

## National Reconstruction Fund

### IRU submission to consultation process – February 2023

The Innovative Research Universities (IRU) welcomes the opportunity to make this submission to the Department of Industry, Science and Resources on the development of the National Reconstruction Fund (NRF).

In the wake of the COVID-19 pandemic and at a time of significant demographic, technological and geopolitical change, we agree that government should focus on policy to drive innovation and inclusive and sustainable economic growth. The development of the NRF provides an important opportunity to set the framework for significant public investment in industry innovation in areas of national priority.

The universities in the IRU combine a focus on innovative research that delivers impact for the community with a commitment to expanding access and equity. We set out below key IRU principles to guide the development of the NRF and would welcome the opportunity to engage further to build stronger links between the work of universities and the aims of the Fund.

#### **Universities play a key role in the Australian innovation system to support industry transformation**

Compared to other nations, Australian universities undertake a higher percentage of total research and development (R&D) activity – in Australia, the share of total national R&D undertaken by universities has risen to 36%, compared to 24% in the UK, 13% in the USA and 12% in Japan. Through both their research and teaching, Australian universities provide key inputs into industry innovation.

Across IRU members, collaboration with industry over the last decade has increased by over 260%. During the same period, our universities have maintained strong partnerships with the public and community sectors to support broader research translation and innovation.

When selecting and making investments to “support, diversity and transform Australia’s industry and economy”, the NRF should facilitate universities and university researchers to be partners in industry-led projects. NRF investments can also build upon successful models of university-industry collaboration (including innovation precincts) established with support from other Australian Government programs (see below). There is a need for new investment in infrastructure on university campuses that can support university-industry collaboration and innovation. The NRF should clarify whether this is within scope for its investment plans.

In order to achieve the long-term goal of industry and economic transformation in national priority areas, universities will also play a key role through the education and training of graduates for the Australian workforce. Analysis by the National Skills Commission found that 90 per cent of the one million jobs expected to be created to 2025 will require post-secondary education with 50% of those requiring a university degree.

There should be an explicit connection made between the priorities of the NRF and the work of Jobs and Skills Australia to analyse future skills needs for the Australian economy. New analysis is needed to show what skills will be needed to meet the NRF goals in the seven priority areas. This analysis will need to recognise that industry draws on a wide range of skills in filling workforce needs – for

[iru.edu.au](http://iru.edu.au)

example, the 2021 Census data shows that approximately 50% of people working in the healthcare industry have qualifications in fields other than health. There should also be an explicit connection between this analysis and the Universities Accord process, with sufficient funding and places in universities (and vocational education and training) to meet future demand.

### **Mapping the innovation ecosystem will lead to more effective investment through the NRF**

Over time, a complex system of government institutions and programs has been built up (at both State/Territory and Federal levels) to support industry innovation. Universities are already active participants in programs such as Australian Research Council Linkage grants, Cooperative Research Centres and the Trailblazer and other recent research commercialisation programs.

To ensure the most effective participation in the NRF of industry and partners from the research community, government should undertake a mapping exercise to clarify how new investments through the Fund will complement other existing public investment. This would make it easier for businesses and researchers with good ideas to find the most appropriate program.

This mapping could also be extended to priority sectors under the NRF (see list below) and to the geographical spread of businesses, infrastructure and expertise across the country. This would create a shared evidence-base to guide future decision-making by the NRF Board and by industry. It would also highlight where gaps exist or where targeted investment is required to build capability for the future. Existing Australian programs for research and innovation often concentrate funding in a small number of institutions often in major metropolitan areas. In contrast, in the United States, the National Science Foundation (NSF) has recently established a new Regional Innovation Engines program to target NSF funding to regions that do not have well-established innovation systems. The aims of the program are to leverage existing R&D capabilities to address national challenges, advance critical technologies, foster partnerships across industry, academia, government and communities and stimulate economic growth and job-creation.

Finally, this analysis should also be extended to provide an evidence-base for NRF investments to put Australian priorities in international context. In the IRU submission to the Australian Government's critical technology list ([link](#)), we noted the huge shifts that have taken place in global R&D and industry. Over just the last twenty years, global R&D investment has tripled to over \$2.2 trillion.

Other countries are also prioritising key industries and technologies for their own national objectives, and investment decisions for Australia should be grounded in an up-to-date understanding of the larger global innovation system. For example, major investments are being made in areas such as high-performance computing and hydrogen energy systems by countries in our region, and this should inform how the Australian Government seeks to invest. In some cases, we may decide to develop home-grown capabilities and industries, whereas in others it may be more effective and efficient to partner internationally.

#### **National Reconstruction Fund priority areas:**

- Renewables and low emission technologies
- Medical science
- Transport
- Value-add in agriculture, forestry and fisheries
- Value-add in resources
- Defence capability
- Enabling capabilities.

### **A portion of the NRF's return on investment should be used to support discovery research**

The NRF consultation paper states that the Fund is modelled on the success of the Clean Energy Finance Corporation (CEFC), which was also linked to the Australian Renewable Energy Agency (ARENA), which provides “funding that spans the entire innovation chain” from research to large-scale deployment. Similar to the CEFC/ARENA model, the NRF should put in place a mechanism to invest some of its “positive portfolio rate of return” into research in the priority areas to help drive future innovation.

This research to support future innovation in key sectors of the economy should span the full range of disciplines, across STEM (science, technology, engineering and mathematics) and HASS (humanities, arts and social sciences) fields. Successful diversification and transformation of industry sectors will require the full range of expertise, knowledge and skills, with innovation dependent on our ability to integrate the most diverse range of perspectives. In its recent Interim Report (2022), the Productivity Commission found that the changing nature of innovation will require new approaches to education and research for the Australian economy – rather than just investing in STEM skills or high-tech R&D, future innovation success will depend on integrating different kinds of knowledge, skills, processes and technologies.

Over recent years, the Australian Government has put more emphasis on research commercialisation and on programs to incentivise research/university collaboration with the private sector. The proportion of higher education R&D expenditure (HERD) directed towards applied research and experimental development increased from less than 40% in the early 1990s to half of all HERD by the mid-2000s and 58% by the mid-2010s. In 2020, it reached 63% of HERD. This shift has been particularly prominent in regional and outer metropolitan universities. There is a risk that the research and innovation system becomes unbalanced, with not enough investment in the basic or discovery research that will drive the next generation of applied R&D and innovation across all sectors of the economy. Through the NRF, government can ensure that funding is fed back into discovery research in key national priority areas without diverting existing funding for “blue-sky” research. The NRF should also clarify its expected rate of return and appetite for risk and how these relate to support for early-stage innovation and projects involving universities.

### **Address the connection between NRF priorities and changes in the broader research system**

The introduction of the NRF also provides an important opportunity to ensure that there is clarity about how government priorities drive research and innovation across the full range of programs. The 2023 review of national science and research priorities should explicitly examine the interface between NRF priorities and broader goals for public investment in research.

The Australian Research Council (ARC) has a distinct role within the Australian innovation system, with a primary role of supporting discovery research across all disciplines. In the recent IRU submission to the independent review of the ARC ([link](#)), we recommended that the ARC focus on this role and that government achieve a balance between top-down priority setting and bottom-up generation of new ideas.

The IRU submission to the ARC review also put forward a proposal for a new, proactive approach to research impact, that would encourage and support researchers to think about the potential economic and social impacts of their work from the beginning of projects, rather than seeking to assess impact after that fact. Any new approach to research impact across Australian universities (as

a result of the ARC Review or Universities Accord) should be informed by wider government priorities including those set for the NRF. The IRU would also support consideration of broader government priorities (as set out in the consultation paper) such as gender equity and opportunity for First Nations communities as part of new programs to support research impact and innovation.

### **Achieving NRF goals will also require innovation in the public and community sectors**

Finally, to fully achieve government goals of diversification and transformation in key industry sectors, leading to secure jobs and future prosperity, new approaches will also be required in the public and community sectors. Transformation in areas such as energy, healthcare and defence, and the successful adoption of new technologies such as artificial intelligence and quantum science will require consideration of policy, services, law, ethics and community values, with a specific understanding of Australia's unique societal characteristics. To ensure that as many Australians as possible benefit from industry and technological transformation, a coordinated and integrated approach will be required across all disciplines and sectors.

To balance multi-billion dollar investments in research commercialisation and industry innovation, the Australian Government should create a parallel program to drive collaboration between researchers and partners in the public and community sectors for public good innovation. IRU universities, with their commitment to research impact that benefits Australia, are ideally placed to support these next steps.

## About the IRU

The IRU comprises seven public research-intensive universities across Australia. The history of our member universities goes back to the late 1960s and early 1970s when, under both Liberal and Labor governments, there was an expansion of new forms of higher education and research to meet the needs of the nation.

From their founding, IRU members pioneered new forms of inter-disciplinary teaching and research, for example in environmental and Asian studies. Today, our members are multi-campus universities with a continued commitment to sustainability. Our shared focus is inclusive education and innovative research that delivers impact for our communities.

The IRU is committed to constructive and evidence-based engagement with government and policy and provides the ideal test-bed for trialling new approaches across the country.

Contact: Paul Harris, Executive Director at [paul.harris@iru.edu.au](mailto:paul.harris@iru.edu.au) or +61 497 439 867.