



WATER SECURITY CRC

# Water Security CRC

Information Brochure  
2020



*The Water Security CRC is industry, utilities, government and the research sector collaboratively addressing the challenges of infrastructure and water availability that underpin the future economic prosperity of rural communities, regional towns and major cities across Australia.*

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# Water Security CRC

## The water security challenge

Australia is the driest inhabited continent on earth and climate change will only further exacerbate our current water security challenge. Growing populations, fluctuating water availability, pandemics and extreme weather events already threaten the resilience of Australia's water service systems and future economic growth. Combined with ageing water service infrastructure and governance structures that were designed in an era with a narrow conceptualisation of water systems and the suite of values they deliver to society means the status quo is no longer sustainable. Infrastructure Australia, the Productivity Commission and the water industry itself have concluded that failure to address water security issues without comprehensive and innovative solutions will lead to higher costs and declining service for urban, regional, rural and remote communities and industries. We need to redesign and reconfigure Australia's water services sector to ensure it meets the evolving needs and to make the system resilient and adaptable to future trends and shocks.

## Our purpose

The proposed **Water Security Cooperative Research Centre (Water Security CRC)**, currently under consideration by the Australian Government, is designed to deliver integrated research solutions aimed at safeguarding Australia's economic and environmental future through addressing the knowledge and training needs of the water industry. The Water Security CRC will provide a key mechanism and forum where water service companies, peak bodies, relevant government agencies and university researchers can come to together to address the challenges of providing the secure, efficient, productive and resilient water systems required for future prosperity. Advancing integrated whole of system water cycle management through technological innovation and policy, regulatory and governance reform will be the purpose of the CRC. All options for securing our water security future will be considered.

## Why a new water CRC?

Water security means much more than just the provision of a safe water supply. It also requires building resilience to water-related disasters and supporting human wellbeing and the health of ecosystems which are central to the water management cycle.

Infrastructure centric solutions alone will not be sufficient to address the water security challenges facing Australia's cities and regions. Industry and government will need to continuously adapt and invest to maximize the value from existing water security investments and to select investment pathways that reduce water risks at least cost over time.

The Water Security CRC will build on and add value to the work of previous CRCs and other collaborative research programs that have focussed on individual aspects of the broader water security challenge such as hydrology, ecology, treatment technologies and water sensitive design.

The Water Security CRC will draw from these initiatives, taking a holistic whole-of-catchment perspective that recognises that the water footprint of cities and regional communities extends well beyond their boundaries and that water insecurity affects our overall economic, environmental and social well-being.



## Current partners

38 partners joined the CRC bid for the Stage 1 submission, representing key stakeholders across the sector including; water utilities, consulting firms, technology providers, government departments and researchers.

The Water Security CRC is actively seeking additional partners (see page 19 for more details on how to join).



**A I T H E R**



Project 412

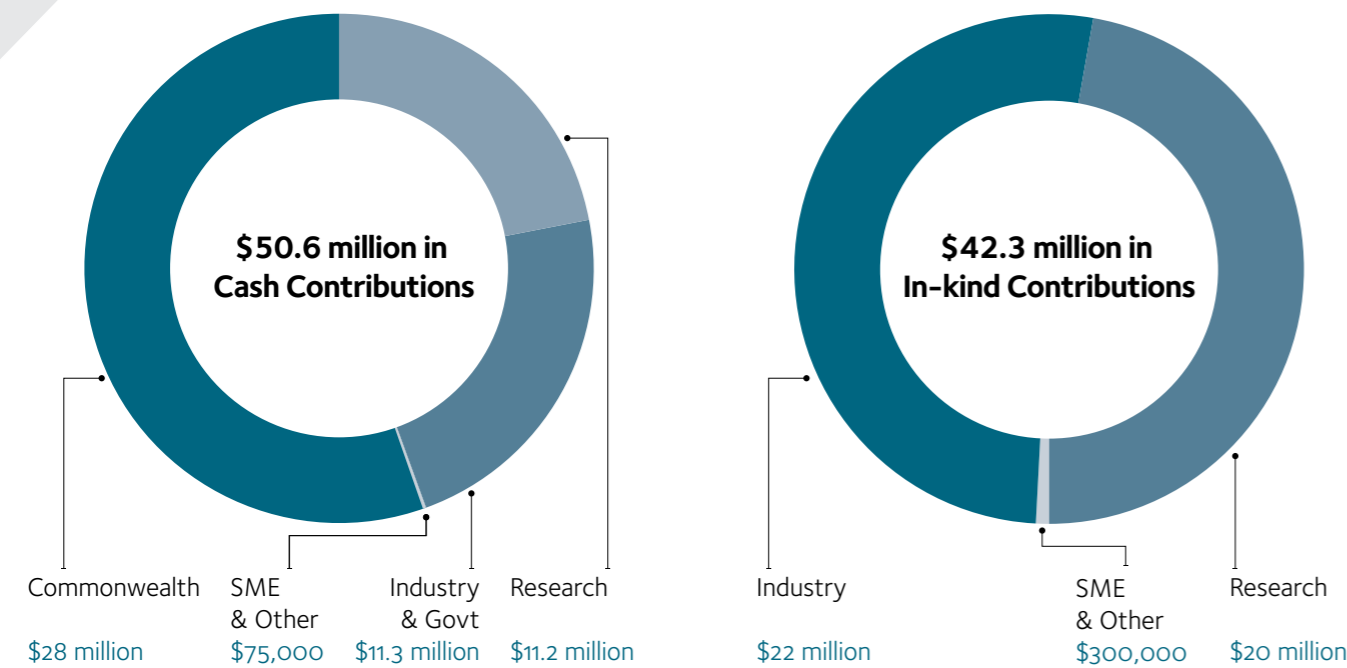


## Status of the Water Security CRC

The Cooperative Research Centre (CRC) Program is the Australian Government's largest program for industry grants. CRCs funded under the program are independent entities led by a skills-based Board that facilitate collaborations between industry, researchers and the community. The current CRC grant program opened in April 2020 and the Stage 1 bid for a Water Security CRC was successfully submitted in July 2020.

This first of a two-stage bid process brought together 38 research, industry and government partners who have agreed to an initial cash and in-kind contribution of \$77 million over the ten-year life of the CRC. A contribution of \$28 million has been requested from the CRC program. Further industry partners are being sought with the goal being to raise an additional \$6 million in cash contributions.

Figure 1: Water Security CRC Partner Contributions to the Water Security CRC



## Proposed research areas

The proposed research program areas have been developed through a collaborative process with our bid partners and broader water industry. These are not intended to be silos of activity and the project areas will evolve and be refined as the Water Security CRC moves toward its proposed commencement in October 2021. Four core research program areas have been identified.

Research Program 1 will focus on the research, development and adoption of technologies that will realise the potential of alternative water sources and maximise the efficient use of existing water. The impacts of future water security risks such as droughts, fires and floods will be investigated, and mitigation strategies developed. Research into emerging bio-contaminants will be undertaken to enhance the safety of community water supplies. Research Program 2 investigates the optimisation of water supply catchments to enhance the role and funding of cost-effective grey-green infrastructure solutions capable of mitigating risks and costs.

Research Program 3 investigates water security liveability and will be focused geographically into areas where significant investment is being made to mitigate the effects of a drying climate. The integrated policy, strategy, governance, and community collaboration requirements needed to achieve water security outcomes and the adoption of new technologies will be addressed through cross cutting supportive investigations under Research Program 4.



## Research Program 1 – Safe and integrated water supplies

Research Program 1 (RP1) takes a holistic view of the water cycle using cross-system integration of climatic, hydrological and technological aspects to meet increasing challenges of water quantity, quality and community expectations. In close collaboration with industry partners it will develop and apply tools for predictive modelling, scenario planning, and collaborative decision making. The research will also create innovative, multi-benefit hybrid technology solutions to address identified challenges and improve capacity, availability and security of our community water systems.

### Outcomes of RP 1

Build the resilience of community water systems and enhance economic growth, public health and liveability. New technologies developed will improve the services provided by the water industry and create valuable business opportunities.

#### Proposed RP1 activities identified are:

- > Enabling integrated and holistic urban/water planning and hybrid solution implementation
- > Quantifying and demonstrating the value and opportunities for water recycling and storage solutions
- > Improving water services asset efficiency and climate resilience using an integrated, digital and whole-of-systems approach to operation and optimisation
- > Safeguarding against contaminants of emerging concern both biological (antibiotic resistance, viruses) and chemical (microplastics, PFAS).

#### Key outputs from RP1 are anticipated to be:

- > Whole of system GIS based collaborative drinking and storm water scenario planning software tools that optimise water management investments
- > Digital prototypes that enable integrated systems approaches to the operation and optimisation of water assets across urban and rural communities
- > Techno-economic model that characterises various water recycling/re-use options to optimise solutions appropriate for given communities
- > Real time warning systems to safeguard against contaminants through the development of intelligent sensors.

## Research Program 2 – Maximising value from water catchments

Research Program 2 (RP2) will undertake collaborative research with industry and government partners to develop solutions for optimising catchment-wide investments in grey, green and blue infrastructure to deliver high performance water cycle management that is cost-effective, resilient and responsive to changing needs. Catchment settings have been identified through industry consultation as appropriate initial testbeds for whole-of-catchment solutions.

### Outcomes of RP 2

Benefit the water industry through creating new income sources and increasing the range of avoidable costs. Enhancing water storage, reuse and treatment through the application of green infrastructure approaches will optimise water supply services.

#### Proposed RP2 activities identified are:

- > Development of innovative spatial planning tools to identify optimal configurations of blue, green and grey investments within catchments to achieve multiple objectives (e.g. least-cost water services, enhanced flood resilience and urban stormwater management, in combination)
- > Analysis procedures to identify location-specific economic incentives and trading mechanisms to fund catchment-based solutions
- > Development of institutional analysis tools to identify governance, regulatory and policy barriers and enablers of cost-effective whole-of-catchment, whole-of-cycle solutions
- > Identifying and characterising urban-rural interface issues for water quantity and water quality
- > Creation and application of database-linked spreadsheet tools for cost-benefit analysis to value the economic benefits of blue and green infrastructure investments.

#### Key outputs from RP2 are anticipated to be:

- > Multi-objective catchment planner with plug-in modules to optimize blue/green infrastructure investments to address user/catchment-specific management priorities such as flood risk
- > Location specific economic incentives and trading mechanisms to fund catchment-based solutions drawing on the above
- > Pricing tools that quantify the benefits of adopting reforms including governance, regulatory and policy barriers that limit cost-effective whole-of-catchment and whole-of-cycle solutions
- > Collaborative and transparent mechanisms that demonstrate recommended funding scenarios so as to balance the costs and benefits of investment decisions.



### Research Program 3 - Healthy people and liveable spaces

Research Program 3 (RP3) will establish a suite of water wise and water sensitive demonstration and case studies. These will be defined with the water industry partners and will be places where significant investment is being made to mitigate the effects of a drying climate and to provide solutions at scale. The demonstration and case studies will also have a clear focus on healthy people and liveable places and the overriding emphasis will be concerned with policy, governance and strategy. RP3 will use these partnerships with industry to develop policy, regulation and guidelines for alternative water systems or drainage management but can also be applied to larger initiatives at scale. An important outcome will be to improve collaboration between industry, government agencies, local government authorities and research organisations to link research and science to support water planning and policy preparation.

#### Outcomes of RP 3

Provide evidence, assessment frameworks and case studies to support the adoption of novel water and urban planning solutions by industry. Community health and liveability will be enhanced through the selection, design and management of blue-green systems.

#### Proposed RP3 activities identified are:

- > Overcoming institutional barriers through quantifying and demonstrating the value proposition of alternative solutions by going to scale.
- > Enhancing the evidence base that human and ecological health outcomes can be delivered through integrated water and urban planning and design solutions.
- > Delivering assessment frameworks and indicators that optimise water balance and enhance health, liveability and ecosystem outcomes.
- > Developing roadmaps that provide the pathway for blue-green, hybrid and other emergent water systems across urban, peri-urban and regional settings

#### Key outputs from RP3 are expected to be:

- > Business cases and policy that illustrate the value proposition for 'next' practices that integrate land and water solutions to maximise people's health and wellbeing and ecosystem outcomes.
- > Exemplar projects at various scales that demonstrate technological solutions, business case and governance options for different types of development (infill, green-fields, peri-urban, regional) illustrating livability, health and ecosystem outcomes.
- > Liveability indices that present evidence for blue/ green and climate resilient water systems that enhance livability (including improved physical and mental well-being) across urban, peri-urban and regional settings.
- > Pathways that illustrate how improved liveability and affordability (including non-monetary benefits) can be embedded in water security investments including identifying what mechanisms can be used to finance these expectations.



### Research Program 4 - Engaged communities and collaborative governance

Research Program 4 (RP4) is a suite of cross-cutting activities embedded across the other research programs. It will produce new evidence, frameworks, methods and tools to build industry capacities for creating social and institutional conditions that enable innovative water security solutions and drive required system transitions. Our social research methods—large-scale quantitative surveys, in-depth qualitative focus groups and interviews, participatory workshops and big data analytics—will be embedded in transdisciplinary processes and focal case studies. Two priorities underpin the proposed research area: (1) a focus on equitable water security for all Australian communities, including those vulnerable, Indigenous and remote. (2) provision of practical guidance for industry and government to accelerate the technological, institutional, community and economic transitions needed to achieve water security.

#### Outcomes of RP 4

Enhance collaborative water governance and reduce the social, political and institutional barriers to implementing water security solutions. Improve community water literacy to reduce the costs and risks of practice change and accelerate policy and practice transitions.

#### Proposed RP4 activities identified are:

- > Governance frameworks: Developing evidence and guidance for strengthening water governance and planning frameworks.
- > Community perspectives: Informing work with communities affected by water insecurity to improve conditions, design new communication and engagement approaches, and foster community capacities.
- > Collaborative approaches: Insights to identify barriers and enablers for participation by different stakeholders and inform the design and trial of new deliberative processes and tools for water co-planning, co-design and co-governance.
- > Collection, curation and hosting of shared datasets.

#### Key outputs from RP4 are anticipated to be:

- > Online repository and training for a "governance toolkit" to incorporate equity principles in water resource management and develop water security benchmarks, standards, incentives and governance mechanisms for water service levels.
- > Framework and implementation guidance for innovative co-governance processes, including their design, implementation and evaluation, trialed and verified by stakeholders across a number of cases and contexts.
- > Online water civics platform for hosting, curating and maintaining digital tools to support envisioning, co-design and co-governance processes led and facilitated by diverse water sector stakeholders.



## Education, training and adoption program

Education and training to equip individuals and organisations with the latest cutting-edge knowledge to tackle the challenges of water security is at the heart of the CRC mission. The CRC will combine university and industry teams to develop the capabilities and capacities needed for successful adoption and mainstreaming of innovative solutions. Our goal is to undertake research that is embedded within industry and to train the next generation of water professionals

The Water Security CRC will fund PhD scholarships and support a broader training program to build the required capabilities across its research students to lead applied water security research and to operate across the research-practice boundary. This will be delivered through the Water Security Industry Training Program (WS ITP). The CRC will build the capabilities and capacity of industry and government to adopt and mainstream research outputs. The WS ITP will ensure that Research Associates are provided with opportunities to learn from and embed their research in practice.

Industry-shaped and hosted research degrees and training are still relatively rare in Australia but internationally they have been recognized as important for decades. The WS ITP will provide:

- > A common but flexible framework for industry and government shaped and hosted student research and training.
- > A cohort-based experience for Research Associates including an annual conference, a Community of Practice, monthly interactive digital events and industry mentoring.
- > Industry and government internship opportunities to shape research agendas and provide development.
- > Formal, feedback intensive 'on the job' leadership development provided through a student focused leadership program.
- > Access to relevant postgraduate and industry education and training for Research Associates including digitally badged micro-credentials.

The CRC will also run a **WS Innovation Accelerator** program to catalyze the adoption and mainstreaming of new technologies, processes and services to be produced by the CRC. The WS Innovation Accelerator program will respond to industry and government needs through embedding capability and capacity development (CCD) specialists within research projects and their case studies.

## The Water Security CRC will provide:

Approximately 30 Higher Degree by Research (HDR) candidates (PhDs and research Masters) and 60 coursework Masters graduates.



Customised programs in business, leadership, commercialisation and driving innovation that will generate highly valued and effective workplace candidates

Tertiary programs that provide graduates with the skills, knowledge and aptitude required for incorporating water sustainability in their field of studies



Flexible vocational, trade and micro credentialing courses

Innovation centres that foster creativity in the CRC's partners and other SMEs and start-ups, particularly those working in the digital technology space



The means to enable the broader Australian community to be aware of water security and promote local and household measures that can be implemented to support it





## Governance of the Water Security CRC

The Water Security CRC will be governed by an independent skills-based Board. Leith Bouly has accepted the nomination as the interim chair of the Board, with Professor Stuart Bunn accepting the position of interim CEO. The Board of Directors will comprise a Chair and 6 Directors who are independent of the CRC Partners. The recruitment of the Board Directors will be coordinated by a third party and managed by the Nominations, Remunerations and Performance Committee. The Board will be voted in by Core and Supporting Partners of the CRC at the inaugural annual general meeting. Core Partners will have 3 votes and Supporting Partners will have 1 vote. The Board will meet on a monthly basis for the first 6 months of the CRC before reverting to a quarterly meeting schedule. Board sub-committees identified are:

- > The Research Advisory and Commercialisation Committee
  - > The Partners Committee
  - > The Audit, Risk, Privacy and Finance Committee
  - > The Nominations, Remunerations and Performance Committee
- The sub-committees will comprise expertise from the Board, CRC partner and independent experts, and will be responsible for providing expert advice and recommendations to the Board and CEO. Sub-committee appointments will be for a one-year or two-year term.



## The Water Security CRC Bid Team



Leith Bouly (Interim Chair) is an experienced Chair and Company Director having served on more than 30 boards. She is currently the Chair of Sunwater. Previously Leith has been a National Water Commissioner, and Chair of Healthy Waterways Ltd, the Wide Bay Water Corporation and the Tropical Water Quality Hub.



Professor Stuart Bunn (Interim CEO) is the Director of the Australian Rivers Institute at Griffith University and has over 250 technical publications. He is currently a member of the Murray Darling Basin Authority and was recently appointed as an Earth Commissioner under Future Earth. He has previously served as a National Water Commissioner and a Director of Land and Water Australia.



Professor Jurg Keller (Leader Program 1 – Safe and integrated water supplies) was the Founding Director of the Advanced Water Management Centre at the University of Queensland and has over 300 professional publications. Jurg was previously the Research Director for the Water Sensitive Cities CRC.



Associate Professor Jim Smart (Leader Program 2 – Maximising value from water catchments) is an environmental economist at Griffith University and has over 50 research publications. Jim has worked across Europe and Australia and is currently leading large-scale research projects through the NESP Northern Australia Research Hub, working closely with industry partners, local communities and state government.



Professor Greg Morrison (Leader Program 3 Healthy people and liveable spaces) is Director of the Curtin University Sustainable Policy Institute and has over 119 professional publications. Greg has previously served as Deputy Head of the School of Civil and Environmental Engineering at Chalmers University of Technology Sweden and was a Director for the Alliance for Global Sustainability.



Associate Professor Briony Rogers (Leader Program 4 – Engaged communities and collaborative governance) is the Director of MSDI Water at the Monash Sustainable Development Institute. She is the Chief Research Officer for the CRC for Water Sensitive Cities and an academic with Monash University's Faculty of Arts. Briony has over 60 research and professional publications, and worked with cities across Australia and internationally in action research settings to develop strategic guidance for organisations and communities pursuing visions of sustainable water futures.



Mr Mark Pascoe (Education, Training and Adoption Manager) is Chief Executive Officer of the International Water Centre. Mark has over 40 years of experience working in water management, wastewater and sewerage management. He has served on many national and international boards in the water industry.



Professor Tony Wong is the former Chief Executive of the Cooperative Research Centre for Water Sensitive Cities (CRCWSC). Tony is recognised for his research and practice in sustainable urban water management. His expertise has been gained through national and international consulting, research, and academia.



Mr Greg Spinks (Bid Consultant) has over 15 years' experience in assisting clients with major grant applications, including CRCs, and in the past 8 years has helped them raise \$584 million from granting bodies, with a success rate over 80%.

## The Benefits of joining the Water Security CRC

Becoming a partner in the Water Security CRC will provide significant business benefits, influencing and leveraging opportunities. It will link your organisation directly with world class researchers across some of Australia's best universities and provide you access to a vast network of research and industry professionals across Australia and internationally all striving to address the water security challenge.

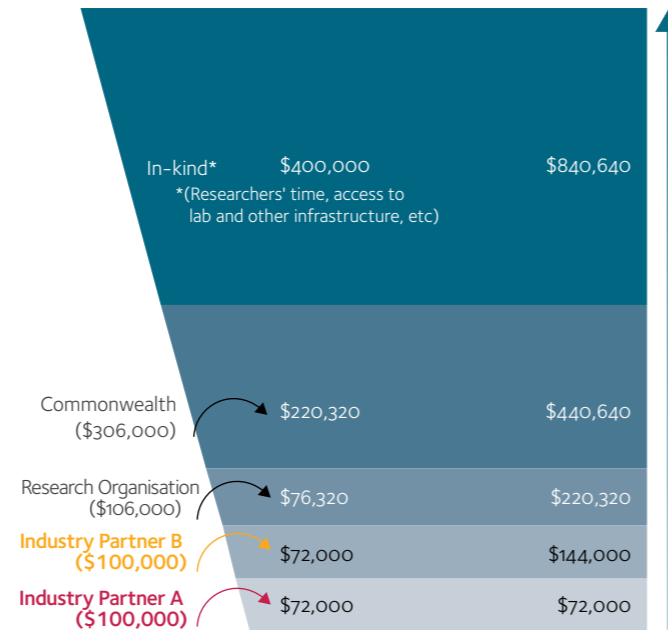
The CRC will provide an independent forum for all participants in the water sector to come together to tackle challenges in an integrated manner.

Core members of the CRC will play a critical role in establishing the board of the CRC and the shaping of the research program.

Membership of the CRC can also qualify partners for R&D tax concessions (Please refer to business.gov.au and the Australian Tax Office).

The diagram opposite provides an example of the true benefit of the leveraged funding and return on investment available to partners conducting their collaborative research projects through the CRC. The diagram shows **how partner contributions on 1 CRC research project with 2 partners collaborating can be significantly leveraged**. Note: 72% of cash contributions goes to Research, with 28% going to Education & Training, Tech Transfer and HQ.

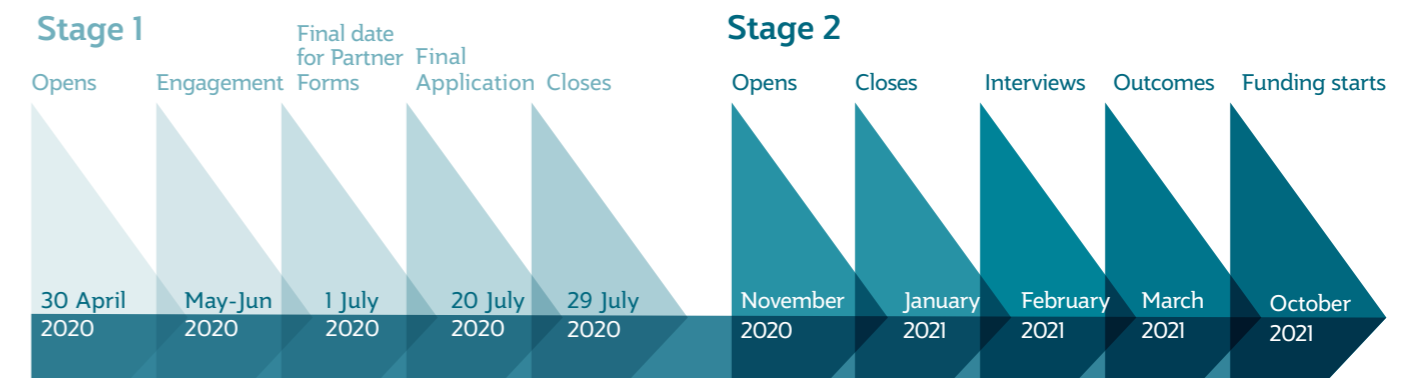
**EXAMPLE: How \$100,000 industry cash contribution for research project becomes → Total \$840,640**



*This is an EXAMPLE ONLY; figures will vary from project to project.*

## Next Steps

Prior to the submission of the Stage 2 bid, we will further engage with our current industry partners and new ones wishing to join, to refine the research and training programs and the desired outputs. Further modelling to quantify the expected impacts of the Water Security CRC research program will also need to be undertaken.



## Want to know more or join the Water Security CRC bid?

**There is still time to join.** There is the opportunity for more organisations to join our CRC prior to the Stage 2 deadline in January 2021. More organisations will strengthen the bid and add to the extensive possibilities for innovative research and training programs and access to leveraged funding.

If you are interested in learning more about our CRC and becoming a partner, please contact:

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