

Future State

FROM POTENTIAL TO PERFORMANCE

AUSTRALIA'S PATH TO INNOVATION EXCELLENCE

URBIS

**Innovation is essential
for Australia's
future prosperity.**



FOREWORD

Innovation is essential for Australia's future prosperity. Afterall, it is fundamental to how we drive economic growth, create jobs and solve our most pressing challenges.

As a nation, we've made significant progress in promoting innovation. We've increased our investment in research and development (R&D), strengthened our research and education institutions, and created a more supportive environment for businesses to innovate within.

But we need to ensure these efforts lead to real-world impact and national prosperity.

Australia has the potential to be a global leader in innovation. We have the resources, the talent and the drive to succeed. But if we want to realise this potential, we need to examine more holistically the factors and dynamics that shape innovation.

In this paper, we outline six strategic pathways that our governments, industry and institutions can take to strengthen Australia's innovation efforts, by understanding and leveraging the forces that drive innovation:

- 1. Embrace geography's role in the national innovation system**
- 2. Focus on high value sectors and technologies where there's a clear advantage**
- 3. Improve the functioning of regional innovation ecosystems**
- 4. Reshape the university sector for commercialisation**
- 5. Establish a strong foothold in technology value chains**
- 6. Leverage public sector procurement to drive innovation**

I believe these pathways can collectively help Australia to become a global leader in innovation.

A strong innovation ecosystem will help Australia create jobs, grow the economy and build a better future for all. While these strategies require a significant investment of time, effort and resources, I'm confident it will be worth it.

I hope this paper sparks a national conversation about how we can accelerate Australia's innovation journey and urge you to read this carefully and share your thoughts with me and with others.

Together we can build a more innovative Australia.



James Tuma

Group Director, Future State
Managing Partner, Urbis

INNOVATION IS AT THE HEART OF STRONG NATIONAL ECONOMIES

Innovation is essential for economic growth, prosperity, and sustainability.

It drives economic growth by creating new markets and opportunities, while improving our productivity and efficiency. Innovation also helps us to address some of the most pressing societal challenges facing Australia, such as climate change and poverty.

Unprecedented global connectedness and rapid technological change have created new opportunities and challenges. This is particularly true of countries that compete for market share in high-value growth industries and cutting-edge technologies.

The ability to generate and capture value from novel ideas is critical to establishing a favourable position in the innovation-led economy. As a result, many governments now invest heavily to improve the performance of national and regional innovation ecosystems.

The critical role that innovation plays in driving national prosperity is widely recognised. This has resulted in a tripling of worldwide R&D investment from \$USD 726 billion to \$USD 2.4 trillion between 2000 and 2019.¹ Since 2003, countries such as Korea and China have more than doubled their investment in innovation relative to GDP, resulting in significant economic growth and support for pioneering technologies in developing industries.²

Innovation is now seen as the indisputable source of competitive advantage and prosperity for all nations.³ It is consistently shown to have a major positive influence on businesses, industries and countries, whether measured by R&D spending, patenting or innovation counts.

The Federal Government's [2023 Intergenerational Report](#) states that Australia's productivity trajectory will be shaped by a combination of government policies, decisions made by businesses and investors, and shifts occurring within the global and domestic economy.⁴ The report emphasises the importance of policies that encourage investment in people, capital and innovation. It recognises the diffusion of new technologies and ideas, not only to tackle the headwinds to productivity growth but to facilitate Australia's transition to net zero and minimise the impacts of an aging population.

This paper examines Australia's current position in the global innovation economy and advocates novel strategies to deliver a step change in the nation's ability to innovate, commercialise research and maximise the value of innovation outputs to the economy. The opportunity is here – but the window is closing quickly.

Talent, capital and economic gains are accruing in nations able to translate research and ideas into economic success stories. Participating in these gains requires a deeper understanding of innovation processes and dynamics, a shift in policy focus, new institutional arrangements and significant long-term investment.

If we embrace this opportunity now, the upside potential for Australia is enormous.





AUSTRALIA'S INNOVATION IMPERATIVE

Innovation is more than creating new ideas and propagating knowledge – it requires change.

Australia is navigating a unique trajectory in the global innovation milieu. While our nation certainly has areas of competence, we also have weaknesses that limit our capacity to realise the potential of innovation-led economic growth.

In 2022, Australia scored 24th out of 48 high-income economies in the [World Intellectual Property Organization's Global Innovation Index](#), which ranks countries based on their ability to innovate.⁵ This positioning highlights both the progress Australia has made in promoting innovation and the obstacles we must overcome to bolster our global standing.

Despite our strengths in innovation inputs, such as Australia's tertiary education sector and reputation for research, we continue to face barriers that restrict our ability to put ideas into practice and capture value by transforming research and development efforts into commercial outcomes.

Australia's inability to get the most out of its national innovation system has been well canvassed in reports, papers and policy documents over the last decade.⁶ Compared to its peers, Australia ranks third in the world for government and university researchers as a share of population and eighth for top academic citations.⁷

Despite these promising rankings, we perform poorly when it comes to turning world-leading research into new-to-world innovations.⁸ Even with increased public and private investment in R&D, there's a widening gap in the commercialisation and diffusion of breakthrough research and technologies in Australia.

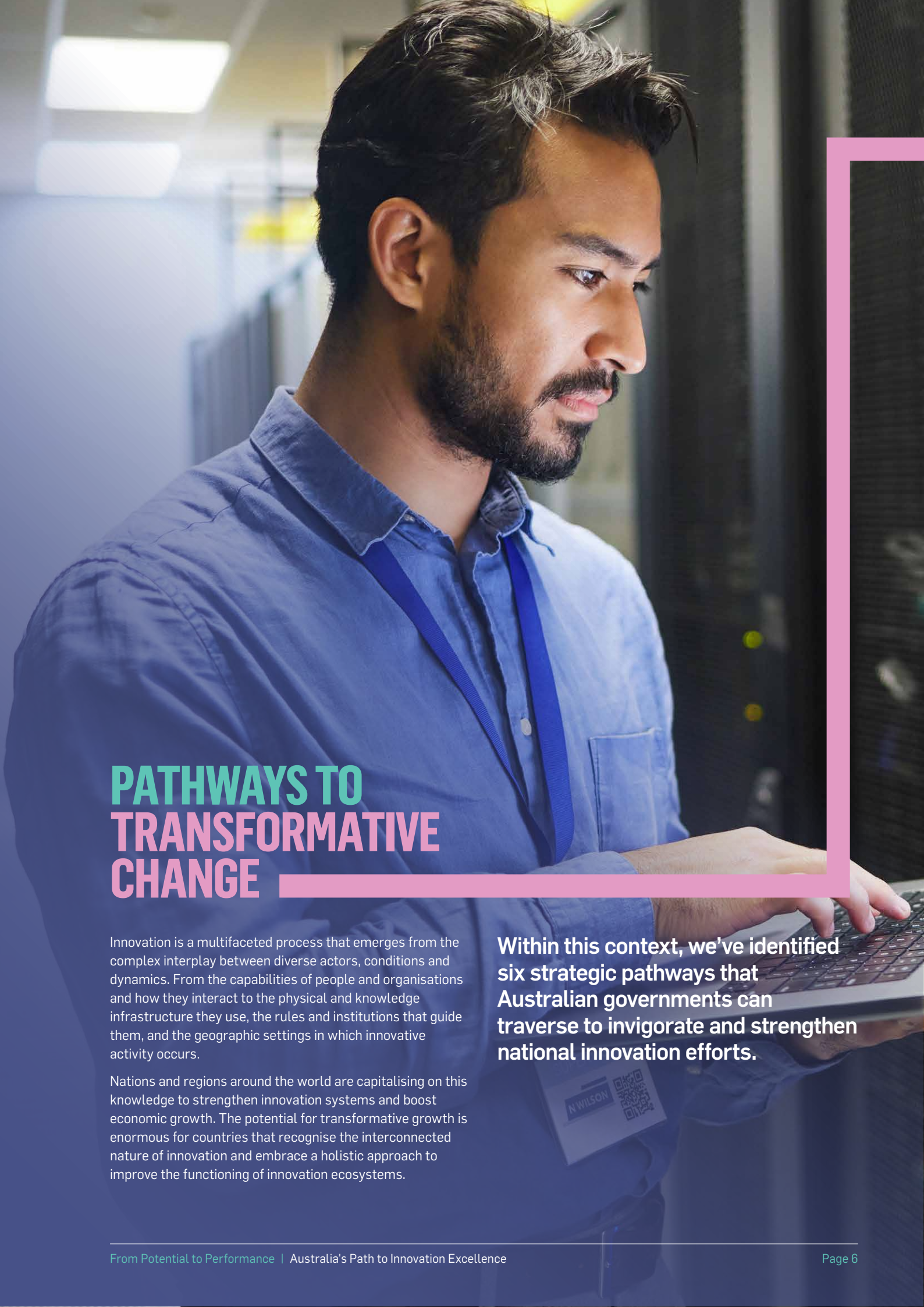
This gap is reinforced by weaknesses in both national and regional innovation ecosystems, where:

- publication remains the key performance indicator for academic researchers
- there are low levels of collaboration between research institutions and industry and within industry, the transfer of knowledge and ideas is constricted
- businesses and research institutions lack a high-performance innovation culture
- regulatory, legal, cost, experience and expertise barriers stand in the way of high-impact entrepreneurship and the growth of young innovative firms
- the transition to commercial, product-driven results is hampered by a lack of knowledge in the 'business of science'
- the high cost and high risk of failure in developing the hard-to-reproduce technological or scientific advances acts as a barrier to investment.

Addressing these challenges is a significant undertaking. The gap in commercialisation and diffusion of breakthrough research and technologies is a big concern for Australia's innovation ecosystem.

Despite efforts to increase investment in R&D, there's a clear need for more effective strategies and policies to bridge this gap. Particularly if we're to ensure Australia can capitalise on its world-leading university sector and research capabilities.





PATHWAYS TO TRANSFORMATIVE CHANGE

Innovation is a multifaceted process that emerges from the complex interplay between diverse actors, conditions and dynamics. From the capabilities of people and organisations and how they interact to the physical and knowledge infrastructure they use, the rules and institutions that guide them, and the geographic settings in which innovative activity occurs.

Nations and regions around the world are capitalising on this knowledge to strengthen innovation systems and boost economic growth. The potential for transformative growth is enormous for countries that recognise the interconnected nature of innovation and embrace a holistic approach to improve the functioning of innovation ecosystems.

Within this context, we've identified six strategic pathways that Australian governments can traverse to invigorate and strengthen national innovation efforts.

01

EMBRACE GEOGRAPHY'S ROLE IN THE NATIONAL INNOVATION SYSTEM

A growing body of evidence shows that innovation has a propensity to cluster in certain locations and pinpoints the conditions within which this clustering occurs.⁹ While many characteristics associated with economically vibrant innovation clusters are the result of success rather than an underlying cause, there's compelling evidence that clusters emerge through microeconomic and social processes enabled by specific regional conditions.

These geographic conditions shape access to and interactions between people, institutions, industries and resources.



A place-based approach to innovation policy recognises and exploits the unique strengths and assets of different regions and leverages them to drive innovation. This approach acknowledges that innovation is not a one-size-fits-all endeavour; rather, it thrives when tailored to local contexts.

Governments can catalyse this process by identifying clusters of innovation excellence – geographic areas where industries, research institutions and support networks are concentrated – while directing efforts towards places and clusters that have a clear advantage in terms of knowledge capital, R&D and sectoral strengths as we'll explain.

Research into the geography of innovation is barely 30 years old, but the literature has developed sufficiently enough that the emergence and success of regionally embedded innovation ecosystems can be linked to several widely accepted conditions or factors:

- **The presence of world-class academic and research institutions** are important input suppliers in terms of providing applied research and skilled labour, and can be production sites of innovation in their own right.
- **Diversity among industry sectors, technologies and firms**, with underlying commonalities and low technological and 'cognitive' distance between them, have been shown to increase innovation, growth, and employment creation.
- **Expertise in commercial, product-driven science** helps organisations recognise or create market opportunities when they arise, and then realise those opportunities by translating science into solutions, products and companies.
- **A strong entrepreneurial culture and business aptitude** with drive, expertise and experience in forming, building and scaling high-impact technologies and companies.
- **Technologies and platforms that support R&D activity** are available for entrepreneurs and new and growing ventures to access, without the high costs associated with capital intensive industries.
- **High levels of amenity with connective infrastructure and community** are attractive to the types of firms, entrepreneurs and human capital that underpin regional innovation ecosystems.
- **Supportive social and institutional settings** create interdependencies, collaboration and knowledge sharing between business, academia and government.
- **Spatial proximity and colocation of ecosystem actors** supports both deliberate and unintended flow of knowledge and ideas between economic actors and is central to understanding the dynamics of innovative locations.¹⁰

EMBRACE GEOGRAPHY'S ROLE IN THE NATIONAL INNOVATION SYSTEM

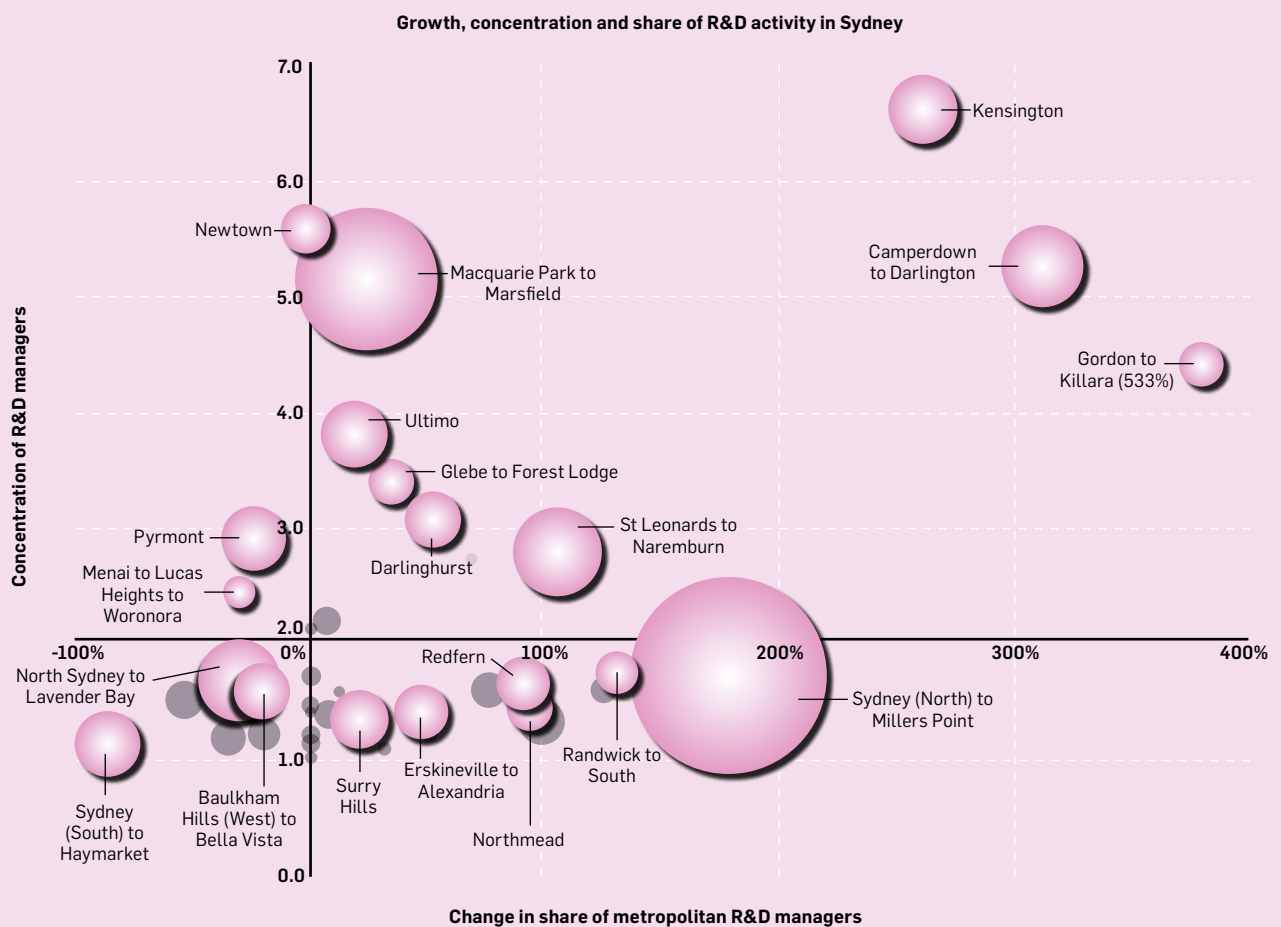
Sydney's geography of innovation

Where innovation occurs has implications for policymaking and investment decisions across public and private sectors. Policymakers can tailor support to nurture these pockets of innovation, while businesses can optimise operations, partnerships and R&D endeavours by tapping into cluster strengths and institutional networks.

To identify potential innovation clusters in Sydney, we looked at the concentration, share, and growth in R&D managers in functional areas representing a community that interacts together socially and economically – as a proxy for where innovative activity is likely to be occurring. We've called these functional areas Statistical Area Level 2s (SA2s).

Locations with a high and growing concentration of R&D managers relative to the Sydney average are considered important drivers of Sydney's innovation economy – especially important if they also comprise a sizeable share of the city's overall R&D talent pool. The chart below provides a visual representation of the results.

The vertical axis shows the concentration of R&D managers in 2021.¹¹ The horizontal axis shows the percentage change in the SA2s' share of all metropolitan R&D managers between 2011 and 2021. The bubbles on the chart represent the 2021 share of R&D managers for each SA2 while the size of the circle reflects the relative share of R&D managers within that specific SA2.



Based on the relationship between concentration and growth of R&D managers, the identified clusters can be classified as falling into one of four categories:

Thriving Wellsprings.

These clusters exhibit both a high concentration of R&D managers compared to the city's average and growth in their share within the metropolitan R&D talent pool. They are considered among Sydney's most vibrant and dynamic hubs of innovation and account for over 30 per cent of all R&D managers in Sydney.

Macquarie Park to Marsfield is home to Macquarie University and leading technology, research, healthcare, financial services and manufacturing firms. It stands out as a focal point for innovative activity, boasting a significant concentration and growing share of metropolitan R&D managers.

Nearby cluster, Gordon-Killara has experienced a more than five-fold increase in its share of R&D managers, likely underpinned by its proximity to Macquarie Park. Meanwhile, the SA2s of Camperdown to Darlington, Glebe to Forest Lodge, Newtown and Ultimo have emerged as a spatially cohesive cluster located near the University of Sydney and the University of Technology Sydney (UTS).

In the city's east, Kensington, home to the University of New South Wales, has among the highest growth and concentration of R&D managers of all the SA2s, while Darlinghurst ranks eighth in the metro area for concentration of R&D managers. St Leonards to Naremburn has the fourth largest share and registers as one of the fastest growing SA2s for R&D managers in Sydney.

Emerging Potentials.

While the concentration of R&D managers in these clusters may be lower than the city's average, over the past decade they have witnessed growth in their share. This signals a budding innovation potential and the upward trajectory indicates promise for future growth. In this category, SA2s make up nearly 30 per cent of Sydney's R&D managers.

At just over 22 per cent, Sydney (North) to Millers Point has the greatest share of R&D managers in the metropolitan region and by virtue of this, is a significant innovation asset. While non-innovating activities such as retail and services, and higher costs in the CBD likely contribute to diluting the concentration of R&D managers here, the SA2s' share of metropolitan R&D managers almost doubled between 2011 and 2021.

Redfern, Surry Hills and Randwick in the city's east and Northmead in the Hills District show a steady increase in their share of metropolitan R&D managers, positioning them as prospective hubs of innovation. Similarly, the Erskineville to Alexandria SA2s are emerging as a significant contributor to the thriving Inner West cluster.

EMBRACE GEOGRAPHY'S ROLE IN THE NATIONAL INNOVATION SYSTEM

Stagnating Leaders.

These clusters display a high concentration of R&D managers but have seen a decrease in their share over the past ten years. While the concentration underscores their existing innovation strength, the decline raises questions about sustainability. Stagnating Leaders account for three per cent of all R&D managers in the Sydney metropolitan area.

While still displaying a high concentration of R&D Managers, Pyrmont and Menai to Lucas Heights to Woronora face challenges with negative growth. The concentration of R&D managers in Pyrmont is almost three times that of the broader Sydney area, but its share of all R&D managers in Sydney has declined by 24 per cent over 10 years.

Decline in both concentration and share of metropolitan R&D managers is also evident in the Menai to Lucas Heights to Woronora SA2, which serves as the location for the Australian Nuclear Science and Technology Organisation (ANSTO).

Declining Prospects.

Clusters in this category have a lower concentration of R&D managers and have declined in their share over the past decade. While current innovation activity might be limited, the negative growth trend suggests structural challenges, changes in demand or market conditions, or competition from emerging areas with more favourable conditions for innovating firms. Around nine per cent of all R&D managers in Sydney work in SA2s that fall within this category.

While North Sydney to Lavender Bay ranks as the fifth largest SA2 in terms of its share of metropolitan R&D managers, it's experienced a 30 per cent decline over the past 10 years. The Sydney (South) to Haymarket SA2 experienced a huge decline of nearly 90 per cent over the same period, possibly because of businesses choosing to establish in the nearby and fast-growing Inner West innovation cluster.

Home to Norwest Business Park and associated technology, healthcare and finance businesses, the role of the Baulkham Hills (West) to Bella Vista SA2 in Sydney's innovation landscape is also waning, with its share of metropolitan R&D managers shrinking by 21 per cent.



As the city continues to evolve, employing diverse datasets and methods, to pinpoint and understand localised clusters of innovative activity, will be crucial to shaping effective policy responses that foster and amplify regional innovation. By harnessing the strengths and addressing the challenges of each cluster and ecosystem, Sydney can propel itself towards a future of sustained, innovation-led economic growth.

FOCUS ON HIGH VALUE SECTORS AND TECHNOLOGIES WHERE THERE'S A CLEAR ADVANTAGE

02

Strategically allocating national efforts and resources toward high-value, high-growth sectors and cutting-edge technologies is critical if we're to gain a competitive edge in the global innovation economy. National and state governments can increase their chances of success and maximise the return on their innovation investment by focusing their efforts on high-potential sectors and industries that align with each region's strengths.

Identifying high-potential industries and technologies requires matching skills to markets and demonstrating their ability to create value. Adopting the appropriate criteria for evaluating and prioritising options is critical. At its most basic level, criteria may include:

- **Market Demand and economic potential** – evaluate sectors and technologies based on projected market demand and their potential to make a substantial economic impact, contributing to job creation, export opportunities and GDP growth
- **Research and technical expertise** – consider areas where there is a depth of knowledge and a proven track record of successful research and technical capabilities
- **Distinct competitive advantage** – focus on sectors or technologies where the region or nation holds a unique competitive edge over global counterparts, such as specialised resources, skills, technology and intellectual property
- **Infrastructure and resources** – assess the availability of essential infrastructure, facilities and resources necessary to support innovation in the chosen sectors or technologies
- **Talent and workforce** – examine the presence of a skilled workforce and the potential for developing the required talent pool to drive innovation
- **Barriers to entry and competition** – consider potential barriers to entry, competition and the risk of imitation from other countries or regions that could influence the success of the chosen sectors or technologies
- **Value capture** – identify opportunities to enhance industry value chains and capture downstream value-added activities from innovation.

By carefully considering and weighing these criteria, governments can strategically pinpoint sectors and technologies that offer the greatest potential for growth and success. This considered and targeted approach will not only improve the effectiveness of innovation policies but lead to the creation of robust and sustainable innovation ecosystems, which will accelerate economic growth and shore-up global competitiveness.





IMPROVE THE FUNCTIONING OF REGIONAL INNOVATION ECOSYSTEMS

Effective innovation policy at the local or regional level involves considering the broader aspects of an innovation system while also addressing the unique strengths, conditions and needs of a particular region or geography.

Taking a systems-level approach to innovation policy can make or break innovation outcomes. Interventions solely focused on addressing a perceived market failure in one part of the system frequently overlook the interconnected nature of the system, and fail to address the broader context in which innovation occurs. For example, providing R&D funding for medical research where basic scientific findings in a laboratory setting are consistently failing to translate into human applications and potential treatments.

A systems approach takes a broader view of the functioning of innovation systems.¹² It considers how various elements are interconnected and influence each other, including the agents (individuals and organisations), the physical and knowledge infrastructure within which they interact, the rules that govern their interactions and the overall system.

Failures or weak points in innovation systems can be brought on by:

- **Network failures** from weak or inefficient connections between different actors and entities within the innovation ecosystem. These can lead to a lack of knowledge exchange, collaboration and resources, hindering the flow of ideas, expertise and capital necessary for innovation.
- **Institutional failures** involve deficiencies in the formal and informal rules, norms and structures that govern the innovation system. When institutions lack effective regulatory frameworks, favour entrenched interests or fail to provide clear incentives for innovation, the emergence and diffusion of novel solutions can be hampered.
- **Agent failures** refer to shortcomings in the behaviour and decision-making of individuals, organisations and stakeholders within the innovation ecosystem. When key actors are risk-averse, resistant to change or fail to recognise opportunities, it can undermine the system's ability to adapt, experiment and pursue innovative paths.
- **Cognitive failures** are biases, limited mental models and cognitive barriers that prevent people from seeing, understanding or appreciating new opportunities. These failures can result in a narrow focus, resistance to new ideas and missed opportunities to explore new avenues of innovation.
- **Resource allocation failures** occur when resources such as funding, talent and infrastructure are not distributed optimally within the innovation system. Uneven access to resources, misallocation of funds and lack of support for under-represented innovators can stifle the full potential of diverse and impactful innovations.

These conceptual categories provide a framework for understanding the underlying dynamics that can prevent Australia's innovation ecosystems from operating effectively. To address these failures, a comprehensive approach that considers the complex interactions and interdependencies of various system elements is required.

By analysing innovation systems in this way, stakeholders from government, industry and academia can gain insights into the underlying causes of underperforming innovation systems, the specific areas that require intervention and how to create targeted strategies to address them.

KEY ACTORS AND THEIR ROLE IN THE INNOVATION ECOSYSTEM

Universities and research institutions produce both the new ideas and human capital essential to innovative activity and can also play an active role in the innovation system through commercial collaborations and spin-offs. But in contrast to commercial entities driven by a simple profit motive, universities and research institutions have a complex set of educational, academic and societal objectives. These objectives can make it difficult to exploit and diffuse public research through commercialisation.

Startups are young firms founded by one or more entrepreneurs to develop and market a unique service or product and define and develop a scalable business model. One of their key challenges is how to raise enough funds to bring the product or service to market. Startups play an important role in the ecosystem. They tend to display higher levels of collaboration and innovation than larger entities and be sensitive to university research inputs that take place in proximity.

Scaleups are firms that are in the 'growth phase' of the product and business lifecycle. They've largely solved the startup problems but face challenges scaling the identified business model while maintaining operational control. Scaleups typically grow their sales revenues or number of employees by 20 per cent year-on-year over a three-year period and are one of the key drivers of growth in most economies.

Corporates are established firms with mature business models, products and customer markets. Even the largest multinationals are embedded in ecosystems that support and sustain their activity. While corporates tend to be 'closed shops' in terms of innovation, they play a significant role in attracting new firms and skilled labour to a location. They're an important source of labour for other ecosystem actors and new ventures created by entrepreneurial staff.



Investors play an essential role in the innovation ecosystem by providing the risk capital for early-stage ventures as well as longer term investments for rapidly growing firms. Investors will often work directly with firms, bringing their networks, experience and industry expertise to bear.

Supplier firms can provide specialised services to innovating firms and the commercialisation activities of universities and research institutions. This could be in the form of scientific and technical capabilities, intellectual property advice and commercial and legal services.

Governments and public agencies play a critical role within innovation ecosystems by creating framework conditions conducive to innovation. In addition to formulating industry and innovation policy, regulations and providing funding for research, governments can play a significant role as facilitators and moderators of innovation processes at all levels.

04

RESHAPE THE UNIVERSITY SECTOR FOR COMMERCIALISATION

A university's capacity to move discoveries and innovations out of academia and into the market and to integrate with industry is central to a high performing and economically vibrant innovation ecosystem.¹³

Australia's public universities are world-class research bodies but first-rate research isn't enough if we're to excel in the innovation economy.

Unlike many of our European and American counterparts, Australian universities are not good at turning research into commercial returns. In fact, research spending in Australia is four times what it was 20 years ago but invention disclosure numbers have flatlined.¹⁴

Current education, research and innovation settings within the university sector are targeted more toward pure research than commercialisation and don't always foster a culture of industry engagement and collaboration.¹⁵ Australian universities must show leadership in the ever-expanding role of the sector to drive and enable the innovation economy and play a much greater role in national and regional innovation ecosystems.

To fully engage with Australia's transition to an innovation-led economy, universities must take a more market-oriented approach without losing basic academic values. Strategies to transform commercialisation outcomes in the nation's university sector could include:

- making innovation and commercialisation a core part of the university's mission
- revising policies to make them more supportive of commercialisation and an entrepreneurial culture
- changing recruitment practices to build real capability in innovation, commercialisation and enterprise
- introducing new curricula aimed at better preparing scientists and researchers for working with industry and bringing their discoveries and ideas out of the lab and into the market
- rewarding researchers engaged in commercialisation the same way that publishing success in academic journals is rewarded
- providing scope for academic career paths to include more time working with or within industry
- identifying, tracking and reporting on the social and economic contributions from its innovation and commercialisation activities
- breaking down institutional barriers that limit the efficacy of university-industry collaborations.

There are promising signs of accelerating commercialisation efforts such as the University of Melbourne and Breakthrough Victoria's Genesis Pre-Seed Fund, which supports researchers, students and alumni to establish investment-ready startups.¹⁶ At a national level, the Federal Government is investing \$1.6 billion to accelerate reform in the higher education sector for the translation and commercialisation of university research through a new stage-gated funding program, Australia's Economic Accelerator.¹⁷





ESTABLISH A STRONG FOOTHOLD IN TECHNOLOGY VALUE CHAINS

05

A further consideration for governments is whether the nation or region has the capacity to establish a strong foothold in the value chains associated with the sectors and technologies it's pursuing.

A value chain refers to the series of activities and processes undertaken to move a new technology, product or service from conception to final delivery to the customer. It encompasses every step along the way such as design, production, marketing, distribution and customer support. Each stage adds value to the product or service.

Capturing high value downstream activities arising from innovation and commercialisation offers numerous benefits for a country's economy, including economic growth, job creation, export opportunities and increased resilience.¹⁸ A key challenge for Australia is fostering and mobilising the specialised know-how needed to produce more diverse and sophisticated products and services.

This is evident in the complexity of the nation's exports. In 2021, high technology products comprised around two per cent of total exports, while minerals, fuels and agricultural products comprised around 67 per cent.¹⁹ In fact, Australia ranks amongst the lowest countries in the world for economic complexity, which highlights a deficiency in future sources of growth.²⁰

To solidify a competitive position in sectors and technologies where Australia possesses a research and technical advantage, we must establish a significant presence in value chains. This requires nurturing national and regional capabilities, expertise and infrastructure to capture economic and other benefits associated with later stages of development, production and distribution.

It may also necessitate a re-think of industry policy by focusing investment and interventions on targeted stages of production in industry value chains. By cementing a resilient domestic presence in these critical downstream stages, Australia can gain better control over essential components, processes and intellectual property.

This control not only strengthens economic resilience but also fosters a self-sustaining environment conducive to continuous growth and advancement.



05

ESTABLISH A STRONG FOOTHOLD IN TECHNOLOGY VALUE CHAINS

MONASH UNIVERSITY ADVANCING HOMEGROWN MRNA VALUE CHAINS

Monash University's involvement in establishing a homegrown mRNA value chain, along with Moderna's investment in building an mRNA production facility on campus, is a significant development in the field of biotechnology and pharmaceuticals for Victoria and Australia. It also provides a useful case study on how to establish a significant presence in downstream value chains.²¹

mRNA stands for 'messenger RNA', which carries genetic information from DNA to ribosomes for protein synthesis within cells. The technology has gained prominence owing to its successful application in COVID-19 vaccines. The annual global market value of mRNA vaccines and therapies is expected to grow from around \$38 billion in 2023 to more than \$68 billion in 2030.²² The partnership between Monash University and Moderna, and the establishment of an mRNA production facility on a university campus underscores the growing importance of mRNA in medicine and the potentially significant benefits of establishing a strong and early foothold in mRNA technology value chains.

The production facility – located within the Monash Technology Precinct in Melbourne's south-east – will be the first built by Moderna in the southern hemisphere.²³ It will also be the world's first mRNA production facility to be located on a university campus and complements Monash's own RNA ecosystem.



The facility will be complemented by Australia's first dedicated mRNA workforce training centre, which will draw on Monash University's pool of talent and knowledge to deliver best-practice education and training programs across the mRNA value chain.²⁴ In addition, Monash University has partnered with Moderna to establish the Monash-Moderna Quantitative Pharmacology Accelerator (MMQPA), a five-year program which aims to drive advancements in mRNA medicines, including therapeutics and vaccines.

Headquartered in the heart of Parkville's biomedical precinct, MMQPA will facilitate collaboration between local and international researchers, industry and academia to accelerate the development of new safe and effective mRNA medicines. These efforts are instrumental in creating IP, jobs and skills across the entire mRNA value chain, while developing sovereign manufacturing capabilities and boosting Victoria's export opportunities.

The partnership between Monash University and Moderna shows how Australia can capitalise on downstream value from research and development activities. By fostering collaboration, investing in workforce development, accelerating commercialisation and promoting domestic manufacturing, Australia can harness the full economic potential of cutting-edge industries and boost exports in high-value and hard to replicate goods and services.



LEVERAGE PUBLIC SECTOR PROCUREMENT TO DRIVE INNOVATION



Governments have historically played a key role in fostering innovation through a variety of supply-side policy initiatives to enhance the performance of national and regional innovation systems. But leveraging public sector procurement to stimulate the demand side of innovation is becoming an increasingly recognised and potent avenue for governmental influence.²⁵

Public procurement can drive innovation and improve national innovation outcomes by signalling the market's value for innovation, incentivising businesses to invest in R&D and develop novel solutions, fostering collaborations and partnerships, and promoting start-up and SME growth. Public procurement can also enhance the efficiency and effectiveness of government services by promoting competition and ensuring value for money.

By leveraging the purchasing power of the public sector, governments can encourage market competition, resulting in lower costs and better-quality goods and services for citizens. This not only benefits the economy but can also contribute to meeting sustainable development goals.

Several countries have effectively harnessed the potential of public procurement to drive innovation and technological advancement, such as:

- United States' initiatives – the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs – fund innovative solutions developed by small businesses to meet government needs²⁶
- South Korea's Public Procurement for Innovation program encourages collaborations between public agencies, businesses and researchers to develop tailored innovative solutions²⁷
- Finland's integration of innovation into procurement practices through the Finnish Innovation Fund (Sitra) has positioned the country as an innovation leader²⁸
- The United Kingdom's Small Business Research Initiative (SBRI) connects government challenges with innovative businesses, generating solutions for public sector requirements.²⁹

These examples, along with efforts in other countries such as Denmark, Sweden, the Netherlands and Singapore, showcase how public procurement can foster innovation, fuel economic growth and address societal challenges.



06 LEVERAGE PUBLIC SECTOR PROCUREMENT TO DRIVE INNOVATION

THE CATAPULT NETWORK (UK)

The Catapult Network is a network of technology and innovation centres known as 'catapults' located across the United Kingdom, with a collective aim to accelerate the commercialisation of innovative ideas and technologies.

The network's origin can be traced back to the 2006 Cooksey Review, which highlighted the need to improve the translation of scientific research into economic growth and recommended the creation of a network of technology and innovation centres to bridge the gap between research and commercialisation. These recommendations led to the formation of the Technology Strategy Board (now Innovate UK) in 2007, which launched The Catapult Network in 2011 as a key platform of the UK's innovation strategy.

The network comprises nine key innovation centres which specialise in key growth industries such as: Cell and Gene Therapy, Compound Semiconductor Applications, Energy Systems, Satellite Applications and Medicines Discovery. The focus of each centre was identified based on industry challenges, national research strengths, global market demand and the potential for economic impact.

Catapults bring industry experts, start-ups, governments and academics together in strategically chosen locations to:

- foster collaboration
- provide access to cutting-edge facilities and expertise
- support research and development
- offer market validation and investment guidance
- facilitate technology transfer.

They are oriented towards late-stage research and development to bring commercially viable ideas to the market quickly and to enable the adoption and diffusion of breakthrough products and technologies into the UK economy.

The network has become a fundamental pillar of the UK's innovation system. From 2011-2021, Catapults generated over £2.5 billion in private and public sector investment, over 16,000 academic and industry collaborations, and has provided support for more than 8000 small and medium sized enterprises (SMEs), with the longest established centres having had the greatest impact.³⁰

The program continues to secure public sector and institutional support as the UK moves towards its commitment to increase R&D investment to 2.4 per cent of GDP by 2027. The Catapult Network demonstrates how leveraging regional advantages, giving high-value industries priority and fostering innovation ecosystems can transform a country's innovation performance and drive economic growth.

PAVING THE WAY FOR NATIONAL INNOVATION EXCELLENCE

The journey from potential to performance in Australia's innovation landscape demands a comprehensive rethinking of current strategies and approaches. Innovation is a driving force for economic growth, global competitiveness and sustainable development. Rapid technological advancements have created both opportunities and challenges that require adept navigation and dynamic policy formulation.

Australia's position in the global innovation ecosystem presents a paradox. While the nation is strong on innovation inputs, translating these into novel businesses, products and technologies remains a challenge. Bridging this gap demands a paradigm shift, where the focus extends beyond research excellence to embrace a culture of commercialisation and value capture.

By embracing the role of geography in fostering innovation clusters, Australia can tap into regional strengths to boost innovation and collaboration. At the same time, prioritising high-value sectors and technologies where the country has an advantage will increase the likelihood of success and return of investments. Nurturing regional innovation ecosystems and establishing a strong presence in technology value chains are both vital if we're to ensure sustained growth and resilience in Australia.

Transforming the university sector to focus on commercialisation while upholding academic values is crucial for realising the full potential of research outputs, while leveraging the power of public sector procurement as an innovation driver will enhance the demand side, generating a market for innovative products and services.

Australia stands at a pivotal juncture, where targeted and thoughtful interventions can propel it onto the global stage as a true contender in the innovation economy. The journey toward innovation excellence is one of transformative potential. We have the opportunity to script our own success story by pushing beyond comfort zones, setting higher goals and ambitions, and invigorating the country's nascent innovation ecosystems.



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ABOUT FUTURE STATE

Future State is the strategic advisory arm of Urbis. We operate at the intersection of policy and commerce to help government and business leaders improve the performance of cities and harness their potential as engines of sustainable prosperity.

We work side-by-side with our clients and their stakeholders to diagnose multidimensional challenges, identify trends that will shape the future of cities, and unlock bold strategic moves that will generate positive and lasting change. We do this by integrating disciplines, data, and methods to create new insights and strategic tools that offer game changing potential for cities, communities, and our clients.

Our interdisciplinary team combines capabilities in policy and strategy, economics, spatial data science, design and systems thinking, and behavioural insights. We are passionate about tackling the world's most pressing urban challenges and making an impact where it matters most – improving lives, building strong economies, and protecting the planet.