UNSW Submission – Strategic Examination of R&D

Executive Summary

UNSW Sydney welcomes the opportunity to contribute to the Strategic Examination of R&D, and strongly supports a bold, coordinated national agenda to enhance Australia's research and innovation system. As a global top 20 university - with leading expertise in areas such as quantum technologies, artificial intelligence, clean energy, defence, and health - UNSW is committed to helping shape a high-performing, mission-driven R&D ecosystem that delivers long-term national benefit.

It is important to acknowledge the current inadequacy of investment, both public and private, in Australian R&D, as highlighted by the Australian Universities Accord. This shortfall has been widely acknowledged across government and is counter to efforts to lift national R&D intensity in line with international benchmarks. While peer OECD nations are investing around 3 per cent of GDP in R&D, Australia lags significantly behind at just 1.68 per cent.

The urgency of addressing this gap is further amplified by growing economic and geopolitical uncertainty, with Treasury identifying low R&D investment as a risk to Australia's sovereign capability. Indeed, realising the ambition of lifting R&D investment nearer the OECD average of 3 per cent is likely a fundamental precondition of achieving the Government's objective of a *Future Made in Australia*.

Nevertheless, even within the existing funding envelope, there are meaningful opportunities to invest more strategically. It is these opportunities that this submission has chosen to explore and advance.

Many new technologies that are perceived as overnight successes, are often the result of
UNSW calls for interconnected and mutually reinforcing reforms to support a more globally competitive, resilient, and inclusive innovation economy. Central to this objective is the need to strengthen collaboration between government, universities, and industry at scale — through structured consultation, targeted and strategic investment, and clearer alignment of research and national priorities.

A key enabler of innovation is an effective suite of R&D incentives. UNSW supports comprehensive reform of the R&D Tax Incentive to promote collaboration with research institutions and ensure that benefits are felt locally. UNSW strongly supports the submission made by the Business Council of Australia (BCA), particularly its recommendations on effective strategies to incentivise long term, high risk R&D to attract industries and grow them at scale.

Government procurement should be used as a strategic lever to support home-grown innovation and de-risk commercialisation. In parallel, unlocking new sources of long-term private capital—

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particularly from superannuation funds and other latent sources such as family offices—will be critical to scaling high-potential technologies. Successful international models such as the UK's Mansion House Compact and Catapult Network offer valuable lessons for Australia.

Improved coordination across all levels of government is vital. UNSW recommends establishing a National Collaboration Framework to align R&D investments and reduce duplication. Expanding shared research infrastructure and supporting long-term, mission-oriented funding will better enable translation, scale-up, and commercial impact across sectors.

It is also critically important to build a skilled, future-ready workforce through education pathways that are embedded in industry, aligned with national priorities, and inclusive of lifelong learning.

Reimagined research systems must elevate Indigenous knowledge and leadership, embed scientific expertise in policymaking, and ensure that innovation delivers against both economic and societal outcomes.

UNSW's submission calls for the development of a comprehensive national impact framework that moves beyond traditional metrics to capture the full value of R&D—spanning commercialisation outcomes, regional development, social equity, and environmental sustainability.

UNSW has drawn on experience and deep engagement with more than 100 industry partners for this submission. We are committed to working with government and business to evolve the nation's R&D system to be more ambitious, integrated, and outcomes-focused for the benefit of all Australians.

Recommendations

1. Given the critical role that industry must play in lifting national R&D intensity, UNSW strongly encourages a structured and inclusive process for industry consultation in the next phase of the SERD, ensuring the review reflects the practical needs and aspirations of Australian businesses central to Australia's innovation system.

2. Noting the stated desire of government to reach R&D investment of 3 per cent of GDP, it should be recognised that government will have an important role to play to leverage and de-risk R&D for industry, in addition to incentivising direct investment by business.

3. In line with a Recommendation 2 of the 2016 Ferris, Finkel and Fraser ('3F') Review of the R&D Tax Incentive (RDTI), the RDTI should be restructured to allow for a premium tax credit where industry collaborates with universities and publicly funded research agencies (PFRAs), a measure that will incentivise greater collaboration, and minimise misuse of the tax credit.

Leveraging government programs to incentivise industry participation

4. UNSW recommends targeted investment in mission-driven innovation centres that de-risk late-stage development and encourage private sector investment in applied research.
    a. Australia should draw on lessons learned from the Trailblazer program and successful international models, such as the UK's Catapult Network, to establish centres that focus on national priorities and drive translational impact.

b. Such programs should purposefully support the transition of research from discovery to translation readiness, as they pass through Technology Readiness Level (TRL) stages 4-7.
c. Sustainability is crucial, both in grants programs and the research they support, beyond initial investment, so that promising models and pilot programs can be expanded.

5. The Government should develop a national strategy to better leverage philanthropy—including the growing influence of Family Offices—as a key source of funding for bold, high-risk research. This strategy should include policy frameworks that encourage collaboration between public research institutions and private donors, alongside targeted tax incentives for philanthropic contributions to R&D.

6. Government procurement should strategically support Australian innovation. Prioritising the adoption of home-grown technologies and sourcing from local startups will strengthen sovereign capability and also help scale emerging businesses and accelerate commercialisation pathways. Consideration should also be given to creating a boost for businesses undertaking R&D in subsequent tenders for government contracts.

7. Government has an important role to play in promoting Australia's research expertise, with a view to attracting greater industry participation and wider public appreciation for our world-leading excellence. This should include government being an exemplar user of the nation's research expertise.

Incentivising risk

8. Reforms should be implemented to support Australia's superannuation sector and other latent sources of capital (such as Family Offices and high-net worth (HNW) individuals) to invest in high-risk, high-reward domestic R&D. This would require appropriate regulatory adjustments, accompanied by public co-investment and innovation-led procurement to reduce risk and incentivise participation. Australia should consider mechanisms such as and expanding current Capital Gains Tax structures for Family Office and HNW investors, and the UK's Mansion House Compact, which aims to better leverage institutional capital for national innovation and commercialisation outcomes.

Supporting industry collaborations with universities

9. University research funding arrangements should better incentivise industry engagement, commercial outcomes, and translational research as well as traditional academic outputs.

10. There is significant value in expanding co-funded initiatives that build capacity and strengthen collaboration between researchers and industry. This includes scaling up collaborative research grants, industry-linked PhDs, internships, and two-way secondments to improve mutual understanding and increase firms' R&D capability. The Trailblazer programs provide a positive example of achieving these at scale with a particular focus on national priority areas.

Reform the R&D Tax Incentive

11. The R&D Tax Incentive should be reformed to better encourage collaboration between large firms and domestic research institutions, especially in areas of national strategic importance.

Importantly, eligibility should be restricted to R&D activities genuinely undertaken within Australia to ensure the benefits of the scheme are felt locally.

Aligning Government's R&D investments and efforts

12. UNSW recommends the development of a National Collaboration Framework to improve alignment of federal and state R&D investments. Greater coordination would help reduce duplication, minimise administration and reporting costs, ensure efforts are strategically directed, and maximise public return on investment. This should include alignment between the Strategic Examination of R&D and the recommendations emerging from the current review of the ARC's National Competitive Grants Program, to ensure coherence across Australia's research funding landscape.

13. Strengthening the national research infrastructure system is critical. Investment in shared, accessible infrastructure will support cross-sector collaboration, enable both discovery and applied research, and enhance Australia's competitiveness in priority areas.

14. UNSW calls for the establishment of dedicated mechanisms to ensure that technical and scientific expertise is embedded in policy development and national strategy.

Elevating Indigenous knowledge and leadership

15. Enabling policies and protocols to support and embed Indigenous knowledges and leadership should be a priority for government, including appropriate research grants schemes, oversight, intellectual property, and partnership incentives.

Globally competitive

16. UNSW strongly supports enhancing Australia's international R&D engagement. Targeted bilateral agreements, participation in global research missions, and improved mobility for researchers are essential to maintain our global standing and accelerate solutions to critical challenges. Australia should actively prioritise international collaboration on shared problems—particularly in areas such as climate change, clean energy, and emerging technologies—where collective effort will deliver outsized returns.

Rebuilding Australia's Industrial Base Through Strategic R&D Policy

UNSW Sydney welcomes the Strategic Examination of R&D as a timely opportunity to address the long-term structural challenges facing Australia's innovation economy.

UNSW is a leading research-intensive university with a strong reputation for delivering interdisciplinary research that addresses national and global challenges. UNSW was ranked number one in the country in 2023 for the largest number of new startup and spinout companies founded through technology developed at the university. This is the third consecutive year UNSW has topped the table in the independent annual Survey of Commercialisation Outcomes from Public Research Report (SCOPR). Our research strengths span quantum computing, renewable energy, advanced materials, health sciences, public policy, and digital technologies—areas closely aligned with Australia's strategic priorities and the national interest.

Chief among the challenges Australia is facing is the changing nature of our industrial base, particularly in manufacturing—a sector that has traditionally played a central role in driving business investment in R&D. Australia's current industrial landscape is shaped by a growing presence of large multinational firms that often operate locally as sales and distribution hubs, with limited investment in domestic research, development or manufacturing. This dynamic has contributed to the country's persistently low business R&D intensity and undermines efforts to build sovereign capability and economic complexity.

At the same time, small and medium-sized enterprises (SMEs)—ranging from local service providers to technology startups with global ambitions—are not fully enabled to scale, commercialise innovation, or access the kinds of infrastructure and capital required to compete on the world stage. These businesses represent a significant but under-leveraged source of national innovation potential.

The Strategic Examination of R&D presents a key opportunity to reset the policy environment—to encourage multinational firms to embed research and advanced capability functions in Australia through targeted incentives, co-investment and long-term partnerships. Simultaneously, there is a need to strengthen the ecosystem that supports Australian SMEs, ensuring they have access to translational funding, shared infrastructure, and workforce development programs that enable them to grow and compete globally.

A dual-track strategy—attracting global R&D investment in the short term while enabling domestic SMEs to scale over the medium and longer term—is essential for rebuilding Australia's industrial base and securing a more sustainable, resilient and innovative economy.

UNSW recognises that there is no quick fix to addressing Australia's low R&D intensity. International experience shows that increasing national R&D expenditure to levels above 3% of GDP—a benchmark associated with high-performing innovation economies—requires sustained effort over decades. Analysis of leading R&D nations indicates that it has taken, on average, 20 years of consistent investment, policy stability, and strategic coordination to reach this level, although this has been achieved faster and at a higher level in countries where a clear mandate has been set, such as Israel and South Korea. Australia must take a similarly long-term, whole-of-government approach, underpinned by bipartisan commitment and deep collaboration across sectors.

Partnering for Inclusive and Sustainable Productivity Growth

UNSW Sydney supports the Strategic Examination of R&D's recognition that lifting Australia's productivity and innovation performance requires shared leadership across government, industry and the university sector. It is only through coordinated action that we can align the R&D system with national priorities and ensure that the benefits of innovation are broadly realised.

Government plays a foundational role in establishing the macro-economic, regulatory and investment frameworks that underpin productivity growth, including setting norms and creating incentives that sectors respond to. Stable, long-term policy settings are critical to enabling strategic R&D, attracting business investment, and paving the way for a more complex, resilient economy.

Universities must continue to generate new knowledge, and ensure that education and research are relevant, accessible and aligned to national needs. This includes equipping the workforce with skills to adapt and thrive in emerging industries—particularly in areas like critical technologies, advanced manufacturing, and clean energy. UNSW sees a clear role for the sector in fostering agility, problem-solving and interdisciplinary expertise, which are vital in supporting sovereign capability and future economic competitiveness.

Industry must continue to scale innovation, adopt new technologies, and partner with universities to shape a workforce that reflects future demands. Businesses are best placed to identify current and emerging skills gaps, helping to inform responsive training and research agendas.

Collectively, we must ensure that productivity and innovation gains are distributed equitably across sectors, communities and regions. Targeted collaboration, inclusive funding settings, and coordinated workforce planning will be essential to avoid concentration of opportunity and to maximise national benefit. As the discussion paper outlines, a high-performing R&D system must serve not only economic goals but also social, cultural and national interests.

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

Effective collaboration between industry, universities, and government is essential to building a high-performing R&D system—one that delivers innovation, drives economic growth, and addresses national priorities. These partnerships must be guided by a cohesive, long-term strategy that focuses effort and investment where it matters most; and must be supported by comprehensive policy settings that account for the different incentives and barriers of government, industry, and universities, to best enable all three sectors to work in partnership.

Australia cannot afford to spread its R&D efforts thinly across disconnected initiatives; instead, we require a unified direction that identifies national priorities and aligns research, development, and commercialisation accordingly.

Past approaches have often been fragmented and short-term, with inconsistent policy settings and ad hoc support undermining impact. A strategic, coordinated, and bipartisan approach is needed—one that avoids duplication, encourages long-term investment, and strengthens alignment across sectors. This will unlock the full potential of its research capacity and translate knowledge into commercial outcomes that benefit the economy and society at large.

Policy Clarity, Alignment and Strategic Direction

UNSW strongly supports clear, consistent, and coordinated policy settings across government portfolios and departments to drive national R&D performance and innovation-led growth.

Australia's legislated priorities—through the National Reconstruction Fund (NRF) and the Future Made in Australia (FMA) initiative—provide a robust strategic foundation. These frameworks identify critical growth areas such as advanced manufacturing, clean energy, critical technologies, and value-add in agriculture and resources. They should serve as a guide for upstream R&D investment decisions, ensuring that funding for early-stage research and capability development is aligned with longer-term economic and sovereign objectives, including trade, investment, and workforce strategies.

Fundamental research plays a vital role in the future economic potential for Australia, supported through institutions such as the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC). Breakthrough discovery underpins applied innovation, and the pipeline from research to impact depends on a balanced and integrated funding ecosystem.

UNSW supports a strategic review and consolidation of existing R&D programs, including the goals of the ARC led review of the National Competitive Grants Program currently underway. Current initiatives and government investments are fragmented, poorly communicated, or underutilised, limiting their reach and impact. Better alignment with national priorities across portfolio responsibilities—and

improved visibility and accessibility for industry and researchers—would enhance program effectiveness and reduce duplication.

Importantly, industry looks to government to set the direction and provide policy certainty. When national priorities are clearly articulated and supported by sustained policy, businesses are far more likely to co-invest, engage in long-term partnerships, and embed R&D functions within Australia. Strategic clarity from government is not only a matter of public sector efficiency—it is a powerful lever to unlock private sector innovation and scale.

Improving Access to R&D Incentives and Commercialisation Funding to attract investment

UNSW supports the continued ambition of the Research and Development Tax Incentive (RDTI) to be a broad-based mechanism that enables companies of all sizes to invest in innovation. As one of the few nationally accessible instruments supporting business R&D, the RDTI should help to democratise access to research and development across Australia's diverse business landscape. However, there is significant scope to improve both the design and accessibility of the program.

In the recently released 2025-26 Budget, funding budgeted for the RDTI shows a downward trend over the forward years, and we know from our own experience that companies engaging with UNSW are not RDTI recipients. From having spoken to these companies, we know that some of them have elected not to claim RDTI benefits, as the benefit is too small for the administrative burden, or it is otherwise too complex to use.

Despite its national reach, the current RDTI framework is widely regarded as administratively complex, particularly for emerging or resource-constrained firms. The benefit thresholds—especially for large multinational enterprises—are also increasingly out of step with the competitive realities of global capital allocation. Currently, multinationals operating in Australia face a capped benefit of 8.5 per cent with a lifetime ceiling of $150 million, which is insufficient to attract or retain significant R&D investment from global firms competing for internal budget allocations.

Several multinational partners of UNSW have stated that they will only establish R&D operations in Australia if they receive a government grant, highlighting the limitations of the RDTI in its current form. For many firms, the evidence suggests that tax incentives alone are not sufficient to positively influence investment decisions. This is borne out in declining business expenditure on R&D.

There is now a strong case for a comprehensive review of the RDTI, to consider resetting thresholds and simplifying access, particularly for sectors aligned with national priorities. The 2016 '3F' Review outlined a number of options for reform that have not yet been implemented, and consideration should be given to those measures as a starting point for reforming the RDTI. The revised incentive should reflect the structure of Australia's economy, and provide meaningful support for both early-stage innovation and large-scale investment, to attract and scale activity in areas where Australia seeks to compete globally.

Alongside the RDTI, targeted grants for commercialisation are essential to accelerate the development and delivery of new products, services, and technologies aligned with national missions—such as clean energy, critical technologies, and health innovation. Where the RDTI provides baseline support for all

R&D activity, grants can be deployed more selectively to drive strategic outcomes, de-risk commercialisation, and scale capability in areas of national importance.

The overall ease of doing business in Australia is a critical factor in attracting multinationals to establish an R&D presence beyond regional sales functions. In particular, barriers such as the complexity of the migration system may limit or deter companies from locating high-value research activities in Australia.

Together, a revitalised RDTI and a more strategic grants system can provide a coherent, complementary suite of incentives—supporting early-stage exploration, enabling commercialisation, and attracting private investment to priority sectors.

SBIR (Small Business Innovation Research) and STTR (Small Business Technology Transfer):

The SBIR (Small Business Innovation Research) and STTR (Small Business Technology Transfer) programs are U.S. government initiatives that support R&D in small businesses to drive innovation and commercialisation. Often referred to as "America's seed fund," they are managed across federal agencies such as the Department of Defense, NASA, the Department of Energy, and NIH. SBIR supports small businesses directly, while STTR requires collaboration with nonprofit research institutions to promote tech transfer from academia. Both programs follow a three-phase model: Phase I (feasibility), Phase II (development), and Phase III (commercialization, often through private or government partnerships).

These programs have enabled the launch and growth of thousands of companies by de-risking early-stage innovation. Notable success stories include Qualcomm, which used SBIR funding to develop the wireless technologies behind CDMA, and iRobot, which initially developed robotics for defence before releasing the consumer-friendly Roomba. Through targeted support, SBIR and STTR have become critical engines for transforming research into market-ready technologies.

Policy stability and consistency is critical to fostering a thriving innovation system. For companies and investors to commit to long-term R&D and commercialisation in Australia, they must have confidence that programs will be delivered as promised and that support mechanisms will not be subject to frequent shifts in direction with changes of government. The current stop–start nature of funding programs—along with extended decision-making timelines and ministerial bottlenecks—creates uncertainty and deters investment. A bipartisan approach is needed.

More broadly, capital availability remains a major barrier to innovation and commercialisation in Australia, particularly for high-potential, early-stage ventures. UNSW strongly supports efforts to expand the scale and diversity of venture capital (VC), including attracting foreign direct investment and encouraging greater domestic participation from high-net-worth individuals, family offices and institutional investors. There is untapped potential in the role of superannuation funds, which could be encouraged through policy frameworks to allocate a small percentage of funds under management to venture and innovation assets. The UK's opt-in model—where individual members can choose to direct

a portion of their superannuation into high-growth asset classes—is a model worth exploring. Such an approach would empower Australians to directly support the next generation of national innovation.

Unlocking Australia's Research Expertise and Capability

Australia possesses world-class research expertise and capability across its universities, research institutes—including CSIRO and Medical Research Institutes—and other public and private research providers. Collectively, this network represents a critical national asset, spanning a broad range of disciplines from medical science and quantum computing to clean energy, digital technologies, and advanced manufacturing. Universities play a keystone role in this ecosystem.

Australia must become more effective at strategically identifying, promoting and leveraging its areas of global research leadership. In a highly competitive international environment, visibility and differentiation are key. Multinational firms assessing where to locate R&D investment are drawn to ecosystems that can offer something they cannot access elsewhere—be it unique scientific expertise, cutting-edge infrastructure, talent, or co-investment opportunities aligned with strategic capability. UNSW's experience engaging with large global companies reinforces this view. Firms are more likely to invest in Australia when they see clear, compelling reasons to do so—particularly when Australia offers specialised capabilities or infrastructure that align with their innovation priorities.

Solar photovoltaics and quantum technologies are two clear examples where Australia has achieved global leadership in research and innovation. In photovoltaics, UNSW researchers pioneered foundational advances in solar cell efficiency, and many of the world's most efficient commercial solar technologies can trace their lineage back to Australian research. In quantum technologies, Australia is recognised as an emerging player in quantum computing, quantum sensing, and quantum communications. UNSW is a founding partner of the Sydney Quantum Academy, which plays a national leadership role in developing quantum talent, infrastructure, and industry partnerships.

Access to National and Global Research Infrastructure

UNSW underscores the critical importance of research infrastructure as an enabler of world class research and industry collaboration. Australia has made significant progress through the development of the National Collaborative Research Infrastructure Strategy (NCRIS) and the Australian National Fabrication Facility (ANFF).

A strengthened national infrastructure network—NCRIS "on steroids"—would provide the research community and industry with the facilities and tools needed to accelerate innovation, de-risk commercialisation, and attract global partnerships. UNSW supports the development of a globally connected infrastructure network, particularly in areas of national significance. This includes leveraging international partnerships—such as those developed under AUKUS Pillar II—to ensure that Australia has both access to, and a stake in, cutting-edge facilities and capability development.

To maximise impact and avoid duplication, infrastructure planning should be undertaken with a clear focus on collaboration, enabling institutions and industries to share resources, expertise, and data. By positioning research infrastructure as a strategic national asset—rather than a series of siloed

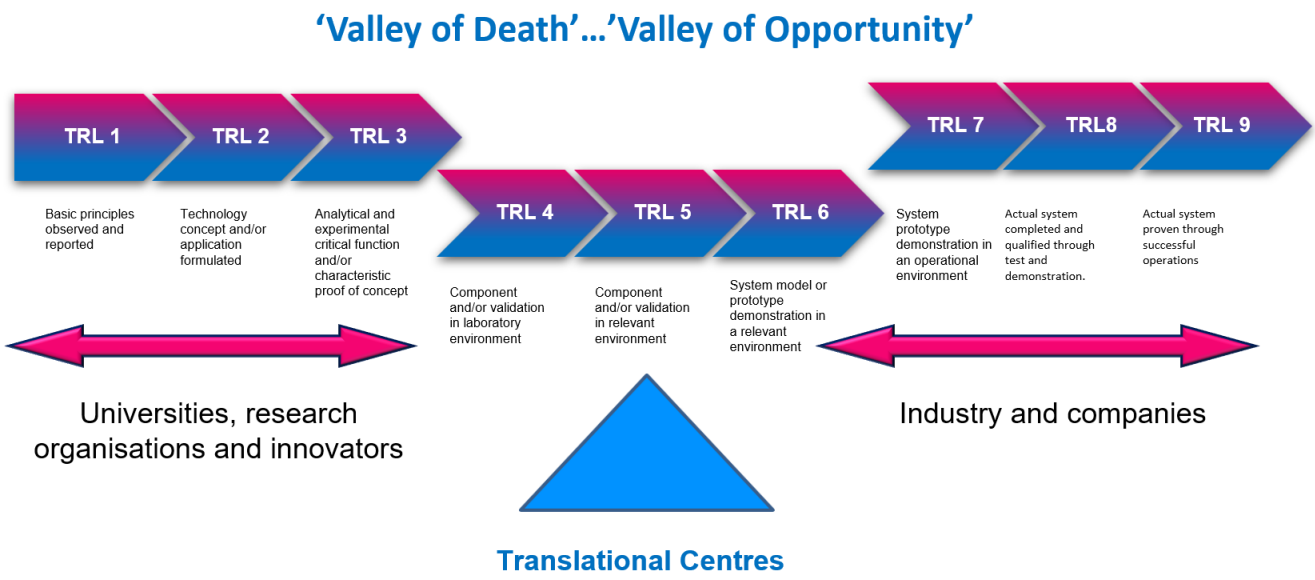
investments—Australia can significantly enhance its innovation capacity, improve return on investment, and build deeper international R&D partnerships.

Strengthening Workforce Access

Access to a skilled, adaptable and future-focused workforce is fundamental to the success of Australia's research and innovation system. Meeting this need requires a deeper and sustained collaboration between universities, TAFEs, and training providers to deliver lifelong learning pathways that enable Australians to upskill, reskill and thrive in a rapidly evolving economy. This collaboration must go beyond general training to include the bespoke development of programs aligned to national priorities and emerging industries, such as advanced manufacturing. These programs should be co-designed with industry to ensure graduates are equipped with technical expertise as well as transferable skills, such as entrepreneurship, interdisciplinary problem-solving, and commercial acumen.

A coordinated, national approach to workforce development will be essential to supporting the growth of future industries, ensuring inclusive participation, and building sovereign capability in priority areas.

Figure 1: The Research Investment Life Cycle: Overcoming the Valley of Death



Source: Wren, G. (2025). Industry partnerships the Strathclyde way: No 'one size fits all', University of Strathclyde

UNSW's Entrepreneurial Campus

'It takes 20 years of patient investment in research to become an overnight success.'

What often appears to be an overnight success in research or new technology is, in reality, the result of more than two decades of sustained, patient investment. Breakthroughs rarely happen suddenly—they emerge from decades of foundational research, iterative discovery, and long-term commitment from researchers, institutions, and funders.

Translating that research into real-world impact requires dedicated infrastructure and support. At UNSW Sydney, the Entrepreneurial Campus and Founders Program play a vital role in bridging the gap between research and commercialisation, particularly for small and medium-sized enterprises (SMEs). These initiatives help SMEs navigate the challenges of scaling innovation by providing access to university expertise, infrastructure, and facilities—resources that are often out of reach in capital-constrained environments.

In Australia's major cities, access to commercially available research facilities is increasingly limited, with much of the space taken up by larger organisations. SMEs, which often lack the capital to acquire or build such infrastructure, benefit significantly from the flexibility to access smaller, fit-for-purpose research spaces embedded within UNSW's broader ecosystem. This co-location model supports R&D feasibility for emerging companies while delivering mutual benefits for industry and academia.

By embedding SMEs within the university environment, the Entrepreneurial Campus enhances talent mobility in two key directions. Externally, it enables SMEs to tap into a rich pipeline of research personnel without the administrative and financial burden of traditional recruitment. Internally, it fosters greater exposure of academic and research staff to commercial practice, improving understanding of industry priorities and accelerating research translation.

The success of co-located quantum technology companies at UNSW exemplifies this model. While access to cutting-edge facilities has been foundational, their sustained growth has been driven by deeper integration with the university. These companies benefit from close collaboration with continuing UNSW research teams, access to emerging talent, and opportunities to influence curriculum and sponsor undergraduate and graduate research. This not only strengthens their internal capability but also cultivates a growing pool of quantum-skilled graduates.

Quantum Technologies – Charting the growth of SQC and Diraq

Two of the most prominent examples of the success of co-location are Silicon Quantum Computing (SQC) and Diraq, both of which were catalysed through the first Centre of Excellence for Quantum Computation and Communication Technology (CQC2T), headquartered at UNSW. These companies remain embedded within UNSW's Entrepreneurial Campus, drawing on its research talent, infrastructure, and collaborative culture while actively reinvesting into university-led research and student training.

Founded in 2017, SQC has raised over A$130 million in funding, including A$80 million in seed investment and a further A$50 million in 2023. The company has developed a globally unique atomic fabrication platform, positioning it at the forefront of quantum technology innovation. SQC operates

across 18 purpose-built laboratories on UNSW's Kensington campus, with a team of over 80 scientists and engineers. With significant investment and a focused vision, SQC is on track to deliver a utility-scale quantum computer by 2033.

While Diraq, founded in 2022, has raised over $70 million, including $30 million in foundation funding and $40 million in Series A investment. The company is rapidly scaling with a focus on mass-producing quantum chips using standard semiconductor manufacturing processes, and aims to have a commercially viable quantum computing system by 2028.

Both SQC and Diraq have been selected for projects under the prestigious US Defense Advanced Research Projects Agency (DARPA) Quantum Benchmarking Initiative (QBI)—a significant international endorsement of Australia's leadership in quantum computing.

Unlike global competitors such as Google and IBM, SQC and Diraq are focused on building scalable quantum computers on silicon chips, leveraging conventional semiconductor fabrication methods. This strategy has the potential to deliver quantum systems that are faster to manufacture, more easily integrated, and globally competitive at scale.

Both companies exemplify the strategic value of university-led commercialisation, where research excellence, infrastructure, and talent converge to deliver high-growth, high-impact outcomes. They also demonstrate the importance of long-term public investment, place-based innovation, and sustained collaboration between academia, government, and industry.

International Collaboration for Australian Benefit

An integrated, sustainable, dynamic and impactful R&D system will have international collaboration as a core element. International collaboration is essential in identifying niche markets and opportunities for Australian research and research commercialisation. It assists in avoiding duplication of effort and the building of "me too" facilities, particularly in areas where we cannot compete with scale of investment internationally. International research collaboration between universities that are deeply engaged with industry facilitates collaboration between industry partners.

There are many examples of new trade relationships that have been catalysed by a connection between researchers where an Australian company has been able to break into a new export market opportunity as a direct result. Horizon Europe is the EU's key funding programme for research and innovation. The programme facilitates collaboration and strengthens the impact of research and innovation in tackling global challenges and many schemes require industry partnerships. Australia has the opportunity to join the program and this could be one element of our international collaboration strategy.

International Models of Collaboration

National Labs and Institutes for Advanced Manufacturing (USA)

U.S. Department of Energy's National Laboratories—such as Oak Ridge National Laboratory and Argonne National Laboratory—play a pivotal role in driving breakthrough research and accelerating technology transfer. These institutions conduct world-leading work in materials science, additive manufacturing, automation, and clean energy, while maintaining strong partnerships with universities, industry and government. Their model integrates fundamental research with applied development, enabling technologies to move from lab to market with greater speed and impact.

Complementing the national labs are the Manufacturing USA institutes, a network of 16 public–private partnerships that focus on strategic technology areas including smart manufacturing, lightweight materials, robotics, and biofabrication. Institutes like America Makes, MxD, and CESMII provide shared R&D infrastructure, advanced workforce training, and collaborative environments that connect academic research with real-world industrial application. These partnerships have been instrumental in enhancing the resilience, competitiveness and sustainability of the U.S. manufacturing base.

UNSW sees strong merit in adopting and adapting similar models in the Australian context. Establishing nationally coordinated centres of excellence in advanced manufacturing, supported by enduring public–private partnerships, would help bridge the gap between research and commercialisation, build critical infrastructure, and support the development of a skilled, future-ready workforce. These ecosystems can also serve as vehicles for delivering on national priorities, including the clean energy transition, sovereign supply chains, and regional industrial revitalisation.

Industry on Campus Model (Germany)

The "Industry on Campus" model, widely adopted in Germany, offers a compelling model of collaboration that embed industry more directly within the research and education ecosystem. By co-locating industrial R&D activity within university precincts, this model facilitates seamless knowledge exchange, accelerates commercialisation, and enhances the practical relevance of higher education. It breaks down traditional boundaries between research and application, allowing students and researchers to work directly on real-world problems alongside industry partners.

A leading case study is ARENA2036 in Stuttgart—an advanced research campus originally focused on Industry 4.0 – the 'fourth industrial revolution' - , now expanded into fields such as quantum technology, artificial intelligence, and software-defined mobility. This initiative demonstrates how integrated research environments can adapt over time to national strategic priorities, while fostering innovation ecosystems that are both agile and globally competitive.

UNSW sees significant potential to adapt this model in Australia, particularly within university innovation precincts, and encourages policy support for long-term partnerships that enable industry to be embedded in the everyday research and teaching environment. Doing so will not only strengthen Australia's sovereign innovation capability but also ensure students graduate with the skills, experience, and networks required to drive national productivity and impact.

The Catapult Network (UK)

The Catapult Network, established by Innovate UK, provides another compelling model for how government can build institutional infrastructure to support the translation of research into commercial success. Operating as a network of independent, not-for-profit innovation centres, Catapults focus on bridging the gap between cutting-edge research and market-ready technologies, particularly in the later stages of R&D where commercial risk is highest.

These centres offer dedicated facilities—such as labs, testbeds, and pilot-scale manufacturing sites—staffed by technical experts who work directly with businesses, researchers, and entrepreneurs to accelerate innovation. By fostering collaboration between academia, industry, and government, the Catapult model strengthens the broader innovation ecosystem and reduces the barriers that often prevent promising ideas from reaching market.

Many of the Catapult centres are surrounded by other centres that support research at different TRL's. One example is at the University of Strathclyde where a long history in photonics (founded in periscope manufacturing for submarines in 1870) let to a market leading position in the manufacture and export of Cube satellites. Embedded in a manufacturing ecosystem, the Photonics institute supports research to TRL3 and the Fraunhofer Center for Applied Photonics TRL 4-7. TRL's 4-7 and the supporting scaling and derisking infrastructure (as shown in Figure 1 above) are somewhat neglected in the Australian environment to date. There remains a persistent 'valley of death' in Australia's innovation ecosystem—both in accessing capital to bridge early-stage development and in overcoming the barriers to scaling emerging technologies. This strategy at Strathclyde has played a key role in ensuring that commercial outcomes are anchored to the region and capture benefits for the region.

The impact of this model is clear. For example, Digital Catapult has helped participating companies raise more than £550 million in private investment since 2018, and its FutureScope program is advancing innovation in high-growth areas such as AI, IoT, 5G, and immersive technologies. Perhaps most impressive, the Cell and Gene Therapy Catapult played a central role in transforming Stevenage into a globally recognised biotech hub. An initial £72 million public investment has since attracted over £1.5 billion in private capital and the involvement of 45 companies.

The success of the Catapult Network highlights the importance of physical innovation infrastructure, long-term investment, and institutional mechanisms that connect research with real-world outcomes. For Australia, it offers a practical and scalable example of how mission-driven innovation centres can de-risk late-stage development, spur private investment, and deliver enduring national benefit.

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

Realising the full potential of Australia's innovation capacity will require a fundamental shift towards clearer policy direction, long-term investment, and more dynamic partnerships between universities, government, and industry.

Concerns about fragmented and uncertain funding were raised repeatedly by both researchers and industry stakeholders in our consultation with them. Grant programs, including those run by the Australian Research Council, typically operate on short cycles and are project-based, limiting the pursuit of generalised research. University research operations are required to respond to and implement these requirements, perpetuating a short-term and unsustainable model. A strategic shift toward longer-term, stable funding for high-impact research would enable Australia to support the kind of breakthrough, mission-led innovation required in areas such as decarbonisation, critical technologies, and sovereign capability.

Grants applications, administration, and acquittal processes could be streamlined. Complex application requirements, low success rates, and prolonged approval timelines consume time and resources that could otherwise be spent on the core mission of research and development. Simplified two-stage applications would allow researchers and businesses to focus on innovation, rather than navigating red tape. It would also reduce administrative burden and complexity for public servants.

To further support Australian innovation, government should take a more active role as a lead consumer of research, adopting home-grown technologies and prioritising procurement from local startups or businesses undertaking R&D in Australia over international providers. Public procurement can be a powerful lever for accelerating commercialisation and demonstrating confidence in local capability.

Barriers to Effective R&D Collaboration: Insights from the UNSW Innovation Community

Challenges to Effective Collaboration

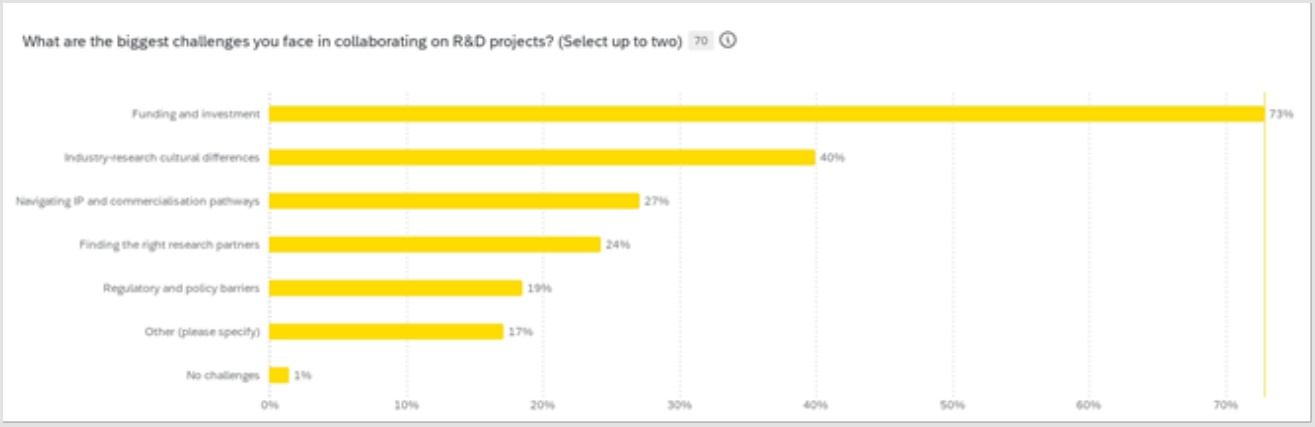
As part of its response to the Strategic Examination of R&D, UNSW highlights a number of practical challenges experienced by our Innovation Community in establishing and sustaining collaborative R&D partnerships.

Nearly one in four participants identified funding and investment as the most significant barrier to effective R&D collaboration. While this concern was slightly less pronounced among our industry partners (65 per cent) than across the broader innovation community (73 per cent), it remains the most frequently cited constraint to impactful partnership.

Beyond funding, respondents emphasised persistent barriers related to cultural differences between academia and industry (40 per cent), and challenges in navigating intellectual property and commercialisation pathways (27 per cent). These issues are widely seen to slow down progress, dilute collaborative intent, and often prevent high-potential projects from scaling.

The challenges identified extend beyond financial considerations. They encompass structural and procedural friction points – including institutional rigidity, time and resourcing limitations, and a lack of coherent, supportive frameworks at the government–industry interface. These factors collectively contribute to a system that is harder to navigate than it should be and, as a result, risks undermining Australia's ambitions to translate world-class research into meaningful outcomes for the nation.

Figure 2 - Biggest challenges collaborating on R&D projects



Policy Barriers Undermining Innovation Potential

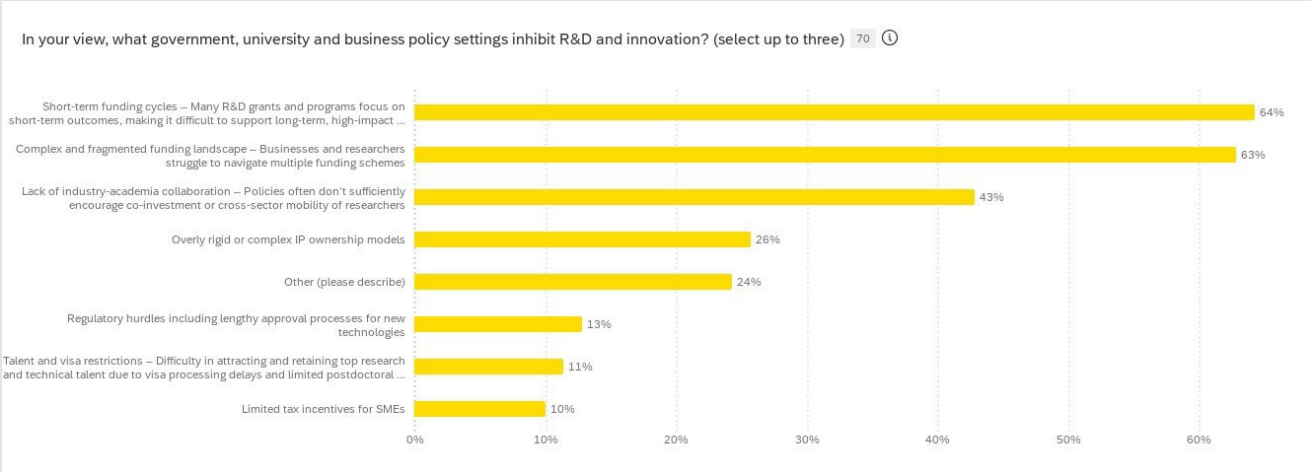
The UNSW Innovation Community identified short-term funding cycles (64 per cent) and complex, fragmented policy frameworks (63 per cent) as the most significant systemic challenges. These conditions create an unstable foundation for long-term research and development, making it difficult for researchers and industry partners to commit to sustained innovation agendas. Short-term funding cycles force researchers to prioritise quick outputs over strategic, high-impact research. Without bipartisan support and longer time horizons, investment in R&D – particularly for translation and commercialisation – becomes high risk and commercially unattractive.

Respondents also raised concerns about inflexible grant conditions and regulatory frameworks that lock in overly prescriptive project designs. Grant applications that are overly specific compromise agility and the possibility for projects to respond to emerging opportunities.

Beyond funding structures, the third most cited issue was the lack of policy support for industry-academic collaboration and co-investment. Our community stressed that the current settings do little to incentivise or de-risk partnership, leaving much of Australia's innovation potential untapped.

Intellectual property (IP) ownership models emerged as a critical friction point. Over 40 per cent of respondents identified IP arrangements as a major barrier to collaboration. The feedback reflects both real and perceived constraints — from protracted negotiations to misaligned expectations — that delay or derail high-potential research projects.

Figure 3 - Policy setting barriers



There is strong consensus within the UNSW Innovation Community that Australia needs to reform its R&D policy settings. Long-term, stable funding, simplified grant processes, and stronger incentives for collaboration are essential. As one respondent noted:

> *"The problem isn't Australia's brains – we have plenty of those. The problem is that we don't invest enough in R&D, treat IP as a zero-sum game, and fail to commercialise what we create – and that's criminal."*
>
> Defence & Innovation Analyst

To avoid losing valuable research and commercial opportunities to global competitors, Australia must align its policy, funding, and regulatory settings with the realities of a modern innovation ecosystem.

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?

Australia's approach to research commercialisation remains cautious and slow-moving, constrained by risk aversion, short-term funding models, and institutional barriers across the R&D ecosystem. Effective collaboration between industry, universities, and government is essential to building a high-performing R&D system. One that delivers innovation, drives economic growth, and addresses national priorities.

These partnerships must be guided by a cohesive, long-term strategy that focuses effort and investment where it matters most. Australia cannot afford to spread its resources thinly across disconnected initiatives; instead, we need a unified direction that identifies national priorities and aligns research, development, and commercialisation accordingly.

Past approaches have often been fragmented, with inconsistent policy settings and ad hoc support undermining impact. A more strategic and coordinated approach is needed to avoid duplication, both in Australia and internationally.

Building trust between universities, government, and industry is central to this shift. It requires open communication, mutual understanding, and clarity of purpose. Universities, for their part, must be agile, outward-looking, and transparent in their collaborations, ensuring that research is not only excellent but relevant and ready for adoption.

By creating a more connected and coordinated ecosystem, Australia can unlock the full potential of its research capacity and turn knowledge into outcomes that benefit the economy and broader society.

4. What types of funding sources, models and/or infrastructure are currently missing or should be expanded for Australian R&D?

Much public funding for R&D in Australia is short-term and project-specific, driven by diverse (sometimes uncoordinated) portfolio priorities, making it difficult to sustain work on complex, long-horizon challenges. There is a clear gap in the system for long-term, mission-oriented programs that enable consistent progress and minimise disruption.

A more effective mix of grants and tax incentives would help to stimulate industry-led R&D. To be successful, these incentives must be accessible and attractive to companies of all sizes, from startups and SMEs to large enterprises. One proposed approach is to increase the value of tax incentives for businesses that partner with universities on research aligned to national priorities. This would not only incentivise collaboration but also direct investment toward areas of greatest strategic importance.

Australia's superannuation system represents a largely untapped source of capital. With appropriate legislative and regulatory support, even a small portion of superannuation funds allocated to high-risk, high-reward domestic R&D could significantly boost national investment levels. Encouraging private sector investment, especially in conjunction with public co-investment and procurement-led innovation, is essential if Australia is to meet its ambition of lifting R&D intensity to 3 per cent of GDP.

Australia's innovation ecosystem suffers from a shortage of scale-up capital and a risk-averse venture capital market. Unlike the more mature VC sector in countries like the United States, Australia lacks the financial depth and risk appetite required to back transformative, deep-tech ventures. Government has a vital role to play in addressing this through mechanisms such as a sovereign deep-tech venture fund, co-investment programs, and expanded R&D loan guarantee schemes to encourage private sector lending to innovative firms.

Too often, Australian startups relocate offshore or are acquired by foreign firms due to the lack of local scale-up support. Expanding access to growth-stage funding and building a stronger VC market would help keep R&D-intensive businesses, and their long-term economic benefits, here in Australia.

Together, these reforms would help build a more resilient, responsive, and opportunity-rich innovation system—one that enables Australia to compete globally and deliver sustained national benefit from its research and development.

Australia's $4 trillion superannuation system, while globally significant, has largely remained on the sidelines of early-stage R&D commercialisation investment. The Compact model demonstrates how policy coordination and signalling from government can shift investor behaviour toward long-term, nation-building priorities.

As the Discussion Paper highlights, Australia must explore new mechanisms to invest in translation, scale-up, and commercialisation. International examples like the Mansion House Compact provide valuable insights into how institutional capital can be better leveraged to support not only innovation intensity, but also sovereign capability and long-term economic prosperity.

Australia has a proud philanthropic culture, one that should be better leveraged and encouraged to fund bold, high-risk research that may fall outside the scope of traditional government or industry funding. To realise the full impact philanthropy, we require a cohesive national strategy. By creating policy frameworks that actively encourage collaboration between public institutions and private donors—and by offering meaningful tax incentives or funds matching for contributions to R&D—government can help attract greater philanthropic investment in innovative research.

The growing prominence of family offices presents a significant opportunity to harness venture philanthropy — combining philanthropic capital with a focus on measurable, scalable outcomes — to drive greater investment in R&D. Australia is home to an estimated 2,000 family or private offices, nearly 60 per cent of which were established in the past decade. The largest 350 are estimated to manage between $515 billion and $695 billion in wealth, presenting a substantial and largely untapped pool of capital that could be mobilised to accelerate innovation aligned with national priorities.

The Mansion House Compact – A UK Model

The Mansion House Compact, announced by the former Chancellor of the United Kingdom Jeremy Hunt in July 2023, offers a compelling example of how national governments can align private investment with innovation strategy.

Under this agreement, nine of the UK's largest defined contribution (DC) pension funds have committed to allocating at least 5 per cent of their default assets to domestic startups and high-growth companies by 2030. This initiative seeks to unlock up to £75 billion in investment—mobilising capital from both private and public pension schemes—to support the country's innovation economy.

This approach reflects a broader understanding that achieving national R&D ambitions requires not only strong public investment, but also greater participation from private capital markets. The Compact's goal is not just to improve retirement outcomes, but to deepen the pool of scale-up capital available to UK innovators, enabling them to grow, commercialise, and compete globally without being forced offshore.

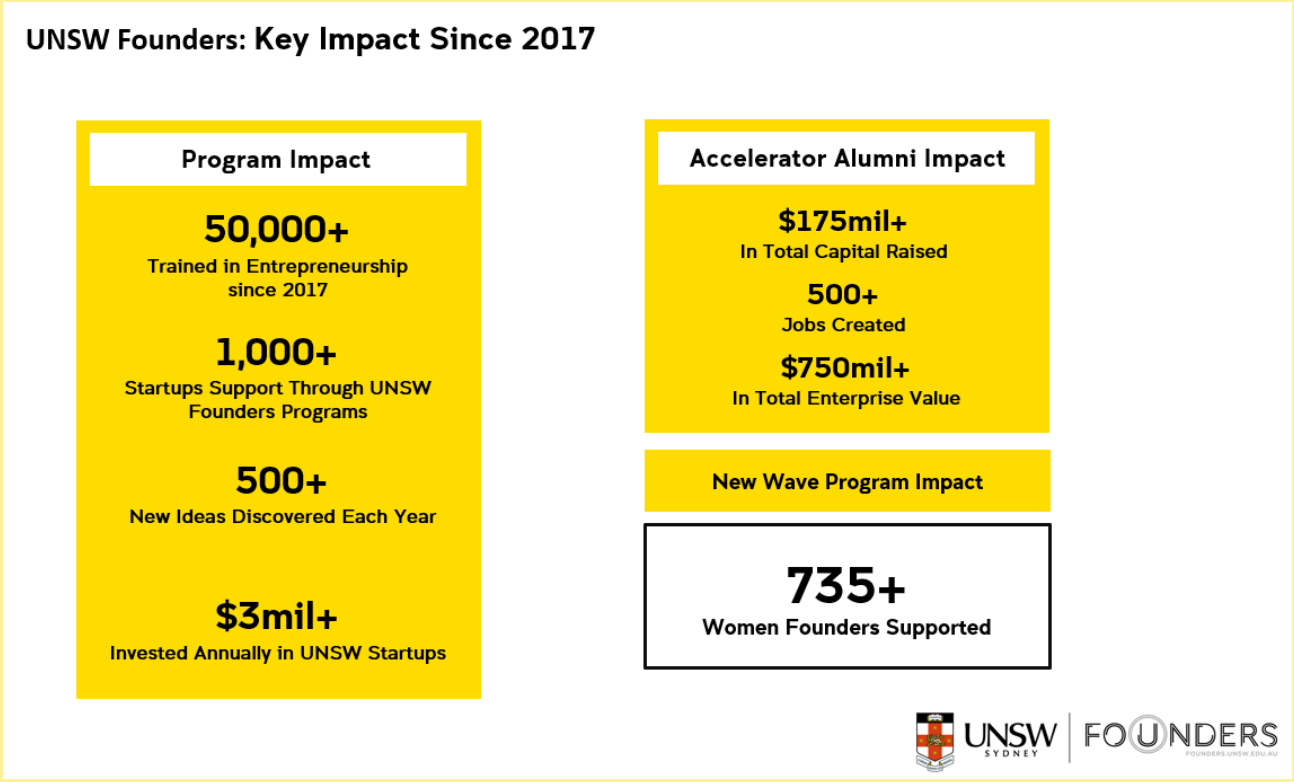
UNSW Founders: Seeding Australia's Innovation Economy

Since its establishment in 2017, UNSW Founders has become one of Australia's leading university-based entrepreneurship programs, delivering entrepreneurial training to over 50,000 individuals and providing direct support to more than 1,000 Australian startups.

Collectively, startups supported by UNSW Founders have raised in excess of $175 million in capital, created over 500 new jobs, and generated more than $750 million in enterprise value. These outcomes reflect the program's growing impact as a catalyst for new venture creation and its central role in advancing Australia's innovation economy.

Recognising the constraints of the domestic investment landscape—particularly the scarcity of later-stage capital—UNSW Founders has developed a suite of global landing pads and cultivated an international investor network. These platforms enable high-growth Australian ventures to expand into international markets while maintaining strong institutional and operational ties to the Australian innovation ecosystem.

Each year, more than 25 early-stage startups receive seed investment—often with UNSW acting as the first investor—alongside tailored acceleration support. A further 200+ ventures receive one-on-one coaching and strategic guidance, with access to 500+ experienced mentors drawn from UNSW's extensive innovation networks. These services are delivered through dedicated incubation facilities, further strengthening the pipeline from research to real-world commercial outcomes.



The Need for Funding Reform: Insights from UNSW Innovation Community

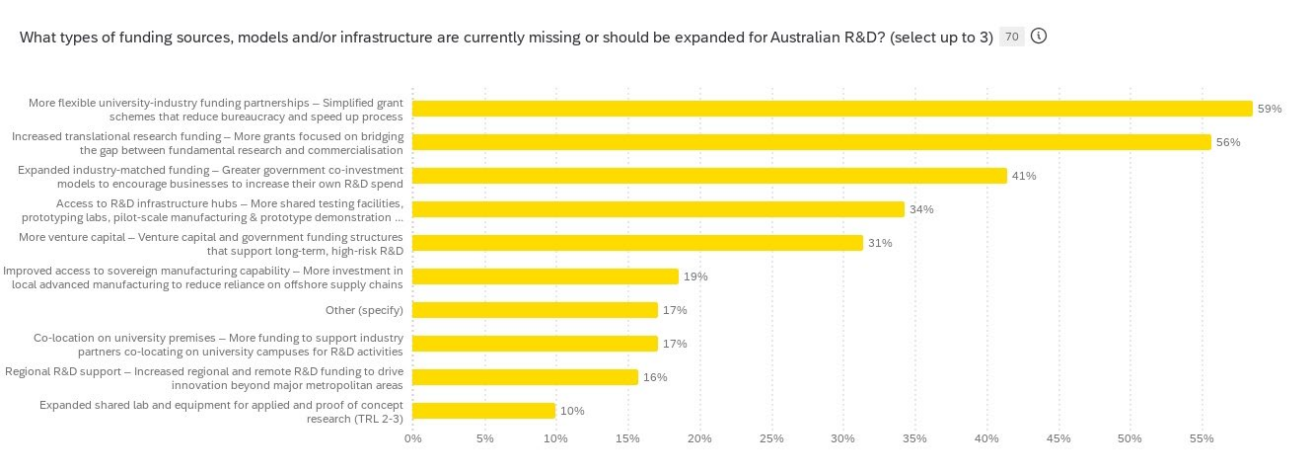
The UNSW Innovation Community identified a range of funding reforms to strengthen the national R&D system, with the need for more flexible funding arrangements (59 per cent) and greater investment in translational research (56 per cent) emerging as the most prominent priorities. These preferences reflect a shared view that Australia's current funding structures are not sufficiently adaptable to the dynamic, iterative nature of modern research and innovation. Flexibility is seen as essential for supporting longer-term, higher-risk projects and for enabling researchers and industry partners to respond to emerging opportunities as they arise.

UNSW Innovation Community also emphasised the importance of government co-investment (41per cent), expanded access to shared R&D infrastructure (34 per cent), and a stronger venture capital ecosystem (31per cent). These responses point to a recognition that government has a vital role in de-risking early-stage innovation and catalysing private sector participation. Infrastructure and capital are seen as critical to bridging the gap between research and impact.

Areas such as regional support, proof-of-concept funding, co-location initiatives, and sovereign capability development were identified by fewer industry partners as key priority areas. While these areas remain strategically important, particularly in a national context, feedback suggests they are not perceived as urgent within UNSW's innovation network.

The clear message from the UNSW community is that to lift Australia's R&D intensity and unlock the full potential of our research efforts, reforms must prioritise flexibility and support for commercialisation.

Figure 4 - Funding Gaps



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?

As outlined in the Strategic Examination of R&D discussion paper, universities must evolve beyond traditional models of research excellence to actively support translation, commercialisation, and long-term partnerships with industry.

Enabling policy frameworks should expand the availability of co-funded programs that bring researchers and businesses together. Initiatives such as collaborative research grants, industry PhDs, internships, and staff secondments help build trust, transfer knowledge, and increase the absorptive capacity of firms to engage in and benefit from R&D.

Startups and small businesses, in particular, need tailored support to participate in the R&D system. Early-stage companies often face significant barriers to investment, including access to capital and infrastructure. Government procurement policy, aligned with clearly articulated mission-led goals, and with favourable terms for co-funded solutions between SME and public research institutions, can help to bridge the capability gap, expand the pool of business expertise, and deliver local solutions to local problems. Existing targeted policy tools—such as refundable R&D tax credits, startup grants, and vouchers for accessing university expertise—can also help reduce these barriers. While procurement policy should also incentivise industry participation in R&D, with active engagement in research and development being a key metric for consideration in government tender evaluations.

Expanding access to publicly funded research infrastructure and establishing sector-specific incubators in high-growth areas such as clean energy, biotech, and quantum can provide critical scale-up support.

Larger firms, meanwhile, should be incentivised to deepen their engagement with Australia's research system. Adjustments to the R&D Tax Incentive that reward collaboration with domestic research institutions, particularly on national priority areas, would help anchor more R&D activity led by large firms onshore, especially if coupled with government co-investment in mission-driven research, industry policy, and sector workforce development..

Across all business sizes, greater coordination and clarity in partnership pathways are essential. A national approach that fosters alignment across governments, research institutions, and industries—supported by shared infrastructure, streamlined processes, and long-term investment—would create the enabling conditions for a more collaborative, commercially engaged R&D ecosystem. By supporting businesses and research institutions to work together more effectively, Australia can drive innovation, grow sovereign capability, and deliver greater economic and social returns from its R&D investments.

Trailblazer Universities Program

The Trailblazer Universities Program offers a practical demonstration of how a more integrated, sustainable, dynamic, and impactful R&D system could operate in Australia. It responds to the need for more directed investment, better coordination between sectors, increased absorptive capacity within industry, and scalable models of commercialisation. By translating high-quality research into market-ready technologies and building enduring cross-sector partnerships, Trailblazer is helping to shift the national R&D system from fragmentation to focus, and from promise to impact.

Trailblazer for Recycling and Clean Energy (TRaCE)

The Trailblazer for Recycling and Clean Energy (TRaCE), jointly led by UNSW Sydney and the University of Newcastle, is a model for how integrated, mission-driven R&D can deliver real economic and environmental outcomes. From an initial $50 million in federal funding, TRaCE has leveraged nearly $280 million in total contributions across government, universities and industry investment to accelerate technologies in solar, energy storage, electrification, green fuels, and circular economy solutions.

TRaCE exemplifies the type of initiative that bridges the longstanding gap between research output and commercial impact. The program is currently supporting 26 active major R&D projects across both universities—22 at UNSW and four at the University of Newcastle—collectively valued at $90 million. These projects are driving collaboration between researchers and over 20 industry partners, including both major firms and a significant cohort of SMEs. Initiatives such as green ceramics made from textile waste, optimising perovskite solar cells and electrolyser systems for sustainable aviation fuel exemplify how research is being translated into practical, high-impact innovations.

Workforce development is central to TRaCE's mission. Twenty-three PhD students are embedded in industry-aligned research, while broader education initiatives have supported 74 students through work-integrated learning, launched five new micro-credentials, and established TAFE-to-university pathways in clean energy sectors. The Enterprise Academics program, which allows researchers to focus on commercial R&D and spinouts, has already exceeded its initial targets, funding 17 academics across both institutions.

To address early-stage funding barriers—the so-called "Valley of Death"— TRaCE has pioneered Australia's first university-led reinvestment seed fund, in partnership with venture capital, such as Investible and Hampton Capital. This innovative model channels returns from successful startups back into the ecosystem, creating a sustainable cycle of innovation. Already, TRaCE supported ventures have raised $1.4 million in seed funding and created 10 direct jobs. This approach is blending university research expertise with private sector agility to drive greater investment in R&D.

The program is also advancing staff mobility and sector connectivity. Nine researchers have completed industry placements, part of a longer-term target of 80. TRaCE has also engaged 48 new SMEs through R&D voucher schemes and other targeted support mechanisms.

Despite the complexity of delivering such an integrated model, TRaCE remains cost-efficient. Its $13.8 million administration and governance budget represents just 8 per cent of the total investment in both R&D and enabling projects, with overheads shared across project delivery, education, translation, and infrastructure.

TRaCE's structure, reach, and measurable outcomes reflect the type of systemic shift the Strategic Examination of R&D advocates—moving from fragmentation to coordination, from research excellence to application, and from siloed efforts to cross-sectoral partnership. It is a practical example of how Australia can build a more impactful, responsive, and resilient national R&D system.

Defence Trailblazer for Concept to Sovereign Capability

The Defence Trailblazer for Concept to Sovereign Capability, a $200 million initiative co-led by the University of Adelaide and UNSW, is a national model for translating research into deployable defence technologies while building a skilled, sovereign innovation workforce. Backed by the Australian Government, the program addresses a key gap identified in the Strategic Examination of R&D—the need for stronger collaboration between universities, industry, and government to meet complex national challenges.

Focusing on critical technologies such as quantum computing, hypersonics, cyber, AI, and space, the Defence Trailblazer has launched over 100 collaborative projects with over 95 partners, including SMEs and major defence firms. Its integrated approach—spanning technology co-development, staff mobility, and workforce training—demonstrates how targeted, mission-driven investment can deliver long-term national security, economic resilience, and system-wide R&D reform.

To date, the program is supporting a total of 189 projects, with 135 initiatives focused on workforce innovation and culture, and 54 projects advancing technology development through its accelerator stream. The program is forging strong industry linkages, having established partnerships with 9 major defence Primes and 86 SMEs. The Trailblazer is also advancing staff mobility, with 8 individuals having already completed industry placements, and an additional 27 in the pipeline.

Importantly, the program is facilitating the advancement of 121 technologies toward operational impact, further demonstrating its role as a practical engine for capability development and research translation. These early results speak to the potential of the Trailblazer model to accelerate outcomes that matter to both national interest and economic competitiveness.

Both Trailblazer initiatives have maintained overhead costs at approximately 8 to 10 per cent of total budget, a figure that compares favourably with other established research programs. By contrast, administrative costs for Cooperative Research Centres (CRCs) typically range between 20 to 25 per cent.

6. How should Australia support basic or 'discovery' research?

The future of Australia's R&D system must strike a deliberate balance between basic research, applied research, and development activities—each of which plays a distinct and essential role in delivering innovation and impact. As emphasised in the Strategic Examination of R&D, supporting only one part of the pipeline is insufficient (and inefficient); a high-performing system must enable progress from discovery to deployment.

The intersection of academia and industry is crucial for innovation and societal progress, with qualitative impacts resonating deeply within society. In their World Economic Outlook, the International Monetary Fund (IMF) calculated the impact of a 10 per cent increase in the stock of basic research increases GDP per capita by 0.3 per cent. For foreign basic research this figure is 0.6 per cent.[1]

Comprehensive analysis of the economic value generated by scientific research, published in June 2024, found that UNSW Science alone contributes $2.2 billion to the global gross domestic product (GDP) each year, including a $350 million annual impact on Australian GDP.[2]

A key insight of recent years is the need to move away from a linear view of research translation—where discovery leads neatly to application, then to commercialisation. Breakthroughs in basic research often lead to transformational technologies, even if their applications are not immediately apparent. Australian discoveries such as Wi-Fi and long-lasting sunscreen emerged from publicly funded, curiosity-driven research. Supporting basic research, therefore, is not a luxury, it is essential to creating the knowledge base that underpins future industries and long-term national competitiveness.

To ensure this research can flourish, Australia should establish a more holistic policy framework that links federal and state investment in R&D. A National Collaboration Framework could help align state industry strategies with a unified national R&D agenda, allowing grants, incentives, and infrastructure investments across jurisdictions to complement each another.

Australia has an opportunity to better integrate R&D into major national initiatives like Future Made in Australia, Rewiring the Nation, and the National Reconstruction Fund. These programs should not operate in parallel to the research system but be aligned with it, and indeed should incorporate research into their operation.

Shared research infrastructure is a vital enabler of collaboration across universities, industry, and government, and plays a central role in building a more integrated and capable R&D system. As noted in the Strategic Examination of R&D, access to high-quality infrastructure supports both the generation of new knowledge and its application in real-world settings.

Industry partners have consistently highlighted the need not only for translational research facilities, but also for access to fundamental analytical capabilities that support product development, testing, and scale-up. These foundational resources—such as advanced characterisation tools, fabrication

[1] See chapter 3 of https://www.imf.org/en/Publications/WEO/Issues/2021/10/12/world-economic-outlook-october2021/#Chapters for details and a summary blog post at https://www.imf.org/en/Blogs/Articles/2021/10/06/blog-ch3-weo-whybasic-science-matters-for-economic-growth

[2] The Economic Contribution of Science at UNSW, Professor Richard Holden, June 2024

labs, and pilot production environments—are essential for bridging early-stage research with commercial readiness.

By investing in and expanding access to shared infrastructure, Australia can foster deeper collaboration, reduce duplication, and ensure that businesses of all sizes can engage meaningfully in innovation. This is particularly important for SMEs, which often lack the capital to build or maintain such facilities independently. Maximising the use and visibility of shared infrastructure—especially world-class university research infrastructure, such as that supported through the National Collaborative Research Infrastructure Strategy (NCRIS)—will help unlock their full value and ensure they support both discovery and commercial impact across the innovation pipeline.

Increasingly, international collaboration is essential to ensuring return on investment, particularly in basic research, where duplication of effort is costly and unnecessary. Partnering with global peers not only helps avoid duplication of effort, but also ensures Australia remains connected to the cutting edge of scientific and technological discovery. Australia should prioritise purposeful collaboration, focusing on shared challenges such as climate change, clean energy, and critical technologies. By aligning research goals with like-minded nations, Australia can leverage global expertise, accelerate innovation, and ensure that its investments contribute to solutions with both domestic and international relevance.

Government has a central role to play in enabling these partnerships, through targeted bilateral agreements, participation in global research missions, and support for international researcher mobility.

7. What should we do to attract, develop and retain an R&D workforce suitable for Australia's future needs?

UNSW supports a coordinated national approach to education and skills development that enables lifelong learning, workforce agility, and cross-sector mobility. This includes industry-engaged education and research pathways, including co-supervised PhDs, placements in non-academic settings, and joint research initiatives that expose candidates to real-world challenges and innovation ecosystems. By embedding doctoral researchers within industry environments and aligning training with national priorities, the Trailblazer program demonstrate this approach and provides a scalable model that should be expanded and diversified to encompass a broader range of disciplines and partners.

UNSW also supports the bespoke development of training programs in areas aligned with national priorities—such as clean energy, critical technologies, health and defence—to ensure the workforce is aligned with the needs of emerging industries. A critical enabler of this will be greater mobility across sectors, supported by structured secondments, fellowships, and sabbatical opportunities between academia, industry and governments. It is essential to normalise cross-sector careers. The Australian Early- and Mid-Career Researcher Forum (EMCR Forum) plays a vital role in representing the next generation of Australian research talent. UNSW has established a dedicated Seed Grant program designed to support emerging researchers in developing their research independence and building track records for future competitive funding.

UNSW echoes the call from our industry partners for long-term, mission-oriented funding programs to support research leaders and partners create the pipeline of talent needed for industry growth. Stable investment supports research continuity and impact, and provides industry leaders with the conditions for workforce stability and career progression needed to attract and retain research talent.

Building Australia's Quantum Workforce through the Sydney Quantum Academy

UNSW is a proud founding partner of the Sydney Quantum Academy (SQA), a collaborative initiative that exemplifies how universities can work with government and industry to build sovereign capability in an emerging, high-impact field. NSW Government is a founding partner of SQA.

Through strategic partnerships, SQA collaborates with businesses to explore the potential of quantum technologies and ensure students from undergraduates to PhDs are gaining hands-on experience via internships, joint research projects, and innovation challenges. This integrated model supports both technical excellence and workforce readiness, helping position Australia at the forefront of the global quantum technology race.

In recognition of its leadership, SQA was commissioned by the Department of Industry, Science and Resources in April 2023 to lead the development of the National Quantum Collaboration Initiative (NQCI). This work is shaping a coordinated national approach to quantum workforce training, recruitment, and talent development, and stands as a model for how specialised workforce strategies can be developed in alignment with national science and industry priorities.

SQA shows that mission-driven, cross-sector collaboration can build deep capability in critical technologies—serving both the needs of the economy and the strategic interests of the nation.

8. How can First Nations knowledge and leadership be elevated throughout Australia's R&D system?

Elevating First Nations knowledge and leadership in Australia's R&D system requires a whole-of-pipeline approach, supporting Indigenous research training, employment pathways, and professional development. At UNSW, we actively support Indigenous leadership through senior appointments, Indigenous-led research initiatives, and governance structures that reinforce Indigenous agency in decision-making.

To truly elevate Indigenous knowledge systems within the R&D sector, there must be a sector-wide focus on Indigenous data sovereignty, ethics, and the development of a strong Indigenous research workforce. Reducing the cultural load on Indigenous leaders while promoting collaboration between Indigenous and non-Indigenous researchers is crucial for sustainable change. 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. Enabling policies and protocols should be a priority for government, including appropriate research grants schemes, oversight, intellectual property, and partnership incentives.

9. What incentives do business leaders need to recognise the value of R&D investment, and to build R&D activities in Australia?

UNSW strongly supports the submission made by the Business Council of Australia (BCA), particularly its recommendations on effective strategies to incentivise long term, high risk R&D to attract industries and grow them at scale. The strongest incentives for industry leaders are growth (including whole-of-economy growth and productivity gains) and competitive advantage in an increasingly dynamic world. Government investment in mission-oriented research is a proven incentive for business co-investment, as it shares risks and rewards and creates mutually supportive conditions for success.

Direct financial incentives remain a significant driver for encouraging business expenditures on R&D. However, as noted by the BCA, the R&D Tax Incentive (RDTI) at its current rate is too low compared to other global markets to truly drive R&D investment here in Australia. Two-thirds of business leaders we engaged identified financial support—particularly in the form of non-dilutive funding and targeted grants—as the top incentive influencing their willingness to invest in high-risk, high-impact R&D. This highlights the importance of predictable, accessible funding mechanisms in stimulating private sector innovation.

Research institutions and businesses need a more streamlined and enabling policy environment. Reducing the administrative burden and improving the design and accessibility of commercialisation grants are considered fundamental to better enable R&D. This is particularly important for smaller and medium-sized enterprises that often lack the resources to navigate complex regulatory and funding systems.

Several industry stakeholders also identified government procurement policies as a powerful but underutilised lever. Specifically, there is considerable support for the role of Government in setting expectations and leading by example cannot be understated. Government procurement frameworks should favour Australian-developed R&D solutions for policy development, program implementation, service delivery, technical solutions, and other forms of applied research. This, which would help create a domestic market for emerging innovations and support local scale-up. streamlined regulatory approval processes—particularly in sectors such as health, energy, and defence—are essential to accelerating commercialisation and improving return on investment timelines (for industry) and benefits realisation (for government agencies).

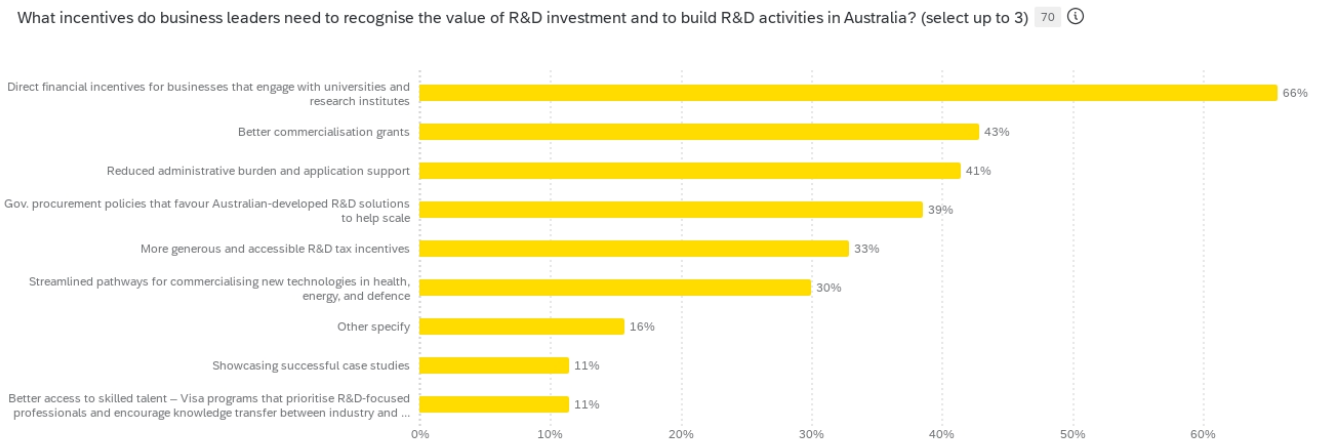
Incentivising business R&D investment requires an integrated and sustained approach—one that combines targeted financial mechanisms, responsive regulatory settings, and strategic procurement with long-term partnerships and collaboration. UNSW believes that reforms in these areas are critical to achieving the national ambition of lifting R&D intensity and ensuring the translation of research into economic and societal benefit.

Embedding scientific and technical knowledge into corporate and public governance is essential for informed decision-making in areas such as cybersecurity, climate adaptation, digital transformation,

and ethical AI deployment. It also plays a critical role in enhancing Australia's capacity to scale innovation, evaluate risk, and invest strategically in future-facing industries.

Established advisory mechanisms to ensure that technical and scientific expertise is embedded in policy development and national strategy can also lead to better outcomes. One such international example is the concept of CTOKRIES—a "CTO Circle" (drawing from the German word Kreis, meaning circle)—which brings together Chief Technology Officers and senior technical leaders across sectors to engage directly with government.

Figure 5: Most desirable incentives to effectively value R&D



10. What should be measured to assess the value and impact of R&D investments?

UNSW supports the Strategic Examination of R&D's call for better ways to measure and assess the value and impact of research and development investments. To ensure policy and investment decisions are evidence-based and outcome-oriented, Australia must adopt a comprehensive framework that captures both economic and societal returns across both the short to medium, and longer term horizons. The ERA and EI processes previously undertaken should be redesigned. For effective assessment, an impact framework must be useful to universities in their regular reporting and monitoring activities, rather than an additional resource-intensive reporting requirement. UNSW Science Faculty's 'Pact for Impact' provides a flexible and comprehensive approach to assessing impacts across multiple domains to more effectively capture the value and impact of R&D[3].

At the national economic level, labour productivity and job creation are a critical indicators of effective and enabling R&D investments and cross-sector collaborations, especially in high-value, innovation-intensive sectors such as advanced manufacturing, clean energy, medical technologies, and critical technologies. These sectors are central to Australia's future competitiveness, to lifting Australia's economic complexity and for securing the nation's sovereign capability. Mapping R&D intensity by sector will help identify priority areas and reveal persistent underinvestment in crucial stages of the innovation cycle.

At the project and institutional level, direct outputs of R&D including patents, prototypes, commercial products, and spinouts, are regularly assessed. Monitoring research commercialisation activity, including licensing deals, startup formation, and IP revenue, provides meaningful insights into the effectiveness of translation pathways and ecosystem maturity.

Outcomes measures by societal domains are also important. This includes improved health outcomes through innovation in diagnostics and treatment, enhanced climate resilience through low-emissions technologies and adaptation strategies, and regional economic development that promotes equity and participation across the nation.

UNSW underscores the importance of ensuring that R&D investment and measurement frameworks elevate and include First Nations knowledge systems. This includes recognising Indigenous-led research, protecting cultural and intellectual property, and ensuring that R&D outcomes contribute meaningfully to equity, self-determination, and opportunity for First Nations communities. Australia's future R&D performance framework must reflect the full spectrum of impact—economic, environmental, social, and cultural.

[3] https://www.unsw.edu.au/science/about-us/pact-for-impact

Conclusion

UNSW welcomes the opportunity to contribute to the Strategic Examination of R&D. The SERD is a critical opportunity to reshape Australia's research and innovation system for long-term national benefit. UNSW stands ready to work in partnership with government, industry, and the broader research sector to ensure that our R&D system delivers not only economic growth, but social, environmental and national security outcomes for all Australians.

We welcome further engagement with the Strategic Examination consultation process and, in particular, would encourage greater industry participation in the next phase of consultation. Should you wish to discuss any issue raised in this submission, please do not hesitate to contact our Director of Government Relations, Mr Robin Schuck, on 0411 124 258 or r.schuck@unsw.edu.au.

APPENDIX

About UNSW

UNSW is one of Australia's leading research-intensive universities, with a strong reputation for delivering interdisciplinary research that addresses national and global challenges. UNSW Sydney has ranked number one in the country for the largest number of new startup and spinout companies founded through technology developed at the University in 2023. This is the third consecutive year the UNSW has topped the table in the annual *Survey of Commercialisation Outcomes from Public Research Report (SCOPR)*. Our research strengths span quantum computing, renewable energy, advanced materials, health sciences, public policy, and digital technologies—areas closely aligned with Australia's strategic priorities and the national interest, as outlined in the Strategic Examination of R&D.

The university maintains a deep commitment to research translation and impact. The UNSW Strategy 2035, Progress for All, underscores our commitment to advancing expansive and inclusive global positive impact, including through our research priorities, collaborations, and outcomes. UNSW consistently ranks among Australia's top institutions for industry-funded research, reflecting its applied R&D orientation and strong engagement with end users.

As highlighted in our recently launched strategy, Progress For All, as well as through the ongoing work of the UNSW Founders Program, the university supports entrepreneurship and commercialisation across the academic community, while UNSW Knowledge Exchange enables collaborative partnerships with industry, government, and the community.

The Randwick Health & Innovation Precinct—delivered in partnership with the NSW Government and key health providers—exemplifies UNSW's approach to co-located, mission-driven research that accelerates innovation in health and medical technologies. UNSW also plays a leading role in national research initiatives, participating in ARC Centres of Excellence, and Cooperative Research Centres (CRCs).

Globally, UNSW is ranked among the top 50 universities for research impact and plays a leadership role in networks such as the Group of Eight (Go8) and Universitas 21. Our contributions to the UN Sustainable Development Goals and collaborations with leading institutions in the US, Europe, and Asia reflect the university's international research reach and relevance.

UNSW is well placed to help drive R&D in Australia, being home to nationally significant research infrastructure, including the Mark Wainwright Analytical Centre, advanced semiconductor fabrication facilities, and the National Facility for Human-Robot Interaction. These assets are key enablers of sovereign capability and innovation at scale—further reinforcing UNSW's role in building the dynamic, integrated R&D system envisioned in the discussion paper.

UNSW industry engagement in preparation for this submission

UNSW has proactively engaged with our industry collaborators to support broad and meaningful participation in the Strategic Examination of R&D process. All partners involved in R&D collaborations with UNSW over the past three years were contacted and informed about the review. We promoted awareness of the discussion paper and encouraged partners to provide individual submissions reflecting their unique experiences and perspectives.

These partners were also invited to contribute to UNSW's institutional submission. Their input has helped shape a consolidated response that reflects both the depth and diversity of industry perspectives across our collaborative research network.

To facilitate deeper engagement, UNSW hosted boardroom-style discussions with a number of our long-term partners. These sessions provided a forum for detailed consideration of the opportunities and challenges raised in the discussion paper, and enabled partners to share insights on strengthening Australia's R&D system.

In parallel, we engaged with more than 100 of our affiliated portfolio companies to raise awareness of the consultation process and encourage participation. Additionally, through our Trailblazer programs—the Defence Trailblazer for Concept to Sovereign Capability (DTB) and the Trailblazer for Recycling and Clean Energy (TRaCE)—we supported approximately 100 further industry partners to provide input into their respective Trailblazer submissions and to consider making individual contributions to the SERD process.

Given the critical role that industry must play in lifting national R&D intensity, UNSW strongly encourages more structured and inclusive industry consultation as part of the next phase of the SERD process. Broader engagement will ensure that the review is informed by the practical experiences, needs and aspirations of the businesses that are central to Australia's innovation system.