

# SUBMISSION TO THE GOVERNMENT'S NATIONAL RECONSTRUCTION FUND

3 February 2023

## INTRODUCTION

As the peak body for Australia's 39 universities, Universities Australia (UA) welcomes the opportunity to make a submission to the Department of Industry, Science and Resources' consultation on the National Reconstruction Fund (NRF) and urges the government to include representation from the higher education sector on the NRF Reference Group.

Universities are major contributors to Australia's economic and social success, undertaking research and development projects and educating the future, skilled workforce. Both of these activities are critical to the success of the NRF, placing Australian universities at the forefront of the program's implementation and development.

UA believes the most effective way to achieve the objectives of the NRF is to invest in projects that involve substantial amounts of research and development (R&D) and are driven by university-industry collaboration.

## COMMERCIALISATION OF RESEARCH

Universities are a part of Australia's national research effort, with 36 per cent of all research in Australia performed by universities (the eighth highest total in the OECD).<sup>1</sup> Australian universities are significant contributors across the ecosystem of research translation – from basic research through to commercialisation. Universities perform 45 per cent of all applied research (more than industry at 39 per cent) and almost 90 per cent of Australia's basic research. Adding to this, Australian universities have broad research expertise across all fields, including the seven priorities identified in the discussion paper. This deep and diverse expertise allows universities to respond to pressing challenges and seize opportunities. This is not developed overnight but through persistent investment and partnership with government and industry.

UA encourages the government to apply the seven priorities widely to capture Australia's broad expertise, from science, technology, engineering and mathematics (STEM) disciplines to humanities and social sciences disciplines (HASS).

Discoveries, ideas and innovation contribute to the development of new products and technologies. New innovations and technologies will spawn new industries, increase our competitiveness in a global marketplace and advance our existing industrial and manufacturing capabilities, all in line with the purpose of the NRF.

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<sup>1</sup> In comparison, levels of university research as a share of national research are lower in peer nations, including Singapore (28 per cent), New Zealand (25 per cent), the UK (24 per cent), France (21 per cent), Germany (18 per cent), USA (13 per cent), Japan (12 per cent) and South Korea (8 per cent). An example of a peer nation with similarly high rates is Canada (42 per cent).

## TRAINING THE FUTURE WORKFORCE

Australian universities educate around 1.5 million domestic and international students each year. University graduates go on to become a key part of our workforce, and will play an even greater role in the future. According to government projections, a million new jobs will be created in the next five years, more than half of which will require a university degree, while nine in 10 jobs will require a post-school qualification. Across all seven priorities, skills developed through STEM, medical, and HASS degrees will be beneficial.

Universities also educate and train the next generation of researchers. While researchers also work in government, not-for-profits and the industry sector, universities are home to the majority of Australia's research workforce.<sup>2</sup> University researchers are a critical part of the research system, building a pipeline of innovative ideas, which boost productivity, enhance our society and contribute to knowledge globally. With their stellar track record in commercialising their ideas, researchers also go on to start businesses and become company leaders.

While researchers will have lots to offer the NRF, the Australian research workforce will also benefit from one of the largest government investments in Australia's sovereign capability. As noted by Minister Husic, the NRF will help maintain industries onshore, create jobs and expose and harness opportunities nationally. This is positive for Australia's researchers and workforce. The creation of the NRF will help retain and develop Australia's world-class research workforce by providing the opportunities and career pathways that will keep our best and brightest in the country and attract researchers from around the world.

## BOOSTING INDUSTRY-UNIVERSITY PARTNERSHIPS

To translate new ideas into reality, universities and industry work closely together. While universities are uniquely placed to guide initial development and product ideas toward the runway of commercialisation and produce a pipeline of investment opportunities, businesses take the lead on identifying the commercial potential of an idea and scaling it up for eventual launch into the marketplace. Industry can also assist in identifying real world problems, which are brought to our researchers who in partnership develop solutions.

It is in our national interest to facilitate greater collaboration between universities and industry to spur the development of more great ideas. The NRF provides a platform for this.

### **Case study 1: University of Canberra and Cisco partner to address cyber skill shortage**

The University of Canberra is working with global technology company Cisco to boost Australia's cybersecurity resilience. The partnership comes as Australia's defence establishment is grappling with critical skill shortages, with the predicted shortfall of cybersecurity professionals alone tipped to hit up to 30,000 in the next few years.

UC and Cisco are working together to address this skills shortage, secure Australia's critical infrastructure, and expand the National Industry Innovation Network – an alliance of companies and universities focused on the role that digital adoption can play in meeting Australia's economic and social challenges.

Without a strong and capable cyber workforce, Australia will be left vulnerable to increasing cybersecurity threats, putting our national security and way of life at risk. Australia's in

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<sup>2</sup> Universities represent the majority of Australia's research workforce at 81,090 FTE out of a total workforce of 180,540 FTE (45 per cent) in 2020.

collaboration with key industry partners universities are here to train and develop the future cyber workforce.

### **Case study 2: Universities partner with industry to move to clean energy**

The University of New South Wales and the University of Newcastle, together with 27 industry partners, are developing research commercialisation initiatives to help Australia transition to sustainable recycling and clean energy systems and solutions.

Priority areas of the research include electrification, energy systems and storage; sustainable fuels and chemical manufacturing; next-generation solar PV and systems; and recycling and MICROfactories.

These initiatives will contribute to Australia's efforts to reach net-zero emissions by 2050 and bring critical new skills for a high-value manufacturing workforce, creating jobs and driving Australia's economic growth and prosperity.

### **Case study 3: Monash University trials electric buses to reduce emissions**

Monash University is working with transport company ComfortDelGro Corporation Australia to trial electric buses to reduce carbon and particulate emissions.

The transport sector accounts for 25 per cent of Victoria's emissions and is the fastest growing source of the state's emissions.

The University is trialling electric buses on a transport route used solely by its students and staff, as well as operating a living lab on campus, which combines laboratory research with real world research. This is helping to understand the logistics of operating the battery powered vehicles along busy bus routes.

This partnership is part of the Victorian Government's three-year Zero Emission Bus Trial, which is part of the state's effort to achieve zero net emissions by 2050.

Besides the evident environmental impact shown in the case studies, formal collaborations between Australian businesses and universities generate \$12.8 billion a year in revenue directly for the firms which partner with universities. By the time this flows through to the economy, these collaborations are contributing \$26.5 billion a year to Australia's income and have created an estimated 38,500 full-time jobs across the country. Modelling by Deloitte Access Economics estimates that for every dollar invested in higher education research, \$5 is generated in economic activity.

It is well-known that the partnership between universities and industry face challenges, preventing the collaboration from being scaled up. The University Research Commercialisation Action Plan found that differences in priorities, values and cultures, barriers with IP and regulations were some of the reasons impacting collaboration between industry and universities.<sup>3</sup>

These barriers need to be removed so that knowledge and ideas can transfer into products and services, passed from one actor in the system to the next. We need to ensure that each of these handover points are frictionless, where ideas can seamlessly travel back and forth. The NRF must consider how to address these challenges as part of its policy objective, as they will be critical to the realisation of the fund. As an example, programs such as the National Industry PhD Program and the Industry Fellowships Program that encourage researchers and entrepreneurs to move between sectors will promote alignment between universities and industry, having direct positive impact on economic growth and prosperity.

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<sup>3</sup> University Research Commercialisation Action Plan, 2022, p.16.

UA understands the NRF will be driven by an independent board which will make investment decisions and manage the investment portfolio to achieve the noted goals. UA recommends the panel specifically invest in projects that involve a high degree of collaboration between businesses and university researchers. Designing the NRF in this way is likely to be the most effective way of achieving the NRF's goals.

1. Collaboration between business and researchers is an effective way of creating, developing and implementing new and innovative ideas, products and projects that transform and diversify the economy. Case studies, provided above, illustrate this.
2. Using the NRF to directly invest in projects that focus on R&D, and researcher-business collaboration, would provide an important complement to existing government policy. As noted below, existing policy focuses on supporting R&D indirectly, via the R&D tax incentive. The NRF is a great opportunity for government to diversify how it supports R&D. This would give it greater dexterity to target R&D it believes the economy needs to grow and diversify.

## DIRECT FUNDING TO BOOST R&D OUTPUT

Unlike our international peers, Australian Government support for business R&D is delivered through indirect funding. Eighty-two per cent of the Australian Government's total innovation investment in businesses flows through the Research and Development Tax Incentive (RDTI). This is the highest level of indirect support for R&D across OECD nations.<sup>4</sup>

Expenditure on the RDTI rose sharply by 54 per cent from 2010-11 (\$1,895 billion), to \$2,982 billion in 2011-12, standing at \$2,919 billion (budget estimate) in 2021-22. Business investment as a share of GDP has been declining from an all-time peak of 1.37 per cent in 2008 to the present (0.92 per cent in 2019). The numbers show that despite the increase in indirect incentives, business investment in research has declined to levels that may reduce Australia's capacity. A large injection of direct funding through the NRF may reverse the trend.

UA has been consistent in calling for a shift away from such high levels of indirect investments. Direct, targeted funding will better support business to undertake and commercialise research and foster industry-university partnerships.<sup>5</sup> This is especially true for SMEs, who face limitations to engaging with universities through indirect incentives.

While the introduction of the NRF is not a change to the funding principles supporting business R&D, the direct investment into our sovereign capability is welcomed.

UA notes that the NRF intends to crowd-in additional sources of private sector investments. UA has long echoed the policy principles of additionality, efficacy and absorptive capacity for investment in R&D. The requirement of additional sources of private sector investment may help reverse the trend of declining business R&D investment, bringing it more in line with OECD businesses who have significantly raised their research expenditure over the last 10 years.<sup>6</sup>

## UNIVERSITY REPRESENTATION ON THE NRF REFERENCE GROUP

UA notes Minister Husic's announcement at the National Press Club on 29 November 2022 about an NRF Reference Group made up by leading figures in industry and investment circles.<sup>7</sup> Given the

<sup>4</sup> OECD (2021). "R&D Tax Incentives: Australia, 2021", [www.oecd.org/sti/rd-tax-statsaustralia.pdf](http://www.oecd.org/sti/rd-tax-statsaustralia.pdf), Directorate for Science, Technology and Innovation, December 2021.

<sup>5</sup> <https://www.universitiesaustralia.edu.au/wp-content/uploads/2022/04/UA-submission-to-Productivity-Commission-inquiry-into-productivity.pdf>

<sup>6</sup> From 1.49 per cent to 1.92 per cent, which amounts to an additional \$US 350 billion in real terms every year. In the same period R&D expenditure of Australian businesses has fallen from 1.27 per cent in 2010 to 0.92 per cent in 2019 (latest), which amounts to a reduction in real expenditure of \$3.17 billion (AUD, 2020 dollars).

<sup>7</sup> <https://www.minister.industry.gov.au/ministers/husic/speeches/national-press-club-address-building-economy-future>

critical role universities play in undertaking research across the pipeline, developing new ideas and training our workforce, **UA strongly urges the government to include representation from the higher education sector on the NRF Reference Group.** Governments have a long history of drawing on the expertise of Australian academics to provide critical advice and insights, such as academics supporting State and Commonwealth Chief Medical Officers during the pandemic and researchers sitting on Medical Services Advisory Committees. Australia's universities are ready to work with the government on the creation and implementation of this important investment.