



Cooperative  
Research  
Australia

**CRA's response to “Developing Australia’s Science  
and Research Priorities and National Science  
Statement - a National Conversation Starter”**

**(April 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.*

**For further enquiries contact:**

Jane O'Dwyer

Chief Executive Officer

Cooperative Research Australia

PO Box 5357. Braddon, ACT, 2612

02 6260 3988

[www.cooperativeresearch.org.au](http://www.cooperativeresearch.org.au)

ABN 42 892 101 689

## Executive Summary

Cooperative Research Australia (CRA) welcomes the opportunity to provide a response to “Developing Australia’s Science and Research Priorities and National Science Statement - a National Conversation Starter”.

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 importance of investing in research and development, creating productive collaborations between research organizations and businesses, and a supportive policy environment for science and innovation, to achieve economic prosperity.

The highlights of CRA recommendations are:

Challenges that science could help to address:

1. Prioritise the development of solutions for long-term challenges such as climate change, new energy sources, water resource management, cybersecurity, economic competitiveness, social inequality and social exclusion.

Opportunities we should seize:

2. Increase collaboration between research and industry to stimulate innovation and economic growth.
3. Invest in science and research to leverage new technologies such as artificial intelligence, quantum computing, and advanced manufacturing, and collaborate with international partners to access new markets and expertise.

Strengths we should maintain or build:

4. Enhance current collaborative research in renewables and low-emission technology, medical science, transport, value-adding in agriculture, forestry, and fisheries, value-adding in resources, defence, and enabling capabilities.

Developing capability and capacity:

5. Map the research and development sector.
6. Increase R&D investment as a percentage of GDP from 1.8 to 3 percent.
7. Enhance the return on public investment in R&D by coordinating programs across Government and governments
8. Incentivise innovation through industry-led research collaboration by establishing an up to 20% R&D tax collaboration premium.
9. Grow the Cooperative Research Centres Program and similar industry-led programs to further induce private R&D.

10. Foster a highly skilled workforce through creation of innovative clusters and culture change.
11. Focus on restoring migration to Australia as a strength to compete in the global race for highly skilled talent.
12. Review PhD stipends to make them more competitive in the labour market and address attraction and completion rates.

Additional principles

13. Consider the values of diversity, gender equality, and creating opportunities for regional and remote communities, including the incorporation of First Nations knowledge into our innovation strategy.
14. Emphasize the importance of social license in shaping priorities for science and research.

Cooperative Research Australia is committed to working collaboratively with the Australian Government in the process of updating Australia's National Science and Research Priorities as well as the National Science Statement. We are committed to a prosperous and innovative future for all Australians, and -as such- we are open to facilitating a platform for further consultation and/or clarification on any of the recommendations.

1. What are Australia's greatest: a) challenges that science could help to address? b) opportunities we should seize? c) strengths we should maintain or build?

**a) Challenges that science could help to address:**

Australia has a competitive advantage in high-quality science, encompassing humanities and social sciences, driven by top-notch research. If we invest wisely in our areas of strength and critical needs, while simultaneously growing our capacity to translate that knowledge into commercial, economic, social, and environmental benefits for the nation, we can harness this potential to the fullest.

Science is critical to addressing and adapting to climate change across all sectors, developing new energy sources, improving water resource management, enhancing cybersecurity, ensuring food security and resolving social and cultural challenges.

Identifying and leveraging the areas where we have critical mass and significant existent investment – for instance technologies and systems to enable a decarbonised economy – , we can achieve our goals faster and more efficiently.

**b) Opportunities we should seize:**

Innovation can enable a country to move up the value chain by developing and exporting more complex and sophisticated products and services, leading to increased competitiveness and economic growth. By investing in science and research, and promoting collaboration between research organisations and businesses, Australia can improve its economic complexity and position itself as a leader in high-value industries. This, in turn, will create opportunities for higher-paying jobs, increased productivity, and a more resilient economy that can better withstand global economic shocks.

Collaboration between publicly funded research institutions and businesses have not yet reached their full potential. The 2017 OECD Science, Technology and Industry Scoreboard ranked Australia last out of the thirty-three countries surveyed in firms' collaboration with the higher education/public research institutions, with equal weighting between SMEs and large firms.

The potential benefit of collaborative research and translation driving innovation in the Australian economy cannot be understated. For Australia to recover and prosper, stimulating and facilitating productive collaboration between research organisations and business must be a priority.

An example of the importance of continuing to invest in science and research to seize new opportunities for economic growth and innovation is highlighted in the ACIL Allen Impact Assessment of the CRC Program (2021):

The total economic impact of the CRCs extends beyond the direct impacts [...] Economy-wide impacts include increased investment in research, capital, human capital, spending,

jobs, imports and exports. [...] The economic impact on GDP of CRCs active in the period 2012-20 was \$23.5 billion.

An area for opportunity in the CRC program includes leveraging new technologies such as artificial intelligence, quantum computing, and advanced manufacturing to create new products and services, as well as collaborating with international partners to access new markets and expertise.

**c) Strengths we should maintain or build:**

It is important to maintain Australia's strong research and innovation capabilities since they are broadly recognised as key drivers of innovation and industry engagement in the country. Below are some examples to note:

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
- METsignighted

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

## 2. Does Australia have the capability and capacity needed to address these challenges, opportunities and strengths? If not, how could we build this?

A top-level glance across current entities in the Australian innovation ecosystem provides an indication of the advanced capacity that is being developed in Australia. The National Science Priorities should consider the capacity built through existing grant-funded programs to open pathways for continuous innovation. However, in defining its priorities, a mapping of existing entities and capacity would support informed decision making and management of investment risk.

CRA believes that -from a collaborative research approach- Australia has world leading potential or existing capacity in several sectors. This was evidenced in the 2021 Acil Allen Cooperative Research Centres Program Impact Evaluation, which concluded that the CRC program has been successful in addressing some of Australia's major challenges, including developing solutions for environmental sustainability, advancing public health and medical technologies, and improving Australia's competitiveness in key industries such as agriculture, mining, and manufacturing.

While Australia has many strengths in science and innovation as outlined above, CRA acknowledges there are also areas where additional capability and capacity are needed. In this sense, CRA recommends complementary measures that would be critical to effectively address science and research challenges:

### **a) Increase R&D investment as a percentage of GDP from 1.8 to 3 percent**

While the October 2022 Budget maintained most of the current Science, Research and Innovation (SRI) programs and seeded the establishment of the National Reconstruction Fund (NRF). A significant further step would be to increase R&D investment as a percentage of GDP from 1.8 to 3 percent, in line with ALP's National Platform and -more recently- Minister for Industry and Science's speech at the UTS Vice-Chancellor's Innovation Showcase (3 November 2022). This would be a clear signal to the rest of the world that Australia is backing innovation in the context of an OECD average of 2.674 percent in 2020.



**b) Enhance the return on public investment in R&D by coordinating programs across Government**

Taken as a whole, Australia's investment in the translation of research to commercial, economic, social and environmental benefit is substantial. However, as a result of multiple attempts to unleash the potential of industry-led research, we see the unintended creation of a disconnected system of programs across governments and states that overlap and compete with one another.

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

This endeavour should also include the creation of pathways for high-performing industry-research collaborative entities of national importance, such as Cooperative Research Centres (CRC), National Collaborative Research Infrastructure Strategy (NCRIS), Trailblazers and Industry Growth Centres, to be extended through appropriate channels, including through a relevant portfolio agency if the work they are undertaking is of ongoing national importance and cannot be continued in the absence of some continuing investment.

A way to do this would be to potentially reviewing and enhancing the role of Industry Innovation and Science Australia (IISA) to better cover innovation programs across government and provide advice to government.

Additionally, a coordinated effort would help to ensure that publicly-funded research entities have a clear pathway to achieving their policy objectives, even after their funding has been terminated. This would prevent the loss of valuable investment and effort by facilitating the identification of relevant portfolios that align with policy objectives. By providing a framework for continued engagement and collaboration between research entities and relevant stakeholders, this coordinated effort would enable the ongoing translation and dissemination of research outcomes and findings, maximizing the impact of publicly-funded research.

In line with this, and following Recommendation 4 of the 2021 Acil Allen Impact Assessment, CRA proposes that a CRC stream for health and medical research be created jointly under the Health Portfolio with a 15-year funding life, to allow for the longer runway needed for industry-led health and medical research translation and commercialisation.

**c) Incentivise innovation through industry-led research collaboration by establishing an up to 20% R&D tax collaboration premium**

According to the 2016 Research and Development Tax Incentive Programme Review, approximately 30% of Australia's spend on R&D is through the indirect measure of the R&D Tax Incentive (R&DTI). Although there is an element of the programme that targets collaboration, its impact is not significant. The Review acknowledges that there is potential to increase collaboration within the R&D TI programme with greater offset rates for collaborative projects.

We believe incentivising collaboration through the introduction of up to a 20% collaboration premium consistent with Recommendation 2 of the Review of the R&D Tax Incentive, would be an effective mechanism generating new collaboration between industry and research institutes and foster a culture of innovation.

We also support the subsequent point in Recommendation 2 of the review to apply the collaboration premium to the cost of employing new STEM PhD or equivalent graduates in their first three years of employment.

**d) Grow the Cooperative Research Centres Program and like programs to further induce new private R&D**

Recommendation 1 of the 2021 Acil Allen Cooperative Research Centres Program Impact Evaluation of states that with the program achieving excellent outcomes, “future efforts to drive industry growth and innovation should leverage the Program’s success and consider further investment in both CRCs and CRC-Ps, as proven ways to drive industry-research collaboration”.

CRA recommends the Australian Government adopt the recommendations of the Acil Allen Report and grow the program both through both by restoring annual investment in the program to 2008 levels, and where there is a critical and urgent need for the nation, make use of the CRC program to deliver economic growth and enhance sovereign capability through funded, ad hoc-special purpose rounds of the CRC program.

**e) Foster a highly skilled workforce through creation of innovative clusters and culture change**

The 2020 report on Australian business investment in innovation revealed a concerning trend: Australian businesses have low employment with research capacity and low investment in R&D as part of their business strategy. This indicates a significant gap between the research capabilities of Australian businesses and the level of investment required to drive innovation and economic growth.

To support the notion of a productive profession for HDRs, 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.

A way to achieve this is by building ecosystems with the capacity to integrate our system and build scale at speed, offering opportunities for business and industry to grow here, and providing highly skilled workers with attractive career progression.

Successful clusters that bring together the innovation ecosystem in Australia would create real potential to transform existing industry, generate new jobs and new career pathways.

Attracting, developing, and retaining a highly skilled and diverse workforce is critical to unlocking the potential of science and research in Australia. A highly skilled workforce is intrinsically associated with levels of innovation and productivity needed to transition to a more complex economy.

**f) Focus on restoring migration to Australia as a strength to compete in the global race for highly skilled talent**

Australia has a long history of benefits from skilled migration, and we encourage to focus on restoring migration as a strategy to complement our domestic workforce. Speeding up and simplifying the process for HDR graduates to take up permanent residency then Australian citizenship would make Australia a more attractive destination not only for study but for a lifelong career.

**g) Review PhD stipends to make them more competitive in the labour market and address attraction and completion rates**

Our members report difficulties in attracting high-performing scholars due to the competitive global talent market and high cost of living. The low PhD stipends under the Research Training Program and lack of incentives for industry-focused programs are barriers for mid-career talent seeking further development. A review of incentives, such as increased PhD stipends and cost-of-living support, would make a highly skilled industry-research career more attractive and help prepare the skilled workforce needed to increase productivity.

### 3. Are the principles the right principles to shape the priorities?

CRA fully supports the principles outlined in the document for shaping priorities in science and research. We believe that these principles provide a strong foundation for promoting excellence, collaboration, and innovation in the research sector.

Moreover, we would suggest to also emphasize the values of diversity, gender equality, and creating opportunities for regional and remote communities. We would emphasize that First Nations scientific knowledge and understanding of this continent offer unique insights and potential solutions to complex problems. By incorporating their knowledge into our innovation strategy, we can tap into a vast array expertise that has been developed over generations. This requires building strong partnerships with communities, investing in cultural education and training for researchers and research organisations, and fostering a deep respect for Indigenous knowledge systems. By doing so, we can create a more equitable and sustainable innovation ecosystem that draws on the strengths of all Australians for all Australians.

In line with this, we recommend embedding the concept of social license when shaping priorities for science and research. By prioritizing principles that promote community engagement, transparency, and accountability, researchers can help build and maintain

social license for their projects, which can ultimately lead to greater support, trust, and success.