Strategic Examination of Research and Development - UA Recommendations and answers to discussion questions

Universities Australia (UA) welcomes the opportunity to respond to the Strategic Examination of Research and Development Discussion Paper. In addition to responding to the questions posed in the Discussion Paper via the online portal, UA also intends to publish a series of more detailed policy papers for the consideration of the review panel, the parliament and the general public.

A list of UA recommendations is provided below for ease of reference:

Universities Australia Recommends:

- Reducing administrative overheads and creating synergy through appropriate Machinery of Government changes and program consolidation.

- Enhancing collaboration across the system via establishing a Ministerial Research Council.

- Increasing government investment (GBARD) in research and development to at least the OECD average of 0.74 per cent of GDP.

- NCRIS certainty and the re-establishment of the Education Investment Fund to help universities meet future demand for university teaching and research facilities.

- The introduction of a premium rate to the RDTI for businesses that collaborate with universities and publicly funded research agencies.

- A coordinated approach to direct funding for SMEs including expanding the Government's Business Research and Innovation Initiative (BRII) to include a program, such as Small Business Technology Transfers (STTR), which will specifically target SMEs with a focus on how this could assist Indigenous-led SMEs.

- The development and implementation of a National Research Workforce Development Strategy.

- The continuation of a specific funding stream in the National Competitive Grants Program for Indigenous Researchers.

- Increased funding and programs that support Indigenous-led innovation, entrepreneurship and development of Indigenous-owned R&D enterprises and start-ups.

- Strengthened protections for Indigenous Cultural and Intellectual Property (ICIP) within patents and commercialisation frameworks.

- A national Indigenous research agenda

- Greater coordination between the Universities Australia Deputy Vice-Chancellors Indigenous Committee and government research funding bodies (such as the ARC Indigenous Forum and NHMRC Indigenous Advisory Group).

1. WHAT SHOULD AN INTEGRATED, SUSTAINABLE, DYNAMIC AND IMPACTFUL AUSTRALIAN R&D SYSTEM LOOK LIKE?

The desired future state

Australia is recognised for producing world-class research and for its world leading innovation system. Collaboration is supported by complimentary industry and research policies which incentivise the colocation of research partners in innovation precincts and support Australian researchers to engage on a global scale, as well as domestically to solve the most significant challenges facing Australia, our region and the world.

Integrated

A system in which the roles of governments, research institutions and industry are clear and where Ministerial responsibility, funding sources and national priorities are aligned and complimentary. Administrative burden is appropriately minimised and yet there is clear line of sight from R&D investment to economic and social outcomes.

Sustainable

Universities are not dependent on their own revenue sources (i.e. largely international student revenue) to fund research of critical importance to the economy and the nation's future. Direct and indirect costs are appropriately supported both for government funded and industry funded research with reasonable co-contribution from university revenues as appropriate.

PhD candidates are afforded a living wage during their candidature and acknowledged for their valuable contributions to the knowledge and innovation ecosystems.

Dynamic

The R&D sector has the ability to respond to emerging domestic and international research and development priorities in the context of mission-based compacts developed based on local industry and community need.

Researchers are empowered and supported to explore more expansive career paths within and between academia, industry and government.

Impactful

Our research and development adds to the scientific body of knowledge while feeding into a robustly supported translation pipeline. We achieve the necessary level of sovereign research capability – the ability for Australia to develop its own ideas into the products, services and social benefits that we need.

2. WHAT GOVERNMENT, UNIVERSITY AND BUSINESS POLICY SETTINGS INHIBIT R&D AND INNOVATION WHY?

The key issue from a government perspective is the disjointed and incoherent funding system which exacerbates the overall issue of underfunding from the Government perspective. There needs to be a coherent balance between stable funding for infrastructure, competitive funding appropriately target and designed and government funding of agencies and other that addresses long term areas of national need.

Another critical aspect with respect to the disconnected nature of our R&D system is a lack of alignment between Government priorities and both Ministerial responsibility and funding sources.

An enduring, research-focused Ministerial Research Council could connect and inform decision making across government with respect to research governance, funding mix and priorities. Such a mechanism could support the coordinated implementation of necessary reforms in the context of the Universities Accord and beyond.

Currently five separate portfolios invest at least $500 million annually into Australia's research ecosystem. Ministers across these and other critical portfolios have a vested interest in ensuring that this investment is complimentary and connected.

A Ministerial Research Council (with appropriate support from the officials in the APS) could perform an important role in coordinating whole-of-government research and research funding policy, and submissions seeking to harmonise the sector through the identification of strengths and weaknesses in Australia's research and innovation ecosystem.

The establishment of a Ministerial Research Council could be complimentary to the rollout of Accord recommendations and is not dependent on the establishment of Australian Tertiary Education Commission (ATEC) though it could be shifted into the remit of ATEC (once established).

Universities Australia Recommends:

- Reducing administrative overheads and creating synergy through appropriate Machinery of Government changes and program consolidation.
- Enhancing collaboration across the system via establishing a Ministerial Research Council.
- Increasing government investment (GBARD) in research and development to at least the OECD average of 0.74 per cent of GDP.

A cohesive funding system is also critical with respect to the flow on impacts to universities internal research policies and strategies. Only in a scenario where universities have the funding flexibility to consider local and national research needs in the context of their respective strengths and communities can we hope to see the kind of connectivity the Discussion Paper calls for.

3. WHAT DO WE NEED TO DO TO BUILD A NATIONAL CULTURE OF INNOVATION EXCELLENCE, AND ENGAGE THE PUBLIC FOCUS ON SUCCESS IN R&D AND INNOVATION AS A KEY NATIONAL PRIORITY?

A good first step would be bipartisan support for a coherent set of reforms which instil our innovation system with the ability to regularly and consistently develop our own ideas into the products, services and social benefits that Australians need and want.

4. WHAT TYPES OF FUNDING SOURCES, MODELS AND/OR INFRASTRUCTURE ARE CURRENTLY MISSING OR SHOULD BE EXPANDED FOR AUSTRALIAN R&D?

Research funding in the university sector is hampered by an overly complex mix of partial funding and cross-subsidy. For example, Government competitive grants don't cover the full direct of

projects commissioned (in 2024 and 2025 the ARC provided 80% and 86% of requested funding for successful Discovery Projects) and block grant funding does not come close to covering the indirect costs associated with those projects, the cost of stipends and project support for our PhD candidates.

The co-investment model employed in the Rural Research and Development Corporations initiative has proved successful in bringing industry in to collaborate on strategic and targeted R&D, however, industry levy rates and matching funds from government also do not cover the full cost of research, resulting in a further need for universities to cross-subsidise projects.

Universities have for some time up until 2021 managed to cover these gaps through international student revenue – a precarious proposition looking beyond 2025. Even in this context there is one particular gap which is the most glaring.

Since the abolition of the Education Investment Fund in 2019, Australia has not had a dedicated fund for maintaining and upgrading research and teaching facilities. It has been acknowledged by successive governments that base funding is not sufficient to keep up with infrastructure needs. Again this issue may not become evident immediately but is under threat because of the financial strains resulting from the Job Ready Graduate Package and the changes in the international student market. In the long term this decline may also discourage investment and collaboration across sectors and borders, if Australia's facilities are not up to the standard required.

The Final report of the Australian Universities Accord recommends that the Government provides stable and predictable ongoing funding for the NCRIS. This would be heartily welcomed by the research sector, with UA for a long time having called for ongoing investment in critical research infrastructure and its maintenance, as well as greater certainty.

UA's members encourage the Government to create a stable basis for investment in the NCRIS program and make national research infrastructure a catalyst for further research collaboration between different sectors by adopting a life-cycle approach to funding for national research infrastructure, capturing ongoing maintenance and operation costs of the infrastructure and the skilled workforce required to support world leading facilities.

Universities Australia recommends that the Australian Government re-establish the Education Investment Fund to help universities meet future demand for university teaching and research facilities.

5. WHAT CHANGES ARE NEEDED TO ENHANCE THE ROLE OF RESEARCH INSTITUTIONS AND BUSINESSES (INCLUDING STARTUPS, SMALL BUSINESSES, MEDIUM BUSINESSES AND LARGE ORGANISATIONS) IN AUSTRALIA'S R&D SYSTEM?

Enhancing the role of both research institutions and industry requires policy settings which support them to constructively collaborate with each other.

As a basis, this requires a coherent funding system which supports universities and other research institutions to be strategic and place-based in their approach to research (see answer to Q.1 & Q.2)

This also necessitates the removal of workforce mobility barriers and a coordinated, forward-looking approach to research workforce issues (see answer to Q.7)

Then we need to address the power gap which faces startups and SMEs in engaging in collaboration with research institutions who are the holders of significant content knowledge, research expertise and practical expertise (in areas such as IP and contracting).

This begins with the right mix of direct and indirect incentives for industry, in particular SMEs. A recent OECD report highlights that indirect and direct funding measures complement each other as they are particular effective targeting and supporting different part of the Technology Readiness Level (TRL). Creating a mix of direct and indirect programs expands opportunities for business innovation. More direct support for innovation would also benefit university spinouts and startups, who often face barriers to securing funding and cash flow.

Australia's support for BERD is skewed towards indirect support through tax incentives, with 78 per cent of support for business R&D received through tax incentives such as the R&D Tax Incentive (RDTI).

With 93 per cent of businesses in Australia being classified as small businesses (based on the employee count of the company rather than annual turnover), it is crucial that the RDTI is not restricting SMEs in their growth. There are various definitions of SMEs and key determining factors for a SME threshold that can be considered.

While 83 per cent of businesses accessing the RDTI in 2023-24 were classified as SMEs (defined by a turnover of less than $20 million), this threshold has not been reviewed since its introduction in 2011, not even to consider an average annual inflation rate of 2.6 per cent over this period. SMEs receive a refundable R&D tax offset which will give them capital to reinvest in R&D.

Larger companies receive a non-refundable tax offset with a lower return for its R&D investment. This restricts growth for SMEs which also means that SMEs are generating less value added compared to the OECD average, meaning they may be less inclined to reinvest in R&D.

Sitting on the precipice of the threshold can cause uncertainty and difficulty in future planning for a company. SMEs are known to have a lower risk appetite to innovate. Certainty is important to encourage R&D activities. Australia also has a low number of medium-sized businesses, which means that scaling innovation in Australia is challenging.

An RDTI collaboration premium rewarding businesses who collaborate with universities could also be a significant force multiplier. This has been suggested in many contexts over the last decade, but it is yet to eventuate.

Turning to direct incentives, some States and the Federal governments provide a range of programs to increase SMEs research activities and foster university-industry collaboration. Innovation and tech transfer vouchers offered by multiple states and territories, Cooperative Research Centres, ARC Industry Linkage Programs, Rural Research and Development Corporations, ARC Industrial Transformation Research Hubs, Australia's Economic Accelerator Program, Industry Growth Program and the Trailblazer Universities Program are some of the many programs available to support research and research commercialisation at various point during the TRL.

There is currently not a holistic approach to taking research along the TRLs noting it is not always a linear process in any case. When one program ends, there is not necessarily the obvious next step to move the project along.

Universities Australia Recommends:

- That RDTI threshold be reviewed to further incentivise businesses to invest in R&D.

- The introduction of a premium rate to the RDTI for businesses that collaborate with universities and publicly funded research agencies.

- A coordinated approach to direct funding for SMEs including expanding the Government's Business Research and Innovation Initiative (BRII) to include a program, such as Small Business Technology Transfers (STTR), which will specifically target SMEs with a focus on how this could assist Indigenous-led SMEs.

6. HOW SHOULD AUSTRALIA SUPPORT BASIC OR 'DISCOVERY' RESEARCH?

Through appropriate sources of funding for both 'pure basic' and 'strategic basic' research.

Recent research conducted by the University of Queensland and CSIRO found that funding deficiencies, particularly for basic research, may be contributing to Australia's decline in global innovation ranking, noting that between 1996 and 2019 the proportion of research funding in Australia dedicated to basic research dropped from nearly 60% to a mere 40% - a significant turning of the tables. ABS data show that this has trend is ongoing with funding for basic research dropping to 37 per cent in 2020 and 35 per cent in 2022. This includes an actual contraction in nominal government funding for 'pure basic' research.

The ARC share of total government investment in R&D has fallen in real terms from ~10% in 2008 to under 7% in 2024, and within that budget there have been further declines in funding of Discovery research.

This evolving trend fails to acknowledge two critical facts; firstly, that the pipeline between discovery and product may be long and unpredictable and secondly, that basic research is the prerequisite for developing practical applications and commercial ideas – it is the well that feeds that pipeline.

Pure basic research is truly investigator led, to identify the gaps in our fundamental knowledge that need answers. This is sometimes mischaracterised as 'science for science's sake' but this mistaken. It implies that there is not expected to any kind of economic or social outcome. While it is true that such research may not have specific outcomes/products/services realisable at the outset, it can and does feed into the research translation pipeline, supporting and informing the work of contemporary and future researchers.

Basic research is not an area where industry investment is warranted. Universities continue to step into the breach funding 51.4% of the sector's research effort in 2022 (compared to 31.9% from Commonwealth and just 5.2% from business sources). This level of investment from Universities was always unsustainable as we saw this very pointedly when COVID-19 exposed the precariousness of internal student revenues and this has been compounded by recent changes in government settings.

In a world were both major parties are intent on limiting international students flows, the words 'precarious' and 'unsustainable' are no longer appropriate – we will now see university investment in research drop off significantly.

The Australian Government therefore must step up its commitment via strong an independent research funding bodies with the clear remit of supporting the best and boldest blue-sky research proposals. It is these investments that in the past that have positioned Australia as leaders in quantum, solar and other technologies.

7. WHAT SHOULD WE DO TO ATTRACT, DEVELOP AND RETAIN AN R&D WORKFORCE SUITABLE FOR AUSTRALIA'S FUTURE NEEDS?

The future of Australia's research endeavours – whether in industry, academia, the MRI sector or elsewhere, is dependent on the existence of a broad based and highly skilled research workforce. At no point in our history has Australia taken a coordinated strategic approach to this aim.

Despite this, our university sector has consistently produced world-class researchers across a broad range of disciplines providing our research and innovation system with a strong backbone. However, the lack of coordination (both within the higher education sector and between it and industry) means that there are significant gaps.

Looking at our most research-intensive industries, 42 per cent of Manufacturing industries, 35 per cent of Professional, Scientific and Technical Services and 33 per cent of Financial and Insurance Services noted that they experienced some sort of skills shortage in June 2022.

The third most common measure to address this was "on the job internal training", with 37 per cent of businesses using this approach to address skills shortage. This could point to a disconnect between the graduates tertiary education providers produce and what industry is after or mismatch between school lever knowledge about industry opportunities and actual opportunities.

In this context, UA considers that there would be significant value in a high-level framework which could drive cohesion within the research training space, aimed at collectively identified goals, while also supporting critical reforms around the barriers to researcher mobility and the connectivity of industry and academia more broadly.

A model for a Research Workforce Development Strategy

It is critical that any framework be co-designed with participation from key industry sectors, universities and Medical Research Institutes as well as relevant Government funding bodies and agencies including (but not limited to) the Australian Research Council, the National Health and Medical Research Council, the Department of Education, Jobs and Skills Australia and the Department of Innovation, Industry, Science and Resources.

The process for developing and research workforce strategy should include a detailed research sector profile as a baseline and outline clear expectations and roles across stakeholder groups. Ultimately a research workforce strategy could:

- Identify and address systemic barriers to researcher mobility between industry and academia

- drive engagement around particular skills needs across the R&I system both from an initial research training and professional development perspective

- consider the appropriate mix of domestic and skilled migration-based solutions to addressing skills gaps with respect to researchers and other innovation professionals

- consider the barriers to entry for prospective Higher Degree by Research (HDR) candidates (including stipend rates) and supports institutional decision-making around HDR offerings

- Identify the appropriate size and shape of the PhD cohort as well as appropriate incentives.

- articulate and encourages non-traditional research career pathways and with identified supports for Early to Mid-career Researchers

- support the development of an inclusive and diverse research and innovation workforce, which is representative of modern Australian society

- highlight the value of Indigenous Knowledges and methods as well as targeted strategies for the development of the Indigenous research workforce.

8. HOW CAN FIRST NATIONS KNOWLEDGE AND LEADERSHIP BE ELEVATED THROUGHOUT AUSTRALIA'S R&D SYSTEM?

Supporting the development of Indigenous research is essential to elevating Indigenous knowledge and leadership in the R&D system. Whole of pipeline approaches from providing research training to employment pathways to professional development is critical to support Indigenous research scholars and students. Appropriately supported Indigenous leadership roles within institutions are essential to support initiatives such as these across institutions for Indigenous advancement including in R&D.

The number of roles at the Pro Vice-Chancellor Indigenous level or higher has grown in recent years to 31 active roles (see the 2023 UA Indigenous Strategy Annual report). However, this number still falls below the target called for under the 2022 UA Indigenous strategy of a PVC role or equivalent at every institution.

The inclusion in the recently developed National Science and Research Priorities of Priority 3: Elevating Aboriginal and Torres Strait Islander knowledge systems (supported by the new Prime Minister's Prize for Aboriginal and Torres Strait Islander Knowledge Systems) provides a critical framework for the continued elevation of Indigenous leadership.

However, this also needs to be backed up by broad capability and education and training of critical issues around Indigenous data sovereignty, ethics in Indigenous research and through support for the pipeline of Indigenous higher degree by research students (tomorrow's Indigenous leaders in industry as well as academia).

This broader uplift is required to reduce cultural load on Indigenous leaders and researchers and to support greater, and more appropriate engagement in/with Indigenous research by Indigenous and non-Indigenous researchers alike.

Strengthening global Indigenous research collaborations will ensure that Australia's Indigenous researchers can connect with and learn from Indigenous scholars worldwide.

There is growing potential for Indigenous research to contribute to innovation, entrepreneurship, and economic development. However, there are barriers to ensuring that Indigenous knowledge systems are appropriately valued and protected within commercialisation pathways.

Current research funding models often categorise Indigenous research within broad themes rather than prioritising Indigenous-led agendas. A national Indigenous research agenda, shaped by Indigenous scholars and communities, ensuring that research aligns with Indigenous aspirations and priorities.

Universities Australia Recommends:

- The continuation of a specific funding stream in the National Competitive Grants Program for Indigenous Researchers

- The establishment of a coordinating mechanism such as a Minister Research Council with appropriate Indigenous representation.

- The inclusion via a National Research Workforce Development Strategy which articulates career pathways for Indigenous academics and supports the Indigenous HDR pipeline.

- Increased funding and programs that support Indigenous-led innovation, entrepreneurship and development of Indigenous-owned R&D enterprises and start-ups.

- Strengthened protections for Indigenous Cultural and Intellectual Property (ICIP) within patents and commercialisation frameworks.

- A national Indigenous research agenda

- Greater coordination between the Universities Australia Deputy Vice-Chancellors Indigenous Committee and government research funding bodies (such as the ARC Indigenous Forum and NHMRC Indigenous Advisory Group).

9. WHAT INCENTIVES DO BUSINESS LEADERS NEED TO RECOGNISE THE VALUE OF R&D INVESTMENT, AND TO BUILD R&D ACTIVITIES IN AUSTRALIA?

See answer to Q.5

10. WHAT SHOULD BE MEASURED TO ASSESS THE VALUE AND IMPACT OF R&D INVESTMENTS?

R&D Investments have broad outcomes (both commercial and non-commercial) and can be measured in many areas, it should have a coordinated approach and be across all public funded research organisations that does not add an administrative burden. Categories could include.

- Skills, academic and entrepreneurial

- Strengthening existing Industries

- Creation of new breakthrough technology companies

- Sector impacts both commercial and social.

- Influence on public policy

In terms of metrics on the strengthening of existing industries and the creation of new companies the Public Research sector places a lot of value on SCOPR (the Survey of Commercialisation Outcomes from Public Research) conducted by Knowledge Commercialisation Australasia (KCA). SCOPR metrics include normalising data, work outcome data and a set of commercialisation metrics which are widely regarded as invaluable in analysing commercialisation outcomes both by the respondents and in government circles. Included are number of patents and non-patented

technologies, invention disclosures, new spinouts and start-ups and overall commercialisation revenue. Plus, the amount of investment industries contracts to universities each year. SCOPR is an extremely valuable and we believe yet to be a fully utilised tool

KCA picked up the mantle of collecting research commercialisation data in 2019 after the Australian Government defunded its National Survey of Research Commercialisation in 2016. KCA even went to the effort of collecting 2017 and 2018 data to ensure continuity. While KCA have recently partnered with the Department of Education to drive broader participation in SCOPR, they (along with partners gemaker) continue to do the heavy lifting on a shoestring budget. The Department of Education entered a Partnership with KCA to enhance the outcomes and by universities. In addition, several useful tools are being developed in this partnership. The Australian Government could be taking a more active role in this work. Universities Australia provided support for a joint meeting between KCA and the Department as a satellite to the 2025 summit titled "Measuring Research Commercialisation Outcomes". This was well attended by a broad section of the university community.

Broadly speaking the question is not so much what should be measured but the categories in which measurement should be done and who is best placed to conduct such measurements. Further how the resulting data might be better utilised - in particular with respect to its potential use in evaluating and informing Australian Government R&D policy.