PREMIER’S SCIENCE AND INDUSTRY COUNCIL

Investing in our prosperity: The role of science, research and innovation
Premier’s Science and Industry Council

The Premier’s Science and Industry Council (PSIC) provides advice to the South Australian Government on a wide range of issues related to science and research and development, including industry needs and partnerships, funding opportunities and priority areas for research.

The Council is chaired by the Chief Scientist and reports to the Premier and the Minister for Science and Information Economy.

The Council operates three working groups:

1. **Science, research and innovation strategy**

2. **Industry engagement**

3. **Strategic opportunities, communications and council processes**
Message from the Chief Scientist

South Australia has a proud record of scientific achievement. We are fortunate to have a strong community of outstanding researchers and technologists in our universities and other research institutions contributing to our fundamental and applied knowledge in a broad range of areas. This includes areas such as the social sciences, which are often overlooked in technology-based strategies, yet the societal implications of our improved technological understandings and developments may often be a key aspect upon which success of a particular development depends.

The South Australian record of investment in research has produced many strong success stories. There may be no better example of this than the strong field of nominations for the annual South Australian Science Awards. These nominations show clearly that investing in talented people in our science community brings substantial returns. However, it is disappointing that their achievements are not more widely recognised across the community.

Importantly, for our economic advancement and sustainability, we are not particularly strong in translating the outcomes from our research investments into enhanced productivity and competitive advantage in our industries and the public sector. Fortunately there are notable exceptions to this generalised statement that give us encouragement that we can do much better in this area. The Premier’s Science and Industry Council is working particularly hard to develop improved strategies of engagement among the key sectors. It is also working to ensure that the science community can provide better support to the South Australian Government’s seven strategic priorities and existing strategies such as the Advanced Manufacturing Strategy ‘Manufacturing Works’, the STEM Strategy and others discussed in other areas of this document.

Australia’s Chief Scientist, Professor Ian Chubb, is leading substantial and much needed changes at the national level that will see our country direct more of its fundamental and applied research effort towards five key societal goals recently endorsed by the Federal Government. There is a strong alignment between these national initiatives and what is already happening here in South Australia.

Throughout December 2012 and January 2013, the Premier’s Science and Industry Council conducted a broad consultation on the directions for science, research and innovation in South Australia. More than 1000 people were invited to provide feedback on the consultation paper, with a large number attending the four public forums or providing a written submission.

I would like to take this opportunity to thank everyone who provided input to the consultation. Your experience and ideas for the future have shaped these recommendations for the Premier and the State Government.

Your enthusiasm for science and innovation is encouraging and greatly appreciated.

Professor Don Bursill AM
Chief Scientist for South Australia
Chair, Premier’s Science and Industry Council
Message from the Chair, Premier’s Science and Industry Council Science, Research and Innovation Strategy Working Group

In 2004, the South Australian Government launched STI10 – a ten-year vision for the role of science, technology and innovation in growing the State’s prosperity and well-being. STI10 centred around three interrelated strategies: building capability and infrastructure, momentum through collaboration, and developing people and communities.

Much has been achieved under this plan. In particular, it has provided the policy framework for considered and objective evaluation of major projects and investments for the State. Examples include the 100km SABRENet fibre optic network to provide ultra-high speed broadband communications across all our innovation precincts; establishing a number of world-class research alliances in areas of economic priority; and establishing the Royal Institution of Australia (RIAus), in Adelaide as a national centre for science communication.

The creation of the role of Chief Scientist for South Australia has provided our State with a high profile ambassador for science, technology and innovation within Government, industry and the community.

The three core strategies for STI10 remain as relevant today as in 2004. But it is timely to update the State’s plan to focus on the specific challenges and opportunities in science, research and innovation that we face over the coming years. So the Premier’s Science and Industry Council (PSIC) was delighted when the Premier approached us to request advice on this important task.

In developing Investing in our prosperity: the role of science, research and innovation, the PSIC has adopted several key principles:

- South Australia’s Strategic Plan and the recent Economic Statement 2013 from the South Australian Government provide the core foundation for the plan.
- We prioritised strategies that can bring real benefits in the immediate to short term and leave a lasting legacy for the State.
- We are also cognisant of the financial challenges facing South Australia. Wherever possible we have sought opportunities that offer substantial leverage from Federal Government and private sector funding, and/or bring synergies through collaboration and networking.

I would like to thank the other members of our working group - Prof Don Bursill, Prof Roger Leigh, Mr Dennis Mutton, Dr Suzanne Miller, Prof Göran Roos and Prof Phyllis Tharenou – for their insight and enthusiasm for this important task. Many thanks also to Laura Dodson for her excellent coordination and drafting of the report, and to Ann-Marie Purvis for managing the consultation process and outcomes.

Through the strategies proposed in this report, South Australia can position itself as a national leader in innovation, with world-class public sector research seamlessly integrated with our priority industry sectors.

The economic benefits to the State from improved productivity will be substantial.

Dr Leanna Read, FAICD, FTSE Chair, Premier’s Science and Industry Council Working Group Member of the South Australian Economic Development Board
Executive Summary

This paper and recommendations were developed by the Chief Scientist and the Premier’s Science and Industry Council (PSIC) for consideration by the Premier as part of the process to develop a new State Government strategy for investment in science, research and innovation.

A consultation paper developed by the PSIC in late 2012 provided the basis for a broad public consultation process, which sought to explore the future directions for science, research and innovation in South Australia. Feedback obtained during the consultation process contributed to this paper and its recommendations.

This paper identifies opportunities in science, research and innovation that will complement the State’s Economic Statement and other strategic planning, with a particular emphasis on the Premier’s four key priorities of advanced manufacturing, mining, premium food and wine, and a vibrant city. These opportunities are discussed under the following four themes:

• **Enhancing our research capabilities**: The PSIC considers that greater support for researchers is a key feature in building on the State’s research excellence and intellectual, human and social capital. The PSIC has determined three key priority areas for investing in talented researchers, focusing on attracting and retaining research leaders and increasing support for early career and mid-career researchers.

  The PSIC also recognises the importance of encouraging local, national and international collaboration as an important component of building an effective research capability. In this paper the PSIC identifies a range of opportunities to further build collaboration opportunities in the State, including the need for more formal mechanisms to enhance international research collaboration, and a more proactive and strategic process to prioritise major research equipment and infrastructure needs.

• **Realising the benefits of our research investments**: Translating research into commercial outcomes will deliver significant economic benefits to South Australia. The PSIC considers this a priority for the State and has identified areas for improvement, including brokering introductions between potential industry/research collaborators, additional incentives and resources to facilitate and promote commercialisation of publicly funded research, and greater assistance for researchers to identify and evaluate the commercial potential for their ideas.

• **Innovation within the State Government**: The paper identifies the importance of innovation within State Government agencies to engender more efficient practices and the adoption of new technology. The PSIC believes that a culture of innovation should be inculcated broadly across the State Government. It is the PSIC’s view that a cultural shift towards a more innovative economy would be greatly assisted by requiring public sector agencies to produce and regularly maintain an innovation plan.

• **Communication, education and culture change**: The paper recognises that there is significant potential to improve community support for science, research and innovation that will flow through to education and career choice. The Science, Technology, Engineering and Mathematics (STEM) Skills Strategy is an important policy direction that the PSIC believes can be supported by coordinating activities, events and media, ensuring the community receives consistent messages on the importance of science and technology innovation to everyday life and on the employment opportunities for STEM graduates.
The PSIC believes that implementing the recommendations identified in this paper will position South Australia as a national leader in innovation, provide a magnet to attract and retain the brightest and best researchers to the State, and lead to seamless integration of science, research and innovation into our priority industry sectors. The economic benefits to the State from improved productivity will be substantial.

Recommendations

Enhancing our research capabilities

Recommendation 1:
The State Government should increase the funding commitment for the PRIF programs by $500,000 per annum to give additional impetus through five collaborative projects between mid-career researchers and industry partners, in areas of economic priority for South Australia. Projects should involve collaboration with international partners from leading countries or key regional partners.

Recommendation 2:
It is recommended that the State Government increase the funding commitment for the PRIF by $450,000 to provide for no less than 15 projects per annum, offered over three calls during each year (with five in each call) to early career researchers. The emphasis of these projects should be on industry and end-user involvement and co-funding, as well as the key State priorities.

Recommendation 3:
The State Government should increase the funding commitment for the PRIF by $500,000 per annum to give additional impetus through five collaborative projects between mid-career researchers and industry partners, in areas of economic priority for South Australia. Projects should involve collaboration with international partners from leading countries or key regional partners.

Recommendation 4:
Consideration should be given to establishing a more formal mechanism of enhancing international research collaboration by building on the existing joint initiatives of the Department of Premier and Cabinet (DPC) and the PSIC. This might take the form of a coordinating committee led by DPC with membership that includes DPC, Department of Further Education, Employment, Science and Technology (DFEEST) and Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE). The primary focus would be in research that supports the State’s priorities and the imperatives outlined in the recent economic statement.

Recommendation 5:
The PRIF should be enhanced by an additional $600,000 per annum to support research projects that target significant research collaboration with leading countries in subject areas that support the State’s priorities and the imperatives of the recent economic statement.

Recommendation 6:
The State Government, together with the key research institutions and centres should develop a more proactive and strategic process to prioritise major research equipment and infrastructure needs for future Federal Government funding bids on the basis of their potential return to the State’s economy.
Recommendations

Realising the benefits of our research investments

Recommendation 7:
Consideration should be given to establishing research commercialisation services facilities drawing on the various models identified, as appropriate to the sector concerned. Leadership and staffing should draw on the key characteristics identified in BioSA and the MDPP. Initially the focus should be on existing research strengths such as minerals, food, medical devices and energy technologies.

Innovation within the State Government

Recommendation 8:
The State Government should require all operational areas of the SA Public Sector to produce innovation plans that address identified challenges and opportunities in ways that provide more effective and efficient services through best practice technologies and approaches. Public sector executives and relevant senior management should be held materially accountable for the quality of their innovation plans and their implementation. This approach should be incorporated into the Public Sector Renewal Program.

Communication, education and culture change in the community

Recommendation 9:
A process should be developed and implemented to coordinate the numerous communications activities and events currently operating in South Australia, as well as developing some consistent key messages for these activities. The Department of Premier and Cabinet should determine how this coordination can be managed effectively across the State Government.

Consideration should be given to extending the above to non-operational agencies in a second phase of this initiative.

Recommendation 10:
The strategies on preparing university graduates for entrepreneurship and innovation management, as proposed by Prof Göran Roos in the Manufacturing into the future report, should be extended to address broader industries beyond Advanced Manufacturing.
1. Introduction

South Australia has a proud history of scientific and social innovation, research excellence and talented researchers with world-class reputations. The ability to share ideas and work together is accommodated by the relatively smaller South Australian community, particularly in Adelaide, which is recognised as one of the world’s most liveable cities.

The State now has an opportunity to build on our achievements and become a leader in effective collaboration between researchers, industry and Government.

The Economic Statement 2013\(^1\), recently released by the Premier, demonstrates the State Government’s commitment to science, research and innovation as an essential component of economic and cultural growth. From the Premier’s seven strategic priorities, the statement focuses on the four key priority areas for innovation: advanced manufacturing, mining, premium food and wine, and a vibrant city.

The Economic Statement is the culmination of a large body of strategic planning within the State Government, incorporating the Economic Development Board’s Framework for Economic Development in South Australia, South Australia’s Strategic Plan, the Strategic Infrastructure Plan for South Australia, Water for Good, Manufacturing Works, Plan for Accelerating Exploration (PACE), Natural Resources Management Plan, Skills For All, STEM Skills Strategy, and the Public Sector Renewal Program (see Appendix for links to these documents).

The Premier has asked the Premier’s Science and Industry Council to identify opportunities in science, research and innovation that will complement the Economic Statement and the strategic planning that has occurred. The Council also acknowledges that universities and industry have strategic directions that can be complemented by well-designed government initiatives, collaboration and streamlined processes.

The national directions for science, research and innovation provide another context for the Council’s advice to the Premier and the State Government. South Australia leverages significant funding from the Australian Government and alignment with the national direction is essential for the State. The Chief Scientist for South Australia has worked closely with Australia’s Chief Scientist, Professor Ian Chubb, to influence these national directions, providing strong leadership and advocacy to progress policies that will benefit the research community.

The Economic Statement notes a number of challenges for South Australia, some that are national but felt in South Australia to a greater extent than some other States, and others that are specific to the State. At the national level, global competition for export revenue, industry market share, and skilled workforce has been exacerbated by a high Australian dollar. Challenges specific to South Australia include a workforce nearer to retirement, an industry base that comprises predominantly small and medium enterprises, and a revenue base that requires subsidisation from larger states\(^2\).

Innovation in technology, processes and social policy is the solution to many of the State’s challenges. Innovation creates wealth, reduces costs, changes community behaviour and retains talented researchers in our State. It is important that research and innovation is recognised as an investment, not a cost.

Collaboration between researchers and industry and between firms is the key to maintaining market share and economic growth – not only to commercialise new products for market, but also to add value to existing products, improve productivity and reduce business costs. South Australia must collaborate locally, nationally and internationally to leverage funding, expertise and facilities for the benefit of the State.

Over the last decade, South Australia has grown and improved its innovation systems. Research precincts and clusters have brought diverse research groups together with industry. Universities and researchers have greater flexibility to work on applied research, and there is greater support for the commercialisation process.

Much of this has been achieved under the State Government’s STI10 strategy, released in 2004. As the State Government prepares to develop a new strategy to reflect South Australia’s aspirations for innovation, the Premier’s Science and Industry Council (PSIC) provides the following recommendations and expert advice, with an emphasis on strategies that lead to sustainable advantage for the State.

---


2. Enhancing our research capabilities

The Economic Statement sets the direction to create a vibrant and creative economy through attracting and retaining talented innovators – “people in science and engineering, architecture and design, education… whose economic function is to create new ideas, new technology and new creative content.” It notes that Adelaide must become a ‘beacon of opportunity’ not only to South Australians seeking career paths and job opportunities, but to expatriates and migrants considering moving to Australia. This can be done through building intellectual, human and social capital, i.e. people, skills and capabilities.

Building intellectual, human and social capital requires excellence from the State’s research capabilities, and greater translation of research into practical outcomes that benefit the economy and the community.

A recent analysis by the federal Chief Scientist shows that the best performing countries in economic terms and/or in their record of driving productivity through research and innovation are well above world standard with their research quality rankings.

South Australia also boasts research excellence in some of its non-university research organisations, such as the Centre for Cancer Biology, the SA Museum, the Australian Wine Research Institute, the Australian Centre for Plant Functional Genomics, the South Australian Health and Medical Research Institute, the Australian Water Quality Centre and the CSIRO, just to name a few.

Notwithstanding these positive observations, our State cannot afford to rest on its laurels. There are other fields of research in which Australia, including South Australia, compares much less favourably with the world leaders.

The determination of the State’s seven priorities and, more recently, the four key areas for immediate focus in relation to our economic development provides us with the opportunity to compare our current research strengths with these priorities and ensure that key investments are prioritised towards those fields that are aligned to our current and likely future needs.

The PSIC considers that greater support for talented researchers and enhanced collaboration are key features in building on the State’s research excellence and intellectual, human and social capital.

“We need to be smart about how we invest our research dollars. We need to invest in the right people and provide them with the right skills and environment for them to be innovative.”

Professor Lynne Cobiac
Deputy Chief, CSIRO Food & Nutritional Sciences

---

3 South Australian Government, Economic Statement 2013, p120
4 ibid, p109
5 ibid, p110
Recommendation 1: Attracting research ‘stars’ to the State

Attracting international researchers to the State has proven to be an effective strategy for South Australia. There are many examples of international researchers and returning ex-patriots who have established new research capabilities in the State. These leading researchers make a substantial contribution to South Australia. They are attracting major international and local industry partners, as well as providing and developing their good ideas and innovations. They enhance our reputation as a place where technology companies and advanced manufacturing enterprises can obtain high quality scientific and technical support. Their work also creates opportunities for other talented researchers through their capacity to leverage significant funding from a range of public and private sources.

In 2011, South Australian universities attracted 994 higher degrees by research international students (Masters by Research, PhD, PhD preparatory programs) to the State. The four-year study visa that allows them to stay in Australia is an opportunity for the state to maximise their contribution to applied research and innovation and retain the best talent for the future. Education is now the third largest export industry in South Australia behind only coal and iron ore, and the higher education sector is the major contributor to international student intakes.

There are many attractive features here for international researchers, including world-class research infrastructure, the ease of collaboration in a smaller research community, highly educated and enthusiastic local researchers, and a supportive higher education system. These, in addition to the State’s recognised liveability, give South Australia an advantage over other locations which can be used to attract the best international researchers.

The State Government recently allocated funding under the PRIF to recruit world-class researchers into South Australia. This program targets leading-edge expertise in research fields that have strong potential benefits, including significantly enhancing the State’s research strengths in priority sectors and improving our competitive advantage and productivity in those areas through research support and technological developments. This is a critical program for the State which could be expanded beyond the current two fellowship offers per year.

While recruiting highly talented research leaders is an excellent way to supplement key research capability, consideration also needs to be given to the chain of development of our own home grown expertise. This is discussed further under recommendation 2.

There are many attractive features here for international researchers, including world-class research infrastructure, the ease of collaboration in a smaller research community, highly educated and enthusiastic local researchers, and a supportive higher education system. These, in addition to the State’s recognised liveability, give South Australia an advantage over other locations which can be used to attract the best international researchers.

The State Government recently allocated funding under the PRIF to recruit world-class researchers into South Australia. This program targets leading-edge expertise in research fields that have strong potential benefits, including significantly enhancing the State’s research strengths in priority sectors and improving our competitive advantage and productivity in those areas through research support and technological developments. This is a critical program for the State which could be expanded beyond the current two fellowship offers per year.

While recruiting highly talented research leaders is an excellent way to supplement key research capability, consideration also needs to be given to the chain of development of our own home grown expertise. This is discussed further under recommendation 2.

---

8 Australian Education International – Market Information Package, Detailed Pivot Table 2011
Recommendation 2: Supporting early career researchers to establish their career path

Skilled people are the single most important prerequisite for successful innovation. Assisting PhD students at the beginning of their research career with strategic career planning, mentoring and skill development will benefit both the researcher and the State in the long-term. Primarily this is the role of the employer, but there are ways in which the State Government can assist.

Early career researchers (ECRs) - those who completed their graduate or postgraduate qualification less than ten years ago - generally have a difficult time getting established. Most are on short term grant funding and often spend substantial time applying for further research grants to keep themselves and their research activities in operation. Many of them are questioning their choice of a research career, especially when their uncertain, short-term employment conditions make it difficult to obtain a mortgage to set up a home and start a family. These ECRs are some of our brightest, most innovative and enthusiastic young people. Their situation may be a character building experience where only the toughest survive. However, this is hardly an optimal way to develop our intellectual resources for the future development of knowledge and innovation - based enterprises of the future.

South Australia is not unique in this respect. It is a national issue.

The Early Career Researcher Network (ECRN) is a joint initiative of the Chief Scientist and the Director of the RiAus, Dr Paul Willis, and is now operated by RiAus with sponsorship from the three South Australian universities. The ECRN provides a series of networking events to assist early career researchers in both universities and non-university research institutions to establish inter-disciplinary and cross institutional networks, identify research and funding opportunities, and gain skills in grant preparation and media interviews. Participants have attributed a number of successful joint research projects and grant applications directly to their involvement with the ECRN. This Network should continue to be supported by the State Government.

There is a need to encourage ECRs to interact much more with industry and other research users and be influenced by the needs of users in formulating their research plans. Furthermore, industry and other research users should be encouraged to draw more heavily on the research community, including the ECR group. This has been recognised in Göran Roos’ Manufacturing into the Future Report10 and some actions relating to entrepreneurial training and other development activities are being developed with the institutions.

However, one practical and relatively low cost initiative is for the State Government to provide small catalytic project grants for ECRs which require collaboration with industry and other research users and, in some instances at least, give some emphasis to applications that involve interdisciplinary, cross institutional or international collaboration. A pilot of two project grants of $30,000 each has recently been initiated. These trial opportunities require the priority features mentioned above and matching funding from the home institution. This has been very successful with 29 submissions received. The standard of many of the proposals was high and the response encouraging, given the short notice provided for applicants to submit.

It is recommended that this pilot program be extended and multiple rounds offered each year. Existing federal grant systems such as the ARC and NHMRC are funded annually and little feedback is provided to unsuccessful applicants on the reason their proposal failed. This has resulted in applicants having to wait a year to reapply without understanding how to improve their proposal from the previous year. Multiple rounds for the State Government program would give unsuccessful applicants a chance to further hone their skills in developing their submissions, hopefully developing better proposals over a shorter time frame.


“Empowering young researchers who are energised and innovative will ensure that South Australia is well-equipped to address the local and international challenges of the future.”

Dr Craig Priest, 2011 Tall Poppy of the Year
Recommendation 3: 
Supporting mid-career researchers to pursue applied research project opportunities

To a lesser (but still concerning) degree, there are hurdles for mid-career researchers to confront. This is a period where the right opportunities successfully taken up can give the boost needed for successful mid-career researchers to become the leading edge research stars of the future. Universities and other public sector research institutions in Australia understandably strive for increased world-ranking and have based their reward systems around fundamental research, publications in high impact journals and citation rates. The recent introduction of the Excellence in Research Australia (ERA) system by the Federal Government has further strengthened this approach. As researchers necessarily plan their careers around these reward systems, an unintended consequence has been a negative impact on the interactions of university researchers with industry, particularly by mid-career researchers who are striving to achieve permanent positions or prestigious fellowships. While high-quality fundamental research should be rewarded, so too should effective research that is directed to national and state priorities and where translation of the research outcomes can lead to social and economic benefits.

This balance could be redressed by offering project based funding for mid-career researchers to pursue applied research and work with industry, without distancings themselves from the university system. Such funding can be best administered through the Premier’s Research and Industry Fund (PRIF).

The PRIF (and its predecessor funding program) has an excellent record of investing in people and facilities that have created important and substantial research and technology strengths for South Australia. Usually State funding is only a small part of the investment needed to transition to a larger and higher level research entity. Nevertheless, this funding is a critical catalytic element in this important development process.

The following recommendation seeks to enhance the track record of mid-career researchers through high quality international collaborations and to direct their attention to the research needs of local industry and State priorities.

Recommendation 4: 
Encouraging greater collaboration

Local, national and international collaboration is an important component of building an effective research capability. In a globally connected world, South Australia cannot afford to be isolated from national and international projects, and with the State’s smaller research community it makes sense for researchers to collaborate. Collaboration with researchers in leading countries such as the USA, Germany, Switzerland and the Scandinavian countries enhances the citation rate of publications by an average factor of three over what is achieved by Australians publishing similar work alone.

Currently, the Federal policy and program structure does not adequately support research collaboration with such countries, although there is support for collaboration with China and India. This may change in the future but it is important that the South Australian Government continues to encourage and support our research community to build collaborative links – especially with leading countries and other countries in the region. In stakeholder consultations, the PSIC received consistent feedback that South Australian researchers are well networked nationally, but international networks could be improved substantially.

12 Dr M Matthews et al, A Bibliometric Analysis of Australia’s International Research Collaboration in Science and Technology: Analytical Methods and Initial Findings, FEAST Discussion Paper, Centre for Policy Innovation, Australian National University, Australia, Jan 2009. Reference to the enhancement of citation rate by a factor of three is inferred by the graphs within this report.
The Australian Centre for Visual Technologies (ACVT): leveraging State Government investment in research by over 40-fold

In 2010, the State Government invested $20,000 in a research project led by Professor Van Den Hengel, Director, ACVT. This grant allowed the project to leverage an ARC Discovery Grant of $240,000 over 3 years and $660,000 from the DSTO Capability Technology Demonstrator Scheme.

Leveraging funding has enabled Professor Van Den Hengel’s team to grow from four to more than 40 world-class researchers, and establish strong international links with Germany, Belgium and the Netherlands.

This well-placed State Government investment demonstrates how a minimal amount of project based funding for mid-career researchers can result in a substantial dividend for South Australia.

The Chief Scientist and the PSIC have been working with the Department of Premier and Cabinet (Professor Sasanelli) to enhance the opportunities for international engagement with Germany, Italy and China. These initiatives have produced early positive outcomes, but they are largely due to personal initiatives and there should be a more formalised process for ensuring optimal success and coordinating of this effort across the State Government and research sectors.

The Federal Government has a number of grants designed to support collaboration, including the Cooperative Research Centres Program and the Australian Research Council Linkage grants. South Australia has been quite successful in leveraging Federal funding and this should continue to be a priority. However, it is important that the State Government become more strategic and targeted by using these leveraging opportunities to further the State’s economic priorities.

Recommendation 5: Prioritising major research equipment and infrastructure needs

The PRIF should be enhanced by an additional $600,000 per annum to support research projects that target significant research collaboration with leading countries in subject areas that support the seven State priorities and the imperatives of the recent Economic Statement.

Clustering researchers and companies within innovation precincts is widely recognised as an effective means to leverage research talent.

Adelaide and its regional areas are already home to a number of successful clusters and precincts spanning the strategic priorities of food and wine, defence and ICT, naval industries, biosciences and medical technologies. The Industry Clusters Map on page 16 shows the diversity of metropolitan clusters and precincts. There are also successful regional clusters at Roseworthy, Port Lincoln and Whyalla, among others. Several additional metropolitan precincts are under development, including the Tonsley Park Redevelopment for clean technologies and a creative industries hub. The importance of these clusters to the State has been highlighted in the recent Economic Statement. The PSIC strongly supports the State Government’s continued investment in these precincts, particularly to attract world-class talent.

In addition to supporting existing areas of strength, it is worth considering other opportunities that might be taken up – such as an advanced housing construction technology initiative that draws on the successful prefabricated homes available in Germany that have high energy efficiency and utilise a wide range of new materials and technologies.

---

Such an initiative could be an attractive way of supporting an ongoing, high technology manufacturing sector for South Australia.

The Federal Government recently announced the establishment of 10 new Industry Innovation Precincts, with total funding of $500 million over four years, to drive business innovation and growth in areas of Australian competitive advantage.\(^\text{14}\) The precincts will enable firms to collaborate and build scale with researchers and with each other to improve knowledge and skills, deploy technology, create new products and services and take advantage of business opportunities.\(^\text{15}\)

These new innovation precincts present an opportunity for South Australia to build on our existing investments in precincts, research infrastructure and research and development to maximise the potential for collaboration and the commercialisation of research outcomes.

In view of the time frames to apply for the precinct funding (June 2013), there is considerable urgency to develop industry-led bids with a strong presence in South Australia and a clear national focus in areas of current Australian competitive advantage or emerging opportunities, while also addressing the State’s economic priorities. Because of the timing and the need for industry to lead in this Federal program, it is assumed that any action on this matter in South Australia will happen independently of the other advice in this document.

Collaboration in the use of research equipment and other major infrastructure is also an important strategy for South Australia. To date, the State has leveraged significant funding for research infrastructure, especially through matching funding for Federal Government grants. However, the short timeframes imposed for many such bids has led to a rather ad hoc process that does not necessarily maximise the strategic value of the investment. Better coordination and collaboration is needed to ensure that the investment of State and Federal Government funding provides the greatest return for the State’s economy.

Recommendation 6:
The State Government, together with the key research institutions and centres develop a more proactive and strategic process to prioritise major research equipment and infrastructure needs for future Federal Government.

“Collaboration creates critical mass in thinking and application, as well as greater efficiency.”

Dr Ian Gould, Chancellor, University of South Australia

“Clusters are an antidote to problems of scale experienced by small economies such as South Australia”.

Professor Göran Roos, Adelaide Thinker in Residence

“Industry and research must collaborate to ensure knowledge is captured and converted into commercial realities in an efficient and timely manner. A strong model of collaboration must ensure engagement at all phases of investigative research – beginning to end”.

Mr Paul Sandercock, Executive Director, SMR Automotive Australia Pty Ltd
INDUSTRY CLUSTERS MAP

EDINBURGH DEFENCE PRECINCT
- Defence manufacturing hub

TECHPORT AUSTRALIA
- Premier naval industry hub

TECHNOLOGY PARK ADELAIDE
- Defence and aerospace, electronics and ICT expertise

WINGFIELD WASTE AND RESOURCE RECOVERY PRECINCT

NORTH TCE HEALTH PRECINCT
- Medical research, clinical application and laboratories

THEBARTON BIOSCIENCE PRECINCT
- Commercial medical bioscience hub

GLENISIDE REDEVELOPMENT
- Creative industry services hub

WAITE PRECINCT
- Plant biotechnology, cereal breeding, sustainable agriculture, wine and horticulture and land management

TONSLEY PARK REDEVELOPMENT
- Advanced manufacturing and clean technology

3. Realising the benefits of our research investments

As highlighted in Section 2 of this report, South Australia has world-class research capabilities in its research centres and universities. However, we trail our global competitors in translating that research excellence into economic benefits, and our business sector underperforms in innovation, research and development.

This problem is not unique to South Australia - it is a national challenge. The Federal Government’s Powering Ideas policy paper\(^{16}\) makes the following conclusions:

- Too many Australian inventions and discoveries end up being commercialised overseas where the value they create is captured by others. This costs Australia jobs and wealth, and denies us the chance to build new industries.
- Business expenditure on research and development collapsed in the late 1990s, and while it has grown since then, we still lag many of the countries we compete with.
- The proportion of Australian firms introducing innovations has been stuck at one in three for years.

Yet there is reason for optimism, because South Australia has a reputation nationally for being able to draw together partnerships within the State to build effective teams, without running into the local competitive issues that can be a block to progress in larger States. Obviously there are exceptions to this generalisation. However, our size and other South Australian characteristics do provide the State with a unique advantage and opportunity to become leaders in creating dynamic, effectively connected partnerships between researchers and end-users, ultimately enabling better translation of research into practical and commercial applications.

One of the issues is that our research capabilities are very heavily concentrated in the higher education sector, and other public sector research institutions. As shown in the graph\(^{17}\), around 70-80 per cent of European or US researchers work in industry with only 20-30 per cent in universities. In Australia and South Australia these percentages are reversed, with the greater majority of researchers working in universities or other public sector institutions.

Given this concentration of research capabilities in the public sector, the strategic priorities for South Australia must take the dual approach of (a) increasing the link between our research centres and industry, and (b) enhancing technology translation from our public sector research.

“The ability of South Australia to link its industry with problems to be solved with researchers who can develop the answers, will give the State a massive competitive advantage”.

Professor Suzanne Miller, Director, SA Museum

Percentages of researchers in the Business sector versus the Higher Education sector in 2008

---


Australia ranks poorly in OECD rankings on the total proportion of firms collaborating with universities on innovation (18th). Across Australia during 2008–09, the proportion of innovation-active businesses collaborating with universities increased to 2.4 per cent, a rise of 0.8 percentage points since 2006–07, yet their collaboration with non-university research agencies fell by nearly 2.8 percentage points to 4.4 per cent.19

Creating an environment that supports researchers and enterprises to collaborate more effectively and allows for better technology translation will require a number of cultural considerations to be addressed:

- As discussed earlier, universities and other public sector research institutions in Australia have based their reward systems around the criteria to achieve an increased world ranking. Students and researchers necessarily plan their careers around these reward systems and therefore are inadvertently discouraged from pursuing career opportunities in more applied, industry-directed research.

- While South Australia’s larger companies are already accustomed to working with the research community on innovative approaches to their business, the State’s industry base comprises largely small to medium enterprises, which often are not aware or informed of the benefits of working with the research community. Even if they see the potential of innovation and research, working with universities and the research community may prove a daunting option for the inexperienced. In 2011, the State’s top five industries by employment were health care and social assistance, retail trade, manufacturing, education, and public administration. Retail and manufacturing industries in particular are more likely to employ staff and managers who hold vocational qualifications and may be less likely to consider connecting with universities.

- Business owners are unlikely to be cognisant of the research capabilities available and often require funding support to facilitate collaboration with researchers. The Council commends the State Government’s new Innovation Voucher Program for providing funding to support small-scale collaborative projects between researchers and businesses.

“Look to Germany as a benchmark, where researchers are culturally and often organisationally part of business development.”

Dr Ian Gould, Chancellor, University of South Australia

“Until industry starts discovering the depth and quality of research conducted right here in our state, we will never realise our full potential. The extensive research capabilities of SA are largely untapped by the majority of industry at the moment. Those who have made the discovery are not looking back.”

Mr Kim Scott
Director, Land and Integrated Systems, BAE Systems Australia

---

19 ibid
20 Australian Bureau of Statistics, Category 1345.4 - SA Stats, Apr 2011.
The PSIC consultations revealed that higher education and public sector researchers have difficulty in identifying and evaluating the commercial potential for their innovations. Intellectual property rights are also seen as a barrier that leads both researchers and industry to approach patenting with suspicion and mistrust, rather than understanding the benefits that a patent can provide. Indeed, there has been a gradual decrease in South Australian patent filings since 2005.21

While all three of South Australia’s universities and some of the other research institutions have technology transfer offices that provide relevant commercialisation services to their researchers, the evaluation of commercial potential for a new innovation often requires very specific industry expertise that is beyond the resources of these offices. Often it is all too hard for researchers. Together with the pressures imposed by the focus of the ERA system on research excellence, rather than research translation, the difficulty in evaluating commercial potential has led researchers to increasingly abandon efforts to achieve commercial outcomes.

The PSIC consultation process for this report identified a number of possible strategies that could be employed to address these challenges. Firstly, strategies are needed to broker introductions between potential collaborators, especially between researchers and firms, and to educate these stakeholders in the collaborative opportunities available. Secondly, additional incentives and resources need to be offered to facilitate and promote commercialisation of public sector research.

The brokering models exemplified by BioSA and the Medical Device Partnering Program could provide effective strategies to address this challenge through specialised and current industry intelligence.

Some potential strategies include the following:

- BioSA is an example of a successful industry brokering model that could be applied more broadly to connect researchers and enterprises, and to advise researchers on commercialisation opportunities from their innovations. BioSA was established by the State Government in 2001 to foster the growth of South Australia’s bioscience industry. Its success stems in large part from the quality and sector knowledge of the BioSA business advisors, who come from the private sector and bring with them a track record of working across research institutions and industry in the biosciences. They are ideally positioned to match researchers with businesses and support them with advice on business and product development, mentoring, financing, marketing and communication as well as infrastructure planning and specialist facilities management.

BioSA also offers targeted networking events as a cost effective method of providing a platform for researchers to demonstrate their capability to relevant enterprises. These have proven to be successful in connecting researchers and enterprises, sometimes resulting in productive joint venture projects.

There is an opportunity for the State Government to use a comparable model for other areas of strategic priority such as food and agriculture, and the mineral resources sciences where our research performs well above world standard and there are significant prospects for commercialising research.

"Traditionally we have tended to look at challenges in a linear way, but more and more we are seeing relationships between disciplines flourish, providing exciting and innovative solutions and products. The interface between biotechnology, ICT and precision engineering is a great example."

Dennis Mutton
Chair, BioSA

• A second model for partnering can be found in the Medical Device Partnering Program (MDPP)\textsuperscript{22}. This program supports the development of cutting-edge medical devices through collaborations between researchers, industry, end-users and government. Headquartered at Flinders University, the MDPP involves all three SA universities, as well as a range of industry participants and clinicians. The program coordinates the efforts of key stakeholders for the development of prototypes, proof of concept, and commercialisation planning.

The MDPP’s success is indicated by endorsement from ResMed Ltd, one of Australia’s leading medical device companies: “The MDPP is possibly the best model for fostering university/industry collaboration that I have encountered in an Australian University” - Dr Steven Farrugia (VP Technology), ResMed Ltd.

The State Government could consider applying this model to other sectors, particularly those dominated by small to medium enterprises.

• The Federal Government’s Cooperative Research Centre (CRC) program is another successful model for supporting researchers and industry enterprises to partner on longer-term research problems. The State Government contributes a relatively small amount of funding to CRCs through the longstanding CRC assistance program. In return, the State gains exceptional leverage through the associated funding support from the Federal Government, industry and research organisations. State Government support for partnership programs such as the CRC program and Australian Research Council (ARC) Centres of Excellence should therefore continue in areas that are of strategic priority for the State.

• The State Government’s Innovation Voucher Program could be enhanced by making businesses more aware of the available research capabilities and strengths, and promoting the program more widely within research institutions. The Voucher Program brings researchers and industry together through funding for small-scale projects that are geared toward finding a solution for a specific industry challenge. There is an additional opportunity for the State Government to extend the Program to support more substantial projects that will return an economic benefit to the State.

• The State Government could also consider providing incentives for companies to employ or contract researchers, with a view to improving productivity and competitive advantage and creating a more diversified economy.

South Australia has the opportunity to position itself as a national leader in harnessing science, research and innovation to the economic benefit of the State. The strategies identified above would achieve this, yet the PSIC recognises the need for additional expert work to prioritise and cost the proposals. The most important features that the PSIC considers vital to realising the economic benefits of research investments are:

• high quality leadership that combines an excellent understanding of the public sector research system and its challenges with private sector experience in the target sector and a strong understanding of global market opportunities

• a small but capable team that provides high quality support in identifying commercialisation partners, venture capital and other investment options, developing intellectual property strategies and associated legal issues.

• an organisational structure that sits outside the public sector with flexibility and independence.
“Given the right opportunity and a transparent and effective model for engagement, barriers to collaboration and innovation can be overcome. This is evident through the success of the Medical Device Partnering Program (MDPP), a model aimed to foster collaboration between researchers, clinicians and industry.”

Professor Karen Reynolds, 2012 SA Scientist of the Year, Director, Medical Device Partnering Program
4. Innovation within the State Government

The Economic Statement acknowledges the importance of a strong government committed to partnership with business and the community in creating growth. It also recognises the need for effective and innovative administration within the State Government to enhance efficiency and responsiveness.

The PSIC strongly supports an innovative State Government administration. Innovation in public sector practices will flow through to the supply chain organisations that provide goods and services to Government, and to community organisations that rely on public funding support. A public sector and its supply chains looking to enhance innovative approaches to current challenges and future opportunities will require more support from our research institutions. An enhanced level of innovation will drive further interactions between research users, both public and private sectors, and the research providers. Consequently, it is the view of the PSIC that Government leadership in innovation will result in more efficient practices and enhanced adoption of new technology and approaches throughout the State.

Some government agencies already have a strong focus on innovation. Using government research and development expenditure as an imperfect proxy measure, the State Government spent approximately $132m and the Commonwealth Government $308m on internal government research and development (R&D) in South Australia in 2008-09. Advice from the State Government is that the SA Research and Development Institute (SARDI) and the Central Adelaide Health Network, incorporating the Royal Adelaide Hospital, accounted for the bulk of the State Government R&D expenditure.

The Premier recently announced a Public Sector Renewal Program directed at five key areas: improved service delivery, staff capability development, local empowerment, productivity improvement and budget savings. The PSIC supports the Premier’s program and considers innovation to be essential to achieving gains in each of these five areas.

The PSIC believes that a culture of innovation should be inculcated broadly across the State Government. In fact, every State Government agency should be tasked with developing an innovation strategy that will improve productivity and cost effectiveness, as well as the quality of community services. The PSIC recognises the challenges around implementing effective innovation in the public sector (as outlined in the international research literature around this) but this just makes the task more important.

Leadership from the top is essential in setting up the processes, environment and cultural change that is needed for success, and therefore the development and implementation of the innovation strategy is championed and driven at the Chief Executive level. Only then can an innovative culture spread throughout the State public service. Further, the innovation strategies should be subject to external peer review, and built into the performance evaluations of Chief Executives.

Many would take the view that it is impossible to mandate for innovation. However, it is not accepted that larger organisations, particularly government agencies could not identify new and better ways of addressing current challenges or future opportunities to a greater extent than exists now. For example, when modern occupational health and safety approaches and zero injury targets were introduced, large operational departments such as water or transport thought them far too ambitious and optimistic, although highly desirable. However, these high levels of safety performance have been accepted and achieved, and are now expected by the community. The key element of successfully changing the culture on safety in the workplace has been the policy and legislative support that requires leaders and individuals, to be personally accountable.
Small Business Innovation Research Pilot Program

The Small Business Innovation Research (SBIR) pilot program is designed to help small businesses develop products which can solve specific problems faced by Government. The program will assist companies to turn innovative ideas into solutions and products ready for commercialisation.

Through this program, public sector organisations (in this case, SA Water) will be encouraged to take the lead role in developing and de-risking innovative solutions for potential future customers. The State Government will engage with industry during the early stages of development and support their projects during the stages of feasibility and prototyping.

The SBIR program will commence in the first quarter of 2013 and run in two phases:

- Phase 1 will be a feasibility stage and will last up to six months, with contracts being up to a maximum of $100,000 per company.
- Ideas funded in the first phase may be awarded a Phase 2 contract for detailed product development.

After completion of Phase 2, companies are expected to commercialise the resulting product or service, which is then taken to market and open to competitive procurement.

The program is open to collaboration between small to medium enterprises and research providers.

It is the PSIC’s view that a substantial cultural adjustment towards a more innovative economy would be greatly assisted by requiring public sector agencies (at least those with operational roles) to produce and regularly maintain an innovation plan. Such plans should be subject to independent peer review by an international expert in the field involved. The rated success of these plans from the peer review process in addressing identified challenges and opportunities should, in some realistic and measurable way, impact on the remuneration of the relevant executives and senior management teams. Personal accountability will be the key to an optimal outcome.

“The Public Sector Renewal Program is about striving for a higher quality public sector.”

The Hon. Jay Weatherill MP
Premier for South Australia
South Australia can boast a proud history of scientific and social innovation, research excellence and talented researchers with world-class reputations. But this is not widely recognised by the general community. There is significant potential to improve community support for science, research and innovation that will flow through to education and career choices.

In 2010, the Australian National University released its findings from a national survey to gauge public opinion about science:

- The Australian public is more interested in science (in particular health issues, medical discoveries and environmental issues) than news about sport, films or politics.
- Despite this interest, a large number of people feel poorly informed about science.
- Australians also highly rate the contribution of scientists to society, valuing their contribution above that of nearly all other professions.

A survey of year 11-12 students indicated less support or understanding. Of those studying science, only 33 per cent thought science was ‘almost always’ relevant to their future and 19 per cent thought it ‘almost always’ useful in everyday life. Of the students not studying science, only 1 per cent thought it relevant to their future and 4 per cent thought it ‘almost always’ useful in everyday life (42 per cent thought sometimes and 18 per cent thought never). These are extremely worrying findings.

The national Inspiring Australia Strategy aims to develop a scientifically engaged Australia through inspiring the public, attracting national and international interest in science, engaging the public on key scientific issues and encouraging young people to pursue scientific studies and careers. Inspiring Australia has, in conjunction with the Australian Government’s Coordination Committee on Innovation, established an ongoing working group to provide a whole of government approach to supporting the Inspiring Australia strategy.

Inspiring Australia officers, located in each state and territory, are co-funded by the Australian Government in partnership with state and territory governments and local institutions.

The State Government’s STEM Skills Strategy is a whole of government framework for taking a strategic approach to investment in improving the supply of people with STEM skills into the workforce. The priorities of the Strategy include increasing awareness and understanding of STEM within the community, providing better training and career information and greater encouragement for people with an aptitude for STEM, upskilling adults in STEM skills, retaining the existing STEM workforce, and recognising the contribution of industry. A key component of the STEM Skills Strategy is an online portal that will provide a repository for career and training information about STEM opportunities in our State.

“Science deserves as much, if not more, community attention as is given to sport because it changes our lives forever”

Professor Angel Lopez
Director, Centre for Cancer Biology
Recommendation 9: Coordinating communications activities and encouraging a better understanding of science in the community

The PSIC strongly supports the priorities of the STEM Skills Strategy and recommends that the Strategy’s Executive Reference Group take a stronger role in coordinating the numerous communications activities and events currently operating in South Australia, and develop consistent key messages for these activities.

For example, activities designed to interest school children and their parents in careers in the science, technology, engineering and mathematics (STEM) occupations include the RiAus Outreach Program, Advantage SA Speakers in Schools, the Science and Engineering Challenge, BHP Billiton Science Awards, CSIRO Science Education Centre, the Science through Sport initiative and National Youth Science Forum, among many others. General community activities include the Science Excellence Awards SA, SA Tall Poppies Awards, National Science Week, Australian Science Media Centre, RiAus’ Science Outside the Square and SpiRit of Science Program. These activities are provided by unconnected organisations, and while their key messages are similar, they may not necessarily provide students and the wider public with consistent information and advice. As a minimum it should be possible to enhance the effectiveness of this effort through better collaboration and coordination.

There is also a range of programs for teachers that would benefit from better coordination, including the CSIRO Teacher Tours, the DECS Primary Mathematics and Science Strategy, TIMES Teacher modules, Flinders Centre for Science Education’s Mathematics Science and Innovation Project, Science Lynx, and the Scientists in Schools website.

There are direct economic reasons for ensuring that the STEM Strategy is successful in bringing about a higher level of interest and participation in STEM education, training and career development. However, Australian society could benefit in other ways from a substantial lift in scientific literacy and understanding among the general population. It is worrying that so many people seem to think that science is not important in our daily lives. Even more worrying is the developing disregard of scientific evidence in favour of popular opinion or doctrine, sometimes pushed from a position of vested interests. The dangers in this development are perhaps best seen in issues such as vaccination, fluoridation of public water supplies, water resources management, the climate change debate and wind power. In these and in other similar issues where scientific facts and understandings should be able to guide us to optimal, sustainable outcomes, the quality of the public debate is usually rather poor.

Popular mantra has most scientists portrayed as ‘nerds in white coats’ playing around with strange equipment of no interest or comprehension to most people. Their work is often seen as novel and curious at best - certainly not necessarily useful in the immediate term.

The reality, of course is much different. One only needs to examine the wealth of information in nominations for the annual South Australian Science Excellence Awards to appreciate that there are many roles that STEM-based professionals are employed in. They are usually bright and nearly always very dedicated to their professional function and calling. Importantly for society, they are undertaking vital roles that support our State, economy, health system, water supplies, environment, power generation and distribution and much more. Indeed, it would be difficult to contemplate our daily existence if these roles were not being undertaken by STEM professionals in our modern communities.
The Chief Scientist has recently been liaising with a group of professional associations (such as the Institute of Engineers, the Royal Australian Chemical Institute and the SA Branch of the Australian Water Association) with a view to providing better public exposure for our leading STEM professionals and our emerging STEM high achievers. The broad objective is to give the public a better appreciation of what roles STEM careers play in the community and to hear from these people in such a way that their personal qualities and motivations are understood to a greater extent. A regular weekly program on Regional Northern ABC radio has provided a chance for some of our high achieving scientists to talk about their work. It is hoped that activities like this can be extended to the broader community and supported by the State Government.

The PSIC recommends that the Government develop a cohesive communications strategy for STEM in the community to leverage and coordinate the range of STEM related promotional activities already underway. The obvious means of undertaking this coordination is through the STEM Strategy’s Executive Reference Group. However, this Group has already attempted this task and considered it inappropriate for it to dictate how budgets of the various departments be applied. Although this position is understandable, it is not satisfactory to have multiple messages from the Government on this key issue. It would seem appropriate for the Department of Premier and Cabinet to determine a process by which coordination will occur.

Recommendation 10: Preparing university graduates for entrepreneurship and innovation management

A second issue relates to the preparedness of university graduates to develop entrepreneurial business skills that can fuel the growth of new innovative companies in South Australia. The PSIC supports the strategies proposed by Prof Göran Roos in the Manufacturing into the Future Report26 to assist graduates to develop skills in innovation management, and recommends that these are extended to address broader industries beyond advanced manufacturing. For example, Prof Roos recommends to:

- encourage universities and TAFEs to establish a path for promoting start-up firms by students
- establish an interdisciplinary research and teaching centre within the domain of integrated innovation management, which will develop and transfer tools and competence in this domain to students, researchers and firms and, ideally, be joint venture between the three universities
- establish specific structures, programs, competencies and links at universities and TAFEs to enable lifelong learning in firms.

---

6. Conclusion/Next steps

This paper and recommendations have been provided to the Premier for his consideration. The Chief Scientist and the Premier’s Science and Industry Council have been working closely with State Government representatives to discuss the proposed directions and strategies.

The PSIC believes that implementation of these recommendations will position South Australia as a national leader in innovation, provide a magnet to attract and retain the brightest and best researchers to the State, and lead to seamless integration of science, research and innovation with our priority industry sectors. The economic benefits to the State from improved productivity will be substantial.

The State Government, through the Department for Further Education, Employment, Science and Technology (DFEEST), will consider the recommendations and develop the State Government strategy that will outline their approach to investment in science, research and innovation.

What success looks like

With successful implementation of the PSIC recommendations, we can look forward to the following bright future:

SA is a place that attracts many highly intelligent and innovative people to our institutions and industries. Our developing talented young people see SA as the best place to develop their STEM-based careers, including many who have gained invaluable experience internationally. South Australia is performing well in a range of national and global indices of research excellence, across many sectors of economic priority for the State.
4. Innovation within the State Government

South Australian strategic planning
South Australia’s Strategic Plan guides individuals, community organisations, governments and businesses to secure the wellbeing of all South Australians. Its 100 measurable targets reflect the priorities for South Australia.

The Premier’s Seven Strategic Priorities are those areas the government has chosen to focus on. The work, budgets, policy making and legislative agenda of the Government will reflect the priorities.

Advanced manufacturing:
- Manufacturing into the Future — Goran Roos, former Adelaide Thinker in Residence advice to State Government on the future of manufacturing in South Australia.

PACE 2020: Plan for accelerating exploration in the mineral resources industry.

The 30-year Plan for Greater Adelaide — The 30-year Plan sets a direction for the growth and development of the greater Adelaide region as well as protecting its environment, heritage, and character.

Water For Good — Water Planning for South Australia.

Natural resource management plans — A number of different plans direct and inform decision making about natural resources management in South Australia.

Skills for All — South Australians now have the opportunity to gain more qualifications, many at low or no cost, through the Skills for All training provider of their choice.

STEM Skills Strategy — The Science Technology, Engineering and Mathematics (STEM) Skills Strategy is aimed at increasing the number of people taking up STEM occupations to meet the growing needs of our local industries, including mining and defence.

Public Sector Renewal Plan — The State Government has announced a Public Sector Renewal Program to ensure the delivery of better quality and more innovative community services.


Australian Government strategic planning
The Australian Government has produced a large body of strategic plans that impact on science, research and innovation, including:

- ‘A Plan for Australian Jobs’
- National Research Investment Plan
- Health of Australian Science Report
- National Research Priorities
- National Enabling Technologies Strategy
- Research Skills for an Innovative Future.