
SmartCrete CRC
ANNUAL
REPORT
2023-24

CONTENTS

SmartCrete CRC acknowledges the Traditional Owners of the lands on which we collaborate and innovate. We are inspired by their connection to land, waters and community. In particular, we pay respect to the Wallumattagal clan of the Dharug Nation, the Traditional Owners of the land on which our office is located. We acknowledge Aboriginal and Torres Straig Islanders as Australia's First Nation Peoples and pay our respect to Elders past and present.

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HIGHLIGHTS

as at 30 June 2024

$17.6 million
of project investment (cash + in-kind) from Commonwealth, industry and universities

3
research programs: Sustainable Concrete, Engineered Solutions, Asset Management

36
research projects of which 10 commenced during the reporting period

5
completed projects of which 1 was completed in FY2023-24

3
Communities of Practice launched

67
industry, government and research partners across Australia

2
"Pathways to Sustainable Concrete" funding rounds resulting in 9 new projects

32
PhD and 3 Masters students

MESSAGE FROM THE CHAIR

In 2020, SmartCrete CRC and its partners commenced building the collaboration that is transforming the concrete ecosystem to meet the challegnges of a sustainable future. Since then, we have established a diverse portfolio of 36 industry-led innovation projects that explore critical decarbonisation pathways to improve the design, use and management of concrete. Together with our partners from across the concrete value chain – designers, engineers, manufacturers, asset owners, innovators, researchers and Government – we have made significant progress this past year in delivering material change, securing supply chains, lowering costs, improving durability and asset management, all while reducing the carbon footprint of concrete.

As the CRC enters the second half of its 7-year term, we are well on track to fulfill our Commonwealth and partner commitments. Our robust operational framework has enabled us so far to invest $17.6m Commonwealth and other funding into sustainable research and development (R&D) projects. We are focused on allocating the remaining Commonwealth funds while continuing to work closely with our partners, helping them generate value and wider impact through their R&D projects. We use thought leadership and knowledge transfer to create new learning pathways to build lasting innovation capability within the sector.

With Australia's decarbonisation efforts gaining momentum, SmartCrete CRC will leverage its connections and deep understanding of the concrete ecosystem to drive innovation collaborations that facilitate the transition. Yet further action is needed to mobilise new R&D investment for decarbonising and future-proofing the sector. We are engaging with stakeholders through workshops, consultations, and roundtable discussions to understand what actions industry is willing to take now, where their pain points are and how best to collaborate and support them in their decarbonisation journey.

On a personal note, I want to express my deep appreciation of the personal integrity, commitment and diversity of skills and experiences of the CRC Directors. They have been key to maintaining our clarity of vision and meeting our compliance obligations. We welcomed Dr Ross Harper to the Board, who brings extensive expertise in large corporate operations and technology. This year, Mr Peter Williamson retired from the Board after making significant contributions to the CRC and its Investment and Impact Committee.

Under CEO Clare Tubolets' leadership, SmartCrete CRC's capable team stands at the forefront of concrete innovation. They are highly professional and a pleasure to work with. I am enthusiastic about the opportunities ahead and very much appreciate the support from our partners, Government and drivers of change in the broader ecosystem. I am pleased to share this report, which highlights our achievements over the past year and includes case studies that demonstrate the impact of our work

Emeritus Professor Elizabeth Taylor AO FAICD
Independent Chair

> "With the impact of member collaboration driving material change and decarbonisation initiatives gaining momentum, it's an incredibly exciting time for SmartCrete CRC."

MESSAGE FROM THE CEO

SmartCrete CRC has come into its own this year. We saw significant progress in project activities and continued to invest in innovative collaborative R&D projects that drive meaningful change within Australia's concrete ecosystem.

With the launch of the "Pathways to Sustainable Concrete" funding round at Concrete 2023 we catalysed and enabled new and existing industry and research partners to invest in concrete innovation. We signed 10 project agreements with a net value of $5.1m (cash) and $9.2m (in-kind), growing our portfolio to 36 industry-led projects.

We also successfully completed one research project. In September 2023, Hawks Excavation, Stretford Civil Construction and Swinburne University of Technology completed their collaboration exploring recycled concrete aggregates (RCA) as semi-rigid inclusion columns for ground improvement. The researchers successfully stabilised RCA to match the strength and structural performance of conventional stone columns. The achievements of this project have led to a second stage SmartCrete project investigating the use of RCA in the chemical stabilisation of road bases.

All SmartCrete projects have progressed and reached major milestones this year. With 5 projects now completed and more R&D collaborations finishing in 2025, a key focus for us going forward will be the effective translation and commercialisation of research outcomes.

This past year we have established ourselves as a 'catalyst for change' in the concrete ecosystem. Together with industry, research and government organisations, we identified and prioritised trends that matter. We plotted strategic directions that the Australian concrete sector needs to take to reduce its carbon emissions and successfully decarbonise by 2050. Instrumental to this work were collaborations with organisations such as Concrete Institute of Australia, Green Building Council of Australia and Materials and Embodied Carbon Leaders Alliance (MECLA).

I am particularly proud of SmartCrete CRC contributing to MECLA's "A Guide to Low Carbon Concrete in Australia". The guide is designed to provide background information and help industry to ask the right questions when specifying low carbon concrete. Launched in May 2024, the guide has received Australia-wide recognition by defining low carbon concrete in an Australian context and offering practical steps to integrating it in construction projects from day one.

As we look to the future we are considering the legacy that SmartCrete CRC can create towards sustainable concrete infrastructure, and to that end look forward to engaging with the supply chain to look at additional activities towards a decarbonisation transition.

Clare Tubolets
CEO, SmartCrete CRC

> "We are collaborating with inspiring people, doing extraordinary work. I am looking forward to unlocking more of these collaborative capabilities to accelerate the decarbonisation of concrete."

ACHIEVEMENTS IN FY2023-24

SmartCrete CRC delivered resilient performance in FY2023-24 – despite a challenging economic environment and lower appetite for research and development (R&D) investment – with new projects coming on board and existing innovation collaborations gaining momentum, contributing to the transition of concrete for a sustainable Australia.

Operation

SmartCrete CRC has transformed into an effective and efficient cooperative research centre geared up to connect, communicate and collaborate with Australia's concrete ecosystem. In FY2023-24, we implemented our revised strategy, streamlined processes and removed unnecessary complexity to support our industry and research partners in achieving project milestones and delivering on outcomes.

In May 2024, we appointed James Tarrant as SmartCrete's new Chief Financial Officer, following the retirement of Chief Operating Officer Robert Newton. We thank Robert for his great contribution to the CRC and welcome James, who's skills and experience will strengthen our executive leadership tream.

Impact and Collaborations

In FY2023-24, SmartCrete CRC successfully managed a portfolio of 36 R&D projects across its three research streams - Sustainable Concrete, Engineered Solutions and Asset Management. Ten industry-led projects commenced during the reporting period, with a net value of $5.1m (cash) and $19.3m (in-kind), involving small, medium and large businesses from across the concrete ecosystem. Backed by SmartCrete CRC's governance and reporting structures, which align industry, research and other supporting partners, most projects achieved key milestones and progressed towards their research objectives. One project was successfully completed in FY2023-24.

Stakeholder Engagement and Communications

SmartCrete CRC has truly cemented its position as "a catalyst for change" within Australia's concrete ecosystem. In FY2023-24, we collaborated with Government organisations, industry associations and sustainability initiatives such as the Climate Change Authority, the Green Building Council of Australia, Australia's Sustainable Built Environment Council (ASBEC), the Concrete Institute of Australia (CIA) and the Materials and Embodied Carbon Leaders Alliance (MECLA) to drive the change that is urgently needed to decarbonise Australia's built environment. We presented at various industry events, responded to consultation papers, contributed to MECLA's *A Guide to Low Carbon Concrete in Australia* and published numerous thought leadership articles.

In September 2023, Smartcrete CRC featured at Concrete 2023 – the industry's biennial conference – where we hosted two engaging panel discussions focused on career and sustainability pathways. During the conference, we also launched the first of two successful funding rounds for FY2023-24, resulting in investment in 9 new projects.

Capability Development

SmartCrete CRC continues to identify, develop, and nurture industry capabilities - the hard and soft skills - essential for maximising the potential of Australia's concrete ecosystem. In FY2023-24, we welcomed 25 PhD and master degree students into our R&D projects. And since the launch of our Communities of Practice in July 2023, we have created a collaborative platform that allows industry leaders, researchers and emerging talent to connect, exchange knowledge and learn on a regular basis.

IMPACT AND COLLABORATIONS

Concrete is the cornerstone of Australia's built environment. With about 70 million tonnes of premixed concrete produced every year (CCAA, 2022), it is the most widely used building material in the country. Yet, concrete – due to its raw material acquisition, processing, transportation, and recycling – contributes significantly to Australia's CO_2 emissions.

With the push for net zero gaining momentum, the challenge of decarbonising concrete will require combined effort and actions involving everyone - from manufacturers, designers, engineers, builders, research and end users along the entire construction value chain.

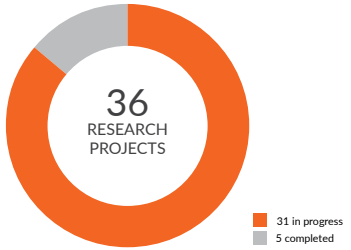
SmartCrete CRC has to date invested $17.6m of Commonwealth and partner funding in 36 innovative R&D projects across three research programs – Sustainable Concrete, Engineered Solutions and Asset Management – driving material change, developing new technologies and promoting best practice to decarbonise concrete.

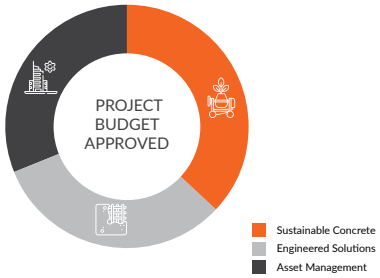
In FY2023-24, 10 new research projects commenced generating a net value of $5.1m (cash) and $9.2m (in-kind). Integral to the progress were:

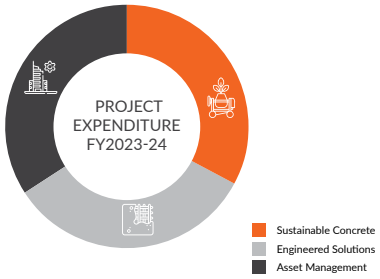
- SmartCrete CRC's 'Pathways to Sustainable Concrete' funding rounds leading to 9 approved project proposals
- SmartCrete CRC's innovation collaboration framework, empowering industry, government and research partners to overcome commercial and operational barriers to research collaboration
- SmartCrete CRC's efficient investment and project approval processes
- SmartCrete CRC's project governance and reporting structures with clear guidelines and deliverables
- SmartCrete CRC's proactive industy engagement, working with wider concrete community to identify and address pressing sectoral problems, particularly on the route to net-zero concrete.

As a result, SmartCrete CRC has now successfully completed 5 projects, of which one was completed in the reporting period. Also, 3 additional projects have been approved and are due to commence in FY2024-25.

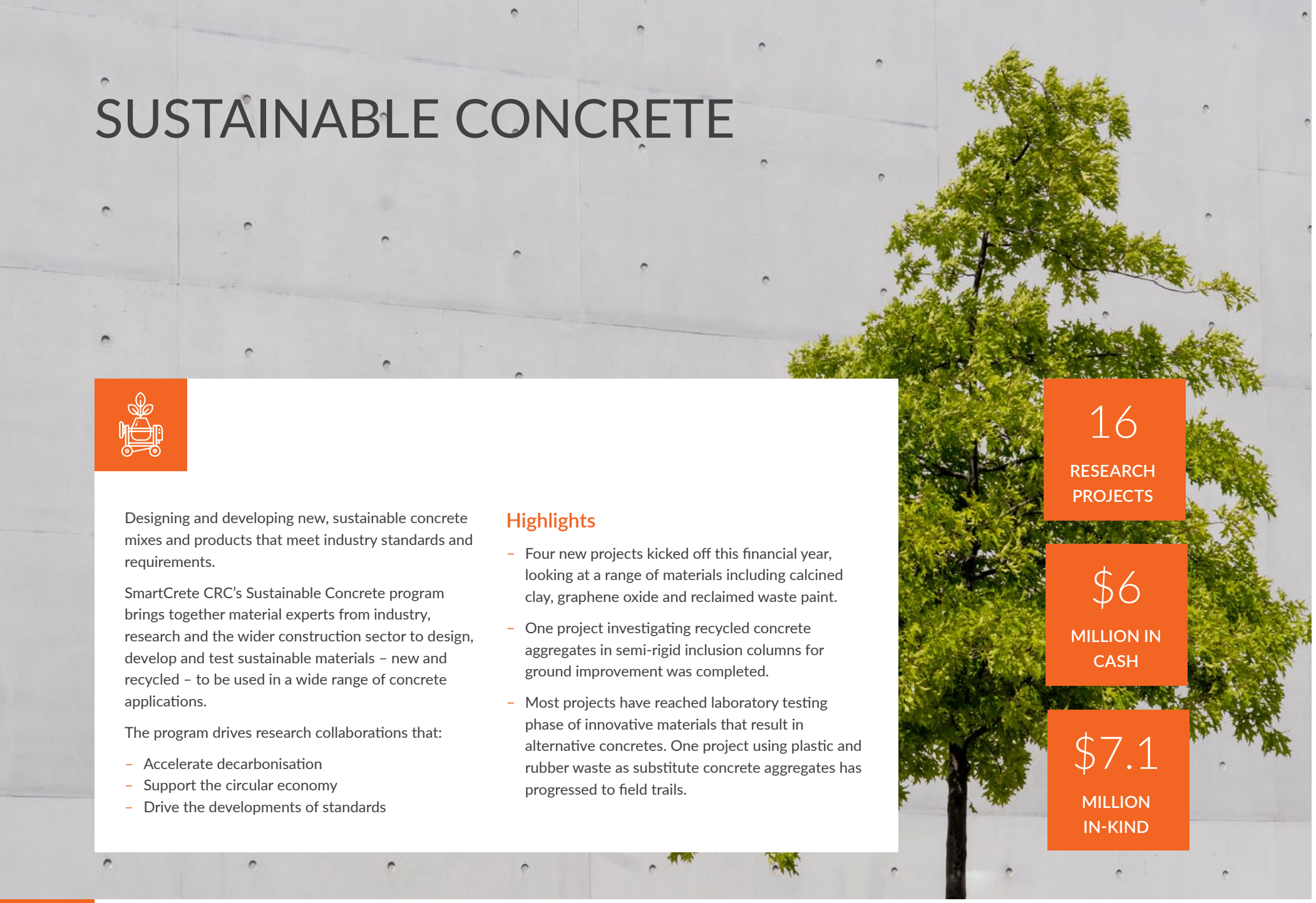
With most of SmartCrete CRC's projects being at the beginning of their innovation journey, no project IP outputs are mature enough yet to be utilised or commercialised.







SUSTAINABLE CONCRETE



Designing and developing new, sustainable concrete mixes and products that meet industry standards and requirements.

SmartCrete CRC's Sustainable Concrete program brings together material experts from industry, research and the wider construction sector to design, develop and test sustainable materials – new and recycled – to be used in a wide range of concrete applications.

The program drives research collaborations that:

- Accelerate decarbonisation
- Support the circular economy
- Drive the developments of standards

Highlights

- Four new projects kicked off this financial year, looking at a range of materials including calcined clay, graphene oxide and reclaimed waste paint.
- One project investigating recycled concrete aggregates in semi-rigid inclusion columns for ground improvement was completed.
- Most projects have reached laboratory testing phase of innovative materials that result in alternative concretes. One project using plastic and rubber waste as substitute concrete aggregates has progressed to field trails.

16
RESEARCH PROJECTS

$6
MILLION IN CASH

$7.1
MILLION IN-KIND

CASE STUDY

Low carbon footprint supplementary cementitious materials for concrete and blended cement use from mineral carbonation

Project partners
MCi Carbon
University of Technology Sydney

Duration
September 2022 – August 2025

Value (Cash + In-kind)
$1.7m

MCi Carbon (MCi) is an Australian clean technology company that has developed a mineral carbonation technology that captures and transforms CO_2 into carbon powders and low-carbon-footprint silica products to be used in construction and manufacturing.

By mixing CO_2 with calcium or magnesium-rich material, such as steel slag and mine tailings, MCi produces artificial limestone and silica products that can be added as Supplementary Cementitious Material (SCM) to cement, plasterboard and other products.

In 2023, MCi embarked on a research project with the University of Technology Sydney (UTS) and SmartCrete CRC to assess the technical risks and performance of its silica products in concrete. Over 3 years, UTS researchers will examine the material properties, conduct comprehensive performance tests adhering to industry standards, and refine, if necessary, MCi's silica formulation to enable larger field trials. With support from industry partners, UTS will test MCi's silica products in practical concrete applications to ensure they meet industry requirements and will be accepted for SCM use both in the Australian and international context.

The Impact

Due to their pozzolanic nature, MCi's silica products offer potential performance advantages in concrete. The project will provide the necessary data to verify their performance and assess the conformance of the products to existing industry standards. The overall outcome of the project will be the validation of new SCMs with a range of advantages, including consistent composition and reliable supply.

MCi's mineral carbonation technology – by effectively storing large amounts of CO_2 and producing low carbon SCMs that replace cement - has the potential to play a significant role in improving the sustainability of concrete.

What's next

The project will identify potential markets and applications where MCi's silica products will offer most value. In parallel to the project activities, MCi will develop and later scale-up their commercialisation process which includes conducting low-risk trials, connecting with prospective partners, and securing investment to expand its production facility to accommodate future commercial quantities.

In December 2023, construction of MCi's newest carbon plant Myrtle began on Kooragang Island in Newcastle. Once complete, Myrtle will abate over 1000 tonnes of CO_2 annually through customer-focused trial campaigns. MCi Carbon are planning to build their first industrial large-scale plant, together with RHI Magnesita, the leading global supplier of high-grade refractory products, systems and solutions, in Hochfilzen, Austria.

MCi's scale and commercialisation pathway targets further industrial plants from 2027-2030, and large-scale plants across multiple sites realised from 2030 and beyond.

> "With our mineral carbonation technology, we can capture CO_2 in hard-to-abate sectors and transform it into something that can be used in cements and concrete. Yet to use it commercially, we need to ensure that the materials meet industry standards. This project allows us to achieve that with the help of UTS' concrete experts."
>
> Mark Rayson
> Chief Technical Officer, MCi Carbon

ENGINEERED SOLUTIONS

Engineering new solutions that improve the durability, longevity and sustainability of concrete buildings and infrastructure, and lift the productivity of the sector.

The Engineered Solutions program taps into Australia's concrete and engineering expertise and invests in industry-research collaboration that improve the cost, durability and applications of concrete.

The program aims to safeguard and future-proof Australia's concrete buildings and infrastructure to:

- Drive sustainable design and construction
- Provide predictive service life modelling
- Optimise supply chains
- Support quality control and certification

Highlights

- Five new projects kicked off this financial year, investigating innovations including solar roof tiles, precast building cores, hybrid footings for housing.
- A recently added project looks at improving durability of precast culverts and deformation predictions by investigating volume stability.
- Several projects are being led by industry groups such as the Australian Engineered Fasteners and Anchors Council (AEFAC) and the Foundations and Footings Society of Victoria (FFSV). By representing their sectoral members, these industry groups lend considerable credibility and influence to the projects and their innovations.

11
RESEARCH PROJECTS

$5.8
MILLION IN CASH

$11.8
MILLION IN-KIND

CASE STUDY

Upgrading Design Guidelines for Innovative Concrete Fasteners

Project partners
Australian Engineered Fasteners and Anchors Council (AEFAC)
Swinburne University of Technology

Duration
July 2022 – June 2025

Value (Cash + In-kind)
$861K

The construction industry is beginning to use more innovative concrete products like high-performance concrete, steel fibre reinforced concrete, and low-carbon concrete made with supplementary cementitious materials. But engineers and architects don't know whether fasteners for traditional concrete will work the same way for these innovative products.

To find a solution, SmartCrete CRC brought together 6 collaborators led by the Australian Engineered Fasteners and Anchors Council (AEFAC) and Swinburne University with guidance from fastener manufacturers such as Leviat.

The 3-year project will investigate whether traditional fasteners work in innovative concrete products and update their designs and specifications if necessary. Researchers will conduct tests to arrive at designs for fasteners that perform well under normal conditions and earthquake conditions. The results will go towards the revised Australian Standard for fasteners - AS5216.

The Impact

With standardised design guidelines for fasteners into innovative concrete products, the construction industry will be more easily able to use the new, higher performing concrete products coming onto the market. Together, these types of concrete and improved fasteners will build stronger and longer-lasting buildings, which are therefore more cost-effective and safer.

Being able to build with less concrete, and with lower carbon concretes, will help the industry decarbonise in time for net zero by 2050. This helps concrete compete against building materials such as timber and steel, giving the industry and its workforce a future.

What's next

While this project does much of the groundwork for establishing technical guidelines for fasteners into innovative concrete, more work needs to be done. Together with the same partners, Swinburne University and AEFAC are investing in a sister SmartCrete CRC project to provide complementary guidelines on the fire performance of innovative concrete fasteners.

Researchers will conclude both projects by writing technical notes to be published by AEFAC on their website for use by, and feedback from, the sector. AEFAC then plans to pitch this to the Australian Standard in time for the anticipated 2028 review of the fasteners standard.

In this way, the study will produce the first Australian technical guidance for innovative concrete fasteners in normal and earthquake conditions. Engineers and designers will be able to refer to this guidance to work with innovative concrete and their fasteners within 5 years.

> "We're saving energy. We're saving materials. There are so many small benefits that I hope will add up and create greater benefits for the whole."
>
> Andreas Boomkamp
> Global Design Engineering Lead, Leviat

ASSET MANAGEMENT

Developing new technologies and procedures to enhance the use and longevity of concrete assets.

SmartCrete's Asset Management program connects asset owners and managers operating and maintaining concrete infrastructure with experts from different research disciplines to develop innovative, technology-focused solutions to mitigate concrete degradation.

To protect and maintain the health of Australia's infrastructure, the program:

- Supports concrete health monitoring and maintenance
- Fast-tracks sensor development and data analytics
- Offers Digital Twin and predictive modelling

Highlights

- One new project leverages robotic sensors for concrete sewer inspections.
- Several projects have progressed to field trials, testing sensors and other inspection tools in sewers, maintenance holes and bridges.
- One in-flight project makes use of waste-water sensor interrogator units developed in a previously completed SmartCrete project, taking a crucial next step towards commercialisation.

9
RESEARCH PROJECTS

$5.8
MILLION IN CASH

$10.4
MILLION IN-KIND

CASE STUDY

Modernising Sewer Pipe Maintenance through Robotic Sensors

Project partners
South East Water
La Trobe University

Duration
February 2024 – January 2027

Value (Cash + In-kind)
$1.29m

Water authorities own and operate sewerage networks consisting of thousands of kilometers of pipes under our cities and are responsible for their maintenance and repair.

Current limitations when maintaining the sewer network, often involving someone watch CCTV footage and make naked-eye assessments, can result in pipe failures such as leaks and collapses. The related repairs, replacements, clean ups and fines cost water authorities $982 million each year, the equivalent of $60 per adult Australian (ACA).

Pipe leaks and collapses can also pose risks to human health and damage the environment, for example, if sewage spills enter waterways.

South East Water, in partnership with La Trobe University, is developing a system which can go into the pipes to collect accurate data on pipe conditions.

SmartCrete CRC has invested $218k into this project to advance an already-in-the-making robotic-based sewer pipe condition assessment system.

The system will assess the pipe's condition by collecting data, using AI to accurately predict the lifespan of the pipe and if repairs are required.

The project will field test the robot to make sure the sensors are collecting accurate data.

The Impact

Once operational, the condition assessment system will give South East Water and other water authorities an effective solution to maintain their pipes and keep them in good condition for longer.

It will provide a more accurate way to determine when repairs are required, which is anticipated to reduce the number of pipe failures - which means less disruptions to the community, and better environmental and health outcomes.

It will also result in significant savings for water authorities each year, which can potentially be returned to customers through reduced network costs.

What's next

The project lays the groundwork for future research to test the condition assessment system across the city and collect data to train the AI. Once the AI system can accurately assessing pipe conditions, it will be ready for industry adoption.

It is anticipated that detection services and maintenance contractors will see this as an attractive offering and will be interested in its utilisation.

The system would also help refine the existing code for assessing pipe conditions, making it more precise and better at preventing pipe failures.

> "We always need to clarify with industry, *Is that a suitable method? Is what we're proposing going to actually work?* So having this opportunity to be working with industry and funded by SmartCrete CRC is a really great way of doing research and development, with the ultimate goal to translate research and impact out of the university."
>
> Alex Stumpf
> Lecturer, Engineering Department I RAMPS
> La Trobe University

STAKEHOLDER ENGAGEMENT AND COMMUNICATIONS

Communication is at the heart of everything SmartCrete CRC does. We believe that effective communication can help bring about the shift in attitudes and behaviours needed to transition concrete for a sustainable Australia.

In FY2023-24, SmartCrete CRC connected, communicated and engaged with a wide array of stakeholders from industry, research and government. We identified innovation collaboration opportunities, secured additional industry investment and strengthened our position as "a catalyst for change" within Australia's concrete ecosystem.

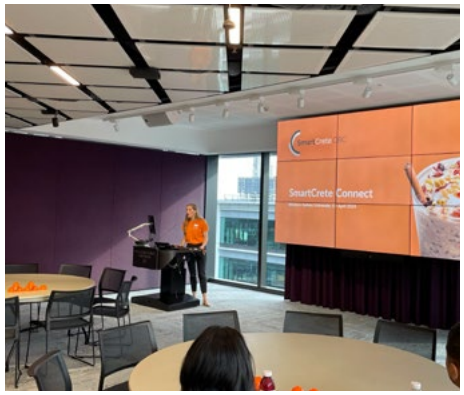
We achieved this by:

- Implementing engagement and communications initiatives that emphasise the impact, value and benefits of cross sector collaboration. Integral to this approach have been 2 successful funding rounds 'Pathways to Sustainable Concrete' and tailored industry seminars that united representatives from across the concrete value chain to discuss industry problems around supply chain complexity, decarbonising infrastructure and stalling adoption of low carbon concrete technologies. Insights from these discussions have been captured in thought leadership articles and submissions to government agencies such as the Climate Change Authority's 2024 *Issues paper: Targets, Pathways and Progress*.
- Strengthening our involvement with industry associations such as the Concrete Institute of Australia (CIA), Cement, Concrete Aggregates Australia (CCAA) and the Materials and Embodied Carbon Leaders' Alliance (MECLA) to broaden our reach and gain insights into the industry's state of play. We were involved in putting together MECLA's *A Guide to Low Carbon Concrete in Australia* which was released in April 2024.
- Speaking and contributing to key industry events with the highlight being CIA's biennial national conference Concrete 2023. The conference attracted over 600 Australian and international concrete experts to discuss and share information on the changing built environment, the challenges in meeting new sustainability and resilience requirements and how to overcome those. SmartCrete CRC was present with an exhibition booth and hosted 2 engaging panel discussions. One of these featured the next generation of industry experts and the other encouraged an open sustainability conversation between industry, research and government.
- Launching 3 Communities of Practice – each aligned with Smartcrete CRC's 3 research streams - in July 2023. Chaired by industry experts from Cement Australia, BE&G and Sydney Water, these communities bring together industry and research professionals to discuss challenges, share research outcomes, and exchange knowledge. In FY2023-24, we hosted a total of 9 Communities of Practice.
- Expanding SmartCrete's online and social media presence through a new website that showcases the breadth and depth of the CRC's research collaborations and delivering innovative news segments. These include Clinker Chat and Innovation Insights, which highlight research breakthroughs and general advancements within the cement and concrete industry in Australia and globally.
- Providing regular updates about SmartCrete CRC's research initiatives, organisational and industry news through our newsletter – *smartcrete news* – reaching an audience of 1400+ subscribers.

Concrete 2023

Clinker Chat: Kayasand

University visit: Wollongong



SmartCrete Connect: Western Sydney

> Communication inspires people, drives innovation and leads to transformation.
>
> Catherine Ferrari
> Independent Director

Image Source: SmartCrete CRC

CAPABILITY DEVELOPMENT

The next generation of concrete experts will be the driving force behind Australia's transition to net zero concrete. That's why SmartCrete CRC invests in building their capabilities and creating opportunities for them to challenge and recognise their contributions to decarbonising the built environment.

In FY2023-24, with Estelle Clapham stepping into the role of Education Manager, we

- onboarded 25 new PhD and Master students into research projects, expanding our student cohort to 35 across 12 universities and various disciplines. These students are at the forefront of innovation, bringing fresh ideas and transformative solutions to the concrete sector.
- engaged with our students on a regular basis – both online and in person - to ensure they are well-equipped to succeed within their SmartCrete projects. We also created opportunities for personal and professional development, for example, presenting at our networking breakfast, SmartCrete Connect.
- collaborated with CIA's NexGen Committee at Concrete 2023, hosting an engaging panel discussion that highlighted different career pathways within the industry. As a result of this, we were able to forge a broader CIA NexGen partnership focusing on joint capability building initiatives from July 2024 onwards.

To inform and build capabilities within the broader concrete ecosystem, we

- launched three Communities of Practice in July 2023 which since then have become vital platforms for knowledge transfer, robust discussions on best practices and driving concrete innovation.
- partnered once more with Ducere Global Business School on two research projects: one evaluating Australia's net zero legislation in an international context and the other developing a commercialisation framework for sustainable concrete technologies.
- initiated a review of Australia's concrete industry skills, education and training landscape, scheduled for completion in September 2024. The review aims to uncover possible knowledge gaps and make recommendations for workforce development and training.
- featured over 35 emerging talent and thought leaders in our 'Innovation Insights' social media initiative this year, shining a spotlight on the state-of-the art industry and research capabilities that exist within Australia's concrete sector.
- explored additional partnerships with education providers and industry stakeholders to enhance training programs and disseminate research findings across the cement and concrete ecosystem.

> "Investing in the next generation, the young talent is key to success."
>
> Stephen Harmer
> Independent Director

SmartCrete CRC and MECLA Partnering for Sustainable Concrete

The Materials and Embodied Carbon Leaders' Alliance (MECLA) brings together industry, research and government to help the building and construction sector decarbonise and transition to circular economies. Funded through a combination of industry and NSW Government and supported by WWF Australia, Presync and Climate-KIC Australia, MECLA focuses on reducing the embodied carbon in construction materials to meet net zero targets as per the Paris Agreement.

Given the complex building and construction ecosystem, MECLA's approach is to bring together different sectors of the supply chain for a collaborative approach. It works to understand the barriers and create solutions to the uptake of low-carbon innovations. Through these innovations, MECLA aims to position Australia as a top material supplier in the global market.

MECLA has 10 working groups that drive decarbonisation in various parts of industry. Shortly after SmartCrete joined Working Group 5b for concrete and cement in 2021, the CRC and MECLA kicked off their partnership by promoting the *Decarbonisation Pathways for the Australian Cement and Concrete Sector* report which has since become the industry's widely accepted roadmap.

MECLA has been an instrumental partner in raising industry awareness of our shared goals of decarbonisation and circularity. The working group itself involves such influential members as Evan Smith from Holcim and Ali Kashani of University of New South Wales alongside our own representatives Clare Tubolets and Jana Kuthe. The working group's monthly meetings have provided valuable industry updates and perspectives.

MECLA and SmartCrete have also collaborated on other initiatives to engage our stakeholders in important conversations. These include our Sustainability-led Procurement webinar which showcased the headway of 3 industry professionals on supplying, procuring and specifying low-carbon concrete. The event earned SmartCrete a record number of 300 sign ups, helping to raise awareness of SmartCrete's webinar series and growing our audience for subsequent events.

In FY2023-24, SmartCrete was also proud to support MECLA in producing their *Guide to Low Carbon Concrete in Australia*. This guide advises specifiers on the emissions profiles of concrete at different compressive design strengths and how to improve their procuring processes for sustainable outcomes.

SmartCrete will continue working closely with MECLA on achieving the commitments and workstreams of the concrete and cement working group, leveraging each other's platforms for ongoing mutual support.

ABOUT SMARTCRETE CRC

We are a catalyst for change

Smartcrete is an independent, for-impact Cooperative Research Centre (CRC) that empowers innovation collaborations to transition concrete for a sustainable Australia.

Working with manufacturers, architects, engineers, developers, asset owners and government, we invest $21m of Commonwealth funding in university-delivered R&D projects that spur sustainable design, use and management of concrete.

Our strength lies in connecting Australia's concrete ecosystem, creating research opportunities and setting up mutually beneficial partnerships that accelerate material change, develop new technologies and promote best practice to decarbonise concrete and achieve net zero by 2050.

$21
MILLION IN COMMONEALTH FUNDING

67
INDUSTRY AND RESEARCH PARTNERS

36
RESEARCH PROJECTS

We believe in concrete innovation

Open Communication

We are unapologetically bold. We are open, honest and transparent. By doing so, we remove barriers, build trust and create an environment for research collaboration. And, we are not afraid of hard conversations along the way.

Collaboration

We embrace diversity, equality and inclusivity and treat everyone with respect. We know that we are at our best when we work together, leveraging the "collective genius" of our stakeholders and the wider community.

Integrity

We do what we say we will. We are industry-led, act from a well-informed position and embrace sustainable business practices to achieve outcomes that propel Australia's concrete ecosystem forward. We don't lose sight of what's right for our innovation collaboration.

True to Purpose

Everything we do drives outcomes for community benefits – whether it's new technology or a different approach to producing, using and/or re-using concrete. We are looking for innovative, sustainable ideas that help transform Australia's built environment. Incremental won't cut it.

Smart Thinking

We are inquisitive, question the status quo and bring together smart people, who use their skills and expertise to make a difference and bring about change for a better, sustainable Australia.

The Team behind the SmartCrete CRC

Through open, honest and transparent conversations, SmartCrete CRC's management team and staff connect and collaborate with industry, research and government and the wider concrete ecosystem.

Clare Tubolets
Chief Executive Officer

James Tarrant
Chief Fiancial Officer

Hugh Ong
Portfolio Director

Professor Vute Sirivivatnanon
Research Director

Jana Kuthe
Marketing and Communications Manager

Estelle Clapham
Education Manager

Lydia Gunawan
Project Coordinator

Dr Sorn Vimonsatit
Outreach Manager

In FY2023-24, the following staff members left the orgnisation:

- Robert Newton, Chief Operating Officer
- Zachary Foster, Video Producer

Board of Directors

SmartCrete CRC is a not-for-profit company limited by guarantee. It was established under the Commonwealth Government's CRC Program in 2020 and is governed by an independent board of directors that oversees the organisation's research portfolio and work to drive the transition of concrete for a sustainable Australia. The board represents a broad range of industry, research and government expertise.

In FY2023-24, Peter Williamson retired from the Board.

Emeritus Professor Elizabeth Taylor (AO)

Independent Director,
Chair of the Board, appointed on 16 June 2020

Skills and Experience
Governance, Strategy Risk, Education, Technology

Stephen Harmer

Independent Director,
Deputy Chair of the Board, appointed on 16 June 2020

Skills and Experience
Construction, Concrete, Marketing, Business Development, Government relations, Governance, Sustainability

Dr Gunilla Burrowes

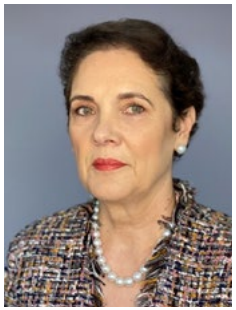
Independent Director,
Chair of the Imvestment and Impact Committee, appointed on 12 November 2020,

Skills and Experience
Entrepreneurship, Commercialisation, Technology Innovation, Business Strategy, Governance

Dr Ross Harper

Independent Director,
appointed on 22 January 2024

Skills and Experience
Strategy and Operation, Infrastructure Management, Materials, Technology, Commercialisation, Entrepreneurship, Stakeholder Engagement, Sustainability and HSE Leadership



Catherine Ferrari

Independent Director, Chair of the Partners and Stakeholders Committee, appointed on 12 November 2020

Skills and Experience
Governance, Stakeholder Engagement, Communications, Strategic Planning, Business Management

Elizabeth Whitelaw

Independent Director, Chair of the Audit, Risk, Privacy and Finance Committee, appointed on 12 November 2020

Skills and Experience
Governance, Risk and Compliance, Financial, Performance, Intellectual Property, Commercialisation

Committees

The board of directors has established 3 advisory committees - each designed to help the board deliver on its resposnibilities.

Audit, Risk, Privacy and Finance Committee

Offers guidance in terms of corporate governance pertaining to audit, risk, privacy, and financial matters. It also addresses cyber security and compliance matters.

Investment and Impact Committee

Provides strategic advice on the selection of innovative research projects and the acquisition, maintenance, and exploitation of related IP to facilitate industry impact consistent with SmartCrete CRC's objectives.

Culture, People and Stakeholder Committee

Provides governance and advice on managing Smartcrete CRC employees, partners and the wider community of stakeholder.

SmartCrete CRC governance is alinged with the structures set out in the Constitution, Commonwealth and Participants Agreements.

The CRC has income tax-exempt status. It is endorsed by the Australian Charities and Not-for-profit Commission (ACNC) and the ATO as an advancing education charity. As a not-for-profit company limited by guarantee, SmartCrete CRC is governed by ACNC rules and regulations and the Corporations Act. There have been no changes to the structure during this financial year.

> "Our Governance framework supports our ambition to deliver project outcomes and impact."
>
> Elizabeth Whitelaw
> Independent Director

Finance

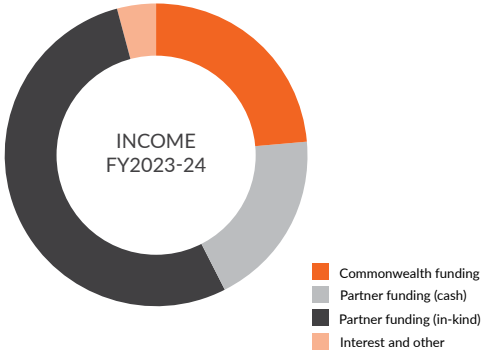
SmartCrete CRC completed its fourth financial year of operations in a healthy financial position, with $13.8m in cash and term deposits at bank as at 30 June 2024. This balance is sufficient to fund current projects, administration obligations and the CRC's activities.

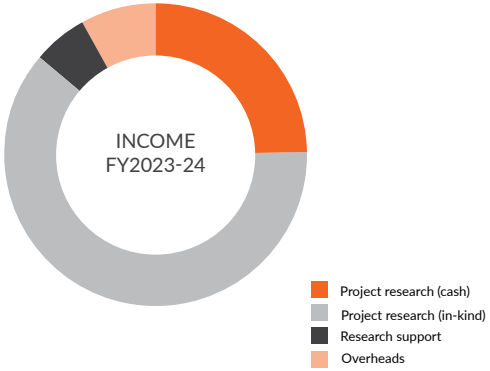
In FY2023-24, the Commonwealth contributed $4.2m in cash to SmartCrete CRC, bringing the total Commonwealth cash contributions received since 2020 to $15.7m. Although delayed project activities have resulted in a higher-than-expected combined cash balance, spending is set to increase as activities in current and upcoming research projects accelerate over the CRC's lifespan.

During the reporting period, SmartCrete CRC started 10 new projects, significantly boosting project activity and increasing in-kind contributions and participation from project partners.

Total expenditure on an accrual basis for the financial year was $15.4m. Research expenditure accounted for $14.1m of this total and included partner in-kind contributions of $9.5m (compared to $5.2m in FY2022-23). The increase in research expenditure in FY2023-24 can be attributed to increased project activity during the reporting period.

Contributions from the Commonwealth and Participants have been recognised in the Statement of Profit or Loss in accordance with the Commonwealth Agreement and applicable Australian Accounting Standards. Appointed external auditors, LBW conducted the end of financial year audit of the accounts in line with Australian Accounting Standards, International Financial Reporting Standards and Interpretations and Commonwealth Guidelines where applicable. At the conclusion of the audit process, no audit issues were found, and no adjustments were required.





Partners

SmartCrete CRC connects industry, research and government partners to collaborate, share knowledge and resources and transition concrete for a sustainable Australia. In FY2023-24, SmartCrete CRC's partners (core and affiliated) included:

Core

Cement Concrete & Aggregates Australia

NSW Transport

paintback

Macquarie University

La Trobe University

UTS University of Technology Sydney

The University of Sydney

Western Sydney University

Industry and Government

Adelaide Brighton Cement Ltd

Bentley

CanEnviro Innovations

ACSE

ETA International Associates

Cement Industry Federation

Ash Development Association of Australia

BG&E

City of Ryde

AEFAC Australian Engineered Fasteners and Anchors Council

BHP

concrush reduce. re-use. recycle.

APozA Australasian Pozzolan Association

Blue Economy Cooperative Research Centre

DARACRETE

asa

BORAL

Delta electricity

Austroads

BRICKWORKS

Seven Hill Engineering & Construction


Foundation & Footings Society
Holcim
mainroads WESTERN AUSTRALIA
Qatar Foundation
SOUTHERN PORTS
ALBANY BUNBURY ESPERANCE
WATER SERVICES ASSOCIATION OF AUSTRALIA
Curtin University
Fremantle PORTS
HUNTER WATER
Melbourne Water
RACE for 2030
Stretford Civil Constructions
WÜRTH
RMIT UNIVERSITY
GHD
intelligent water networks 10 years
MCi Mineral Carbonation International
Ramset
Sydney WATER
ZEOLITE
SWINBURNE UNIVERSITY OF TECHNOLOGY
Hanson HEIDELBERGCEMENT Group
Lastek Photonics Technology Solutions
Mint innovation
SCENIC RIM REGIONAL COUNCIL
vinsi PARTNERS
THE UNIVERSITY OF NEWCASTLE AUSTRALIA
Hawks Excavation
Leviat A CRH COMPANY
Molycorp THE RARE EARTHS COMPANY
朝上科技 UPWARD TECHNOLOGY
VICTORIA State Government Department of Transport
University of South Australia
HILTI
PRECAST CONCRETE STRUCTURES (QLD)
PBM PACIFIC BLUE METAL
SA Water
VICTORIA State Government Treasury and Finance
THE UNIVERSITY OF QUEENSLAND AUSTRALIA
HOBSON ENGINEERING
MACDONALD LUCAS
parchem
South East Water
WATER CORPORATION

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Australian Government
Department of Industry, Science and Resources

Cooperative Research Centres Program