



Cooperative  
Research  
Australia

**National Reconstruction Fund Submission**  
**February 2023**

*Cooperative Research Australia acknowledges the traditional custodians of the land on which we operate, the Ngunnawal people. We also acknowledge the traditional custodians of the various lands across Australia upon which our members operate.*

*We pay our respects to Elders past, present and emerging and celebrate the diversity of Aboriginal peoples and their ongoing cultures and connections to our lands and waters.*

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## Executive Summary

Cooperative Research Australia (CRA) welcomes the opportunity to participate in the consultation on the National Reconstruction Fund (NRF).

CRA is the voice of industry-research collaboration and advocates for the translation of research into commercial, economic, social, and environmental outcomes that benefit all Australians. Our members are the lynchpin in the Australian innovation system and are focused on creating new products, services, industries, and value in our economy. CRA represents Cooperative Research Centres (CRCs) and their spinoff/successor entities, CRC – Projects grant participants, 30 universities and research institutions, as well as other industry-research collaboration entities, associated businesses, alumni and professionals.

Our contribution focuses on the opportunity for the NRF to ensure that Australian R&D capability is supported to success and to the generation of economic benefit for all Australians.

The highlights of CRA recommendations are:

1. That the NRF should be linked to existing programs that harness joint investment from government, industry and research institutions, such as the CRCs and the Rural Research and Development Corporations (RDCs), along with the expertise that sits in CSIRO, Australia's universities, National Critical Research Infrastructure Facilities (NCRIS) and build upon the capacity they develop.
2. In defining the NRF's priorities, a mapping of existing entities and capacity would support informed decision making and management of investment risk.
3. Clarity of national targets should be included in the definition of the priority areas, and a balance in investment be struck that allows significant risks to be taken in pursuit of major gains, with a built-in capacity for fast failure.
4. The NRF should provide a vehicle to drive cross-entity collaboration and partnership in areas of national priority and capacity.
5. The NRF should support the development of place-based clusters, which in turn can help build ecosystems with the capacity to create scale at speed.
6. There should be a national coordinating body to foster coordination across government and to ensure the NRF builds upon embedded capacity.
7. There should be a strong link to Education and to Skills Australia to ensure that the conditions for attracting, training and retaining a highly skilled workforce are right.

Cooperative Research Australia is committed to working collaboratively with the Australian Government to transform this country's industry and economy for a prosperous, sustainable and innovative future for all Australians. We are open to facilitating a platform for further consultation and/or clarification with our members on any of the recommendations.

## The role of the NRF in transforming Australia's industry and economy

The current socio-economic and political conditions in Australia are an opportunity to gift future Australians an innovative, prosperous, and sustainable economy that captures and generates greater value from our human capital.

The potential benefit of industry-research collaboration and translation in driving innovation for the Australian economy cannot be understated. For Australia to prosper, stimulating and facilitating productive industry-research cooperation must be a priority. A sophisticated and complex Australian economy of the future is one with a higher proportion of companies for whom research and development is the core business. Companies that invest in R&D and partner with research organisations are critical to Australia meeting the great challenges of our time, including the transition to a decarbonised economy.

### **Better Harnessing Australia's Research Capacity**

Australia holds a superior position in its research capability. Our research performance is ranked 11<sup>th</sup> in the current Nature Index of Country/Territory Research Output. Focused, long-term commitment and investment in Australian R&D will enable us to harness this asset through translation for commercial, economic, social and environmental benefit. We are well served by our universities and public research institutions.

Successful programs that harness joint investment from government, industry and research institutions, such as the Cooperative Research Centres (CRCs) and the Rural Research and Development Corporations, along with the expertise that sits in CSIRO, Australia's universities, National Critical Research Infrastructure Facilities and others provide a strong basis for the NRF to succeed *if it is strongly linked to these programs and builds upon the capacity they develop.*

It is critical the NRF enhances what Australia does well and draws upon the capacity developed in our research institutions, and in translation entities such as CRCs. The 2021 Acil Allen Cooperative Research Centres Program Impact Evaluation, released in January 2023, concluded that the CRC program delivers significant benefit back to the Australian economy, having induced around \$200 million per year of new private R&D over the life of the program, and grew GDP by \$32.5 billion. Elements of the influence of the model can be seen in the eight Drought Resilience Adoption and Innovation Hubs established by the Department of Agriculture, Water and the Environment; the Trailblazer Universities Program; and the Department of Defence's Trusted Autonomous Systems CRC and the Defence Materials Technology Centre (DMTC).

### **NRF Providing Lift-Off**

The great potential of the National Reconstruction Fund lays in its potential to enable the capacity built through existing grant-funded programs to scale, to build critical mass and create innovative ecosystems that self-generate continuous innovation.

**If programs such as the CRC program, CSIRO Missions, Trailblazers etc are conceived as the runways to industrial transformation, then the NRF can be conceived as providing the lift that will enable translated research to fly.**

Matured innovations resulting from government programs and funding that fit the profile are a logical investment for the NRF to fulfill its goal of complementing (without duplicating) existing initiatives that support innovation, early-stage research and development, and commercialisation.

This endeavour should also include the creation of pathways for high-performing industry-research collaborative entities of national importance to evolve and scale to ensure full return on investment, but also ensuring that we are building on capacity Australia has in areas of demonstrated competitive advantage or sovereign importance.

## Priority Areas

The seven priority areas identified for the NRF play to Australia's areas of competitive advantage and of potential for industrial transformation. What will be critical is that the NRF acts as a catalyst to scale in areas where Australia has significant and world leading potential or existing capacity. It is at those junctions that the potential for real transformation exists.

In defining its priorities, a mapping of existing entities and capacity would support informed decision making and management of investment risk.

For example, a top-level glance across existing entities provides an indication of the advanced capacity that can be harnessed with the NRF, noting that this is by no means a comprehensive list:

Renewables and low-emission technologies:

- Heavy Industry Low-carbon Transition CRC - low-carbon heavy industry sector
- Future Energy Exports CRC - LNG and Hydrogen exporter
- Future Batteries CRC – resources, battery technologies, battery storage, battery value chains.
- Race for 2030 CRC - Sustainable energy technology
- Future Fuels CRC - Energy transition to low-carbon; hydrogen and biogas.
- Recycling and Renewable Energy Commercialisation Hub (REACH) Trailblazer
- Australian Trailblazer for Recycling and Clean Energy (ATRaCE)
- Co2 CRC (post CRC entity)
- CSIRO Hydrogen Industry Mission
- CSIRO Towards Net Zero Mission
- National Energy Resources Australia (NERA) Industry Growth Centre

Medical science:

- Digital Health CRC - Health and healthcare; clinical expertise, data and information telecommunications technologies
- Canthera Discovery (formerly the Cancer Therapeutics CRC ) - cancer research organisation with a primary focus on small molecule drug discovery and development
- Carina Biotech (Formerly the CRC for Cell Therapy Manufacturing)
- Autism CRC (post CRC entity)- Autism; guidance, support for their families, medical practitioners, educators, therapists, support workers and employers
- Brien Holden Vision Institute/BHVI (formerly the Vision CRC) - Eye conditions such as myopia, presbyopia and hyperopia; eye care systems in Indigenous / developing communities
- MTP Connect Growth Centre

#### Transport:

- iMoveCRC - Transport network
- Race for 2030 CRC -Sustainable energy technology
- Future Battery Industries CRC

#### Value-add in the agriculture, forestry and fisheries sectors:

- SAAFE CRC - Agriculture industry, safe food and water; antimicrobial, antimicrobial resistance
- One Basin CRC - Policy, technical and financial; climate, water and environmental threats in the Murray-Darling Basin
- Marine Bioproducts CRC - Marine bioindustry for bioproducts
- Future Food Systems CRC - Smart logistics to link collaborative business cultures: farms, greenhouse complexes, food factories, freight forwarders and services providers
- Fight Food Waste CRC - Food waste, supply chain, co-products, behavioural change.
- Food Agility CRC - Food value chain, digital technologies, shared data
- Blue Economy CRC - Commercially viable and sustainable offshore developments; marine renewable energy output and seafood production.
- Soils CRC - High performance soils, farming community, farming practical solutions
- Developing Northern Australia CRC - Northern Australia, food, tropical health and Agriculture sectors.
- Food and Beverage Accelerate (FaBA) Trailblazer
- Australian Pork Research Institute (formerly the Pork CRC)
- Food Innovation Australia (FIAL) Industry Growth Centre
- CSIRO Future Proteins Mission
- Rural Research and Development Corporations, Drought Resilience, Adoption and Innovation Hubs

#### Value-add in resources:

- Transformations in Mining Economies CRC - Sustainable post-mine future.

- Future Battery Industries CRC - Battery minerals and chemicals production, deployment, circular economy
- MinEx CRC - Mineral environmentally friendly drilling, technologies, drilling and exploration data
- CRC for Optimising Resource Extraction (Post CRC) - Advanced manufacturing approach for efficient and sustainable mining
- Digital Finance CRC - Transformation through the digitisation and direct trading
- Resources Technology for Critical Minerals Trailblazer
- METS Ignited Industry Growth Centre

#### Defence capability:

- Cyber Security CRC
- SmartSat CRC - Space industry, space-technologies, space research-industry collaboration
- Defence Trailblazer for Concept to Sovereign Capability (CSC)
- Innovative Launch, Automation, Novel Materials, Communications, and Hypersonics Hub (iLAUNCH Hub)
- Trusted Autonomous Systems Defence CRC

#### Enabling capabilities:

- SoMAC CRC - Intelligent manufacturing automation and high-value industries; digital-export-ready, cost-competitive, high-quality platform capability.
- Innovative Manufacturing CRC - High value, high knowledge-based manufacturing
- Digital Finance CRC - Transformation through the digitisation and direct trading
- SmartCrete CRC - Integrated product development and systems capability in Design Engineering and Advanced Manufacturing.
- Building 4.0 CRC - Productive, Affordable, sustainable building industry
- Natural Hazards Research Australia (formerly the Bushfires and Natural Hazards CRC) - Bushfire and natural hazards, disasters

### **Scale Up and Commercialization**

The NRF can leverage already successful public programs that promote industry-research collaboration by providing a pathway to investment in scaled up commercialisation. The NRF potentially provides a vehicle to drive cross-entity collaboration and partnership in areas of national priority and capacity, which will foster the creation of critical mass, scale and innovative ecosystems.

In addition, the NRF can help build ecosystems with the capacity to create scale at speed, offering opportunities for industry to grow locally by supporting the development of place-based clusters that bring together a variety of research institutions and collaborative entities, large and SME businesses, with access to downstream manufacturing capability. This would create real potential to transform existing industry, and generate new jobs and new career pathways. An ecosystem approach that draws together different institutions,

schemes and participants to promote cross-fertilisation will ensure better return on investment.

An innovative ecosystem comprehends interactions between universities and research institutes, Australian Research Council and NHMRC programs, the National Collaborative Research Infrastructure Strategy, Growth Centres, Cooperative Research Centres, University Research Commercialisation, incubator hubs, entrepreneurs' programs, different levels of Government, industry partners, start-ups, etc. unified by their core industrial goal.

A case study sits in the industrial transformation and Australia's energy transition and net zero emissions targets. CRA's Decarbonisation Group is an initiative of CRA members to quantify and enhance the work being done by CRCs and post-CRC entities in decarbonisation and to identify cross-entity and cross-sector collaboration opportunities. At the moment, there is no obvious 'next step' to harness that collective effort in a way that scales and builds a rich ecosystem of innovation, and all the potential economic, social and environmental benefits that flow from playing to our strengths.

### **Targets and Coordination**

While commercial return is central to the NRF, targets that quantify the economic, social and environmental return are valuable for long term outcomes that benefit all Australians.

Clarity of national targets should be included in the definition of the priority areas, and a balance in investment be struck that allows significant risks to be taken in pursuit of major gains, with a build in capacity for fast failure.

'Valued-add' measures can include the level of sophistication of the technologies created, manufactured exports, R&D expenditure, stimulation of private sector investment, jobs created and contribution to a more complex economy.

Critical to achievement of the ambition of the NRF is better coordination across government, States, and programs. The NRF priority areas stretch across portfolios, across state boundaries and across sectors, and some coordination needs to take place to ensure that the NRF builds upon our strengths and clear areas of national competitive advantage.

### **Investment needs and opportunities**

In pursuing the areas of priority, the NRF can play a significant role in growing a skilled workforce and improving Australia's attractiveness to very high skilled workers, as well as improving our capacity to retain outstanding Australian talent. The NRF can help bridging this gap by approaching its investments as an opportunity to build innovation ecosystems, for instance, through the creation of place-based clusters, that generate critical mass with the potential to transform existing industry and generate new jobs and new career pathways.



## Returns, financial instruments and working with other investors

As is the case of the Clean Energy Finance Corporation (CEFC), CRA recommends that the NRF uses a project-based, tailored investment approach and co-finance model with a special stream to invest in projects that arise from publicly-funded and industry-led collaboration programs.

The CRC program, for example, already has a network of industry partners invested in the development of products and technologies with aid of universities and research institutions. If a direct stream were to be created for post-CRCs and similar industry-research entities, the pool of national and international investors would already exist.

A complementary incentive would be the introduction of up to a 20% R&D tax collaboration premium consistent with Recommendation 2 of the Review of the R&D Tax Incentive, as well as a collaboration premium to the cost of employing new STEM PhD or equivalent graduates in their first three years of employment.

## Complementary reforms

### **A unifying body**

Greater cross-departmental coordination and a set of shared principals could be led by the Australian Government, drawing upon existing initiatives such as the Waratah Research Network and its cross-government coordination in NSW.

This could be done by reviewing and enhancing the role of Industry, Innovation and Science Australia (IISA) to better cover innovation programs across government and provide advice to government.

### **Jobs and Skills Australia**

To attract talented people to undertake the training needed for very high skill jobs that contribute to Australian industrial transformation, we need address the myth that a Higher Degree by Research (HDR) leads only to a career in academia, rather than to a myriad of career options. We also need to incentivise and encourage businesses to recognise the benefit of employing and investing in staff with HDR qualifications as prospective drivers of innovation and growth for their business.

Many of our members work in the spaces of emerging industries and transitioning sectors and embed significant knowledge in those areas. However, we believe there's a wider opportunity for the government and industry to promote and celebrate existing achievements, jobs, skills and businesses that are using Australia's remarkable research performance and capacity to innovate and create new products and processes, setting a precedent and example for many more to come. This narrative is important to encourage consideration of HDR as a career path.

Validation from the NRF that there is great potential in research collaboration and a signal to both industry and researchers that Australia is committed to the future R&D intensive future to achieve prosperity, would be crucial to change the narrative. To that end, we recommend coordination between Jobs and Skills Australia and the NRF.

## **Education**

Domestic and international scholars are abandoning research training at a greater rate as they contend with the cost of living and a hot labour market.

To develop the workforce that is needed in a sophisticated economy, a complementary reform to incentivise a highly skilled workforce to build a career in innovation will have a long-term impact on Australia's very high skilled workforce.

We recommend an increasing PhD stipend under the Research Training Program to ensure we are able to attract and train the workforce needed for a more complex economy.

## **Diversity**

A diverse and inclusive workforce is critical to an innovative economy, and career pathways to leadership for highly skilled workers of diverse backgrounds are essential if we are to benefit from the full talent of our population.

Our members recognise that the increased participation of traditionally underrepresented cohorts in the workforce is important both for the workforce growth and to address historic inequality of access.

We welcome the NRF's consideration of including matters of regional development, gender equality and opportunities for First Nations communities as part of their guiding principles.