



Australian Government  
Department of Industry, Science,  
Energy and Resources

AusIndustry  
Cooperative Research  
Centres Program

## Senate Inquiry into Australian Manufacturing Industry

### Building 4.0 CRC Submission

#### **Building 4.0 CRC Overview**

Building 4.0 CRC is an industry-led research initiative co-funded by the Australian Government Cooperative Research Centre program. The CRC aims to develop an internationally competitive, dynamic and thriving Australian advanced manufacturing sector, delivering better buildings at lower cost and the human capacity to lead the future industry.

#### **Building 4.0 CRC Mission Statement**

Building 4.0 CRC's mission is to carry out research and development activities that lead to tangible benefits for the building industry and the broader community. Working collaboratively, we strive for innovative research outcomes that translate into commercial, technological and efficiency benefits for our industry partners, and improved environmental, safety and cost performance for the community. We aim to lead industry change and deliver a new building eco-system: leveraging the latest technologies; creating a data-driven industry; promoting human-centric design; and encouraging new thinking and expert collaboration between our best-in-class partner organisations. Together, this will position Australia as a leader in the advanced manufacture of buildings, developing new industry-wide culture and the human capacity to lead the future industry.

#### **Submission Summary**

As Building 4.0 CRC proposes to transform the building industry from a construction logic towards a manufacturing logic, the principles of advanced manufacturing could be easily and gainfully applied to the built environment. The construction and property industries are the country's third largest employer and contribute a combined 13% to GDP.

Australian manufacturers are recognising the need to compete on value rather than cost and to invest in R&D and capacity-building that can position Australia as a leader in future-leaning industries. Most commonly, this involves contributing innovative products, components or services within global supply chains.

As we have seen through the Advanced Manufacturing Growth Centre (AMGC), there is indeed a growing market for advanced manufacturers that not only creates finished products, but that also add value at every stage of and within the global supply chain. The adoption of advanced manufacturing approaches in the building production system can result in a 5-10x productivity increase (*McKinsey, 2017*).

This is the same pattern we see for the future building industry, in which Australia has little-known global leadership.

#### **Background – the Building Industry**

Unlike other sectors, the building industry has failed to modernise and is plagued by rising costs and stagnating productivity, high waste and low margins. Building has not kept pace with the rapid technological and organisational change of modern business and society, which has led other sectors to gains in productivity and customer satisfaction. It is a fragmented and adversarial industry, blocking the collective problem-solving approach required for change.

These problems are compounded by the record demand for buildings of increasing complexity, higher performance standards with increased customer expectations, and sustainability requirements.

In Australia, evidence of the building sector's shortcomings is found in the housing affordability crisis, several high-profile safety events, falling quality, skills shortages, and the highly disproportionate levels of insolvency of the industry's 345,000 SMEs.

The building industry needs to meet the demand for change while finding new efficiencies to lower costs.



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## The Opportunity

Sovereign manufacturing capacity, economic growth, national resilience, rising living standards for all Australians, and future-oriented high-skill jobs are all objectives that are supported by a thriving advanced manufacturing economy.

Australian Government-funded consortium, Building 4.0 CRC, recommends the development of a Growth Centre specific to the **Built Environment**. This Growth Centre would apply advanced manufacturing principles to the building and construction industry, which should also include infrastructure and smart cities initiatives.

Manufacturing capacities are already required within the industry, to help find new efficiencies and lower costs. Furthermore, the adoption and discovery of new and existing manufacturing capacities by this proposed Growth Centre, and thus the building industry, would help to solidify the manufacturing industry's key role in driving growth.

Below is an outline of the potential opportunities and benefits of aligning the manufacturing industry with the built environment through Building 4.0 CRC/the CRC's involvement in a Built Environment Growth Centre. Opportunities are matched with the Inquiry's Terms of Reference (**ToR**).

- Construction is Australia's third largest employing industry, accounting for 9% of Australian workers (over 1.4 million). This, together with the 13% contribution to GDP (through the construction and property sectors), makes the building industry central to Australia's economy. This is effectively a new *growth area*, and therefore an opportunity to 1) drive growth in manufacturing in Australia, and around the world, and 2) leverage the strengths of Australia's existing manufacturing industry and its development and expansion.

***Relates particularly to ToR a, b, c, d, f***

- The building industry needs new business models, high-skill jobs, and value chain re-structuring, and to ensure that R&D efforts remain focused on the opportunities of this new industry paradigm. 'Building 4.0' is one such instance of this collaborative approach. We suggest that more structure and funding is required to leverage this value for the nation.

***Relates particularly to ToR a, b, c, d, e, f, g(i), g(ii), g(iii), g(vi)***

- New technologies informed by advanced manufacturing and Industry 4.0 are redefining the traditional approach to certification, provenance and quality assurance in the building and infrastructure industry. This will impact training and its interaction with regulatory frameworks. Training will also deliver change management for senior positions to unlock new possibilities and break down the barriers of traditional thinking.

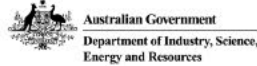
***Relates particularly to ToR a, b, c, d, e, f, g(i), g(vi)***

- A Built Environment Growth Centre could help to engage key stakeholder groups to prepare businesses for Industry 4.0, part of which is a competency in digital transformation, effectively a digitalisation of building and infrastructure delivery. This will connect the sector with new protocols and shared data, accelerating the processes and technologies of industrialisation towards a greener, more sustainable future, which relies on reliable, cheap, renewable energy.

***Relates particularly to ToR a, b, c, d, e, f, g(i), g(ii), g(iii), g(vi)***

- Building 4.0 CRC's research projects will place Australia at the forefront of global developments in the advanced manufacture of buildings. The CRC is already working with the AMGC to introduce the advanced knowledge, processes, and business models that are needed through two projects: 1) The implication of Industry 4.0 for the construction industry: towards smart prefab (<https://building4pointzero.org/projects/the-implication-of-industry-4-0-for-the-construction-industry-towards-smart-prefab/>), and 2) Prefab Housing Solutions for Bushfire & Disaster Relief (<https://building4pointzero.org/projects/prefab-housing-solutions-for-bushfire-disaster-relief/>)

***Relates particularly to ToR a, b, c, d, f, g(i), g(ii), g(iii)***



- Australian industry needs to join international early movers to ensure it can compete. A Built Environment Growth Centre could help protect Australia from international competitors, particularly new entrants in the Australian market in the building and technology sectors. Our high-cost and low-tech building industry provides fertile ground for disruption and reveals an underlying unpreparedness.

*Relates particularly to ToR a, b, c, d, f, g(i), g(ii), g(iii)*

- A Built Environment Growth Centre that engages the manufacturing industry means that all stakeholders can leverage benefits:
  - **Australian industry:** increased profitability and productivity and the ability to generate collaborative partnerships with leading industry, government, research, education, and training stakeholders.
  - **Australian research organisations:** ability to conduct leading R&D with global best-in-class companies and build the innovation ecosystem that will underpin Australia's future leadership in the advanced manufacture of buildings.
  - **End-Users:** reductions in costs and wider improvements in building functionality, sustainability, and operational efficiency.
  - **Australian Government:** a stronger economy, improved competitiveness and the generation of an innovation ecosystem that will lead to improved construction policy and regulatory frameworks and a more connected industry.

*Relates particularly to ToR b, c, d, f, g(ii), g(iii)*

- Benefits from the proposed Built Environment Growth Centre will not only flow to the building and manufacturing industries but also to the wider community. The Growth Centre could address several critical issues facing the national economy including housing affordability (by lowering the cost of building), sustainability (by reducing waste and using more renewable materials, along with the creation of more ecologically-friendly, high-performing, less energy-intensive buildings and infrastructure, reducing costs for users), Tech Adoption (by better understanding and applying new and emerging technologies to the problem of building), and the Commercialisation and R&D Ecosystem (by accelerating the creation and commercialisation of unique IP stemming from the collaborations).

*Relates particularly to ToR a, b, c, d, e, f, g(i), g(ii), g(iii), g(vi)*

In summary, the vision and objectives of the proposed Built Environment Growth Centre align with the Commonwealth Government's national priorities to develop an internationally competitive, dynamic and thriving Australian advanced manufacturing sector that boosts the long-term health of the economy and the nation.

On the whole, the proposed Built Environment Growth Centre can assist with improving the overall competitiveness of the Australian manufacturing industry, providing access to supply chains, improving managerial and workforce skills, establishing cooperation between industry and research institutions, reducing the 'red tape', developing digital solutions, and improving safety. Such a Growth Centre could deliver transformational impact through the establishment of a deeply integrated, open and cooperative building and infrastructure value chain, better meeting market and consumer needs.

#### **Return address and contact details**

Building 4.0 CRC

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