South Australia's Advanced Manufacturing Strategy

SOUTH AUSTRALIA

Government of South Australia

Acknowledgement of Country

The South Australian Government acknowledges and respects Aboriginal people as the state's first people and nations and recognises Aboriginal people as the traditional owners and occupants of South Australian land and waters.

Minister's foreword

South Australia's long and productive manufacturing history is a foundational strength of our state.

South Australia has more than 6,700 manufacturing businesses contributing around 25 per cent of business research and development, 20 per cent of exports, 7 per cent of employment, and 6 per cent of industry gross-value add.

We have always been good at making things. We must now leverage our industrial capabilities to forge a new path. We must grow and respond to a rapidly shifting global dynamic where decarbonisation, geopolitical uncertainty, new technologies and disrupted supply chains will continue to present challenges and opportunities.

In March 2023 the Government released South Australia's *Economic Statement*, outlining a clear intention for South Australia to be an ambitious state that embraces technology and innovation. The Government's objective is to position our state as a stable and secure partner of choice in an increasingly turbulent world and deliver an economy that is smart, sustainable and inclusive.

South Australia's Advanced Manufacturing Strategy highlights the unparalleled opportunity to leverage our competitive advantages in defence, space, renewables, agriculture, food, forestry, resources, construction, and health, to enable this economic transformation as we emerge from the global health pandemic to embrace sovereign manufacturing in a circular, net-zero industrial future.

Our international leadership in renewable energy and investment in hydrogen production, together with increased global commitments to the 2015 Paris Agreement, create new manufacturing opportunities for premium net-zero carbon products like green metals, minerals, and fuels that capitalise on the global green transition, and transition to a nature positive economy that eliminates carbon emissions and restores biodiversity and natural systems.

Increased global spending on defence, space and cybersecurity also play to South Australia's strengths, enhancing sovereign capabilities, and creating connections into global supply chains.

We want manufacturing to drive greater productivity and complexity in our economy by moving up the value chain exporting higher value-added goods and services to enable high living standards for communities across the state.

We recognise the role government plays in working closely with industry, education, unions, and community stakeholders to set the direction for a future that is built on our competitive strengths and provides the actions and conditions for success.

I would particularly like to thank Emeritus Professor Roy Green for his valuable assistance and input with this strategy. We look forward to continuing to partner with manufacturing businesses as we forge South Australia's new role in the global economy.

Dr Susan Close MP
Minister for Industry, Innovation and Science

"We want manufacturing to drive greater productivity and complexity in our economy by moving up the value chain exporting higher value-added goods and services to enable high living standards for communities across the state."

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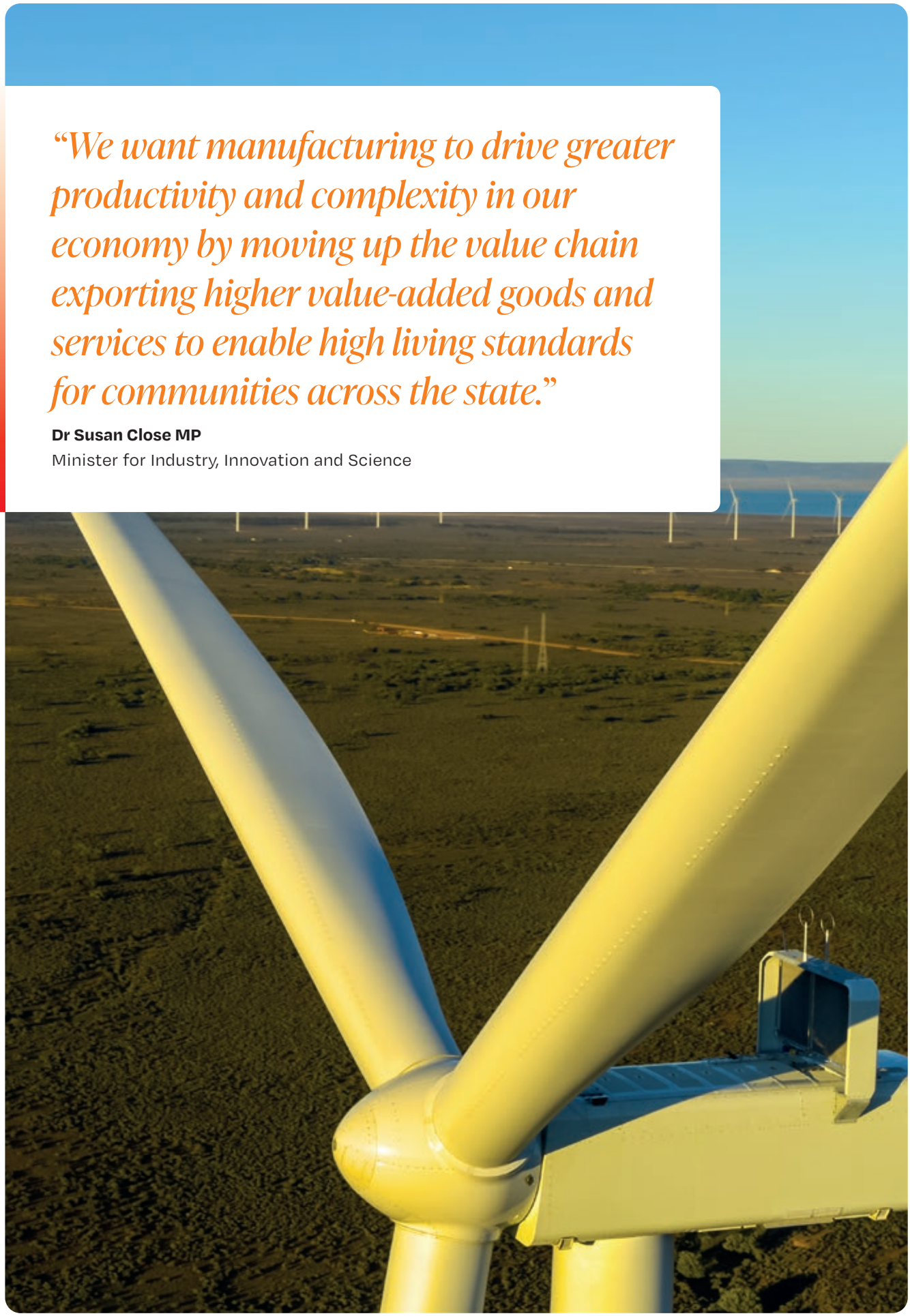
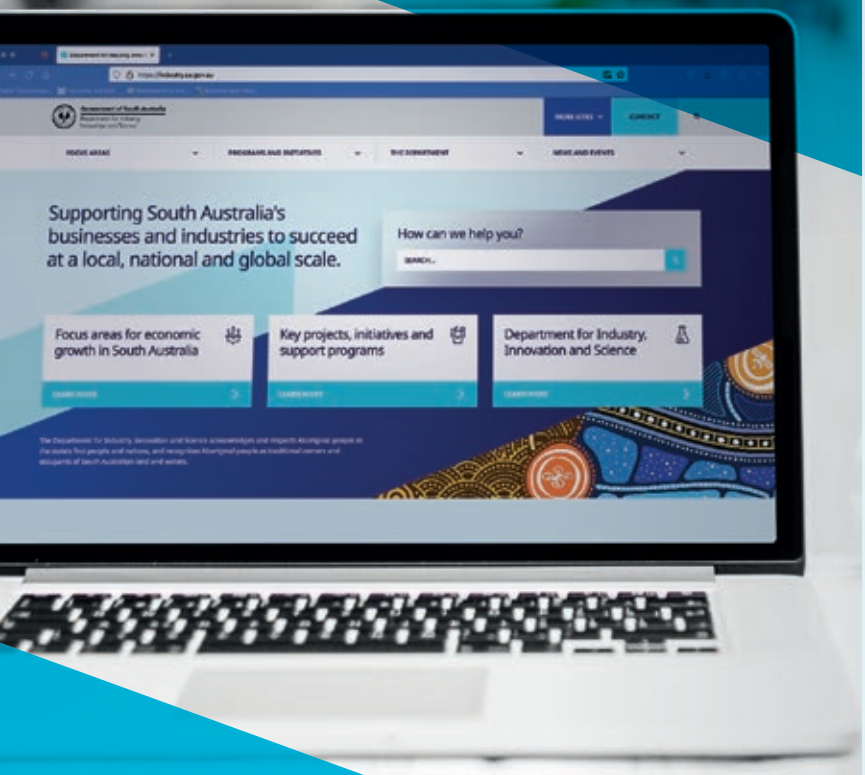


Your central online source for manufacturing

Informed by the manufacturing industry in South Australia, for the benefit of local industry and businesses, the manufacturing hub on industry.sa.gov.au is South Australia's Advanced Manufacturing Strategy in action.

Access insights, information, services, tools and resources that support South Australia's businesses and industries to succeed on a local, national and global scale.



Visit industry.sa.gov.au to:

- Discover more about opportunities to leverage the state's competitive advantages in defence and space, renewable energy and green hydrogen, critical minerals and resources, food and beverage, forestry and timber, building and construction, health and medical.
- Learn more about the enablers for growth and how industry can leverage opportunities for investment so that manufacturers can grow and succeed.
- Access the expertise of business and industry leaders through the Insights Series program of events that will further explore South Australia's competitive advantage and where the opportunities for growth are.
- See industry best-practice being showcased in success stories and case studies.
- Find out about key projects, initiatives, and support programs.
- Get the latest manufacturing news from across the state.
- Access help to navigate opportunities in manufacturing and support your growth ambitions.

industry.sa.gov.au

SOUTH AUSTRALIA

Government of South Australia

Department for Industry, Innovation and Science

Executive summary

Vision

South Australia has a diverse manufacturing capability and skilled workforce that is internationally competitive, productive, ambitious, connected into global supply chains, and focussed on growth.

Manufacturing in South Australia is a necessary foundation of South Australia's Economic Statement ambition for a smart, sustainable, and inclusive economy that is fit for the future, improving the wellbeing of all South Australians. Manufacturing will play a role in addressing the three missions:

- **to capitalise on the global green transition**
- **position South Australia as a partner of choice in an insecure world**
- **build South Australia's talent.**

Manufacturing output has declined in the last decade to one of the lowest levels in the Organisation for Economic Co-operation and Development (OECD) however. The need to enhance South Australia's manufacturing capabilities to capture new opportunities has become urgent.

Offering a forward-looking approach to industrial policy by identifying sectors of competitive advantage and five enablers of growth, South Australia's Advanced Manufacturing Strategy targets an ambitious increase of the share of manufacturing to the South Australian economy of 10 per cent within the next decade.

A diverse manufacturing capability backed by a skilled workforce that is internationally competitive, connected into global supply chains, and focussed on growth should also enable manufacturing to achieve an uplift in business expenditure on research and development from 25 per cent to 30 per cent, value-added exports from 20 per cent to 25 per cent, and manufacturing employment from 7 per cent to 8 per cent.

This strategy, which has been informed by engagement with over 70 manufacturers and key industry stakeholders, recognises that manufacturing is a capability that contributes to many sectors. However, some of the most prospective opportunities for manufacturing growth in South Australia will be in the following sectors:

- Defence and Space
- Renewable Energy and Green Hydrogen
- Critical Minerals and Resources
- Food and Beverage
- Forestry and Timber
- Building and Construction
- Health and Medical.

As part of a modern industrial framework, this strategy identifies six growth enablers to develop a globally competitive and productive manufacturing capability:

1. **Investment**
   Increase private investment by providing a coordinated approach to help manufacturers access support from government organisations and the private sector.

2. **Innovation**
   Drive coordinated research and innovation across South Australia's innovation ecosystem, including innovation districts and future manufacturing precincts.

3. **Capability**
   Enable competitiveness in a high-cost environment by enhancing enterprise and management capability in the use of Industry 4.0 technologies, design, and sustainable business models.

4. **Markets**
   Increase the confidence of manufacturers to invest by increasing access to new and existing markets, including through major public and private projects.

5. **Workforce**
   Attract, retain, and develop a highly skilled and productive manufacturing workforce. The state's manufacturing sector can support increased participation and access to well paid, secure employment opportunities for under-represented cohorts.

6. **Circular Economy**
   Increase competitiveness, innovation, economic profitability, and environmental benefits from the adoption of circular economy principles of reducing waste, keeping materials in use longer and regenerating natural systems.

Our Ambition for Manufacturing in South Australia

Now

- 6% of SA economy
- 7% of SA employment
- 25% of SA business R&D
- 20% of SA value-added exports

In 10 Years

- 10% of SA economy
- 8% of SA employment
- 30% of SA business R&D
- 25% of SA value-added exports

Manufacturing in South Australia

South Australia has the second largest share of manufacturing in its economy compared with all Australian states except Victoria, established in sectors such as food and beverages, defence, and previously automotive. This potentially offers a springboard to higher levels of innovation, research and development, skilled jobs, exports, productivity, long-term sustainable growth, and wealth distribution across the State.

For many years South Australia was a manufacturing powerhouse for the nation, particularly when the state had cost advantages in energy, land, and labour during the 1960s and 1970s. However, the global expansion of low-cost manufacturing in the 1980s, commodity booms, high exchange rates, closure of automotive manufacturing, and global health pandemic in the 2020s has meant to survive that manufacturers have needed to evolve to compete more on design, quality, innovation than cost. This is something the South Australian Government has understood since releasing its previous strategy, *Manufacturing Works*, in 2012.

In the last decade, manufacturing has contracted in South Australia from 9.7 per cent of industry gross value-added (2011-12) to 6.3 per cent (2021-22). This is consistent with reduced manufacturing across Australia from 7.5 per cent to 5.8 per cent, and most OECD nations over the same period. The OECD average is much higher at 13 per cent and more economically complex nations such as Germany and Finland have higher shares of manufacturing in their economies of 16 to 20 per cent reflecting a diverse and complex export base.

However, in 2021-22 manufacturing grew strongly in South Australia at 10 per cent due to higher spending on food, machinery, and equipment (including defence). This is the strongest growth in 32 years and may reflect a recovery from the loss of automotive manufacturing in 2017.

Key statistics

South Australia has 6,717 manufacturing businesses, including 6,159 small, 523 medium and 35 large-sized businesses.

These businesses contribute:

24.9% of business expenditure on R&D

20% of exports

7.7% of employment

6.3% of industry gross value-added

Nearly half of all manufacturing in South Australia is food and beverage manufacturing and machinery and equipment.

With an average of 68,100 people employed in the year to August 2022, manufacturing is the fifth largest employer in South Australia at 7.7 per cent. A decade earlier it was the third largest employer at 9.2 per cent.

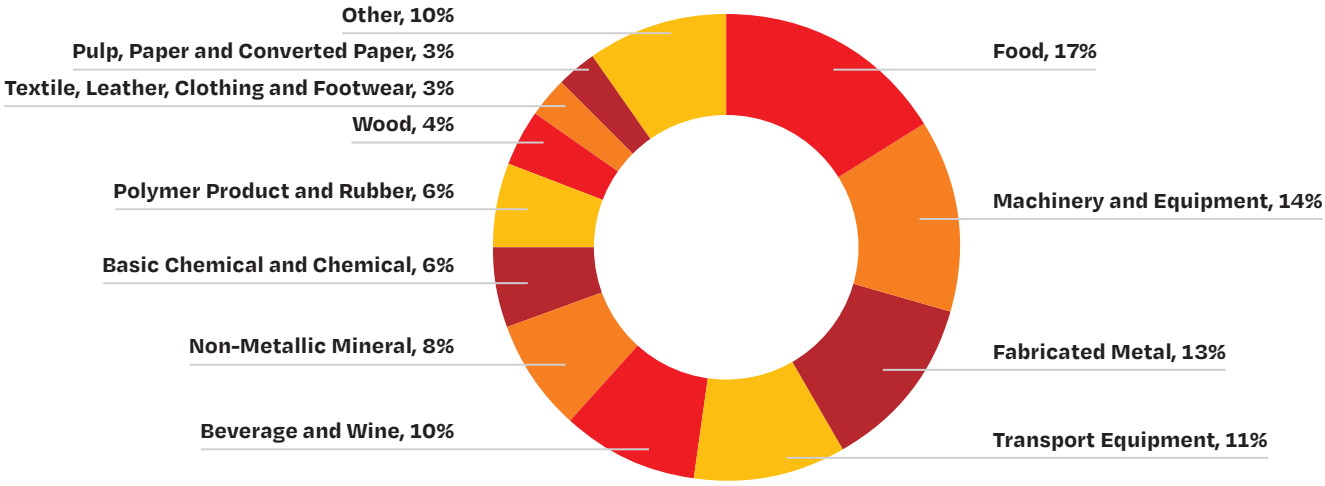
Given the higher share of manufacturing employment in the economy than industry value-add, there is room for productivity growth. The ideal scenario would be higher industry value-add than employment by a margin of 1-2 per cent, as was the case a decade ago when manufacturing industry gross value-added was 9.7 per cent and employment 9.2 per cent. COVID-19 stimulus measures may have temporarily affected productivity however the recent manufacturing recovery has shifted the focus towards attracting, retaining, and developing a skilled workforce.

There are 6,717 manufacturing businesses in South Australia with the majority (92 per cent) employing fewer than 20 people. Of particular interest is the high share of medium and large businesses (8 per cent), which is above industry average (2 per cent) in South Australia and explains the high share of manufacturing in the state's exports and business research and development.

Food and beverage manufacturing, machinery and equipment are the largest components of manufacturing in South Australia accounting for nearly half of all manufacturing, or 3 per cent of the state economy.

These figures highlight the urgency of the significant transition that is needed to ensure that manufacturing delivers high productivity over the next decade as the ultimate source of long-term economic growth.

SA Manufacturing Value Added, 2021-22



The opportunity in a new global context

Key objectives

In modern economies innovation in manufacturing is a key driver of:

1. economic complexity - through diverse and complex exports
2. net-zero transition – through global green value chains and the circular economy
3. productivity - through Industry 4.0 capabilities

South Australia is at a turning point in its economic history with exciting new opportunities for re-industrialisation as the State emerges from the impacts of the COVID-19 pandemic and embraces sovereign manufacturing in a net-zero carbon, clean industrial future.

Manufacturing is known globally as a knowledge-intensive and value-adding capability that underpins 70 per cent of world trade and is therefore fundamental to South Australia's participation in the global economy.

However according to the Harvard University Atlas of Economic Complexity that helps to understand the economies of different countries based on their research and development intensity and industrial diversity, Australia has fallen in the global rankings in the last two decades from 60th to 93rd out of 133 countries, behind Uganda, Armenia, Honduras, Malawi, and Kazakhstan. Australia is also significantly below the OECD average in relation to research and development as a share of Gross Domestic Product, around 1.7 per cent compared to 2.7 per cent for the OECD. This is also lower than in 2008 when Australia and the OECD were both around 2.2 per cent. By contrast, Japan, Switzerland, South Korea, Germany, and Singapore all have higher shares of research and development, between 2.2 – 4.9 per cent of GDP, and are ranked in the top five for economic complexity based on the diversity and complexity of their exports.

To stem further decline, manufacturing must be reinvented through value-add to production, technology, circular design, and sustainable business models. While the fundamentals of competing in a high-cost environment have not substantially changed in the last decade, there have been significant global shifts bringing a new set of challenges and opportunities.

Climate
Environment
Decarbonisation
Circular economy
Climate adaptation

Society
Ageing population
Workforce
Productivity
Inequality

Geopolitical
Health
Global security
Cyber
Migration

Digital
Industry 4.0 - automation
Digital literacy
Business models
Innovation ecosystem

Climate – at a time of growing international commitments to carbon abatement, Australia and South Australia already have an advantage with the highest per capita wind and solar capacity among developed nations. Hydrogen and battery technologies will enable further development of the green energy sector, while there is likely to be an increased need for climate adaptation and mitigation measures to protect critical supply chains and infrastructure. Adopting circular economy principles and rethinking the way goods and materials are manufactured, distributed, and used is also imperative in creating net-zero emissions as 45% of global emissions are associated with the production and use of products. South Australia seeks to grow and decarbonise manufacturing within the broader context of reducing South Australia's greenhouse gas emissions by more than 50 per cent below 2005 levels by 2030, and to achieve net zero emissions by 2050, as well as capitalising on the global green transition and contributing to global emissions reduction.

Society – an ageing global population will require preventative and precision health to deliver better health outcomes and reduce global health budgets. South Australia already has some manufacturing strengths in this area with medical devices, pharmaceuticals, medicines, and vaccines among others, critically highlighted and accelerated during the COVID-19 pandemic. An ageing population also presents an opportunity to reduce social and economic inequality by tapping into experienced workers, particularly in regions.

Geopolitical – the war in Europe, global health pandemic, and rise of cybercrime have all contributed to an energy crisis, rising fuel costs, supply constraints, inflation, and lower global economic growth. Global defence spending, the increasing importance of space in global security, health solutions to mitigate the impacts of future pandemics, and increased cyber security requirements for businesses are all likely to develop further over the next decade. Geopolitical unrest and climate change are also likely to increase migration trends.

Digital – digital technologies are disrupting every sector and require new approaches to creating business value through business models and workforce capability, including digital literacy. From a manufacturing perspective, digital technologies have the potential to reduce South Australia's historical challenges of scale, cost, and distance to market. They will also open new job opportunities requiring cognitive and communication skills between people and machines, freeing up production workers to engage in more creative, productive, and value-adding roles.

Industry 4.0 - refers to a platform of digital technologies (such as artificial intelligence, machine learning, automation, robotics, additive manufacturing, sensors) that enable manufacturing of customised products in small volumes, in remote or decentralised locations, and decarbonisation through data analysis and smart production. They also enable data-driven business models to strengthen links between customers and suppliers.

Innovation

For manufacturers, innovation is the constant search for new ways to be globally relevant and competitive. Unlike invention, innovation is something that customers are willing to pay for. The goal is to create and capture value, which can be achieved through production, technology, design, and sustainable business models.

South Australia's competitive advantage sectors

Some of the most prospective opportunities for manufacturing in South Australia over the next decade will be in the following sectors.

Defence and Space

South Australia is at the forefront of the nation's defence and space industries with significant advanced manufacturing capability supporting not only the future Royal Australian Navy Hunter Class Frigate and Arafura Class Offshore Patrol Vessel platforms, but existing platforms including the Anzac Class Frigates, Hobart Class Air Warfare Destroyers, and Collins Class Submarines.

The Government is also building South Australia's space ecosystem with a $33 million investment over four years including $20 million for a common user facility to support space manufacturing.

There are around 15,000 South Australians working in the defence industry. Up to 4,000 workers will be employed to design and build the infrastructure for the newly announced submarine construction yard in South Australia, with a further 4,000 to 5,500 direct jobs to build the nuclear-powered submarines.

The South Australian Government has established the Office for AUKUS with responsibility for delivering the Cooperation Agreement signed by the South Australian and Australian Governments in March 2023 to realise the following:

- An exchange of land as soon as possible to facilitate development of the new Submarine Construction Yard and a Skills and Training Academy campus at Osborne.
- The construction, establishment and operation of a Skills and Training Academy campus in South Australia, to be developed in consultation with industry and unions.
- An increase in Commonwealth Supported Places to South Australia Universities over the next four years, focused on STEM disciplines in professional engineering (mechanical, electrical, chemical), computer science, mathematics, chemistry, physics, psychology, and management. The Commonwealth will allocate an additional 800 places to South Australia Universities over the next four years, with the first 200 places commencing in 2024.

- Investment in research capability and infrastructure in priority disciplines in South Australia to generate a workforce close to the submarine construction yard.
- Progress consideration of options for defence-related science and technology facilities in Adelaide.
- A potential land exchange and appropriate easement and access arrangements for Department of Defence owned and leased land at Cultana.

The Government is also investing $450,000 over three years to fast-track the development of a software engineering degree apprenticeship pilot program in partnership with the University of South Australia, defence industry and the Australian Industry Group, to enable students to prepare for defence careers ahead of the construction of the AUKUS submarines.

Renewable Energy and Green Hydrogen

National and international requirements for reduced carbon emissions creates demand for innovative net-zero carbon technologies, infrastructure, and recycled materials. With an increase in the renewable energy mix from 1 per cent to almost 70 per cent in 20 years, South Australia has already become a leader in renewables with an early advantage to decarbonise the economy and participate in the global energy transition.

With a significant pipeline of investment for on and off-grid renewables and storage, the state has established a platform for green industrial transformation. The South Australian Government's Hydrogen Jobs Plan will see the delivery of world leading hydrogen facilities in the Whyalla region – including 250MWe of electrolysers, 200MW of power generation and hydrogen storage infrastructure. The capability we are building will make South Australia a substantial global player in green hydrogen production and aims to attract supply chain and manufacturing opportunities.

Additionally, the proposed Hydrogen and Renewable Energy Act aims to make a significant contribution to unlocking low-cost renewable energy, enable the green transition, and build an advanced manufacturing capability by introducing a 'one window to government' licencing and regulatory system for the lifecycle of large-scale hydrogen and renewable energy projects in South Australia.

With abundant renewable resources, South Australia is already a global leader in renewable energy production and supply. Net-zero carbon energy intensive manufacturing, exports, and circular economy practices in sectors such as iron, copper, steel, cement, critical minerals, and fuels represent a future competitive advantage, particularly when linked to the net-zero aims of our trading partners, including Asian and European markets.

South Australia is developing its Net Zero Pathways Strategy to allow government and the private sector plan for change and make an economically positive transition to net zero emissions by 2050.

The Australian Government's recent announcement of developing sector decarbonisation plans for industry, energy, built environment, agriculture, transport, and resources also provide an opportunity to collaborate on manufacturing development and decarbonisation of industry.

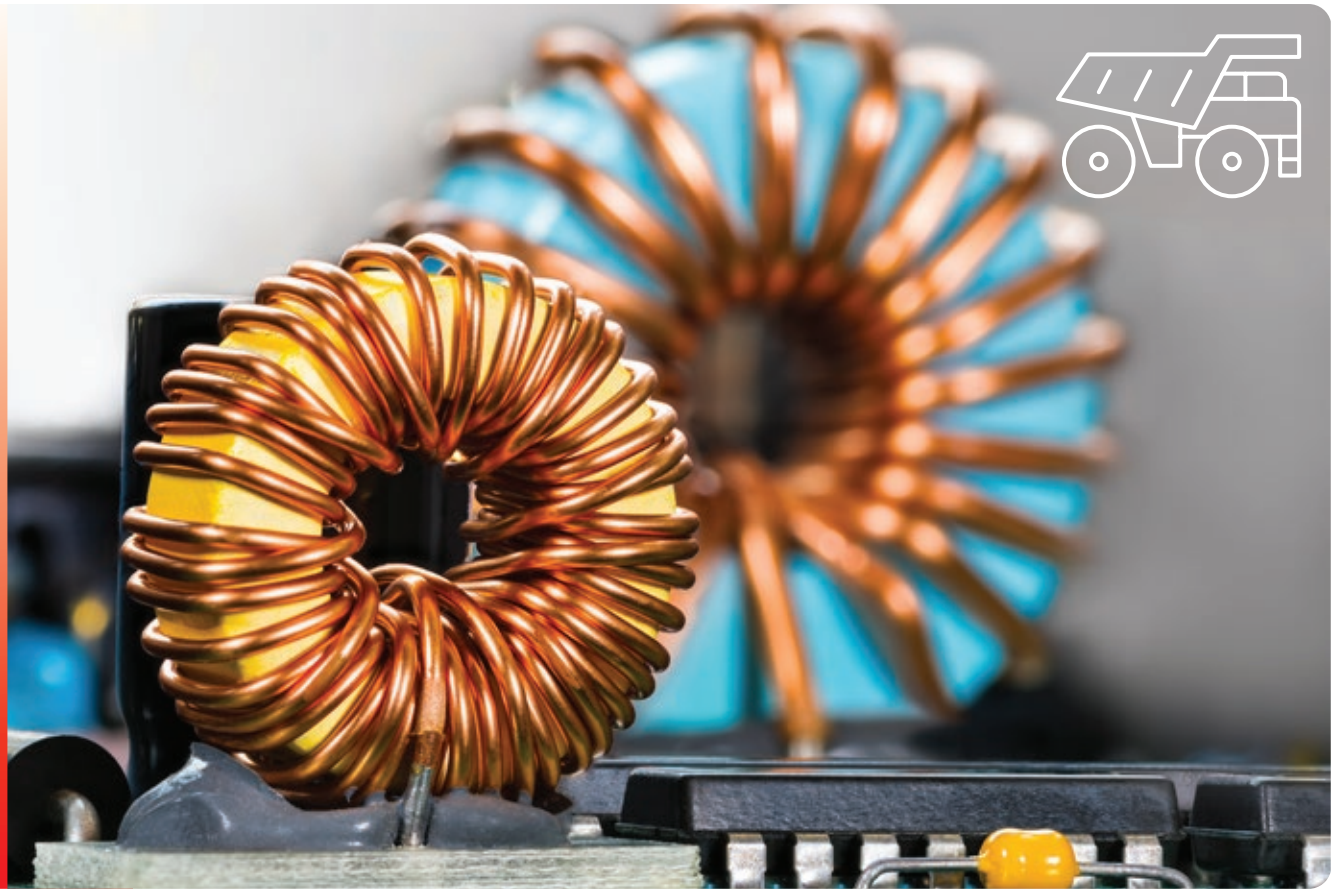
Critical Minerals and Resources

As the world transitions to net-zero carbon technologies, large amounts of copper with critical minerals such as rare earth elements, graphite and cobalt will be required. South Australia holds more than 69 per cent of Australia's known copper and graphite resources and is highly prospective for cobalt.

Copper is used in most renewable energy technologies with global demand expected to triple by 2050. There is a major opportunity to leverage our established copper sector and its associated polymetallic prospects, to expand production, processing and manufacturing capability. Copper is used to manufacture computers, phones, electric vehicles, and many other electronic devices and is used in sectors such as construction, defence, and energy to build wind farms, solar panels, naval vessels, and energy efficient transmission infrastructure.

There will also be new remanufacturing opportunities to provide high value-adding recycling for waste batteries, solar panels, carbon fibre wind turbines, and other net-zero carbon technologies as markets mature, technologies evolve, and raw materials increase in value.

To support expansion of the state's resource industries, the Government has announced the establishment of a copper taskforce to maximise the public benefits of the state's copper deposits including growing local refining and downstream copper manufacturing. It is also partnering with the private sector to undertake studies to increase water in the Upper Spencer Gulf and far north regions.



Food and Beverage

With a diverse food production sector processing meat, grains, dairy, seafood, nuts, fruit and vegetables, food and beverage are the largest manufacturing sub-sector in South Australia.

South Australia is indisputably Australia's wine state, producing 50 per cent of Australia's bottled wine and about 80 per cent of premium wine, with nearly a billion bottles of South Australian wine on tables and in cellars around the world. Opportunities to develop new products and expand into new markets with high quality no and low-alcohol wines are being explored with an almost $2 million investment by the South Australian Research and Development Institute into machinery at the University of Adelaide to enable winemakers to trial no and low alcohol wine using as little as 150 litres of wine.

There are important challenges and opportunities for the sector, particularly in European markets, including food waste, traceability, high fat, salt, and sugar (HFSS) foods, and packaging. Food manufacturers are increasingly required to demonstrate compliance with Environmental, Social and Governance (ESG) criteria to maintain international trade and exports. Protection from antimicrobial resistance will also support the state's food expansion into global export markets, strengthen biosecurity and protect human health.

Innovation in agricultural technologies, or AgTech, presents further opportunities for manufacturers to make inroads into global export markets through sensors, imagery, aquatech, and smart farm equipment incorporating robotics and automation.

A plant-based food pilot laboratory has been established at the Waite Research Precinct to enhance South Australia's research capability into plant-based foods. This will help attract further investment and increase the potential of additional value-adding, food manufacturing and export opportunities for South Australia.

There are also significant opportunities to add value to South Australia's commodities, particularly grain, pulse, and oilseeds. Others such as hemp, macro, and micro-algae have a range of future uses including food, fibre, biofuels, chemicals, and animal feed supplements.

There are also opportunities for transforming waste organic materials into value-added products such as starch and nutraceuticals, animal feed, along with other circular economy solutions. These include composting with application back on farms to improve soil health for productivity, anaerobic digestion and other technologies that provide an alternative power source along with nutrient-rich by-products for use in agriculture reducing water and artificial fertiliser requirements.

Harris Smokehouse

Harris Smokehouse – a story of opportunity and growth from near-disaster.

An unexpected listeria contamination and public recall could be a death knell for a small, niche food manufacturer.

But for Adam Harris, owner and director of Harris Smokehouse, it was an opportunity to test and prove a new way of safely making chemical-free products in the tradition they'd been using for more than 60 years.

Harris Smokehouse is a fourth-generation family owned and operated smokehouse located in the Adelaide Hills, which produces a range of premium smoked foods using traditional curing methods.

With 40 employees across Australia, their range of products include traditional European style mackerel, Tasmanian and wild Alaskan smoked salmon, barramundi and South Australian yellowtail kingfish.

Traditional oak wood is used to ensure the subtle smoky aroma does not overpower the flavours of the premium produce. Their low food mile products come from Tasmanian aquaculture, low impact from small scale aquaculture, and some wild caught fish. They have a focus on creating ethical, sustainable and natural choices for the consumer.

"The product recall and the four month investigation by SA Health was devastating but we were given three options – to eradicate the listeria, which was impossible given the testing carried out showed it was ever-present on the raw material; to add a chemical-based compound to our products, which went against our ethos for clean, chemical free produce; or to trial and prove safe a natural process using the Lactobacillus culture – something that was used in Europe but not in Australia," Adam said.

Harris Smokehouse partnered with global bioscience company Chr Hansen to trial and pilot Lactobacillus culture to compete with and fight the listeria, while also ensuring it was harmless to consumers.

"We put everything on the line to prove the culture could work, as well as satisfy Australian health regulations.

"It was essential that we stuck to our beliefs to have products that are preservative-free, transparent, and clean."

Harris Smokehouse has trained – and continues to train – its staff in the new process; the collaboration meant laboratories in South Australia also had to be upskilled to offer the testing process required and verify the work.

"In the middle of the recall, we hired a new quality assurance manager to help us cope and get back on track. None of us knew anything about this solution at the time. There were significant ramifications to our existing food safety program, so she had to learn on the job, as we all learned, and applied the concept together to satisfy health authorities.

"She is now guiding two other companies through the processes of adopting this concept.

"The next step for us is to apply the tech to some different products in our range to try and gain back yield by using the culture to protect our product, so we don't have to cook to such a high temperature which can cause the product to become drier.

"It was essential that we stuck to our beliefs to have products that are preservative-free, transparent, and clean."

Adam Harris
Owner and Director, Harris Smokehouse

"We backed the research and our ethos, and we were confident that was also the way the market for premium goods was moving as well.

"The manufacturing efficiencies have resulted in a product that has double the shelf life, with no added gases, additives or chemicals; reduced food wastage and reduced plastic pollution."

Adam now sees further opportunities in packaging, highlighting their clean and natural credentials.

"The opportunity for growth is now in changing our packaging to show that we are sodium diacetate free, much like the nitrate free movement in smallgoods, because not only is that our ethos, but that's also where the market is moving," Adam said.

Forestry and Timber

Forestry and timber are a significant industry in the state's South-East, accounting for a third of Australia's locally produced house framing and interior sawn wood, and a quarter of particleboard.

With an anticipated four-fold increase in global fibre consumption by 2050, increased demand of 41 per cent for new housing in Australia by 2050 (from 183,000 dwellings annually to 259,000), and new opportunities from the Australian Government's plan to eliminate plastic waste by 2040, there are a range of growth drivers for the sector and opportunities for new manufacturing.

Approximately 40 per cent of timber leaving the region is unprocessed. Manufacturing opportunities, many of which were identified in 2014 by VTT Finland, include value-adding to hardwood, generating new structural timber products, creating new wood products to replace plastic, developing new biofuels and biochemicals.

The South Australian Government has committed $2 million for a roadmap to strengthen the state's forest industries, domestic manufacturing, and infrastructure capability, and $15 million to establish a Forestry Centre of Excellence to deliver on these priorities.

Building and Construction

With direct links to the forestry, timber, steel, cement, brick and other industries, the building and construction sector presents new opportunities for innovative new products such as fibre and cement composites that support future net-zero carbon building systems and the circular economy.

Drivers of growth include a predicted doubling of the global built environment by 2060 with buildings of higher environmental performance standards to support urbanisation and population growth.

Currently the built environment generates 40 per cent of global CO2 emissions, with concrete and steel – both commodities that are manufactured in South Australia – and aluminium responsible for 23 per cent of global emissions. There will also be opportunities to value-add to materials originating in end-of-life buildings with the built environment accounting for nearly a half of the world's raw material use and landfill waste. The built environment presents significant circular economy opportunities for long-term economic and community benefits.

Health and Medical

South Australia has an emerging health manufacturing capability including medicines, vaccines, medical devices, pharmaceuticals, nutraceuticals, traditional medicines, biological manufacturing, and reagents.

South Australia also has strong medical research capabilities at the $3.8 billion Adelaide BioMed City, Royal Adelaide Hospital, Flinders Village incorporating the Flinders Medical Centre, Flinders Private Hospital, Flinders Health and Medical Research Institute and the new $280 million Health and Medical Research Building, and Tonsley Innovation District, as well as a high share of national clinical trials at around 14 per cent.

Due for completion in late 2023, the Australian Bragg Centre will be a purpose-built biomedical facility set to become home to leading cancer research institutes as well as the first clinically dedicated proton beam precision therapy centre in the Southern Hemisphere.

The Government is investing in the development of end-to-end mRNA vaccines and therapies, while the Marine Bioproducts CRC will develop a range of bioproducts over the next decade for the health, food, and chemical industries. The Medical Device Partnering Program at Flinders University also enables manufacturers to develop, test, and commercialise new medical products through to market.

Growth in the health and medical sector will help attract medical institutions, professionals and researchers and drive health tourism with the state positioned as a centre for treatment excellence.

The opportunity: Enablers of growth

South Australia's Advanced Manufacturing Strategy offers a forward-looking approach to industrial policy by identifying sectors of competitive advantage, and six enablers of growth to target an ambitious return of manufacturing to the South Australian economy of 10 per cent within the next decade.

However, a number of common challenges to achieving growth have been identified through engagement with over 70 manufacturers and key industry stakeholders, including workforce and skills gaps, the increasing need for decarbonisation to meet emissions reduction targets, accessing government procurement, and encouraging more businesses to adopt new technologies, circular economy business models and reduce waste.

Ultimately, it is the responsibility of business and industry to adapt and take advantage of opportunities. Governments can and should:

- provide **policy certainty, set direction** and **intervene for the public interest** – not private benefit
- **regulate** to help not hinder competitive and innovative solutions
- use its **purchasing power** in a clever way that benefits industry and supports the industrial policy
- broker **knowledge** and **relationships** that create value
- provide **infrastructure** and **information** for productivity, knowledge generation and growth.

A collective effort by all stakeholders will be required to deliver *South Australia's Advanced Manufacturing Strategy* and achieve manufacturing growth over the next decade. **We will work with industry**, with the resources that we have, to execute a plan that supports manufacturers to invest in growth, with a global mindset and productive workforce.

1. Investment

Investment is critical for manufacturers to grow. Mobilising the necessary resources to enable manufacturers to access patient capital from all sources, public and private, will help achieve scale, capability development, and productivity. For South Australia, investment that increases access by manufacturers to low-cost renewable energy and water will also be important.

According to the Australian Investment Council private capital markets are growing strongly in Australia despite the recent global economic slowdown. In 2022 there was a 21 per cent increase in assets under management to $118 billion, while tighter bank lending conditions have driven Australia's private equity and venture capital markets to record levels of $41 billion and $17 billion respectively. In 2022, the information technology sector accounted for more than half of venture capital deals, providing a boost to start-ups in technology areas such as blockchain, artificial intelligence, and cryptocurrencies. This environment highlights the positive private capital environment in Australia at present, and expectation that manufacturers will co-invest when seeking government investment.

The Australian Government has specifically called on private equity and venture capital investors to engage with the $15 billion National Reconstruction Fund that will finance projects in seven priority areas including (1) renewables and low or net-zero emissions technologies, (2) medical science, (3) transport, (4) value-add in the agriculture, forestry, and fisheries sectors, (5) value-add in resources, (6) defence capability and (7) enabling capabilities. In addition to $1 billion for advanced manufacturing, priority allocations include up to $3 billion for renewables and low or net-zero emissions technologies, $1.5 billion for medical manufacturing, $1 billion for value-adding in resources, $1 billion for critical technologies, and $500 million for value-adding in agriculture, forestry, fisheries, food, and fibre.

The $392 million Industry Growth Program is being established to provide advice and grant funding to small and medium sized businesses, with a view to developing a pipeline of initiatives for the National Reconstruction Fund.

The South Australian Government has been working closely with the Australian Government during the design phase of these programs, actively advocating to ensure the programs will be accessible to SA manufacturers, maximising opportunities for investment in projects that align to the purpose of the funds. The South Australian Government will continue to work with the Australian Government to implement the funds and work with industry to assist with awareness of opportunities and the identification of potentially eligible projects. The South Australian Government will also partner with the Australian Government to deliver business and technical advisory services, consistent with the focus of these programs.

Primary industries and regions are important contributors to our state's ongoing prosperity. An annual commitment of $15 million for the Thriving Regions Fund supports projects that enable regional industries to grow jobs and strengthen regional communities.

As an election commitment the South Australian Government committed to establish a grants program to boost manufacturing growth. This will be delivered as part of South Australia's $122 million Economic Recovery Fund that helps businesses and industry in key areas build advanced capabilities, grow long-term employment opportunities, and increase productivity and innovative technologies.

STRATEGIC PRIORITY	KEY ACTIONS FOR GOVERNMENT
1. Investment **Increase private investment by providing a coordinated approach to help manufacturers access support from government organisations and the private sector.**	**Invest SA** – working with international, national, and local companies to identify opportunities and facilitate investment in key sectors for South Australia. **Industry funding Programs** – supporting manufacturers to access: **Economic Recovery Fund** – funding round to help manufacturers enhance their growth prospects. **National Reconstruction Fund** – the NRF will provide finance for projects that diversify and transform Australia's industry and economy. Projects will be targeted investments in the following priority areas: renewables and low emissions technologies, medical science, transport, value-add in the agriculture, forestry and fisheries sectors, value-add in resources, defence capability, enabling capabilities. **Industry Growth Program** – the IGP will provide advice and matched grant funding for SMEs and startups to commercialise their ideas and grow their businesses. The Program will support early-stage businesses in their most challenging development phase. **Thriving Regions Fund** – to achieve thriving, resilient regional communities through improved quality of life, developing diverse leadership, implementing place-based programs, attracting and retaining a skilled workforce, and capitalising on growth potential. **Concierge Service** – SA Government Industry Development Managers (IDMs) to support manufacturing growth by coordinating industry, research, and government investment into manufacturing.

APS Industrial and Siemens

A destination of choice for multinational tech conglomerates

Siemens and its national distribution partner APS Industrial (APS) have announced the opening of a new manufacturing facility in Adelaide's inner southern suburbs.

The site is the first non-Siemens facility worldwide to manufacture and assemble the company's air circuit breakers, a critical piece of technology required for all infrastructure where a high demand for low voltage power is required – such as large buildings and manufacturing sites.

This product is in high demand globally, and the new domestic manufacturing capability is set to reduce lead times from 12 – 24 weeks to as little as one to four weeks. The new facility is also expected to create more than 150 local technology jobs over the next 10 years.

This project is just the latest in a long and proud history of Siemens in Adelaide – which began in 1872 with the establishment of the Overland Telegraph line stretching from Adelaide to Darwin.

Siemens technology can be found supporting critical infrastructure, industry and iconic South Australian brands – everything from Cooper's Brewery to Haigh's Chocolates and more.

2. Innovation

Modern innovation ecosystems are at the heart of advanced economies. There are many international examples from which South Australia can learn of governments, particularly in Europe, which are introducing national and regional innovation strategies to stimulate industry and research connections, place-making, clustering, and smart specialisations including:

- Catapult Network (UK)
- Norwegian Catapult (Norway)
- Fraunhofer Institute (Germany)
- Flanders Make (Belgium)
- TNO (Netherlands).

South Australia has the building blocks of a regional innovation ecosystem with world class universities and key economic activity zones and innovation assets located across Adelaide. Many businesses however have said they do not feel engaged or connected with these.

The South Australian Government has announced the development of a national first, state-wide framework, to connect existing and future economic activity zones including Lot Fourteen, Adelaide BioMed City, Tonsley Innovation District, and manufacturing precincts including Technology Park, Edinburgh Defence Precinct, and Osborne Naval Shipyard. This will be the catalyst for increasing business engagement and investment opportunities across these sites, supporting knowledge transfer, developing new skills, and creating new jobs.

Building on the UK Catapult model, the South Australian Government will develop a new model for translational research by promoting connectedness between research facilities and engagement with manufacturers. The South Australian Government's $25 million investment into six National Collaborative Research Infrastructure Strategy (NCRIS) projects, which is expected to attract more than $65 million from research organisations and the Australian Government, will provide an early opportunity to develop and implement this model. These projects provide an important role to actively connect with industry and stimulate private investment in research. The six NCRIS projects include:

1. *Australian Plant Phenomics Facility* – University of Adelaide (headquarters)
2. *Australian National Fabrication Facility* – University of Adelaide, Flinders University, University of South Australia (nodes)
3. *Bioplatforms Australia* – Australian Wine Research Institute, University of Adelaide, University of South Australia, SA Health and Medical Research Institute (nodes)
4. *Microscopy Australia* – University of Adelaide, Flinders University, University of South Australia (nodes)
5. *National Imaging Facility* – SA Health and Medical Research Institute (node)
6. *Terrestrial Ecosystem Research Network* – University of Adelaide (node)

South Australia is also the headquarters of five Cooperative Research Centres (CRC) and five 'nodes' that support industry-led collaborations with a focus towards research application. The CRC headquarters and nodes in South Australia include:

CRC Headquarters

1. *Marine Bioproducts CRC* – fast track the growth of next-generation marine bioproducts and advanced manufacturing
2. *Heavy Industry Low-carbon Transition CRC* – develop technologies to transform heavy industry for the low-carbon economy
3. *CRC for Solving Antimicrobial Resistance in Agribusiness, Food and Environments* – develop solutions to increased resistance to antibiotics, antifungals and antivirals
4. *Fight Food Waste CRC* – focussed on food waste reduction and development of innovative high-value products
5. *Smart Sat CRC* – develop technologies in advanced telecommunications and IoT connectivity, intelligent satellite systems and Earth observation next generation data services.

CRC Nodes

6. *Minex CRC* – create new opportunities and technologies for mineral discoveries
7. *Future Fuels CRC* – transition energy infrastructure to a net-zero carbon economy such as hydrogen and biogas
8. *Future Battery Industries CRC* – expand opportunities for battery design and production, re-use, repurpose and recycling
9. *RACE for 2030 CRC* – improve energy affordability, reduce carbon emissions, develop energy technology businesses
10. *One Basin CRC* – grow the competitiveness of irrigation regions to produce food and fibre.

The Research and Innovation Fund will complement this model by investing in a more connected system that helps manufacturers to develop and commercialise new product and services.

The Flinders University Factory of the Future is an excellent example of a world-class research facility involving researchers from Flinders University working seamlessly with BAE Systems Maritime Australia and other manufacturers to modernise and transform defence and other manufacturing through Industry 4.0 technologies. Co-location of the Tonsley Technical College with the Factory of the Future also highlights the importance of secondary education as a pathway to rewarding careers in advanced manufacturing.

Lot Fourteen will be home to a flagship $400 million Entrepreneur and Innovation Centre and $20 million Innovation Hub, bringing industry, research, and entrepreneurs together in a purpose-designed building to drive innovation and commercialisation, focussed on the defence, space and critical technologies sectors.

STRATEGIC PRIORITY	KEY ACTIONS FOR GOVERNMENT
2. Innovation **Drive coordinated research and innovation across South Australia's innovation ecosystem, including innovation districts and future manufacturing precincts.**	**Innovation Ecosystem Coordination** – establish a state-wide framework to connect South Australia's innovation districts and future facing economic activity zones as the catalyst for high levels of business engagement and investment across these sites, supporting knowledge transfer, developing new skills, and creating new jobs. **National Collaborative Research Infrastructure Strategy** – $25 million to support nationally significant, accessible, and shared research infrastructure for cutting edge research and attracting world-class talent. These facilities connect industry to advanced technologies and are expected to attract more than $65 million from research organisations and the Australian Government. **Research and Innovation Fund (RIF)** – $53 million investment between 2023-24 – 2027-28 to fund strategic research initiatives, commercialisation of products and services and innovation and entrepreneurship programs. **Forestry Centre of Excellence** – $15 million to establish a Centre of Excellence in Mount Gambier to increase manufacturing of premium products as a priority. **Forest Products Domestic and Infrastructure Masterplan** – $2 million to develop a manufacturing and infrastructure capability roadmap including a focus on future skills needs. **SA Research and Development Institute** – value-adding to wine, plant proteins, canola, seaweed, hemp, and new food product development through research and development.

Factory of the Future

Exploring the potential of Industry 4.0 technologies

Leading the state's efforts to build advanced manufacturing capability is Flinders University's Factory of the Future facility, located in Tonsley Innovation District.

A truly collaborative venture, Factory of the Future was established to enable researchers from Flinders University to work seamlessly with BAE Systems Maritime Australia to unite governments, research bodies, industry and training providers towards the common goal of building a high-value manufacturing sector.

The facility plans to leverage new investment, technologies and research to unlock 4000 Australian jobs over five years, including the skilled employees required to fulfil the state's major shipbuilding and defence projects.

In 2022, the South Australian Government granted Flinders University $4 million over four years to establish a Manufacturing Growth Accelerator as part of Factory of the Future. Additional funding of $10 million from the Australian Government will be provided to expand the facility.

Collectively, government funding has allowed the university's Australian Industrial Transformation Institute (AITI) to work with industry to accelerate the adoption of advanced manufacturing technologies amongst the SME community.

3. Capability

Enhancing enterprise and management capability in the adoption of Industry 4.0 technologies, design, and sustainable business models will be important for growth.

Being a fast follower of new technologies that have been developed elsewhere is important for productivity, but for economies to become more advanced they must be capable of supporting first movers to design and develop new technologies, products, and processes.

South Australia is globally competitive in several transformative technology areas that are relevant to advanced manufacturing:

- Artificial intelligence and machine learning – including augmented and virtual reality for production efficiencies, predictive maintenance, and new product development
- Photonics and sensors – specialty glass and optical fibres for defence, space, medical, agriculture, resource, and infrastructure sectors
- Robotics and automation – digitising tasks not previously possible, such as collaborative robots, digital twinning
- Quantum materials – operating at the boundary of several engineering disciplines including quantum physics, material sciences, optoelectronics, and photonics
- Cyber security - protecting digital infrastructure across all facets of personal life and business
- Medical devices – medical and assistive technology innovations such as X-ray products, cancer diagnostics, scanners, and mobility equipment
- Biomanufacturing and synthetic biology – new biological systems and products such as mRNA vaccines, plant-derived pharmaceuticals, biofuels, industrial chemicals, and new yeast strains for wine, food, and beverage production.

Progressing the development of these technologies through the nine Technology Readiness Levels (TRL) and their adoption by manufacturers over the next decade will be important for the development of new products, services, and sustainable business models. As advanced technologies continue to disrupt supply chains an uplift in digital literacy and cyber capabilities to support the integration of Industry 4.0 technologies with existing workforces, particularly for smaller businesses, will be needed.

STRATEGIC PRIORITY	KEY ACTIONS FOR GOVERNMENT
3. Capability **Enable competitiveness in a high-cost environment by enhancing enterprise and management capability in the use of Industry 4.0 technologies, design, and sustainable business models.**	**Manufacturing Growth Accelerator** – $4 million to build industry capability at Tonsley for the defence and other sectors such as medical devices, energy, circular economy, and construction with $2 million from Flinders University, as part of a network of innovation districts 2022-23 – 2025-26. **Digital Literacy** – $500,000 to assist businesses to develop digital literacy and cyber capabilities through South Australia's Small Business Fundamentals Program and Cyber Uplift Step Program, delivered by the Office for Small and Family Business as part of South Australia's Small Business Strategy 2023-2030. **Space Industry** – $33 million to support the development of South Australia's space ecosystem including $20 million for a common user facility to support space manufacturing. **Emerging Technology Interest Groups** – enable local manufacturers to learn about and adopt transformative technologies that are relevant to advanced manufacturing.

"We recognise the role government plays in working closely with industry, education, unions, and community stakeholders to set the direction for a future that is built on our competitive strengths and provides the actions and conditions for success."

Dr Susan Close MP
Minister for Industry, Innovation and Science

Derby Rubber

Enabling smarter decision making

The history of Derby Rubber is intertwined with that of our state. Established in 1964, the company produced engine mounts and radiator hoses at the height of South Australia's automotive industry, and has since expanded into specialised products for the nation's rail, mining, defence and infrastructure sectors, relocating to a larger site in Wingfield in 2019.

Operating for almost six decades, it's no surprise the Derby Rubber factory houses a mix of new and older equipment. However, the business has found that the transition to modern manufacturing practices doesn't have to mean a complete overhaul of this existing kit.

In 2022, the company adopted a digital manufacturing solution offered by local provider TilliT to boost operational efficiency and digitalise their paper-based processes.

A SAGE Group company, TilliT retrofitted lightweight, inexpensive Internet of Thing (IoT) sensors to capture data from Derby Rubber's machinery.

This data was then made accessible to operators through software on a mobile, tablet or desktop – providing a holistic view of what's happening on the factory floor.

It has allowed business leaders to capture the team's valuable insights and observe trends, so that this information can now be stored, shared and acted upon.

As a result, Derby Rubber successfully eradicated all paper from their factory floor, reports fewer operator mistakes, and has celebrated a record-high year of exports.

"In 2022, the company adopted a digital manufacturing solution offered by local provider TilliT to boost operational efficiency and digitalise their paper-based processes."

"We want to respect and understand our country and land, and start telling the stories of how Indigenous culture applies to the Australian wine industry."

Damien Smith
Managing Director, Munda Wines

Munda Wines

Munda Wines: a First Nations approach to wine making

Munda Wines crafts premium wines sourced from world-renowned growing regions in the land we now call Australia. The business's philosophy is to express a deep connection to munda – which is Wirangu and Kokatha for land or country – specifically the traditional Aboriginal country from which the fruit was sourced.

Munda Wines is about exploring and celebrating the long history that stands within the varied countries of South Australia. It's about understanding the qualities of different lands, and how these shape a wine's personality.

"My ancestors innately understood the seasons, adapting lifestyle patterns to work in harmony with munda," says Munda Wines Owner/Director Paul Vandenbergh.

However when Europeans settled here, their understanding of soil and agriculture was limited to their European experience.

Munda Wines embraces learnings from First Nations people with a deep understanding of the munda they live on – such as Vandenbergh's ancestors – gained through thousands of years of storytelling.

"We are a very young business telling an old story," says Managing Director Damien Smith.

"The wine world has had little, if any, Indigenous representation. We want to respect and understand our country and land, and start telling the stories of how Indigenous culture applies to the Australian wine industry."

Munda Wines currently sells three varieties – the Munda Walgalu Country Chardonnay, Munda Ngadjuri + Peramangk Country Grenache, and Munda Kaurna Country Blewitt Springs Syrah.

4. Markets

By virtue of its size, South Australia is a relatively small market. The need to be present in national and international markets is therefore paramount. Through its international networks and overseas offices, the South Australian Government works with South Australian businesses wanting to grow through exporting, including mentoring for First Nations businesses. Recent commitments include expanding the state's presence in Washington DC to build on the AUKUS agreement, and Frankfurt in recognition of Germany's significant position in the global green hydrogen economy.

The post-pandemic global trend of sovereign manufacturing has made access to some markets difficult, particularly Europe with increased Environmental, Social and Governance regulations. In the United States, regulatory stimulus through the *Inflation Reduction Act, Infrastructure Investment and Jobs Act*, and *CHIPS and Science Act* all provide strong signals of the United States' intention to fast-track its clean energy transformation via the development of local manufacturing capability.

We know from manufacturers that some, particularly those with head offices in Europe, are setting carbon abatement targets from 2025 with penalties for non-compliance. Despite the state's high level of renewable energy, much of this is exported via the National Electricity Market with the benefits of renewable energy supporting net zero manufactured goods not always flowing to local manufacturers. This presents risks for exporters in global markets.

The South Australian Government spends over $11 billion a year on goods, services, and construction activities. Industry has told us government procurement is an important economic lever that drives innovation and local jobs, with many businesses seeking access to government as a customer. The South Australian Government is strengthening its focus on increasing opportunities for local businesses to participate in government procurement through early engagement with the market in the design and tender specification stages, and increased recognition of businesses that employ residents of South Australia and Aboriginal businesses.

As a priority, the South Australian Government will also encourage more locally manufactured products in public housing, construction, and maintenance projects.

From 2023, new government procurement rules require public authorities to complete an Industry Advocate Checklist for contracts between $55,000 and $550,000, with reasons needed for not awarding procurement to South Australian businesses. The Industry Capability Network SA (ICNSA) continues to play an important role in connecting local businesses to major projects across the public and private sectors and identifying future industrial capability requirements to build our key sectors.

STRATEGIC PRIORITY	KEY ACTIONS FOR GOVERNMENT
4. Markets **Increase the confidence of manufacturers to invest by increasing access to new and existing markets, including through major public and private projects.**	**Hydrogen Jobs Plan** – $593 million for the construction of a world leading green hydrogen power plant, electrolyser and storage facilities to be built at Whyalla by December 2025. **Hydrogen and Renewable Energy Act** – a 'one window to government' licencing and regulatory system for the lifecycle of large-scale hydrogen and renewable energy projects in South Australia. **Green Iron** – Steel Taskforce and $50 million co-investment to secure the sustainable future of the Whyalla Steelworks. **Critical minerals** – development of a Critical Minerals Strategy for South Australia with a focus on value-adding through mineral processing and new technology. **Northern Water Supply Project** – securing project approvals, undertaking detailed environmental assessment and obtaining tender prices needed for the final investment decision by government for a new and sustainable water supply for the northern parts of the State and Eyre Peninsula. **International markets** – $3 million for South Australian businesses wanting to grow through exporting, including mentoring for First Nations businesses. **Government procurement** – increase opportunities for local manufacturers through coordination between OIA, Procurement Services SA, and ICNSA.

Hydrogen Jobs Plan

Underpinning future industries

South Australia's advanced manufacturing capability will be the foundation of the state's success in many industries – including our relatively recent foray into the production of hydrogen for domestic use, at scale industrial use and export.

Hydrogen made from renewable electricity (which South Australia has in abundance) is a versatile zero-carbon fuel that can be used in a range of applications. It can:

- be burnt creating heat and therefore replace the use of coal, oil and gas in power generation and manufacturing processes
- be combined with catalysts, acting as a reductant in chemical processes such as the manufacture of green iron, alumina or cement
- used in place of petrol, diesel and LNG in heavy and public transport
- be made into ammonia to create a green fertiliser alternative to traditionally made ammonia from coal, oil and gas.

The South Australian Government has invested more than half a billion dollars into the Hydrogen Jobs Plan that will see the construction of a world-first hydrogen power station, electrolyser and storage facility within the Whyalla City Council by the end of 2025.

Among the significant benefits for our state – including job creation and enhanced grid security – is the opportunity for South Australian manufacturers to contribute to the supply, construction and operation of the hydrogen power plant.

ICN SA (within the Department for Industry, Innovation and Science) has undertaken a Hydrogen Supply Chain Study to match South Australian manufacturers with work arising through in this new hydrogen sector.

This study maps all aspects of the supply chain—from the manufacture and installation of solar panels, wind towers and batteries, to renewable energy generation, production of hydrogen, and the manufacture of green iron.

5. Workforce

With extensive supply chains across multiple sectors, manufacturing is a multiplier of jobs across the economy with at least one additional job created for each manufacturing job. However, the role of manufacturing workers will change over the next decade as Industry 4.0 technologies combine with human creativity and digital literacy to create new jobs of the future. Industry has told us that attracting and retaining a suitably qualified workforce is a significant challenge for many businesses, particularly in a low unemployment environment, with international students and migration becoming increasingly important. Increased competition for talent and an ageing workforce will require a renewed focus on building the profile of manufacturing in schools as an exciting, challenging and rewarding career opportunity. A deliberate focus on overcoming the barriers to participation and promoting the career opportunities to under-represented cohorts across all job roles, including in leadership will help to attract and retain a more diverse workforce, including more women.

Closer alignment between the vocational and higher education sectors, together with new industry engagement models, are key features of modern education systems as recently noted by the *Australian Universities Accord* interim report. Equipping people with the deep theoretical and cross-cutting practical expertise will be needed for future manufacturing jobs as people move between these sectors during their lifetime. Universities and training providers are opportunity creators, for people to be economically active and socially included in workplaces and communities across the State.

Engagement with businesses and key industry stakeholders to build this strategy highlighted that many smaller manufacturers have limited digital literacy or understanding of digital technologies in the workplace. This reflects low 'absorptive capacity' – the ability to acquire, assimilate, transform, and exploit knowledge to create competitive advantage. This is a critical managerial responsibility and depends on capable people with the ability to translate knowledge and ideas into workable solutions.

The South Australian Government is mapping future workforce needs both in emerging sectors such as hydrogen and defence, as well as in the regions, to ensure that industry, government, and the education and training sector have a clear understanding of the requirements for developing industries and attracting investment as well as opportunities for local people, communities, and First Nations people.

STRATEGIC PRIORITY	KEY ACTIONS FOR GOVERNMENT
5. Workforce **Attract, retain, and develop a highly skilled manufacturing workforce that is productive, creative, diverse and ambitious to support sustainable employment and the development of future industries.**	**Technical Colleges** – $208.8 million for five new Technical Colleges to support years 10 to 12 students to complete their SACE while undertaking vocational education and training, including advanced manufacturing at Findon Technical College. **Skills and Training** – significant investment in training aligned to the skills needs of manufacturing. The development of a long-term Skills Plan will build on the VET system strengths to deliver a highly skilled workforce that is adaptable and responsive to current and emerging economic opportunities, including those in advanced manufacturing. **Defence Industry Workforce** – joint South Australian and Commonwealth Taskforce with key stakeholders to focus on building a highly skilled and diverse defence industry workforce. **Regional Workforce Strategies** – enabling regions and their businesses to attract, develop and retain the skilled workers they need to grow and prosper. **Hydrogen Workforce Roadmap** – to identify and prioritise strategies that will help the state's emerging hydrogen industry to grow. **Skilled Migration** – delivery of skilled and business migration programs to help business and industry access a skilled workforce. **Population Strategy** – working to attract young talent from interstate and support the retention of local talent for South Australia.

Findon Technical College

Building better connections between education and industry

The South Australian Government is establishing five technical colleges across metropolitan and regional South Australia, equipping senior high school students with the skills, qualifications and industry connections required to embark on their chosen career path.

The first of these technical colleges, Findon Technical College, is already welcoming enrolment applications for 2024. Students can focus their studies in one of three industry specialisations, Advanced Manufacturing and Engineering, Early Childhood and Education, or Health and Social Support.

Technical colleges offer an alternative model of learning to better suit hands-on and career-minded students. At Findon Technical College, students complete foundation-level VET qualifications, undertake industry placements, and develop technical skills within state-of-the-art facilities and equipment—all while achieving their SACE.

Skills taught within the Advanced Manufacturing and Engineering Industry Training Program include welding, computer-aided design and drafting (CADD), robotics and automation.

Upon graduation, these students are well-placed to find careers with the technical college's employer partners. If inclined, they may also choose to pursue an apprenticeship (having completed their first year while at school), further VET training, or direct entry into a relevant university degree.

The Government's investment in technical colleges will enable better connections between South Australian schools, tertiary education providers and employers, helping to meet the skilled workforce requirements of the state's major defence, infrastructure and high-demand sectors.

6. Circular Economy

A circular economy is an alternative to the wasteful traditional 'linear' economy based on 'take, make, use and dispose'. It is a self-sustaining system driven by renewable energy and an imperative to keep material resources in use, or 'circulating' for as long as possible. Transitioning to a circular economy in South Australia provides economic, social and environmental benefits. Compared to a 'business as usual' scenario, a more circular economy improves competitiveness and delivers significant job creation, greenhouse gas reductions, economic returns from reduced waste, and improved security from local supply chains.

The adoption of circular design and remanufacturing principles across all sectors are part of the suite of enterprise and management capabilities necessary to ensure that South Australia capitalises on the economic and environmental benefits of reducing waste and keeping materials in use for longer.

The Government is driving the transition to a net-zero carbon economy with the introduction of a Sustainable Procurement Policy across infrastructure and transport. In addition to requesting low emission or carbon neutral goods and services, from mid-2024, all contractors bidding on work over $50 million will be required to have organisational emission reduction targets that address emissions from their own fuel and electricity use as well as in their supply chain. A collaborative research project is being undertaken to examine best practice and policy options for the development of a whole of government sustainable public procurement policy.

Our imperative is to support economic growth and drive positive environmental outcomes. There is an urgency to be smarter with our resources, to 'close the loop' by keeping materials in use for as long as possible, and to create a circular economy culture. By 2050, this would mean for South Australia an extra $3.5 billion to the economy, 26,000 new jobs, and 45% lower carbon emissions from the embodied carbon in the products and services we use.

STRATEGIC PRIORITY	KEY ACTIONS FOR GOVERNMENT
6. Circular Economy **Increase competitiveness, innovation, economic profitability, and environmental benefits from the adoption of circular economy principles of reducing waste, keeping materials in use longer and regenerating natural systems.**	**Circular Economy and Sustainability** – funding and resources to help implement circular and sustainable business practices, including boosting South Australia's resource recovery sector, developing circular economy markets, and supporting business and industry adopt resource efficiency, net zero, and other sustainability initiatives to help increase productivity, profit, and market share. **Sustainable Procurement Policy** – achieving circularity and net zero emissions through government procurement of climate-smart and circular economy smart goods and services across infrastructure and transport, as well as increased opportunities for local manufacturers through coordination between OIA, Procurement Services SA, and ICNSA. **SA ZERO** – Industry Cluster with membership from key South Australian businesses to support the State's transition to net-zero. This includes companies that are large emitters that can support decarbonisation and circular economy strategies, and State Government agencies.

Detmold Group

Striving for sustainability

Established in 1948, Detmold Group's products and services have evolved over the decades to meet the changing demands of its global customer base.

This family-owned South Australian business is a leading manufacturer of paper and board-based packaging products through its brands Detpak, Paperpak, Cup and Carry and Detmold Medical. Its consistent growth can be attributed to significant and ongoing R&D investment, including in the establishment of 'LaunchPad', a dedicated centre for concept creation and rapid prototyping.

Recent global market challenges have proved advantageous for Detmold, a result of the company's foresight and agility.

At the outset of the COVID-19 pandemic, Detmold Medical was established to produce face masks and other PPE of the highest quality for health and care settings, in addition to retail trade. Three years on, masks are still mandatory for many workers, and Detmold Medical has established its brand as the trusted choice for healthcare settings throughout South Australia and beyond.

Additionally, the Detmold Group has enabled its customers to be proactive in the transition to more sustainable packaging practices, recently partnering with Woolworths to introduce the environmentally friendly paper bag. The business has also set ambitious sustainability targets for its own operations, including goals to reach the following by 2025:

- 100 per cent of products in compliance with Sustainable Packaging Guidelines
- 95 per cent of waste diverted from landfill across all production facilities
- Less than 1MJ of energy per kilogram of product
- 80 per cent of fibre to be forestry-certified or contains recycled content, with no controversial sourced fibre
- Three facilities using renewable energy.

Key South Australian government agencies

Defence SA
defencesa.com

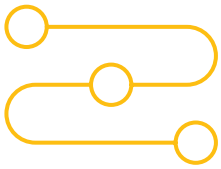
Defence SA is South Australia's lead government agency for all defence matters. It is a single point of contact for all defence stakeholders, streamlining their interaction across the South Australian Government and capturing valuable investment opportunities in the shipbuilding, cyber and systems, defence science and research and space domains.

Department for Education
education.sa.gov.au

The Department for Education provides integrated, high-quality services to South Australian children and young people across early childhood, education, and training. The Department is establishing five technical colleges across South Australia, the first of those, Findon Technical College, opening in 2024 with a focus on advanced manufacturing.

Department for Energy and Mining
energymining.sa.gov.au

The Department for Energy and Mining oversees the responsible mining and production of minerals, metals, and fuels, to generate energy and low-carbon products of the future safely and sustainably. The Department encourages constant innovation in renewable energy solutions, robotics, and advanced manufacturing to decarbonise industry and transform the community.



Department for Environment and Water
environment.sa.gov.au

The Department for Environment and Water aims to help South Australians conserve, sustain, and prosper. Its work is critical to South Australia's future social, environmental, and economic prosperity. The way we manage, conserve, and sustain our environment and cultural resources is vital for the wellbeing of all South Australians.

Department for Industry, Innovation and Science
industry.sa.gov.au

The Department for Industry, Innovation and Science supports sustainable economic growth by assisting South Australian industries and businesses to succeed in a local and global environment. The Department is responsible for growing creative, innovative, and productive industries and businesses, improving the state's industrial capability and capacity, developing a high performing research and innovation system, and supporting industry to get the skilled workforce it needs.

Department of the Premier and Cabinet
dpc.sa.gov.au

The Department of the Premier and Cabinet delivers specialist policy advice to the Premier and ministers and supports the Cabinet process. The Department leads the implementation of South Australia's strategic priorities and policy commitments in the areas of economic and social development, international relationships and strengthening engagement between government and the community. The Department is leading the development of the SA Innovation Ecosystem framework.

Department of Primary Industries and Regions
pir.sa.gov.au

The Department of Primary Industries and Regions aims to advance the prosperity and sustainability of South Australia's primary industries and the liveability of regional communities. The Department's mission is to stimulate the value growth of South Australia's primary industries agriculture, food, wine, and forestry, while protecting and sustaining the resources that underpin them.

Department for Trade and Investment
dti.sa.gov.au

The Department for Trade and Investment is responsible for driving business investment in the state across all industries, and for facilitating trade in all goods and services both interstate and internationally. The Department has investment specialists working across key sectors including minerals and energy, food, wine, and agribusiness, hi-tech, medical, space and defence.

Department of Treasury and Finance
treasury.sa.gov.au

The Department of Treasury and Finance has the role of ensuring accountability for public sector resources through providing policy, economic and financial advice to the government and coordinating resource allocations for government programs and priorities at the whole of government level.

Green Industries SA
greenindustries.sa.gov.au

Green Industries SA is an enabler and driver of change, supporting development of the circular economy through diverse collaborations and partnerships which improve productivity, resilience, resource efficiency and the environment, including helping businesses to implement sustainable resource efficiency measures and increase productivity.

Infrastructure SA
infrastructure.sa.gov.au

Infrastructure SA provides independent advice to government to enable informed and evidence-based decisions on infrastructure planning, investment, delivery and optimisation. The role is to ensure better planning and more transparent decision-making for critical public infrastructure projects for the State.

Office of Hydrogen Power SA
ohpsa.sa.gov.au

The Office of Hydrogen Power SA oversees the design and delivery of the South Australian Government's Hydrogen Jobs Plan, including the early procurement, contracting and construction stages of the hydrogen production, hydrogen power plant and hydrogen storage facilities, which will be established in the Whyalla region. The Office is also facilitating the development of the Port Bonython Hydrogen Hub, as has a dedicated hydrogen industry development team which is focused on accelerating South Australia's emerging hydrogen economy.

Office of the Industry Advocate
industryadvocate.sa.gov.au

The Office of the Industry Advocate supports the Industry Advocate meet the objectives in the Industry Advocate Act 2017 and the SA Industry Participation Policy.

Skills SA
skills.sa.gov.au

Skills SA works in partnership with learners, businesses, peak and representative groups and the community to increase skill levels so that more people have job and career opportunities, enable a quality, accessible and relevant training eco-system, respond to current and emerging skills needs, deliver timely services and supports for customers, clients and partners, and promote VET pathways and make it easier to navigate the options available through VET.

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Roy is Emeritus Professor and Special Innovation Advisor at the University of Technology Sydney, where he was previously Dean of the UTS Business School. He is a graduate of the University of Adelaide and has a PhD in economics from the University of Cambridge. He has published widely in the areas of innovation and industrial policy, including projects with the OECD and European Commission, and led a number of government inquiries. Currently Roy chairs the Advanced Robotics for Manufacturing Hub, FIAL (Food Innovation) Industry Growth Centre and the Port of Newcastle, and he is a board director of the SmartSat CRC and a member of the Australian Design Council and NSW Modern Manufacturing Taskforce.

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