DfCO2 Newsletter

March 2026 edition

Message from Centre Director

DfCO2 has kicked off 2026 on a high note, with an impressive start across research publications, academic milestones, and prestigious awards. This momentum reflects the depth of talent and collaboration within our community.

The infrastructure landscape is rapidly evolving in Australia and globally, driven by climate imperatives, digitalisation, and the push for carbon-neutral, resilient systems. DfCO2 plays a pivotal role in translating research into practical, scalable solutions that drive transformative change across the industry.

Our recent *DfCO2 Scaling Impact: Carbon-Neutral Infrastructure Roundtable* brought together leading voices from industry and academia, highlighting opportunities to close the implementation gap, accelerate industry adoption, and advance a resilient, low-carbon future.

We thank our partners and collaborators for their continued support in scaling innovation and delivering transformative change across Australia's infrastructure sector.

Professor Chun-Qing Li
Centre Director

DfCO2 Scaling Impact: Carbon-Neutral Infrastructure Roundtable

27 February 2026, RMIT University

We kicked off 2026 with a high energy roundtable discussion - a packed-room event that brought industry leaders, researchers, and students together for a bold, future-focused conversation on infrastructure.

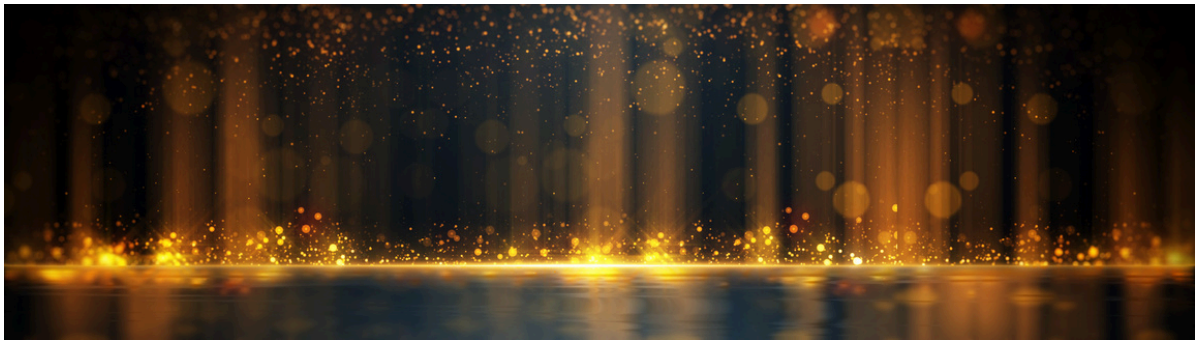
Professor Chun-Qing Li, Centre Director, and **Professor Mark Sanderson**, Dean of Research & Innovation (STEM) at RMIT University, set the tone with inspiring opening remarks. A big thank you to our panel facilitator, **Mr William Cox** of Aurecon, who expertly steered the discussions -keeping every session insightful, focused, and dynamic.

Across two key themes - **Designing Carbon-Neutral Infrastructure for Impact** and **Pathways to Greater Impact** - we heard diverse and practical perspectives from leaders across research and industry, including:

- **Professor Swee Mak** (RMIT) led a thought-provoking discussion on Designing for Impact, highlighting how transdisciplinary research and innovation can be harnessed to deliver meaningful, real-world outcomes.
- **Sandra Valeri** (Mott MacDonald) provided an industry perspective on the lessons learned and key barriers in tackling the carbon-neutral challenge in infrastructure.
- **Hugh Ong** (SmartCrete CRC) - Advancing decarbonisation via SmartCrete's Technical Readiness Levels, supporting circular economy and standards development.
- **Joan Ko** (ARUP), discussed infrastructure decarbonisation through design, innovation, systems transformation, and leadership.
- **Professor Jie Li** (RMIT), presented pioneering work transforming spent coffee grounds into high-value materials to reduce the carbon footprint of concrete.
- **Professor Kim Rasmusse**n (University of Sydney) highlighted research advancing infrastructure circularity and longevity to maximise long-term impact.

What stood out most was the shared commitment in the room: not just to excellent research, but to research that translates - that gets adopted, implemented, and makes a measurable difference for society and industry.

Awards and Recognitions



- Congratulations to Deputy Director, **Professor Kevin Zhang** on his appointment as Dean of the School of Engineering at RMIT University. A standout leader, he brings deep expertise and a strong track record, having strengthened research collaboration and ECR engagement as Deputy Dean, Research & Innovation. He also serves as Director of the RMIT Centre for Future Construction, underscoring his leadership in advancing engineering research.
- Congratulations to CI **Professor Sujeeva Setunge** on her well-deserved recognition as a Distinguished Professor at RMIT University, honouring more than 25 years of outstanding contributions to Civil Engineering and RMIT. Her leadership as ARC D*f*CO2 Program Leader, ARC TREMS Director, and ADVC R&I in STEM reflects her expertise at the forefront of net-zero innovation and STEM research excellence.
- Congratulations to CI **Professor Hao Zhang** on his promotion to Professor at the University of Sydney. His research focuses on structural reliability, probability-based design, risk and resilience of infrastructure systems - he has been instrumental in developing reliability-based design criteria for steel structures. He also serves on the editorial boards of leading international journals
- The Coffee Biochar Concrete Innovation Team at RMIT, led by D*f*CO2 researchers **Professor Jie Li** and **Dr Rajeev Roychand**, won the 2025 RMIT Team Award for Research Engagement and Impact. Their low-energy process turns waste coffee into biochar, boosting concrete strength by 30% - and went from lab to deployment on the Pakenham Roads Upgrade in just one year.
- In February 2026, Deputy Director **Professor Kevin Zhang** hosted the RMIT Construction 5.0 Leadership Forum: Innovations for Smart and Sustainable Built Environments. The forum united industry, government, and university partners to explore how Construction 5.0 principles can be applied in practice, identifying opportunities for cross-sector collaboration, research, and capability building.
- Cooperative Research Centre Projects (CRC-P) grant success: Congratulations to CI **Professor Kate Nguyen** and her team on securing a CRC-P grant for research on “Hot Loads: Advancing fire tech for lithium battery fire in waste trucks”.

Talks/ Webinar series

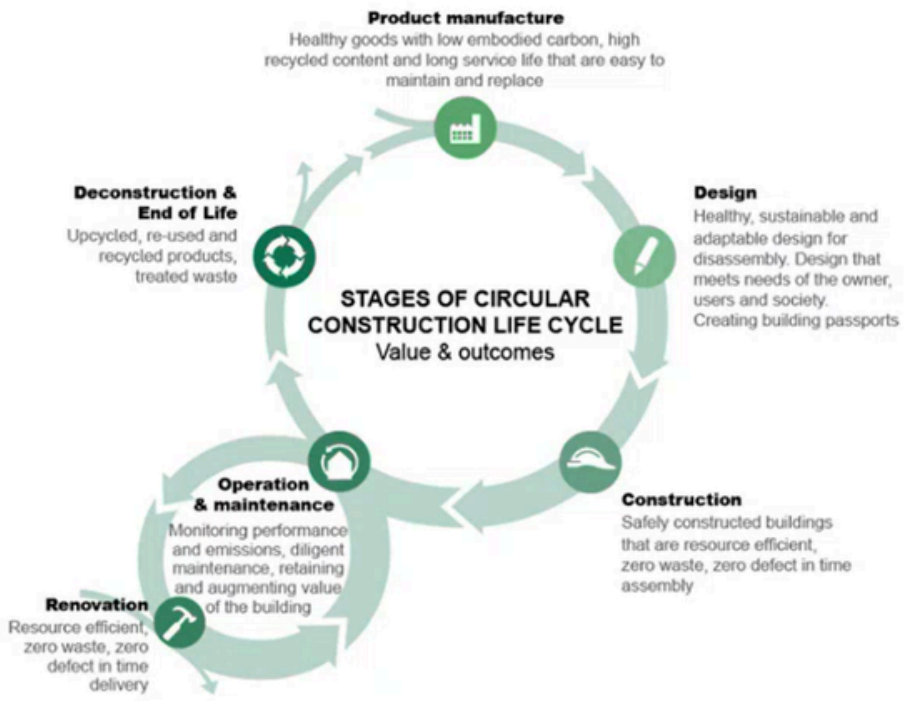
Throughout the year, we host a series of webinars aimed at promoting the outcomes of the Centre's research and training programs.

March 2026 Webinar

18 March 2026 webinar - **Building a Circular Future in Australia: Why, What and How?** featured **Professor Usha Iyer-Raniga**, our Chief Investigator from RMIT University, a leading expert in sustainable built environment and infrastructure.

The transition to a circular economy is explored through a multi-dimensional lens, underscoring its importance for a sustainable future. In this session, Usha examined the public and network governance models needed to enable systemic change, contextualising them within Australia's unique socio-political and evolving regulatory landscape, and outlining practical strategies for implementation.

The session also highlighted the 10 Whole-of-Life Cycle Recommendations for the Buildings Breakthrough, developed through extensive stakeholder engagement led by the Global Alliance for Buildings and Construction (GlobalABC), hosted by the United Nations Environment Programme. These recommendations aim to strengthen resilience in the buildings and construction sector while accelerating progress toward near-zero emissions across the entire lifecycle.



The presentation is drawn from Usha's recent publications: Iyer-Raniga, U., & Cramer, J. (2026). Building a Circular Future in Australia: Why, What and How? (1st ed.). CRC Press. and Cramer, J. and Iyer-Raniga U. (2025) Governing the Transition to a Circular Economy

Guest speaker nominations:

If you're interested in presenting in our upcoming webinar series, or would like to nominate an expert, we'd love to hear from you. Please email us at dfco2@rmit.edu.au to start the conversation!

Personnel Updates

Our Centre's growth is accelerating, fueled by a vibrant community of researchers driving our mission forward. We're excited to welcome new students and research fellows from across our seven university nodes in Australia.

Yifan Duan

PhD student
University: University of New South Wales
Supervisor: Professor Flora Salim

Yifan Duan is a PhD researcher working on carbon performance and lifecycle modelling of infrastructure systems. He received his Master's degree in Software Engineering from the University of Science and Technology of China.

Research focus: Carbon emission modelling, multimodal learning, spatio-temporal AI, and agentic learning.

Krishni Ambagala

PhD student
University: University of Adelaide
Supervisors: Dr Navodana Rodrigo and Professor Jian Zuo

Krishni holds a Master's degree in Construction Management from the University of Adelaide, with a research background in the adoption and application of digital technologies in the construction sector.

Research focus: Integration of blockchain and digital twin to monitor progress and track carbon emissions in construction projects.

Yupeng Zhang

PhD student
University: University of Adelaide
Supervisor: Professor Jian Zuo and A/Professor Ruidong Chang

Yupeng holds a Master of Architecture and a Master of Information Technology and brings with him over 6 years of industry experience across real estate, investment, and built-environment data analysis.

Research focus: Quantifying the life-cycle emissions associated with infrastructure maintenance through a data-driven and simulation-based approach.

Opportunities to join D*f*CO2

At D*f*CO2, we are committed to advancing growth, productivity, and competitiveness in the infrastructure sector. This includes cultivating skills and capacity through research that directly addresses the needs of end-users.

The following opportunities are currently available across our five key research programs.

Research Assistant - Carbon Neutral Infrastructure

The research project will focus on designing for carbon neutrality across the full life cycle of infrastructure assets. Key activities will include producing technical manuals to support design and operational decision-making, informed by validated prototypes, and supporting industry uptake through deployment within partner networks and national-level dissemination.

- RMIT University
- Duration: Fixed-term contract – 3 years
- Location: Melbourne, Australia
- Hiring manager: Professor Chun-Qing Li (chunqing.li@rmit.edu.au)
- Application close: 26 April 2026

To apply:
https://rmit.wd3.myworkdayjobs.com/RMIT_Careers/job/Melbourne/Research-Assistant--whole-life-design-of-carbon-neutral-infrastructure-_JR42726

Research Assistant for Machine Learning for Carbon Performance

The project aims to advance the next-generation AI methods to model, benchmark, and optimise carbon performance across infrastructure systems.

- The University of New South Wales
- Duration: Fixed-term contract – 1.5 years
- Location: Kensington – Sydney, Australia
- Hiring manager: Professor Flora Salim (flora.salim@unsw.edu.au)
- Application close: 27 April 2026

To apply: *https://external-careers.jobs.unsw.edu.au/cw/en/job/538379?lApplicationSubSourceID=11198*

DfCO2 is actively seeking talented researchers to fill PhD positions across all our university nodes - please refer to scholarship opportunities listed on https://dfco2.org.au/opportunities/

Publications by DfCO2 researchers

- **A time-dependent reliability method for assessing carbon neutrality of civil infrastructure in its whole life (Structure & Infrastructure Engineering)** - This paper examines whole-life carbon emissions of civil infrastructure and develops a probabilistic method and generic model to assess carbon neutrality.
  DOI: https://doi.org/10.1080/15732479.2025.2557568

- **An advanced probabilistic indicator for assessing circular economy life cycle carbon performance in municipal solid waste to pavement construction (Journal of Cleaner Production)** - This study introduces the Circular Economy Reliability Index (CERI), a probabilistic metric defined as the proportion of cases that reach or exceed a predefined carbon-saving threshold.
  DOI: https://doi.org/10.1016/j.jclepro.2026.147681

- **Decarbonising and Advancing the Sustainability of Construction and Demolition Waste Management in Australia: A Regionalised Life Cycle Assessment Across States** (Sustainability) - This study evaluates the environmental performance and circularity potential of construction and demolition waste (C&DW) management across five Australian states.
  DOI: https://doi.org/10.3390/su18020902

- **Application of waste Eucalyptus-derived biochar for sustainable low-carbon and carbon-negative geopolymer: Drying shrinkage, mechanical performance, acid resistance** (Powder Technology) - This study develops a multi-scale, multi-model framework to forecast PV waste distribution, assess the resource, environmental, and economic benefits of different management strategies in China.
  DOI: https://doi.org/10.1016/j.isci.2025.112332

- **Modelling system evolving in circular economy transitions: a trajectory-based analysis of carbon saving** (International Journal of Construction Management) - This study develops a trajectory-based model to assess CE carbon savings under uncertain recycling rates and transport distances, using TSI, TET, and TSM metrics.
  DOI: https://doi.org/10.1080/15623599.2025.2603424

Publications by D*f*CO2 researchers

- **Effects of biochar on the shrinkage and mechanical properties of sustainable engineered geopolymer composites: A comparative study between biochar sources, pyrolysis temperatures, and particle sizes** (Cleaner Materials) - This paper investigates autogenous shrinkage and mechanical performance of low-carbon geopolymer composites modified with biochar from wood, bamboo, and coconut shell at different pyrolysis temperatures.
  DOI: https://doi.org/10.1016/j.clema.2025.100345

- **Effects of recycled concrete powder on shrinkage, mechanical, and thermal behaviours of multi-walled carbon nanotubes-reinforced engineered geopolymer composites** (Construction & Building Materials) - This study explored the feasibility of incorporating construction waste-derived recycled concrete powders as fine aggregates in EGC reinforced by polyethylene fibres, hybrid MWCNTs and PE fibres.
  DOI: https://doi.org/10.1016/j.conbuildmat.2025.144603

- **Sustainable urban freight: pavement, environmental, and economic impacts of heavy-duty electric trucks (Transport Research)** - This study investigates the effects of these weight-limit exemptions on the serviceability and sustainability of three typical pavement designs under different traffic volumes.
  DOI: https://doi.org/10.1016/j.trd.2025.105033

- **A coupled chemical-electro-mechanical model for multi-ion corrosion-induced degradation in offshore reinforced concrete: Development and potential for residual life assessment** (Construction & Building Materials) - In this study, a coupled chemical-electro-mechanical model was developed to predict the residual life of offshore RC structures by assessing the corrosion rate of reinforcement embedded inside the structures
  DOI: https://doi.org/10.1016/j.conbuildmat.2025.143377

- **Temporal fluctuations in waste generation: An environmental and cost evaluation of glass waste collection and recycling in glass containers and asphalt production** (Waste Management) - This study addresses this gap by evaluating the environmental and cost performance of kerbside glass recycling in Australia, focusing on seasonal peaks such as summer and holidays.
  DOI: https://doi.org/10.1016/j.wasman.2025.115040

Industry News

- **Infrastructure Australia has unveiled the 2026 Infrastructure Priority List** - A blueprint to address the nation's critical infrastructure gaps and unlock opportunities over the next decade. The list features 68 of the highest-priority proposals that aim to strengthen the nation's productivity, liveability and sustainability. *Read further here:*

- **Version 2 of the Materials & Embodied Carbon Leaders' Alliance (**PO **MECLA) Guide to Low Carbon Concrete in Australia.** This guide is a major step forward for the industry, featuring the Cement Concrete & Aggregates Australia adoption of the GCCA – Global Cement and Concrete Association classification scheme, breakdowns on state based regional EPD data - allowing users for the first time to access this when looking to specify low carbon concrete in Australia. *Read further here:*

- PO **Sitzler** acknowledged as one of Australia's Best Managed Companies for 2025. The business award, sponsored by Deloitte Private and Google Cloud, shines a spotlight on successful private businesses from across Australia and the exceptional performance that drives them to be the best.

- PO **Sitzler** has once again been recognized in the annual Australian Defence Magazine Top 40 Defence Contractors list, securing the #10 spot! 2025 was another landmark year for Sitzler, with over $500 million in major projects successfully completed. Highlights include the handover of LAND19Ph2B and AIR7000Ph1B facilities at RAAF Edinburgh and Tindal respectively.

Industry News

- PO **AECOM** has been named one of the 2026 World's Most Ethical Companies by Ethisphere - marking its 10th time overall and 6th consecutive year on this list.

- PO **MECLA** has launched its new "Designing Out Carbon" Working Group, bringing together developers, government, builders, designers, and material suppliers to co-create practical, industry-ready solutions to reduce carbon through smarter design. If you are interested in joining this working group, please contact info@mecla.org.au.

- PI **Yew-Chin Koay** appointed to the Engineers Australia Victoria Division Committee 2026. The Committee plays an important role in supporting and advancing the engineering profession across Victoria. This well-deserved recognition reflects Yew-Chin's outstanding contributions to the profession and his strong commitment to developing and inspiring the next generation of engineers.

Upcoming Events

World Sustainable Built Environment Conference

To register: **https://www.wsbe26.org**
Conference Co-chair: Professor Usha Iyer-Raniga, RMIT University

Connect with Us

We are dedicated to keeping you informed about our Centre's activities. Please visit our website **https://dfco2.org.au** which is regularly updated to showcase the Centre's progress and opportunities to collaborate.

If you have any news stories, achievements, or exciting updates to share with us, please email **dfco2@rmit.edu.au** and Tag us on **LinkedIn**

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We acknowledge the Traditional Owners of Country throughout Australia on whose unceded lands we conduct the business of the Centre. We pay our respect to Aboriginal and Torres Strait Islander cultures and to Elders past, present, and emerging. We also acknowledge the Traditional Custodians and their Ancestors of the lands and waters across Australia where we conduct our business.