South Australian Productivity Commission

Final Report

Building our R&D Intensity to Deliver a More Productive and Competitive State

12 December 2025

Government of South Australia

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Transmittal Letter

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12 December 2025

The Hon Peter Malinauskas MP
Premier of South Australia
State Administration Centre
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Dear Premier

In accordance with the terms of reference you provided me on 23 September 2025, I am pleased to submit the South Australian Productivity Commission's Final Report on our inquiry into "Building our R&D Intensity to Deliver a More Productive and Competitive State".

Background

Successive state governments have been trying to boost South Australia's R&D intensity and economic complexity for decades. While some initiatives have been successful, collectively the innovation programs of the past four decades have failed to materially lift South Australian business R&D, business innovation, or exports of complex goods and services.

It is time for a new approach.

South Australia has an opportunity to build on the momentum from recent educational reforms and the newly established Adelaide University, to position our state to seize the benefits of transformative opportunities in coming decades.

Economies around the world are being reshaped by rapid technological change, intense competition for talent, and a global "winner-takes-all" race to secure the industries of the future.

Geopolitical shifts, combined with South Australia's stability and lifestyle advantages, mean that there have been few better times to attract and retain talent in areas of comparative advantage.

Top research talent is critical for driving innovation and economic growth. Highly skilled individuals not only bring complementary expertise, partners, and investment, but also help develop local talent and future generations of innovators. Economic research increasingly shows that returns from talent are highly concentrated in star researchers surrounded by world class teams, making strategic talent attraction a powerful lever for boosting business innovation, new firm formation, and long-term economic competitiveness.

R&D

R&D sits at the heart of a process that ultimately drives sustainable, long-run growth in productivity, household incomes and living standards.

Business R&D delivers substantial economic benefits, with average private returns of 10–20 per cent and social returns approaching 60 per cent yet, generally, firms invest well below the socially optimal level without government support.

Supporting R&D that meets the needs of the local economy is one of the most valuable long-term investments governments can make to drive economic growth and complexity. This creates more high-quality jobs, raises incomes, and generates more government revenue to sustain high-quality public services like healthcare and schools.

South Australian businesses currently spend 0.7 per cent of GSP (or $1 billion per year) on R&D. This needs to increase by 70 per cent to match NSW or Victoria, needs to more than double to reach the OECD average and more than triple to match benchmark US states.

The current characteristics of South Australian businesses, and state and federal supports already in place, mean new State Government policies aimed at businesses are unlikely to deliver an uplift of this magnitude.

Rather, in our view, university associated research institutions represent the greatest current opportunity to boost South Australia's R&D intensity, if they are effectively linked to the local business sector, and focused on strategic opportunities for the state, where economic opportunity, state and national priorities, and existing research strengths come together.

Recommendation

We therefore recommend that the South Australian Government builds five world-class "Frontier Technology Institutes". These will be independent research institutes associated with the state's universities, each with annual funding of $10 million for a minimum of 10 years.

The five focus areas for the Frontier Technology Institutes should be carefully chosen through a structured world class assessment and selection process run by a small international expert panel. These focus areas must be aligned to the state's economic strategy, local business needs and areas of existing research strength, market opportunities, and federal R&D support.

Funding should be used to attract world-class researchers and research translators, develop local talent, and build deep, effective connections with industry. Evaluation of the Institutes should be transparent and timely, based on economic outcomes that will benefit the state and justify ongoing use of scarce public resources.

This recommendation is designed for the state's current economic structure. It is informed by a substantial body of domestic and international economic research, modelling and policy evaluations and case studies of international best practice. We have also drawn on lessons learnt from recent policy successes (e.g. state government investment in the establishment of AIML) and failures (e.g. SAHMRI's flawed priorities and high risk commercial behaviour), input from local experts (across industry, research and government), and findings from previous Commission inquiries.

The Economic Case and Financing

Our modelling predicts that the expected net benefit of our recommended policy will be to increase GSP by $397 million (0.21 percentage points) by 2035-36**.**

Every $1 the South Australian Government spends on the Institutes up to 2025-36 is expected to generate economic output of $3.70. This is a significantly higher cost-benefit ratio than alternative policies to boost GSP, such as infrastructure spending, which international evidence suggests boosts economic output by $1.20 for each $1 spent at best.

This long-term policy will require long-term financing. We recommend funding the proposal via a payroll tax surcharge of 0.4 per cent on organisations with a national payroll greater than $100 million. We do not recommend a new tax lightly. But a new revenue stream will help ensure this policy has the dedicated resources and necessary scale to achieve its objectives, without increasing public debt and to project low sovereign risk. Our entire state, including large businesses subject to the surcharge, will ultimately benefit from the stronger, more resilient local economy this policy will help to generate. If our

design recommendations are followed, taxpayers can rest assured that surcharge funds will be productively invested and not diverted to less productive activities.

Our review of options indicates this is the most feasible and efficient funding mechanism. Importantly, a large firm payroll tax surcharge is preferred on competitiveness grounds as South Australia would still have the lowest (headline and effective) payroll tax rate for large firms of any state or territory.

Summing Up

This policy is intended to be the logical next addition to the State Government's existing economic initiatives. In time, once the Frontier Technology Institutes are established, it will be necessary to assess whether government intervention should develop further to support the expected new R&D intensive firms generated by the Institutes and the broader innovation ecosystem.

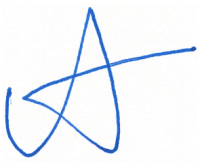
We believe this ambitious policy has very good prospects of materially contributing to the delivery of a more productive and competitive state, lasting income growth, and higher living standards for future generations of South Australians.

Acknowledgement

We are grateful to all stakeholders who have contributed to this inquiry. Throughout the consultation process we have been struck by stakeholders' enthusiasm for a bold new approach to boosting R&D intensity, and for working together across industry, research and government to realise the state's economic potential. We also thank the South Australian Department of Treasury and Finance for its modelling of funding options.

On a personal level, I am also very grateful for the good work of my colleagues Ms Melissa Wilson, Mr Steve Whetton and the rest of the Commission team.

Yours faithfully



Adrian Tembel

PRESIDING COMMISSIONER AND CHAIRMAN

Attachments:

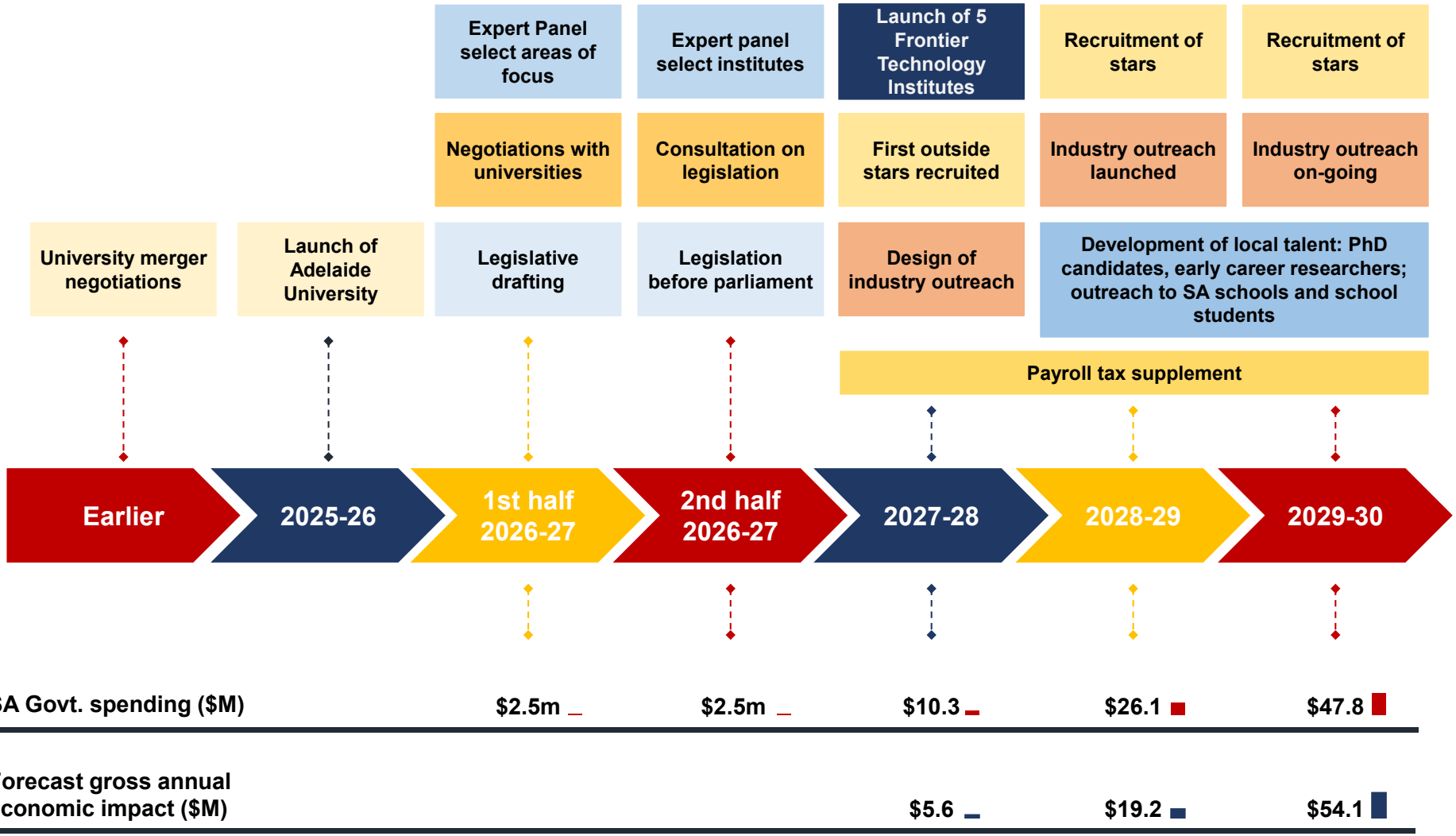
1. *Principles of the policy proposal*
2. *Final inquiry report*

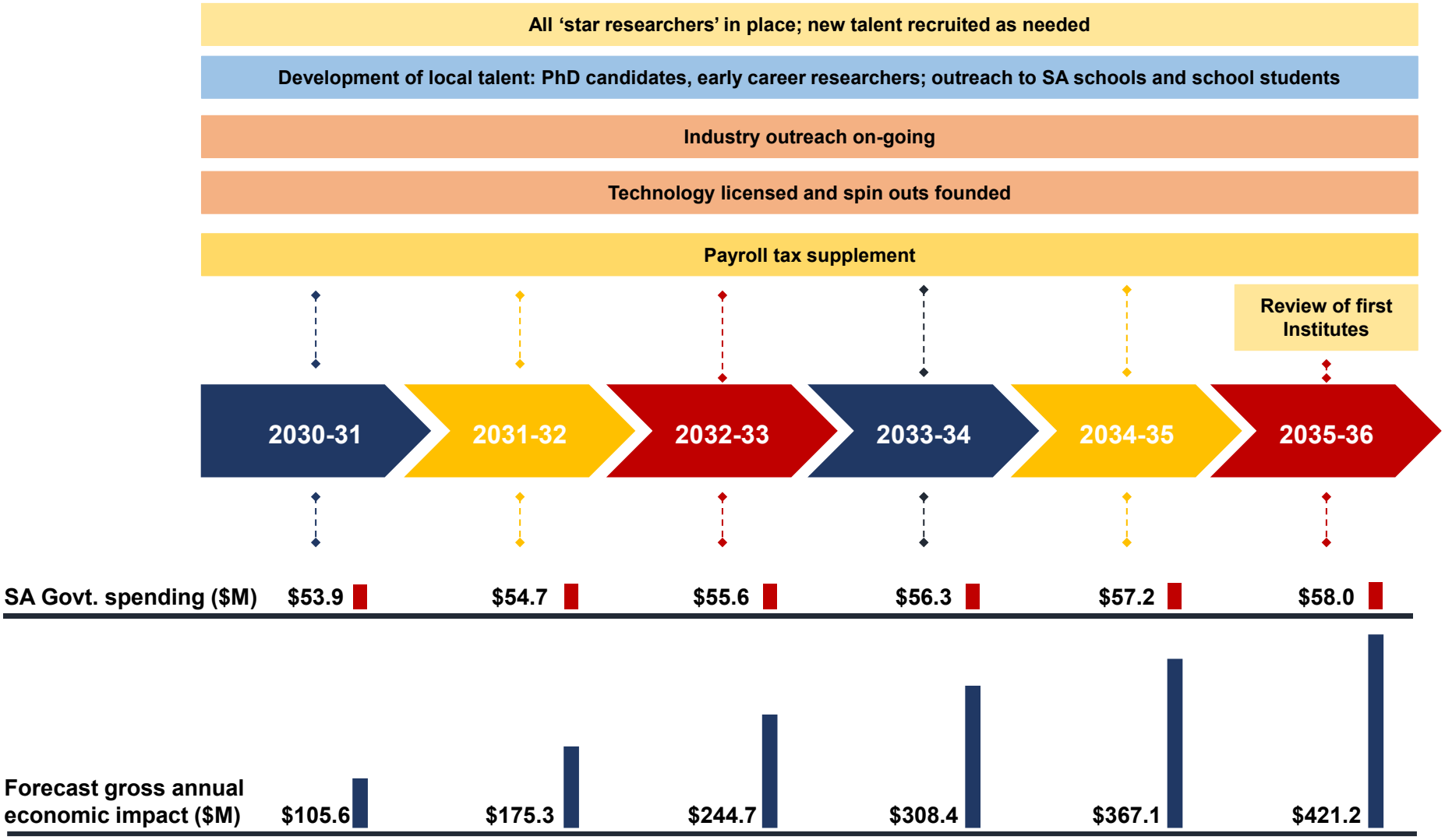
Principles of the Policy Proposal

South Australia needs a new approach to successfully take the next step in building the R&D intensity of our economy, to deliver a more productive and competitive state. Our recommendation has been built around the 10 principles of:

1. Establishing a genuine partnership between the South Australian Government, our universities, and local industry to use R&D to help build the state's economic future. This is not just another grant program.
2. A tight focus on a small number of strategic opportunities which align with the state's economic strategy, local business' needs, scalable markets and areas of existing research strength.
3. Delivery through world-class independent "Frontier Technology Institutes" associated with South Australia's universities.
4. Established though legislation, providing a strong signal of the long-term commitment of the South Australian Government.
5. Building talent and connections, not buildings, by attracting world-class researchers and research translators to live and work in South Australia and connecting them to the needs and opportunities of local industry. This also needs to include efforts to build local talent.
6. Providing structured and dedicated funding that is substantial enough to make a material difference to South Australian research and to scale our economic opportunities.
7. Ensuring that the Frontier Technology Institutes have substantial autonomy in the management of their operations enabling them to be agile and embedded with industry whilst retaining the most valuable parts of the university model and prohibiting activities that generate excessive commercial risks.
8. Building connections into industry needs to be at the core of how these Institutes work.
9. Alignment with Australian Government R&D support, and particularly any federal policy changes resulting from the *Strategic Examination of R&D* in Australia.
10. Transparent and timely evaluation of both this policy and the broader suite of South Australian government innovation policies.

Timeline for the implementation of the Frontier Technology Institutes and the Expected Realisation of Their Benefits




All 'star researchers' in place; new talent recruited as needed
Development of local talent: PhD candidates, early career researchers; outreach to SA schools and school students
Industry outreach on-going
Technology licensed and spin outs founded
Payroll tax supplement
Review of first Institutes
2030-31
2031-32
2032-33
2033-34
2034-35
2035-36
SA Govt. spending ($M)
$53.9
$54.7
$55.6
$56.3
$57.2
$58.0
Forecast gross annual economic impact ($M)
$105.6
$175.3
$244.7
$308.4
$367.1
$421.2

Inquiry team

Commissioners

Mr Adrian Tembel, Chairman, South Australian Productivity Commission, and Presiding Commissioner for the Inquiry

Ms Melissa Wilson, Commissioner, South Australian Productivity Commission

Inquiry lead

Mr Steve Whetton, Chief Executive, Office of the South Australian Productivity Commission

Inquiry team

Dr Ayasha Akter, Senior Analyst

Mr Simon Barnett, Senior Analyst

Dr Owen Churches, Acting Director

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Mr Adam Marafioti, Principal Analyst

Mr Tyson Miller, Principal Analyst

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Mr Nasantogtokh Yunren, Senior Analyst

Conflicts of interest

The Commissioners have declared to the South Australian Government all personal interests that could have a bearing on current and future work. The Commissioners confirm their belief that they have no personal conflicts in regard to this inquiry.

In an abundance of caution, Adrian Tembel declares that his wife, Polly, has been in discussions to provide consulting services to AIML at some point in the future.

List of Findings

Finding 1: Research & Development is the key driver of sustainable long-term growth in living standards.

Finding 2: R&D can significantly boost the performance of the firms investing in it.

Finding 3: The benefits of R&D spillover to other firms, lifting the performance of the whole economy, not just the organisation that undertakes it

Finding 4: R&D's spillover benefits and inherent risks mean the private sector will invest less than is socially optimal without government support.

Finding 5: The economic benefits of business R&D are substantial, delivering a social return of almost 60 per cent.

Finding 6: Business R&D does not need to have developed a successful product or business process to be valuable. Even where the project itself 'fails' it still increases the economy's capacity to conduct and absorb future R&D.

Finding 7: Business spending on R&D is low in South Australia compared to other non-resource intensive states in Australia, or to other advanced economies.

Finding 8: Raising our R&D intensity to a level where it can make a real difference will require a substantial lift in business R&D over time. Matching New South Wales or Victoria would require an increase of 70 per cent, reaching the OECD average would require business R&D to more than double and matching North Carolina would require it to more than triple.

Finding 9: The experience of North Carolina shows that sustained collaboration between industry, universities and state government can transform a region's economic prospects.

Finding 10: Lower business spending on R&D in South Australia is mostly due to fewer firms undertaking R&D, while average spend per firm is comparable with the eastern states. This means lifting business R&D will require increasing the number of firms that can undertake, and see value in, R&D.

Finding 11: The current characteristics of South Australian businesses make policies aimed at business led R&D less effective, at this stage, than in jurisdictions with a more innovative and dynamic business sector.

Finding 12: There are a range of Australian and South Australian Government supports available for businesses undertaking R&D.

Finding 13: Research and innovation policy should focus on a small number of larger scale, strategic and high impact interventions.

Finding 14: AIML shows that government, university and industry R&D collaborations can deliver for South Australia.

Finding 15: The existing policy framework has not lifted the R&D intensity of South Australian businesses. It is time for a different approach.

Finding 16: University associated research institutions represent the greatest current potential to boost South Australia's R&D capabilities, if they are linked to local industry needs.

Finding 17: South Australia must increase the supply of innovation skills in order to increase business R&D activity.

Finding 18: As Codan shows, giving talented young South Australians more places to build their talents and careers here, rather than interstate or overseas, is an important ingredient in producing new innovative firms in South Australia.

Finding 19: Creating a wider range of rewarding research and innovation career opportunities for South Australian graduates is important to reduce the brain drain and build our research and innovation talent.

Finding 20: Government interventions to increase R&D intensity can be highly effective when delivered through public research institutions and well matched to the local business sector.

Finding 21: South Australian R&D support should be focused in areas of local capability, economic opportunity, and local and national strategic importance.

Finding 22: If we want to be able to deliver world-class business research, development and innovation in South Australia we need to build, retain and attract world-class research talent.

Finding 23: Star researchers significantly boost research output, not only because of their own achievements but also because they boost the other researchers around them.

Finding 24: The financial benefits of invention flow disproportionately to a small share of the most successful inventors, making securing them potentially significant for regional incomes.

Figure 25: Star researchers don't just boost local research, they also boost new firm formation and firm success in industries related to their research.

Finding 26: Migration of talented people to collaborate with peers appears to be one of the most important factors in creating clusters of R&D led economic success such as Silicon Valley.

Finding 27: Geopolitical tensions mean that there have been few better times to try and attract new and returning research stars to South Australia.

Finding 28: Adelaide's quality of life, geopolitical stability, and relatively low cost of living, is a comparative advantage in attracting star researchers.

Finding 29: Lack of exposure to inventors means that there is substantial unrealised potential for invention amongst women and people from low-income households.

Finding 30: Targeted programs connecting traditionally underrepresented young people to inventors as role models could improve their prospects and increase the range of inventions available to society.

Finding 31: Government support of R&D is only justified if it generates R&D that is new, useful, and affordable.

Finding 32: Broad macroeconomic conditions in South Australia are generally favourable for business investment, but more targeted policy intervention is required to boost R&D intensity.

Finding 33: Support for business R&D through the Australian Government R&D tax credit is roughly average amongst OECD countries, indicating that this is not a gap in support.

Finding 34: Direct R&D grants are more targeted than tax incentives and can boost productivity, particularly when aligned with high-value socio-economic goals and state and national priorities.

Finding 35: Expanding the supply of skilled human capital – through education, skilled migration, and research career opportunities – is critical to boosting R&D intensity.

Finding 36: The South Australian Government already provides financial support to early-stage companies, and additional policy effort would have greater impact if targeted elsewhere.

Finding 37: Investment in buildings and precincts should be a low priority for State Government R&D spending.

Finding 38: Future R&D organisations established by, or funded by, the South Australian Government should be prohibited from speculative investments and other high risk behaviour that create potential liabilities that are large relative to the organisation's funding. While SAHMRI's conduct is regrettable and may have harmed the reputation of local not-for profit research and development activities, this should not discourage our State Government from investing further in this sector.

Finding 39: Strengthening collaboration between universities and businesses is critical to generating commercial and economic benefits from R&D.

Finding 40: State governments can be an important catalyst for reforming the relationship between universities and business, particularly by removing red tape and barriers to commercialisation.

Finding 41: South Australia needs a new approach to boosting the R&D intensity of our economy

Finding 42: We recommend that the South Australian Government design, establish and fund five independent world-class research institutes, or "Frontier Technology Institutes", with these Institutes associated with one or more of the state's universities and deeply connected into industry.

Finding 43: We recommend that the design and implementation of the Frontier Technology Institutes follow the ten principles outlined in this report.

Finding 44: We recommend that the South Australian Government retains ongoing involvement with the Frontier Technology Institutes to ensure they remain focused on state priorities, and on-track to deliver the expected industry and economic outcomes.

Finding 45: We recommend that the five focus areas for the Frontier Technology Institutes should be carefully chosen through a structured world-class assessment and selection process run by a small international expert panel.

Finding 46: We recommend that the Frontier Technology Institutes be established by legislation encoding the principles under which they will operate, their objectives and functions, and their governance arrangements.

Finding 47: We recommend that the primary use of the funding should be to attract world-class researchers and research translators, develop local talent, and build deep, effective, connections with industry.

Finding 48: We recommend that each of the Frontier Technology Institutes be provided with annual indexed funding of $10 million for a minimum of ten years.

Finding 49: We recommend that evaluation of the Frontier Technology Institutes should be transparent and timely, based on economic outcomes that will benefit the state and justify ongoing use of scarce public resources.

Finding 50: A payroll tax surcharge imposed on large firms based on their national payroll is preferred on efficiency grounds over an increase in mineral and petroleum royalties.

Finding 51: The two tax increases considered in this report are likely to have broadly similar (and small) impacts on equity.

Finding 52: An increase in minerals and petroleum royalty rates may have a lower impact on compliance costs and administrative burden.

Finding 53: A large firm payroll tax surcharge is preferred on competitiveness grounds as it is not expected to reduce our competitiveness relative to other states, whereas an increase in minerals and petroleum royalties would push our rates above most other states.

Finding 54: We recommend a payroll tax surcharge of 0.4 per cent on firms with a national payroll of over $100 million as the preferred approach to funding the Frontier Technology Institutes.

Finding 55: For every $1 the South Australian Government spends on the Frontier Technology Institutes up to 2035-36, the expected cumulative benefit is $3.70.

Finding 56: Our central estimate of the *net social benefit* of the policy after accounting for the cost of taxation revenue is that GSP will be $397 million higher by 2035-36 (in 2024-25 values), an increase in GSP of 0.21 percentage points.

Finding 57: Plausible alternative policies to boost GSP have much lower cost-benefit ratios, with international evidence suggesting that at best infrastructure spending boosts economic output by $1.20 for every dollar spent, well below the $3.70 estimated long-run benefit of the Frontier Technology Institutes.

Finding 58: Even in the most conservative scenario of potential impact of R&D on GSP and potential research revenue of the Institutes, they still deliver a small net benefit for the state.

Finding 59: The Institutes would not directly address the needs of regional South Australia, and restructuring them to do so risks reducing their effectiveness. Regions would be better served by place-based policies to increase their capabilities, particularly through investment in skills.

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Contents

1. A Call to Action

1.1 We have a window of opportunity

We believe South Australia has the potential to transform our economic prospects and build a high income, more complex economy, not for a year or two but for decades and generations ahead.

The first phase of this transformation, recent educational reforms (guaranteed three-year-old preschool, five new technical colleges and fee-free TAFE), has the potential to boost the skills of young South Australians and our future workforce. The creation of Adelaide University — with its enabling legislation following the Commission's recommendation to embed research translation and support for South Australia's economic development priorities at the heart of its objectives — provides, in our opinion, a rare potential opportunity for the State Government to continue to strengthen research translation and accelerating innovation-led growth.[1]

Around the world, economies are being reshaped by rapid technological change, intense competition for talent, and a global "winner-takes-all" race to secure the industries of the future. Breakthrough innovations in emerging fields — from artificial intelligence to clean energy and advanced manufacturing — are becoming more complex and capital-intensive, demanding deep expertise and strong research capability. At the same time, rising geopolitical tensions are shifting the global talent landscape. With leading universities and firms in the United States and elsewhere becoming less welcoming, South Australia may have a once-in-a-generation opportunity to attract exceptional researchers, and in turn entrepreneurs and investors, seeking a stable, open and innovative environment in which to build their careers and businesses.

Australians believe that now is the right time for more ambitious, evidence-based economic reform that will reap long-term benefits.[2] In South Australia, the experts we consulted for this inquiry were enthusiastic about the state's potential and eager to seize and scale the opportunities ahead.[3]

To help South Australian workers and businesses realise these opportunities, increase our productivity and create more high wage jobs, we believe we now need to take the next step towards being a more research-intensive state with, consequently, a more complex economy.

In our view, making these changes can't wait. Over the next few decades there will be potentially transformative opportunities, including the AUKUS nuclear submarine build and the global push for critical minerals that underpin the clean-energy transition. If we are serious about positioning South Australians to seize these chances, then we must further invest in boosting the state's R&D intensity now, so the increased capabilities are there when we need them. R&D is essential to becoming a "smart, sustainable and inclusive" economy,[4] fulfilling the state's economic potential, and boosting incomes and living standards.

[1] *Adelaide University Act 2023*, Section 7 – Functions, https://www.legislation.sa.gov.au/__legislation/lz/c/a/adelaide%20university%20act%202023/current/2023.32.auth.pdf
[2] According to 2025 surveys including McKinnon Democracy (2025), https://mckinnon.co/democracy/insights/mckinnon-poll-australians-are-ready-for-meaningful-economic-and-tax-reform and Centre for Policy Development (2025), https://cpd.org.au/work/2025-purpose-of-government-pulse/
[3] We conducted 25 consultation meetings for this inquiry, with a range of experts and stakeholders across industry, academia and government, and also drew on lessons from the consultations undertaken as part of the previous Turning Research into Economic Competitiveness for South Australia inquiry.
[4] Premier of South Australia (2023), *South Australian Economic Statement,* https://www.premier.sa.gov.au/__data/assets/pdf_file/0004/895054/SA-Economic-Statement.pdf

This second phase towards realising our high value/wage potential will require a new policy approach. We need to build on what already exists in our universities, to deliver new, world-class, independent Frontier Technology Institutes focused on delivering for our current and emerging industries, attracting back star researchers from the rest of the world and give emerging stars the scope to flourish. We need to empower these world class teams to reach into our business sector and society to maximise the economic and employment benefits for our state and the income potential from export markets. We need to accept that risk and failure will be part of the process — but each attempt, even those that fall short, will build skills, connections and capabilities that strengthen our long-term innovation capacity and open the door to transformative success.

Once these new Frontier Technology Institutes are established, it will be worth assessing whether there are unmet needs for the R&D intensive firms that are growing up around them, requiring a third phase of State Government interventions around R&D. This third phase should be considered in the future and will depend on the R&D environment at that time, including whether reforms to Australian Government R&D policies are delivering the support R&D intensive firms need to scale.

This report outlines an ambitious, carefully crafted, long-term blueprint for adding a key new dimension to our economy that we believe will boost South Australia's R&D intensity and in turn in the long run, our economy.

1.2 This inquiry builds on the Commission's previous work

In 2022 the Commission was tasked by the Premier to understand the underlying causes of the lack of complexity and diversity in the South Australian economy that had been holding back growth in productivity and incomes in the state and identify potential policy options for the South Australian Government.[5]

The Commission found that South Australia's business sector was smaller, less dynamic, more inward looking and less productive than the eastern states (see section 3.1 below).

Although overall export values were strong, this was mainly due to our commodity sectors. Businesses in high value-added export sectors were becoming less competitive internationally, with the value of complex exports falling since the mid-2010s.

We found that South Australian firms invested less than the national average in R&D. They were also less likely to patent innovations, and were very inward looking in their innovation, with significantly fewer South Australian firms drawing on universities as a source of ideas for innovation.

Based on the evidence gathered, we concluded that:

- Our State remains less innovative than the national average. That is, we found that South Australia is not an "innovative state" as has sometimes been claimed.
- This has enduring impacts on South Australian incomes, which are materially lower than the national average.

[5] South Australian Productivity Commission (2023), Turning research into economic competitiveness for South Australia, Final Report. Earlier Commission work related to this topic includes inquiries into research and development (South Australian Productivity Commission, 2021, Research and Development Inquiry, Final Report).and health and medical research (South Australian Productivity Commission 2020, Inquiry into Health and Medical Research in South Australia, Final Report).

- Our current State Government innovation policies are unlikely to deliver an increase in R&D intensity and need to change focus.
- That focus should start with building on the strengths of South Australian universities and their potential to shift South Australia to become a more innovative state.

Since the 2022 inquiry, the South Australian Government facilitated the University of Adelaide and the University of South Australia joining forces to form Adelaide University, and the South Australian Government ensured that the Act for the new university put South Australian industry and community impact at the heart of the university's objectives. Flinders University has also continued to shift towards increasing its research strengths and seeking to build agile connections with industry to deliver on its needs.

To build on this momentum, the Premier asked the Commission to identify a cost-effective way for the South Australian Government to deliver an enduring boost the state's R&D intensity, to deliver a more productive and competitive state. The Commission was also asked to consider options for an efficient and sustainable funding mechanism for any recommended approach.

The full terms of reference for this inquiry are provided in Appendix A.

2. Research and Development

2.1 R&D creates new knowledge and ideas

Put simply, research and development (R&D) is the systematic process of trying to discover and develop new ideas. The OECD and ABS define R&D as:[6]

> *"creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge".*

R&D includes three types of activities, each aimed at a different outcome:

- Basic research is experimental or theoretical work undertaken to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in mind.
- Applied research is original investigation undertaken to acquire new knowledge, directed towards a specific, practical aim or objective.
- Experimental development is systematic work, drawing on knowledge gained from research and practical experience, directed towards producing new or improved products or processes.[7]

R&D is:

- novel (aimed at new findings),
- creative (based on original, not obvious, concepts and hypotheses),
- uncertain (about the final outcome),
- systematic (planned and budgeted), and
- transferrable and/or reproducible (leads to results that could be reproduced).

The novelty and uncertainty of the outcome is central to the definition of R&D. R&D and innovation overlap, but they are not the same. Not all innovation is R&D; R&D creates new ideas and knowledge, while innovation can simply be applying or implementing those ideas.[8] For example, a firm buying a computer-controlled cutting (CNC) machine and training staff how to use it would be innovation but not R&D. But if the firm had to undertake a project to learn how to integrate the CNC machine with its other equipment or how to use the CNC machine on a material it hadn't been used on before, then that would be R&D. This is often not a linear process, and innovations can occur simultaneously with R&D or identify the need for R&D to realise the benefits from an innovation. R&D is also inherently uncertain in its outcomes, it won't always deliver direct benefits or may deliver different outcomes than those initially sought.

R&D is not confined to science, technology, engineering and mathematics (STEM) disciplines. It can occur in any field or industry. R&D can be undertaken by any type of organisation, including businesses, governments, universities and not-for-profits.

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[6] OECD (2015), *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities*, Paris: OECD Publishing, p. 44

[7] *Ibid*, p. 45

[8] The ABS defines innovation as *"the introduction of a new or significantly improved good or service; operational process; organisational/managerial process; or marketing method"*, and innovation activity as *"any work that was intended to, or did, result in the introduction of an innovation"*. ABS (2024), 'Innovation in Australian Business – methodology', available at: https://www.abs.gov.au/methodologies/innovation-australian-business-methodology/2022-23#glossary

2.2 R&D powers business and the economy

R&D sits at the heart of a process that ultimately drives prosperity. It creates new ideas and technologies, which innovative firms and other organisations can apply to real-world problems and opportunities. R&D investment brings real benefits to everyday life, from medical breakthroughs (such as the advances in breast cancer detection and treatment that have seen five-year survival rates in the US increase from 76 per cent to 93 per cent),[9] to everyday technologies (like MP3 storage and LED light globes; see Box 1), to industrial technologies (like cutting-edge exploration and metal detection solutions; see Boxes 2 and 5).

These innovations help businesses do more with the same resources, producing higher-value goods and services and supporting more complex industries. Over time, this growth translates into more jobs, higher wages, greater choice for consumers, stronger government budgets and better living standards. In short, R&D generates the ideas and technologies that drive productivity and long-term wellbeing. Without strong local R&D, an economy is forced to rely on innovations developed elsewhere, paying for them through the products and services it buys from the rest of the world.

Box 1: The Fraunhofer Gesellschaft – research collaborations can have significant impacts across society

Our ability to easily stream music and videos to our mobile phones is due to collaborative work led by German's Fraunhofer Gesellschaft, an independent not-for-profit federation of research institutes that bridges the gap between universities and industry. In the late 1980s and early 1990s they led collaborative international research with industry partners that developed the algorithms that compress music files to a size suitable for electronic storage and streaming (the MP3). The researchers and their partners then built on this breakthrough to develop similar techniques for compressing video files.[10]

Equally influential on our day to day lives was research at Fraunhofer Gesellschaft for Applied Solid State Physics which in 1995 discovered a way to produce white light from a single chip,[11] paving the way for the energy efficient, long-lasting LED globes that have lifetime costs of around ¼ of a halogen globe and now account for about 60 per cent of the globes bought for Australian homes and businesses.[12]

"Knowledge transfer is not an end in itself but an intermediate objective that contributes to better attaining the broader goals of science, innovation and, more generally, economic policies to promote more inclusive growth"[13]

Finding 1: Research & Development is the key driver of sustainable long-term growth in living standards.

For most developed economies, innovation is the only way to secure sustainable, long-run productivity growth.[14] Unlike adding more workers or building more physical capital, which

[9] https://abcnews.go.com/Health/breast-cancer-numbers-survival-rates-improved-past-40/story?id=126163284
[10] https://www.thoughtco.com/history-of-mp4-1992132; https://www.hhi.fraunhofer.de/en/departments/vca/technologies-and-solutions/h264-avc/h264-overview.html
[11] https://www.deutschland.de/en/topic/business/fraunhofer-innovation
[12] Beletich Associates (2024), 'Market Update and Conclusions for Minimum Energy Performance Standards for Lighting Products', report prepared for the Australian Government Department of Climate Change, Energy, the Environment and Water.
[13] Guimón, J. and C. Paunov (2019), "Science-industry knowledge exchange: A mapping of policy instruments and their interactions", *OECD Science, Technology and Industry Policy Papers*, No. 66, OECD Publishing, Paris, https://doi.org/10.1787/66a3bd38-en.
[14] Bloom, N., J. Van Reenen and H. Williams (2019) 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33 (3), pp. 163–184

eventually reach their limits, R&D and innovation can keep driving growth by creating new ideas, technologies and ways of doing things. This means that R&D is a central necessary plank to South Australia's ability to achieve greater economic complexity, lasting income growth, and high living standards for future generations of South Australians.

Box 2: Fleet Space Technologies – using R&D and a focus on industry needs to drive productivity in exploration technologies

Fleet Space Technologies is an Adelaide-based company co-founded in 2015 by Flavia Tata Nardini, a rocket engineer who wanted to continue working in the space sector after moving to South Australia from Italy. The company is developing cutting-edge technologies for space, defence and mining exploration. It has successfully combined its R&D in microsatellites and sensing with an unmet industry need to create an innovative mining exploration solution. The technology, called Exosphere, combines wireless Geodes, intelligent cloud processing and a constellation of low earth orbit nanosatellites to locate critical resources in as little as four days (rather than 6-12 months for a traditional ground-based exploration program). Exosphere is also more accurate and with less environmental impact than existing methods. Exosphere has since been used by several leading Australian mining companies and led to Fleet Space Technologies being named by the Australian Financial Review as Australia's fastest growing company in 2023.[15]

By the end of 2024 Fleet Space was employing over 130 staff, providing minerals exploration services to over 40 industry partners and had just concluded a $150 million 'Series D' funding round with investors valuing the company at over $800 million.[16]

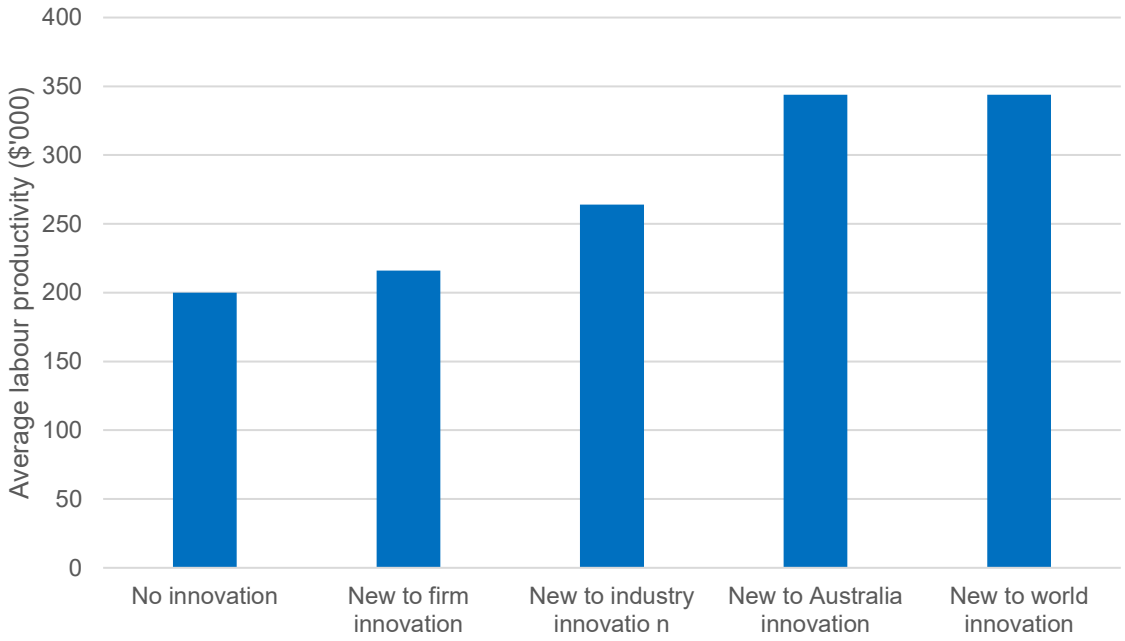
Firms that undertake R&D are typically more productive than those that do not. Recent Australian research found that firms that introduced 'new to Australia' or 'new to world' innovations, which both typically require R&D, had average output per worker of almost $350,000, compared with $215,000 for firms that implemented innovations that were only new to their firm (and therefore unlikely to require much, if any, R&D), and $200,000 for firms that undertook no innovation activity at all (Figure 1).[17]

R&D has also been shown to significantly improve a firm's ability to benefit from external R&D. Employees and organisations with the skills and structures needed to undertake their own R&D are better equipped to identify, learn from, adopt and adapt R&D and innovations undertaken elsewhere.[18]

Finding 2: R&D can significantly boost the performance of the firms investing in it.

[15] https://www.afr.com/work-and-careers/management/this-moonshot-tech-firm-is-australia-s-fastest-growing-company-20231113-p5ejhe
[16] https://www.fleetspace.com/newsroom/fleet-space-closes-a-150m-series-d-with-a-800m-valuation
[17] Majeed, O. and R. Breunig (2023), 'Determinants of innovation novelty: evidence from Australian administrative data', *Economics of Innovation and New Technology'*, 32:8, pp. 1249-1273
[18] Audretsch, D.B. and M. Belitski (2020), 'The role of R&D and knowledge spillovers in innovation and productivity', *European Economic Review*, vol 123; Audretsch, D.B. and M. Belitski (2022), 'The knowledge spillover of innovation', *Industrial and Corporate Change*, vol 31, pp. 1329-1357

Figure 1: Average labour turnover of Australian firms by their level of innovation novelty



Source: Majeed and Breunig (2023)

R&D can also have much wider benefits, as its application can spread far beyond the organisation undertaking the initial research, including new firms (and industries) being set up when entrepreneurial people commercialise ideas they have whilst working in existing firms or academia. This means that, without intervention by the government, the private sector will likely invest less in R&D than is optimal for our whole economy or society, as individual organisations only consider their own costs and benefits when making R&D spending decisions. R&D can also be underprovided by the private sector because financial market imperfections can make it difficult to finance spending on R&D and innovation, because of shortages of the highly skilled labour needed to undertake R&D, and because information asymmetries mean that firms are not always aware of the benefits they could get from investing in R&D.[19] All of these factors mean that there is a strong case for well-designed government intervention to lift the level of R&D.

Finding 3: The benefits of R&D spillover to other firms, lifting the performance of the whole economy, not just the organisation that undertakes it.

R&D is also inherently risky. Not all projects will successfully develop a solution to the problem they set out to solve, other firms can get there first, or the results may not be practical to monetise. These risks mean that R&D tends to be concentrated in large firms that have the resources and risk management capabilities to bear those risks, or in small 'start-up' firms funded largely by risk capital.

While the private returns of R&D seem to be around 10 to 20 per cent on average,[20] a deep pool of empirical research finds that the social benefits are much larger. International experts estimate that

[19] Nelson, R.R. (1959), 'The Simple Economics of Basic Scientific Research', *Journal of Political Economy*, 67, pp. 297-306, http://dx.doi.org/10.1086/258177 and Arrow, K. (1962), '*Economic Welfare and the Allocation of Resource for Invention*' in National Bureau of Economic Research, Princeton, NJ: Princeton University Press.
[20] Lucking, Bloom and van Reenen (2019), 'Have R&D Spillovers Declined in the 21st Century?', *Fiscal Studies*, 40:4, pp. 561-590

the social rates of return of business R&D are around 56 per cent,[21] and a recent meta-analysis produced for the UK Government estimates a whole of economy return on R&D of 36 per cent.[22] Converting the latter estimate to an impact on GSP suggests that a 10 per cent increase in the stock of R&D available to an economy would boost GDP by 0.94 per cent.

Finding 4: R&D's spillover benefits and inherent risks mean the private sector will invest less than is socially optimal without government support.

Estimated impacts from government programs aimed at supporting business R&D and connections between research institutions and business are also large, for example:

- A 2021 study estimated that for each €1 increase in the Fraunhofer Gesellschaft's budget increased long-term GDP in Germany by €21.[23]
- A study looking at the impact of Australian Government funded Cooperative Research Centres (CRCs) over 2012 to 2020 estimated that for every $1 spent by the Australian Government, long-term GDP was cumulatively increased by $5.61.[24]
- The UK Catapult Network claims that it has collectively generated:
  - £8 billion in gross value added for the UK economy;
  - 50 per cent growth in businesses supported by Catapults after 6 years, when compared to similar businesses that didn't receive Catapult support; and
  - 80 per cent of supported projects would not have happened, or would have happened slower, without Catapult support.[25]

The size of these impacts makes supporting R&D to address the needs of the local economy one of the most valuable long-term investments our State Government can make to generate economic growth, higher incomes for South Australians, and the tax revenues needed to sustain high quality government services such as healthcare and schools.[26]

Finding 5: The economic benefits of business R&D are substantial, delivering a social return of almost 60 per cent.

Estimates of the economic impacts of public R&D spending by universities and other public research institutions are broadly similar in magnitude to the social returns to business R&D, but typically have wider range, as the scale of the impact is also influenced by the extent to which university research areas match local business needs, and by the capacity of local businesses to absorb research and innovation.[27]

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[21] Lucking, B. N. Bloom and J. van Reenen (2019), 'Have R&D Spillovers Declined in the 21st Century?', *Fiscal Studies*, 40:4, pp. 561-590

[22] Frontier Economics (2023), 'Rate of Return to Investment in R&D: A report for the Department for Science, Innovation and Technology', March 2023

[23] https://www.fraunhofer.de/content/dam/zv/de/forschung/leistungsangebot/The-macroeconomic-effects-of-the-Fraunhofer-Gesellschaft.pdf

[24] ACIL Allen (2021), Cooperative Research Centres Program, Impact Evaluation prepared for the Australian Government Department of Industry, Science, Energy and Resources, November 2021

[25] Innovate Uk Catapult Network (2025) Catapults at the Heart of the UK's Innovation Ecosystem, available at: https://catapult.org.uk/wp-content/uploads/2025/02/Catapult-Network-Prospectus-Spring-2025-DIGITAL.pdf

[26] But not the only thing worth targeting. For example, strong competition policy to ensure South Australian's benefit from the market economy, delivery of high-quality public services such as education, and ensuring businesses and individuals have the right incentives to invest in their future success are all also important, and are strongly complementary with investments in R&D.

[27] Cohen, W.M. and D.A. Levinthal (1989), 'Innovation and learning: the two faces of R&D,' *The Economic Journal*, 99:397, pp. 569–596; Guellec, D. ad B. van Pottelsberghe de la Potterie (2000), 'The Impact of Public R&D Expenditure in Business R&D, *OECD Science, Technology and Industry Working Papers*, 2000/04; Griffith, R., S. Redding & J. Van

There are benefits from governments encouraging research in technologies and fields of study that are relevant to the local private sector, as reduced 'technological distance' increases the extent to which research spillovers benefit private sector productivity.[28] This 'shaping' role for government to direct research effort towards specific local challenges was also supported by a number of submissions to the Australian Government's *Strategic Examination of R&D*.[29]

Even where R&D 'fails' (in the narrow sense of not achieving its intended outcome) it still creates benefits, building up the skills of the workforce so they are more effective at undertaking future R&D, creating links between researchers and businesspeople that facilitate future collaborations, and increasing businesses' capacities to absorb and use research and innovations generated elsewhere. It can also help to address the loss of talented young South Australians to opportunities interstate and overseas (see Section 3.3).

Finding 6: Business R&D does not need to have developed a successful product or business process to be valuable. Even where the project itself 'fails' it still increases the economy's capacity to conduct and absorb future R&D.

Reenen (2004), 'Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Industries', *The Review of Economics and Statistics*, 86:4, pp. 883-895

[28] Orlando, M.J. (2000), On the Importance of Geographic and Technological Proximity for R&D Spillovers: An empirical investigation', *Federal Reserve Bank of Kansas City Working Papers*, no. RWP-00-02

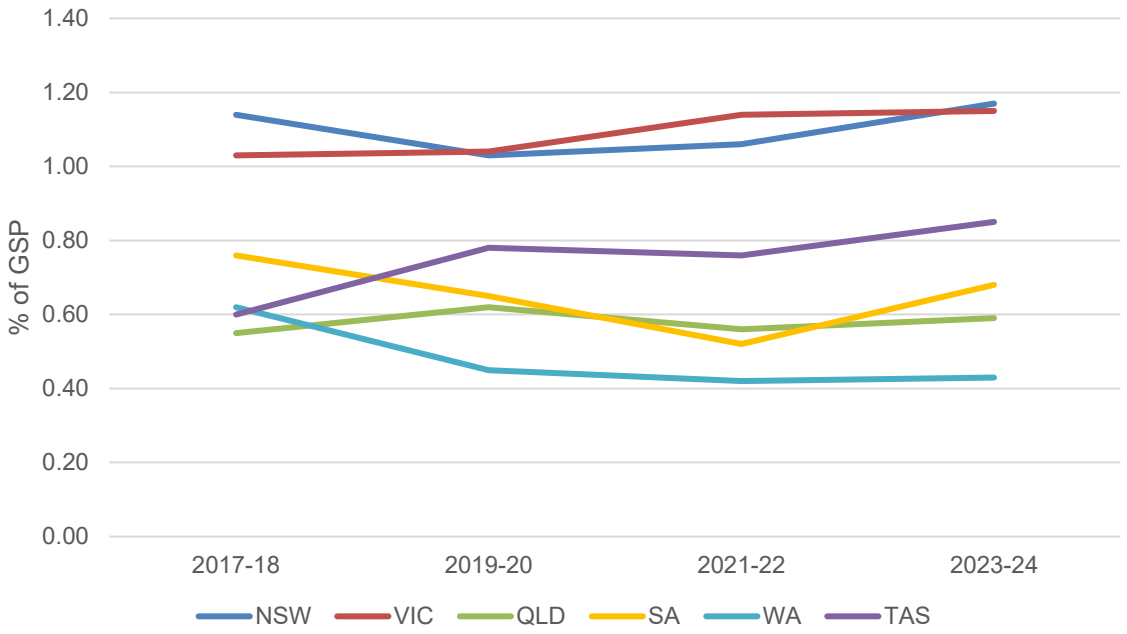
[29] Denholm, R., Chubb, I., Wood, F., Cornick, K., (2025) Strategic Examination of Research and Development: discussion paper, Department for Industry, Science and Resources, Government of Australia, available at: https://consult.industry.gov.au/strategic-examination-rd-discussion-paper

3. South Australia's R&D Performance

3.1 The South Australian business sector does too little R&D

Business expenditure on R&D (BERD) in South Australia has been consistently lower than the best performing regions. In recent years South Australian businesses spent around 0.7 per cent of GSP (or $1 billion per year on average) on R&D, see Figure 2.

Figure 2: Business expenditure on R&D by the state in which it was undertaken, per cent of GSP



Source: ABS (2025), Research and Experimental Development, Businesses, Australia, 2023-24

In contrast, businesses in New South Wales and Victoria spend around 1.2 per cent of GSP on R&D (Figure 2; these states are appropriate comparators for South Australia as they are also reliant on the ingenuity of their people for growth rather than mineral and energy resources). Matching New South Wales and Victoria as the most R&D intensive state in the country is we believe a necessary medium-term ambition. But to achieve this South Australian businesses would need to increase spending on R&D by 70 per cent, to $1.7 billion per year.

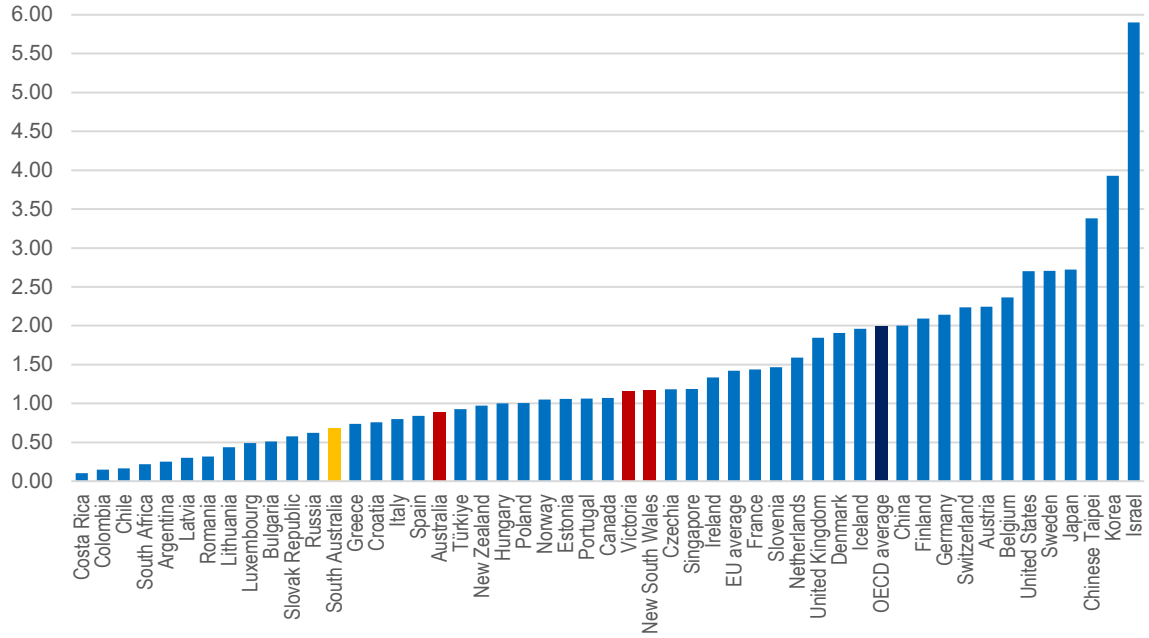
But to build a high-tech, high-income future for South Australia we should look towards international, rather than local, benchmarks. For example, North Carolina in the US shows that well targeted collaborations between industry, universities and the State Government can, over the long-term, use R&D to drive a significant improvement in relative economic performance (see Box 3). By international standards, South Australian BERD is even further below par; the OECD average is 2 per cent of GDP (Figure 3). This puts South Australia on par with Greece and Russia, rather than innovation intensive countries like the US, Germany and Japan.

Finding 7: Business spending on R&D is low in South Australia compared to other non-resource intensive states in Australia, or to other advanced economies.

Business spending on R&D is even higher in the US, at 2.7 per cent of GDP. If we benchmark ourselves against business R&D in the US by state, South Australia is around 40th (Figure 4). To

match North Carolina (Box 3), annual spending on R&D by business would need to triple to $3.2 billion.

Figure 3: Business expenditure on R&D OECD members and selected other countries, per cent of GDP, 2023 or most recent available year.



Source: OECD (2025), 'Main Science and Technology Indicators (MSTI database)', last updated March 2025, accessed 29 August 2025, ABS (2025), Research and Experimental Development, Businesses, Australia, 2023-24

Finding 8: Raising our R&D intensity to a level where it can make a real difference will require a substantial lift in business R&D over time. Matching New South Wales or Victoria would require an increase of 70 per cent, reaching the OECD average would require business R&D to more than double and matching North Carolina would require it to more than triple.

South Australia also lags in terms of innovation outputs, as measured by patent intensity.[30] South Australia produces 17 patents per 100,000 residents[31], which is low based on national and international benchmarks:

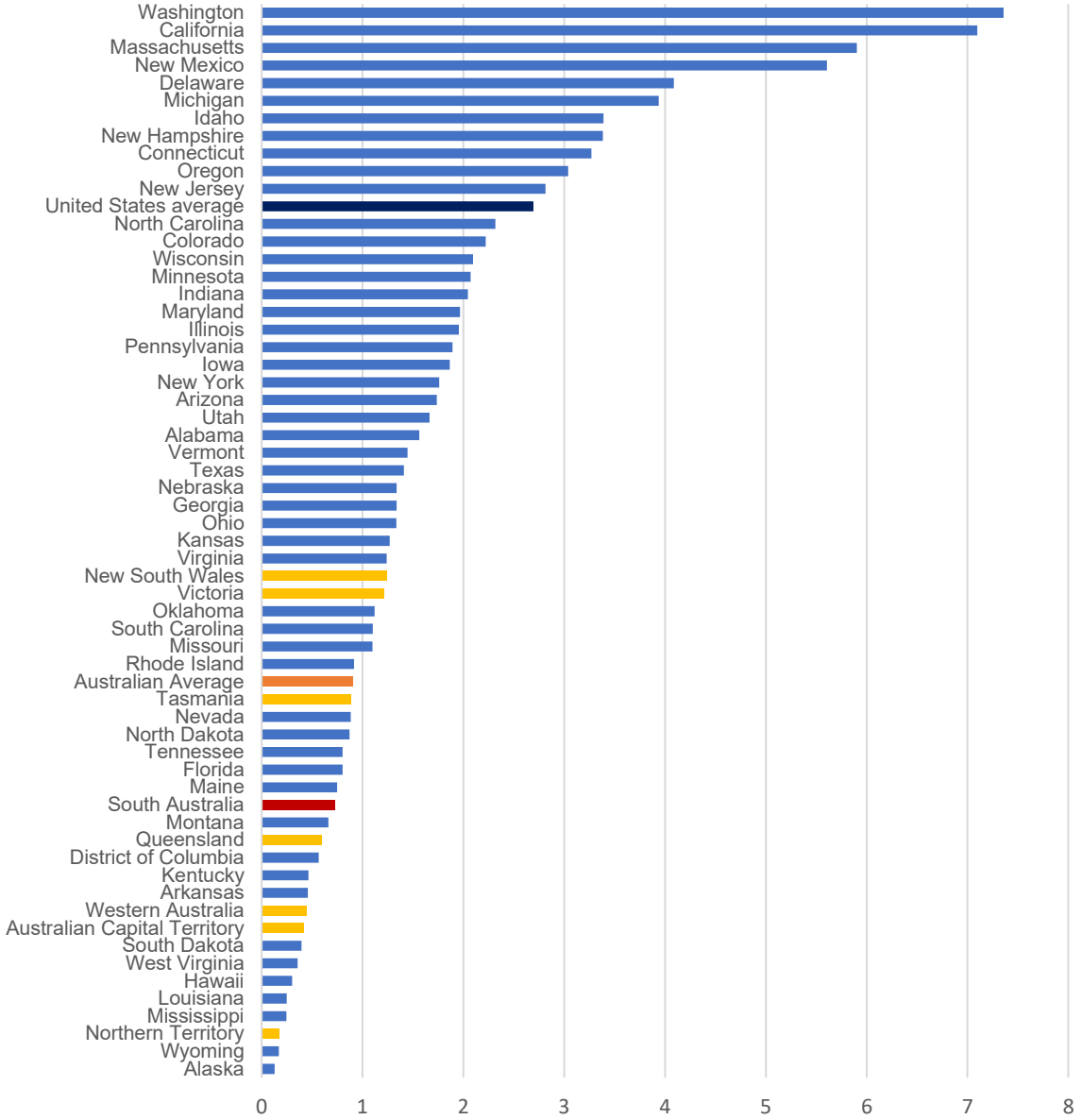
- South Australia has the second lowest patent intensity of the Australian states, ahead of only Tasmania.
- South Australia has a patent intensity equivalent to the 41st ranked US state. The top performing US states have patenting rates that are six times higher than South Australia.[32]

[30] Patents have the advantage of being an identifiable output of the R&D process, and representing decisions by businesses that their idea is valuable enough to warrant spending money to obtain a patent. However, they have some significant limitations as a measure of innovation because there are substantial differences between sectors in the extent to which businesses use patents to protect intellectual property rather than protecting it though secrecy. This means that it is possible that observed differences between regions in patent output could reflect differences in industry structure rather than a difference in research output.

[31] IP Australia (2025), IP Rights Overview dataset, ABS (2025) National, state and territory population

[32] United States Patent and Trademark Office (2021-2024), Performance and Accountability Report, US Census Bureau (2024) Annual Estimates of the Resident Population for the United States, Regions, States, District of Columbia, and Puerto Rico

Figure 4: Business expenditure on R&D in Australian and US states, per cent of GDP, 2023 for US data, 2022-23 for Australian data



Source: US Bureau of Economic Analysis (2024) Experimental estimates of R&D value added by state and performing sector, GDP by State, value add estimates converted to total expenditure using the ratio of US total RE&D value added and total US R&D expenditure, ABS (2025), Research and Experimental Development, Businesses, Australia, 2023-24

Box 3: North Carolina's Research Triangle[33] – transforming a region's economic prospects by linking its universities to industry

North Carolina shows the potential for world leading centres of research and teaching to transform regional economies.

In the early 1950s North Carolina was one of the poorest states in the US. Its economy was dominated by agriculture (particularly tobacco farming and processing), and it also dominated the US market for furniture making.

At that time, North Carolina had three strong research universities all located in fairly close proximity to one another.

Local business leaders recognised the strength of the local university sector and decided to use this to attract new firms to the region. Philanthropic donations were used to buy land for a Research Triangle Park (RTP) and establish an applied research institution located in the RTP to draw staff from the universities into projects addressing the needs of government and local industry.

An audit of the research and teaching strengths of the three universities identified pharmaceuticals, electronics and chemicals as high priority areas to pursue, and leading academics were used to make the approaches to firms. One professor in chemistry at UC-Chapel Hill reportedly met with 200 firms in 1958-59. The business case for firms to relocate was built not just around access to researchers but also easy access to a very high-quality pool of graduating students.

The success of the approach was only finally realised in the early 1960s when the State Government became actively engaged with the RTP. Visionary governor Terry Sanford saw the RTP as a solution to the state's lagging economy. He convinced the incoming Kennedy administration to establish the National Institute of Environmental Health at the RTP, and worked with local leaders to convince IBM to establish a substantial laboratory at the RTP.

IBM remains the single largest tenant at the RTP. The "research triangle" now accounts for 3.5 per cent of North Carolina's GDP, and has grown to include 4,000 technology firms and 600 life sciences firms. Organisations linked to the RTP and its surrounding ecosystem now employ 55,000 people (with 37 per cent employed in technology and 43 per cent employed in life sciences or research).[34]

Key commercial innovations coming out of the RTP include IBM's development of bar codes and bar code scanners, and RTI International's discovery and commercialisation of the breast cancer treatment Taxol.

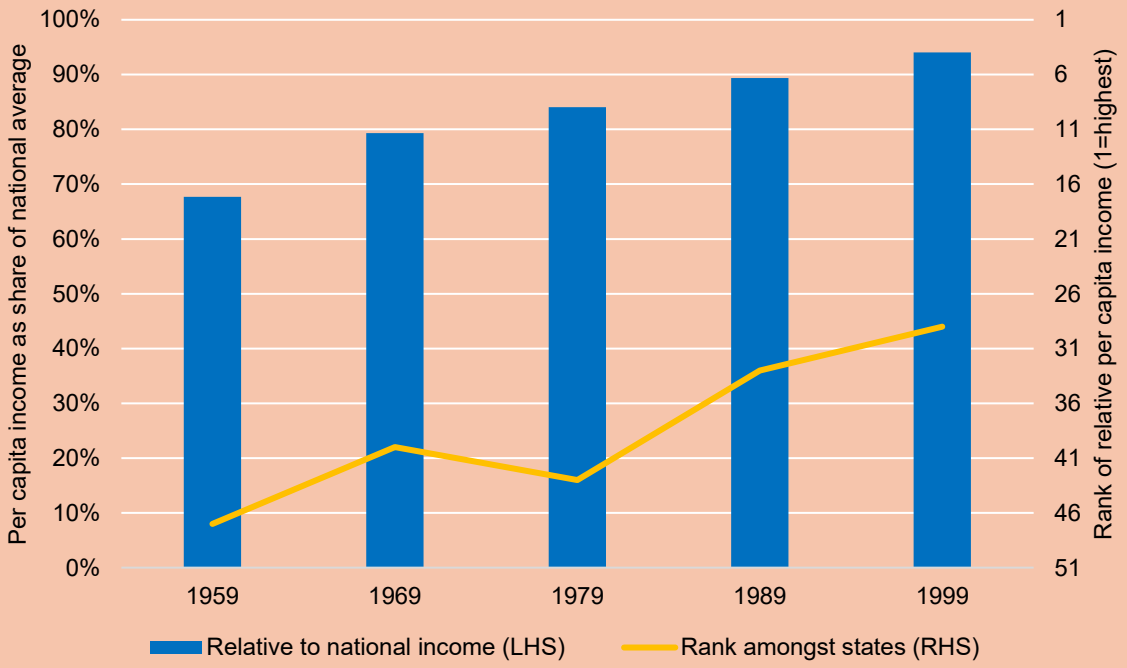
The RTP is broadly credited as being a key factor in improving North Carolina's economic outcomes. In 1959 North Carolina had per capita incomes that were just 68 per cent of the national average, and the state ranked 47th on incomes. A decade later incomes in North Carolina had

[33] The historical overview is based on: National Research Council (US) Committee on Competing in the 21st Century (2013), *Best Practice in State and Regional Innovation Initiatives; Wessner CW, editor. Best Practices in State and Regional Innovation Initiatives: Competing in the 21st Century*, Washington (DC): National Academies Press (US); VI. ANNEX B, North Carolina's Research Triangle Park, accessed 18 November 2025, available at: https://www.ncbi.nlm.nih.gov/books/NBK158811/; Kickler, T.L. (2025), 'Research Triangle Park', North Carolina History Project website, accessed 18 November 2025, available at https://northcarolinahistory.org/encyclopedia/research-triangle-park/; and CNBC (2024), 'How the Research Triangle has helped make North Carolina one of America's fastest-growing economies', accessed 18 November 2025, available at: https://www.cnbc.com/2024/09/16/how-the-research-triangle-helps-north-carolina-economy.html

[34] *Research Triangle Park Foundation (2024), RTP Economic Impact Study - Executive Summary, available at: https://aurp.memberclicks.net/assets/PDFs/2024%20Economic%20Impact%20Study%20Executive%5B82%5D.pdf*

grown to 79 per cent of the national average. By 1999 per capita incomes were 94 per cent of the average and North Carolina had risen to 29th rank by income.

Figure 5: Per capita incomes in North Carolina, as a share of the US average (per cent), and relative ranking among the 50 states + Washington DC, 1959-1999



Source: SAPC analysis of US Census Bureau (n.d.), Table S3: Per capita income by state, available at https://www2.census.gov/programs-surveys/decennial/tables/time-series/historical-income-states/state3.csv
Note: methodology changes mean that state level income data after 1999 is not strictly comparable with earlier data.

Finding 9: The experience of North Carolina shows that sustained collaboration between industry, universities and state governments can transform a region's economic prospects.

There are only 307 South Australian firms employing five or more staff which are R&D active (only 1.2 per cent of firms of South Australian firms of this size).[35] This is a lower share of R&D active firms than in either New South Wales or Victoria (see Table 1). Yet these firms are spending a similar amount on R&D to their New South Wales and Victorian peers. This suggests that a meaningful increase in R&D intensity is unlikely to come from this small group of firms already undertaking R&D in South Australia.

[35] *ABS BLADE microdata*, based on the number of firms reporting R&D Tax Incentive eligible expenditure to the Australian Tax Office. Given the financial incentive to report activities as R&D, and given differences in definitions, there may be some activity claimed as R&D for the tax incentive that would not be considered "true" R&D based on accepted definitions in Section 2.1. The 307 R&D active firms therefore likely to represent an upper bound of firms that are truly "R&D active". However, these factors are consistent across Australia and so the data on relative performance is likely to be reliable.

Table 1: R&D active firms, employing 5 or more people, 2022-23

	Manufacturing		Professional, scientific & technical services		Other		All firms	
	Share of firms R&D active (%)	Ave. spend per firm ($'million)	Share of firms R&D active (%)	Ave. spend per firm ($'million)	Share of firms R&D active (%)	Ave. spend per firm ($'million)	Share of firms R&D active (%)	Ave. spend per firm ($'million)
NSW & overseas	5.0	3.07	5.5	0.9	2.35	2.65	1.7	2.59
Vic., WA &Tas	5.2	3.51	5.6	0.9	2.36	2.18	1.7	2.54
Qld & NT	4.9	1.52	4.0	0.6	2.18	1.59	1.2	1.82
SA	4.0	2.35	4.8	0.6	3.07	2.00	1.2	2.50

Source: ABS BLADE microdata
Note: R&D active = claimed R&D tax credit, selected states were combined to preserve data confidentiality

Finding 10: Lower business spending on R&D in South Australia is mostly due to fewer firms undertaking R&D, while average spend per firm is comparable with the eastern states. This means lifting business R&D will require increasing the number of firms that can undertake, and see value in, R&D.

Low R&D intensity within the South Australian business sector partly reflects the characteristics of South Australian businesses. While South Australia has some highly entrepreneurial and world leading firms, the majority are small, low growth, and less dynamic, meaning they lack the resources and capabilities to initiate R&D activities.

Previous work by the Commission found that South Australian businesses are:[36]

- Mostly very small – 65 per cent are sole traders and 23 per cent employ less than five people.
- Less than half as likely to be 'high-growth firms' than the national average, with fewer high-growth firms in 19 industry sectors.
- Less dynamic, with lower rates of business entry and exit than other states.
- Generally more 'inward looking' in their innovation.
- Less likely to be exporting, with exports predominantly in primary industries (such as agriculture and mining) rather than more complex, higher value exports.

Consequently, the Commission previously concluded that most existing South Australian businesses lack the capacity to drive innovation or boost R&D intensity, and that policy should focus on expanding the pool of new businesses that can leverage R&D to enhance their competitiveness, especially through stronger engagement with universities.

Finding 11: The current characteristics of South Australian businesses make policies aimed at business led R&D less effective, at this stage, than in jurisdictions with a more innovative and dynamic business sector.

The largest single source of financial support for business innovation is the R&D tax incentive provided by the Australian Government, with an estimated budgetary cost of $4.6 billion in 2025-26. The Federal Budget also includes direct research funding to universities (around $4.7 billion),

[36] South Australian Productivity Commission (2023), Turning research into economic competitiveness for South Australia, Final Report, available at: https://www.sapc.sa.gov.au/inquiries/inquiries/turning-research-into-economic-competitiveness-for-south-australia/final-report.

funding for schemes that fund activities across business, universities and not-for-profits (such as the CRC program) ($3.3 billion) and own research activities ($2.5 billion).[37]

South Australian businesses claimed for 5.2 per cent of national R&D tax credit eligible expenditure in 2021-22.[38] If that share is maintained in 2025-26, then the R&D tax credit will provide around $240 million in funding to South Australian businesses. That is around six times South Australian Government funding of R&D and innovation, which is largely provided through the Department of State Development. In the 2025-26 Budget the Department of State Development was allocated $62.1 million to spend on 'Industry, Innovation and Science', including $39.7 million for various grant programs open to businesses and universities.[39]

The Australian Government's *Strategic Examination of R&D* is currently reviewing the range and scale of Australian Government supports for R&D, as well as ways to better focus the supports given around strategic priorities to deliver better outcomes from available funding.

Finding 12: There are a range of Australian and South Australian Government supports available for businesses undertaking R&D.

Previous work by the Commission mapped existing South Australian Government innovation programs against the OECD framework and found that "South Australia has a large number of innovation programs, but most are small and have limited funding. This makes them harder for business to navigate, and reduces their impact".[40] A wide range of existing initiatives exist – most commonly industry researcher placements in universities, collaboration infrastructure (including innovation precincts), networking and outreach activities, and R&D subsidies (see Appendix C).

OECD research suggests that policy effectiveness depends less on the proliferation of instruments than on their coherence, governance, and ability to scale promising initiatives.[41]

The Australian Government's *Strategic Examination of R&D* similarly concluded that nationally:

> *"There are too many programs, spread too thinly. We should be ambitious and target our efforts to build scale in areas of national need and global opportunity. Clear areas of focus are needed."*[42]

Finding 13: Research and innovation policy should focus on a small number of larger scale, strategic and high impact interventions.

Some State Government innovation programs have had success. For example, the bold and innovative decision in 2017 to provide $6 million in government funding over four years for the establishment of the Australian Institute for Machine Learning (AIML) helped build a world-leading

[37] Australian Government Department of Industry, Science and Resources (2025), 'Science, research and innovation (SRI) budget tables, available at: https://www.industry.gov.au/publications/science-research-and-innovation-sri-budget-tables

[38] SAPC analysis of *ABS BLADE microdata.*

[39] South Australian Government Department of Treasury and Finance (2025), 2025-26 Budget, Budget Paper 4 Agency Statements, Volume 4, p. 83

[40] South Australian Productivity Commission (2023), Turning research into economic competitiveness for South Australia, Final Report Section 2.1, available at: https://www.sapc.sa.gov.au/inquiries/inquiries/turning-research-into-economic-competitiveness-for-south-australia/final-report.

[41] OECD (2005). 'Governance of Innovation Systems,' available at: https://www.oecd.org/science/inno/34922613.pdf and OECD (2011), 'Regions and Innovation Policy;' available at: https://www.oecd.org/innovation/inno/regions-and-innovation-policy-9789264097803-en.htm.

[42] Denholm, R., Chubb, I., Wood, F., Cornick, K., (2025) Strategic Examination of Research and Development: discussion paper , p. 4,

research institute in South Australia, with Lockheed Martin as the foundation industry partner (see Box 4). AIML is now the largest AI and Machine Learning group in Australia, with significant research collaborations with the Commonwealth Bank of Australia and Qantas.

Box 4: Australian Institute for Machine Learning – South Australian Government catalysing world-class research and deep industry engagement[43]

The South Australian Government invested $6 million over four years in 2018 to launch the Australian Institute of Machine Learning, building on existing research strength at the University of Adelaide, particularly in computer vision, led by figures such as the founding director Professor Anton van den Hengel. This funding positioned AIML to compete for research talent that would otherwise have been drawn to larger interstate or overseas markets. It also enabled the Institute to deliberately pursue applied research and industrial partnerships, rather than focusing solely on academic outputs. This depth of expertise provided a strong research base, a pipeline of skilled graduates, and an established international reputation, all of which enabled the Institute to grow rapidly once it was formalised, from around 70 researchers (including research students) in 2018 to over 200 today.

A specific component of the initial investment from the South Australian Government was deliberately directing the Institute to engage with South Australian small and medium-sized enterprises. This reflected the structure of the state's economy and the recognition that artificial intelligence could support scale, productivity, and competitiveness in smaller firms. Two notable successes of this part of AIML's work are with local companies Cropify and Rising Sun Pictures. Both partnerships resulted in commercially meaningful outcomes (a new company using AI to automate the quality assessment of wheat in the case of Cropify, and a new world-leading technological capability at Rising Sun Pictures allowing the integration of actors' faces with historical footage).

While local industry engagement was an early priority, AIML has faced challenges in establishing contracts with South Australian businesses, as most are either too small to implement transformative innovations or operate in sectors less suited to integrating machine learning and AI into their operations.[44]

To date, AIML's most substantial growth has come through partnerships with national and global firms. In 2024, AIML signed an agreement with the Commonwealth Bank of Australia worth $6 million. Importantly, this investment is aimed at foundational artificial intelligence research relevant to the diverse needs the Commonwealth Bank of Australia, rather than at solving a specific business problem or automating a particular service. The Commonwealth Bank has estimated that the partnership "paid for itself" in the first three weeks, thanks to early innovations delivered through the collaboration.[45]

Alongside this direct funding of AIML, the Commonwealth Bank has also established a technology research centre in Adelaide to draw on its links with AIML and draw capabilities from AIML into the bank's technology development. This centre is planned to reach 150 staff. If this is achieved (and assuming their average salary is the IT average of $120,000), then the payroll tax revenue alone from this new Commonwealth Bank research centre would almost cover the cost of the State

[43] Australian Institute for Machine Learning (2024) Annual Report, available at: https://www.adelaide.edu.au/aiml/system/files/media/documents/2024-11/aiml-annual-report-2023.pdf. Commonwealth Bank (19 September 2024) 'Five-year partnership to boost foundational AI research in Australia'

[44] South Australian Productivity Commission (2023), Turning research into economic competitiveness for South Australia, Final Report, available at https://www.sapc.sa.gov.au/__data/assets/pdf_file/0008/934343/Turning-research-into-economic-competitiveness-for-SA-Final-Report-Master.pdf

[45] Hendry, J., (2024) 'CommBank AI research investment 'paid for itself' in three weeks', InnovationAus, available at CommBank AI research investment 'paid for itself' in three weeks

Government funding for AIML – Commonwealth Bank would be paying $0.9 million per year, AIML is currently getting around $1.5 million per year from the State Government.

Similarly, Qantas' 2025 decision to base its new Product Innovation Centre in Adelaide, with 420 technology roles and direct graduate recruitment pathways from AIML's students, shows how the presence of AIML has begun influencing national firms' geographic and workforce decisions. These partnerships have positioned AIML and South Australia as part of a broader global AI ecosystem rather than a primarily local one.

Finding 14: AIML shows that government, university and industry R&D collaborations can deliver for South Australia.

Overall, however, the data show that collectively, the innovation programs of the past four decades have failed to materially lift South Australian business spending on R&D, business engagement on innovation, or exports of complex goods and services.[46] Successive State Governments over this period have followed a broadly similar approach, implementing a large number of small, business grant focused programs. Their lack of impact in lifting R&D demonstrates the need for a new approach.

Finding 15: The existing policy framework has not lifted the R&D intensity of South Australian businesses. It is time for a different approach.

3.2 Public sector R&D spending is stronger

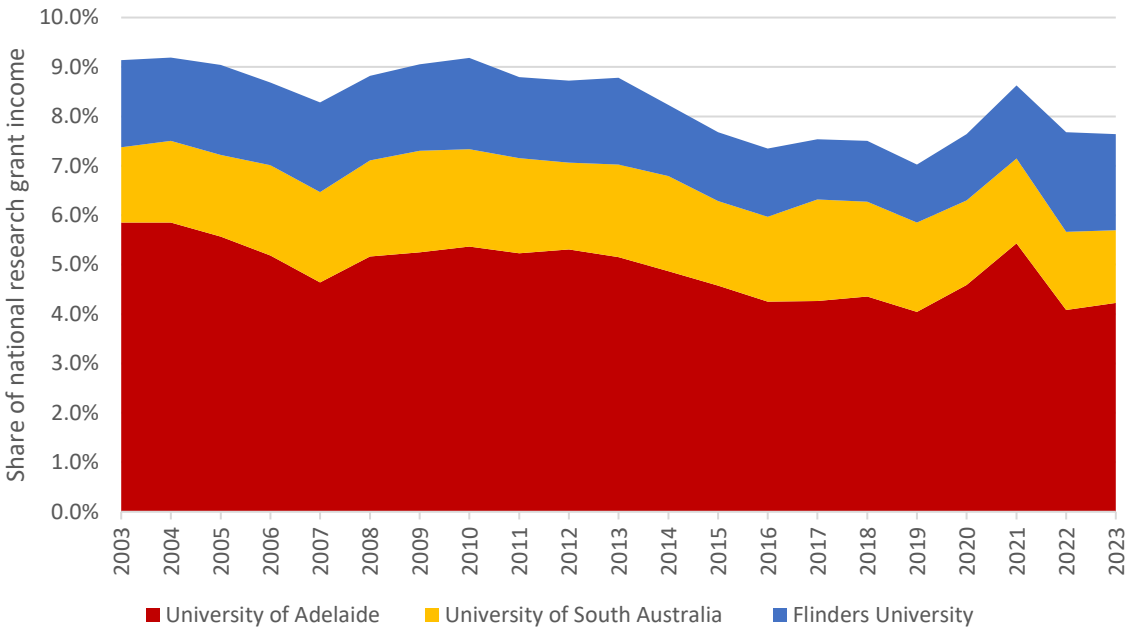
Despite low business spending on R&D, the share of total Australian spending on R&D in South Australia is only a bit below our population share of 6.9 per cent (Table 2).

Higher education institutions in South Australia spend $946 million on R&D.[47] This is almost as large as total R&D spending by all South Australian businesses. While this spending is roughly in line with our population share, our universities outperform in earning research income, securing 7.6 per cent of the national total in 2023 (Figure 6), and 8.7 per cent of the most prestigious peer assessed category 1 grants.[48]

Performance in securing laureate fellowships (targeted at world class researchers) have also been strong for South Australia, with 4 of the 51 (7.8 per cent) awarded to South Australian universities over the past 3 years.

[46] South Australian Productivity Commission (2023), Turning research into economic competitiveness for South Australia, Final Report, available at https://www.sapc.sa.gov.au/__data/assets/pdf_file/0008/934343/Turning-research-into-economic-competitiveness-for-SA-Final-Report-Master.pdf
[47] ABS (2024), Research and Experimental Development, Higher Education Organisations, Australia, 2022
[48] Australian Government, Department of Education (2024) 'Higher Education Research and Development Income time series (1992-2023)'

Figure 6: Research funding earned by South Australian universities, share of national total income



Source: Australian Government, Department of Education (2024) 'Higher Education Research and Development Income time series (1992-2023)'

Government research institutions are also a strength for South Australia, with spending of $578 million in 2022-23. South Australia accounts for 13.3 per cent of Australia's Government R&D, mainly through the Defence Science Technology (DST) Group.

Table 2: Research and development expenditure in Australia, by sector of performance, value ($'million) and share of national total, 2022-23

	Business		Higher education		Government		Private not for Profit		All R&D	
	$'millions	% of total	$'millions	% of total	$'millions	% of total	$'millions	% of total	$'millions	% of total
New South Wales	9,630.4	39.5	4,398.3	31.4	957.9	22.0	460.1	28.8	15,446.7	34.8
Victoria	6,952.9	28.5	4,092.4	29.3	1,098.8	25.3	793.5	49.7	12,937.6	29.2
Queensland	3,014.8	12.4	2,272.4	16.2	762.9	17.6	57.1	3.6	6,107.1	13.8
South Australia	**1,013.7**	**4.2**	**946.2**	**6.8**	**578.1**	**13.3**			**2,538.0**	**5.7**
Western Australia	1,961.8	8.0	1,106.6	7.9	308.1	7.1	130.7	8.2	3,507.1	7.9
Tasmania	356.4	1.5	216.6	1.5	154.7	3.6	1.4	0.1	729.1	1.6
Northern Territory	56.5	0.2	98.4	0.7	77.1	1.8			232.0	0.5
ACT	215.1	0.9	859.5	6.1	386.1	8.9	3.4	0.2	1,464.2	3.3
Overseas	1,208.8	5.0			20.8	0.5	50.1	3.1	1,279.7	2.9
Total	24,410.5	100.0	13,990.4	100.0	4,344.4	100.0	1,594.9	100.0	44,340.2	100.0

Note: Some columns may not sum to 100 due to rounding.
[a] R&D expenditures by the Private Not for Profit Sector are not available for South Australia or the Northern Territory.

Source: ABS (2025), Research and Experimental Development, Businesses, Australia, 2023-24; ABS (2024), Research and Experimental Development, Higher Education Organisations, Australia, 2022; ABS (2024), Research and Experimental Development, Government and Private Non-Profit Organisations, Australia, 2022-23

DST Group's large operations in South Australia has positive impacts on our research workforce and job prospects of young South Australian researchers. Yet evidence from the US indicates that, despite some important technologies emerging from defence research, additional spending *within*

government defence research institutes delivers limited productivity benefits to local businesses due to the inherent secrecy of their activities.[49] This suggests that the economic impact of Government R&D spending in South Australia may be less than the total spending suggests.

Flinders University is now one of Australia's fastest-growing research institutions, increasing its research income by 140 per cent in five years,[50] and ranking 21st globally in the 2025 Times Higher Education Impact Rankings.[51] The University of Adelaide ranks in the global top 100 for 16 subjects in the US News Best Global Universities and 15 subjects in the QS Subject Rankings.[52] Together, South Australia's major universities host 85 research institutes and centres (Appendix B).[53] Both institutions are developing focused research agendas which they are seeking to align to community needs and real-world impact.[54] The creation of Adelaide University will create a consolidated, larger scale, research-intensive university for the state.

Consultations revealed a growing focus on local industry engagement across the universities, with meaningful progress on issues such as access to intellectual property by industry partners, though it was noted that further improvements (particularly in conflict-of-interest and promotion processes, but also in timely intellectual property access in some cases) are still needed.

Finding 16: University associated research institutions represent the greatest current potential to boost South Australia's R&D capabilities, if they are linked to local industry needs.

3.3 South Australia needs more research and innovation skills

Innovation skills in the workforce are critical to a region's ability to undertake research and innovation. Any efforts to increase the level of R&D in South Australia will also increase demand for these skills, increasing their wages (and at least partly offsetting any benefits from increased R&D spending) unless we also increase the supply of these skills.

> *The availability of sufficient human resources for science and technology (HRST) is undoubtedly an important factor for innovation activities to take place… targets for significant increases in … R&D expenditure … will be possible only if there is sufficient growth in scientific and workforce skills.*[55]

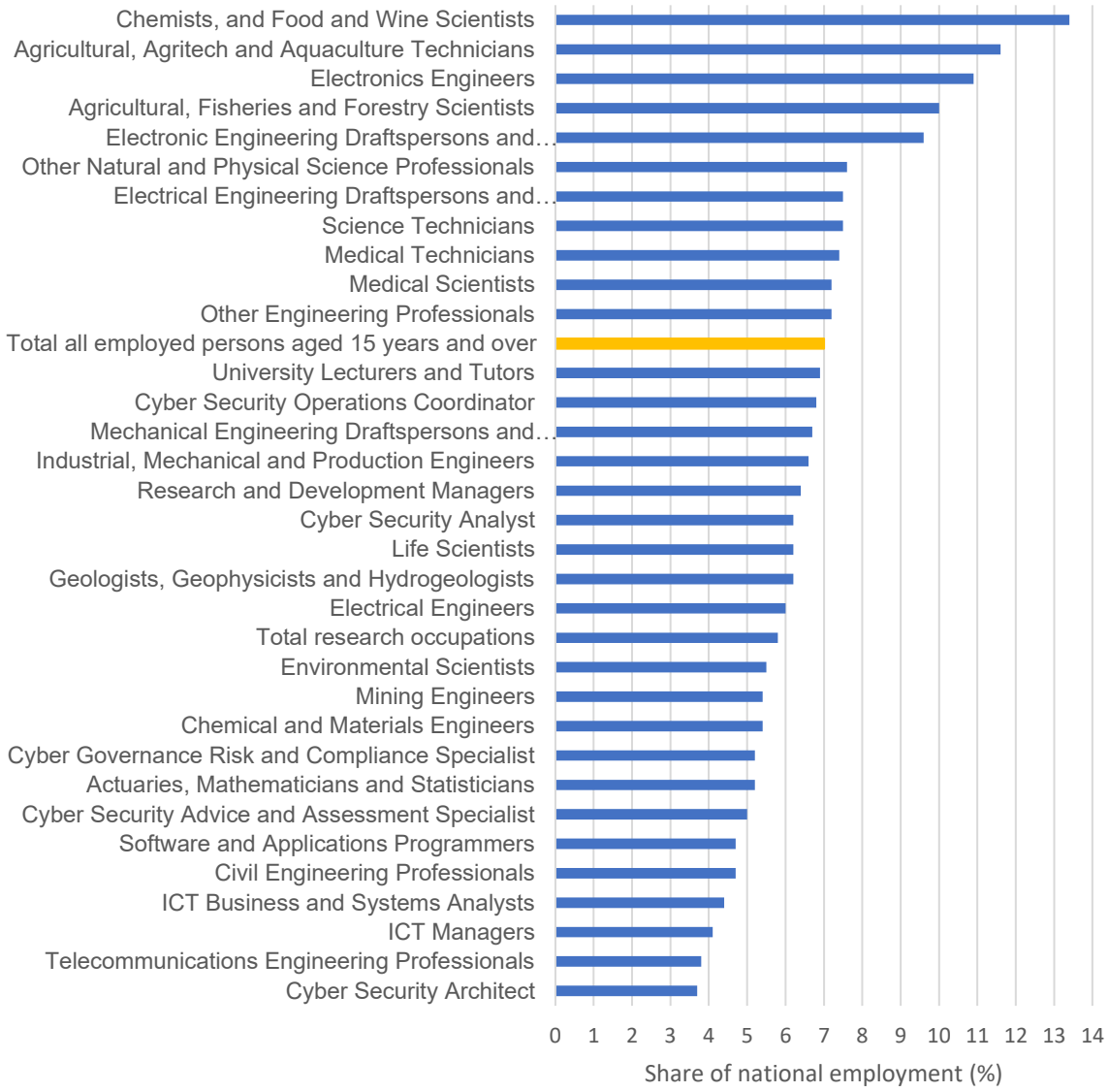
Measures to build the local research and innovation workforce – through local skills development, improved retention of skilled graduates, or increased skilled migration – have also been shown to be effective ways for governments to boost local research and innovation.[56]

[49] Fieldhouse, A.J. and K. Mertens (2023), 'The Returns to Government R&D: Evidence from US appropriations shocks', *Federal Reserve Bank of Dallas Working Papers,* No. 2305
[50] https://news.flinders.edu.au/blog/2024/06/13/flinders-universitys-health-and-medical-research-building-sets-a-benchmark-for-health-innovation/
[51] https://www.flinders.edu.au/about/impact-rankings
[52] https://www.uni.adelaide.edu.au/about/world-rankings
[53] Lists taken directly from the university websites. Some of the institutes listed are short term collaborations for a specific purpose, such as Cooperative Research Centres (CRCs), rather than ongoing research centres with a separate existence. The research structure for the newly merged Adelaide University is yet to be decided.
[54] https://www.flinders.edu.au/wicked-problems, https://adelaideuni.edu.au/content/dam/adelaideuniversity/documents/research/pdfs/AU-Research-Strategy.pdf
[55] Jaumotte, F. and N. Pain (2005), "An Overview of Public Policies to Support Innovation", *OECD Economics Department Working Papers*, No. 456, OECD Publishing, Paris, https://doi.org/10.1787/707375561288
[56] Bloom, N., J. Van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184; Griffith, R., S. Redding & J. Van Reenen (2004), 'Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Industries', *The Review of Economics and Statistics*, 86:4, pp. 883-895,

Finding 17: South Australia must increase the supply of innovation skills in order to increase business R&D activity.

While South Australia has considerable skills around defence and agricultural (including wine) research and innovation, the state lacks skills in ICT and certain segments of engineering and science (Figure 7).

Figure 7: South Australian share of national employment in innovation occupations, per cent of national total, 2021



Source: ABS (2021), 2021 Census - counting persons, place of usual residence, [Census TableBuilder][57]

[57] Unfortunately, detailed data by occupation is only available at the Census of Population and Housing and so the available data is now four years old. Analysis of the less detailed data that is available for the current year suggests that these patterns of relative strengths and weaknesses appear to have held, with ICT remaining an area in which South Australia has a particularly low share of national employment.

Box 5: Codan – shows the benefits of keeping talented, entrepreneurial young people in South Australia working in their field

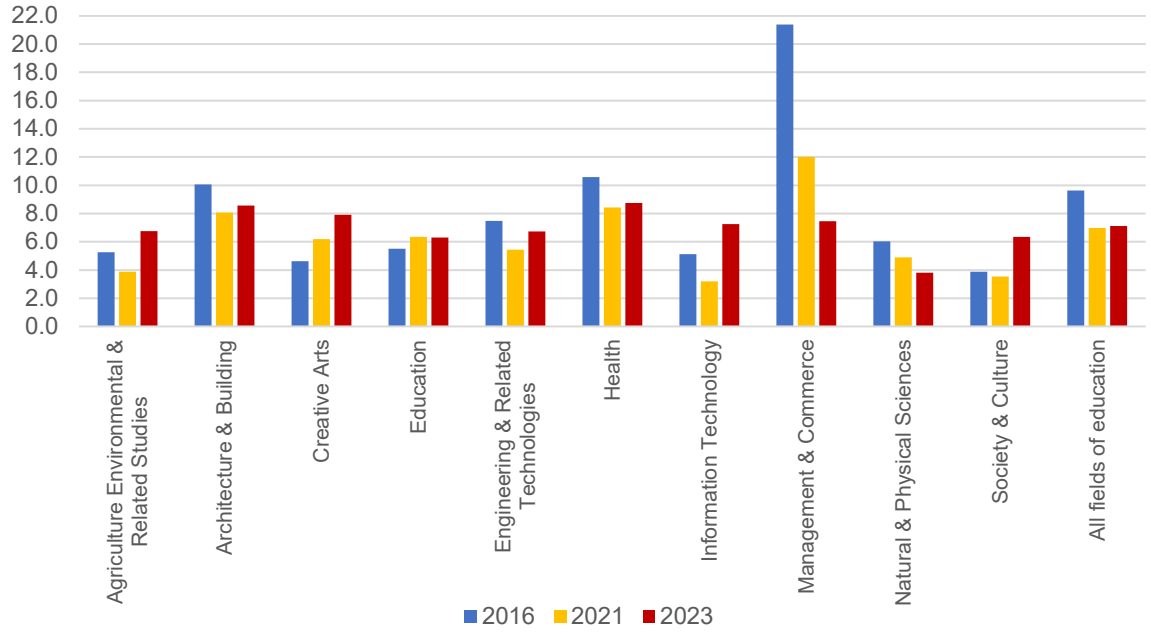
Small economies like South Australia can reap significant benefits if our talented young people are able to stay in the state to do interesting work in their field.

Codan is a great South Australian example of this. It started in Adelaide in 1959 because two talented and entrepreneurial young South Australians – Alastair Wood and Ian Wall – built their careers as electrical engineers in South Australia working at Phillips. They left Phillips to commercialise their own innovative ideas by founding the company that would grow into Codan alongside their friend Jim Bettison. Through on-going R&D and innovation Codan has grown to over 1,000 employees globally and a market capitalisation of over $5.5 billion. It holds a dominant position in the international metal detector market through MineLab and a significant presence in the international communications market focused on high-demand environments such as military and public safety. As well as these direct benefits, Pamela Wall, the wife of the late Ian Wall is now one of South Australia's most prominent, respected and generous philanthropists.

Finding 18: As Codan shows, giving talented young South Australians more places to build their talents and careers here, rather than interstate or overseas, is an important ingredient in producing new innovative firms in South Australia.

These gaps are less obvious in the education system, with South Australia's share of national postgraduate award completions at or above our population for most fields of study, including in ICT (Figure 8).

Figure 8: South Australian postgraduate award completions, by field of study, South Australian share of national total, selected years.

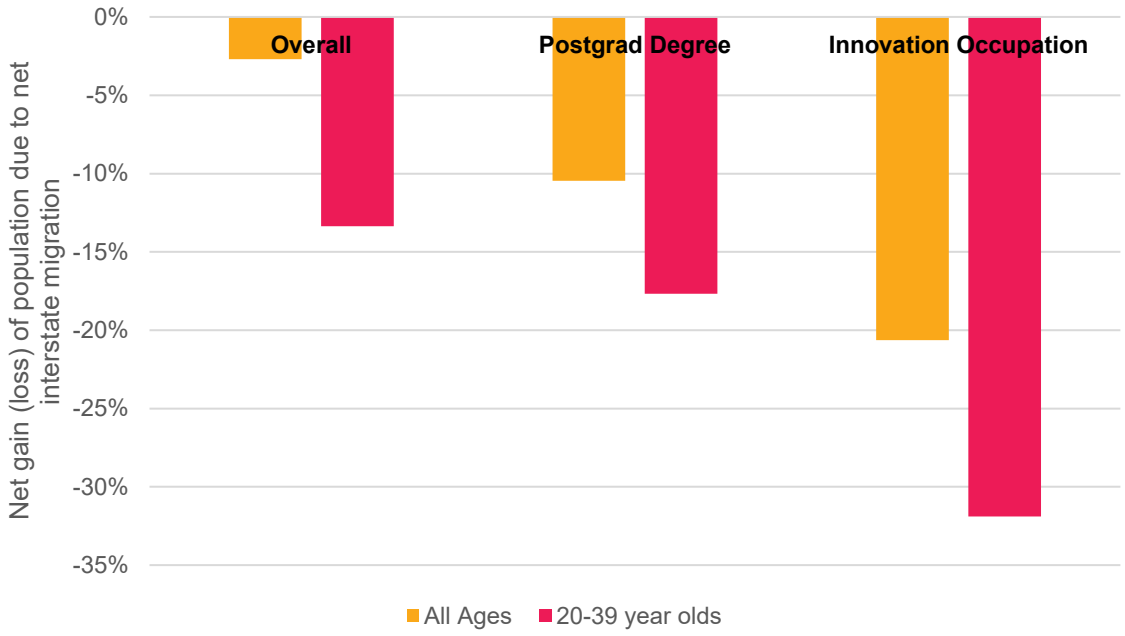


Completions include domestic and international students, so may overstate the potential innovation workforce as only some international students will stay.
Source: Australian Government Department of Education (2024), Selected Higher Education Statistics – 2023 Student data

Outputs from education overstate the availability of innovation skills in South Australia because we have disproportionately lost skilled young people – particularly young people with postgraduate

degrees and in innovation occupations – via net interstate migration.[58] While South Australia experienced 3 per cent more interstate departures than it did arrivals overall from 2016 to 2021, there were 10 per cent more postgraduate degree holders and 21 per cent more innovative workers who departed the state than moved to it. These losses were even larger among 20- to 39-year-olds (Figure 9).

Figure 9: Net gain or loss, shown as percentage of total arrivals, by skill level from net interstate migration, South Australia, 2016 to 2021



Source: SAPC analysis of ABS (2022), 2021 Census of population and housing, Tablebuilder dataset

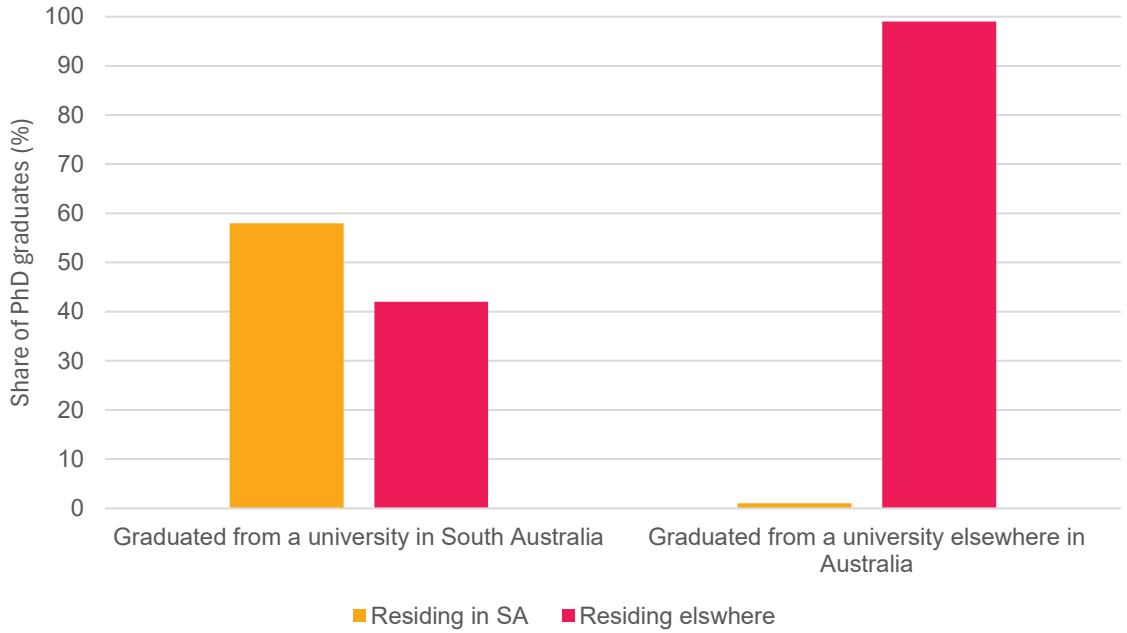
The net outflow of young people from South Australia over the past three decades largely explains the gap between relatively strong education outcomes yet low numbers of innovation workers. It also means that we have been increasingly reliant on international migration to fill gaps in our innovation skills. However, that has limitations as South Australian businesses are much less likely than those interstate to make use of business sponsored migration to meet their specific skills needs. For example, in 2023-24 South Australian firms were responsible for 3.2 per cent of employer sponsored permanent skilled visa stream outcomes, less than half the state's population share.[59] And demand driven migration such as the skilled independent visa categories which account for the bulk of South Australian skilled migration have problems with skills mismatch and lack of recognition of qualifications which mean that many skilled migrants to South Australia end up working outside their field, usually in lower skilled jobs.[60]

There is a similar asymmetry in the flow of graduates with PhDs into and out of South Australia. Of the 608 students who graduated with a PhD from a South Australian university in 2017-18, 58 per cent were resident in South Australia five years later, a net outflow of 254 PhD graduates. This outflow of the most highly trained students from South Australia was not matched by a commensurate inflow from the other states: of the 7,482 students who graduated with a PhD from a

[58] SAPC analysis of Census data.
[59] SAPC analysis of Department of Home Affairs data.
[60] Gamble, H., A. Cebulla and G. Tan (2023), 'Migrants Skills Mismatch: Analysis of Multi-Agency Data Integration Project Data, Adelaide: Australian Industrial Transformation Institute, Flinders University of South Australia, https://doi.org/10.25957/syzv-tk81

university elsewhere in Australia in 2017-18, only 102 (around 1 per cent) made South Australia their home five years later.

Figure 10: PhDs graduates in 2017-18 by their location of residence in 2022-23, per cent



Source: SAPC analysis of data from ABS DataLab (graduating campus location from Department of Education, Higher Education 2005 – latest residential location from Australian Taxation Office, Payment Summaries)

Finding 19: Creating a wider range of rewarding research and innovation career opportunities for South Australian graduates is important to reduce the brain drain and build our research and innovation talent.

3.4 South Australia's characteristics suggest that activities that are proximate to our universities are a good place to start boosting R&D intensity

Research-intensive universities are essential for productivity growth. Universities train and employ researchers who push the frontier of new knowledge, educate graduates who bring new skills and ideas to the workforce, provide the physical infrastructure that makes new discoveries possible, and play a pivotal role in the diffusion of knowledge and ideas throughout the economy.[61]

In Australia, there is some evidence at the national level suggesting that government funding of university R&D is more effective at raising productivity growth than other forms of R&D funding (such as R&D tax incentives).[62] International research has tended to find the economic benefits of R&D taking place in universities is broadly similar to the benefits of business R&D, particularly

[61] Leigh, A. (2025), 'Degrees of growth: How universities help drive productivity', available at: https://ministers.treasury.gov.au/ministers/andrew-leigh-2025/speeches/address-group-eight-go8-dialogue-leveraging-research-and

[62] Fox, K. (2023), "Impacts of Public R&D Funding on Innovation and Productivity', presentation to NZ Treasury, available at: https://www.treasury.govt.nz/sites/default/files/2023-11/tgls-productivity-kevin-fox-2023-11-29-slides.pdf

where there is a good match between the research specialisations of universities and their local business sector.[63]

Previous Commission work found that universities play an outsized role in South Australia's innovation ecosystem, largely because the state's business sector has relatively low R&D spending and innovation intensity. Strengthening university-industry links therefore represents a key opportunity to boost R&D and its returns.[64]

Finding 20: Government interventions to increase R&D intensity can be highly effective when delivered through public research institutions and well matched to the local business sector.

To maximise the economic benefits of our universities' research, we need to focus efforts in areas of strategic impact and bridge the gap between university research and the real-world problems that businesses are trying to solve. Evidence shows that public investment in R&D delivers the biggest boost to productivity when it works hand in hand with private sector research and innovation.[65] And, in particular, where there is a small 'technological distance' between the research being undertaken in universities, and the needs of potential business sector users.[66] In Australia a good example of this is the productivity benefits broadacre cropping farmers have realised from substantial Government and university investment in developing crop varieties tailored to Australian conditions.[67]

This is also an important theme of the Australian Government's *Strategic Examination of R&D*, which is proposing a funding system for translational research that is tightly focussed on a small number of national priorities with substantial engagement and capability in Government, research institutions and business.[68]

Finding 21: South Australian R&D support should be focused in areas of local capability, economic opportunity, and local and national strategic importance.

[63] Soete, L., B. Verspagen and T.H.W. Ziesemer (2022), 'Economic Impact of Public R&D: an international perspective', *Industrial and Corporate Change*, 31:1, pp. 1-18; Guellec, D. ad B. van Pottelsberghe de la Potterie (2000), 'The Impact of Public R&D Expenditure in Business R&D, *OECD Science, Technology and Industry Working Papers*, 2000/04; Orlando, M.J. (2000), On the Importance of Geographic and Technological Proximity for R&D Spillovers: An empirical investigation', *Federal Reserve Bank of Kansas City Working Papers*, no. RWP-00-02

[64] Turning Research into Economic Competitiveness for South Australia, available at: https://www.sapc.sa.gov.au/inquiries/inquiries/turning-research-into-economic-competitiveness-for-south-australia/final-report.

[65] Soete, L., B. Verspagen and T.H.W. Ziesemer (2022), 'Economic Impact of Public R&D: an international perspective', *Industrial and Corporate Change*, 31:1, pp. 1-18

[66] Orlando, M.J. (2000), On the Importance of Geographic and Technological Proximity for R&D Spillovers: An empirical investigation', *Federal Reserve Bank of Kansas City Working Papers*, no. RWP-00-02.

[67] Australian Grain Technologies and SA Grain Industries Trust Fund (2016), '100 Years of Wheat Breeding at Roseworthy', available at: https://cdn.agtbreeding.com.au/docs/general/agronomy_fact_sheet_feb_2016.pdf

[68] Denholm, R., Chubb, I., Wood, F., Cornick, K., (2025) Strategic Examination of Research and Development: discussion paper

4. Build Talent not Buildings to Boost R&D Intensity

Talented people are the driving force behind R&D. Ideas come from people and are spread by people. It is often the most talented minds who push the limits of possibility. New ideas flow through human connections – the movement of people between organisations, collaborations between organisations, and building a deep pool of skills and talent that all firms in a region can draw on to power their innovation. This means that the benefits of R&D flow in two directions – by generating spillovers to other firms, and by increasing a firm's capacity to benefit from research spillovers generated elsewhere.[69]

This makes talent one of the world's most valuable resources for driving innovation and securing our economic future, and an important focus of R&D policy. Experts are increasingly recognising the critical role of talent in driving innovation and growth, and the "economics of talent" is an emerging and rapidly developing field of research.[70] In the Australian Government's *Strategic Examination of R&D* stakeholders viewed attracting global talent as "essential".[71] Local experts we consulted also emphasised the importance of attracting world leading talent to South Australia, recognising that regions and businesses around the world now find themselves in a global battle for talent, with the winners set to dominate the economies of the next century.

Finding 22: If we want to be able to deliver world-class business research, development and innovation in South Australia we need to build, retain and attract world-class research talent.

4.1 The returns to talent are becoming increasingly concentrated in star researchers and leading research teams

Success in many areas of life is concentrated towards those who are at the top of their field. For example, a footballer in one of Adelaide's Division 1 teams could play rings around almost all of us. But put them on the field against an AFL team and the performance gap would make it seem like they were playing different sports.

This is also true in research and innovation. The best researchers (and research teams) are responsible for a disproportionate share of highly cited research, valuable patents, and commercialisation outcomes. Star inventors matter most for aggregate innovation. US research shows that the financial returns to innovation are highly skewed and highly correlated with their scientific impact – the highest paid 1 per cent of inventors earn more than 22 per cent of total inventors' income.[72]

The presence of a research star boosts the output of other researchers in related fields at their institution: working at a university with star researchers in their field boosts academics' research output by 50 to 60 per cent compared with academics working at a university without stars. Star researchers also attract other star researchers, generating geographically concentrated areas of knowledge generation. For example, Stanford University generates more publications in top

[69] Audretsch, D.B. and M. Belitski (2020), 'The role of R&D and knowledge spillovers in innovation and productivity', *European Economic Review*, vol 123; Audretsch, D.B. and M. Belitski (2022), 'The knowledge spillover of innovation', *Industrial and Corporate Change*, vol 31, pp. 1329-1357

[70] A good overview of the breadth of the emerging literature is provided in the March 2025 edition of the International Monetary Fund's Finance and Development Magazine, available at: https://www.imf.org/en/-/media/files/publications/fandd/article/2025/03/the-talent-equation-fd-mar25.pdf

[71] Denholm, R., Chubb, I., Wood, F., Cornick, K., (2025) Strategic Examination of Research and Development: discussion paper, Department for Industry, Science and Resources, Government of Australia

[72] The results use panel data covering virtually all inventors in the US from 1996 to 2012, based on a dataset linking patent records to income tax records. Social/scientific impact is measured by number of citations in subsequent patents. Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Do Tax Cuts Produce More Einsteins? The Impacts of Financial Incentives vs. Exposure to Innovation on the Supply of Inventors', *NBER Working Paper 25493*

biomedical journals than France and Canada combined.[73] Similarly the establishment of the Interuniversity Microelectronics Centre (IMEC) in Belgium around a core of world-class researchers in semiconductor research has created a world-leading centre for research in nanoelectronics and digital technology (see Box 6).

Finding 23: Star researchers significantly boost research output, not only because of their own achievements but also because they boost the other researchers around them.

Box 6: Interuniversity Microelectronics Centre (IMEC), Belgium – backing regional talent to create a global powerhouse

A relatively modest €62 million investment from the Flemish Regional Government backed local world class researchers to create IMEC, as an institute devoted to pushing the boundaries of semiconductor manufacturing which is now "the world's largest independent research and innovation centre for nanoelectronics and digital technology".[74]

IMEC has grown from an initial staff of 70 in 1984 to 6,000 people (including research students and secondees from industry partners),[75] and an annual budget equivalent to around AUD$1.5 billion.[76] This is larger than the University of Adelaide's turnover, which was just over $1.3 billion in 2024.

Three quarters of IMEC's funding now comes from private companies it collaborates with and the remainder mainly comes from the Flemish Government and the European Union.[77]

IMEC's business model allows corporate partners to place their own researchers alongside IMEC's, with (non-proprietary) knowledge sharing amongst not only that partner and IMEC, but other partners contributing to IMEC research, and clear agreement structures identifying the sharing of any intellectual property generated.[78] In addition to its research partnerships, IMEC has multiple programs aimed at start-ups.

While IMEC has been a strong success and has seen many of the start-ups it has worked with secure further funding, none of these has yet grown into a 'large scale-up' of 500+ employees.[79] A lack of relevant manufacturing capacity in Belgium (and Europe at large) has also meant that IMEC's R&D strengths have not led to large-scale semi-conductor manufacturing employment in Belgium, with IMEC reliant on research links with foreign partners.[80]

IMEC's example shows that relatively modest regional government investments in research stars can have very significant impacts in terms of building large scale, sustainable research strength with extensive business support. It demonstrates that to achieve this, the area of research needs to

[73] Chandra, A. and C. Xu (2025), 'Where Discovery Happens: Research Institutions and Fundamental Knowledge in the Life-Sciences', *NBER Working Paper Series*, No. 33996, July 2025.
[74] Mina, A, Connell, D & Hughes, A (2009), 'Models of Technology Development in Intermediate Research Organisations' *Centre for Business Research, University of Cambridge Working Paper No. 396; IMEC (2025), About IMEC, https://www.imec-int.com/en/about-us*
[75] IMEC (2025), *IMEC Annual and Sustainability Report 2024*, viewed 12 November 2025, <https://drupal.imec-int.com/sites/default/files/2025-04/annual_and_sustainability_report_imec_2024.pdf>
[76] At current exchange rates; De Decker, V, and Loiseau, M (2025), 'Semiconductors and Statecraft: Belgium's Role in Europe's Technological Sovereignty', *Egmont Policy Brief 378, Royal Institute for International Relations.*
[77] De Decker, V, and Loiseau, M (2025), 'Semiconductors and Statecraft: Belgium's Role in Europe's Technological Sovereignty', *Egmont Policy Brief 378, Royal Institute for International Relations.*
[78] Mina, A., Connell, D., and Hughes, A., (2009), 'Models of Technology Development in Intermediate Research Organisations', *Centre for Business Research, University of Cambridge Working Paper No. 396*.
[79] De Decker, V, and Loiseau, M (2025), 'Semiconductors and Statecraft: Belgium's Role in Europe's Technological Sovereignty', *Egmont Policy Brief 378, Royal Institute for International Relations*
[80] Mina, A., Connell, D., and Hughes, A., (2009) 'Models of Technology Development in Intermediate Research Organisations', *Centre for Business Research, University of Cambridge Working Paper No. 396* and De Decker, V, and Loiseau, M (2025), 'Semiconductors and Statecraft: Belgium's Role in Europe's Technological Sovereignty', *Egmont Policy Brief 378, Royal Institute for International Relations.*

match local capabilities and have strong global commercial relevance, the supported academics need to be very entrepreneurial in building relationships with industry, and the researchers need to pursue deep engagement with industry partners nationally and globally.

The financial returns to innovation are also concentrated at the top. In the US, the average income at age 40 to 50 of an inventor with a patent in the top 1 per cent of citations was $1.6 million, while the average income of an inventor whose patent had the median number of citations was $116,000.[81]

Finding 24: The financial benefits of invention flow disproportionately to a small share of the most successful inventors, making securing them potentially significant for regional incomes.

4.2 Star researchers boost local business innovation

Star researchers who actively collaborate with local businesses can also boost the R&D output of their local business sector. There is evidence that star scientists who collaborate with industry can significantly boost the entry rates, survival rates, and employment growth of new high-tech firms associated with their field.[82]

For example, collaborations with star scientists have been shown to increase the survival rate of start-up pharmaceutical firms: ten-year survival rates were 80 per cent for firms with a star-researcher collaborators compared with 17 per cent for firms without such a collaborator. Amongst surviving firms, employment growth was also significantly higher for firms with greater levels of collaborations with stars. Over five years, biotechnology companies with two collaborations with star researchers had four times the employment growth of firms with no collaborations, and firms with five or more collaborations had employment growth that was nine times higher.[83]

Star talent with strong research credentials can also drive innovation by moving into industry and applying their skills directly to commercial challenges. South Australia offers several notable examples of this, including rocket scientist and Fleet Space Technologies Co-founder Flavia Nadini (see Box 2), and talented University of Adelaide engineering students Alastair Wood and Ian Wall who established Codan with Jim Bettison (see Box 5).

Figure 25: Star researchers don't just boost local research, they also boost new firm formation and firm success in industries related to their research.

4.3 Research talent is very mobile, and seeks out complementary talent

Talent is also very mobile. A recent study has found that the US has more than five times as many high potential mathematicians (defined as International Mathematical Olympiad gold medallists) living there than it produced. Australia, by contrast, only hosts 80 per cent as many IMO gold medallists as it has produced.[84]

Movement of talent has been linked to the increasing concentration of innovation in a small number of key cities. This geographic concentration of innovation has been significant over recent decades.

[81] Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Who Becomes an Inventor in America? The Importance of Exposure to Innovation', *NBER Working Paper No. 24062*

[82] Zucker, L.G. and M.R. Darby (2007), 'Star Scientist, Innovation and Regional and National Immigration', *NBER Working Paper Series*, No. 13547, October 2007.
For the purposes of their study Zucker and Danby defined star scientists as someone who is one of the 250 most highly cited scientists in ISI's web of science rankings in any of the 21 fields of research included.

[83] *Ibid*

[84] Agarwal, R., I. Ganguli, P. Gaulé and G. Smith (2023), 'Why US immigration matters for the global advancement of science', *Research Policy*, vol. 53.

For example, in 1975-79 the six US "tech-clusters"[85] accounted for 11 per cent of US patents, by 2015-19 this had tripled to 34 per cent.[86] This is supported by a body of literature showing that many skilled postgraduate migrants are attracted by centres of excellence in research and better opportunities for research funding.[87]

The concentration of talent, and the extent to which it tends to cluster, creates both risks and opportunities for South Australia as a small, open state. It is easy for South Australia to lose home grown talent to more exciting or dependable opportunities elsewhere. And there is evidence that we have been losing talent to the rest of the world (see Section 3.3).

Finding 26: Migration of talented people to collaborate with peers appears to be one of the most important factors in creating clusters of R&D led economic success such as Silicon Valley.

But it also gives South Australia an opportunity. With the right plan, cleverly executed and sustainably funded, we can significantly boost our talent. Current geopolitical tensions, and Australia's status as a safe haven in an increasingly risky world, mean this is one of the best opportunities we will have to repatriate home grown and also attract new talent to our state.

Some types of talent are simply impractical to try to attract, both because we lack a deep enough base of existing talent and because it would be unaffordable. For example, the finance sector is concentrated in a few global centres which offer a very wide range of highly paid career opportunities as well as high-end lifestyle opportunities that are not viable in less wealthy cities, and wages in those centres are well above what could be realised in South Australia. Top partners in London law firms working on private equity deals can earn AUD$30 million per year, and graduate salaries at the most prestigious law firms are around AUD$300,000.[88] In contrast, we have a base of existing talented academics at our universities on which to build upon, and the lifestyle afforded on an academic salary in Adelaide compares favourably with the best in the world. This is an advantage for South Australia compared to many larger global cities.

Finding 27: Geopolitical tensions mean that there have been few better times to try and attract new and returning research stars to South Australia.

The important role of local quality of life, and its affordability, in attracting research talent means that in addition to innovation specific policies, the broader effectiveness of a regional government is an important tool to attract skilled workers.

[85] San Francisco, Boston, Seattle, San Diego, Denver and Austin.
[86] Chattergoon, B. and W.R. Kerr (2021), 'Winner Takes all? Tech Clusters, Population Centers and the Spatial Transformation of U.S. Innovation', *NBER Working Paper Series*, No. 29456, November 2021
[87] For examples, see Cañibano, C., D'Este, P., Otamendi, F.J. et al. Scientific careers and the mobility of European researchers: an analysis of international mobility by career stage. High Educ 80, 1175–1193 (2020). https://doi.org/10.1007/s10734-020-00536-z and Han, F., Zhang, R., Zhang, S., Yuan, J., International mobility characteristics, effects of, and effects on elite scientists, Journal of Informetrics, Volume 18, Issue 1, 2024, 101485, ISSN 1751-1577, https://doi.org/10.1016/j.joi.2023.101485.
[88] https://www.afr.com/companies/professional-services/30m-a-year-how-us-lawyers-are-shaking-up-london-s-magic-circle-20240726-p5jwwa

Places that can deliver great schools, quality healthcare, safe neighbourhoods and efficient transport have an advantage in the global race for research talent. Adelaide regularly ranks in the top 10 on the Economist Intelligence Unit's Global Liveability index,[89] and was declared Australia's happiest city (29th globally) in 2025 by The Institute for Quality of Life.[90]

Finding 28: Adelaide's quality of life, geopolitical stability, and relatively low cost of living, is a comparative advantage in attracting star researchers.

4.4 The low rate of business R&D in South Australia also reduces the size of our future pool of inventors and innovators

How likely someone is to become an inventor is very heavily influenced by the wealth of their families, and whether they were exposed to inventors as role models when growing up. A young person whose family is in the top ten per cent of household incomes in the US is around ten times more likely to have patented an invention by the time they are 40 than someone growing up in a household that is in the bottom 10 per cent of incomes (Figure 11).[91] This skew even holds true at relatively high levels of household wealth.[92]

Women and people from historically underrepresented ethnic backgrounds are also much less likely to become inventors, even when controlling for factors such as household income and education. US data suggest that this underrepresentation is caused by lower exposure to inventors and role models. In the case of young women, what matters is not the total number of inventors in their local area, but the number of female inventors.[93]

This means that there is a significant amount of unrealised potential for invention. Increasing exposure to innovation among children who excel in maths and science at early ages, but come from under-represented groups, can have large impacts on aggregate innovation. One study estimates that if exposure to inventors among these traditionally underrepresented groups (including women and children from lower income families) were doubled then the number of young people from these underrepresented groups who go on to become inventors would also double, with no reduction in the average quality of inventions.[94]

Finding 29: Lack of exposure to inventors means that there is substantial unrealised potential for invention amongst women and people from low-income households.

The current underperformance of business R&D in South Australia is not just reducing current productivity and economic growth, it is also reducing our future pool of inventors by providing fewer role models for young would-be inventors.

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[89] https://en.wikipedia.org/wiki/Global_Liveability_Index and https://www.eiu.com/n/store/products/special-reports/2025-liveability-ranking-report/).

[90] Adelaide was the only Australian city to rank in the "golden tier" of cities, with particularly high scores on health, mobility and environment. https://happy-city-index.com/Adelaide/ See article and Adelaide - Golden Cities Profile - Happy City Index.

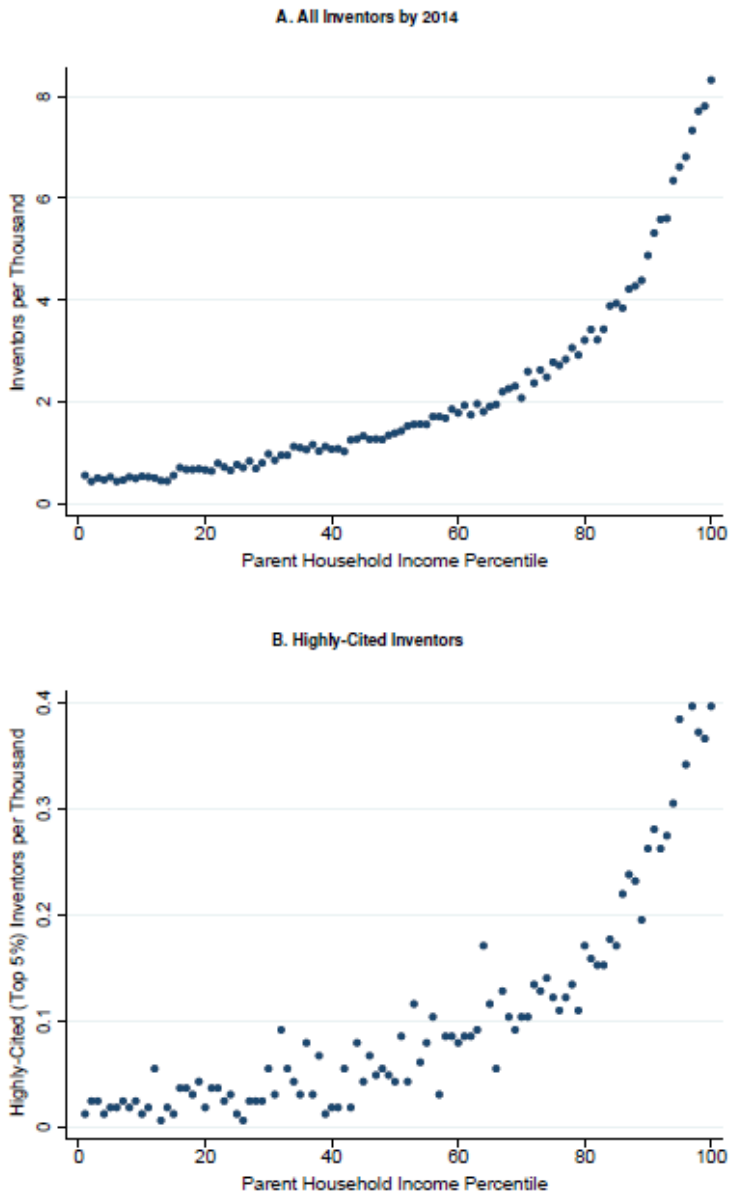
[91] This represents an even more extreme version of the problem of access by young people to universities in South Australia being heavily dependent on the wealth of the area they grew up in, and their parents' level of education; "you can't be what you can't see". https://www.sapc.sa.gov.au/inquiries/inquiries/positioning-all-south-australians-to-share-in-the-benefits-of-economic-growth/final-report

[92] Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Who Becomes an Inventor in America? The Importance of Exposure to Innovation', *Quarterly Journal of Economics,* 134:2, pp. 647-713.

[93] Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Who Becomes an Inventor in America? The Importance of Exposure to Innovation', *Quarterly Journal of Economics,* 134:2, pp. 647-713.

[94] Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Do Tax Cuts Produce More Einsteins? The impacts of financial incentives vs exposure to innovation on the supply of inventors', *Journal of the European Economic Association,* 17:3, pp. 651-677

Figure 11: Propensity of persons born in the US to be an inventor at age 40 or younger, by household income percentile of their parents.



Source: Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Who Becomes an Inventor in America? The Importance of Exposure to Innovation', NBER Working Paper No. 24062

It also means that the State Government can, over the long run, influence the share of South Australians pursuing invention by increasing the exposure of young people to inventors. Based on the difference in innovation rates between regions in the US, it is estimated that increasing the exposure to invention for a child from the equivalent of a city at the 25th percentile of inventors per capita to one at the 75th percentile would increase their chance of becoming an inventor by 37 per cent.[95]

[95] Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Do Tax Cuts Produce More Einsteins? The impacts of financial incentives vs exposure to innovation on the supply of inventors', *Journal of the European Economic Association,* 17:3, pp. 651-677

This type of policy can be particularly valuable when focused on groups who have been traditionally underrepresented amongst inventors. For example, a recent pilot scheme in France demonstrated that exposing young women to female scientific role models in high school significantly increased engagement with STEM, both in terms of likelihood to study and future career intentions.[96]

Finding 30: Targeted programs connecting traditionally underrepresented young people to inventors as role models could improve their prospects and increase the range of inventions available to society.

[96] Breda, T., J. Grenet, M. Monnet and C. van Effenterre (2023), 'How Effective are Female Role Models in Steering Girls Towards STEM? Evidence from French high schools, *Economic Journal*, 133:653, pp. 1773-1809. Positive impacts on career aspirations only occurred when the role models emphasised their own research career rather than focusing on the underrepresentation of women in science.

5. Boosting South Australia's Business R&D Requires a Different Type of Policy

5.1 Government has a role in boosting R&D

R&D is an important driver of long-term, sustainable growth in productivity and incomes (see Section 2). The main justification for government support is to correct for the under provision of R&D, as the market is likely to provide less R&D than is socially optimal. Governments may also have other motivations to support R&D, including directing R&D to priority areas or to solve societal challenges. R&D is also essential for regional economies like South Australia wanting to reduce reliance on commodities and build a more complex and diversified economy.

But this in-principle case for government support of R&D does not mean that any support will do.[97] For policy support of R&D to be effective it:

1. must generate additional R&D activity (not just relabel or relocate R&D that would have happened anyway); and
2. the R&D activity it generates must have spillover benefits to the state economy; and
3. the value of these benefits must be sufficiently large relative to their costs to justify investment compared to other priorities, and create as few distortions or inefficiencies in the economy as possible.

Finding 31: Government support of R&D is only justified if it generates R&D that is new, useful, and affordable.

5.2 There are many ways governments can boost business R&D

There is no perfect policy mix for governments to boost business R&D.[98] The right approach is context specific, and likely to change over time. It is also likely to require a targeted portfolio of interventions, to address different barriers to R&D and in taking commercial advantage of the opportunities created by R&D.

Similarly, the policy recommended in this report is not intended to be a single "silver bullet" solution to every barrier to R&D. Instead, it is intended to be the logical next addition to the existing portfolio of supports offered by the Australian Government and the South Australian Government and is designed with the broad existing ecosystem of other supports in mind.

The analysis below examines the evidence on R&D policy effectiveness across several key policy areas and pinpoints the strategies with greatest potential for South Australia at this point in time.

Macroeconomic conditions

Macroeconomic settings are largely determined federally, and Australia's strong institutions, stable economy, flexible labour markets, and robust intellectual property and insolvency laws provide a

[97] Banks, G. (2000) Productive R&D assistance, Speech to the Melbourne Institute Public Economies Forum; Daley, J., Reichl, J., and Ginnivan, L. (2013) Australian Government spending on innovation, Grattan Institute

[98] OECD: Science-Industry Knowledge Exchange: A Mapping of Policy Instruments and Their Interaction. The OECD has identified 21 types of intervention that are commonly used to by governments to increase business R&D, including financial instruments, regulatory instruments and 'soft' instruments, but this list is by no means exhaustive.

solid base for innovation.[99] Openness to trade and competition also supports R&D,[100] and revitalising National Competition Policy is a current federal priority.[101] South Australia's own macroeconomic conditions are generally favourable. The Business Council of Australia has ranked South Australia as having the best regulatory and tax setting for doing business in Australia for the third consecutive year.[102] Stakeholders did caution, however, that rapidly rising house prices could make it harder to attract and retain skilled workers. Favourable and predictable macroeconomic conditions support R&D investment, and such stability is becoming even more critical amid rising geopolitical volatility. But they are not sufficient to drive R&D investment to socially optimal levels, so more targeted policies are still required.

Finding 32: Broad macroeconomic conditions in South Australia are generally favourable for business investment, but more targeted policy intervention is required to boost R&D intensity.

R&D tax incentives

The largest single source of financial support for business innovation is the Australian Government's R&D tax credit (see Section 3.1), which is roughly average in size among OECD countries (Figure 12).[103] It is difficult to measure the impact of such policies.[104] International evidence indicates that R&D tax incentives raise both the volume of business R&D and its productivity (despite some relocation and rebranding of existing activity), although the strength and statistical significance of the effects varies across countries and studies.[105] Several studies have found that tax breaks on investment are less effective in Australia than in other countries,[106] while a newer firm-level analysis has found some evidence of positive effects.[107]

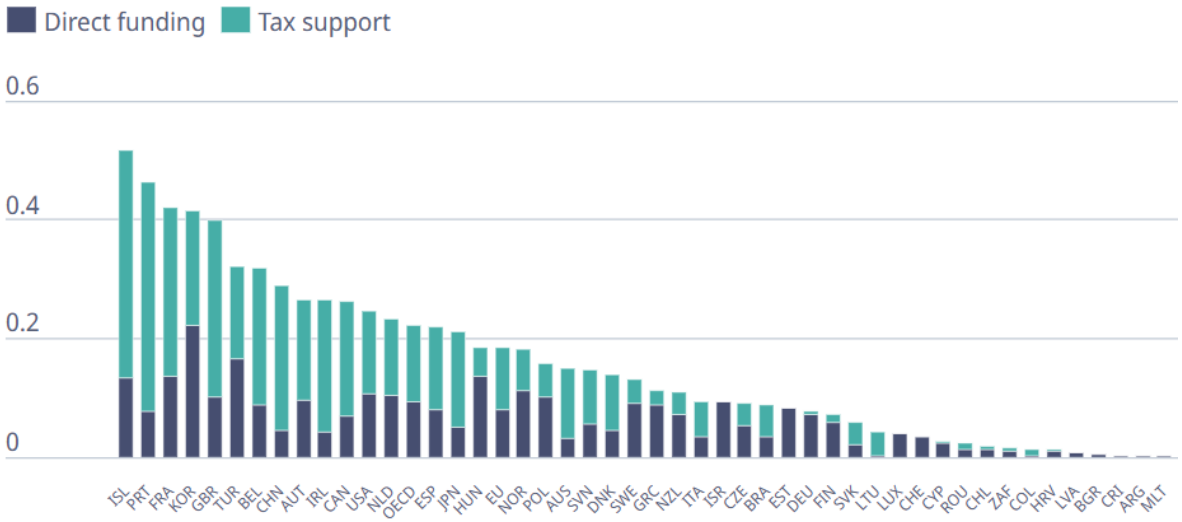
An equivalent policy at the state level could involve payroll tax rebate for R&D expenditure or employment within businesses, but this approach has several disadvantages. In particular, it is difficult to target tax support toward R&D activities that generate the greatest knowledge

[99] https://www.imf.org/en/news/articles/2025/11/19/cs-australia-staff-concluding-statement-of-the-2025-article-iv-mission and Daley, J., Reichl, J., and Ginnivan, L. (2013) Australian Government spending on innovation, Grattan Institute
[100] Bloom, N., J. van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184
[101] The Treasury, Revitalising National Competition Policy, Government of Australia, available at: https://treasury.gov.au/review/competition-review-2023/ncp
[102] Business Council of Australia (2025), Comparing regulations and tax policies across states and territories to inspire a race to the top. Available at: bca.com.au/reports-submissions/reports/regulation-rumble-2025
[103] Although given business R&D in Australia is below average this suggests that the support offered per dollar of spend is above average.
[104] The CIE (2016) R&D Tax Incentive Programme Review, available at: https://www.industry.gov.au/sites/default/files/May%202018/document/extra/research-and-development-tax-incentive-review-report-cie_0.pdf
[105] Bloom, N., J. van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184, OECD (2023), "The impact of R&D tax incentives: Results from the OECD microBeRD+ Project", OECD Science, Technology and Industry Policy Papers, October 2023 No. 159.
[106] RBA (2025),; Fox (2023),;
Daley, J., Reichl, J., and Ginnivan, L. (2013) Australian Government spending on innovation, Grattan Institute
. Shanks, S. and S. Zheng (2006), 'Econometric Modelling of R&D and Australia's Productivity', Productivity Commission Staff Working Paper, Canberra, April. 2018 Review of the R&D Tax Incentive found that the scheme "falls short of meeting its stated objectives of additionality and spillovers". Thomson, R., 2010. Tax policy and R&D investment by Australian firms. *Economic Record*. 86, 260–280.
BIE, 1993. Research Report 50. R&D, Innovation and Competitiveness: An Evaluation of the Research and Development Tax Concession. *Bureau of Industry Economics*, Canberra,
The 2016 *Review of the R&D Tax Incentive* found 'that the programme falls short of meeting its stated objectives of additionality and spillovers' - B Ferris AC, A Finkel AO and J Fraser, *Review of the R&D Tax Incentive*, 2016, p. 3.
[107] Jared Holt, Ahmed Skali and Russell Thomson (2021), "The additionality of R&D tax policy: Quasi-experimental evidence", Technovation 107 (2021)102293.

spillovers,[108] and while such incentives may make marginal projects viable, they are unlikely to drive transformative, high risk-high return investments. The effectiveness of tax incentives may also be limited given South Australia's firm profile (see Section 3.1).

Finding 33: Support for business R&D through the Australian Government R&D tax credit is roughly average amongst OECD countries, indicating that this is not a gap in support.

Figure 12: Government funding of business R&D, direct and tax support, OECD members, share of GDP



Source: https://www.oecd.org/en/data/insights/statistical-releases/2025/04/rd-tax-incentives-continue-to-outpace-other-forms-of-government-support-for-rd-in-most-countries.html

Government research grants

Direct R&D grants provide moderate net benefits over the medium term and are more targeted than tax incentives.[109] However, governments often lack the information to pick the highest-value projects. A better approach is to define high-value socio-economic goals or enabling technologies and allow market participants to select the specific projects.

In Australia, there is suggestive evidence that government funding of university R&D is more effective at raising productivity growth than tax and other R&D incentives.[110] Matched grants can be particularly effective for states, as every state dollar can leverage additional national funding, although matched funding priorities are usually set by the federal government. This highlights the importance of aligning state R&D programs with federal priorities to maximise impact.

Finding 34: Direct R&D grants are more targeted than tax incentives and can boost productivity, particularly when aligned with high-value socio-economic goals and state and national priorities.

[108] Bloom, N., J. van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184
[109] Bloom, N., J. van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184
[110] Fox, K. (2023), "Impacts of Public R&D Funding on Innovation and Productivity', presentation to NZ Treasury, available at: https://www.treasury.govt.nz/sites/default/files/2023-11/tgls-productivity-kevin-fox-2023-11-29-slides.pdf

Human capital

Increasing R&D activity ultimately depends on expanding the supply of skilled workers (see Section 3.3).[111] Over the long run, school education has the greatest impact,[112] and South Australia has already introduced major reforms – such as universal three-year-old preschool, new technical colleges and fee-free TAFE – to strengthen future skills. The Commission has also previously recommended measures to lift school completion and reduce youth disengagement, where South Australia lags other states.[113]

Strong evidence shows that boosting R&D-related human capital, including through skilled migration, is one of the most effective ways to increase innovation.[114] This highlights the need to attract top researchers, expand research-trained STEM graduates, and create more research careers to retain talent (see Chapter 4). Better business education may also help, given the link between strong management and innovation,[115] but further work is needed to determine whether South Australian firms have specific management gaps that policy could meaningfully address.[116]

Finding 35: Expanding the supply of skilled human capital – through education, skilled migration, and research career opportunities – is critical to boosting R&D intensity.

Financial capital

Access to finance is often cited as a barrier to R&D, especially for smaller or younger firms, but South Australia already provides substantial support through two $50 million venture funds and the Seed-Start Grant Program,[117] and the Commonwealth's *Strategic Examination of R&D* is exploring further ways to boost private capital flows to start-ups and scale-ups. [118] For larger firms, concerns focus on the cost rather than the availability of finance, yet a 2009 Australian study found no evidence that the cost of capital materially affects R&D spending.[119] Overall, financing constraints did not emerge as a significant barrier to R&D in our consultations and analysis. South Australian Government resources would likely have greater impact if directed to other policy levers.

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[111] Romer (2001) quoted in Bloom, N., J. van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184.
[112] Daley, J., Reichl, J., and Ginnivan, L. (2013) Australian Government spending on innovation, Grattan Institute
[113] South Australian Productivity Commission 2024, Positioning All South Australians to Share in the Benefits of Economic Growth, Draft Report, October (2024)
[114] Bloom, N., J. van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184.
[115] Bloom, N., Lemos, R., Marques, O., Sadun, R., Scur, D., Todeschini, M. and Van Reenen, J., (2024), Management matters in an era of disruption, POID Briefing Paper; Wilson, M; Agarwal, R; Li, W; and Bajada C, (2023) "Dynamic capabilities: How Australian firms can survive and thrive in uncertain times", Committee for Economic Development of Australia,.
[116] Management capabilities of South Australian businesses is a current topic of research for the Commission. Government-sponsored pilots of targeted management training programs have shown promise in New Zealand (Willson, M., (2024), Boosting dynamism: What Australia can learn from other nations, CEDA.)
and the UK (Phipps, J., and Fuller, R., (2024) Unpicking the Productivity Puzzle – Business Basics Program Final Report, Department for Business, Energy and Industrial Strategy, Government of the United Kingdom, .
[117] The South Australian Venture Capital Fund was established in 2017, and a second $50 million early-stage venture capital fund was announced in the 2025-26 state budget (Department of Treasury and Finance (2025), State Budget, Government of South Australia)[117] The South Australian Venture Capital Fund was established in 2017, and a second $50 million early-stage venture capital fund was announced in the 2025-26 state budget (Department of Treasury and Finance (2025), State Budget, Government of South Australia.).
[118] Denholm, R., Chubb, I., Wood, F., Cornick, K., (2025) Strategic Examination of Research and Development: discussion paper, Department for Industry, Science and Resources, Government of Australia
[119] Thomson, R. (2010), Tax Policy and R&D Investment by Australian Firms*. Economic Record, 86: 260-280. https://doi.org/10.1111/j.1475-4932.2010.00636.x

Finding 36: The South Australian Government already provides financial support to early-stage companies, and additional policy effort would have greater impact if targeted elsewhere.

Physical capital

The Australian Government is making substantial investments in research infrastructure, including $4 billion through the National Collaborative Research Infrastructure Strategy (2018–29) and $600 million over 10 years for critical health and medical research infrastructure.[120] South Australia is also seeing major investments, such as Flinders University's new 10-story Health and Medical Research Building.[121] While innovation precincts aim to accelerate ideas by co-locating firms and infrastructure,[122] evidence on their effectiveness is mixed, and research suggests governance, leadership and collaboration matter more than physical facilities.[123] South Australia already has a strong network of 22 "innovation places" anchored by seven key innovation centres, supported by a state-wide strategy, and benefits from Adelaide's compact layout and low congestion.[124] Office space is also readily available, with Adelaide CBD office vacancy rates of 15 per cent as at August 2025.[125]

The experience of SAHMRI also suggests that investments in research that focus too heavily on physical capital do not always work as intended (see Box 7).

Finding 37: Investment in buildings and precincts should be a low priority for State Government R&D spending.

Consultations identified only one unmet infrastructure need: facilities for short-run manufacturing of prototype medical devices and drugs for clinical trials, which experts see as a major opportunity. Beyond this niche, the Commission maintains its previous recommendation that new buildings or precinct investments should remain a low priority for state innovation spending.[126]

Box 7: South Australian Health and Medical Research Institute – lessons learnt

The South Australian Health and Medical Research Institute (SAHMRI), was established in 2009 as an independent Medical Research Institute, incorporated as a company limited by guarantee jointly owned by the South Australian Government and the three research universities. In 2023-24 it had income of $86.7 million and employed 500 staff.

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[120] https://www.education.gov.au/national-research-infrastructure Strategic priorities are guided by the 2021 National Research Infrastructure Roadmap, https://www.health.gov.au/our-work/mrff-national-critical-research-infrastructure-initiative?language=en. Stakeholders emphasised that many businesses are unaware of NCRIS and that it can be hard to navigate unless you know what you are looking for.

[121] https://news.flinders.edu.au/blog/2024/06/13/flinders-universitys-health-and-medical-research-building-sets-a-benchmark-for-health-innovation/

[122] https://statedevelopment.sa.gov.au/science-and-research-excellence/innovation-districts

[123] Bloom, N., J. van Reenen and H. Williams (2019), 'A Toolkit of Policies to Promote Innovation', *Journal of Economic Perspectives*, 33:3, pp. 163-184 and Bajada, C., Agarwal, R., Skellern, K., Luff, S., Soco, S., & Green, R. (2022). Enablers of successful innovation precincts. *Regional Studies, Regional Science*, *9*(1), 732–756. https://doi.org/10.1080/21681376.2022.2144427

[124] https://www.innovationplaces.sa.gov.au/,. https://statedevelopment.sa.gov.au/science-and-research-excellence/innovation-districts names seven key districts and major centres of innovation: Adelaide BioMed City, Edinburgh Defence Precinct, Osborne Naval Shipyard, Lot Fourteen, Technology Park Adelaide, Tonsley Innovation District and Waite Institute. And https://www.innovationplaces.sa.gov.au/assets/documents/Innovation-Places-SA-Framework_FA.pdf

[125] Ranjbar, E. (2025) Adelaide CBD Office Figures, CBRE, https://www.cbre.com.au/insights/figures/adelaide-cbd-office-figures-q2-2025

[126] South Australian Productivity Commission, Research and Development Inquiry, Final Report, January (2021), Denholm, R., Chubb, I., Wood, F., Cornick, K., (2025) Strategic Examination of Research and Development: discussion paper, Department for Industry, Science and Resources, Government of Australia

The initial funding of SAHMRI was almost entirely to fund a new building to house it, and the lack of a sustainable model for how it should actually operate over the long term has created significant issues, demonstrating the potential risks of investing too much in physical capital over human capital.

Many talented people work at SAHMRI, and it has provided some high quality common-use infrastructure for health and medical research in South Australia. However, the view almost universally expressed to the Commission,[127] is that SAHMRI has not achieved its objectives and that its costs to the health and medical research system outweigh its benefits.

SAHMRI's governance model means that control of its strategy and oversight of its operations rests with the board, with the owners having relatively little direct influence. SAHMRI's founding objectives were to reverse the decline in the state's health and medical research performance and to enhance collaborations between existing researchers and research teams.

Australian Government peer reviewed health and medical research funding for South Australian universities has not increased as a share of the national total since SAHMRI's establishment. In 2009 South Australia's three universities secured 10.4 per cent of national funding, while in 2023 they secured 7.2 per cent of the total.[128]

Stakeholders reported that very little of the research funding won over the past decade is attributable to SAHMRI, instead attributing the success to the quality of researchers employed in the state's universities. Stakeholders expressed concern that SAHMRI has increased the level of bureaucracy and coordination problems in undertaking medical research in South Australia, and its need to meet its own revenue targets has fostered an at times unhealthy level of competition between South Australian health and medical research institutions, at the expense of increasing the overall scale and impact of medical research in South Australia.

A substantial proportion of the funding for SAHMRI was for the original building and, more recently, rent liabilities for the Australian Bragg Centre building constructed to host the proposed proton therapy unit (PTU) have taken a substantial share of its budget, diverting resources away from hiring researchers.

The initial excessive investment in building at the expense of sustainable long-term financing of research, together with ineffective governance arrangements, appears to have contributed to the failure of the high-risk PTU project pursued by the SAHMRI board in which it caused SAHMRI to enter into high-risk speculative commercial arrangements that exposed SAHMRI to, for example, substantial lease liabilities without having contractual funding in place to meet those liabilities.

The motivation for the project appears to have been a combination of a wish to provide a cutting-edge, domestic treatment option for certain high-risk cancers, while also generating an ongoing revenue stream for SAHMRI from the potential private operator of the PTU to fund additional research space. [129] The original business case for the PTU developed by SAHMRI in 2019 anticipated no on-going SA Government funding, with the only support required being the provision of the land on which the Australian Bragg Centre building would be constructed. By 2023 SAHMRI requested a one-off capital and operating grant of $108 million from the South Australian

[127] In consultations with the South Australian Health and Medical Research sector across this inquiry and the previous innovation inquiries: Turning Research into Economic Competitiveness for South Australia; Health and Medical Research Inquiry; and Research and Development Inquiry

[128] Defined as category 1 funding from either the National Health and Medical Research Council or the Medical Research Future Fund. Australian Government, Department of Education (2024) 'Higher Education Research and Development Income time series (1992-2023)'

[129] Audit Office of South Australian (2025), 'Proton therapy project: SA Government context and insights, p. 13-14, available at: https://www.audit.sa.gov.au/reports/proton-therapy-project-sa-government-context-and-insights

Government, as well as an on-going subsidy of $7.1 million per annum thereafter.[130] The lease liabilities associated with the PTU project were the most significant factor in SAHMRI reporting a loss of $77.7 million in 2023-24 from revenue of $86.7 million.[131]

The Commission believes that some important lessons can be learnt from the commercial conduct of the SAHMRI board for any future South Australian Government funded research centre or institute. In particular, it is important in the future to prohibit high-risk speculative ventures, implement more effective governance arrangements, ensure a better strategic fit with Government priorities, concentrate funding on talent not buildings, and ensure a greater sense of ownership and engagement from universities.

Finding 38: Future R&D organisations established by, or funded by, the South Australian Government should be prohibited from speculative investments and other high risk behaviour that create potential liabilities that are large relative to the organisation's funding. While SAHMRI's conduct is regrettable and may have harmed the reputation of local not-for profit research and development activities, this should not discourage our State Government from investing further in this sector.

Collaboration between businesses and universities

Collaboration between businesses and universities is widely recognised as a critical gap in our state and national innovation ecosystems.[132] Over the past six years Australia has averaged a global ranking of 16th for innovation inputs and 31st for innovation outputs. The importance of improving business university collaboration to reduce this gap has been a consistent focus of submissions to the Australian Government's *Strategic Examination of R&D*.[133]

Evidence suggests some approaches – like co-location, matchmaking services, or technology transfer offices – often have limited impact,[134] while mission-oriented policies work only in specific contexts.[135] A more effective strategy is to align South Australia's R&D with existing state and national priorities and areas of competitive advantage. Networking and outreach alone are unlikely to drive substantial impact given the limited absorbative capacity of the state's business sector (see Section 3.1). For example, AIML has succeeded with interstate and international partners but has had more limited engagement with local businesses, highlighting the need to connect research with scalable local and interstate firms (see Box 5).[136] Structured approaches such as staff placements, industry PhDs, internships, secondments, and hybrid appointments are rare in Australia but have proven effective overseas.[137]

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[130] Audit Office of South Australian (2025), 'Proton therapy project: SA Government context and insights, p. 13-14, available at: https://www.audit.sa.gov.au/reports/proton-therapy-project-sa-government-context-and-insights

[131] SAHMRI 2023-24 Annual Report, available at https://www.acnc.gov.au/charity/charities/81a4131b-38af-e811-a962-000d3ad24a0d/documents/

[132] Denholm, R., Chubb, I., Wood, F., Cornick, K., (2025) Strategic Examination of Research and Development: discussion paper, Department for Industry, Science and Resources, Government of Australia
, Jaumotte, F. and N. Pain (2005), "An Overview of Public Policies to Support Innovation", *OECD Economics Department Working Papers*, No. 456, OECD Publishing, Paris, https://doi.org/10.1787/707375561288.

[133] WIPO Global Innovation Index (2025): https://www.wipo.int/edocs/gii-ranking/2025/au.pdf

[134] Daley, J., Reichl, J., and Ginnivan, L. (2013) Australian Government spending on innovation, Grattan Institute

[135] Bloom notes that "Moonshots" or "Missions" are common in defence (e.g. The US Defence Advanced Research Projects Agency, or DARPA) and space (e.g. the US National Aeronautics and Space Administration or NASA) and have led to important innovations in these sections, but this approach relies on large-scale private sector research capacity that can bid in to address the missions.

[136] South Australian Productivity Commission, Research and Development Inquiry, Final Report, January (2021)

[137] Zucker, L.G. and M.R. Darby (2007), 'Star Scientist, Innovation and Regional and National Immigration', *NBER Working Paper Series*, No. 13547, October 2007; Zucker, L.G. and M.R. Darby (2014), 'Movements of Star Scientists and Engineers and High-Tech Firm Entry', *Annals of Economics and Statistics,* 115/116, pp. 125-175; OECD (2019), *University-Industry Collaboration : New Evidence and Policy Options*, OECD Publishing, Paris.

Finding 39: Strengthening collaboration between universities and businesses is critical to generating commercial and economic benefits from R&D.

Stakeholders emphasised that successful collaborations require aligned objectives, clear goals and commercialisation pathways, mutual commitment and trust, and strong project management and governance from the outset.

Regional governments can play an important role in fostering a culture shift within their local universities to drive local economic impact. For example, a strong commitment by the University of Utah's leadership to create an entrepreneurial culture amongst their researchers and students was enabled by state government leadership which removed regulatory barriers to commercialisation and put the strengths of the university at the core of its economic strategy (see Box 8).

Finding 40: State governments can be an important catalyst for reforming the relationship between universities and business, particularly by removing red tape and barriers to commercialisation.

Box 8: University of Utah – how collaboration between university leadership and state government transforming it into a leading entrepreneurial university

The University of Utah shows that lesser-known universities in relatively small jurisdictions can be an important catalyst for start-ups and scale-ups.

The University of Utah has had one of the highest rates of firm-formation of US universities. This was catalysed in the mid-2000s by the then President of the university switching focus to a mission of integrating commercialisation with the university's core educational and research missions.[138] This saw the university prioritise start-up formation, including creating structures and incentives to encourage academics to commercialise their research (such as recognising start-up creation in promotion decisions for junior academics).[139]

The university's actions were complemented by a strong focus from the Utah state government on using the strengths of the university to spur economic development. As part of the state government's 10-Point Economic Plan for Revitalisation launched in 2005, the Utah state government actively engaged with the university to remove regulatory barriers to commercialisation, reduce red-tape within the university and foster a more collaborative approach to working with entrepreneurs. The government also allocated substantial new funding to endow new academic chairs and fund a 'centres of excellence' program to incubate more start-ups in areas of research strength.

The number of start-ups created at the University of Utah averaged 3 per year between 1970 and 2005. This figure increased sharply after 2005, 15 start-ups were created per year between 2006 and 2021.[140] This rapid growth propelled the University of Utah to be ranked equal first with the prestigious Massachusetts Institute of Technology by the Association of University Technology Managers (AUTM) for the number of start-ups created in 2008-09, and was consistently ranked in the top 5 over the 2010s by the AUTM.[141] More recently, a study by Stanford Venture Capital

https://doi.org/10.1787/e9c1e648-en; Chandra, A. and C. Xu (2025), 'Where Discovery Happens: Research Institutions and Fundamental Knowledge in the Life-Sciences', *NBER Working Paper Series*, No. 33996, July 2025..

[138] https://archive.unews.utah.edu/news_releases/u-of-u-creates-position-of-vice-president-for-technology-venture-development/

[139] Etzkowitz, H., Germain-Alamartine, E., Keel, J., Kumar, C., Smith, K., and Albats, E., (2019), 'Entrepreneurial university dynamics: Structured ambivalence, relative deprivation and institution-formation in the Stanford innovation system', *Technological Forecasting and Social Change*, 141, pp. 159-171.

[140] TVC Annual Report 2018, and Pivot Centre Annual reports, 2019, 2020, 2021, the University of Utah.

[141] https://utahutes.com/sports/2016/6/10/library-u-of-u-111110-html.aspx

Initiative identified the University of Utah as having the second highest rate of producing 'unicorn' (start-ups that reach a US$1 billion value) founders.[142]

Another important element of the University of Utah's success has been its efforts to build links across the university connecting the 'technical' expertise from science and engineering schools, with entrepreneurship, management and marketing skills and expertise from the business school. These links are fostered amongst both academics and students. The business school also houses the Lassonde Entrepreneur Institute which helps students launch start-ups and raise money and the Lassonde Studios which provides housing, entrepreneurial workspace, and laboratory for students to test ideas and build prototypes.

5.3 We need a new approach

South Australia has implemented elements of many policy approaches over the years; however, these have generally been at very small scale and, in most cases, for short time periods.[143]

Despite forty years of policy interventions aimed at boosting R&D and innovation in local businesses, South Australia's business R&D remains too low to support substantial productivity growth or economic complexity.

Business spending on R&D in South Australia is weak and the South Australian business sector does not yet have the scale of R&D intensive firms for this to be the driver of growth in incomes. Existing, business focussed, policy measures are unlikely to turn this around. It is time to change. This is not to say existing policy frameworks should be abandoned, but rather if we wish to realise the Government's ambition of the state becoming a complex, high-income, economy then we need a new approach to boosting R&D intensity.

Reviewing the best available evidence on innovation activity in South Australia, international evidence on the effectiveness of policies and models adopted elsewhere, and broad consultation with a range of stakeholders, has led the Commission to conclude that South Australia needs a new approach to boosting the R&D intensity of our economy.

Finding 41: South Australia needs a new approach to boosting the R&D intensity of our economy.

Given current gaps in business R&D and innovation in South Australia, and the extent to which Australian Government and South Australian Government funding is already providing support to help businesses undertake R&D, this fresh approach should build on academic and university associated applied research. Not to increase the scale of the already great theoretical research that is already being done in our universities, but to attract world-class talent to South Australia and deeply connect them into the needs of our local industry and economy. Drawing great local universities into industry was a catalyst for North Carolina's rise from one of the poorest states in the US (see Box 4), and the evidence suggests that better connecting our universities to State Government priorities and the needs of South Australian industry could be transformative for our State too.

[142] Strebulaev, I., (2025) The Unicorn Founder Myth: Why Education Actually Matters, CrunchBase News, https://news.crunchbase.com/edtech/unicorn-founder-myth-education-matters-strebulaev-stanford/

[143] See section 2.1.1 of the final report of South Australian Productivity Commission, Research and Development Inquiry, Final Report, January (2021) for a mapping of SA Government projects current at the time of that report against the OECD framework. The more sustained funding provided to the Medical Devices Partnership Program at Flinders University and the Australian Institute of Machine Learning at Adelaide University are notable exceptions to the short-term funding approaches more often taken.

Finding 42: We recommend that the South Australian Government design, establish and fund five independent world-class research institutes, or "Frontier Technology Institutes", with these Institutes associated with one or more of the state's universities and deeply connected into industry.

This fresh approach should be built around the following **10 principles**:

1. Establishing a genuine partnership between the South Australian Government, our universities, and local industry to use R&D to help build the state's economic future. This is not just another grant program.
2. A tight focus on a small number of strategic opportunities which align with the state's economic strategy, local business' needs, scalable markets and areas of existing research strength.
3. Delivery through world-class independent "Frontier Technology Institutes" (Institutes) associated with South Australia's universities.
4. Established though legislation, providing a strong signal of the long-term commitment of the South Australian Government.
5. Building talent and connections, not buildings, by attracting world-class researchers and research translators to live and work in South Australia and connecting them to the needs and opportunities of local industry. This also needs to include efforts to build local talent.
6. Providing structured and dedicated funding that is substantial enough to make a material difference to South Australian research and to scale our economic opportunities.
7. Ensuring that the Frontier Technology Institutes have substantial autonomy in the management of their operations enabling them to be agile and embedded with industry whilst retaining the most valuable parts of the university model and prohibiting activities that generate excessive commercial risks.
8. Building connections into industry needs to be at the core of how these Institutes work.
9. Alignment with Australian Government R&D support, and particularly any federal policy changes resulting from the *Strategic Examination of R&D* in Australia.
10. Transparent and timely evaluation of both this policy, and the broader suite of South Australian Government innovation policies.

Finding 43: We recommend that the design and implementation of the Frontier Technology Institutes follow the ten principles outlined in this report.

6. Our proposed model

The South Australian Government should design, establish and fund five independent world-class research institutes, or "Frontier Technology Institutes", to build up our state's star research talent, with these Institutes associated with one or more of the state's universities and connected into industry.

This is not a short-term fix; this is a long-term investment in the state's potential.

Not just a grant scheme – a genuine long-term partnership between government, universities and in due course, industry

This is not simply an allocation of funding from the South Australian Government to universities. It is a new model for the government, universities and industry, working together in a genuine partnership to deliver the knowledge and intellectual property needed to spur the growth of key industries and create many more good quality, high wage jobs for South Australians.

Ongoing South Australian Government involvement is important to ensure that the Frontier Technology Institutes remain focused on state priorities, and on-track to deliver the expected industry and economic outcomes. International examples such as IMEC in Belgium (see Box 6) and the University of Utah (see Box 8) show that state government collaborations with research can be transformative.

Researchers in the Frontier Technology Institutes would retain complete academic freedom.

Finding 44: We recommend that the South Australian Government retains ongoing involvement with the Frontier Technology Institutes to ensure they remain focused on state priorities, and on-track to deliver the expected industry and economic outcomes.

Focused on a small number of strategic opportunities for South Australia

The Institutes should focus tightly on a small number of key strategic opportunities, aligned with the state's economic strategy, market opportunities, and areas of existing research strength.

Ideas offered by stakeholders in consultations include:

- combining the state's strengths in AI and machine learning, sensing, electronic engineering and defence into a specialisation in autonomous vehicles;
- comprehensive capabilities to lead trials of novel drugs, including small batch manufacturing facilities, clinical trial registry capabilities and integration of SA Health and university data and data analytics;
- prototyping capabilities for precision equipment including medical devices and defence technology;
- identifying the technology, pharmaceuticals, services and government policy needed to support active ageing;
- using AI to transform business (and government) services delivery;
- energy efficient and low carbon extraction and refining of metals and critical minerals; and
- cost effective management of high renewables electricity grids.

Determining which five areas of strategic opportunity the five Frontier Technology Institutes will focus on is critical. This selection process should be undertaken by a small international expert

panel who would consult across government, industry and the universities, with support provided by the Department of Premier and Cabinet to maximise connections across government and alignment with the South Australian Economic Statement and broader economic priorities. It should not be a process where university research centres bid to be funded.

Selection should be based exclusively on identifying the five strategic opportunities (whether framed in terms of technology or socio-economic objective) that best deliver on:

- strategic fit with the South Australian Government's economic strategy;
- local business needs that could be met through high-quality R&D;
- genuine potential to trigger substantial South Australian economic growth through helping existing local businesses to scale, creating new high-quality jobs, and forming new businesses;
- the scale of opportunities in national and international markets;
- alignment with Australian Government areas of R&D focus;
- the presence of at least one existing world-class translational researcher in South Australia who actively engages with industry; and
- the potential to build a genuinely world-class research team that addresses local industry needs or opportunities by attracting star researchers to South Australia.

We anticipate that this process of prioritisation would take at least six months to ensure it is comprehensive.

Finding 45: We recommend that the five focus areas for the Frontier Technology Institutes should be carefully chosen through a structured world-class assessment and selection process run by a small international expert panel.

Delivered through world-class, independent Frontier Technology Institutes

The delivery of R&D to support the areas of strategic opportunity should be through five world-class independent Frontier Technology Institutes associated with one or both of South Australia's universities. This could involve building on an existing research centre or institute, integrating disparate efforts split across one or more of the universities whilst bolstering them with key recruits, or it could involve establishing new Institutes.

Selecting five strategic opportunities allows enough resources to be devoted to each to have a meaningful impact while also providing some variety to appropriately diversify the risk of individual Institutes underperforming or the research needs of the state economy changing over time. Stakeholders consulted through this inquiry were unanimous that the temptation to spread resources too thin to allow 'everyone to win a prize' must be avoided, because it prevents meaningful impact and diverts funding away from the highest potential opportunities.

Striking the right balance in the relationship between the Frontier Technology Institutes and the universities is also challenging. There is no single best approach, and the best method is likely to differ across organisations and disciplines. The South Australian immunoGENomics Cancer Institute (SAiGENCI) is one local example where this appears to be done well, with SAiGENCI operating as an 'independent' research institute that is also 'embedded' in the University of Adelaide.[144] This structure could provide a useful starting point for the Institutes to draw on.

[144] https://www.adelaide.edu.au/saigenci/about-saigenci

Established by legislation to signal policy stability and long-term commitment

It is also important to ensure that the South Australian Government's commitment to the Frontier Technology Institutes is long-term and that this is strongly signalled to potential recruits and partners. We recommend that the Frontier Technology Institutes be established by legislation encoding the principles under which they will operate, their objectives and functions, and their governance arrangements including management of relationships with industry partners.

The legislation (or associated legislative instruments) should set a 'hard target' that spending be primarily focused on research and industry engagement, with bureaucratic support costs being no more than 15 per cent of the total budget.

This legislation should also set out the taxation instrument that will provide funding (see Chapter 7) and establish a permanent endowment fund into which the allocated taxation revenues would be paid. A dedicated funding source with a legislative basis is another very important signal to potential staff, and potential industry partners, of the South Australian Government's long-term commitment.

The experience of SAHMRI highlights that, whilst autonomy is important, having appropriate guardrails in place is also a critical element of risk management. The enabling legislation (or its associated legislative instruments) should explicitly prohibit high risk activity of the type seen with the proton therapy unit project where SAHMRI, for example, entered into a contract exposing it to substantial lease liabilities without having contractual funding in place to meet those liabilities (see Finding 38).

This prohibition would be focused on the scale of consequences. For example:

- An Institute providing seed funding to a small number of start-ups being spun out of the Institute would be 'high-risk' in the sense that the chances of recouping the funding would be low as most start-ups do not achieve commercial viability. But the resources being risked would be small and so it would be allowed provided it was aligned to the Institute's objectives.
- An Institute renting some commercial space to host industry outreach activities would be permissible if the lease costs were proportionate and could easily be met though its existing budget.

Finding 46: We recommend that the Frontier Technology Institutes be established by legislation encoding the principles under which they will operate, their objectives and functions, and their governance arrangements.

Building talent and connections, not buildings, by attracting world-class researchers and research translators

The focus of spending needs to be on building talent and connections, not buildings, as it is the star researchers who drive impact, not a new building (particularly given that there is a significant amount of vacant office space in Adelaide; see Section 5.2).

That is not to say that none of the funding should be used for infrastructure; there may well be a need to fund specialised equipment, other common use infrastructure or fit out of laboratory space, particularly to the extent that this unlocks the development of commercial products. But it is important to learn from the SAHMRI experience and avoid substantial diversion of funding away from people to new buildings.

The primary use of the funding should be to attract world class researchers and research translators to South Australia, by funding globally competitive salaries for world-class research stars whose work aligns with the objectives of the Institute , and who have a demonstrated aptitude for engaging with industry. This latter element is very important as the ability and commitment to building deep connections with industry will be critical to each Institute's success, including ability to attract other funding sources and deliver economic outcomes.

The Director of each Institute should have the flexibility to pay salaries that are in excess of standard academic rates where needed. Consultations indicate that, in many fields of research, to attract researchers from overseas institutions with their much more generous opportunities for academics to retain consulting revenue, a salary package of $500,000 or higher is required. Stakeholders noted that a known flaw of federal programs, such as Australian Research Council and National Health and Medical Research Council funding schemes, (outside the fellowships) is that they do not fund principal researcher salaries. Nor can funding from the newly created South Australian Global Researcher Attraction Program be used to pay the principal researcher's salary.[145]

No less than five of these star researchers would ultimately be expected to be employed by each Institute, with the potential for the salary of one to two researchers already resident in South Australia to be supplemented if needed as a retention strategy, with the remainder recruited from interstate and overseas.

South Australian Government funding should not be used to attract researchers from one South Australian university to another.

Commercial talent and experience are also critical to the success of the Frontier Technology Institutes, and part of the funding should be used to employ an experienced and skilled commercial manager, with expertise in commercialising relevant research in the private sector, to help deliver industry outreach and commercialisation. These individuals will require an executive level salary in line with private sector rates for a senior R&D manager.

Finding 47: We recommend that the primary use of the funding should be to attract world-class researchers and research translators, develop local talent, and build deep, effective, connections with industry.

Building talent isn't just about attracting stars into South Australia, we also need to build up local talent

Building local talent in both research and commercialisation is important to ensure that R&D can fulfil its potential to boost the South Australian economy. Increasing R&D spending without building local talent can easily result in the increased spending being lost to higher wages.

Ensuring that there are local opportunities for our talented young people is hugely important. If we want more success stories like Codan (see Box 5) we need to ensure there are interesting opportunities to keep future Alastair Woods, Ian Walls and Jim Bettisons here to build their futures rather than losing them, and the businesses they will create, to the rest of the world.

[145] Government funding under the Global Researcher Attraction Program must instead be used to fund the Fellow's research program, with the Fellow's salary paid by the university or research institute partner: https://statedevelopment.sa.gov.au/file/downloads/sa-global-researcher-attraction-program-guidelines

Effective R&D collaborations between researchers and industry will tend to build local R&D capacity organically, as industry participants enhance their skills and capabilities by working in partnership with academic researchers, and vice versa.

The Institutes would also be expected to build the research talent of the state through activities such as supervising PhD candidates, employing early- and mid-career researchers, building the commercialisation skills of research students and researchers, and hiring technicians to manage common use research facilities to benefit both industry and academia.

Active connections between researchers and the broader community are important to build the next generation of inventors and innovators. Evidence shows this is particularly important for young people growing up in lower income households, and for young people who are traditionally underrepresented in invention and STEM, who are less likely to pursue it as an option due to a lack of role models (see section 4.4).[146]

Community outreach to underrepresented young people to build local talent should be a requirement of the Institutes. This could also link well with the funding provided by the State Government to both Adelaide University and Flinders University to attract young people from regional areas and educationally disadvantaged backgrounds to undertake university study.[147]

Structured and dedicated funding that is substantial enough to make a material difference

The funding allocated should be substantial enough to make a material difference to R&D in South Australia.

Each of the Frontier Technology Institutes should receive annual funding of $10 million in 2025-26 values (with the grant indexed annually to the growth in nominal GDP to maintain parity with the employment cost of world class researchers).

Our estimated requirement of $10 million arose from consultations with several research sector stakeholders around the costs of the various elements needed for success (including recruiting, retaining, and building, world-class talent), as well as examination of the resources provided to key international successes in establishing world-class research centres.

We recommend that the funding commitment to each of the Institutes should be for a minimum of ten years at their full South Australian Government funding allocation (after a partial allocation over the first few years as staff are recruited).

Evaluation of the performance of the Frontier Technology Institutes could inform a decision about whether the funding for the five initial Institutes should be renewed for another 10-year period, or whether there should then be a ramp down of South Australian Government funding to allow the establishment of the next wave of Institutes.

Finding 48: We recommend that each of the Frontier Technology Institutes be provided with annual indexed funding of $10 million for a minimum of ten years.

[146] Bell, A.M. R. Chetty, X. Jaravel, N. Petkova, and J. Van Reenen (2019), 'Who Becomes an Inventor in America? The Importance of Exposure to Innovation', *Quarterly Journal of Economics,* 134:2, pp. 647-713

[147] https://www.premier.sa.gov.au/media-releases/news-archive/review-of-laws-to-better-recognise-unpaid-carers/crucial-crossbench-support-secured-to-deliver-university-of-the-future

The Frontier Technology Institutes need substantial autonomy, whilst retaining the best elements of the university model

While we recognise the substantial steps that the state's universities have taken over the past couple of years to make themselves more entrepreneurial and agile, there are still many elements of the universities' procedures that are unnecessarily bureaucratic and would impede the Institutes' ability to be agile and maximise impact. In particular, concerns have been raised with us about decision making processes that remain far too risk averse, particularly around senior researcher appointments, paying salaries that are globally competitive for key researchers, managing potential conflicts of interest, managing IP, establishing joint appointments with industry partners, and promoting researchers who focus on industry engagement.

To address this risk, the Director of each Institute should have substantial autonomy in managing the operations of their Institute, including how to spend South Australian Government funding, an ability to take industry engagement activities into account in promotion decisions, and retention of surpluses from South Australian Government and industry funding for use in subsequent years.

This autonomy would necessarily be subject to compliance with appropriate probity and HR management standards.

The broad principles of these arrangements (including ensuring that they are consistent with relevant State Government legislation, such as the *Independent Commission Against Corruption Act 2012*) should be set out in the establishing legislation and its instruments. Finer details for each Frontier Technology Institute should be specified in the agreements between the South Australian Government and the universities.

The arrangements to provide the Frontier Technology Institutes with much more agile processes, and provide the Director with more delegated authority than is typically the case, should draw on the best elements of the deed between the Australian Government and the University of Adelaide to fund SAiGENCI and the arrangements developed for the Australian Government funded Trailblazer program.

Each Institute would have a small governance board appointed by the Premier whose role is to support the Director in setting strategy for the Institute, ensuring focus remains on the objectives for which the Institute has been established, and maintaining the probity of governance arrangements. They would also be responsible for working with the Director to ensure that the Institute is on track to deliver its objectives.

Approaches to accessing supports, such as commercialisation, HR and financial management should be pragmatic and collaborative, where possible sharing or contracting-in supports across the five Institutes or with the partner universities to avoid duplication and minimise costs.

It is important that the participating university(ies) commit to deep engagement with the Institutes, to maximise the benefits and avoid the sense of disconnect and competing priorities that many stakeholders have identified as limiting SAHMRI's impact.

Connections into industry need to be at the heart of how the Frontier Technology Institutes work

Building connections into industry to bring problems facing businesses into the university and foster collaborations with businesses is a core objective of the Institutes and something their performance should be measured against.

Stakeholders have told us that this not only benefits industry, but it can stimulate new academic research programs. It is also critical to translating R&D into tangible economic outcomes for the state, which is the core purpose of the Institutes.

Joint appointments with industry partners and shorter-term secondments of researchers into industry partners as part of research, or research translation, projects would be an expected part of the operation of the Institutes and conflict of interest policies would need to operate in a way that supported rather than impeded these types of engagement. Promotion processes also need to recognise and reward these types of substantial industry collaboration and engagement.

As well as seeking to deeply embed local industry priorities into their core research each Institute should also have specific industry outreach activities with dedicated resources, amounting to between 10 and 25 per cent of the Institute's annual funding.

The optimal approach may well differ between priority areas and so the establishing legislation should not be prescriptive about the preferred approach to realising industry engagement. Instead, this is better dealt with as part of the selection of Institutes which could consider the strategic fit between the proposals and the needs of the relevant industry sector(s). As examples, these outreach strategies could be based around employing staff to work directly with and within industry partners (a model used by AIML), having corporate partners place their own researchers alongside Institute researchers (like IMEC; see Box 6) or by providing and staffing common use facilities (such as the prototype manufacturing facilities that some of the UK Catapults provide to businesses and academics and prototype drug manufacturing facilities like Ab Initio supported by the New South Wales Government).

Institutes would also be required to have an active process for educating researchers in intellectual property and commercialisation, identifying potentially commercially valuable IP, and developing industry partnerships and spin outs to commercialise it.

Alignment with Australian Government R&D support is needed to maximise opportunities and minimise wastage

The proposed reforms to the Australian Government's research, development and innovation supports arising through the *Strategic Examination of Research and Development* will involve a significant narrowing of federal government support to focus on a small number of strategic areas (the issues paper released in August 2025 tentatively identifies five: Defence, Health, Agriculture, Energy and Resources – although this may not be the final list recommended by the panel), with sub-goals underpinning each focus area. If adopted, this model will see future Australian Government support for research translation delivered through collaborations on each sub-goal. To maximise potential resources, the Institutes should each be aligned with one of the Australian Government priorities (or sub-goals), once these have been defined and implemented.[148]

This means that final selection of the focus areas (and therefore of the Frontier Technology Institutes) will need to wait until the Australian Government has released its response to the *Strategic Examination of Research and Development* and Australian Government priorities are clear.

[148] The Strategic Examination of Research and Development independent expert panel are due to submit their report on 31 December, but it is not yet known when the Australian Government will release a formal response, including the final selection (if at all) of priority areas and sub-goals.

Build timely and transparent evaluation into the model from the start

Finally, as with any policy intervention, it is important to build in high quality evaluation as part of the design and implementation. This allows policymakers and those involved in delivery to understand what is working well and why, what needs to be adjusted or stopped, and build up the evidence base for future policy decisions. Inherent in this is having a broader evaluation lens beyond traditional academic metrics (such as publications and grants), to include economic outcomes that will benefit the state and justify ongoing use of scarce public resources.

Clear and measurable goals linked to the objectives of the Frontier Technology Institutes need to be set at the outset, along with a strategy for measuring and reporting on progress.

This evaluation should be built into the delivery and consistently inform it, allowing the management of the Institutes to evolve and continuously improve using the lessons identified from the evaluation (an 'action research' approach).

Finding 49: We recommend that evaluation of the Frontier Technology Institutes should be transparent and timely, based on economic outcomes that will benefit the state and justify ongoing use of scarce public resources.

7. Sustainably Funding the Frontier Technology Institutes

7.1 Current South Australian taxation

In 2024-25 the South Australia Government was expected to raise $7 billion in its own taxation revenue, which was around 23 per cent of total State Government revenues (Table 3).

Payroll tax was the largest source of own taxation revenues, making up just over one quarter of the total, followed by stamp duty on property conveyances[149] which raised just under one quarter of taxation revenues.

Royalties on minerals and hydrocarbons, which are not classified as taxation, are expected to have raised $422 million, and sales of goods and services (such as regulatory fees and user charges) $3.6 billion in 2024-24.

Table 3: Estimated South Australian Government taxation revenue, 2025-26 budget

	2024-25 estimated result ($million)	Share of SA government taxation revenue (%)
Payroll tax	**1,950**	**27.8**
Total Property taxes	**1,122**	**16.0**
Land tax	*831*	*11.8*
Emergency services levy on fixed property	*203*	*2.9*
Other property taxes	*87*	*1.3*
Water levies	**19**	**0.3**
Stamp duty on conveyances	**1,604**	**22.8**
Total gambling taxes	**697**	**9.9**
Gaming machines	*455*	*6.5*
SA Lotteries	*116*	*1.7*
Casino	*62*	*0.9*
Betting operations tax	*61*	*0.9*
Other	*4*	*0.1*
Insurance taxes	**703**	**10.0**
General insurance + life insurance	*579*	*8.2*
CTP renewal certificate and insurance	*124*	*1.8*
Motor vehicle taxes	**925**	**13.2**
Motor vehicle registration fees	*577*	*8.2*
Stamp duty on registration transfers	*276*	*3.9*
Other	*71*	*1.0*
Total taxation revenue	**7,020**	
Selected non-tax revenue		
Mining and resources royalties	***422***	
Sales of goods and services	***3,571***	

Source: South Australian Department of Treasury and Finance (2025), Budget Paper 3, 2025-26 Budget Statement

[149] Unlike other states South Australia has abolished stamp duties on commercial property conveyancing, and so this revenue relates only to sales of residential and primary production properties.

South Australia is a relatively low tax jurisdiction with the second lowest state taxation revenue per capita, partially due to lower levels of potential tax revenue due to relatively lower property prices and wages. But even when these differences are adjusted for, our relative "tax effort" (which adjusts the per capita taxation based on potential revenue streams to reflect the different economic bases of the states) is still below average (Table 4). If our tax effort was at the national average total taxation revenue would be around $340 million higher.

Table 4: Comparison of relative state taxation levels, 2023-24

	Per capita taxation ($)	Tax effort ratio[a]
New South Wales	5,296	97.2
Victoria	5,344	113.5
Queensland	4,100	91.9
Western Australia	4,654	93.0
South Australia	3,417	95.1
Tasmania	3,089	85.9
All states and territories	**4,797**	**100.0**

Note: [a] *Tax effort ratio calculations are from Commonwealth Grants Commission's GST Relativities 2025-26 publication, average = 100*

Source: South Australian Department of Treasury and Finance (2025), Budget Paper 3, 2025-26 Budget Statement

Although the South Australian budget is currently projecting a net operating surplus across the forward estimates, the very large capital expenditures planned over the next five years will increase net borrowing, with non-financial public sector debt projected to reach $48.5 billion by 2028-29 (up from $27.9 billion in 2023-24).[150]

This means that we do not recommend trying to fund the proposed Frontier Technology Institutes through reduced net operating surpluses as this would further increase public sector debt.

Nor does targeting "efficiency savings"[151] seem the most appropriate way to fund our proposal, as planned savings do not always materialise, and efficiency savings may be needed for unexpected calls on the budget.[152]

It is our judgement that sustainable funding of our proposed Institutes will instead require a dedicated, new revenue stream, either from a new tax or an increase in the rate of an existing tax.

7.2 Potential taxation options

On our request, the South Australian Department of Treasury and Finance modelled the expected revenue streams from several possible changes to state taxation we had identified.

The two options that would deliver sufficient revenue are:

a. introducing a payroll tax surcharge of 0.4 per cent on organisations which have a national annual payroll of greater than $100 million, or

[150] South Australian Government Department of Treasury and Finance (2025), State Budget 2025-25, Budget Paper 3, Budget Statement, Table B.7

[151] State budget "efficiency savings" are reductions in government spending that agencies are required to achieve by operating more efficiently, without reducing the level or quality of services they provide.

[152] For example, since the last election substantial unanticipated calls on government funding have included responses to the Murray River flooding, the drought, support for Whyalla steelworks administration and for the Port Pirie smelter, and assistance for communities and businesses affected by the algal bloom. Governments are also likely to face higher and more unpredictable expenses over the medium term as climate change drives more frequent and more intense extreme weather events.

b. increasing the royalty rates on minerals and petroleum by 0.5 percentage points.

Decisions on preferred taxation instruments usually involve considering a combination of:

- the economic efficiency of the tax;
- the equity of the tax;
- its compliance and administrative burdens; and
- its relative competitiveness to other jurisdictions.

Economic efficiency

An economically efficient tax is one which raises the revenue a government needs while causing the least possible distortion to people's decisions about working, investing, producing and consuming.

Where royalties on minerals and petroleum are calculated on a value added (rather than volume) basis as is the case in South Australia, they are generally a relatively efficient form of revenue (although resources rent taxes such as the Australian Government's petroleum resources rent tax are more efficient). The estimated average marginal excess burden of mining royalties in Australia is 57 per cent, with the petroleum resource rent tax estimated to have an excess burden of -8 per cent (that is, it increases the efficiency of the economy).[153]

A universal payroll tax is also a relatively efficient form of taxation, with a similar efficiency cost to the GST (a marginal excess burden of 22 per cent). However, tax free thresholds or surcharges reduces the efficiency of payroll taxes as this creates an incentive for firms to avoid growing their payrolls beyond the threshold to avoid becoming liable for payroll tax.[154] The average marginal excess burden of Australian payroll taxes as they are actually applied is estimated to be 42 per cent.[155]

Neither of these options should be ruled out on efficiency grounds, but payroll tax is expected to have a slightly smaller cost to economic efficiency.

Finding 50: A payroll tax surcharge imposed on large firms based on their national payroll is preferred on efficiency grounds over an increase in mineral and petroleum royalties.

Equity

Minerals and petroleum royalties and payroll taxes are likely to have broadly similar impacts on equity, with the impacts of the tax split between reduced profits (which ultimately tend to flow to relatively high-income households) and lower wages depending on the strength of the relevant labour markets. Periods where a greater share of the cost of the tax are felt by workers through lower wages will tend to reduce the equity of these taxes, while periods of strong demand for labour will tend to increase their equity.

Finding 51: The two tax increases considered in this report are likely to have broadly similar (and small) impacts on equity.

[153] Murphy, C. (2025), 'Modelling Reform Packages for Property, Corporate and Household Taxes', ANU Tax and Transfer Policy Institute Working Paper, 10/2025, August 2025

[154] Andrews, D. J. Buckley and R. Lee (2024), A Counterproductive Tax Cut? How Size-Based Payroll Taxes Can Create a Roadblock to Firm Growth', e61 Micro Note 23, 7 August 2024 find strong evidence for 'bunching'; Steinhauser, R., M. Sinning and K. Sobeck (2020), 'State tax elasticities of revenue bases,', ANU Tax and Transfer Policy Institute, did not find evidence of bunching around payroll tax thresholds.

[155] Murphy, C. (2025), 'Modelling Reform Packages for Property, Corporate and Household Taxes', ANU Tax and Transfer Policy Institute Working Paper, 10/2025, August 2025

Compliance costs and administrative burdens

An increase in minerals and petroleum royalty rates (assuming it is applied on the existing basis) would have a one-off compliance and administrative burden as rates are adjusted in finance systems, however it should not impose any additional on-going compliance costs or administrative burden as all mines subject to the higher rate would already be subject to the existing royalty.

A payroll tax surcharge is likely to impose not just implementation costs, but it could potentially involve some limited on-going costs, for both compliance with the tax by affected businesses and for RevenueSA in administering the tax.

Finding 52: An increase in minerals and petroleum royalty rates may have a lower impact on compliance costs and administrative burden.

Relative competitiveness

A payroll tax surcharge for larger firms assessed on their national annual payroll already exists in Victoria, Queensland and the Australian Capital Territory (universities are exempt from the surcharge in the ACT), and in each case is levied at a higher rate than is proposed for South Australia.

If a large employer payroll tax surcharge of 0.4 per cent on firms with national annual payrolls above $100 million were adopted, then South Australia would still have the lowest effective payroll tax rate for large firms of any state or territory and so this would not be expected to materially impact South Australia's relative competitiveness.

Table 5: Current effective payroll tax rates inclusive of surcharges at selected total payrolls, by state and territory

Payroll:	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
$1 million	-	-	-	-	-	-	-	-
$1.7 million	1.60	2.00	1.28	2.61	3.20	1.06	-	-
$2 million	2.18	2.43	1.90	3.17	3.47	1.50	-	-
$5 million	4.14	4.85	4.02	5.08	4.36	4.26	4.11	4.13
$10 million	4.80	4.85	4.92	5.50	4.65	5.18	5.48	5.50
$20 million	5.12	5.35	5.08	5.50	4.80	5.64	6.17	5.50
$50 million	5.32	5.65	5.15	5.50	4.89	5.92	6.58	5.50
$100 million	5.38	5.75	5.18	5.50	4.92	6.01	6.96	5.50
$150 million	5.41	6.12	5.35	5.50	4.93	6.04	7.25	5.50

Source: SA Department of Treasury and Finance

South Australia's royalty rates for petroleum are in line with most other Australian jurisdictions (see Table 6). Our royalty rates for copper are in line with or slightly higher than the rate applied in most other jurisdictions (depending on the copper price in the case of Queensland). If the royalty rate were increased by 0.5 percentage points, then it would increase the cost of mining copper and extracting petroleum and natural gas in South Australia relative to other states and territories, resulting in some loss of relative competitiveness.

Finding 53: A large firm payroll tax surcharge is preferred on competitiveness grounds as it is not expected to reduce our competitiveness relative to other states, whereas an increase in minerals and petroleum royalties would push our rates above most other states.

Table 6: Copper and petroleum royalty rates[a]

	NSW	Vic	Qld	WA	SA	Tas	NT
Copper royalty rate	4.0% of the ex-mine value (net of deductions)	2.75% of the net market value	Between 2.5% and 5% of gross value depending on ave. metal prices	Metallic form: 2.5% Concentrate 5.0% Crushed & screened ore: 7.5%	Metallic form: 3.5% Concentrate 5.0%	1.9% of net sales + profit royalty (max total of 5.35% of net sales)	Metallic form: 2.5% Concentrate 5.0% Crushed & screened ore: 7.5%[b]
Basis of copper royalty	Ad valorem	Ad valorem	Ad valorem	Ad valorem	Ad valorem	Hybrid	Ad valorem
Petroleum royalty rates	10% at well head	10% at well head	Sliding rate scale based on price and volume	10% or 12.5% at well head[c]	10% at well head	12% at well head	10% at well head
Basis of petroleum royalty	Ad valorem	Ad valorem	Ad valorem	Ad valorem	Ad valorem	Ad valorem	Ad valorem

Notes: [a] *ACT excluded*
[b] *Royalties for new mines, older mines have a grandfathered royalty applied*
[c] *Gas extracted under the Barrow Island Royalty Variation Agreement Act 1985 is taxed at a 40% royalty rate using a similar approach to the Australian Government's PRRT.*
Source: SA Department of Treasury and Finance

Conclusion

The efficiency costs of a payroll tax increase (assuming that South Australian relative excess burdens reflect the national averages) would be lower than the efficiency costs of an increase in mining and petroleum royalties.

As South Australia's payroll tax rate for large firms would remain the lowest in the country, a modest surcharge would likely have a small or no impact on our relative competitiveness, whereas an increase in minerals and petroleum royalties would result in South Australia having a higher tax burden for mining and resource firms than the other states, plausibly reducing our competitiveness.

Increasing private sector investment to expand the State's copper, magnetite, critical minerals and natural gas industries is an area of focus for the South Australian Government. The reduction in relative competitiveness from increasing royalty rates to a level above most of the other states and territories would potentially run counter to these efforts.

Introducing a payroll tax surcharge of 0.4 per cent on firms with a national annual payroll of $100 million or more is therefore our recommended approach to funding the Frontier Technology Institutes as it has less impact on the efficiency and competitiveness of the state economy.

A surcharge at this level is estimated to raise around $65 million per annum in revenue based on current payrolls, allowing some contingency for the funding of the Institutes.

We do not recommend a new tax lightly. But a new revenue stream is necessary to ensure that the Frontier Technology Institutes have the dedicated resources and necessary scale to achieve their objectives, without increasing public debt and to project low sovereign risk. Our entire state, including large businesses subject to the surcharge, will ultimately benefit from the stronger, more resilient local economy this policy will help to generate. And these benefits will substantially exceed the costs of the additional tax needed to fund the Institutes. If our design recommendations are followed, taxpayers can also rest assured that surcharge funds will be productively invested and not diverted to less productive activities.

Finding 54: We recommend a payroll tax surcharge of 0.4 per cent on firms with a national payroll of over $100 million as the preferred approach to funding the Frontier Technology Institutes.

Implementation

There are administrative advantages in commencing any change in payroll tax arrangements at the start of a new financial year. There may be benefits from timing the commencement of the preferred tax increase so that revenue is received for at least one quarter before the commencement of the first Frontier Technology Institutes, ensuring that funds are available as soon as the first Institute starts operations.

Income from the allocated taxation stream should be held within a perpetual fund established by the legislation founding the Institutes, giving certainty around revenue streams by allowing surpluses to be built up in years of higher tax revenues and then drawn down in years of lower revenue.

8. Potential impacts

8.1 Estimated impact

The Frontier Technology Institutes are a policy explicitly targeting increases in economic activity, so economic impact needs to be the relevant metric for success.[156] Whether or not it is worth the South Australian Government investing in expanding R&D in the state depends largely on how large an impact it is expected to have on economic output and jobs, as well as on the efficiency and cost of taxes used to fund it and the opportunity cost of plausible alternative types of government spending to boost economic output.

The Commission is generally reluctant to recommend expenditures of this scale, and even more reluctant to recommend increases in taxation. To assess whether this spending and taxation are justified we have carefully modelled the scale of the potential impacts using internationally accepted approaches and parameters. We are confident that the scale of the expected boost to state incomes, and the importance to the South Australian economy of boosting our R&D intensity, justifies the spending and a potential the tax impost.

It is also important to recognise that investing in R&D is an intervention where the economic payoffs are enduring and long term. This is not a policy to boost incomes over the next few years, but over the next few decades.

To reflect this, economic impacts have been estimated as at 2035-36.

The central estimate from our modelling of the potential *gross impact* on gross state product (GSP), should the Institutes be successfully implemented in line with our proposed timeline (see pages 8 and 9), is that GSP would be 0.22 percentage points higher in 2035-36, or an increase of $421 million.

The *cumulative gross impact* on GSP over the decade to 2035-36 would be $1.1 billion in 2024-25 values (assuming the scale of impact in our central estimate). Over the same period, the South Australian Government would have spent a cumulative total of $291 million (including $5 million for design and set up costs).

Assuming the share of the economy that goes towards paying wages remains at its recent average, as does the proportion of payrolls liable for payroll tax, then this increase in GSP would increase South Australian Government 2035-36 payroll tax revenues by around $7 million.

The cumulative benefits (from increased GSP) up to 2035-36 are 3.7 times higher than the spending by the South Australian Government, a very favourable ratio of benefits to costs.

Finding 55: For every $1 the South Australian Government spends on the Frontier Technology Institutes up to 2035-36, the expected cumulative benefit is $3.70.

Government spending comes with costs and trade-offs. Any revenue that governments raise through taxation or user charges reduces the overall efficiency of the economy (referred to by economists as the “marginal excess burden”) because it changes individuals’ and businesses’

[156] This goal differs from many other types of government spending, such as healthcare, where the relevant metric for assessing success is improved quality of life.

behaviour, diverts some resources away from their most efficient use, and imposes collection and compliance costs.[157]

The introduction of the payroll tax surcharge on large firms to fund the policy is estimated to reduce economic output by $24 million (in other words, the reduction in GSP from the additional payroll tax raised to fund the Institutes would be $24 million).[158]

These efficiency losses from taxation are the appropriate factor to offset against benefits in calculating the *net social benefits* of government policy, as the tax revenue itself represents a transfer rather than a cost to the economy.

Including these costs results in an estimated net social benefit from the Institutes of $397 million in additional GSP in 2035-36, an increase of 0.21 percentage points compared to its expected level without the investment in the Frontier Technology Institutes.

Finding 56: Our central estimate of the *net social benefit* of the policy after accounting for the cost of taxation revenue is that GSP will be $397 million higher by 2035-36 (in 2024-25 values), an increase in GSP of 0.21 percentage points.

Key timing assumptions (see the timeline at pages 8 and 9):

- Work on implementing the policy begins in July 2026, but no additional research attributable to the Frontier Technology Institutes takes place in 2026-27 as that first year is spent first on identifying the state's R&D priority areas and enacting the enabling legislation, then on negotiating with the universities on operating arrangements and establishing necessary processes.
- South Australian Government research funding gradually ramps up in subsequent years as staff are recruited and industry engagement is put in place
- Full South Australian Government funding is reached in 2030-31.

Other key assumptions underlying the calculation:

- Institutes win additional net research funding of $1 from Australian Government schemes plus $1 from industry partners – i.e. $2 of additional funding – for every $1 of SA Government research funding, with a two-year lag. This seems appropriate given the international examples discussed in this report, the goals of the program and the calibre of researchers being targeted. (For comparison, the Commonwealth Bank's investment in AIML alone is roughly equal to the current South Australian Government grant to AIML, and the research centre Commonwealth Bank has established in Adelaide, if it reaches its full scale, will involve spending of around 12 times the current South Australian Government grant to AIML.)
- This additional funding would not have been won by South Australian researchers were it not for the South Australian Government's initial investment in the Institutes.
- Industry partners are assumed to increase their own R&D and/or relocate R&D into South Australia to collaborate with R&D being undertaken at the Institutes. This is also assumed to be a net increase in R&D undertaken in South Australia.

[157] Debt funded spending has similar costs as it is funded by either future taxes being higher than they would otherwise have been or future spending being lower.
[158] The economic efficiency loss of the potential taxation is calculated using the marginal excess burden of the proposed tax (see section 7.3) and the expected revenue in 2035-36.

- The scale of this additional research undertaken by industry is assumed to be equal to the South Australian Government grant, again with a two-year lag. This is a conservative assumption based on some of the international examples considered in this report, or the recent experiences of AIML.
- The Institutes will be successful in keeping administrative overheads low, with at least 85 per cent of total funding spent on R&D activities.

Section 8.3 provides more details on these impact calculation and sensitivity testing.

8.2 Offsetting costs and alternatives

The estimated economic impact of establishing the Frontier Technology Institutes compares very favourably to alternative State Government policy options to increase economic output, such as tax cuts or investing in physical infrastructure.

The marginal excess burden of taxation available to the Australian states varies widely, from under $0.10 for each $1 raised (for a universal land tax or municipal rates) to $2.25 for each $1 raised (for stamp duties on conveyancing for commercial property; a reduction in output that is more than twice the revenue raised).[159] This implies that providing tax cuts of equal value to the proposed spending on the Frontier Technology Institutes would boost annual GSP in 2035-36 by $23 million to $43 million in 2024-25 values (depending on which tax was cut). These estimates assume that these tax cuts are funded through government spending cuts or reduced operating surpluses, which would add pressure to the state budget.

Another way of thinking about the cost of government spending is to consider the opportunity cost, or the benefits of the next most plausible use of the funds for a similar objective. This can be difficult to quantify as the impacts of different projects are highly variable.

Studies in the US and Australia that have looked more broadly at the impacts of government spending targeted at raising GSP have found impacts on economic activity from infrastructure spending ranging from negative, particularly where spending occurs at times of high employment, up to a best case of increases in economic activity of around $1.20 for each $1 spent during periods of high unemployment and low demand for construction workers.[160] Estimated impacts of general government spending aimed at stimulating economic activity range from $0 to $0.50 for each $1.00 of government spending.[161]

[159] Murphy, C. (2025), 'Modelling Reform Packages for Property, Corporate and Household Taxes', ANU Tax and Transfer Policy Institute Working Paper, 10/2025, August 2025. South Australia abolished stamp duty on conveyancing for commercial property in 2018, https://www.revenuesa.sa.gov.au/resources/publications/information-circulars/information-circulars/ic_076

[160] Haug, A.A. and A. Sznajderska (2024), 'Government spending multipliers: Is there a difference between government consumption and investment purchases?', *Journal Of* Macroeconomics, vol.79; Reynolds, Z. and L.A. Fisher (2025), 'Estimates of Government Spending Multipliers in Australian Data', *Applied Economics*, February 2025; Gravelle, J.G. and D.J. Marples (2021), 'Fiscal Policy and Recovery from the COVID-19 Recession, Congressional Research Service report R46460, February 2021

[161] Chetty, R., J.N. Friedman, M. Stepner and The Opportunity Insights Team (2023), 'The Economic Impact of COVID-19: Evidence from a new public database build using private sector data, *NBER Working Paper,* No. 27431; Gravelle, J.G. and D.J. Marples (2021), 'Fiscal Policy and Recovery from the COVID-19 Recession, Congressional Research Service report R46460, February 2021

Long term impacts can be higher, for example if infrastructure spending is well targeted and lowers the cost of doing business.[162]

Finding 57: Plausible alternative policies to boost GSP have much lower cost-benefit ratios, with international evidence suggesting that at best infrastructure spending boosts economic output by $1.20 for every dollar spent, well below the $3.70 estimated long-run benefit of the Frontier Technology Institutes.

8.3 Detailed approach to calculating impact and sensitivity testing

Impacts on GSP were calculated using estimates of the elasticity of national economic output to changes in the national R&D stock.[163] (The elasticity is the average percentage change to economic output in a country or region as a result of a 1 per cent increase in the total stock of R&D available to the regional economy.)

The elasticity we used was estimated by Frontier Economics from a meta-analysis of studies undertaken for the UK Government. The 'whole economy' estimates were used, as they measure the combined impacts of R&D undertaken in the private, higher education, public and not-for-profit sectors.[164]

The mean elasticity estimate identified by Frontier Economics for whole of economy impacts is 0.094; that is for each 10 per cent increase in the stock of R&D, GDP increases by 0.94 per cent.

This could be an *underestimate*, as it is roughly equivalent to a 36 per cent annual rate of return on R&D which is towards the lower end of estimates reviewed during this inquiry. On the other hand, the relatively lower level of business R&D in Australia suggests that Australian firms may have less capacity to absorb external R&D than firms in other countries. If this is the case, then international estimates would tend to *overestimate* the potential impacts in Australia.

To test the sensitivity of our impact calculation to this choice of elasticity, we replicated our calculations using a lower bound elasticity estimate of 0.047 (half the mean elasticity calculated by Frontier Economics) and 0.188 (twice their mean elasticity calculated by Frontier Economics, but still well below the maximum value of studies included in their meta-analysis of 0.56), see Tables 7 and 8.

We also tested the sensitivity of our results to alternative assumptions about how much additional research revenue the Institutes could attract.

As a lower bound we modelled extremely conservative scenarios where the Frontier Technology Institutes attracted no additional R&D grant or partnership funding beyond the South Australian Government funding.

As an upper bound we modelled scenarios where on average the Frontier Technology Institutes each attracted average additional grant income of $20 million, starting two years after they reach full

[162] There are, of course, other quality of life benefits from infrastructure spending such as less time wasted stuck in congestion, which can make the overall benefit cost ratio much more favourable. However the focus here is on the relative impacts of policies on increasing economic output.
[163] The potential impacts of policies to increase R&D can be assessed using either estimates of the annual social rate of return from R&D or using estimates of the elasticity of economic activity to a change in R&D stock. We prefer the elasticity approach because it recognises that the economic impact of an extra $1 or R&D depends on how much it adds to the overall existing stock of R&D in a country or region. In contrast, using a rate of return based approach a $1 increase in R&D will always produce the same dollar value increase in economic output.
[164] Frontier Economics (2023), 'Rate of Return to Investment in R&D: A report for the Department for Science, Innovation and Technology', March 2023, p. 28

scale (with 85 per cent of this income spent on research) and attracted net additional $20 million in business R&D to South Australia, for total research spending of 1.66 times that used in our central estimate.

This gave eight additional impact scenarios in addition to our central estimate.

The sensitivity testing suggests that, after taking into account the economic costs of the tax revenue needed to fund the institutes, the net impact on GSP by 2035-36 would be an increase of between 0.03 and 0.72 percentage points compared to where it would be without the Institutes (with a central estimate of impact of 0.21 percentage points increase; see Table 7).

Finding 58: Even in the most conservative scenario of potential impact of R&D on GSP and potential research revenue of the Institutes, they still deliver a small net benefit for the state.

Table 7: Percentage point net increase in GSP in 2035-36 as a result of additional R&D associated with the Institutes

		Assumed annual additional average research spending associated with each institute, 2035-36:		
		$9.9 million	$29.3 million	$48.7 million
Alternative elasticities:	**0.047**	0.03	0.10	0.18
	0.094	0.07	0.21	0.35
	0.188	0.16	0.43	0.72

In 2024-25 values this suggests a gross impact on GSP of between $81 million and $1,243 million (see Table 8). This is equivalent to a ratio of benefits to South Australian Government costs of 1.01 at the lower bound (where the elasticity is low and the Institutes do not attract any additional research funding), to 13.9 at the upper bound.

Table 8: Real net increase in GSP in 2035-36 as a result of additional R&D, $'millions associated with the Institutes, 2024-25 values

		Assumed annual additional average research spending associated with each institute, 2035-36:		
		$9.9 million	$29.3 million	$48.7 million
Alternative elasticities:	**0.047**	$56.8	$186.2	$330.4
	0.094	$138.0	$396.8	$663.2
	0.188	$300.4	$818.0	$1,350.7

Other parameters and assumptions used in the analysis were:

1. The eventual full funding allocation will be $50 million in 2024-25 values and indexed annually at 4 per cent nominal (a 1.5% real increase per year), reflecting trends in skilled wages.

2. Funding rolls out gradually as the Institutes are selected and recruit their key staff, so in 2024-25 values the unindexed spending would be $10 million in 2027-28; $25 million in 2028-29; $45 million in 2029-30; and then reach the full allocation of $50 million in 2030/31.

3. R&D stock depreciates at 10% per annum[165]
4. Without the policy, GSP would increase at an average real rate of 2% over the next 11 years.

[165] Frontier Economics note that firm level studies of the returns to R&D typically follow Griliches, Z. (1998) R & D and Productivity: The Econometric Evidence. The University of Chicago Press, Chicago. https://doi.org/10.7208/chicago/9780226308906.001.0001is assuming a 15% depreciation rate for a firm's own R&D not least because much of the R&D undertaken within a firm is replacing existing stock of R&D for example by developing a new product of process. However, they also note that at a societal level this will overstate the depreciation of R&D as basic science becomes obsolete much more slowly, and other firms can build on old R&D stock in other firms (2023, p. 11, 19). For that reason, we adopted 10% as a plausible depreciation rate for R&D stock in South Australia.

9. Implications for Regional South Australia

The proposed model has been designed to maximise the economic benefits for the statewide economy. It is not intended, and in our assessment is not suitable, for addressing the specific needs of regional South Australia.

Extending the model to the regions would conflict with the model's focus on a small number of core strategic opportunities, risking dilution of benefits by diverting scarce resources away from these opportunities. As discussed in Chapter 6, stakeholders were unanimous that spreading resources too thinly would limit meaningful impact and reduce resources available for the highest-potential opportunities.

The model could, however, provide indirect benefits to the regions to the extent that it:

- prioritises industries of regional relevance (e.g. critical minerals, wine, agriculture);
- strengthens the state economy and budget over the long term, thereby supporting regional infrastructure and service delivery; and/or
- offers remote outreach (in person or digitally) to connect young people in regions to role models and mentors, to increase the future pool of talent in the state (see Section 4.4).

These outcomes should be seen as potential by-products of our proposal, not as intended goals.

Similarly, international or interstate models should not be adopted in South Australia without careful consideration of local structural conditions. For example, Queensland's Regional University Industry Collaboration Program relies on large regional centres, a strong network of regional universities and a dynamic regional industry base,[166] making it difficult to directly replicate in South Australia. Likewise, overseas programs such as the UK's Innovation Accelerators and the US National Science Foundation's Regional Innovation Engines benefit from much larger domestic markets and regional centres than those in South Australia.

A place-based approach is essential for designing innovation policies with regional impact. The benefits of R&D are not evenly distributed across regions – they depend on a region having sufficient economic development and absorbative capacity, including entrepreneurial capital.[167] South Australia's regions may first need to build this capacity before they can fully benefit from additional R&D investment.

Regional economic policy in South Australia is therefore likely to be more effective if it initially focuses on building skills, capabilities and enabling infrastructure. For example:

- Education and workforce development: The Commission has previously recommended a suite of education reforms to reduce youth disengagement and improve education-to-employment pathways, particularly further away from Adelaide. This includes funding career advice function through the Regional Development Australia (RDA) SA network, and trialling

[166] A $7 million program funded by the Queensland Government from 2024-2027 and delivered by the CSIRO SME Connect team, https://statements.qld.gov.au/statements/100613

[167] Ma, H, Ortega-Argil´es, R, Lyons, M (2024), 'UK levelling up R&D mission effects: a multi-region input-output approach', Manchester Institute of Innovation Research Working Paper 2024/03;
Sterlacchini, A. (2008). R&D, higher education and regional growth: Uneven linkages among European regions. R*esearch Policy*, 37:6-7, pp. 1096-1107.

place-based, demand-driven employment and skills programs in high-unemployment regional centres with willing employers.[168]

- Business capabilities: Strengthening business and management capabilities helps regional firms plan strategically, adopt innovation, improve productivity, and respond to challenges and opportunities. This could be achieved through supports such as targeted training, mentorship, peer networks, and support from universities or regional development agencies providing practical guidance tailored to local needs.
- Enabling infrastructure: RDA SA has highlighted the importance of tackling key infrastructure challenges that constrain regional economic development.[169] This includes addressing barriers to technology adoption and digitisation, such as improving high-speed broadband and mobile coverage.

A more detailed examination of the specific economic needs of South Australia's regions, and the specific policy solutions to address them, is beyond the scope of this inquiry.

Finding 59: The Institutes would not directly address the needs of regional South Australia, and restructuring them to do so risks reducing their effectiveness. Regions would be better served by place-based policies to increase their capabilities, particularly through investment in skills.

[168] See recommendations 17 and 18 in https://www.sapc.sa.gov.au/__data/assets/pdf_file/0007/1140496/Positioning-All-South-Australians-to-Share-in-the-Benefits-of-Economic-Growth-Final-Report.pdf

[169] Regional Development South Australia. (2025). *Regional Priorities Statement: Strong Regions, Smart Growth*, https://regionaldevelopmentsa.com.au/wp-content/uploads/2025/06/RDSA_Regional_Priorities_Statement_01.pdf

Appendix A: Terms of Reference

THE HON PETER MALINAUSKAS MP

PREMIER OF SOUTH AUSTRALIA

Mr Adrian Tembel
Chair, South Australian Productivity Commission
GPO Box 2343
ADELAIDE SA 5001

fB506296

Dear Mr Tembel Adrian,

Please find enclosed a Notice of Inquiry into Building our R&D intensity to Deliver a More Productive and Competitive State which sets out the terms of reference for the inquiry.

I thank you and the Commission in advance for your efforts in relation to this matter.

Yours sincerely

Peter Malinauskas
PREMIER
MINISTER FOR DEFENCE AND SPACE INDUSTRIES

23 / 9 / 2025

SOUTH AUSTRALIAN PRODUCTIVITY COMMISSION INQUIRY: BUILDING OUR R&D INTENSITY TO DELIVER A MORE PRODUCTIVE AND COMPETITIVE STATE

I, Peter Malinauskas, Premier, hereby request that the South Australian Productivity Commission (the Commission) undertake an inquiry into Building our R&D intensity to Deliver a More Productive and Competitive State.

Background

Despite some recent challenges, South Australia's economy remains strong with a record number of South Australians employed, an unemployment rate of 4.3 per cent (as at July 2025), and growth in final demand that is well above the national average in annualised terms.

However, this strong recent performance has not fixed the long-term structural economic challenges facing South Australia. A lack of complexity and diversity in our economy is holding back wages and productivity growth, leaving us too dependent on our natural resources and vulnerable to a changing international environment. There are very significant opportunities ahead of us as a state through AUKUS, particularly the nuclear submarine build, and the opportunity to combine our natural endowments in copper, iron and critical minerals with our abundant renewable energy to become a leader in clean minerals. But we cannot realise these opportunities and secure the economic future of the state with business as usual.

My Government recognises the importance of building the state's research and development (R&D) base as a key element of boosting the state's productivity, the complexity and competitiveness of its economy and South Australian's incomes. I also note that this has been the focus of past advice from the South Australian Productivity Commission.

It was why we were so focused on driving the formation of Adelaide University from the University of Adelaide and the University of South Australia. Increased R&D will complement the generational reforms my Government has been making to the state's education and training system, including guaranteed three-year-old pre-school, the new Technical Colleges, and fee free TAFE.

With the university merger about to become completed, we need to focus on the next stage of building our state's R&D base. This will likely require my Government to step up and ensure that the right incentives and supports are provided to grow our world-class research and ensure it is transmitted into the heart of the South Australian economy.

For this reason, I have asked the South Australian Productivity Commission to explore models for increasing the R&D intensity of our state. I have also asked the Commission to provide options for an efficient and sustainable funding mechanism for increased R&D that can endure through budget cycles and day-to-day politics. This will build on and update the work undertaken by the Commission in their inquiry into 'Turning Research into Economic Competitiveness for South Australia' in understanding the existing research and business innovation environment in South Australia.

Terms of reference

The Commission is asked to consider and report on:

1. Whether, given the specific structure of the South Australian economy and best practice international examples, there are options open to my Government to significantly increase the R&D intensity of our state that represent good value for money for South Australian taxpayers.
2. If a model is identified that could deliver cost effective increases in SA based R&D, provide detailed advice on how it could be structured, and what it would be likely to cost.
3. Options for long-term, sustainable and economically efficient funding mechanisms that could support the recommended policy approach over the decades ahead.
4. Assess whether the proposed model can also meet the needs of regional South Australia, or whether additional structures or supports should be considered to help our regions realise their potential.

Inquiry process

The Commission will seek input from relevant experts (including from within the SA Government) and draw on prior work conducted in this field. In particular, the Commission will engage closely with the Department for Treasury and Finance. The Commission will consult with universities and other research institutions active in SA, industry, relevant public and private sector organisations, professional associations and other key stakeholders.

The Commission is to provide me with a report outlining its findings on potential models for sustainably boosting the R&D intensity of our state, and options for funding these activities by Friday, 12 December. If necessary, a further and final report that will refine and further particularise the preferred model, is to be provided to me by no later than six month rom the date of receipt by the Commission of these terms of reference.

Peter Malinauskas
PREMIER
MINISTER FOR DEFENCE AND SPACE INDUSTRIES

23 / 9 / 2025

Appendix B: Existing University Research Institutions in South Australia

Flinders University[170]

Institutes

Institute for Nanoscale Science & Technology

Medical Device Research Institute

Caring Futures Institute

Flinders Health and Medical Research Institute (FHMRI)

Flinders University Institute for Mental Health and Wellbeing

Torrens Resilience Initiative

Flinders Ageing Alliance

Flinders University Institute for Mental Health and Wellbeing

Research Centres

Flinders Digital Health Research Centre

Centre for Marine Bioproducts Development

Research Centre for Palliative Care, Death and Dying

Assemblage Centre for Created Arts

Jeff Bleich Centre for Democracy and Disruptive Technologies

Centre for Social Impact

National Centre for Groundwater Research and Training

Centre for Defence Engineering Research and Training

[170] List as published at: https://www.flinders.edu.au/research/centres-institutes.

University of Adelaide[171]

University Institutes

Defence and Security Institute

Environment Institute

Australian Institute for Machine Learning

Institute for Sustainability, Energy and Resources

Institute for Photonics and Advanced Sensing

Robinson Research Institute (reproductive medicine)

South Australian Immunogenomics Cancer Institute (SAiGENCI)

Waite Research Institute

ARC Centres for Excellence

ARC Centre of Australian Biodiversity and Heritage (CABAH)

ARC Centre of Excellence for Dark Matter Particle Physics (CDMPP)

ARC Centre of Excellence for Gravitational Wave Discovery

ARC Centre of Excellence for the History of Emotions

ARC Centre of Excellence for Mathematical & Statistical Frontiers (ACEMS)

ARC Centre of Excellence for Nanoscale Biophotonics

ARC Centre of Excellence for Particle Physics at the Tera-Scale

ARC Centre of Excellence Plants for Space

ARC Centre of Excellence in Plant Energy Biology

ARC Centre of Excellence for Robotic Vision

ARC Industrial Transformation Research Hubs

ARC Industrial Transformation Research Hub for Wheat in a Hot and Dry Climate

ARC Research Hub for Australian Copper-Uranium

ARC Research Hub for Graphene Enabled Industry Transformation

ARC Training Centre for Innovative Wine Production

NHMRC Centres for Research Excellence

NHMRC Centre for Research Excellence in Frailty and Healthy Ageing

NHMRC Centre of Research Excellence for the Protection of Pancreatic Beta Cells

NHMRC Centre of Research Excellence - EMPOWER: Health Systems, Adversity and Child Well-being

[171] List as published at: https://www.adelaide.edu.au/research/about-us/research-institutes.

NHMRC Centre of Research Excellence in Targeted Nutrition to Improve Maternal and Child Health Outcomes

NHMRC Healthy Housing Centre of Research Excellence

NHMRC Australian Centre for Electromagnetic Bioeffects Research (ACEBR)

Cooperative Research Centres

HILT CRC (lead organisation)

CRC for Greenhouse Gas Technologies (essential participant)

Bushfire and Natural Hazards CRC (essential participant)

CRC for Water Sensitive Cities (supporting participant)

Cell Therapy Manufacturing CRC (supporting participant)

CRC Optimising Resource Extraction (essential participant)

Innovative Manufacturing CRC (essential participant)

CRC for Honey Bee Products (essential participant)

Cyber Security CRC (essential participant)

Future Fuels CRC (essential participant), announced in 2018

Fight Food Waste CRC (essential participant), announced in 2018

MinEx CRC (essential participant), announced in 2018

University of South Australia[172]

Additive Manufacturing CRC

Alliance for Research in Exercise, Nutrition and Activity

Australian Centre for Child Protection

Australian Centre for Precision Health

Behaviour Brain Body Research Centre

Australian Research Centre for Interactive and Virtual Environments

Centre for Cancer Biology

Centre for Change and Complexity in Learning

Centre for Enterprise Dynamics in Global Economies

Centre for Markets, Values and Inclusion

Centre for Pharmaceutical Innovation

Centre for Research in Education and Social Inclusion

Centre for Workplace Excellence

Creative People, Products and Places Research Centre

Digital Health CRC

FenEx CRC (Future Energy Exports)

Future Industries Institute

Ehrenberg-Bass Institute for Marketing Sciences

Health and Biomedical Innovation

IMPACT in Health

Industrial AI Research Centre

MinEx CRC (Minerals Exploration)

Marine Bioproducts CRC

Quality Use of Medicines and Pharmacy Research Centre

Rosemary Bryant AO Research Centre

SAAFE CRC (anti microbial resistance)

Social Relationships and Communities Research Group

SmartSAT CRC

SMART CRC (Regenerative Therapies Manufacturing)

Sustainable Infrastructure and Research Management

[172] List as published at: https://www.unisa.edu.au/research/#research-areas.

Appendix C: Projects Currently Funded by the South Australian Research and Innovation Fund and Manufacturing Support Program

Project Name	*Part Of*	Activity/Objective	Grant Duration	Annualised Funding	Notes
SA Cooperative Research Centre Assistance Program	*Research and Innovation Fund (Stream 1)*	Supports industry to partner with the research sector to solve industry-identified problems in collaborative research.	.	.	Up to $300,000 over lifespan for CRC node located in SA. Up to $600,000 over lifespan for CRC headquarters located in SA.
Australian Institute of Machine Learning (AIML)	*Research and Innovation Fund (Stream 1)*	Conducts globally competitive research and development in AI, machine learning, computer vision and deep learning.	Until 30/11/29	11,000,000 (total, across two grants)	AIML Industrial AI ($6m) Centre for Responsible AI Research ($5m)
Industry Doctoral Training Centre pilot programs	*Research and Innovation Fund (Stream 1)*	Facilitating collaboration between research and business, developing innovations for translation to market, and supporting greater mobility of graduates between research and industry.	Until 31/01/2027	2,000,000 (total, across five grants)	Flinders University ($420,000) University of South Australia ($300,000) University of Adelaide ($1,080,000) Quantum Plus ($100,000) MTPC Biomanufacturing Plus ($100,000)
Inspiring South Australia	*Research and Innovation Fund (Stream 1)*	Works collaboratively with scientists of all kinds, government agencies, citizen scientists, arts organisations, universities, and industry to provide South Australians with opportunities to connect with, be involved in and get excited about science, technology, engineering, maths, and medicine (STEMM).	28/05/2024 - 31/08/2027	370,000 (total)	.
Medical Device Partnering Program	*Research and Innovation Fund (Stream 1)*	Develops novel medical devices with global market potential and fosters collaborations between researchers, industry, end-users and government.	25/01/2024 - 30/06/2026	900,000 (total)	.

Project Name	*Part Of*	Activity/Objective	Grant Duration	Annualised Funding	Notes
Seed-Start Program	*Research and Innovation Fund (Stream 2)*	Seed-Start assists innovative early-stage South Australian businesses with high-growth potential to commercialise products or services that could achieve a sustainable competitive advantage in national and international markets.	.	.	Seed Grants: $50,000 - $100,000 per grant, 2 years max funding period. Start Grants: $100,001 - $500,000 per grant, 3 years max funding period.
Go2Gov Program	*Research and Innovation Fund (Stream 2)*	Supports high-growth potential businesses to partner with a South Australian Government Agency as a first or reference customer.	.	.	Up to $200,000 per grant.
Lot Fourteen Startup Hub	*Research and Innovation Fund (Stream 2)*	This co-working space is designed to give local startups the best foundations for success... benefitting from regular events, workshops and other networking opportunities – as well as the partnerships forged with neighbouring universities and global companies.	.	.	.
_SOUTHSTART	*Research and Innovation Fund (Stream 3)*	Australia's festival of innovation, imagination and impact.	12/06/2025 - 30/03/2029	2,000,000 (total)	.
Tribe Global	*Research and Innovation Fund (Stream 3)*	Delivering international trade missions to the UK and US for South Australian tech startup founders to participate in.	23/05/2025 - 31/03/2028	360,000 (total)	.
Manufacturing Technology Adoption Program	*Manufacturing Support Programs*	Helping South Australian manufacturers improve their productivity and competitiveness in global markets.	2025 - 2026	1,000,000	Ten grants up to $50,000 granted to businesses over two round of funding. *Delivered through Research and Innovation Fund.
Business Growth Fund	*Manufacturing Support Programs*	Aims to assist business and industry in key areas to grow secure, well paid jobs, improve productivity, deliver efficiencies, increase exports and support innovative, value adding technologies in South Australia.	.	56,349,000 (25-26 Budget) 154,000,000 (total)	Formerly 'Economic Recovery Fund'. Grants/loans of up to 50% of project/proposal expenditure, across multiple funding rounds.

Project Name	*Part Of*	Activity/Objective	Grant Duration	Annualised Funding	Notes
Manufacturing Growth Accelerator	*Manufacturing Support Programs*	This initiative is enabling . South Australia's small businesses to accelerate the adoption of innovative manufacturing technologies by connecting these businesses with researchers and industry leaders.		4,000,000 (total)	Part of Flinders University's 'Factory of the Future'.
SiGREEN Pilot Program	*Manufacturing Support Programs*	Siemens has partnered with DSD and Food SA to deliver a pilot of their SiGREEN solution to a cohort of South Australian food and beverage businesses where they identify a product's true carbon footprint to better track and demonstrate progress against set sustainability goals.	.	.	.

For more information

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