over the past decade (2014–2025) to identify and synthesise key themes, predictions concerning and responses relating to demographic, technological, environmental, social, and regulatory transformations. The report categorises these trends under four overarching domains: *Markets and Customers, Sustainability and Resilience, Emerging Technologies and Regulation, and People and Skills.* Collectively, these domains present the contemporary vision represented in the reports reviewed, for the future of the construction industry in Australia, demonstrating the challenges and opportunities the industry faces are couched and anticipated.

In this report, for each of these domains, we deliver an analysis of the reports reviewed to show how contributors to them characterise the domain and propose visions for its future. We then demonstrate how considerations of future human values and practices, drawn from the social sciences and a growing body of qualitative knowledge regarding work futures in the industry, *complicate* these industry, consultancy, government and policy visions. In doing so, we suggest how attention to the messiness of possible futures and the complications that future people will bring to these futures, will support the generation of more effective future industry, policy, government and training as the industry proceeds along its digital and net zero transitions.



Markets and Consumers

Across the reports reviewed, markets and customers are seen as critical as the construction sector navigates complex socio-economic and regulatory landscapes.

Trend 1: Population Growth

Population Growth is seen as a core driver of future demand for construction with Australia's sustained demographic expansion in urban centres, placing increasing pressure on housing, infrastructure, and urban services.

- Anticipated Shift 1: Construction delivery must scale to meet rising housing and infrastructure demands in the midst of economic challenges
- Anticipated Shift 2: Population heterogeneity requires inclusive and adaptable design approaches to housing
- Anticipated Shift 3: Urban planning is expected to prioritise sustainability, affordability, and livability.
- Anticipated Shift 4: Planning and policy systems will need to integrate demographic data into future infrastructure planning.

Complications:

Population growth is often presented in reports as a quantifiable trend to justify infrastructure and housing decisions, while a one-dimensional categorisation of 'customer' does not account for diverse cultural, social and physical needs. This approach risks new inequalities.

Trend 2: Increased Urbanisation

Increased urbanisation is seen as reshaping the spatial and functional orientation of construction, with rapid growth in metropolitan regions creating demand for vertical, high-density, and mixed-use developments within increasingly constrained and contested urban spaces.

- Anticipated Shift 1: Integrated spatial planning will be critical to managing urban complexity, with increased demand to address infrastructure strain, land scarcity, climate-related risks and sustainability goals.
- Anticipated Shift 2: Design and construction innovation in architecture, structures and materials will be necessary to support urban densification.
- Anticipated Shift 3: Construction will focus on infill, renewal, and retrofitting, along with brownfield development and upgrading existing structures, particularly in dense urban areas.

Complications:

Displacement, gentrification, and environmental risks could be posed for marginalised communities, whose voices may not be heard.

Trend 3: Introduction of new technologies

Introduction of new technologies is portrayed as reshaping market practices, project delivery models, and regulatory frameworks, and addressing labour shortages, sustainability goals, improved safety and quality assurance.

- Anticipated Shift 1: Digital technologies such as BIM will reshape the construction lifecycle.

Complications:

Digital transformation risks concentration, exclusion, and uneven uptake across different sized firms.

Sustainability and Resilience

Sustainability and resilience have become defining imperatives for the construction industry, driven by escalating climate risks, evolving regulatory frameworks, and shifting societal expectations.

Trend 1: Impacts of Climate Change

Impacts of Climate Change, such as rising temperatures, extreme weather events, and sea-level rise, are seen as driving the industry to develop adaptive, resilient infrastructure able to withstand climate-related risks.

- Anticipated Shift 1: The industry will be required to integrate climate risk assessment into every phase of the construction lifecycle.
- Anticipated Shift 2: Innovative construction materials and adaptive design solutions will become increasingly common
- Anticipated Shift 3: Stakeholder expectations, including of insurers, financiers, and communities, will prioritise risk mitigation and adaptive capacity.

Complications:

Resilient design is important for sustainability but without adequate care can lead to “green gentrification”, exclusion and displacement.

Trend 2: Global Transition to Net Zero

Global transition to net zero is leading actors (such as regulators, investors, industry bodies, clients, and civil society) to put pressure on the construction sector to transform to low-carbon, climate-resilient, and socially equitable approaches to building and infrastructure.

- Anticipated Shift 1: Construction firms will adopt or rent low-emission technologies, machinery, equipment, and renewable-powered operations.
- Anticipated Shift 2: Green certifications, carbon budgeting, and lifecycle reporting will become central to project evaluation and financing.
- Anticipated Shift 3: Emissions accountability will redefine competitive advantage and investment attractiveness in the sector.
- Anticipated Shift 4: Regulatory and market instruments will reinforce alignment with global climate agreements and national decarbonisation strategies.

Complications:

Compliance with emerging standards and regulation can be difficult to achieve for some actors due to financial and administrative burdens.

Trend 3: Carbon Accountability

Carbon Accountability is expanding from operational to embodied emissions including carbon generated through the extraction, production, transport, and waste.

- Anticipated Shift 1: Policies and building codes will make whole-of-life carbon performance, with embodied carbon disclosure and reduction targets, a statutory requirement.
- Anticipated Shift 2: Demand for lifecycle carbon tools, transparent reporting, and verifiable data will grow as regulatory and market attention focuses on embodied carbon
- Anticipated Shift 3: Supply chains will shift towards low-carbon materials, recycled content, and circular design principles, requiring coordinated action on supply and demand sides.

Complications:

Accounting for embodied carbon in construction is complex due to the fragmented, globalised, and opaque nature of material supply chains. As a result, embodied carbon assessments remain a technically demanding and politically contested terrain within sustainable construction practices.

Trend 4: Electrification

Electrification is seen as a pathway to low-carbon construction futures aligned with clean energy transitions and regulatory expectations.

- Anticipated Shift 1: Electrification of equipment, heating/cooling systems, and site operations will become standard practice.
- Anticipated Shift 2: Policy incentives will reinforce the uptake of electrified systems and penalise carbon-intensive alternatives. Households' will derive energy bill savings from thermal efficiency upgrades and electric appliances.
- Anticipated Shift 3: Building codes and infrastructure planning will evolve to support electric-ready construction environments, requiring new technical capabilities, infrastructure coordination, and design approaches.

Complications:

The transition towards electrified construction practices is often framed as a technologically feasible and environmentally responsible trajectory. However, it does not account for: underlying infrastructural and socio-economic disparities; the role of growing demand for critical minerals in disrupting the long-term sustainability and ethical legitimacy of electrified supply chains.

Trend 5: Mainstreaming Green Materials

Mainstreaming green materials in construction supply chains is seen as essential to the industry's sustainability agenda. This is driven by climate considerations, geopolitical risks, supply chain disruptions, and the need to reduce reliance on high-emission imports.

- Anticipated Shift 1: Sustainable and low-carbon materials will become foundational across all infrastructure projects to meet climate targets and improve performance outcomes.
- Anticipated Shift 2: Domestic manufacturing of green materials will grow, reducing reliance on high-emission imports and enhancing resilience against global supply disruptions and price volatility.

Complications:

Adoption of green materials supports important sustainability initiatives. However it is often hindered by higher costs, supply variability, and technical knowledge gaps. Moreover, the extractivism and inequalities connected to "green" inputs is not always accounted for.

Emerging Technologies and Regulation

Emerging technologies and increasing regulation are leading to a new governance landscape that shapes construction industry practices amid increasing globalisation, digital transition and environmental changes.

Trend 1: Increased Reliance on Imported Components

Increased reliance on imported components is expected, particularly for mechanical, electrical, and prefabricated components, due to the high price of local materials.

- Anticipated Shift 1: Regulatory bodies will strengthen oversight to ensure imported products meet Australian safety and performance standards.
- Anticipated Shift 2: Supply chain transparency and traceability will become central to compliance regimes, reducing exposure to supply shocks, supporting project delivery, and business sustainability.
- Anticipated Shift 3: Trade disruptions (by geopolitical tensions, pandemic-like shutdowns, and logistics issues) will drive policies to localise critical manufacturing capacities.
- Anticipated Shift 4: Local manufacturing will improve supply chains, economic sovereignty, employment, and ensure Australian standards.
- Anticipated Shift 5: Increasingly complex and global supply chains will inspire new risk management strategies for multiple vulnerabilities in international sourcing, to safeguard project timelines, budgets, and quality standards.

Complications:

Governance is difficult to apply in global supply chains and addressing questions of economic sovereignty, sustainability, and distributive justice within the broader architecture of global trade and production is complex.

Trend 2: Increased Introduction of Net Zero Compliance Regulations

Increased introduction of net zero compliance regulations will reshape industry practices, influence investment flows, and determine market competitiveness.

- Anticipated Shift 1: Frameworks such as NABERS, Green Star, and Passivehaus will be integrated into statutory compliance systems in a shift from discretionary adoption to regulatory obligation.
- Anticipated Shift 2: The National Construction Code and state policies will mandate low-carbon design, lifecycle emissions reporting, and sustainable procurement.

- Anticipated Shift 3: Regulatory convergence will link environmental performance directly to building approvals, financing, and certification, making environmental compliance a key determinant of market competitiveness.

Complications:

While regulatory frameworks are crucial for advancing sustainability and emissions reduction goals, their effectiveness is shaped by institutional capacity, sectoral coordination, and stakeholder alignment. Thus there is a need for regulatory approaches that are robust and adaptive, combining enforcement with capacity-building and support mechanisms.

People and Skills

The sector's labour dynamics are changing in response to technological, demographic, and environmental shifts, requiring updated education, training, and workplace structures to support new ways of working.

Trend 1: Slowly increasing Digitisation and Skills Transformation

Slowly increasing Digitisation and Skills Transformation is reported across the sector. Building Information Modelling (BIM), automation, Artificial Intelligence (AI) and robotics are anticipated to reconfigure technical practices, labour organisation, and professional development. Yet the industry's digital transition is slow.

- Anticipated Shift 1: Digital technologies are reshaping core competencies and transforming construction work, requiring workers to develop technical skills and take new responsibilities.
- Anticipated Shift 2: Robotics are improving productivity, efficiency and sustainability, but are inhibited by cost, industry culture, regulation and compliance and safety concerns.
- Anticipated Shift 3: A future construction workforce with hybrid digital and trade skills, will improve productivity and meet compliance, safety, and sustainability standards.
- Anticipated Shift 4: Education, training, and professional development are being restructured to integrate digital competencies, with industry-educational institution partnerships critical to deliver a digitally capable workforce
- Anticipated Shift 5: Firms will need to invest in ongoing digital upskilling, as future competitiveness will depend on their ability to anticipate and respond to rapid technological change.

Complications:

Reports reviewed are highly aspirational and give guidance related to existing and future training needs, responsibilities and outcomes. Yet this is complicated by: inequalities in access to training and in workplace cultures; the value of tacit skills in future co-work with technologies; the challenge of financing and delivering digital training in a fragmented industry.

Trend 2: A Growing Workforce and Intergenerational Transitions

A growing workforce and intergenerational transitions are associated with the need for generational renewal in the sector.

- Anticipated Shift 1: The retirement of an ageing workforce will lead to skills gaps, productivity pressures, and project delivery risks, requiring succession planning.
- Anticipated Shift 2: Strategic worker recruitment will mitigate projected labour shortages and for long-term sustainability and innovation in the sector.
- Anticipated Shift 3: Reforms in flexible work, career development, stable employment, and health, safety, and wellbeing, will align with younger workers' values and expectations.

Complications:

Reports present a strategic vision for generational renewal, but underplay: structural issues such as precarious employment, limited career progression, decline of apprenticeship, gendered workplaces; younger workers' values such as climate-consciousness; and care responsibilities.

Trend 3: Workforce Diversity and Inclusion Initiatives

Workforce Diversity and Inclusion Initiatives are seen as essential strategies for ensuring long-term workforce sustainability and innovation.

- Anticipated Shift 1: Workforce diversity is a strategic imperative, with fair pay, decent working conditions, and material improvements for all workers.
- Anticipated Shift 2: Targeted programs aim to expand the industry's training and employment opportunities for diverse and historically excluded workers.
- Anticipated Shift 3: Inclusive organisational practices, including flexible work, parental and carers' leave, and anti-harassment measures, are promoted to improve retention and workplace culture.
- Anticipated Shift 4: Recruitment and leadership development strategies are reoriented to challenge systemic exclusion.

Complications:

Without deeper transformation in leadership accountability, enforcement mechanisms, and organisational values, inclusion strategies risk being performative or superficial in their effects. It is vital to account for how systemic discrimination, tokenism, and exclusionary site-level practices can persist despite formal diversity policies.

Trend 4: Increasing Demand for Green Skills and Jobs

Increasing demand for green skills and jobs as construction becomes central to delivering net zero infrastructure and energy-efficient buildings.

- Anticipated Shift 1: Net zero transition requires a geographically mobile and adaptable workforce, with versatile skills, to deliver upgrades in large-scale retrofitting initiatives.
- Anticipated Shift 2: Emerging roles supporting green infrastructure and sustainable building systems are projected to become core to construction project teams.
- Anticipated Shift 3: Australia's vocational education and training systems require reform to meet the net zero transition demand for upskilling in trade qualifications and climate-smart roles.
- Anticipated Shift 4: Sustainability regulations will require training in building life cycle assessment (LCA) tools to measure building's environmental impacts across tradespeople, supervisors, and managers.

Complications:

Labour market transitions are complex and uneven. Regional disparities in training access, education gaps, and persistent gendered divisions of labour challenge assumptions that green jobs are inherently equitable. Care is needed to ensure that the sustainability transition does not reproduce existing inequalities or create new ones.

Introduction

The construction industry is critically and inextricably entangled with economic growth, infrastructure development, and social wellbeing in Australia. As the sector navigates rapid technological change, transitions to net zero and to clean energy, shifting demographic patterns, and evolving regulatory landscapes, understanding future trends has become essential for informed decision-making and strategic planning. Yet little is known about how the experience, expertise, values and practices of the people who will work in Australia's future construction industry will contribute to steering its transitions.

This report presents a review of 47 industry reports published over the past decade (2014–2025) to provide a fresh perspective on how the future of the Australian construction sector is currently perceived and represented in the dominant narratives designed to inform decision-making. The review was conducted in the context of growing interest in construction futures and questions relating to how these futures are entangled with technological advances, market demands and the urgent need for sustainable, equitable, and resilient built environments and building practices. Industry reports, authored by government agencies, private consultancies, research institutions, and peak bodies, offer valuable insights into how construction futures are being imagined, planned, and governed. These reports reflect the sector's evolving priorities and the broader socio-political and environmental forces that shape them.

On the basis of this review we identify how and where the values and practices of existing and future workers in this industry are likely to complicate the assumptions underpinning dominant visions, and we identify new knowledge is needed to support the industry's digital and sustainability transitions.

Methodology

The review was based on a qualitative content analysis of 47 publicly available industry reports published between 2014 and 2025 by government bodies, industry associations, consultancy firms, research institutions, and regulatory agencies.

The review aimed to identify future-oriented narratives, themes, and trends that the reports reviewed claim are likely to influence the construction industry in Australia over the next decade. It explored how actors across the sector conceptualise and anticipate change in relation to four interlinked domains identified through the qualitative analysis which shapes this report:

1. Shifting market and customer demands driven by population, urbanisation, technology, and infrastructure needs.
2. Sustainability imperatives shaped by climate change and net-zero transitions.
3. Workforce developments including emerging skill demands and labour transformations.
4. Emerging Technologies and policy and regulatory shifts, including new standards, compliance regimes, and technological mandates.

All 47 reports were uploaded into NVivo, a qualitative data analysis software, to support a systematic and rigorous coding process. Thematic coding was conducted to identify recurring patterns, keywords, narratives, and sector-specific language related to future trends. Coding was both inductive, allowing for emergent themes to arise from the data, and deductive, guided by the predefined domains. The anticipated shifts that the reports reviewed were clustered under the headings of the four domains.

Once the anticipated shifts and the logics that inform them were analysed, they were then compared with state-of-the-art conceptual and empirical knowledge developed in social science. The aim of this comparison was to determine how and where this knowledge complicated the anticipated shifts. This stage of analysis sought to throw light on the limitations of current assumptions and the approaches that are derived from them. Finally, the implications of these critical reviews were considered to ask how they might guide technological and sustainability transitions.

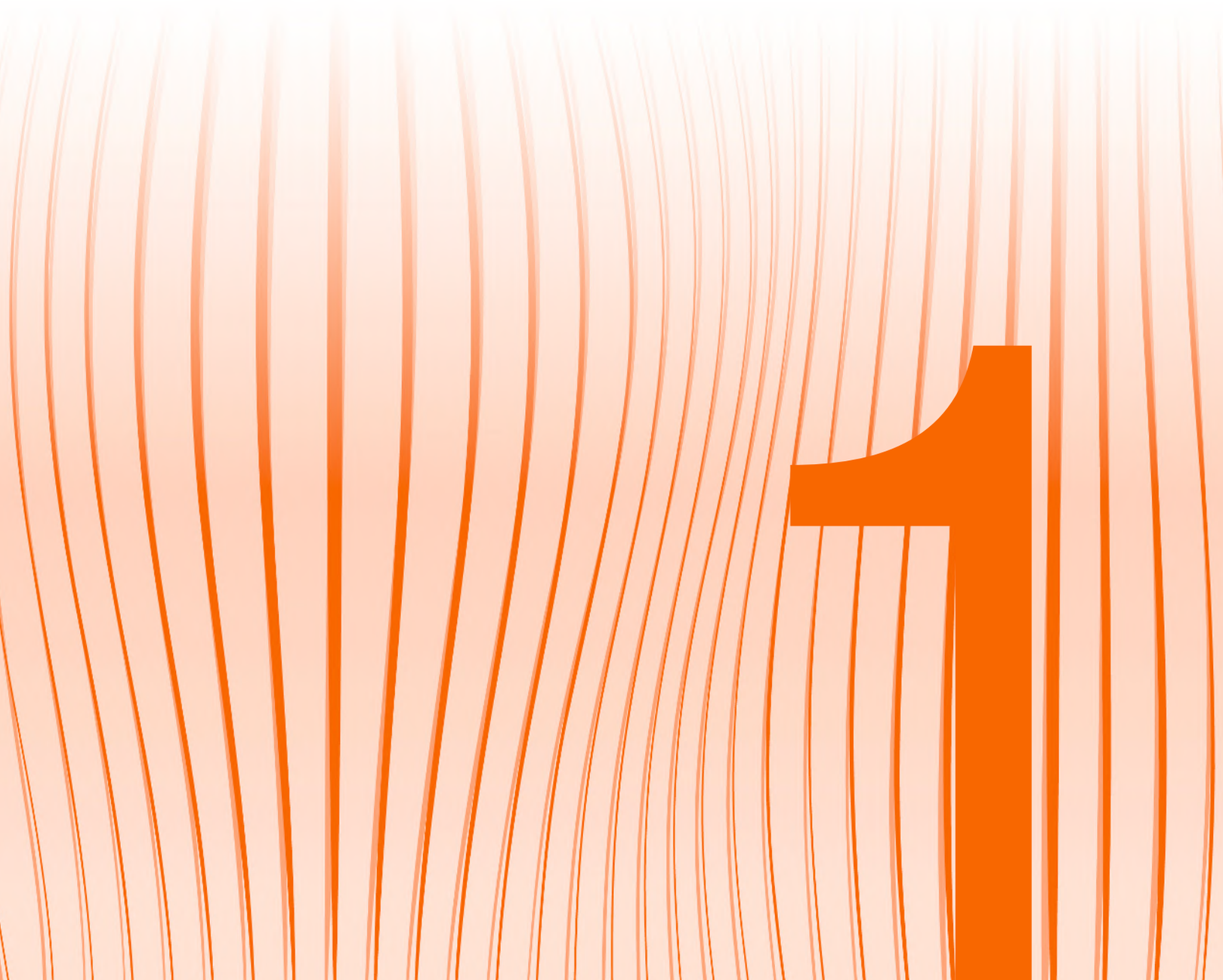
Trends, anticipated shifts and complications of the future of the construction industry

The trends outlined below appeared consistently across the industry reports reviewed and span key domains of ***markets and customers, sustainability and resilience, emerging technologies and regulation, and people and skills.*** These *trends* describe the broad forces that the reports propose are actively shaping the future of the construction industry in Australia. They capture the anticipated shifts in technological capabilities, environmental obligations, labour structures, and regulatory practices. From climate change and carbon accountability to supply chain disruptions and digital workforce transformations, the reports reviewed build on these trends to signal both emerging priorities and contested pathways for the sector.

Within each trend, the analysis identifies a series of *anticipated shifts* drawn from the reports. These shifts reflect the specific projections, expectations, and normative assumptions being made in the reports reviewed about how the industry will evolve. Anticipated shifts often highlight the opportunities and imperatives for innovation, reform, or capacity-building in response to identified trends. For instance, anticipated shifts may assert that firms will need to adopt digital tools to remain competitive or that sustainability standards will be embedded into statutory frameworks. These statements represent dominant narratives in industry foresight but are not necessarily uncontested.

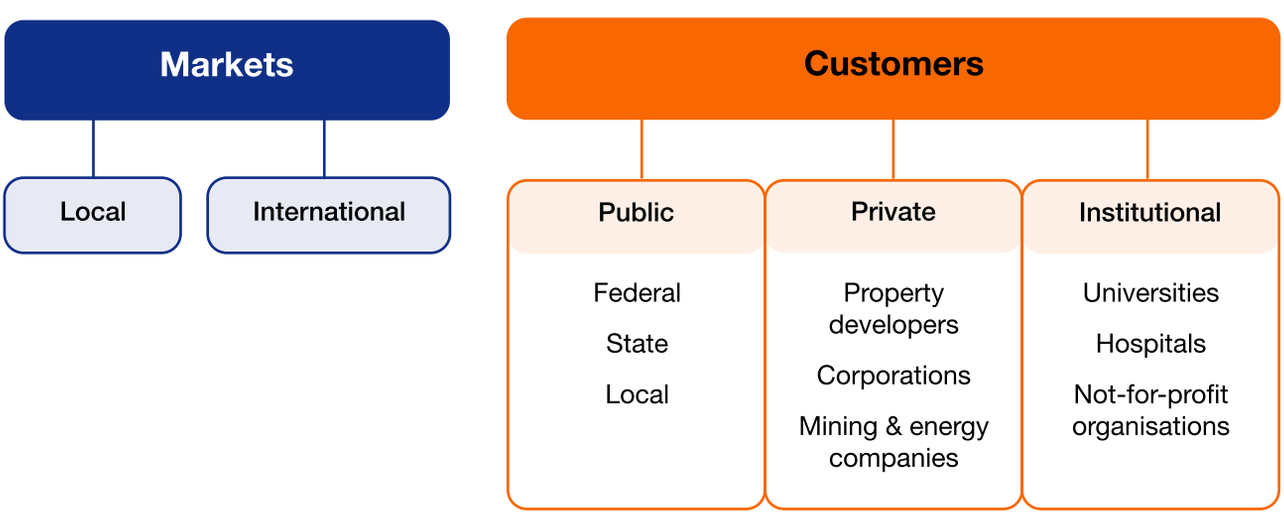
To critically assess the robustness and implications of these trends and anticipated shifts, we identify potential *complications* which might come about when new knowledge not covered by the reports is accounted for: concerning how human values and practices are likely to shape and influence possible futures in the industry. For example, a complication may highlight: how digital transformation policies risk reinforcing workforce inequalities if they fail to address existing digital divides; how ground-up everyday worker innovations might support unexpected digital transformations; or the emergence of a visionary tech-startup founder driving a new technology in the industry. By surfacing these complications, we pave the way towards critical scrutiny and inclusive foresight in shaping just transitions to technological and sustainable construction futures.

Domain 1:
Markets and Customers



The reports reviewed understand the Australian construction industry's future trajectory as profoundly shaped by dynamic shifts in demographic patterns, urban development, infrastructure demands, economic trends and technological innovation.

Across the reports reviewed, markets and customers are seen as critical domains through which the sector must navigate complex socio-economic and regulatory landscapes. By markets, the reports refer to both local and international markets that influence and are influenced by the construction industry. Similarly, customers refer to a diverse range of actors across public, private, and institutional sectors. Government clients include federal, state, and local levels and commission large-scale infrastructure projects. The private sector includes property developers, corporations, and mining and energy companies investing in residential, commercial, and industrial construction while institutional clients include universities, hospitals, not-for-profit organisations, etc. In addition, individual customers include owner-occupiers and property investors who commission residential homes, renovations, and extensions.



In this domain, population growth, driven predominantly by urbanisation and demographic diversification, is pitched as underpinning escalating demand for housing, infrastructure, and services, and as compelling the industry to expand capacity while addressing inclusivity and sustainability imperatives. Concurrently, infrastructure development is positioned as a strategic economic enabler, necessitating advanced project delivery capabilities and integrated stakeholder engagement. Technological advancements are seen as further disrupting traditional processes, promising enhanced efficiency and innovation, yet also raising concerns regarding equitable access and sectoral disparities. Together, these trends highlight the multifaceted challenges and opportunities that the reports reviewed suggest construction markets and customers face amid evolving environmental, economic, social, political and regulatory expectations.

Trend 1: Population Growth

Across the reports reviewed, population growth is identified as a core driver of future demand in the construction industry. Australia's sustained demographic expansion, particularly in urban centres, is framed as placing increasing pressure on housing, infrastructure, and urban services (Newman et al. 2025).

Anticipated Shift 1:

Construction delivery must scale to meet rising housing and infrastructure demands in the midst of economic challenges

Reports highlight that the construction sector must significantly accelerate the pace and scale of housing development to meet the demands of population growth. Particular emphasis is placed on the expansion of high-density and mixed-use developments in metropolitan areas. However, rising inflation presents a critical challenge, as it increases construction costs and places financial pressure on builders, potentially undermining project feasibility and sectoral resilience.

> *Investment in sustainable infrastructure today can unlock long term social, environmental and economic objectives enabling society to flourish as our population grows and urbanises* (ISCA et al. 2020: 24).

Concerns regarding high inflation could prompt further tightening of monetary policy and prolonged higher interest rates by the Reserve Bank of Australia (RBA), exacerbating the sector's challenges with higher interest rate costs for builders and consumers (QBE 2024: 7).

Broader economic uncertainty, including concerns about global economic conditions and domestic economic policies, leading to reduced investment in property. Developers are currently adopting a more cautious approach, which includes delaying or cancelling projects (RLB 2024: 5).

Anticipated Shift 2:

Population heterogeneity requires inclusive and adaptable design approaches to housing

The reviewed reports recognise that growing demographic complexity (such as vulnerable populations, multicultural communities, and changing family structures) will require housing and infrastructure that are flexible and context-sensitive. Alongside demographic changes, the reports define consumers as appreciating the comfort and cost savings associated with sustainable homes, but frequently lacking the technical understanding or agency needed to identify, assess, or advocate for such features. As a result, the reports call for design and communication strategies that are not only adaptable to diverse life-course needs but also accessible and intelligible to a broad range of users, ensuring that the benefits of sustainable design are equitably understood and realised.

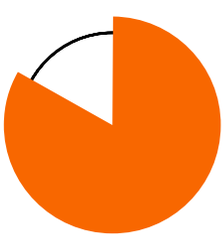
> *Research shows that, while consumers value the benefits of comfort and affordability provided by sustainable homes, they lack the technical language and knowhow to ask for these features* (ASBEC 2021: 8).

> *Australia has an established disclosure scheme for commercial office buildings, but lacks one for residential properties. This means that many homeowners and tenants are choosing homes to buy or rent without adequate information about their expected energy performance, comfort and likely future energy costs* (ASBEC 2021: 9).

Anticipated Shift 3:

Urban planning is expected to prioritise sustainability, affordability, and livability

Reports draw on existing statistics to indicate that changing population dynamics are influencing planning agendas, prompting a stronger focus on integrated transport systems, inclusive public spaces, and environmentally responsive infrastructure. These elements are increasingly framed as essential to ensuring that urban growth supports both equitable access and long-term resilience and are line with Australian Government's urban goals namely, liveable and equitable, productive and innovative, sustainable and resilient as per the National Urban Policy 2024 (Australian Government 2024c). All of these planning agendas have implications for future construction projects, and the planning frameworks which will shape them.



80%

of Australia's population lives in our 20 largest cities.

> *Nearly 80 percent of Australia's population lives in our 20 largest cities. Most people in Australia live in urban areas. How our cities are designed, planned and managed has a profound impact on the daily lives of people. The quality of urban places and the connections between them impact access to basic services, our participation in community life and the amount of time we can spend with friends and family* (Australian Government 2024c: 6)

> *Government investment in infrastructure is an opportunity to maximise resilience and climate change outcomes for the community* (ASBEC 2021: 15)

> *People are choosing to live in cities because of the access to jobs and amenity they provide. Liveability and sustainability are essential to attracting and retaining people and ensuring the efficient and productive operation of our cities. People want to live in places with easy access to parks, schools, community facilities, and reasonable travel times to work and services. Creating liveable places is not optional for governments; it is essential. Liveability is intrinsically linked to economic growth and will play a key role in maximising the opportunities of population growth in our cities in the future*
> (Infrastructure Australia 2018: 3)

Anticipated Shift 4:

Planning and policy systems will need to integrate demographic data into future infrastructure planning

The reports argue that planning and policy frameworks should make better use of demographic forecasting to inform how and where infrastructure is delivered. This includes using statistics and quantitative data on population to shape decisions about where to invest in new housing, transport, and public services, as well as how to structure zoning regulations and plan the timing and order of development. By aligning infrastructure delivery more closely with projected population growth and movement, policymakers aim to ensure that future communities have access to the services and amenities they need.

Good sequencing requires collaboration across levels of government and with industry, as well as a shared understanding of infrastructure needs through the lens of outcomes for a place and community, rather than outcomes for a sector (Infrastructure Australia 2018: 2).

Policymakers must strike a balance between, on the one hand, providing minimum levels of quality, amenity (both to future occupants of the house and the local community) and environmental protection, and on the other, providing affordable housing for a growing population (Australian Government Productivity Commission 2025: 44).

Infrastructure assets are long-term investments, lasting decades into the future. Historically, infrastructure has shaped the long-term physical, social and economic development of Australia's cities, towns and regional areas (ISCA et al. 2020: 12).

Complications:

Risks of inequality and technocratic assumptions in planning

Population growth is often presented in reports as a neutral, quantifiable trend that justifies particular infrastructure and housing decisions. This approach obscures the more complex social and spatial everyday realities that shape how and where people live (James et al. 2021). For instance, reports do not sufficiently address how speculative property development, rising housing costs, and restrictive zoning rules contribute to uneven access to housing and services (Giles-Corti et al. 2022).

Moreover, the industry adopts a catch all categorisation of ‘customer’, which is often a one-dimensional characterisation of varied, diverse actors. This leads to overlooking the specific needs of different groups such as renters, recent migrants, First Nations communities, and people living on low incomes, whose experiences of housing insecurity are shaped by broader histories of exclusion and marginalisation (AHURI 2025). The idea that future housing needs can be met simply by building more, and doing so more quickly, assumes that all communities will benefit equally from such growth. This approach fails to account for questions of fairness, the importance of involving communities in decisions about their neighbourhoods, and the need for housing and infrastructure that reflect diverse cultural social and physical needs.

Trend 2: Increased Urbanisation

The reports reviewed position urbanisation as a key force reshaping the spatial and functional orientation of construction. Rapid growth in metropolitan regions is creating demand for vertical, high-density, and mixed-use developments within increasingly constrained and contested urban spaces.

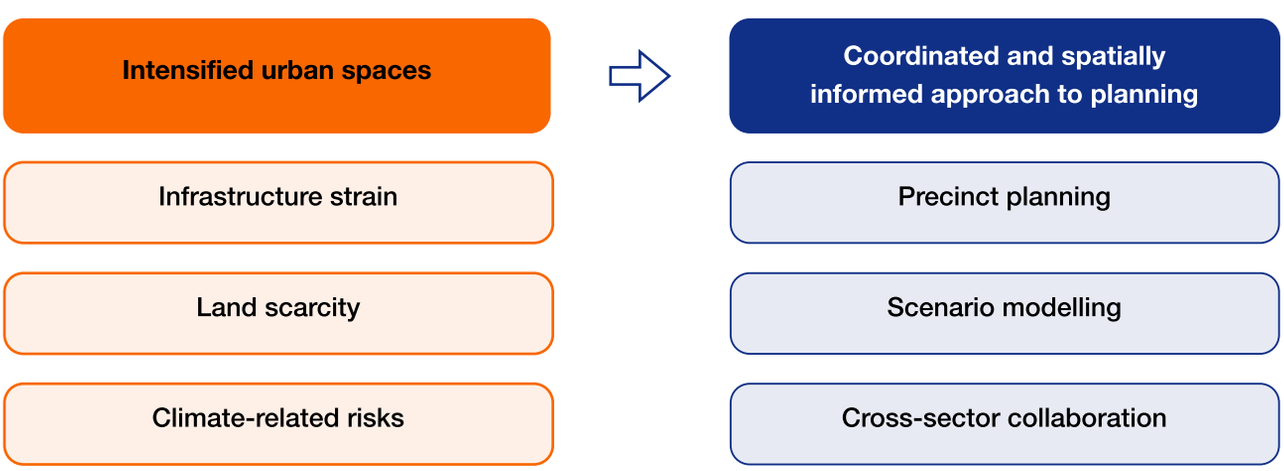
Anticipated Shift 1:

Integrated spatial planning will be critical to managing urban complexity

Along with increasing populations, it is projected that urban spaces will be intensified leading to increased demand for coordinated planning that addresses infrastructure strain, land scarcity, and climate-related risks.

Reports call for a coordinated and spatially informed approach to planning including precinct planning, scenario modelling, and cross-sector collaboration. These measures are seen as shaping a stable and predictable construction environment which would be resilient against pressures generated by population growth, shifting demographic patterns and climate-related risks (flooding, heat stress, and bushfire threats) could generate inefficiencies and delays across the construction pipeline. The absence of such measures is seen as: impacting the feasibility of developments; increasing project delivery risks; and undermining long-term sustainability goals.

> *The dual challenges of rapid population growth and the increasing urban infill task place us at a crucial moment in the development of our cities. Governments need to act now to preserve and enhance their world-renowned livability. To do this, our urban planning, funding, governance, and delivery practices need to evolve and adapt* (Infrastructure Australia 2018: 4)



Anticipated Shift 2:

Design and construction innovation will be necessary to support urban densification

Reports emphasise the need for architectural, structural and material innovation to accommodate growing populations in limited spaces while maintaining liveability and environmental performance. These include modular and prefabrication construction methods, mass timber systems, post-tensioned concrete slabs and increased retrofitting are gaining more interest as efficient solutions for urban housing needs. In addition, novel materials such as the increased adoption of green material in reducing the carbon footprint and enhancing the durability and performance of structures are presented.

> ***Technological advancements present positive opportunities for industry growth. Modular construction, driven by demand for sustainable building practices, could transform the construction landscape for commercial premises, public buildings, and residential dwellings*** (QBE 2024: 13)

Anticipated Shift 3:

Construction activity will increasingly focus on infill, renewal, and retrofitting

Urbanisation is anticipated to shift the geographic and functional focus of construction towards brownfield development and upgrading existing structures, particularly in dense areas.

> ***We recommend that the Australian Government complement state and territory-based energy efficiency programs by focusing on policies that would encourage 'deep retrofits' to whole buildings, which go beyond single technology upgrades and take an integrated approach*** (ASBEC 2021: 28)

Complications:

Displacement, gentrification, and environmental risk

Although reports highlight the promise of urban densification, they often understate the risks to marginalised communities (James et al. 2021). High-density developments can exacerbate social exclusion, lead to displacement, and increase environmental risks. Urban renewal frequently contributes to gentrification unless governed by strong equity frameworks (Morris 2019). Furthermore, technical planning often sidelines community voices and ignores the affective dimensions of place, attachment, and belonging that shape urban life (Anthony 2024).

Trend 3: Introduction of New Technologies

Australian construction industry reports consistently portray technological innovation as a transformative driver of change across the sector, fundamentally reshaping market practices, project delivery models, and regulatory frameworks. Technologies are not only viewed as tools for enhancing productivity and efficiency but are also framed as essential to addressing broader industry challenges such as labour shortages, sustainability goals, and the need for improved safety and quality assurance.

Moreover, technologies like Building Information Modelling (BIM), digital twins, automated machinery, Artificial Intelligence (AI) enabled project management tools, and advanced materials are reshaping how projects are conceptualised, coordinated, and delivered. These technologies are becoming increasingly embedded across all phases of the construction lifecycle from planning and design to execution and maintenance.

Anticipated Shift 1:

Digital technologies will reshape the construction lifecycle

Widespread adoption of tools such as Building Information Modelling (BIM), AI, and prefabrication is anticipated to change coordination, sequencing, and real-time decision-making across the construction process.

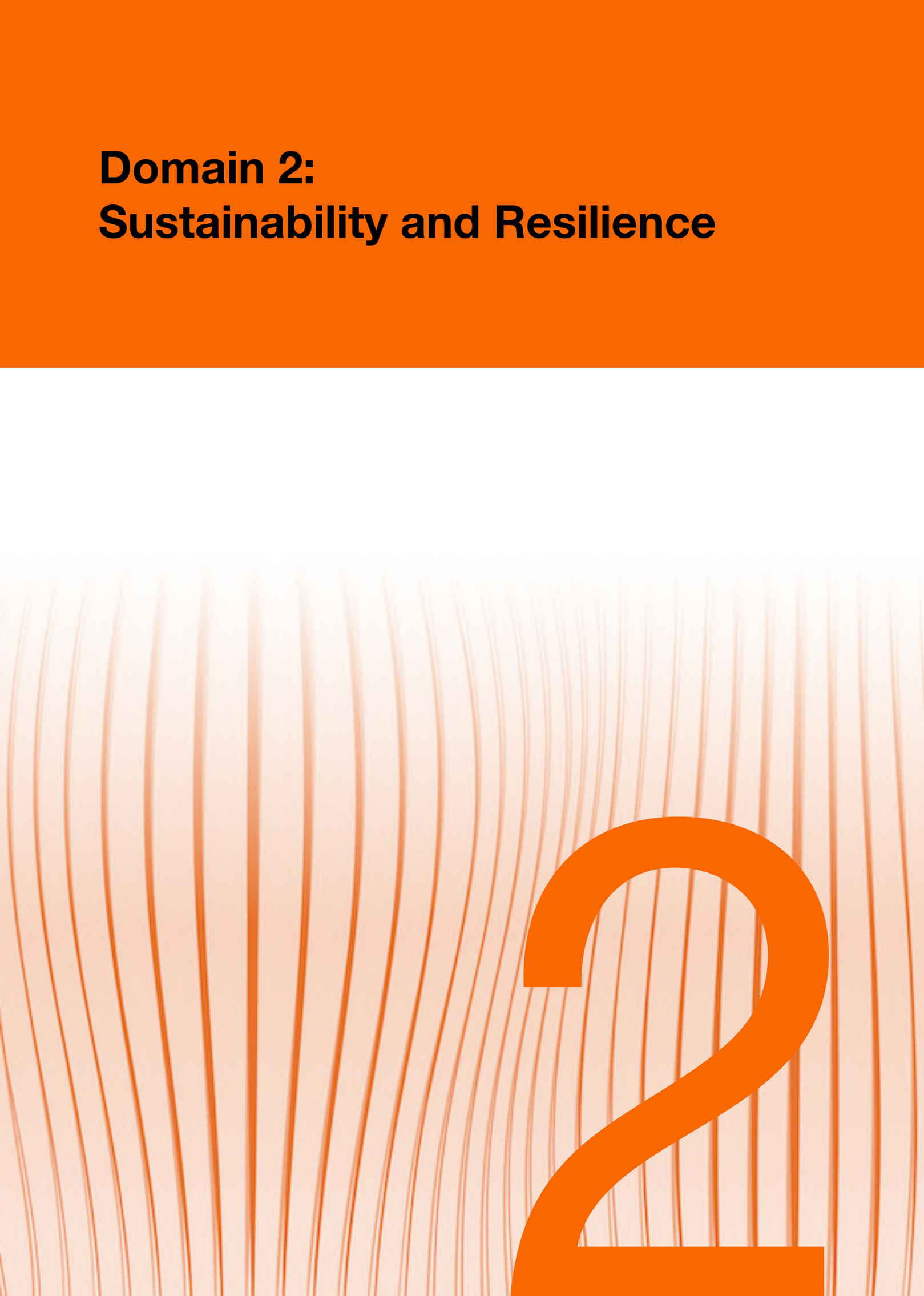
> ***The adoption of digital technologies such as Building Information Modelling (BIM), drones, and AI for project management and design is expected to accelerate. These technologies can enhance efficiency, reduce errors, and improve project outcomes*** (RLB 2024: 3).

Complications:

Risks of concentration, exclusion, and uneven uptake

While technological innovation in construction is widely promoted as a pathway to increased productivity, improved quality, and sustainability, the impacts of digital transformation are neither uniform nor universally beneficial (Chaaya et al. 2025). A major concern is the capacity gap between large firms and small and medium-sized enterprises (SMEs). Larger companies typically possess greater financial resources, dedicated technology teams, and strategic planning capabilities that enable them to invest in and integrate advanced digital tools such as Building Information Modelling (BIM), automation, and digital twins. In contrast, many SMEs face substantial barriers including limited capital, insufficient digital skills, and lack of access to tailored training programs. As a result, these smaller firms are often slower or unable to fully adopt emerging technologies, creating a growing divide in competitiveness and innovation capacity across the industry (Temel & Durst 2021).

Domain 2:
Sustainability and Resilience



Sustainability and resilience have emerged as defining imperatives for the construction industry, driven by escalating climate risks, evolving regulatory frameworks, and shifting societal expectations.

The domain encompasses a broad spectrum of challenges, including the adaptation of infrastructure to climate change impacts, the urgent global transition to net zero emissions, and the comprehensive accounting of both operational and embodied carbon emissions across construction lifecycles. Central to these developments is the growing adoption of electrification and green materials, which are positioned as critical levers for decarbonisation and ecological integration. The reviewed reports collectively underscore how sustainability priorities are reshaping industry practices, regulatory standards, and market incentives, while simultaneously exposing complexities related to equitable adaptation, transparency, and resource dependencies. This domain thus demands a holistic and intersectional approach that recognises the technical, political, and social dimensions of sustainability and resilience in construction, highlighting the need for inclusive governance, systemic innovation, and critical scrutiny of emerging environmental claims.

20%

of the building sector in Australia is responsible for all emissions.

> *The building sector in Australia is responsible for one fifth of all emissions. As such, delivering net zero carbon buildings is of great importance for tackling the climate emergency in Australia. The significance of this is more prominent as Australia's building stock is estimated to double by 2050 based on the 2019 level* (Prasad et al. 2021: 15)

> *The Australian Infrastructure Audit 2019 observes that Australian governments often do not incorporate sustainability or resilience into infrastructure projects, and warns that without taking action to reduce emissions, Australia is risks failing to meet its international climate change commitments* (ISCA et al. 2020: 13).

7,000+

new jobs could be created if Australia accelerates its transition to sustainable housing.

> *Accelerating Australia's transition to sustainable housing could both protect the home building sector, as well as spur growth in delivering more than half a billion dollars of additional investment in the construction industry by 2030 and create over 7,000 new jobs. It would also save Australians $600 million on their energy bills* (ASBEC 2021: 9)

> *There is also an increasing pool of green finance allocated exclusively to sustainable projects. Green finance can take the form of green bonds, loans linked to emissions performance, or finance allocated exclusively to climate change solutions* (ISCA et al. 2020: 22)

Trend 1: Impacts of Climate Change

The reports reviewed highlight that the construction industry is being driven by escalating climate change challenges such as rising global temperatures, extreme weather events, and sea-level rise to develop infrastructure that is adaptive, resilient, and able to withstand climate-related risks.

> *Australia has identified climate change, and the related need for mitigation (reducing emissions) and adaptation, as a key future trend for Australia that will have implications for our infrastructure over the coming 15 years and beyond* (ISCA et al. 2020: 13)

> *Australia's transition to a net zero economy is necessary, inevitable and urgent. Among developed countries, Australia is one of the most vulnerable to the impacts of climate change. The impacts of nearly 1.5 degrees of warming can already be seen in trends of declining rainfall in the south-east and south-west, an increase in extreme fire weather and longer fire seasons, higher sea surface temperatures, rising sea levels and increasing ocean acidification* (Climate Change Authority 2024: 16).

> *Based on observed changes and modelled projections from Section 3.1, there is high confidence that Victoria will continue to become hotter and drier in the future and sea levels will continue to rise. However, how these changes will affect the built environment at a local scale is less certain* (Victoria State Government 2022: 20).

Anticipated Shift 1:

The industry will be required to integrate climate risk assessment into project planning and delivery frameworks.

Industry reports emphasise the growing necessity of embedding climate risk considerations into every phase of the construction lifecycle from initial site selection and design to material specification and long-term infrastructure resilience. Climate risk assessment is positioned not merely as a precautionary measure but as a foundational component of responsible construction project governance. The reports reviewed suggest that by incorporating future climate projections such as extreme weather events, rising temperatures, and sea level rise, these assessments enable more robust decision-making processes. These, it is claimed, will subsequently enhance structural durability, safeguard investments, and align with emerging regulatory and insurance requirements.

> ***Building design, planning and zoning should also consider future climate conditions and risk to ensure buildings have energy security and minimise exposure to climate and natural disaster risk*** (Climate Change Authority 2024: 156).

Anticipated Shift 2:

Innovative materials and design approaches will become standard to respond to climate-related risks.

Reports suggest that innovative construction materials and adaptive design solutions will become increasingly common with increasing climate related risks. Materials engineered to withstand environmental extremes, are expected to play a central role in enhancing structural resilience. These material innovations, combined with climate-adaptive architectural techniques, will no longer be niche or experimental but become necessary elements of best practice. This shift reflects both a pragmatic response to intensifying climate threats and a regulatory push towards embedding long-term sustainability into the built environment.

> ***The costs of net zero products are expected to decline over time as key inputs are produced more efficiently, innovation barriers are overcome and efficient infrastructure is established*** (Australian Government 2024a: 23).

Anticipated Shift 3:

Stakeholder expectations including those of insurers, financiers, and communities, will prioritise risk mitigation and adaptive capacity.

The reports reviewed highlight a broadening of stakeholder influence on construction standards, with financial institutions, insurance providers, and community groups increasingly demanding evidence of climate risk management. Risk mitigation and adaptive capacity are no longer viewed solely as environmental concerns but as critical components of investment security and community wellbeing.

> ***In Victoria, insurance costs could increase as elevated climate risk is factored into premiums. There is also a mortgage risk for properties impacted by climate change. Over time, this is likely to have implications for land use planning. Closer liaison between the insurance and banking industry with strategic planning is a future priority*** (Victoria State Government 2022: 37)

Complications:

Unequal Adaptation and the Political Economy of Resilience

While resilient design is increasingly prioritised in Australia's construction and urban development sectors, the framing of resilience often overlooks the political economy of risk. Within the built environment, construction-led adaptation efforts may inadvertently reproduce or exacerbate existing socio-spatial inequalities, as the benefits of resilience are not equitably distributed. Affluent communities and high-value urban precincts tend to attract investment in resilient infrastructure and protective design, while lower-income or marginalised communities often face barriers to accessing such interventions. These interventions are sometimes critiqued as forms of "green gentrification" when they fail to address questions of displacement, access, and long-term affordability (Sharifi et al. 2021). Such dynamics raise critical concerns about who the construction of resilient futures is designed to serve, and who remains structurally excluded.

Trend 2: Global Transition to Net Zero Emissions

As governments and industries align with net-zero goals, the construction sector is facing pressure to radically transform from a range of actors including regulators, investors, industry bodies, clients, and civil society to develop low-carbon, climate-resilient, and socially equitable approaches to building and infrastructure. This includes not only reducing emissions but also rethinking the very foundations of how buildings are designed, financed, and operated within a carbon-constrained world.

Anticipated Shift 1:

Construction firms will adopt low-emission technologies, machinery, equipment, and renewable-powered operations.

The reviewed reports indicate a growing momentum within the construction sector towards the adoption of low-emission technologies, including electrified machinery and renewable-powered site operations. This shift is driven by both environmental concerns and the economic rationale of reducing reliance on diesel, especially as fuel costs rise and emissions regulations become more stringent. The need to decarbonise construction sites has prompted the exploration of alternatives to diesel fuel, with several contractors expressing a willingness to implement fossil-free solutions in upcoming projects even in the absence of formal regulatory requirements.

In addition, industry trends suggest a shift from ownership to hiring of construction machinery, particularly as newer, function-specific, and low-emission equipment becomes more expensive. Since hired machinery typically has higher annual usage rates than purchased equipment, it plays a critical role in meeting decarbonisation targets and should therefore be explicitly included in emerging policy frameworks. As technological advancements continue and policy support strengthens, electrification and renewable energy use are expected to become integral to standard construction practices.

> *The need for decarbonisation of construction sites has led to the emergence of future options for diesel fuel alternatives* (Smith et al. 2022: 23)

Anticipated Shift 2:

Green certifications, carbon budgeting, and lifecycle reporting will become central to project evaluation and financing.

The reviewed reports highlight a growing emphasis on sustainability metrics such as Green Star certifications, carbon budgets, and whole-of-life emissions reporting as critical components of project assessment and financing. These tools are increasingly recognised not only as regulatory requirements but also as essential indicators of project viability in the eyes of investors, planners, and government bodies. As pressure from asset managers and institutional investors intensifies, firms are being called upon to demonstrate robust climate risk strategies and environmental disclosures.

Failure to align with net-zero pathways may limit access to capital markets, as projects deemed incompatible with long-term emissions targets face heightened credit risks, insurance challenges, and constrained investor interest. Moreover, mechanisms such as planning incentives (e.g., density bonuses or expedited approvals) are emerging as policy tools to reward developers who meet best practice standards in building performance. As such, the integration of sustainability credentials is expected to become a baseline expectation across all stages of construction, from planning and financing to delivery and post-completion reporting.

> ***Responding to climate change risks is becoming critical for accessing capital markets. For investors, the transition risks of climate change have flow-on effects for insurance premiums, credit risks and portfolio value-at-risk (a measure of an investment portfolio's exposure to risk over a given timeframe). As investors increasingly align their portfolios to net zero emissions in order to hedge these risks, infrastructure projects that are incompatible with net zero emissions in 2050 will face a restricted pool of financing and insurance*** (ISCA et al. 2020: 22)

> ***The provision of planning incentives to homebuyers and builders that commit to best practice is an important mechanism that has largely been overlooked in the national policy mix. Planning incentives such as density bonuses and green door policies would support the accelerated deployment of high performing new buildings by targeting one of the highest priorities for building developers – the cost and time invested and the uncertainty of planning processes*** (Green Building Council Australia & Property Council of Australia 2019: 18).

Anticipated Shift 3:

Emissions accountability will redefine competitive advantage and investment attractiveness in the sector.

Across the reviewed literature, carbon transparency and emissions accountability particularly in relation to embodied carbon are increasingly recognised as critical determinants of reputational and financial standing within the construction industry. As attention to embodied emissions continues to grow, companies are expected to face rising expectations to demonstrate clear emissions reduction pathways and adopt credible climate reporting practices.

> *NABERS is developing a national framework to allow building owners to set robust and measurable targets for reducing embodied emissions in buildings, enhance transparency and reporting to investors, and enable organisations to set embodied carbon targets for the buildings they will occupy. This framework will help increase the demand for low-carbon design practices and construction materials from the construction industry, creating a common language for embodied carbon emissions in Australia* (KPMG 2023: 20).

Anticipated Shift 4:

Regulatory and market instruments will reinforce alignment with global climate agreements and national decarbonisation strategies.

The reports underscore that national and international policy frameworks such as the Paris Agreement and Australia's decarbonisation roadmap will shape the future operating environment of the construction sector. Firms will be subject to a growing mix of regulatory measures, including emissions caps, environmental levies, and procurement requirements that prioritise low-carbon outputs. Simultaneously, voluntary market-based mechanisms, such as green bonds and carbon offsetting schemes, are anticipated to further incentivise alignment with climate goals.

> ***The transition to net zero involves much more than each sector moving along technology-based decarbonisation pathways. A zero-carbon mindset must become the new normal so that it permeates operational, policy and investment and purchasing decisions across governments, businesses and households*** (Climate Change Authority 2024: 9).

There will also be a growing emphasis on sustainable construction practices, driven by regulatory requirements and consumer demand for eco-friendly buildings (RLB 2024: 3).

Complications:

Regulatory Assumptions and the Hidden Costs of Decarbonisation

In the construction industry, complying to emerging standards and regulation can be difficult to achieve specifically for some actors. For instance, lifecycle decarbonisation initiatives (such as carbon accounting, reporting obligations, and material disclosure requirements) can impose significant financial and administrative burdens, particularly on small and medium-sized enterprises (SMEs), who may lack the resources to adapt at scale. Moreover, the fragmented structure of the construction sector in Australia characterised by extensive subcontracting, sole-trader operations, and variable project delivery models (Uher & Runeson 2006), further complicates the implementation and verification of carbon reduction measures.

Trend 3: Expanding Carbon Accountability from Operational to Embodied Emissions

Carbon accountability in construction has traditionally focused on operational emissions such as those from heating, cooling, and lighting buildings. However, recent reports indicate a growing shift towards recognising embodied emissions: the carbon generated through the extraction, production, transport, and disposal of building materials like concrete, steel, and aluminium. This reflects increasing regulatory and market pressure to address the full lifecycle of emissions. Tools such as Environmental Product Declarations (EPDs) and Life Cycle Assessment (LCA) software are gaining traction, particularly in public infrastructure and Green Star-certified projects. This shift marks a move towards whole-of-life carbon accounting in the construction sector.

Anticipated Shift 1:

Policies and building codes will increasingly mandate embodied carbon disclosure and reduction targets.

Across the reviewed reports, there is a clear indication that regulatory frameworks both in Australia and internationally are moving towards mandatory disclosure of embodied carbon as part of building and infrastructure approvals. These policies are designed to extend decarbonisation efforts beyond operational energy use by setting benchmarks for the entire life cycle of construction projects. The adoption of embodied carbon targets reflects a shift in environmental regulation, where whole-of-life carbon performance becomes a statutory requirement, not just a voluntary standard.

> ***The Federal Government should embed sustainability in City Deals by associating investment in projects with clear requirements around emissions reduction and climate adaptation and resilience in our buildings, cities and communities.*** (ASBEC 2021: 16)

Anticipated Shift 2:

Demand for lifecycle carbon tools, transparent reporting, and verifiable data will grow.

As embodied carbon becomes a focal point of regulatory and market attention, demand for tools and systems capable of accurately quantifying lifecycle emissions is projected to expand significantly. Reports anticipate a burgeoning market for carbon accounting related software. These systems will be essential to meet compliance requirements, support investor due diligence, and ensure credibility in sustainability claims.

> ***The industry is already working on ways to support the acceleration of low embodied carbon materials at the supply side – for example low carbon versions of concrete and steel. Government can seize this opportunity rapidly by leveraging existing agencies that drive financing for early speed to market approaches, such as the Clean Energy Finance Corporation (CEFC) and Australian Renewable Energy Agency (ARENA), and explore ways in which these low carbon technologies can be rapidly integrated into the market, such as through establishing voluntary industry-agreed technical specifications*** (ASBEC 2021: 22)

> ***Carbon markets are already playing a key role in helping Australia reach its net zero targets. With sufficient demand for carbon credits, carbon markets can spur investment in low carbon technologies and projects that generate credits*** (Australian Government 2024b: 71)

Anticipated Shift 3:

Supply chains will shift towards low-carbon materials, recycled content, and circular design principles.

This shift encompasses both upstream innovation and downstream procurement reform, with increasing attention being given to the environmental credentials of construction materials. Across industry reports, there is a consistent call for prioritising low-carbon materials including recycled and bio-based options as well as for embedding circular design principles that allow for reuse, disassembly, and extended material life cycles.

Material choices are no longer seen as neutral or merely cost-driven; instead, they are framed as key levers for decarbonisation. Reports stress that sustainable procurement frameworks must go beyond energy efficiency at the operational stage to address the full lifecycle of materials, especially in relation to carbon-intensive products such as concrete, steel, aluminium, and plasterboard. This requires coordinated action on both the supply and demand sides: investment in low-emissions innovation, scaling up manufacturing capacity for sustainable products, and cultivating a construction workforce skilled in using and specifying such materials.

> *The transition to low carbon, resilient buildings cannot be achieved without improving the skills and capacity of the workforce. To grow the market's capacity to deliver sustainable, resilient buildings, Australia must have a construction supply chain that can meet the needs of each industry sub-sector and jurisdiction* (Green Building Council Australia & Property Council of Australia 2023: 19).

> *The Australian Government should target embodied carbon through a mixture of supply side and demand side strategies, that support innovation for low emissions products and materials whilst growing their demand in the market. It should also start to explore how to address embodied carbon at the policy and supply chain level* (ASBEC 2021: 21).

Complications:

Transparency Challenges and Hidden Externalities in Embodied Carbon Accounting

Accounting for embodied carbon in construction is inherently complex due to the fragmented, globalised, and opaque nature of material supply chains. One of the primary challenges lies in the lack of standardised methodologies and data reporting protocols across jurisdictions, which makes comparisons between projects inconsistent and often unreliable (Pomponi & Moncaster 2016). Furthermore, supply chains for construction materials often span multiple countries with varying environmental regulations and data transparency standards, making it difficult to trace upstream emissions accurately.

Additionally, challenges exist in lifecycle assessment (LCA) tools specifically in identifying environmental related impacts such as effects on biodiversity, resource depletion etc. due to lack of data (Barbhuiya & Das 2023). These omissions lead to underestimations of true embodied carbon and raise ethical questions about what counts as a legitimate boundary of assessment. Even advanced digital platforms designed to support embodied carbon accounting may reinforce these challenges, given their dependence on incomplete or non-transparent data inputs and assumptions that are not always accessible to end-users. As a result, embodied carbon assessments remain a technically demanding and politically contested terrain within sustainable construction practices.

Trend 4: Electrification as a Pathway to Low-Carbon Construction Futures

Electrification is gaining prominence as a viable route to reduce emissions across construction processes. By shifting from fossil fuels to electric systems especially those powered by renewables, construction activities can better align with clean energy transitions and regulatory expectations.

> *If renovation and re-use is not an option, other principles can help reduce embodied carbon during various stages of a building or infrastructure project. Leadership and innovation in the building and infrastructure sectors has led to development of tools and data for calculating embodied carbon and these are becoming increasingly available and accessible. This includes life cycle assessment based design tools and product labelling such as Environmental Product Declarations* (CEFC 2021: 18)

Anticipated Shift 1:

Electrification of equipment, heating/cooling systems, and site operations will become standard practice.

The reviewed reports consistently project a shift towards electrification across multiple facets of construction activity. Similarly, heating and cooling systems in new builds are anticipated to transition to electric models, such as heat pumps, which offer significant efficiency and emissions benefits. This trend is forecast to reshape site operations, with electrification positioned as a foundational strategy for reducing direct emissions, lowering noise pollution, and improving air quality.

> ***Nearly all gas appliances within buildings can be switched to electric alternatives already, and considering the challenges involved in phasing out emissions in other sectors, which may require the purchase of offsets or sequestration of carbon, it is likely that gas appliances in buildings will not be a productive choice in a zero carbon environment. With an average life of around 10-15 years (but often much longer, particularly for less wealthy households), this implies that gas appliances should be disincentivised in the near future, and phased out by around 2030 at the latest*** (ASBEC 2016: 93)

Anticipated Shift 2:

Policy incentives will reinforce the uptake of electrified systems and penalise carbon-intensive alternatives.

Policy settings are increasingly geared towards reinforcing the adoption of electrified systems while disincentivizing continued reliance on carbon-intensive technologies. As electrification emerges as a key decarbonisation pathway, government support is expected to prioritise upgrades to space conditioning systems and household appliances over additional rooftop solar deployment. With solar uptake already high across the Australian building stock, the marginal efficiency and economic returns of further installations are diminishing.

In contrast, electrifying heating, cooling, and hot water systems offers greater emissions reductions and cost savings per unit of investment. Reports note that as dynamic electricity pricing and lower feed-in tariffs reduce the financial benefits of solar, households will derive the highest energy bill savings from thermal efficiency upgrades and electric appliances. Recent policy shifts such as the phasing out of mandatory gas connections in new residential buildings further underscore this transition.

> ***In the near future, it will be more cost-effective for policy to support thermal upgrades – space conditioning appliances and electrification of appliances – rather than solar installation.*** (Climateworks Centre 2023: 23)

Anticipated Shift 3:

Building codes and infrastructure planning will evolve to support electric-ready construction environments.

The shift towards electrified construction is prompting updates to regulatory frameworks, energy standards, and planning systems. Reforms to the National Construction Code now require provisions for battery storage and electric vehicle charging in certain building categories, signalling a move towards electrification as standard practice.

These regulatory changes are complemented by upgrades to electricity distribution networks to accommodate rising demand from all-electric buildings. Government incentives for adopting electric appliances and storage systems are also expanding, aiming to build industry capacity and accelerate adoption. As electrification becomes embedded across planning and delivery phases, the construction sector will require new technical capabilities, infrastructure coordination, and design approaches to meet emerging compliance and performance expectations.

> ***Legislative support for all-electric developments is strengthening, with previous mandates for gas infrastructure installation being revoked.*** (Green Building Council Australia 2022: 4).

Complications:

Infrastructure Inequities and Resource Dependencies in Electrification Pathways

The transition towards electrified construction practices is often framed as a technologically feasible and environmentally responsible trajectory. However, this framing tends to obscure underlying infrastructural and socio-economic disparities. Electrification requires substantial upfront capital investment, skilled labour, and reliable access to electrical infrastructure, factors that are unevenly distributed across geographic and institutional contexts (Sovacool et al. 2021). Small and medium-sized enterprises (SMEs), as well as contractors operating in regional and remote areas, may lack the financial or technical capacity to adopt electric machinery, potentially exacerbating existing inequalities within the construction sector.

Furthermore, the global shift towards electrification intensifies demand for critical minerals, many of which are sourced from geopolitically sensitive regions with significant environmental and human rights concerns (Ali et al., 2017). These dependencies introduce risks that may compromise the long-term sustainability and ethical legitimacy of electrified supply chains.

Trend 5: Mainstreaming Green Materials in Construction Supply Chains

Green materials are emerging as essential to the sustainability agenda in construction. From recycled content to bio-based composites, these materials promise to reduce environmental impacts while advancing circular economy principles and improving building performance. The reports reviewed indicate that sustainable and low-carbon materials are anticipated to become foundational across infrastructure and building projects as the industry responds to escalating climate targets, investor expectations, and procurement standards. In particular, government and industry-led strategies increasingly frame material sustainability as a core criterion in project planning and delivery, rather than an optional add-on. In addition, several reports point to the strategic importance of expanding domestic manufacturing of green materials. This is driven not only by climate considerations but also by geopolitical risks, supply chain disruptions, and the need to reduce reliance on high-emission imports.

Anticipated Shift 1:

Sustainable and low-carbon materials will become foundational across all infrastructure projects to meet climate targets and improve performance outcomes

Across the reviewed reports, the integration of green materials is positioned as essential not only in building construction but also in broader infrastructure delivery such as transport, energy, and water systems. These materials are increasingly tied to government procurement policies, sustainability rating tools, and lifecycle carbon requirements. Their adoption is framed as contributing to multiple outcomes: meeting regulatory compliance, achieving environmental certifications, lowering embodied carbon, and improving resilience under changing climate conditions. Moreover, using green materials is associated with reputational advantages for firms and long-term cost savings through durability, reduced energy consumption, and alignment with emerging funding and investment criteria.

> ***To decarbonise transport infrastructure, the main emissions reduction pathways will be through materials (low-carbon input materials such as green steel, concrete/cement, asphalt, aluminium and low-carbon recycled materials) and design (circular economy principles such as no-build situations, better maintenance, refurbishment or using more efficient planning, design and building techniques)*** (Australian Government 2024b: 5)

Anticipated Shift 2:

Domestic manufacturing of green materials will grow, reducing reliance on high-emission imports.

Industry reports position the expansion of local manufacturing capacity for green construction materials such as low-carbon cement, recycled steel, and bio-based composites as a strategic priority. This transition supports national climate targets by reducing the carbon footprint associated with transporting and producing high-emission imports and fosters economic and industrial development through job creation and technological innovation. The localisation of green material supply chains is also presented as a way to enhance resilience against global supply disruptions and price volatility.

> ***Australia has significant potential to become one of the lowest-cost producers of green metals. The industry is highly energy intensive and can take advantage of our abundant renewable resources; can make a major contribution to decarbonisation; can achieve economies of scale in Australia; and aligns with our international trading partners' current and future needs*** (Australian Government 2024a: 17).

As green markets mature, demand for green products is expected to grow and the ability for consumers to differentiate between products on the basis of their emissions intensity is expected to improve (Australian Government 2024a: 23).

Complications:

Hidden Externalities and Extractive Risks in Green Material Adoption

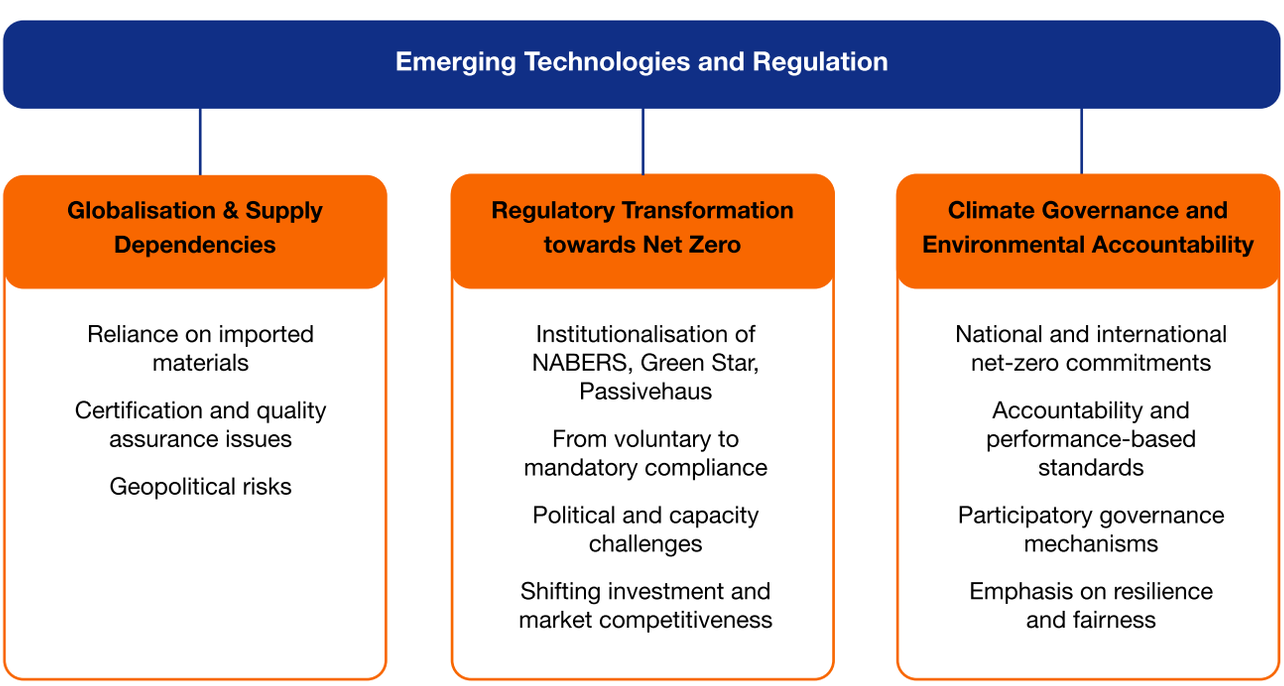
Adoption of green materials is often hindered by higher costs, supply variability, and technical knowledge gaps. Reports do not sufficiently account for the environmental externalities associated with "green" inputs or the socio-economic conditions under which these materials are produced. A critical approach is needed to ensure that material transitions do not reproduce new forms of extraction and inequality (Du & Li 2019; Deberdt & Billon 2024).

Domain 3: Emerging Technologies and Regulation

The emerging technologies and regulation domain addresses the evolving governance landscape that shapes construction industry practices amid increasing globalisation and environmental changes.

A prominent trend within this domain is the sector's heightened reliance on imported components, which introduces multifaceted regulatory challenges related to quality assurance, certification standards, and geopolitical vulnerabilities. This dependency necessitates enhanced oversight mechanisms and strategic policy responses oriented towards supply chain transparency, localisation of critical manufacturing, and sophisticated risk management frameworks.

Concurrently, the domain captures a regulatory shift driven by national and international commitments to net-zero emissions, marking a transition from voluntary sustainability initiatives to mandatory, performance-based construction standards. This shift involves the institutionalisation of frameworks such as NABERS (National Australian Built Environment Rating System), Green Star, and Passivehaus into statutory compliance regimes, with implications for industry practices, investment, workforce capabilities, and market competitiveness. While these regulatory developments represent significant progress towards environmental accountability and resilience, the literature also highlights challenges pertaining to uneven implementation, industry capacity, political contestation, and the necessity of participatory governance to ensure effective compliance. Thus, this domain foregrounds the complex interplay between global supply dependencies, climate regulation, and governance structures in shaping the future trajectory of the construction sector.



Trend 1: Increased Reliance on Imported Components

This trend reflects the construction sector's growing dependence on globalised supply chains, particularly for mechanical, electrical, and prefabricated components due to the high price of local materials. As Australia increasingly sources construction inputs from international markets, new forms of regulatory complexity are emerging. These include challenges related to quality assurance, certification standards, and geopolitical disruptions, which expose the industry to heightened risk and demand stronger oversight mechanisms.

> *Material price increases are well documented with contractors and suppliers forecasting this trend to continue* (RLB 2021: 7)

> *Expansion in work done in future may not add as much value to the Australian construction industry as it used to. Many of the very large projects in the pipeline in areas such as electricity and Heavy Industry will increase reliance on imported components which count as work done when installed in Australia. Meanwhile preassembly of componentry will reduce the proportion of work done by Australian contractors* (Australian Construction Industry Forum 2024: 53).

Anticipated Shift 1:

Regulatory bodies will strengthen oversight to ensure imported products meet Australian safety and performance standards.

The reports reviewed claim that there is a growing concern across the industry about the risks associated with globalised supply chains, particularly in relation to the variable quality and regulatory compliance of imported goods. Strengthening regulatory oversight is seen as essential to safeguarding public safety, maintaining the integrity of built environments, and ensuring that cost-saving measures through offshore sourcing do not undermine long-term performance outcomes.

> *In the context of products or materials where any deficiency in quality – including with code compliance - may not be identified in real-time and may result in either an unexpected programme delay or a latent defect in a product or material that emerges only years later and potentially when there may be no ability to enforce a warranty or make a claim* (Felix & Entwine 2022: 42)

Anticipated Shift 2:

Supply chain transparency and traceability will become central to compliance regimes.

Reports reviewed emphasise the growing imperative for end-to-end visibility across supply chains, driven by concerns around product integrity, ethical sourcing, environmental impacts, and regulatory compliance. As construction materials and components are increasingly sourced through complex and often opaque international networks, the ability to track the origin, composition, and handling of these products is becoming a critical industry priority. Enhanced traceability mechanisms such as digital tracking systems, blockchain technologies, and mandatory disclosure requirements are viewed as key tools for mitigating risks related to substandard materials, supply disruptions, and non-compliance with Australian standards. This shift reflects a broader movement towards greater accountability and resilience in construction procurement practices.

The push for greater supply chain transparency also stems from the need to navigate rising uncertainty linked to global instability, technological shifts, and variable material and labour costs. With the sector often constrained by fixed output pricing, improved traceability is seen as vital for reducing exposure to supply shocks, supporting consistent project delivery, and safeguarding business sustainability.

> *Evolving geopolitical factors and rapid technological advancements create uncertainties that require adaptability. The industry needs resilient supply chains in the face of unexpected vulnerabilities. To support the needs of consumers and financers, the industry often works with highly constrained output pricing while remaining subject to variable input prices for labour and materials across the duration of projects. Resilient, stable supply chains are essential to help minimise the risk of input shocks to price and availability that can have significant implications on delivery timeliness, project viability, and business viability* (National Construction Industry Forum 2025).

> *Contracts are not fair, equitable and transparent down the supply chain, and fail to align the interests of all parties* (National Construction Industry Forum 2025).

> *While some material costs have stabilised or fallen, others remain high due to ongoing supply chain disruptions. These disruptions continue to affect the availability and cost of essential construction materials* (RLB 2024: 5)

Anticipated Shift 3:

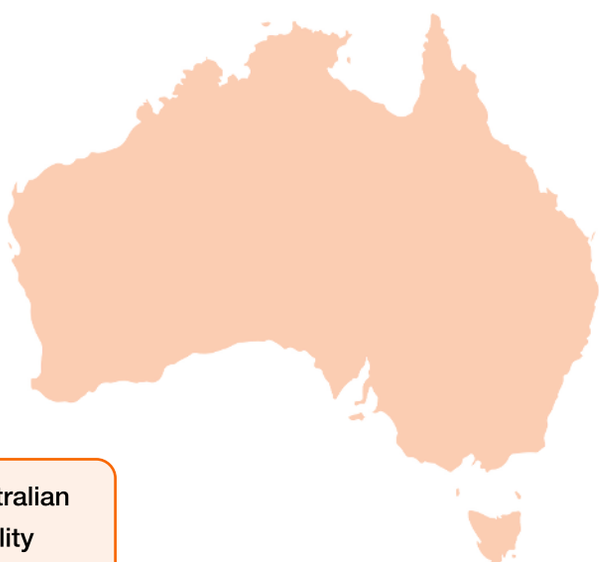
Trade disruptions will drive policy interest in localising critical manufacturing capacities.

In response to recent and ongoing global supply chain disruptions exacerbated by geopolitical tensions, pandemic-related shutdowns, and logistical bottlenecks, industry reports suggest a growing emphasis on strengthening domestic manufacturing capabilities. This strategic pivot aims to reduce the sector's reliance on imported materials and components, particularly those deemed essential for infrastructure, housing, and energy transition projects. Localising production is framed not only as a means of enhancing supply chain resilience but also as a way to promote economic sovereignty, stimulate local employment, and ensure more consistent adherence to Australian standards for safety, quality, and sustainability. This trend signals a potential reconfiguration of procurement models, with increased government and industry investment in domestic manufacturing infrastructure and innovation.

> *Geopolitical tensions, including conflicts in regions like Ukraine and the Middle East, have impacted on the availability and cost of certain construction materials due to sanctions and increased tariffs, whilst disrupting key maritime sea lanes. This has resulted in increased freight costs and prolonged procurement times for construction materials, as shipping routes are redirected to avoid high risk maritime corridors and alternative suppliers and products are identified* (QBE 2024: 9)

Benefits of Domestic Manufacturing

- Enhances supply chain resilience
- Promotes economic sovereignty
- Stimulate local employment
- Ensures more consistent adherence to Australian standards for safety, quality, and sustainability



Anticipated Shift 4:

Risk management frameworks will incorporate geopolitical and logistical vulnerabilities of global procurement.

As global supply chains become more complex and exposed to a wider range of risks from geopolitical conflicts and trade sanctions to shipping delays and raw material shortages, industry reports indicate a growing recognition of the need for more robust and adaptive risk management strategies.

This involves moving beyond traditional cost-efficiency models to account for the multifaceted vulnerabilities embedded in international sourcing. Construction firms are expected to develop more sophisticated assessment tools and contingency planning mechanisms that consider political instability, regulatory divergence, and transport bottlenecks. These expanded frameworks aim to safeguard project timelines, budgets, and quality standards by enhancing foresight and responsiveness in procurement decisions.

> ***Supply chain risk management is not the management of all parties in the supply network but the management of the risks they bring – including the identification and evaluation of. Yet while many in the industry operate robust risk management strategies and employ fit-for-purpose tools to enable these strategies, many do not*** (Felix & Entwine 2022: 9).

Complications:

Governance Limits and the Political Economy of Import Dependencies

The increasing reliance on imported construction materials and technologies presents significant vulnerabilities for the Australian construction industry. While global sourcing is often justified in terms of cost-efficiency and access to specialised inputs, such dependencies expose the sector to geopolitical disruptions, supply chain volatility, and fluctuating international trade policies (Coe & Yeung 2015). National regulatory frameworks are often ill-equipped to manage these transnational risks, particularly when confronted with powerful corporate interests and limited policy coordination across jurisdictions. Furthermore, overdependence on imports may undermine local industry capacity, limit opportunities for domestic job creation, and externalise environmental and labour costs to regions with weaker regulatory protections (Liu & Tortorella 2022). Addressing these challenges requires more than technical standards or procurement reforms; it necessitates a political economy approach that engages with questions of economic sovereignty, sustainability, and distributive justice within the broader architecture of global trade and production.

Trend 2: Increased Introduction of Regulations Around Construction Standards in Compliance with Net Zero Targets

This trend reflects a shift from voluntary sustainability practices towards mandatory regulatory frameworks that embed carbon reduction into construction standards. Driven by national decarbonisation strategies and global climate commitments, the construction industry is facing growing regulatory demands to demonstrate emissions performance across the lifecycle of buildings. Reports highlight that frameworks such as NABERS, Green Star, and Passivehaus are transitioning from aspirational benchmarks to statutory requirements, signalling a broader institutionalisation of environmental accountability. As a result, regulatory alignment is expected to reshape industry practices, influence investment flows, and determine market competitiveness.

The central assumption of the reports reviewed is that transition to net zero emissions is driving a regulatory paradigm shift towards enforceable, performance-based construction standards aligned with national and international climate commitments.

Anticipated Shift 1:

Frameworks such as NABERS, Green Star, and Passivehaus will be integrated into statutory compliance systems.

This trend reflects the formalisation of voluntary sustainability standards into binding regulatory systems. As environmental performance becomes central to policy objectives, industry actors are required to embed nationally recognised sustainability tools within construction planning, approvals, and performance evaluations. The integration of these frameworks signals a shift from discretionary adoption to regulatory obligation, elevating the role of environmental assessment tools in shaping how buildings are designed, operated, and maintained across their life cycles.

For instance, the Net Zero road map of the Australian Government and APS Net Zero (2025) indicate by 1 July 2025;

> Where a lease is entered into for four or more years over an office space of 1000 square metres or more of net lettable area, the office space and the building in which it is located must have and maintain 5.5 star or higher base building and tenancy NABERS energy ratings.

And by 1 July 2026

> Where a contract is entered by or for the Commonwealth for the purchase or construction of office space with a value greater than $15 million, the office space must have and maintain a 6 star NABERS energy rating and GBCA 4 star Green Star rating (minimum) which includes complying with the Climate Positive pathway.

Anticipated Shift 2:

The National Construction Code and state policies will mandate low-carbon design, lifecycle emissions reporting, and sustainable procurement.

A growing regulatory emphasis on carbon accountability is positioning sustainability as a core dimension of construction compliance. Mandates will likely encompass not only energy performance metrics but also embodied carbon, resource efficiency, and procurement standards that favour environmentally responsible materials and suppliers. This signals a fundamental recalibration of construction norms to align with Australia's climate targets that benefit occupants.

> ***The Australian construction sector is transitioning to new building standards under the updated National Construction Code (NCC). As State governments roll-out implementation plans, businesses will need to be across regulatory amendments and policy announcements to ensure compliance as the standards evolve in 2025.*** (QBE 2024: 12)

Deliver a Net Zero Carbon Ready building code and pathways to decarbonise building operations (ASBEC 2021: 2)

Anticipated Shift 3:

Regulatory convergence will link environmental performance directly to building approvals, financing, and certification.

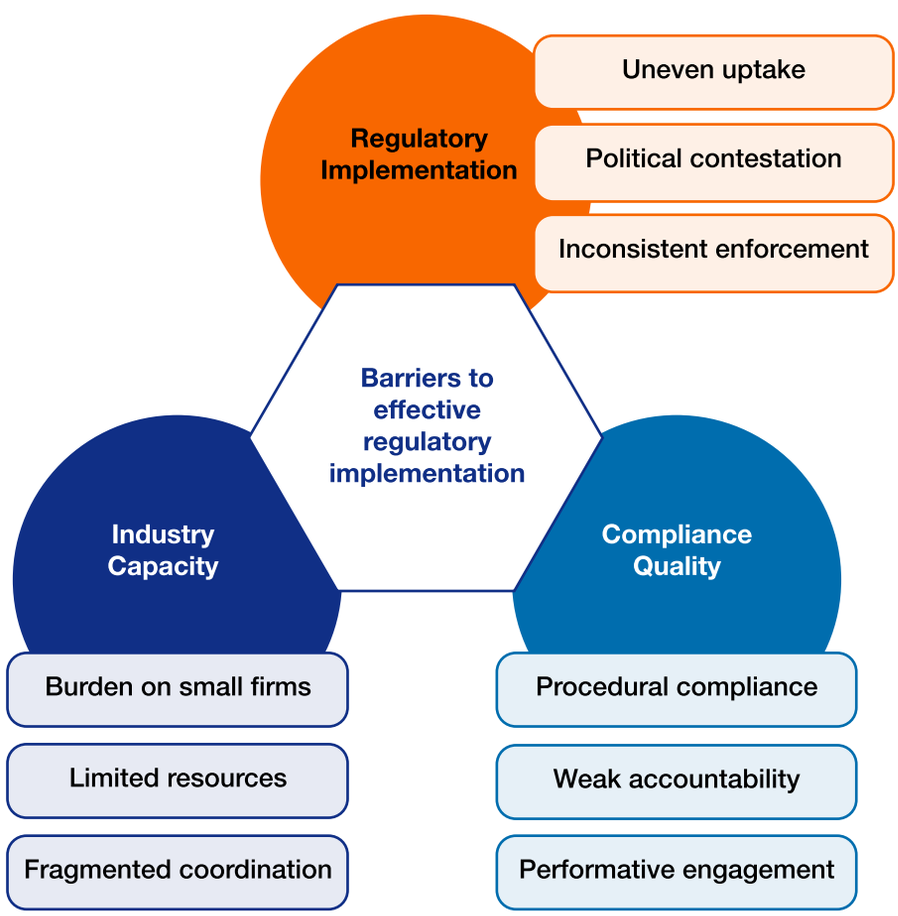
Reports reviewed suggest that as sustainability becomes more deeply embedded in regulatory frameworks, environmental performance will directly influence a project's financial and legal viability. Reports anticipate that planning approvals, access to green financing, and project certifications will increasingly be contingent upon compliance with established emissions, energy, and materials benchmarks. This is viewed as creating a strong incentive for firms to demonstrate credible and measurable sustainability outcomes, making environmental compliance a key determinant of market competitiveness.

> ***The Federal Government should commit to a trajectory of performance improvements for government owned and leased properties over time, with the aim of achieving net zero emissions for new buildings by 2030, and existing buildings by 2050. Measures could include strong minimum standards for new buildings and fitouts, targets for onsite energy efficiency and requirements around renewable energy, offsite renewable energy and offsets*** (ASBEC 2021: 14).

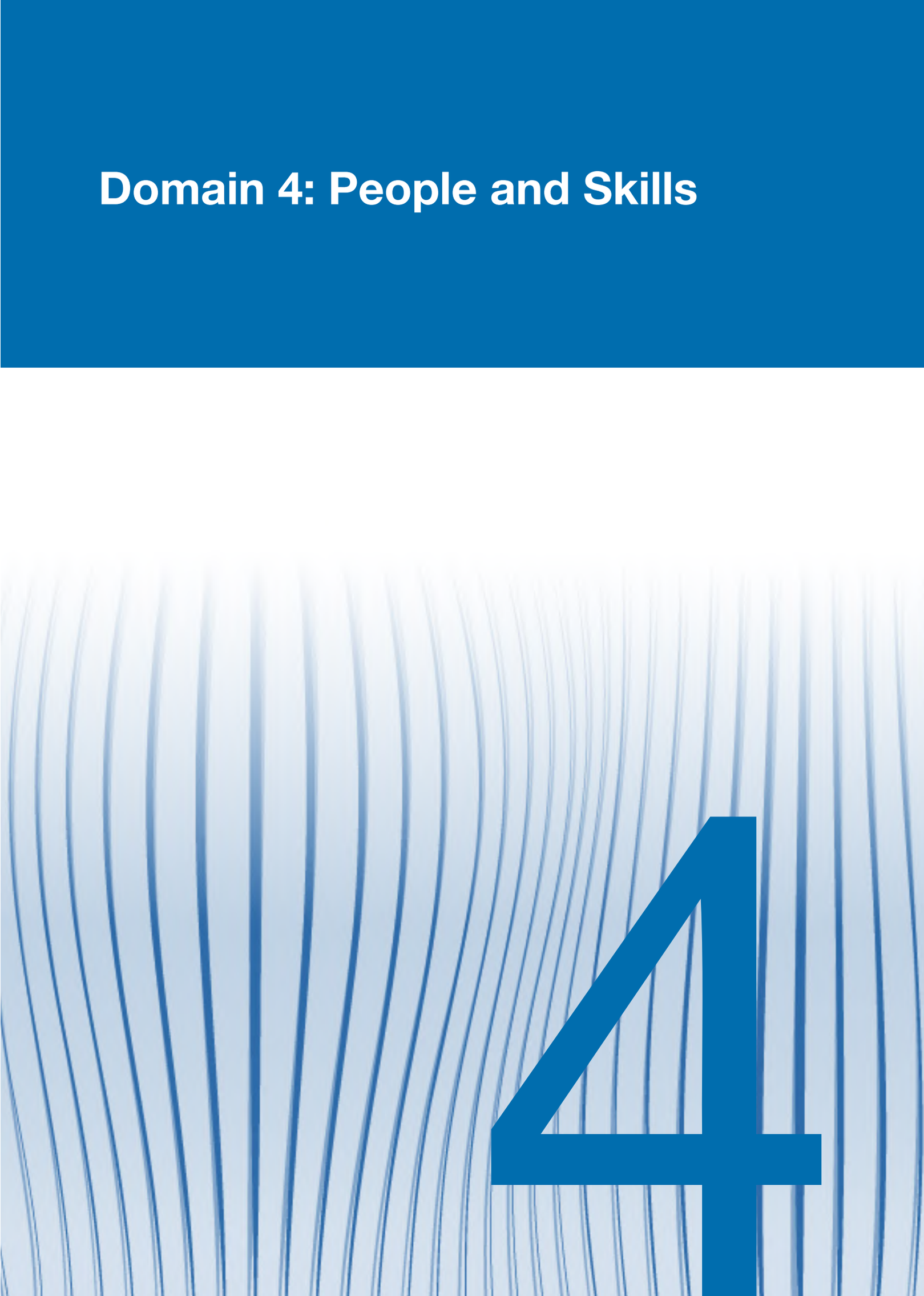
Complications:

Challenges of Regulatory Implementation and Industry Compliance

The implementation of regulatory reforms in the construction sector is often characterised by uneven uptake, political contestation, and inconsistent enforcement (Hurlimann et al. 2018). While regulatory frameworks are crucial for advancing sustainability and emissions reduction goals, their effectiveness is shaped by institutional capacity, sectoral coordination, and stakeholder alignment. Smaller firms in particular may encounter disproportionate compliance burdens, lacking the financial, technical, or administrative resources to meet new standards without targeted support. Moreover, the construction industry's reliance on voluntary certification schemes such as green building ratings has weak accountability mechanisms. As mandatory standards are introduced, there is a risk that firms may adopt compliance strategies that are procedural rather than substantive, resulting in performative or minimal engagement rather than genuine transformation. These dynamics underscore the need for regulatory approaches that are both robust and adaptive, combining enforcement with capacity-building and sector-specific support mechanisms.



Domain 4: People and Skills

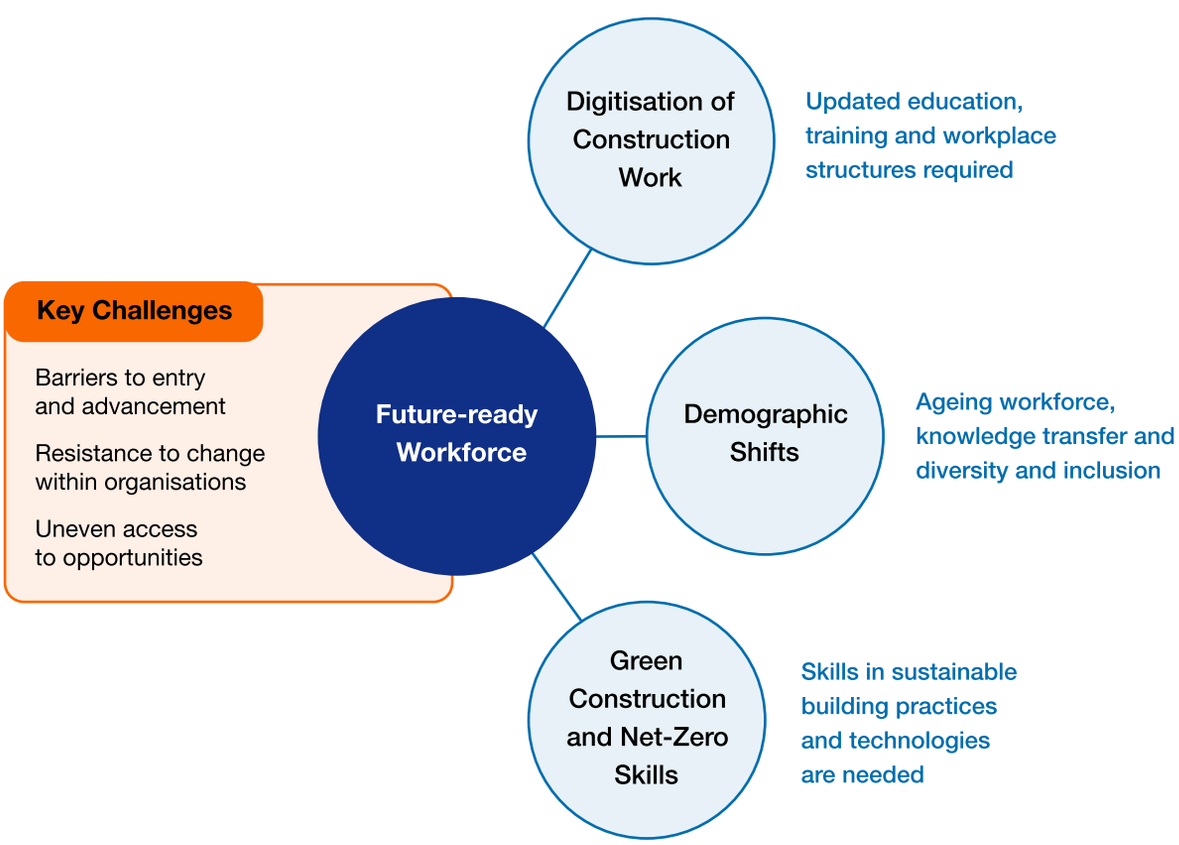


The people and skills domain in construction explores how the sector's labour dynamics are changing in response to technological, demographic, and environmental shifts.

Most industry reports on construction futures focus on developments leading up to 2050, a timeline aligned with broader national goals such as net-zero emissions. A major focus in this domain is the growing digitisation of construction, which is transforming how work is done and what skills are needed. This shift requires updated education, training, and workplace structures to support new ways of working.

Simultaneously, the industry is dealing with an ageing workforce, raising concerns about how knowledge and skills will be passed on to younger workers. Reports also stress the need to improve diversity and inclusion, especially regarding gender, ethnicity, and cultural representation in the sector. Additionally, the push towards green construction and net-zero goals is creating new demands for skills in sustainable building practices and technologies.

While these trends point to positive change, the reports also identify serious challenges. These include structural barriers to entry and advancement, resistance to change within organisations, and uneven access to opportunities in different parts of the labour market. As a result, this domain highlights the need for joined-up strategies that combine technological innovation, social equity, and workforce resilience to ensure a fair and future-ready construction industry.



Trend 1: Slowly increasing Digitisation and Skills Transformation Across the Construction Workforce

Across the industry reports reviewed, a central trend is the increasing digitisation of the construction sector, accompanied by a projected transformation in workforce skills and organisational structures. While digital and emerging technologies such as Building Information Modelling (BIM), automation, AI and robotics are anticipated to reconfigure technical practices, labour organisation, and professional development, the industry has been comparatively slow in embracing such innovations (Pink et al. 2024; Built-It 2024; Smee 2025). This lag in adoption presents ongoing challenges for integrating new technologies at scale, highlighting the need for more coordinated efforts in digital capacity building, education reform, and cultural change within the sector.

> *Australian businesses are middle of the pack when it comes to digital adoption, with businesses using an average of 5.0 technologies, rising to 6.1 technologies for medium and large businesses.* (Autodesk & Deloitte 2024: 22)

Anticipated Shift 1:

Digital technologies are gradually reshaping core competencies within construction roles.

Reports reviewed emphasise that digitalisation is reshaping the construction industry, with technologies such as Building Information Modelling (BIM), digital twins, automation, and artificial intelligence (AI) playing a pivotal role across planning, design, and delivery phases. These advancements are not only enhancing operational efficiency but are also transforming the very nature of construction work, requiring workers to develop new technical fluency and adapt to evolving job responsibilities.

However, the integration of such technologies is still in its early stages. Despite the growing potential of these tools, it will likely take up to ten years before key sectors reach mature digitisation, where advanced technologies are utilised across the industry.

The reports further highlight BIM as the most influential technology driving change, with significant uptake anticipated within the next 3 to 5 years. Following BIM, technologies such as 3D printing, augmented and virtual reality (AR/VR), integrated construction management tools, and drones are also expected to play a critical role in shaping future industry practices. However, the extent to which these technologies will be adopted depends largely on the current level of knowledge within the industry. While some technologies, such as BIM and integrated cost management, have already gained widespread awareness, others like 3D printing, CNC (computer numerical control), and drones remain less understood by many within the sector. This knowledge gap underscores the need for comprehensive training and upskilling to ensure that the workforce can harness the full potential of emerging technologies.

Together, these developments suggest that while the construction industry is poised for a technological transformation, the pace and depth of this shift will depend on overcoming challenges related to digital maturity, knowledge dissemination, and the development of a skilled workforce.

> *Designers and builders believe that BIM is the technology driving major changes in the coming 3 to 5 years... 3D printing, AR/VR, integrated construction management tools are the main technology trends after BIM. However, these responses should be understood in the context of level of knowledge possessed by respondents on advancement of technologies and their capabilities as it is likely that more people are much more aware of BIM, Integrated Cost Management, CNC, 3D printing and drones as technologies* (Perera et al. 2021: 12).

Anticipated Shift 2:

Robotics are slowly improving productivity and efficiency and can support environmental sustainability

Australia's construction industry has been characterised as "slow" to transition to robotic technologies, yet has also demonstrated leadership in innovation in robotics and in uses of robots on construction sites.

Robotics Australia Group's 2025 Robotics Roadmap is optimistic about the future of robotics in the Australian construction industry. It indicates that the industry's engagement with robotics is growing with a set of new strengths, wins and opportunities since 2002 including new interest and investment in technology from state, federal, and venture funding, a strong safety focus and involvement of education institutions, alongside Australia's strength in field robotics for outdoor use (Robotics Roadmap for Australia 2025: 56). The report highlights a series of new innovations in robotics for instance bricklaying, demolition, drone inspection and 3D printing, robotic drilling and in software (Robotics Roadmap for Australia 2025: 58, 62). However it notes current market resistance to robotics at present in relation to factors including: cost; industry culture; complexity; regulation and compliance; workforce; scheduling, lack of incentives and of research and development initiatives; unknown safety concerns (59-60).

The Roadmap suggests that robotics support the net zero transition in multiple ways, but enabling sustainability measures. With reference to the construction industry it particularly highlights uses of "robotics for infrastructure and building inspections" (2025: 285).

> ***Australia's construction sector faces many future challenges, especially in regions and remote areas. They include escalating cost pressures, thinner profit margins, skills shortage, a shortage of social housing, changing climate and safety risks. Robotics will help to overcome these challenges by providing a cost-effective and safe solutions to help boost productivity and improve efficiency*** (Robotics Australia 2025: 67)

More specialised technologies and those with fewer direct use cases in construction and engineering had significantly lower levels of usage, such as blockchain (25%), augmented reality (24%), robotics (22%) and digital twin (21%) (Autodesk & Deloitte 2024: 20).

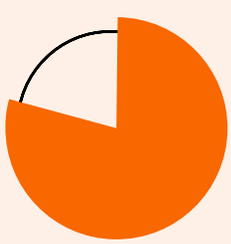
> *Inspection robots are increasingly being used for the maintenance of renewable energy infrastructures. They also help in constructing energy-efficient buildings by performing tasks like insulation and sealing*
> (Robotics Australia 2025: 285)

Anticipated Shift 3:

The future construction workforce will require hybrid skill sets that combine digital literacy with trade expertise.

In the construction industry, technology is poised to play an increasingly central role across all phases of planning, design, and delivery. As the sector moves towards greater digitalisation, the skill requirements of the workforce are also undergoing a significant transformation.

Future workforce models, as articulated in recent industry reports, emphasise a shift away from narrowly defined trade-based roles towards more hybrid forms of expertise. Traditional trade skills will remain critical, particularly in the physical execution of work, but they will no longer be sufficient on their own. Instead, workers will be expected to complement their technical and manual capabilities with a range of digital proficiencies. This underscores the growing interdependence between physical and digital domains. Workers will need to navigate environments where machine learning tools provide real-time data, where digital twins model project performance and risks, and where remote collaboration tools are essential for multidisciplinary teams. Future workers will also need to be trained to co-work with robotic and automated technologies and systems. As such, a digitally competent workforce capable of adapting to and leveraging emerging technologies, will be essential not only to improve productivity but also to meet evolving compliance, safety, and sustainability standards.

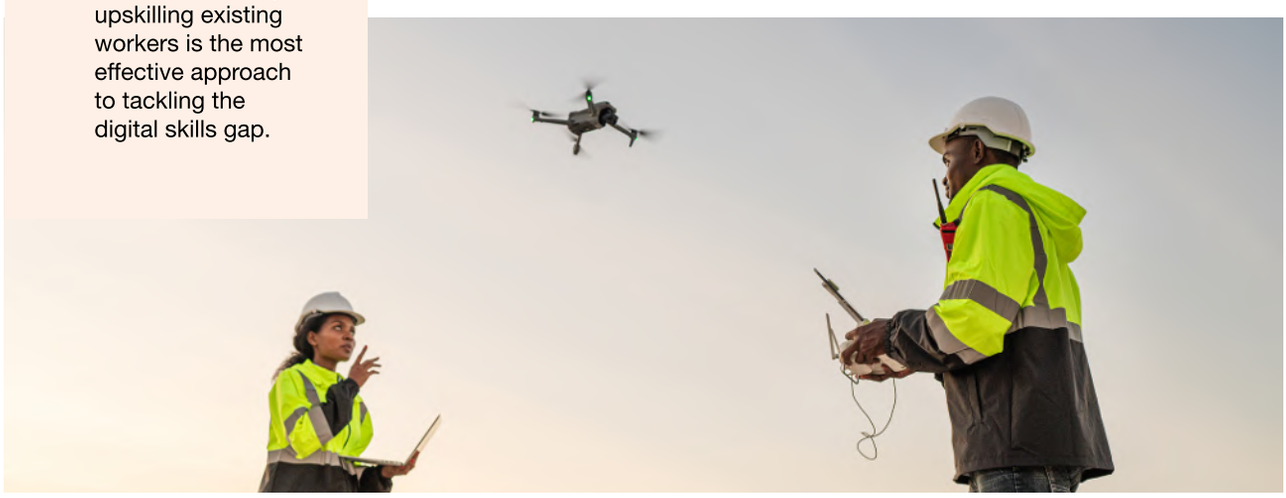


81%

of businesses say upskilling existing workers is the most effective approach to tackling the digital skills gap.

> *Businesses are primarily seeking to upskill their existing workers first and foremost, with 81% reporting this as the most common and most effective approach to tackling the digital skills gaps* (Autodesk & Deloitte 2024: 34).

> *In the next five years, expect to see a new generation of robotics savvy engineers, especially in construction and civil engineering* (Robotics Australia 2025: 65).



Anticipated Shift 4:

Education, training, and professional development systems are being restructured to integrate digital competencies.

Several reports highlight the shift in vocational education and apprenticeship programs to embed digital tools and concepts within core curricula. This includes the incorporation of BIM, simulation environments, and digital safety protocols into both initial and ongoing training. Industry partnerships with educational institutions are positioned as critical to ensuring a digitally capable workforce pipeline.

Education, training, and professional development systems in the Australian construction industry are undergoing targeted transformation to embed digital competencies in response to the sector's evolving technological landscape. Several industry reports recognise that developing a digitally capable workforce requires the integration of digital tools and knowledge within vocational education and training (VET) and apprenticeship pathways. For example, initiatives such as Building Information Modelling courses illustrate efforts to formalise BIM training within accredited programs (State of Victoria 2018). Similarly, the Australian Digital Capability Framework (Australian Industry Standards 2022) has been positioned to guide training providers and employers in embedding digital fluency across occupations, including those in construction.

> *Investment in training and capability building would likely be the most impactful enablers for a faster trajectory towards higher digital maturity, followed by work to reduce barriers related to costs and system interoperability supported by a common data environment* (Perera et al. 2021: vi).

> *Universities and TAFEs across Australia are recognising the need for dedicated robotics courses for employees in the construction sector* (Robotics Australia 2025: 65)

Anticipated Shift 5:

Firms will be required to invest in ongoing digital upskilling to remain competitive.

The reviewed reports emphasise that firms must develop internal capacity for continuous learning and digital adaptability. This includes formalised training programs, the use of digital inclusion strategies, and fostering a culture that supports innovation and lifelong learning. Future competitiveness is linked to the ability to anticipate and respond to rapid technological change.

> ***Prioritising employee safety, training and upskilling is vital to bridging future skill gaps and reducing reliance on skilled migration. This can include various approaches, from in-house training to apprenticeships, or higher education programs tailored to developing the next generation of industry professionals*** (QBE 2024: 15).

Industry will also be working closely with TAFEs and Universities to give students more exposure to the latest technology in the building sector (Robotics Australia 2025: 65).

Complications:

Structural and cultural barriers to digital workforce transformation

Despite the optimistic projections across reports, several complications are either under emphasised or absent. The assumption of universal access to digital training overlooks existing digital divides shaped by age, class, and geography. Additionally, the sociocultural embeddedness of trade identities may lead to resistance to digital transformation, particularly where informal knowledge and tacit skills remain valued. Reports generally do not account for how labour hierarchies and workplace culture shape the uptake of digital tools. Without addressing these social dynamics, digital inclusion policies risk reproducing or exacerbating inequalities within the workforce.

Additionally, while the reports reviewed are highly aspirational and give guidance related to existing and future training needs, responsibilities and outcomes, they do not account for the implications of the fragmented structure of the industry and its subcontracting culture, its project-base and investment cycles for training. Each of these in different ways complicates the possibilities that some organisations and individuals have to deliver or participate in training (Pink et al. 2024).

However, Pink et al. (2024) argue that as automation and robotics become more prevalent, there's a risk of undervaluing the tacit knowledge that experienced workers bring to the job. They further stress that successful integration of digital tools requires acknowledging and incorporating this implicit expertise, ensuring that technological advancements complement rather than replace human skills (Lyall & Pink 2025).

Trend 2: A Growing Workforce and Intergenerational Transitions

Across the industry reports reviewed, the ageing profile of Australia's construction workforce is identified as a key concern shaping future labour capacity. As a significant proportion of skilled tradespeople approach retirement, the reports point to the need for generational renewal, knowledge transfer, and proactive workforce planning to ensure continuity of expertise and productivity within the sector.

> *To be able to keep up with current and future demand, the industry needs net growth of around 10 per cent. About 130,000 people need to join the workforce, on top of those needed to replace those who leave. If the workforce can rapidly increase from 1.37 million to 1.5 million, then the industry may be able to meet the targets of the National Housing Accord for 1.2 million new homes by the end of 2029 by the skin of its teeth* (Master Builders Australia 2024a: 4).

Anticipated Shift 1:

The construction workforce is experiencing a significant demographic shift due to ageing.

Reports consistently note the growing proportion of older workers in skilled trades and supervisory roles. This trend is forecast to result in widespread retirements over the coming decade, creating potential skills gaps, productivity pressures, and project delivery risks if not adequately addressed through succession planning.

> *With an ageing workforce and increasing demand for housing and infrastructure, Master Builders anticipates that at least half a million people must enter the industry over the years to 2029* (Master Builders 2024b: 7).

Anticipated Shift 2:

Strategic recruitment of workers is essential to mitigate projected labour shortages.

Strategic recruitment is widely recognised across the reviewed reports as essential to addressing ongoing and future labour shortages in the construction industry. These shortages exacerbated by an ageing workforce, limited new entrants, and increasing project demands, are particularly acute in trades and blue-collar occupations. In response, the reports emphasise the importance of attracting younger generations to the sector, not only to sustain industry capacity but also to address emerging skills gaps associated with the transition to net-zero targets. Proposed strategies include rebranding the industry to improve its appeal, enhancing career visibility through educational and training institutions, and promoting the diversity of career pathways available within construction. Together, these initiatives reflect a growing recognition that workforce renewal is not only a matter of filling immediate gaps, but also a necessary condition for achieving long-term sustainability and innovation in the sector.

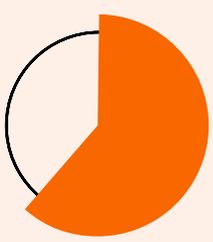
> *The construction industry is facing a skilled workforce shortage, with limited potential for the workforce to be reinforced by additional workers. This shortage, particularly acute in trades and blue-collar labour, is currently facing nearly 28,000 vacancies—almost double the pre-COVID-19 average* (QBE 2024: 11).

Anticipated Shift 3:

Cultural and structural reforms are needed to appeal to younger generations.

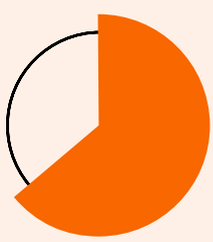
Industry reports suggest that workplace reform is required to align with the values and expectations of younger workers. These include flexible work arrangements, meaningful career development, stable employment conditions, and a greater emphasis on health, safety, and wellbeing. Such reforms are framed as crucial to improving the sector's appeal and retention outcomes.

Construction workers are 8 times more likely to die from suicide than a workplace incident (National Construction Industry Forum 2025: 6)



59%

of workers are unsatisfied with their work life balance (National Construction Industry Forum 2025: 6).



63%

of the workforce is considering leaving the industry (National Construction Industry Forum 2025: 6).

Complications:

Structural disincentives and socio-cultural gaps in intergenerational workforce planning

While the reports present a strategic vision for generational renewal, they tend to underplay the broader structural barriers deterring youth participation (Lingard et al. 2025). These include precarious employment arrangements, limited career progression, decline of the apprenticeship system, and exclusionary workplace cultures often perceived as hyper-masculine or resistant to change (Ghanbaripour et al. 2023; Liu et al. 2023; Pink et al. 2024; Yan et al. 2024). Furthermore, intergenerational knowledge transfer is often informal and context-dependent; institutionalising it may not adequately preserve tacit or experiential knowledge (Lyall & Pink 2025). Reports also offer limited engagement with how younger workers' values such as climate-consciousness, care responsibilities, and desire for meaningful work might conflict with prevailing industry norms. Without addressing these complex dynamics, workforce renewal strategies risk being superficial or ineffective.

> *The industry must be able to meet current and future needs through a more diverse, stable and inclusive workforce* (National Construction Industry Forum 2025: 8)

Trend 3: Workforce Diversity and Inclusion Initiatives

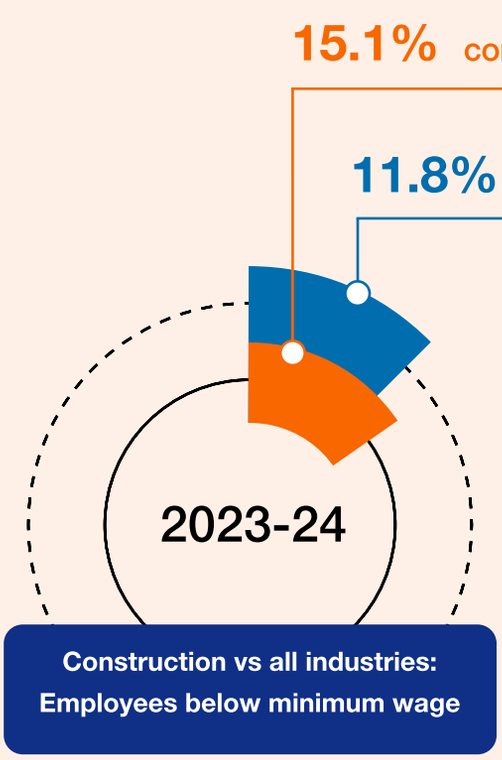
Across the construction industry reports reviewed, increasing workforce diversity and promoting inclusive practices are presented as essential strategies for ensuring long-term workforce sustainability and innovation. The sector's ongoing challenges with gender imbalance, underrepresentation of Indigenous and culturally diverse workers, and systemic inequities have prompted calls for transformative change in recruitment, training, and organisational culture.

> *The HomeBuilder initiative will drive demand for various tradespersons including bricklayers, carpenters and joiners, electricians and plumbers. Meanwhile, procurement professionals, engineers and architects will be required to support new precincts and infrastructure growth in regional Victoria. Construction managers and supervisors will also be needed to support Tier 1 and 2 contractors across Victoria in the delivery of major commercial and civil infrastructure projects. Scientists such as geologists, geophysicists and hydrogeologists will be needed to determine materials, energy, weather, and the environmental impact on construction projects. Their focus will be on keeping buildings safe, healthy, comfortable and efficient* (Victorian Skill Authority 2022).

Anticipated Shift 1:

Workforce diversity is positioned as a strategic imperative, but must be accompanied by fair pay and decent working conditions.

Reports highlight that while a diverse workforce is critical to addressing labour shortages and fostering innovation, diversity alone is insufficient. To attract and retain workers especially from underrepresented groups, industry practices must also ensure equitable pay, secure employment, and dignified working conditions. Diversity is thus framed not only as a matter of equity and resilience but as one that must be grounded in material improvements for workers across all roles.



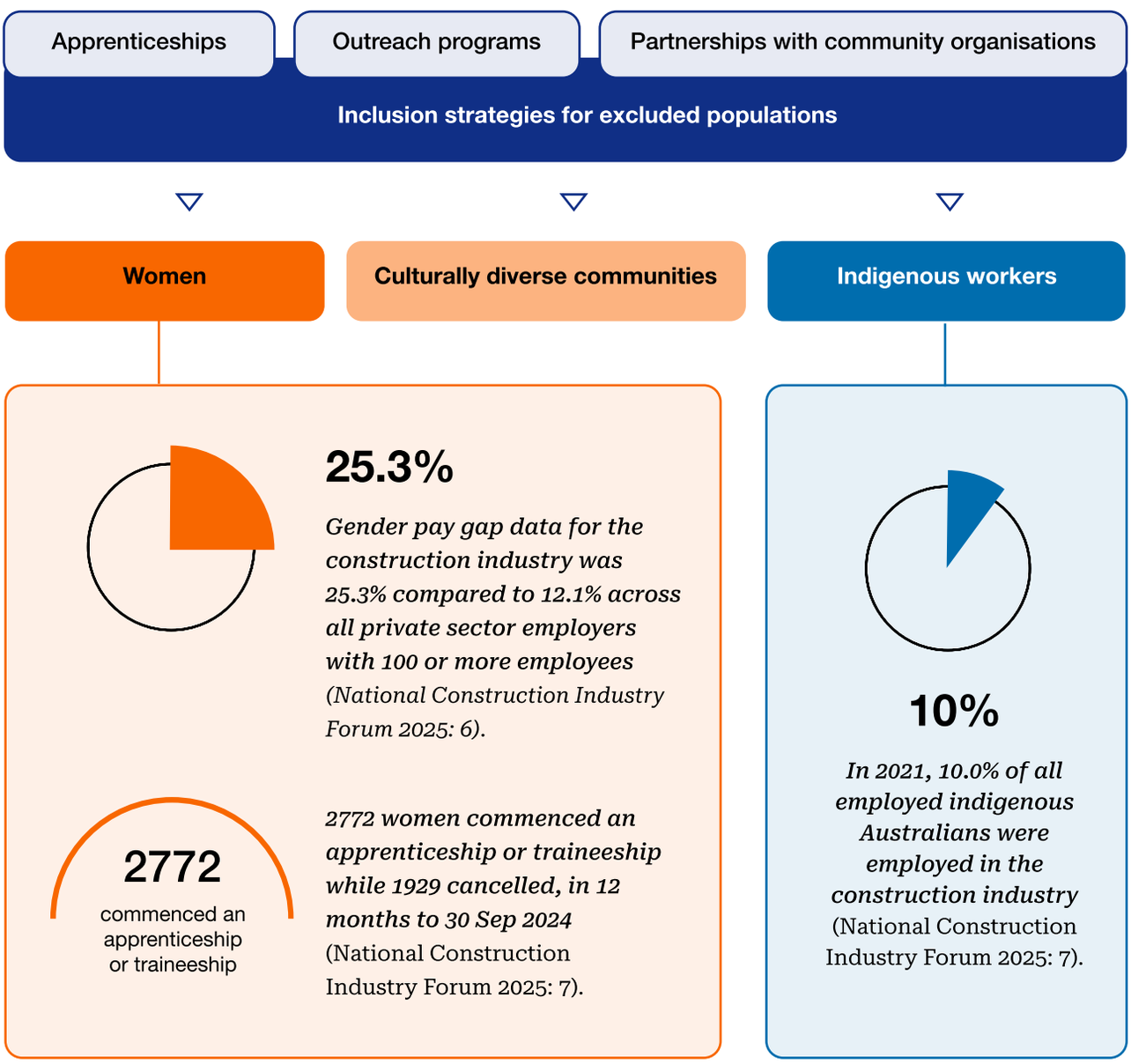
DEWR [Department of Employment and Workplace Relations] estimates using HILDA wave 23 that in 2023-24 15.1% of all employees employed in the Construction industry appeared to be receiving less than the National Minimum Wage, compared to 11.8% for all industries (National Construction Industry Forum 2025: 7)

The Fair Work Ombudsman recovered more than 13.5 million for 3501 workers (National Construction Industry Forum 2025: 7)

Anticipated Shift 2:

Targeted programs aim to expand training and employment opportunities for marginalised groups.

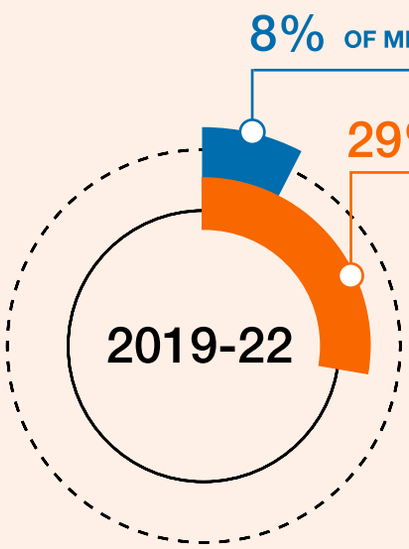
In the reviewed reports, initiatives focused on improving access for women, Indigenous workers, and culturally diverse communities are central to inclusion strategies. These include targeted apprenticeships, outreach programs, and partnerships with community organisations to support pathways into the industry for historically excluded populations.



Anticipated Shift 3:

Inclusive organisational practices, including flexible work, parental leave, and anti-harassment measures, are promoted to improve retention and workplace culture.

Reports emphasise that building an inclusive construction workforce requires more than recruitment targets; it depends on sustained organisational change. Key strategies include flexible work arrangements, equitable parental leave, culturally safe practices, and robust anti-harassment policies. These measures are designed to create safer, more supportive environments that retain women, caregivers, and workers from diverse and marginalised backgrounds, while fostering a respectful and resilient workplace culture.



In the five years to 2022, women were significantly more likely to be harassed in construction, at an estimated 29% of women compared to 8% of men (National Construction Industry Forum 2025: 7).

36%

of employers do not provide employer-funded paid parental leave (National Construction Industry Forum 2025: 7).

Anticipated Shift 4:

Recruitment and leadership development strategies are being reoriented to challenge systemic exclusion.

The reports highlight the need to reform recruitment practices to identify and remove systemic barriers, including gendered assumptions and racial bias in hiring and promotion. There is also increasing attention to the development of diverse leadership pipelines as a means of shifting organisational culture and achieving more equitable representation in decision-making roles.

15.5%

of managers employed in the construction industry in their main job were females in August 2024 (National Construction Industry Forum 2025: 7)

Trend 4: Increasing Demand for Green Skill Sets and Jobs

The reports reviewed consistently highlight a growing demand for new skill sets and occupational roles within the Australian construction sector, driven by national and global shifts towards sustainability and climate resilience. As construction becomes central to the delivery of net-zero infrastructure and energy-efficient buildings, workforce planning is increasingly oriented around climate-aligned capabilities.

Anticipated Shift 1:

The transition to net-zero will require a geographically mobile and adaptable construction workforce

As infrastructure projects increasingly span regional and remote areas particularly in renewable energy zones and large-scale retrofitting initiatives, the construction workforce must be capable of relocating in line with shifting project demands and timelines. Flexible deployment models, including rotational and mobile teams, will be critical to ensuring the timely and efficient delivery of both new builds and upgrades. To facilitate this mobility, reports call for supportive measures such as modular housing, relocation subsidies, and tailored regional training programs. However, workforce mobility must be managed carefully to mitigate adverse effects on local communities, including housing shortages and strain on local infrastructure.

In addition to spatial mobility, the workforce must also be versatile in its skills, able to deliver both comprehensive and incremental upgrades. Retrofitting homes to be all-electric and climate-resilient will require construction workers capable of integrating energy efficiency improvements alongside general maintenance and adaptation work.

> ***The build out and transformation of facilities and infrastructure required across the country will require a workforce that is flexible and mobile. Much of this work will be in regional and remote areas and will require different numbers and kinds of workers for various stages, from initial construction to ongoing maintenance.*** (Climate Change Authority 2024: 186).

> ***Our findings suggest that a workforce capable of upgrading homes to all electric and 'climate-ready' will be critical to deliver the greatest reduction in emissions, bill savings, and peak demand.*** (Climateworks centre 2023: 34).

Anticipated Shift 2:

New roles are emerging to support green infrastructure and sustainable building systems.

Reports reviewed identify the decarbonisation of the built environment as a major catalyst for change in workforce composition and its growth. The reports point to the rapid growth of specific occupations listed below in Table 1 (Climateworks centre 2023; Victorian Skills Authority 2022; Master Builders 2023), involving occupations such as green building designers, energy efficiency engineers, environmental compliance specialists, solar panel installers, retrofitting specialists, sustainability assessors, and low-carbon materials experts. These roles are projected to become core components of construction project teams, especially in residential and large-scale infrastructure developments aligned with sustainability goals.

> *Accelerating Australia's transition to sustainable housing could both protect the home building sector, as well as spur growth in delivering more than half a billion dollars of additional investment in the construction industry by 2030 and create over 7,000 new jobs* (ASBEC 2021: 9).

> *A slow and unwieldy VET system has been a brake on the development of relevant and meaningful qualifications for electrical and mechanical tradespeople in renewable energy* (Climate Change Authority 2024: 186).

> *Australia has a trainer shortage to deliver the training necessary for the near-term priorities of deploying renewable energy and housing upgrades* (Climate Change Authority 2024: 186).

$500M+

could be invested in the construction industry by 2030 if Australia accelerates its transition to sustainable housing

7,000+

New jobs could be created

Sub-Sector	Occupation/Role
Energy Efficiency & Retrofit	Energy rating assessors
	Gap sealers
	Curtain pole installers
	Carbon monoxide alarm fitters
	Insulation installers
	Window installers
	Energy auditors
	Energy efficiency engineers
Electrification & Appliances	Gas plumbers
	Electricians
	Engineers (HVAC and mechanical)
Renewable Energy Infrastructure	Solar installers
	Wind turbine technicians
	Electrical line workers
	Professional truck drivers
Heavy Infrastructure	Tunnellers
	Structural design engineers
	Engineering surveyors
	Geotechnical engineers
	Traffic engineers
	Rail signalling engineers
Workplace Safety & Risk Management	Hazardous materials labourers
	Risk analysts
	Regulatory affairs specialists

Table 1: Roles in demand in the construction industry.

Anticipated Shift 3:

Vocational education and training systems need to support low-carbon career pathways.

Reports reviewed assert that Australia's education and training systems must undergo significant reform to meet the demands of a low-carbon transition in the construction sector. Central to these recommendations is the need to embed sustainability competencies (such as environmental literacy, emissions reduction strategies, and life-cycle assessment) within traditional trade qualifications. In parallel, there is a growing emphasis on developing new certifications aligned with emerging climate-smart roles in construction, particularly those linked to electrification, energy efficiency, and supply chain decarbonisation.

Several reports stress that the existing workforce is not adequately equipped for the scale and urgency of transformation required. As such, education and training are positioned as critical enablers of industry-wide capacity building and workforce readiness. This includes upskilling workers for the design, installation, and maintenance of sustainable technologies, as well as supporting transitions from other sectors into green construction roles.

> ***The wide scale electrification of Australia's built environment will require significant investment into upskilling the supply chain.*** (Green Building Council Australia & Property Council of Australia 2023: 19).

> ***Much of Australia's building sector workforce including architects, designers, installers, maintenance workers and tradespeople, is not equipped for the immediate and urgent change required to electrify our buildings*** (Green Building Council Australia & Property Council of Australia 2023: 25).

> *Skills shortages around energy efficiency is hampering efficiency improvements in the building and transport sectors* (ASBEC 2021: 27).

Anticipated Shift 4:

Firms must train workers in life cycle assessment to meet new environmental standards.

New sustainability regulations are changing how construction projects are planned and delivered. Life cycle assessment (LCA) tools, which measure the environmental impact of buildings over their lifetime, are becoming a standard part of project planning and reporting. To use these tools effectively, workers at all levels (such as tradespeople, supervisors, and managers) need to understand what LCA is and how it affects their work. This means firms will need to update training programs so that the entire workforce is prepared to meet new environmental standards and support compliance across the construction process.

Shortage of specialist skills with product, LCA, embodied carbon assessment (CEFC 2021: 69).

Complications:

Uneven labour transitions and risks of exclusion in emerging green roles

Despite the future-oriented framing of green skills, many reports do not account for the complexity and unevenness of labour market transitions. Regional disparities in training access, education gaps, and persistent gendered divisions of labour may limit who benefits from the shift to low-carbon construction. Without support, workers currently in carbon-intensive roles risk displacement or exclusion (Barreto et al. 2023). Furthermore, the assumption that green jobs are inherently equitable overlooks how many of these roles are emerging within casualised or male-dominated sectors. Without structural changes to employment practices, education systems, and industry norms, the green transition may reproduce rather than redress existing forms of workforce inequality (Clarke et al. 2024).

References

Reports referenced in the report

Australian Construction Industry Forum (2024 May) Australian Construction Market Report. Australian Construction Industry Forum

Australian Industry Standards (2022) Digital capacity for workforce skills. https://www.dewr.gov.au/download/15097/digital-capability-workforce-skills-final-report-2022/32485/digital-capability-workforce-skills-final-report-2022/pdf

Autodesk & Deloitte (2024) State of digital adoption in the construction industry 2024. https://adskconstruction.autodesk.com/digital-journey-resources-apac/state-of-digital-adoption-in-construction-2024

ACT Government (2024) ACT Sustainable buildings pathway. https://www.planning.act.gov.au/__data/assets/pdf_file/0004/2557093/act-sustainable-buildings-pathway.pdf

Australian Government (2023) Net zero in government operations strategy. https://www.finance.gov.au/sites/default/files/2023-11/Net_Zero_Government_Operations_Strategy.pdf

Australian Government (2024a) Future made in Australia: National Interest framework: Supporting paper. https://treasury.gov.au/sites/default/files/2024-05/p2024-526942-fmia-nif.pdf

Australian Government (2024b) Transport and infrastructure net zero consultation roadmap. https://www.infrastructure.gov.au/sites/default/files/documents/transport-and-infrastructure-net-zero-consultation-roadmap.pdf

Australian Government (2024c) National Urban Policy: A vision for the sustainable growth of our cities and suburbs. https://www.infrastructure.gov.au/sites/default/files/documents/national-urban-policy.pdf

Australian Government & APS Net Zero (2025) Our path to Net Zero. https://www.finance.gov.au/sites/default/files/2023-11/APS_Net_Zero_Roadmap.pdf

Australian Constructors Association (2020) Constructing the future: A framework for a more sustainable construction industry. https://www.constructors.com.au/advocacy/submissions/framework-for-a-sustainable-construction-industry/#:~:text=Constructing%20the%20Future%20%E2%80%93%20A%20framework,for%20the%20betterment%20of%20all.

Australian Government Productivity Commission (2025) Housing construction productivity: Can we fix it?: Research paper. https://www.pc.gov.au/research/completed/housing-construction/housing-construction.pdf

ASBEC (2016) Low carbon, high performance: How buildings can make a majori contribution to Australia's emissions and productivity goals. https://www.asbec.asn.au/wordpress//wp-content/uploads/2016/05/160509-ASBEC-Low-Carbon-High-Performance-Full-Report.pdf

ASBEC (2021) Five ways the built environment can help Australia transition to a net zero future. https://www.asbec.asn.au/wordpress/wp-content/uploads/2021/10/211025-ASBEC-Five-Ways...-COP26-advocacy-piece_FINAL-1.pdf

ASBEC & ClimateWorks Australia (2018) Built to perform: An industry led pathway to a zero carbon ready building code. https://www.asbec.asn.au/wordpress/wp-content/uploads/2018/10/180703-ASBEC-CWA-Built-to-Perform-Zero-Carbon-Ready-Building-Code-web.pdf

CEFC (2021) Australian buildings and infrastructure: Opportunities for cutting embodied carbon. https://www.cefc.com.au/media/ovrkk5l3/australian-buildings-and-infrastructure-opportunities-for-cutting-embodied-carbon.pdf

City of Sydney (2024) Smart Green Apartments. https://www.cityofsydney.nsw.gov.au/research-reports/smart-green-apartments-annual-report

Climate Change Authority (2024) Sector Pathways Review. https://www.climatechangeauthority.gov.au/sites/default/files/documents/2024-09/2024 SectorPathwaysReview.pdf

ClimateWorks Australia (2020) Decarbonisation Futures: Solutions, actions and benchmarks for a net zero emissions Australia. https://www.climateworkscentre.org/wp-content/uploads/2020/04/Decarbonisation-Futures-March-2020-full-report-.pdf

Climateworks Centre (2023) Climate-ready homes: Building the case for a renovation wave in Australia. https://www.climateworkscentre.org/wp-content/uploads/2023/11/Climate-ready-homes-Building-the-case-for-a-renovation-wave-in-Australia-Summary-report-Climateworks-Centre-December-2023.pdf

Felix & Entwine (2022) Building in the dark - Construction supply chain risk: Challenges, Responses and opportunities. https://www.felix.net/hubfs/Felix_Whitepaper_BITD.pdf

Green Building Council Australia (2022) The future is electric: A practical guide for grid-optimised precincts. https://gbca-web.s3.amazonaws.com/media/documents/the-future-is-electric--a-practical-guide-for-grid-optimised-precincts.pdf

Green Building Council Australia (2024) A nature roadmap for the built environment: Discussion paper. https://gbca-web.s3.amazonaws.com/media/documents/draft-nature-positive-roadmap.pdf

Green Building Council Australia & Property Council of Australia (2019) Every building counts: a practical plan for emissions reduction in the built environment. https://apo.org.au/sites/default/files/resource-files/2019-10/apo-nid268381.pdf

Green Building Council Australia & Property Council of Australia (2023) Every building counts: Innovating for a greener, healthier, and more equitable built environment. https://www.propertycouncil.com.au/wp-content/uploads/2023/10/Every-Building-Counts-for-Local-Governments.pdf

Infrastructure Australia (2018) Planning Liveable Cities A place-based approach to sequencing infrastructure and growth. https://www.infrastructureaustralia.gov.au/sites/default/files/2019-06/ifa_225232_planning_liveable_cities_report_2018_fa_web_lr.pdf

Infrastructure Australia (2022) Infrastructure Market Capacity. https://www.infrastructureaustralia.gov.au/publications/2022-market-capacity-report

Infrastructure Net Zero (2025) A solid foundation: A common definition for net zero infrastructure and how to get there. https://www.iscouncil.org/wp-content/uploads/2025/03/2025.03.21_INZ_A-Solid-Foundation-A-common-definition-for-net-zero-infrastructure-and-how-to-get-there.pdf

ISCA, ClimateWorks Australia & ASBEC (2020) Issues paper: Reshaping Infrastructure for a net zero emissions future. https://www.climateworkscentre.org/resource/issues-paper-reshaping-infrastructure-for-a-net-zero-emissions-future/

KPMG (2023) Tackling embodied carbon within Australia's construction and infrastructure sector. https://assets.kpmg.com/content/dam/kpmg/au/pdf/2023/embodied-carbon-australia-construction-infrastructure.pdf

Master Builders Australia (2023) Future-proofing constriction: A workforce blueprint. https://masterbuilders.com.au/wp-content/uploads/2023/05/Master-Builders-Australia-Future-proofing-construction-April-2023-1.pdf

Master Builders Australia (2024a) The future of the workforce: the building and construction industry. https://masterbuilders.com.au/wp-content/uploads/2024/09/Workforce-Blueprint_Final-1.pdf

Master Builders Australia (2024b) The future of the workforce: Skilled migrants in building and construction. https://masterbuilders.com.au/wp-content/uploads/2024/08/Skilled-Migrants_FINAL.pdf

National Construction Industry Forum (2025) Blueprint for the future: A building and construction industry that works for everyone. https://www.dewr.gov.au/download/16952/draft-blueprint-future/40149/draft-blueprint-future/pdf

Prasad, D., Dave, M., Kuru, A., Oldfield, P., Ding, L., Noller, C. & He, B. (2021) Race to Net Zero Carbon: A Climate Emergency Guide for New and Existing Buildings in Australia v1b, Low Carbon Institute (Updated July 2022). https://www.unsw.edu.au/content/dam/images/ada/built-environment/logos/2023-01-net-zero-guide/2023-01-24-Net-Zero-guide-v1b-online-version.pdf

Perera, S., Jin, X., Samaratunga, M. & Gunasekara, K. (2021) Industry report on digitalisation of design and construction of Class 2 Buildings in New South Wales. https://www.nsw.gov.au/sites/default/files/2021-08/digitalisation-of-construction-industry-report.pdf

Pwc (2021) Building a more circular Australia: The opportunity of transitioning to a circular economy. https://www.pwc.com.au/assurance/esg/building-a-more-circular-australia.pdf

QBE (2024) Australian Construction Sector Outlook. https://www.qbe.com/media/qbe/apac/australia/files/the-resilience-series/qbe-australian-construction-sector-outlook-2024.pdf

Robotics Australia (2025) A robotics roadmap for Australia 2025. https://www.roboausnet.com.au/robotics-roadmap-2025

RLB (2021) Australia Report: Construction market intelligence. https://www.rlb.com/wp-content/uploads/sites/1/2022/01/RLB-Australia-Report_Q3_2021_2.pdf

RLB (2024) Construction market update: forecasting falling escalation in 2025 across the key centers in Australia. https://www.rlb.com/wp-content/uploads/sites/1/2024/12/RLB-Australia-Market-Intelligence-Update_Q4-2024.pdf

Rowley, S., Crowe, A. Gilbert, C., Kruger, M., Leishman, C. and Zuo, J. (2020) Responding to the pandemic, can building homes rebuild Australia?, AHURI Final Report No. 341, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/sites/default/files/migration/documents/AHURI-Final-Report-341-Responding-to-the-pandemic-can-building-homes-rebuild-Australia.pdf, doi: 10.18408/ahuri8126401.

Sharkey, J., Greenham, P., Bell, M., Jocic, W., Korolkova, J. & Hu, D. (2020) The health of the Australian construction industry: Research report. University of Melbourne. https://law.unimelb.edu.au/__data/assets/pdf_file/0009/4355082/Health-of-the-Australian-Construction-Industry-Research-Report.pdf

Smith, D.A., Whitehead, J. & Hickman, M. (2022) Planning a Transition to Low and Zero Emission Construction Machinery. University of Queensland.

The Insight Centre (2023) Building the future: Why women are key to Victoria's next building boom. https://theinsightcentre.com.au/wp-content/uploads/2023/04/TIC-IL-Building-the-Future-V6-FINAL.pdf

Victorian Skills Authority (2022) Victorian Skills Plan: Construction Industry Insights. https://aen.org.au/wp-content/uploads/Presentation-VSA.pdf

Victoria State Government (2022) Built environment climate change adaptation action plan 2022-2026. https://www.planning.vic.gov.au/__data/assets/pdf_file/0034/635965/Built-Environment-Climate-Change-Adaptation-Action-Plan-2022-2026.pdf

Victoria State Government (2023) Victoria's 2035 emissions reduction target. https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0028/635590/Victorias-2035-Climate-Target_Driving-Real-Climate-Action.pdf

Academic References

AHURI (2025) First Nations Housing Crisis: major study reveals huge gap for affordable rental housing. https://www.ahuri.edu.au/analysis/news/first-nations-housing-crisis-major-study-reveals-huge-gap-affordable-rental-housing

Ali, S.H., Giurco, D., Arndt, N., Nickless, E., Brown, G., Demetriades, A., Durrheim, R., Enriquez, M.A., Kinnaird, J., Littleboy, A., Meinert, L.D., Oberhänsli, R., Salem, J., Schodde, R., Schneider, G., Vidal, O. & Yakovleva, N. (2017) 'Mineral supply for sustainable development requires resource governance', *Nature* (London), 543(7645):367–372, doi:10.1038/nature21359.

Anthony, B. (2024) 'The Role of Community Engagement in Urban Innovation Towards the Co-Creation of Smart Sustainable Cities', *Journal of the knowledge economy*, 15(1):1592–1624, doi:10.1007/s13132-023-01176-1.

Barbhuiya, S. & Das, B.B. (2023) 'Life Cycle Assessment of construction materials: Methodologies, applications and future directions for sustainable decision-making Life Cycle Assessment of construction materials: Methodologies, applications and future directions for sustainable decision-making', *Case Studies in Construction Materials*, 19:e02326.

Barreto, C., Grundke, R. & Krill, Z. (2023) The cost of job loss in carbon intensive sectors: Evidence from Germany. OECS Working Paper No. 1774. Available at https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/11/the-cost-of-job-loss-in-carbon-intensive-sectors-evidence-from-germany_4ff4f3b3/6f636d3b-en.pdf (Accessed: 8 July 2025)

Built-It (30 May 2024) How slow adoption of new construction technologies is worsening Australia's housing crisis. https://build-it.au/tradies/tech-tools/how-slow-adoption-of-new-construction-technologies-is-worsening-australias-housing-crisis

Chaaya, M.L., Sarkis, L.M. & Tahmasebinia, F. (2025) 'Integration of Emerging Technologies with Construction Practices in Australia', *Buildings* (Basel), 15(3):396-, doi:10.3390/buildings15030396.

Clarke, L., Sahin-Dikmen, M. & Werna, E. (2024) 'Climate change, inequality and work in the construction industry' in Forson, C., Healy, G., Ozturk, M.B. & Tatli, A. (eds.) *Research handbook on inequalities and work*. https://doi.org/10.4337/9781800886605

Coe, N.M. & Yeung, H.W. (2015) *Global production networks : theorizing economic development in an interconnected world*, First edition., Oxford University Press, Oxford.

Deberdt, R. & Le Billon, P. (2024) 'Green Transition's Necropolitics: Inequalities, Climate Extractivism, and Carbon Classes', *Antipode*, 56(4):1264–1288, doi:10.1111/anti.13032.

Du, K. & Li, J. (2019) Towards a green world: How do green technology innovations affect total-factor carbon productivity. *Energy Policy,* 131:240–250

Ghanbaripour, A.N., Tumpa, R.J., Sunindijo, R.Y., Zhang, W., Yousefian, P., Camozzi, R.N., Hon, C., Talebian, N., Liu, T. & Hemmati, M. (2023) 'Retention over Attraction: A Review of Women's Experiences in the Australian Construction Industry; Challenges and Solutions', *Buildings* (Basel), 13(2):490-, doi:10.3390/buildings13020490.

Giles-Corti, B., Saghapour, T., Turrell, G., Gunn, L., Both, A., Lowe, M., Rozek, J., Roberts, R., Hooper, P., Butt, A. & Higgs, C. (2022) 'Spatial and socioeconomic inequities in liveability in Australia's 21 largest cities: Does city size matter?', *Health & place*, 78, doi:10.1016/j.healthplace.2022.102899.

Hurlimann, A.C., Browne, G., Warren-Myers, G. & Francis, V. (2018) Barriers to climate change adaptation in the Australian construction industry – Impetus for regulatory reform. *Building & Environment.* https://doi.org/10.1016/j.buildenv.2018.04.015

James, A., Rowley, S., Davies, A., Ong ViforJ, R. and Singh, R. (2021) Population growth and mobility in Australia: implications for housing and urban development policies, AHURI Final Report No. 365, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/365, doi: 10.18408/ahuri8122101.

Lingard, H. & Turner, M. (2023) *Work, health and wellbeing in the construction industry*, Routledge, Abingdon, England.

Lingard, H., Turner, M. & Pirzadeh, P. (2025) 'Is construction my industry of choice? Examining the factors affecting career choice decision-making of young workers', *Engineering, construction, and architectural management*, doi:10.1108/ECAM-08-2024-1125.

Liu, Q., Feng, Y., London, K. & Zhang, P. (2023) 'Influence of personal characteristics and environmental stressors on mental health for multicultural construction workplaces in Australia', *Construction management and economics*, 41(2):116–137, doi:10.1080/01446193.2022.2127154.

Liu, J., Chan, T.K., Tortorella, G.L. (2022). Auditing Australian Construction Industry's Dependency on China to Improve Construction Supply Chain Resilience. In: Guo, H., Fang, D., Lu, W., Peng, Y. (eds) Proceedings of the 26th International Symposium on Advancement of Construction Management and Real Estate. CRIOCM 2021. Lecture Notes in Operations Research. Springer, Singapore. https://doi.org/10.1007/978-981-19-5256-2_116

Lyall, B. & Pink, S. (2025) 'Quiet Sustainability: tacit knowledge and emic capacities in building and construction', In Carr, C. & Stein, J.A. (eds.) *Working Through Planetary Breakdown Labour, Skill and the Changing Climate: Labour, Skill and the Changing Climate*. Routledge.

Newman, J., Lang, M., Mintrom, M., Graycar, A., Lawson, J. & Dodson, J. (2025) Fine-tuning the machine: Evaluating machinery of government for housing policy administration, AHURI Final Report No. 441, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/441, doi: 10.18408/ahuri5232401.

Pink, S., Lyall, B. & Korsmeyer, H. (2024) Construction Work Futures: automation, robotics and work futures in the Australian Construction Industry. FUTURES Hub Report #1. Emerging Technologies Research Lab. DOI: 10.26180/26368825

Pomponi, F. & Moncaster, A. (2016) 'Embodied carbon mitigation and reduction in the built environment – What does the evidence say?', *Journal of environmental management*, 181:687–700, doi:10.1016/j.jenvman.2016.08.036.

Sharifi, F., Nygaard, A., Stone, W.M. & Levin, I. (2021) 'Green gentrification or gentrified greening: Metropolitan Melbourne', *Land use policy*, 108, doi:10.1016/j.landusepol.2021.105577.

Smee, B. (17 Feb 2025) Australia building half as many homes for every hour worked compared with 30 years ago, Productivity Commission finds. https://www.theguardian.com/australia-news/2025/feb/17/australia-building-half-as-many-homes-per-hour-worked-compared-to-30-years-ago-productivity-commission-finds

Smith, D.A., Whitehead, J. & Hickman, M. (2022) Planning a Transition to Low and Zero Emission Construction Machinery.
https://espace.library.uq.edu.au/data/UQ_93110de/ResearchReport_UQ_LL_May2022.pdf?dsi_version=dae742ca3f5c4b31f8bc04861eb28051&Expires=1752022469&Key-Pair-Id=APKAJKNBJ4MJBJNC6NLQ&Signature=c9IsQ2jIwZLxNdFKrXxehgZOULNz8dGyvfw-nZoxcTPCASU45PX9m9Kycar~kf2F~2SMtmnlrGYRd04s5RYoS56WAdOq0QG8hnwbV6hTjUk29rUr5RJc43EjusxfkqHqAlhBfQ0F2BFlaUjkh1xgqR25XjUVH~M3MbWXMVX2Qj7QHuELWz2IBVNeQbGbVhXeobLhXS6zFEPdjfP9WIL7UQI7fqqkWcUHm93ykANl91WYkCP7oy8BWtkcbkbNn3XTFSZiFFs7B78tbL3n6HDVPX8ZdRK0uEgW3Ccyw93~fXmqCvxqnt-KRDyMMnyiVD4R9lP7RVb0ga1Oj~CCXCGEHw__

Sovacool, B.K., Ali, S.H., Bazilian, M., Radley, B., Nemery, B., Okatz, J. & Mulvaney, D. (2020) ‘Sustainable minerals and metals for a low-carbon future’, *Science* (American Association for the Advancement of Science), 367(6473):30–33, doi:10.1126/science.aaz6003.

State of Victoria (2018) Course in Building Information Modelling (BIM).
https://www.vic.gov.au/sites/default/files/2023-05/22508VIC_Course_in_Building_Information_Modelling_%28BIM%29_V1.1.pdf

Temel, S. & Durst, S. (2021) ‘Knowledge risk prevention strategies for handling new technological innovations in small businesses’, *VINE journal of information and knowledge management systems*, 51(4):655–673, doi:10.1108/VJIKMS-10-2019-0155.

Uher, T.E. & Runeson, G. (1984) ‘Pre-tender and post-tender negotiations in Australia’, *Construction management and economics*, 2(3):185–192, doi:10.1080/01446198400000017.

Yan, D., Wang, C.C. & Sunindijo, R.Y. (2024) ‘Framework for Promoting Women’s Career Development across Career Stages in the Construction Industry’, *Journal of construction engineering and management*, 150(7), doi:10.1061/JCEMD4.COENG-14644.

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Australian Construction Industry Futures: a review of dominant visions