Queensland University of Technology

Submission to the
Australian Government's
Strategic Examination of Research and Development

Queensland University of Technology (QUT) welcomes the opportunity to contribute to this timely and vitally important Strategic Examination of Research and Development. We support the Australian Government's aim to strengthen the national research and development (R&D) system as a driver of future prosperity and resilience for all Australians.

We have structured this response in three parts. First, we list the dominant themes that emerged from analysis of insights gleaned from across the QUT research community in response to the discussion paper. Collectively, QUT researchers advocate for a coordinated, forward-looking and inclusive approach to R&D policy and investment that builds long-term sovereign capability, more meaningful organic collaboration, and better alignment between government, industry and research institutions. Success in these elements will ensure Australia strengthens its position as a world leader for research whilst also becoming a world leader in innovation and translation.

We then elaborate further on these themes in response to the specific consultation questions posed by the expert panel (p.41 of the discussion paper).

Finally, we address with further detail several key pressing issues that confront the Australian R&D ecosystem.

A brief overview of QUT research is also appended, for the expert panel's information.

We have rated the importance of the survey statements (also on p.41 of the discussion paper) in the course of making our submission through the portal.

1. Dominant themes

The most significant themes derived from internal QUT consultation are:

(a) **Strategic direction** requiring:

- Mission-driven approach to national priorities
- Long-term planning (5+ years)
- Balancing basic research with applied outcomes
- More coordinated national strategy with dependable bipartisan support

(b) **Appropriate levels of investment**:

- Greater national investment required (minimum 2.7-3% of GDP)
- Short-term vs. long-term funding challenges
- Need for more stable, longer-term research career funding
- Address the underfunding of basic research
- Funding reform to meet the full cost research

(c) Facilitating **collaboration and integration**:

- Better university-industry-government collaboration
- Cross-sector mobility for researchers
- Co-location in and distributed access to research precincts
- Interdisciplinary approaches (HASS + STEM)

(d) Safeguarding **workforce development:**

- Career stability and pathways
- Attracting and retaining talent
- Cross-sector mobility
- Development and recognition of specialised skills

(e) Creating an **innovation culture**:

- Reducing risk aversion in Australian business
- Incentivising industry R&D
- Promote the public awareness of R&D benefits
- Celebrating broader forms of innovation beyond technology
- Cultural change in corporate Australia

(f) Improving **infrastructure and support**:

- Establish a Research Investment Fund for ongoing infrastructure investment
- Further provision of shared public research infrastructure
- Immediately investment in upgrade of high-performance computing
- Provision of operational technical support for research capabilities
- Support for AI and other emerging technology infrastructure requirements
- Better coordination of and easier access to research infrastructure

(g) Embedding **Indigenous knowledges**:

- Better integration of First Nations approaches
- Co-design with Indigenous leaders
- Built-in IP protection for Indigenous knowledges

(h) Advancing **measurement and impact**:

- More relevant and reliable metrics beyond publications, citations and patents
- Long-term economic impact assessment
- Societal benefit measures
- Industry feedback on effectiveness

(i) Leveraging **global collaboration**

- Diversify global research collaboration
- Join Horizon Europe
- Seek opportunities to embed in multilateral research programs
- Better deploy Commonwealth foreign relations capability for research

2. Responses to consultation questions posed in the discussion paper

Question 1: What should an integrated, sustainable, dynamic and impactful Australian R&D system look like?

To be effective, the system must focus on **mission-driven R&D** that focusses on national strengths and priorities within a **more connected ecosystem** that ensures universities, government and industry are genuinely working together. Coordination is key.

The system would benefit from a single **central coordinating body** (akin to the mission but not necessarily the structure of the UK Research and Innovation) that fosters mutual awareness and joint planning across universities, government and industry to streamline programs, align national priorities, and reduce duplication, while preserving institutional autonomy addressing unique missions.

At a minimum, better outcomes could be achieved by augmenting existing mechanisms of the ARC and NHMRC with a focus on aligning national research strengths (including emerging strengths) with targeted mission-driven R&D investment.

The system needs to support the **full spectrum of research** – from discovery to application and translation – and ensure **appropriate levels of investment** over **sustained periods of time**. In line with global benchmarks, Australia must commit nationally to substantial, sustained investment over the long timeframes integral to serious research. For example, countries like Germany, South Korea and Israel all invest more than 3% of GDP in R&D

through coordinated, long-term strategies that align research with national priorities and industry needs. If resourcing remains limited, strategic choices must be made to maximise value and avoid spreading effort too thinly. To this end, QUT recommends reserving an explicit minimum of 20% of government funding for basic research, to ensure discovery remains embedded in the national innovation agenda.

Building and retaining a **strong researcher workforce and ensuring researcher mobility** across sectors should be normalised and supported. This should include flexible mechanisms that allow movement between academia, business and the public service, increasing the flow of ideas and talent back and forth across the system. Mobility could be stimulated through co-funded industry-academic fellowships (see Germany's Fraunhofer Institute model and Singapore's RIE2025 program as exemplars).

The system should encourage **deep interdisciplinary collaboration** embedding HASS disciplines alongside STEM disciplines.

Question 2: What government, university and business policy settings inhibit R&D and innovation and why?

Current policy and funding settings have created barriers and fragmented efforts towards R&D and innovation. The existence of more than 150 funding programs spread across 15 portfolios illustrates the need for reform. We recommend a **machinery of government realignment** that better matches ministerial responsibility with funding levers and outcomes and underpinned by a clear **National R&D Strategy**. There needs to be coordination across portfolios and there could be benefits from consolidation of effort within a single service portfolio(s) – that can provide research services to all other areas of government responsibility – will yield immediate productivity and efficiency dividends, not only for government but also for the entire research sector and the diversity of end-users it serves.

Systemic underinvestment by government and lack of industry engagement needs to be addressed. Universities are shouldering a significant share of the cost of underfunded research, subsidising the national effort through international student income. This unsustainable model must be addressed. **Incentives for industry and university engagement** and **funding research at its full cost** (direct and indirect) re two key issues requiring attention.

Short-term thinking in government planning and funding mechanisms limit both university and industry appetite and capacity to engage in high-impact, long-horizon research. Mechanisms such as **simplifying compliance** and **reducing regulatory requirements** (particularly for SMEs), **changing the cap on the R&D tax incentive** and introducing **more accessible and direct funding mechanisms** could help to bridge this divide. Two international examples of directly funded innovation success with demonstrable positive impact are Finland's Business Finland and Israel's Innovation Authority.

Government programs should **be independently evaluated** periodically. The objective assessment of programs' effectiveness in achieving their stated objectives (as well as the production of indirect benefits or detriments) should inform the active redesign or retirement of programs where warranted.

Question 3: What do we need to build a national culture of innovation excellence?

Establishing a **single consolidated innovation coordinating body** to replace the current overly distributed approach would be beneficial. As mentioned above, several other countries can provide examples of the success and benefits of such an approach, that are also recognised internationally as best practice case studies.

Australia lacks a **clear and consistent story around the value of our nation's research**. Public understanding of the importance of R&D is limited, which in turn affects political willingness to prioritise long-term investment. Research is plainly a public good – as essential to the nation's future as roads, healthcare, the energy grid or defence – and further effort should be devoted to broadening the public understanding of its benefits.

Public communication of research impacts should include not only the major scientific breakthroughs that grab the headlines, but also the incremental advances showing promise in terms of economic, social, health or policy benefit. Innovation education should be embedded across all levels of the education system.

We recommend **bipartisan endorsement** of a **consolidated innovation coordination body** that can:

(i) build and maintain a national narrative around innovation and national benefit.

(ii) facilitate public engagement aligned to mission-based funding priorities.

This effort should include long-term communication initiatives, community-based engagement programs, and practical local case studies that demonstrate how research translates into outcomes that matter to Australians.

Question 4: What types of funding sources, models and/or infrastructure are missing?

Australia's research funding landscape remains heavily dependent on competitive, short-term grants and lacks mechanisms to support the full lifecycle of R&D. A **central coordinated funding body or council** (as mentioned above) could improve the landscape in terms of establishing clearer funding mechanisms and improving career trajectories and workforce mobility.

QUT recommends **a lifecycle approach to infrastructure investment** that includes sustained funding for operations and technical staff. While previous investments have produced world-class facilities, operational and maintenance support is often inadequate, reducing long-term value and limiting access across the sector.

The Australian Government should establish a dedicated **Research Investment Fund** within the Future Fund, to support essential shared research infrastructure hosted by universities, the publicly funded research agencies and related public entities. This suggestion is a more focused model than the resurrected Education Investment Fund (EIF) recommended by the Australian Universities Accord. This would ensure continuous modernisation of laboratories and facilities, providing much-needed reliability of funding for critical upgrades, extensions and maintenance of essential infrastructure.

Relatedly, QUT also recommends **long-term operational funding for NCRIS** and more predictable, responsive co-investment programs, particularly those accessible to SMEs.

These programs should include rolling applications and reduced cash contribution requirements to broaden participation and reduce administrative burden.

Introducing **mid-scale collaborative research programs** would bridge the current gap between small grants and major centres.

To foster deeper ties between government and the research community, the Commonwealth should consider introducing a **Research Policy Fellowships** scheme along the lines of the Science and Technology Policy Fellowships that the American Association for the Advancement of Science has run for decades in collaboration with the UA Federal Government. These see researchers at all career stages spend a year working within the government, lending expertise and new perspectives to government policy challenges. These opportunities would open up alternative career paths for researchers, broaden the pool of talented Australians open to a career of public service, enhance mutual understanding between government and universities, and create strong ties as networks of colleagues become entwined in both domains. An alternative model could see researchers on shorter fellowships of 3 or 4 months could target a broader set of target domains, including government, media, industry, the community sector, and schools.[1]

Question 5: What changes are needed to enhance research institutions and businesses' roles?

The **co-location of research, industry and end-users** in precincts can also improve mobility, provide greater focus on delivering research that industry requires and potentially streamline processes to encourage industry-supported research. Given the geographical constraints in Australia, we should explore other ways to achieve this kind of collaboration in a distributed model.

To reward industry-university partnerships, we would recommend the adoption of the **collaboration premium to the R&D tax incentive**, as recommended by the last major review of the scheme in 2016[2] and urged by virtually every expert commentator ever since. An information campaign to **help business better appreciate the potential benefits of research collaboration** could be a cost-effective force multiplier of financial incentive schemes. Additional direct funding to support SMEs could also be instigated to expand engagement and reduce the risks of early-stage collaboration. This could be similar to the NIH Small Business Technology Transfer (STTR) program.

Question 6: How should Australia support basic or 'discovery' research?

Basic research is the foundation of long-term innovation and sovereign capability. All application and translation of late-stage research is entirely beholden to discoveries made in earlier basic research. However, basic research is often overlooked or deprioritised due to the absence of immediate commercial outcomes. The proportion of research funding

[1] See Alberts, Bruce, 'New Career Paths for Scientists.' Editorial, *Science* 320, 18 April 2008. doi:*10.1126/science.1158719. https://www.science.org/doi/epdf/10.1126/science.1158719*

[2] The so-called 3Fs Review, conducted by Bill Ferris AC, Dr Alan Finkel AO and John Fraser. The report is found at https://www.industry.gov.au/sites/default/files/May%202018/document/pdf/research-and-development-tax-incentive-review-report.pdf

directly allocated to **basic research has declined** over the past two decades, falling from nearly 60% in the 1990s to approximately 35% in 2022.[3] This decline is significantly attributable to a reduction in government funding for 'pure basic' research. Universities have picked up the slack to the extent they can, but – as the Commonwealth is virtually the only other funder of basic research, and universities' revenue stream from international students are now constrained – the current low level of investment in basic research represents a significant risk to Australia's future innovation pipeline.

QUT recommends **strong public investment in blue-sky research** through funding bodies such as the ARC and NHMRC, with schemes that support both pure and strategic basic research. Critically, this investment should be indexed and address the success rates for high-quality, proposals that are lost opportunities with the current success rates.

Basic research should be recognised as central to mission-led approaches and embedded within mid-scale and interdisciplinary programs.

To protect this essential part of the system, and as mentioned above at question 1, QUT recommends that a **minimum designated rate of government R&D funding be reserved for basic research** – in the order of 20% – consistent with international best practice (South Korea has a policy target of approximately 40%; Horizon Europe allocates approximately 25-30%; and Israel maintains approximately 25%).

Question 7: What should we do to attract, develop and retain an R&D workforce?

Australia's research workforce is highly skilled but increasingly insecure. Short-term contracts, limited opportunities for job mobility, and poor alignment of training with future job opportunities are undermining retention and morale.

QUT strongly recommends the development of a **National Research Workforce Development Strategy** to help define research career pathways across sectors, provide greater certainty and clarity for academic researchers, ensure appropriate support for non-academic professionals, such as research engineers and technicians, and increase job mobility for both academic and non-academic research staff. Such a strategy should align with a National R&D Strategy and support long-term funding programs that improve job security.

The low rate of PhD-qualified individuals finding jobs in industry compared to other jurisdictions threatens the diversification and effectiveness of the broad national research effort. Programs designed to encourage PhDs working in industry should be expanded and complemented by greater support for **dual appointments and secondments** between sectors. **Cross-sector mobility initiatives (industry-academic fellowships)** could also be considered to address the gap between universities and industry (akin to Germany's Fraunhofer Institute model for co-funded industry academic fellowships).

[3] Harrison et al. track the reduction of investment in basic research from 1996 to 2019: Harrison RS *et al.* (2023) *Microbiology Australia* **44**(1), 57–61. doi:10.1071/MA23014 https://www.publish.csiro.au/ma/fulltext/MA23014
The subsequent further decline from 2019 to 2022 is revealed in ABS data: Australian Bureau of Statistics (2022), *Research and Experimental Development, Higher Education Organisations, Australia,* HERD by type of Activity, https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-higher-education-organisations-australia/latest-release

HDR training should reflect evolving workforce needs, including digital skills (including AI capacities), policy literacy, career planning, problem solving, teamwork, and data and project management. Our currently non-competitive **stipend levels** must also be reviewed to ensure that HDR students can meet cost-of-living expenses, enabling them to focus on research without financial hardship. Australian talent is turning away from R&D, as they literally cannot afford to pursue otherwise promising research careers.

QUT also recommends introducing targeted strategies to grow and sustain the **Indigenous research workforce** and to foster local innovation ecosystems that offer meaningful career pathways beyond, as well as within, academia.

Question 8: How can First Nations knowledge and leadership be elevated?

First Nations peoples hold deep and distinctive knowledge systems that contribute significantly to Australia's sustainability, ecology, wellbeing and cultural understanding. However, these perspectives are not consistently embedded across Australia's R&D system.

QUT supports the establishment of an **Indigenous-specific funding stream** within the National Competitive Grants Program, as well as dedicated mechanisms for co-design and community-led research. These must be underpinned by strong **Indigenous governance frameworks** and clear and secure protections around I**ndigenous data sovereignty**, **knowledge ownership and intellectual property.**

Career pathways for Indigenous researchers must be strengthened through dedicated and well-funded HDR programs, support for mid-career leadership, and formal recognition of Indigenous knowledge as a standalone national research priority.

Broader efforts are also needed to build **cultural capability** across the research ecosystem and reduce the significant cultural load currently placed on a small number of Indigenous researchers and leaders.

Question 9: What incentives do business leaders need to recognize R&D value?

Many Australian businesses do not view themselves as part of the national research ecosystem. Short-term planning cycles, internal capability gaps, and the perceived risk of research investment often discourage engagement. For SMEs, regulatory complexity and funding uncertainty are significant deterrents.

QUT recommends **revising the R&D Tax Incentive** to better reward collaborative and high-risk research. As mentioned above at question 6, this should include the introduction of a premium rate for businesses that partner with universities or publicly funded research agencies – a measure that the higher education sector has long supported.

We also recommend **expanding programs like the Business Research and Innovation Initiative** (BRII) to include research funding for SME-focused problems and high-risk R&D (e.g. non-traditional innovation that is beyond product development). Alternatively, as discussed above, the creation of a **central innovation coordination body** that reduces duplication, removes fragmented approaches and increases direct access to grants, would help to increase industry engagement in R&D.

Clear, consistent communication of research success stories – especially those involving SME collaboration – will be essential to shifting perceptions and building business confidence in the system.

Trust and mutual understanding between industry and universities are essential to foster deeper and enduring engagement. Along the lines of the Research Policy Fellowships mentioned above at question 4, the Commonwealth should consider introducing an **Industry Research Fellowships** scheme to embed researchers in industry for twelve months. This would not only bring expertise and fresh perspectives to industry challenges in the short term, it would also help embed an industry mindset in the researcher's ongoing approach to problem-solving, enhance mutual appreciation for the challenges and assets each sector can bring to collaboration, open up new career pathways for researchers and bring new potential talent to industry.

Question 10: What should be measured to assess R&D value and impact?

Traditional research metrics do not fully capture the breadth of impact delivered by Australia's R&D system. There is a critical need for a **National Impact Framework** that reflects economic, social, environmental and cultural outcomes, while also recognising interdisciplinarity, equity and knowledge translation.

Existing tools such as the **Survey of Commercialisation Outcomes from Public Research** (SCOPR), led by Knowledge Commercialisation Australasia, should be better resourced and more widely used to support national policy evaluation. SCOPR captures a wide range of indicators such as patents, invention disclosures, non-patented technologies, spinouts, start-ups and commercialisation revenue. However, these indicators remain underutilised.

These quantitative metrics should be expanded to pick up evidence-based estimations of economic benefit derived from cost savings, harm mitigation, and public policy implementation. They should also be **complemented by case studies and narrative evaluation methods** that account for cumulative, long-term contributions to public policy, economic and societal benefit and regulatory reform. **Industry and community feedback and peer assessment** should be key components of such qualitative measures.

Australia currently lacks a dedicated independent academic research focus on research policy, to supplement departmental advice with scholarly rigour and expertise. The Commonwealth should stand up an **Australian Research Policy Institute** with ongoing support at a suitable Australian university. Such an Institute would assist government in setting long-term, evidence-based, best-practice research policy by:

- conducting rigorous primary research into research policy;
- monitoring, collecting and analysing research being conducted on research policy from around the world; and
- providing evidence-based advice to government on research policy.

This activity would supplement work done by the meta-research community, which looks at the conduct of science and research as a professional practice. The Institute would fill a current gap in the provision of a system policy perspective of direct relevance to the concerns of government.

3. Detailed discussion of pressing issues

International research collaboration

The United States has recently withdrawn funding from a number of research programs, organisations and infrastructure, some of which Australian research depends on for data, people-to-people collaboration, and even direct funding. While the Australian research community enjoys many other fruitful international research collaborations, it is clear that we need to diversify those connections further, and work with other partners to fill gaps that have suddenly emerged.

As a matter of priority, the Commonwealth should revisit its prior decision not to join Horizon Europe, the world's largest research collaboration. Much has changed in the past two months, and many more changes are clearly to come, so it is entirely reasonable for the Government to make a fresh evaluation of the merits and come to a different conclusion to that resulting from its previous deliberations. QUT recommends that the Government consults with the research community to ensure it is fully informed of the potential benefits (as well as the emergent deficits resulting from the withdrawal of the USA from myriad research activities).

The Australian Government should send a signal to the world that Australia is open for business on research collaboration, both multi- and bi-laterally, and that we welcome new opportunities to engage with a board range of partners in order to defray risk, maximise the benefit of research investment, and better utilise our considerable potential for soft diplomacy through research engagement and citizen networks.

As a matter of priority, the Government should establish a special global talent attraction scheme to recruit outstanding global research leaders from the USA and elsewhere who may now be seeking opportunities to continue their careers outside the United States.

Overall funding

While many benefits can be obtained from simplifying Australia's overly complex R&D system, better aligning incentives and support structures to researcher and industry needs, and ensuring other government activities (e.g. visa settings and processing priorities) are supportive of the national R&D objective, there is no escaping the fact that there is simply not enough funding to meet the country's R&D requirements. While the discussion paper argues that it will be difficult to secure adequate funding for R&D, it omits to address the question of the cost to the nation of failing to do so.

Overall R&D investment in Australia has been falling for decades. The universities have steady increased their collective contribution over that time to slow the decline, but that effort has been largely funded from a source (i.e. international student fee revenue) that is now quite constrained and is in any case always subject to the vagaries of global economic conditions and geopolitical upheaval. Both government and business need to increase their investments in research, to ensure R&D continues to drive the economic diversification and uplift we all agree the nation needs.

Government has a role to play in helping business to invest, but it most critically needs to make urgent and appreciable increases to its own core research funding. Government could

start with simple measures that will produce immediate tangible benefit, such as committing to fund the indirect cost of research, doubling the ARC budget, expanding the research block grant pool, extend NCRIS, and establish a Research Investment Fund.

R&D tax concession

If Government finds it difficult to find new money to inject into the Australian R&D system to prevent its genteel decline, it could consider redeploying the funding that currently underwrites the R&D Tax Incentive program. This scheme is the single largest research expenditure of the Commonwealth: while it is enormously expensive, it is extremely poorly directed, funds a great deal of business as usual (i.e. product development far removed from genuine innovation) and has little relation to either the formal national research priorities or our nation's underlying actual research needs.

Absent another means of boosting the government continuation to national benefit R&D, QUT recommends the decommissioning of the R&D Tax Incentive, its replacement with a targeted fund to which R&D-active businesses can apply for merit-based research grants (akin to how the rest of the Australian research community does), and use the considerable remainder to properly fund research elements that are operating below their potential due to scarcity of resources.

Conclusion

Australia finds itself at a pivotal moment. Strengthening our national research and development system has never been more critical to our future, but it will require sustained investment, structural reform and a coordinated, mission-driven strategy. This submission outlines a clear case for a more coherent and integrated approach. It recognises the importance of foundational research, a capable and mobile workforce, cross-sector engagement, greater diversity of international collaboration, alignment between research activity and national priorities, and respect for institutional autonomy in pursuing their unique research missions.

Embedding research and innovation across government, industry and education systems is essential to Australia's future economic performance, sovereign capability and social health and wellbeing. Achieving this will require long-term funding certainty, better coordination across systems and strong public engagement that positions research as a vital national asset. It will, frankly, require a larger quantum of better targeted public funding.

QUT, along with other Australian universities, remains committed to working with government, business and research partners to help deliver a world-class, inclusive and strategically focused R&D system. We are ready to contribute to a more innovative, resilient and prosperous Australia, in partnership with governments, industry and the community sector, to the benefit of the entire nation.

Appendix – About QUT Research

QUT is a leading Australian university with a strong focus on research that addresses local, national and global challenges. We deliver coordinated, university-wide capabilities that accelerate high-quality fundamental and applied research with a clear focus on advancing knowledge and creating real-world impact.

Our research strengths, represented by our Research Centres, span digital technologies, robotics, artificial intelligence (AI), health, sustainability, materials science, education and the creative industries, supported through major national and international research initiatives.

QUT Research Centres

· Australian Centre for Health Law Research

· Australian Centre for Health Services Innovation

· Australian Research Council Centre of Excellence for the Digital Child

· Cancer and Palliative Care Outcomes Centre

· Centre for Agriculture and the Bioeconomy

· Centre for Biomedical Technologies

· Centre for Data Science

· Centre for Decent Work and Industry

· Centre for Future Enterprise

· Centre for Future Mobility

· Centre for Genomics and Personalised Health

· Centre for Healthcare Transformation

· Centre for Immunology and Infection Control

· Centre for Inclusive Education

· Centre for Justice

· Centre for Materials Science

· Centre for Microbiome Research

· Centre for Robotics

· Centre for Vision and Eye Research

· Design Lab

· Digital Media Research Centre

· Energy Transition Centre

· QUT Resilience Centre