

FOSTERING INNOVATION TO KEEP PACE WITH CLIMATE CHANGE: BUILDING A RESILIENT FUTURE FOR AUSTRALIA

Contributed by SmartCrete

The building and construction sector is crucial for Australia's prosperity and economic development. As the climate becomes harsher – with severe weather events occurring more frequently – there is an increasing need for the sector to deliver more resilient and sustainable buildings and infrastructure.

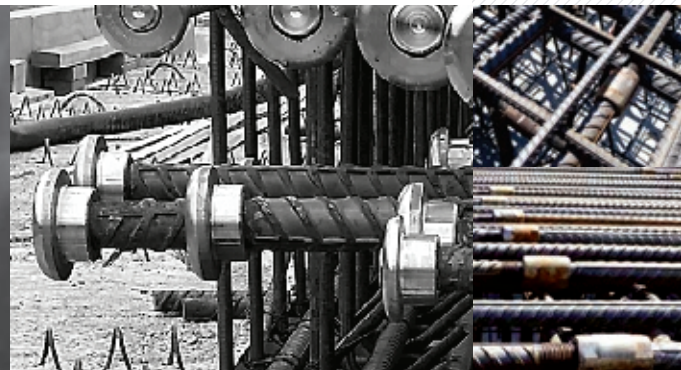
Smartcrete CRC as an independent Co-operative Research Centre (CRC) works with industry, research, and government organisations across Australia's concrete value chain to develop sustainable solutions that enhance resilience and adaptability of the built environment. Since 2020, the CRC has been investing in 40 research projects set to transform the design, use and management of concrete infrastructure. However, research and innovation are only one part of the equation. To foster the adoption of modern design and construction practices, Australia needs to overcome market barriers and supply chain risks. This requires evidence-based policy, legislation, and effective knowledge-sharing systems to ensure reliable and resilient infrastructure for the future.

ADVANCING MATERIALS, DESIGN AND CONSTRUCTION PRACTICES

The impact of climate change is undeniable. 2023 was the hottest year on record, with the recent COP29 in Baku noting that without significant emission reductions, climate conditions will deteriorate further. The building materials sector is already undertaking important work to reduce emissions through advancements in low carbon cements, new concrete mix design, sustainable engineering and decarbonisation practices. Notable initiatives include:

- **Graphene Oxide for Concrete Strength:** Research by Macquarie University explores the use of graphene oxide to enhance concrete durability.
- **Recycled Materials Usage:** The University of NSW integrates recycled crumbed rubber into concrete for road-base applications.

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- **Carbon Capture Innovations:** MCI Carbon and UTS incorporate captured carbonate and silicate materials into new building products.
- **3D Printing Advancements:** Contour3D advances concrete construction methodologies using 3D printing technology.

Once research and development activities have demonstrated the viability and reliability of these innovations, systems need to be in place to streamline market adoption, including continuous review and evolution to regulatory frameworks.

INNOVATION IN REGULATORY FRAMEWORKS

The National Construction Code (NCC) has recently been the subject of sectoral debate regarding the timeline for its review and update.

Those advocating for extended review periods argue that frequent changes can create confusion in the construction supply chain, requiring significant investments to understand and implement new requirements. This can lead to challenges in maintaining compliance and identifying accountability when issues arise.

Conversely, infrequent reviews and updates may slow the adoption of innovation. When new products, design techniques and construction practices are recognised in regulatory frameworks like the NCC, Australian Standards and measurement systems such as Green Star and the Infrastructure Sustainability Assessment Tool, they gain market credibility and assurance that they meet construction requirements. While some manufacturers can independently verify product performance to satisfy a procurer of the efficacy of a new product or design, formal recognition in the NCC or Standards is crucial for widespread acceptance.

Regular review and update of the various regulatory frameworks and measurement systems are essential for improving the safety, sustainability, and performance of building materials, design protocols and construction practices. A review cycle of 3 years, with effective communication to the sector, would allow for the consideration, interrogation and adoption of innovations which may greatly enhance the productivity and profitability of the construction sector.

BUILDING FOR FUTURE RESILIENCE

To create a resilient built environment, implementing a proactive approach to design and planning will be key. This includes climate risk assessments during project development and embedding resilience strategies into building designs. Embracing innovative designs and sustainable practices is essential for ensuring that our infrastructure can withstand the impacts of a changing climate.

As Australia progresses towards a sustainable future, it is vital to adapt and evolve our standards and practices to both mitigate and adapt to the realities of climate change. Ongoing innovation and research will continue to deliver solutions for safety, sustainability, and resilience throughout our built environment. A sectoral commitment to innovation, and empowering pathways to adoption of that innovation will shape a resilient future for our communities amid an ever-evolving climate landscape.

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