Innovative Research Universities

Strategic Examination of R&D – IRU submission

The Innovative Research Universities (IRU) welcomes the opportunity to provide input to the *Strategic Examination of R&D* (SERD). The SERD panel is tasked with exploring ways to optimise R&D investment, enhance research-industry collaboration, align efforts with national priorities, encourage industry innovation, and increase Australia's R&D intensity. Lifting Australia's R&D intensity to OECD levels requires significantly increased investment in R&D from all sectors.

The IRU strongly supports the intention of the SERD to examine how a more systematic approach to public R&D investment and policy could increase R&D intensity in the business, government and not-for-profit sectors. We believe there is considerable potential to better leverage Australian universities' strength in foundational research, research training and education towards solving problems in the national interest. Universities are unique within the R&D system as institutions dedicated to advancing knowledge and providing research-informed education. All university graduates are exposed to research throughout their education and build the absorptive capacity of Australia's workforce for R&D and new ideas.

The SERD discussion paper recognises how Australia has successfully increased our national research base through university expansion. The IRU discussion paper *Concentration and diversity in Australian research funding, output and impact* demonstrates how this has been achieved through a broadening of research excellence across the Australian university sector. This is a uniquely Australian success story of greater differentiation, productivity and equality. Other countries, such as Canada and the UK, remain heavily reliant on a minority of research-intensive universities to support their national research systems. The Australian system is now less reliant on our traditional research-intensive universities and is more equal, with newer universities outperforming others in publication output growth rates. This contributes importantly to the SERD Terms of Reference for ensuring R&D benefits are equitably distributed across regions and communities.

However, there are systemic challenges in our research system. Australia is now more reliant on university R&D due to the declines in business and government expenditure (BERD and GOVERD). University research is now more oriented towards applied research, rather than the basic or discovery research that has provided the foundational knowledge for our system. Base public funding for university research has eroded, leaving universities more reliant on private sources, including international student revenue. IRU analysis of the "dual funding system" for university research (where funding for competitive grants and contract research is matched by the research block grant) suggests that block grant funding has declined from around $0.80 in block grant per $1 research income in the early 2000s, to $0.40 in recent years. This has been due to a growth in engagement and contract research that has outstripped the growth in the research block grant, as well as the addition of the Medical Research Future Fund into the competitive grants system.

It is essential that the ambition to lift Australia's gross expenditure on R&D is driven by new public investment and careful reconfiguration of existing investments. There are problems in our R&D system with a fragmentation of Australian Government programs and policies, limiting business sector investment in R&D. But there are also good examples of where universities are effectively collaborating with industry. The SERD discussion paper encouragingly notes the initial success of the new National Industry PhD Program established under the 2021 Research Commercialisation Action

Plan, including ARC Linkage Industry Fellowships. There are also the longstanding Cooperative Research Centres (CRC) and rural research and development corporations (RDCs). These programs are home-grown examples of innovation that are admired globally. They are intended to be partnerships that help business solve their problems, but they can end up being too reliant on universities to drive the research agenda due to the limited scale of R&D in industry. But it is important that the successes of these programs are not lost in any changes. The IRU recommends that the SERD panel consider how a new national coordination agency could advise on how existing public R&D programs can be updated, broadened or scaled up to better enable small and medium sized enterprises to engage with universities on their problems.

A new national coordination agency could also help foster innovation by partnering with the proposed Australian Tertiary Education Commission (ATEC) to fund mission diversity through university compacts. A new national R&D agency could direct public investment towards strategic priorities, with ATEC helping align these with individual university missions. Mission-based compacts currently outline each university's mission and priorities to government, but they lack incentive mechanisms. The Accord proposed that an ATEC work with universities through their mission-based compacts to establish strategic priorities and deliver base funding for research and teaching. A national R&D agency could help further secure our research base and better leverage university compacts towards solving problems in the national interest. It could also help resolve challenges of how to provide long-term support for strategic and collaborative research infrastructure.

The IRU recommends that the SERD panel:

1. Fully consider the research recommendations contained in the Australian Universities Accord.
2. Prioritise the development of a National Research Evaluation and Impact Framework.
3. Recognise the need for balance between commercial outcomes and broader public/social good impacts from R&D.
4. Explore a systematic approach to public R&D investment through a new national coordination agency.
5. Consider how the R&D system can foster innovation and boost R&D intensity through mission diversity.

About the IRU

The IRU was established in 2003 as a coalition of comprehensive research universities committed to inclusive education and innovative research that delivers impact for our communities.

Our membership is Flinders University, Griffith University, James Cook University, La Trobe University, Murdoch University, University of Canberra, and Western Sydney University.

The history of our member universities goes back to the 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 growing nation.

The young public universities in the IRU trace their history to this moment in Australia's social and economic development.

As outlined in the IRU Strategy 2022–27, the IRU continues to contribute to a better future for Australia through collaboration, innovation and constructive engagement in public policy.

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1. Fully consider the recommendations contained in the Accord

The Australian Universities Accord Final Report (the Accord) recommended a comprehensive review of research funding and a strategy to boost R&D investment, set national targets for R&D intensity, and reform governance for global competitiveness and societal benefits (Recommendation 24). The Australian Government's 2024 Budget announced the SERD as part of its response to the Accord, and the SERD Terms of Reference rightly ask the panel to consider the Accord recommendations.

The Accord offered many complementary recommendations for how to optimise R&D investment towards the goals of the SERD. Although the SERD discussion paper acknowledges the Accord, it only makes a solitary reference: "The Australian Universities Accord emphasises the need to bolster our research sector and promote the effective use and commercialisation of research results." None of the specific ideas or recommendations contained in the Accord are mentioned in the SERD.

The Accord includes a broad range of research recommendations, including but not limited to bolstering research, promoting its effective use and commercialisation. These recommendations were developed following extensive consultation with the university sector. Many directly respond to the SERD discussion paper questions and should be fully considered.

For example, the SERD discussion paper asks: "6. How should Australia support basic or 'discovery' research?" and "7. What should we do to attract, develop and retain an R&D workforce suitable for Australia's future needs?" The Accord is well placed to offer guidance, given the Australian higher education sector conducts roughly 60% of the country's basic research, trains the bulk of R&D workforce and is the largest employer of PhD holders in Australia. Universities are now also undertaking an increasing share of Australia's applied research as well. The Accord outlines the urgent need for a National Research Workforce Development Strategy that captures and facilitates pathways into and out of universities, and supports lifelong training needs for researchers.

The Accord also outlines the urgent need to increase domestic research training. In 2023 there were 7,100 commencing domestic postgraduate research students, down from 9,700 in 2013 and the lowest intake this millennium. PhD graduates are a critical part of the talent pool that we need for a more innovative future, but aspiring candidates are prevented from undertaking a PhD due to base stipends below the poverty line, taxation on part-time stipends, and PhD candidate ineligibility for government benefits available to other low income Australians. Two thirds of Australian PhD candidates are 30 years of age or older (66%) and most are enrolled part-time (51%). This suggests most are returning from the workforce to study, compared with 14% part-time enrolment for those under 30. The low stipend and inflexibility to study part time is a significant challenge outlined in the Accord. But the Accord also offers numerous other examples for how to enhance Australia's foundational research (see Recommendations 26, 42, 43). These include:

- Greater investment into Australian Research Council programs, including longer grant durations;
- Create a pathway towards funding more of the full economic cost of research;
- Fund First Nations scholarships and fellowships for critical contributions across all disciplines;
- Provide a stable National Collaborative Research Infrastructure Strategy funding;
- A Higher Education Future Fund with university co-contributions to support infrastructure;
- Boost the Research Training Program and PhD stipends, provide tax-free part-time stipends, and integrate business, transferable and entrepreneurial training for careers beyond universities.

The Accord also made recommendations for how to better leverage the Australian higher education's foundational research strength towards greater impact, while not compromising on Australia's unique strengths (see Recommendation 25). These include:

- Australian governments leading by example in the use of university R&D to solve acute economic, social, health, climate and environmental challenges;
- Establishing a Research Investor Forum to keep universities, industry and government informed of significant research problems;
- Establishing a Solving Australian Challenges Strategic Fund to reward universities for impactful research;
- Encouraging firms to upskill staff by employing PhD candidates for industry-relevant research.

The SERD also asks: "How can First Nations knowledge and leadership be elevated throughout Australia's R&D system?" The Accord does not speak to how this can be achieved in the business, government and not-for-profit sectors, but for the higher education sector this is part of strengthening Australia's foundational research across all disciplines (see Recommendation 26 noted above), as well as promoting First Nations knowledge (Recommendation 27). This includes

- Elevating First Nations knowledge, knowledge systems and Closing the Gap through First Nations Leadership to the National Science and Research Priorities;
- Establishing a framework that ensures First Nations-led research, leadership, capacity building, self-determination, and impactful outcomes.

Additionally, the IRU Accord submission recommended that the ARC should set a target of at least 5% of its total research funding going to Indigenous researchers (through new programs where needed) to match the 5% target set for the Medical Research Endowment Account. The IRU submission to the 2025 Policy Review of the National Competitive Grants Program also supported the proposal for more investment in scholarships and fellowships for Indigenous students and researchers.

The Accord does not provide answers to all the SERD consultation questions, but the IRU recommends that the SERD closely examine the Accord recommendations as a starting point for understanding how the university sector can better contribute to the SERD goals.

2. Prioritise the development of a National Research Evaluation and Impact Framework

The SERD asks: "What should be measured to assess the value and impact of R&D investments?" This will depend on the purpose of the R&D investment, the field of research and perspective of the funder. The Government's Innovation Metrics Review in 2019 aimed to accurately measure and communicate innovation performance and its impacts over the short and medium-term. That Review may be more relevant for commercial investment in R&D. But the impact of basic and foundational research can only be realised over a longer timeframe. The impact of applied research also cannot be limited to commercial impacts. Increasing the impact of most R&D investments in the higher education sector requires improved measurement, as well as advocacy and understanding of impact.

ACIL Allen's *Impact assessment of ARC-funded research* identified opportunities and potential benefits from the ARC developing an impact evaluation framework, including data-driven approaches to strengthen impact data collection and demonstrate the value of public funded research. This

underpinned the Accord's recommendation for a National Research Evaluation and Impact Framework that can efficiently assess research quality and impact, as well as incentivise and support researchers to consider pathways to impact, build external partnerships and advocate for the impact of their research (see Recommendation 29). Such a framework can support and enable an examination of whether research activity is aligned to national priorities, such as the redeveloped National Science and Research Priorities, and incentivise research in these areas. This is why the IRU's submission to the 2025 Policy Review of the National Competitive Grants Program recommended making better use of the ARC's expertise and immediately prioritise work on this Framework. Irrespective of Government and national priorities, the R&D sector needs to invest in impact evaluation and its capacity to inform strategic directions for R&D within the higher education sector, and in partnership with other sectors.

3. Recognise the need for balance between commercial outcomes and broader public/social good impacts from R&D

The SERD discussion paper focuses on lost opportunities to leverage Australia's research strengths for commercial benefit through greater university-industry collaboration, but generally ignores the non-commercial benefits of research and those that derive from the advancement of knowledge and university partnerships with government and community organisations. This side-steps the SERD Terms of Reference, which include "ways to measure the value and impact of R&D investments", including benefits to communities. Sweeping claims that much of our research "rarely addresses the needs of the main users of research and innovation in Australia – industry, government and the community" are simply not supported with evidence.

IRU data shows that collaboration by our member universities with industry partners has grown by 250% since the early 2000s, while over the same period, collaboration with government/public sector partners has grown by 265%.

Australian universities are deeply committed to research on five main societal problems outlined in the SERD: disease and illness; aging population and disability; food and water security; climate change and environment; and cybersecurity. This is directly evident in past national research evaluations (e.g. Excellence in Research for Australia) or a cursory search of research databases on the specific R&D opportunities (e.g. "tropical and zoonotic diseases"). These challenges engage researchers across a broad range of disciplines and with partners across sectors and countries. Commercialisation revenue is not the main purpose of this research. It is not always the main reason why organisations and end users partner with Australian universities. Australian research is being developed into globally transformational technologies by and with partners in other countries and this delivers benefit to Australia. We should do more to develop our sovereign capabilities, but our commitment to high quality, open science is not a zero-sum game. Solving the main societal problems outlined in the SERD will require stronger international partnerships and open exchange, rather than a shift towards short-term nationalism. What is urgently needed is a coherent national strategy for international collaboration in R&D that addresses the significant geopolitical/economic changes happening around us and balances the need for security and protection with the significant benefits of open collaboration.

The narrow focus of the SERD on industry partnerships on commercially oriented research also ignores an important equity consideration that is part of the SERD Terms of Reference: "…ways to

ensure R&D benefits are equitably distributed across regions and communities". There is no mention of measures to ensure disadvantaged communities are not left behind, or of leveraging an expanded university research system across the country. Similarly, the role of humanities and social sciences receive little mention. For example, when discussing how "our workforce is not aligned to the needs of our economy", the SERD discussion paper only considers STEM education. We argue that the SERD should focus on recommendations to drive productivity and inclusive economic growth, in such a way so as to not exacerbate existing economic and social inequalities. There are recent international models that we can learn from, such as the re-direction of US National Science Foundation funding into its new Regional Innovation Engines program.

We recommend that the SERD broaden its focus beyond commercialisation, economic benefit and the contribution STEM fields, towards being more inclusive of community partnership for environmental, cultural and social good underpinned by interdisciplinary collaboration. Funding for university-industry collaboration and research commercialisation must be balanced with funding for engagement and collaboration with the public and community sectors, to ensure the broadest possible translation of university knowledge and expertise. This is in line with the recommendations of the Accord and we recommend that the existing Research Commercialisation programs should be broadened in this way.

4. A systematic approach to R&D through a national coordination agency

The SERD discussion paper notes that Commonwealth R&D investment is spread broadly and thinly, with 84% dedicated to "bottom-up" measures that are not targeted towards national priorities, and the remaining 16% for "top-down" or purpose-led R&D being subscale, disjointed and spread across many specific purposes. The distinction between bottom-up and top-down can mask important differences within each type. For example, the R&D tax incentive is not a grant system and national competitive grants from the ARC carry different purposes and compliance measures compared with research block grants. ANSTO also has a mandated role to advise the Australian Government on all nuclear and science technology matters. The Medical Research Future Fund (MRFF) is also distinct with its activities based on national priorities identified by the Australian Medical Research Advisory Board (AMRAB). Confusingly the SERD discussion paper cites the MRFF as a bottom-up initiative (within the 84%), but also as an example of a top-down purpose-led R&D initiative: "A stronger role for missions or targeting societal challenges to be addressed through R&D could increase impact. The Medical Research Future Fund (MRFF) Research Missions target big health challenges. For example, aiming to double brain cancer survival rates by 2027 and defeat brain cancer in the long term."

Irrespective of the whether research funding is researcher-led bottom-up R&D, purpose-led top-down R&D or some combination, the SERD correctly identifies that Australia lacks a national institution to oversee strategy and public investment in R&D. This has led to a proliferation of disjointed, purpose-led initiatives of different durations and lifespans, funded from different government portfolios on the initiative of different ministers. Significant new government funding programs have prioritised collaboration with the private sector and research commercialisation, but the Productivity Commission recently found that these programs are "too narrow in their scope" and privilege commercialisation at the expense of other important pathways to knowledge transfer and research impact. These programs have eroded the capacity of the university research block grant to support research infrastructure, career development and work with communities that does not generate an immediate financial return. IRU analysis shows that the ratio of the block grant to total

research income has been cut in half over the last twenty years from around 80c block grant per $1 research income, to around 40c in recent years.

The IRU Accord submission recommended that purpose-led top-down R&D programs funded by other Australian Government portfolios (such as health, defence, agriculture, etc.) should have an agreed rate of support for indirect costs built in, to avoid further erosion of the dual funding system, and remove requirements for cash contributions from universities. Requiring cash contributions from universities (eg. in the agricultural RDC model) creates perverse incentives. This would ensure that the research block grant can cover the research mission of all universities, linked to the total research funding provided by the Education portfolio, preferably at a rate of at least 50 cents to the dollar.

The IRU Accord submission also highlighted the need for stronger national coordination, drawing on global models like the UKRI or the Tri-Council in Canada. A national coordination agency could take a system-wide view of research and innovation to support informed analysis and collaboration across different parts of government and the research sector. The SERD discussion paper encouragingly notes the successes of some government initiatives supporting university-industry collaboration, such as the National Industry PhD Program, Cooperative Research Centres (CRC) and rural research and development corporations (RDCs). However, there is also fragmentation and limited coordination between government programs, which drives competition instead of collaboration.

It is important that the significant successes of these programs are not lost in any changes. Therefore, the IRU recommends that the SERD panel consider how a new national coordination agency could advise on how existing public R&D programs can be updated, broadened or scaled up to better enable small and medium sized enterprises to engage with universities on their problems. Additionally, it could provide national capability to map research strengths against needs and trends, supported by open-source data to inform decisions and strengthen links between universities and national priorities. In partnership with the proposed Australian Tertiary Education Commission (ATEC), it could also help drive greater mission diversity within the university sector.

5. Consider how the R&D system can foster innovation and boost R&D intensity through mission diversity.

The Australian higher education sector contains a diversity of institutions: 44 universities, 8 university colleges and 158 institutes of higher education. However, within the Australian university category there are minimum requirements for teaching and research which can lead to standardisation and inhibit substantive mission diversity. All universities must deliver education and conduct research across multiple fields, including research at “world standard” or of “national standing in fields specific to Australia” in most fields. The *Higher Education Support Act 2003* requires the universities to have autonomy over the choices of research activities and the ways in which they are conducted. It also requires academic staff to be provided academic freedom to conduct research and to disseminate their research.

In other words, all Australian universities must have strong teaching and research missions across multiple fields, and freedom to pursue research without external interference. This ensures strong public understanding of what an Australian university is, and confidence that the education and research at their local university is of high and critical standard. It has also underpinned the strong and broad growth in foundational research across the higher education system. We support an R&D

system with diverse institutions that are incentivised and supported to fulfill their unique roles within the system, and to collaborate more effectively across the system, rather than competing.

The SERD notes that, as Australia's universities have expanded, they have also broadened their profile of students and staff across fields, and that this has brought benefits of a wider range of education and R&D initiatives, and cross-disciplinarity. However, declining block grant funding and the dependence on revenue from students to support research has also made it difficult to set strategic research agendas. With limited capacity to establish concentration of research in fields that do not attract students, universities may be less able to meet local industry needs or aggregate efforts towards strategic areas.

It is important that the autonomy of universities and academics are protected. Academics in teaching and research roles must be free to independently pursue research of the highest standard as judged by their peers. Their research contributes to the advancement of knowledge and the educational experience of their students, who are the future innovation workforce. Neither the Government nor university management should force academics to pursue certain types of research. However, there is scope for Government and universities to use additional funding to incentivise academics in areas of national interest or enable more research in these areas. Traditionally this would be through externally funded research-only roles and project-based funding, such as through the MRFF and National Institutes Funding. However, there is also scope for strategic research to be prioritised through mission-based compacts.

Mission-based compacts currently outline each university's mission and priorities to government, but they lack funding or incentive mechanisms. The Accord proposed that an ATEC work with universities to establish strategic priorities and deliver base funding through compacts. The IRU Accord submission recommended institution-specific mission-based agreements as the primary basis for allocating public funding to universities in line with agreed priorities, with universities reporting publicly on outcomes and impact. A new R&D agency could help further secure our national research base and leverage it towards solving problems in the national interest by directing public investment towards strategic priorities, with ATEC helping align these with individual university missions.

Optimising our national R&D system, and ensuring that it is set up for success into the future, will require securing the foundational role of universities in the broader innovation ecosystem. It will also require more effective mechanisms for networking the diverse capabilities that exist in the system, whether they be in universities, business or government. By setting clear national priorities and then driving greater mission diversity among institutions, public investment and policy can support more effective place-based innovation ecosystems that can build critical mass in key areas of sovereign capability, increase the attractiveness of business investment and better meet the needs of communities right across Australia.