

SOUTH AUSTRALIA'S SPACE SECTOR STRATEGY

EXECUTIVE SUMMARY



Government of
South Australia



SOUTH AUSTRALIAN
SPACE INDUSTRY
CENTRE



The South Australian Space Industry Centre drives space industry innovation, research and entrepreneurial development in South Australia, with a vision to create a thriving and enduring space ecosystem.

Home to the Australian Space Agency, Australian Space Discovery Centre, world-class Mission Control Centre, the nation's first two launch facility licences, over 100 space-related companies, Australia's first state satellite and a future space manufacturing hub - South Australia is at the forefront of Australia's space endeavours.

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The Space Sector Strategy is aimed at ensuring our state's space industry journey continues its upward trajectory.

Key Pillars for Growth

Three pillars for growth will shape efforts to build a thriving and enduring South Australian space sector. These efforts will be realised through key actions developed in partnership with industry.

Vision for Growth

A thriving and enduring South Australian space ecosystem, supporting Australia's national space strategy, building on the opportunities of NewSpace.

Mission

To grow a thriving and enduring South Australian space sector, in partnership with industry.

Contribute

to Australia's national space strategy

Capitalise

on the opportunities presented by NewSpace

Cultivate

South Australia as a centre-of-gravity for space activities

1
Launch into accessible lower Earth orbits

1
Many, small, connected satellites

1
Build an expanding workforce

2
Create an innovation ecosystem

2
Support positive norms for space actors

2
Utilise machine learning and AI to exploit space derived data

3
Establish supportive infrastructure

4
Be globally competitive

3
Moon to Mars - food production in space

5
Attract investment

South Australia's space sector at a glance

With its vibrant space ecosystem, South Australia is playing a crucial role in supporting the Australian Space Agency's goal to triple the space sector's contribution to GDP to AUD\$12 billion per year and create an additional 20,000 jobs by 2030.

Today, the capabilities of South Australia's space sector span small satellite design and manufacture, including components and sensors; launch operations; mission control and ground stations; connectivity and bespoke applications; and data analysis and processing.

The Space Sector Strategy is not just a technology roadmap; it will drive future effort and investment in the sector. It also ensures the South Australian Government is enabling local industry to develop and mature. This partnership between industry and government is a critical ingredient of South Australia's future space industry.

With national and international organisations acknowledging South Australia as a major hub for NewSpace activity, we will build on this success and become an exemplar for the NewSpace ecosystem.

South Australia's competitive advantages and opportunities lie in several key areas.

INFRASTRUCTURE AND INNOVATION PRECINCTS

+ **Lot Fourteen** brings together leading abilities in space, defence, Hi-Tech and creative industries. It hosts the Defence and Space Landing Pad, and is home to the Australian Space Agency, SmartSat Cooperative Research Centre (CRC), personnel from the Australian Defence Force Wide Area and Space Surveillance Systems Program Office, the Andy Thomas Space Foundation, and Adelaide University's Australian Institute for Machine Learning.

Opened at Lot Fourteen in March 2021, the **Mission Control Centre** delivers next-generation mission control capabilities, concurrent design, pre-flight testing, launch support, and flight operations

The **Australian Space Discovery Centre**—also opened on site in March 2021—is a public place to inspire, educate

and engage those who aspire to a career in space.

+ **Technology Park** is a thriving business hub with a portfolio of technology, defence and training businesses, nearby the Australian Institute of Telecommunications Research and the International Space University's Southern Hemisphere Space Studies Program, run in partnership with the University of South Australia.

+ **Tonsley Innovation District** brings together leading-edge research and education institutions, businesses and start-ups, business incubators and accelerators, and government.

+ South Australia will be home to Australia's first dedicated space manufacturing hub, Australian Space Park, focussing on collaboration and production of satellites and their payloads boosting the nation's space capability and capacity.

BUSINESS CLIMATE AND INVESTMENT

South Australia's progressive space sector is attracting market-leading venture capital firms and start-up funds.

With the global space economy's upward growth now being led by the private sector, increased visibility of the space market will unlock new clients for South Australian SMEs and start-ups and activate investment in their unique capabilities.

More than 100 research and educational institutions, government departments and private companies—from multinationals to local SMEs and start-ups—are based in South Australia. The NewSpace start-ups of today will become our future leading businesses.

INDUSTRY AND GOVERNMENT AS PARTNERS

The **South Australian Space Industry Centre (SASIC)** provides a whole-of-state government focal point for local industry and international organisations. With staff derived from Defence SA, Department for Trade and Investment, and Department for Innovation and Skills, SASIC coordinates industry and workforce development initiatives, events, scholarships, and an innovation fund.

The **South Australian Space Council** supports the growth and development of the space industry in South Australia and encourages innovation in the sector. The council has representation from space research organisations, universities, private enterprise, defence, government, and space specialists.

The **Space Industry Association of Australia (SIAA)** has a lead role in advising government on behalf of the space industry.

RESEARCH, DEVELOPMENT AND INNOVATION

A vibrant research and education capability in South Australia supports the growing space industry, including three universities ranked within the top 2% of the world, two international universities and world-renowned national research centres—all of which actively contribute to the state's innovation ecosystem.

The Adelaide-based **SmartSat CRC** is a \$245 million research effort focused on growing the nation's space capabilities, supported by the Australian Government.

NEWSPACE AND DISRUPTION

The NewSpace sector is growing rapidly and underpins the potential for Australia's space sector growth. NewSpace is characterised by commercial opportunities, access to venture capital and disruption.

As a complement to a national space strategy seeking aspirational growth, South Australia's priorities are selective to maximise the opportunities presented by disruption and NewSpace.

WORLD-CLASS EVENTS

One of the strategic objectives of South Australia's inaugural 2016 *Space Innovation and Growth Strategy Action Plan* included hosting the prestigious International Astronautical Congress (IAC) in Adelaide in 2017. This event put Australia on the world space stage.

The Adelaide-based biannual Australian Space Forum has grown remarkably, from just 50 attendees at the first forum in 2016 to more than 1,000 registrations for the February 2020 event including dignitaries like the Prime Minister of Australia.

DEFENCE CAPABILITY

South Australia will work closely with other jurisdictions and space stakeholders to deliver on Defence's security challenges, enhance resilience, and provide sovereign capability for the future.

South Australia will work to maximise local value and final impact of the Australian Defence Force investment of approximately \$17 billion for space capabilities leading up to 2035.

Contribute to Australia's Space Strategy

South Australia's first pillar for growth is to contribute to a whole-of-government national strategy for space security and industry growth.

The South Australian space sector currently represents:

Direct value-add to economy of **\$166m**

Workforce of **1,584 FTE**

Average wage of **\$98k**

\$140m 2020 baseline revenue

64% annual growth rate in NewSpace sector since 2016

Sector growth rate of **6.2%** from 2017-2021

Annual average growth rate target of **5.8% to 2030**, equating to **\$250m** in revenue

LAUNCH TO ACCESSIBLE LOWER EARTH ORBITS

South Australia's geography is well suited to ground-based infrastructure, including launch sites, ground stations and mission control centres, needed to support the large constellations of satellites to be launched in the next decade.

However, the space environment provides extreme challenges for deployed systems, meaning civil and government purchasers and investors must consider the space flight heritage for new products. Securing funding to achieve flight heritage is also a challenge for small companies.

Goal

Enable industry to develop space qualified, or 'flight heritage' products.

SUPPORTING POSITIVE NORMS FOR SPACE ACTORS

"The rules, norms and institutions that help maintain peace and security and guide global cooperation are under strain. Pressures on governance in the global commons, and in domains such as space and cyberspace, will open up potential sources of friction.¹"

Goal

Support the establishment and enforcement of rules that enable industry growth through responsible access to space.

MOON TO MARS - FOOD PRODUCTION IN SPACE

Venture capitalists and space agencies with aspirations to explore the solar system are looking at the biotechnology needed to sustain humans in space for extended durations.

The Australian Space Agency's 'Moon to Mars' initiative is seeking a trailblazer project to contribute flagship Australian space capability within an international space exploration program.

At a state level, the University of Adelaide is mapping expertise that could contribute to a space farming and food production capability, and the Adelaide Botanic Gardens have committed research and development expertise. Spinoffs and applications of innovations for space farming and food production will benefit producers and consumers on Earth, as more tolerant crops and improved food production techniques will be needed to mitigate the impacts of environmental degradation and climate change.

Goal

Leverage South Australia's expertise in food production for extreme environments to support international human spaceflight missions.

¹ 2020 Defence Strategic Update: https://www.defence.gov.au/StrategicUpdate2020/docs/2020_Defence_Strategic_Update.pdf

SITAEI is a global leader in the development of next-generation small satellites and satellite electric propulsion technologies. Image: Sitael Australia.

Capitalise on NewSpace

South Australia's second pillar for growth is to capitalise on the phenomenal opportunities presented by NewSpace.

DEVELOP MANY, SMALL, CONNECTED SATELLITES

Small satellites describe a broad class of satellites that can be loosely defined as having a mass less than 500kg. Their development has been enabled through technological advances in production of semiconductors, electronics, batteries, propulsion, antennas and communications, as well as cheaper launch services.

Constellations of thousands of satellites in low Earth orbits have already been approved globally, with more emerging.

UTILISE MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE TO EXPLOIT SPACE DERIVED DATA

Space-enabled services cater for existing business through timely and cost-effective data on crops, mining, water flow, bushfire detection and tracking, or the effects of a global pandemic, among others. These services also create opportunities for new business as the costs of obtaining detailed, persistent surveillance drops.

The Australian Institute for Machine Learning (AIML) department for Machine Learning for Space is using a \$20 million investment to develop next generation space technologies. But with so much data arriving through space services, new concepts are needed to unearth niche opportunities from data sources.

SASAT1 Space Services Mission: launching our vision

The South Australian Government, in partnership with the SmartSat CRC and local companies Inovor Technologies and Myriota, will send Kanyini, a locally manufactured small satellite to low Earth orbit—the first State Government to ever embark on such a mission.

The information gathered by the satellite will help improve state services like emergency services, the environment, water quality monitoring, mining and bushfire mitigation.

Boosting South Australia's space economy, the \$6.5 million space mission will strengthen the competitiveness of South Australian businesses in the small-satellite supply chain and pave the way for external investment and future growth in Australia and abroad.

Goal

Support the development of many, small, connected satellites with disruptive approaches to design and technology.

Goal

Boost the productivity of the South Australian economy through accurate, timely and easily accessible space-derived data.

Cultivate South Australia as a Centre-of-Gravity for Space Activities

South Australia's third pillar for growth is to cultivate the state as a centre-of-gravity for Australia's expanding space activities.

BUILD AN EXPANDING SPACE WORKFORCE

This is essential for innovation, business creation and growth. South Australia's space industry is vibrant, but the civil sector is dominated by start-up companies which presents the challenge of achieving scale-up and critical mass. Current education in the sector is also university-based only; the state must expand this offering to include vocational training.

CREATE AN INNOVATION ECOSYSTEM

The South Australian Government has a strong, multi-million dollar funding framework. However, the emergence and growth of start-ups and SMEs requires capital investment as well as tailored education catering for both business and space domain issues.

ESTABLISH SUPPORTIVE INFRASTRUCTURE

While South Australia is home to world-class precincts supporting collaboration and innovation, the development of critical infrastructure for space products requires high-cost bespoke equipment that is often out of reach for small companies.

Complicating this, space services are not yet considered critical infrastructure in federal government policy. A state task force (typically only enacted for larger capital projects) is coordinating approvals necessary for critical space infrastructure in South Australia.

BE GLOBALLY COMPETITIVE

South Australian companies like Fleet and Myriota are already operating in national and international markets, with other companies generating strong international interest in their products and services.

However, supporting South Australian companies to increase their technical readiness for international supply chains and develop international networks can also be a challenge and will take focused effort.

ATTRACT INVESTMENT

South Australia continues to attract emerging space companies and international players who are establishing key operations in the state. But given limited funding in the Australian market to entice NewSpace inbound investment, South Australia must leverage existing competitive points of difference as well as existing programs.

Goal

Develop a comprehensive space education program that leads to an interdisciplinary space workforce that supports the exchange of professionals between industry and/or academia.

Goal

Generate a steady pipeline of start-up and scale-up space related companies with strong investment potential in South Australia.

Goal

The South Australian space sector has access to the infrastructure needed to promote the space industry, demonstrate investment potential, and unlock business opportunities.

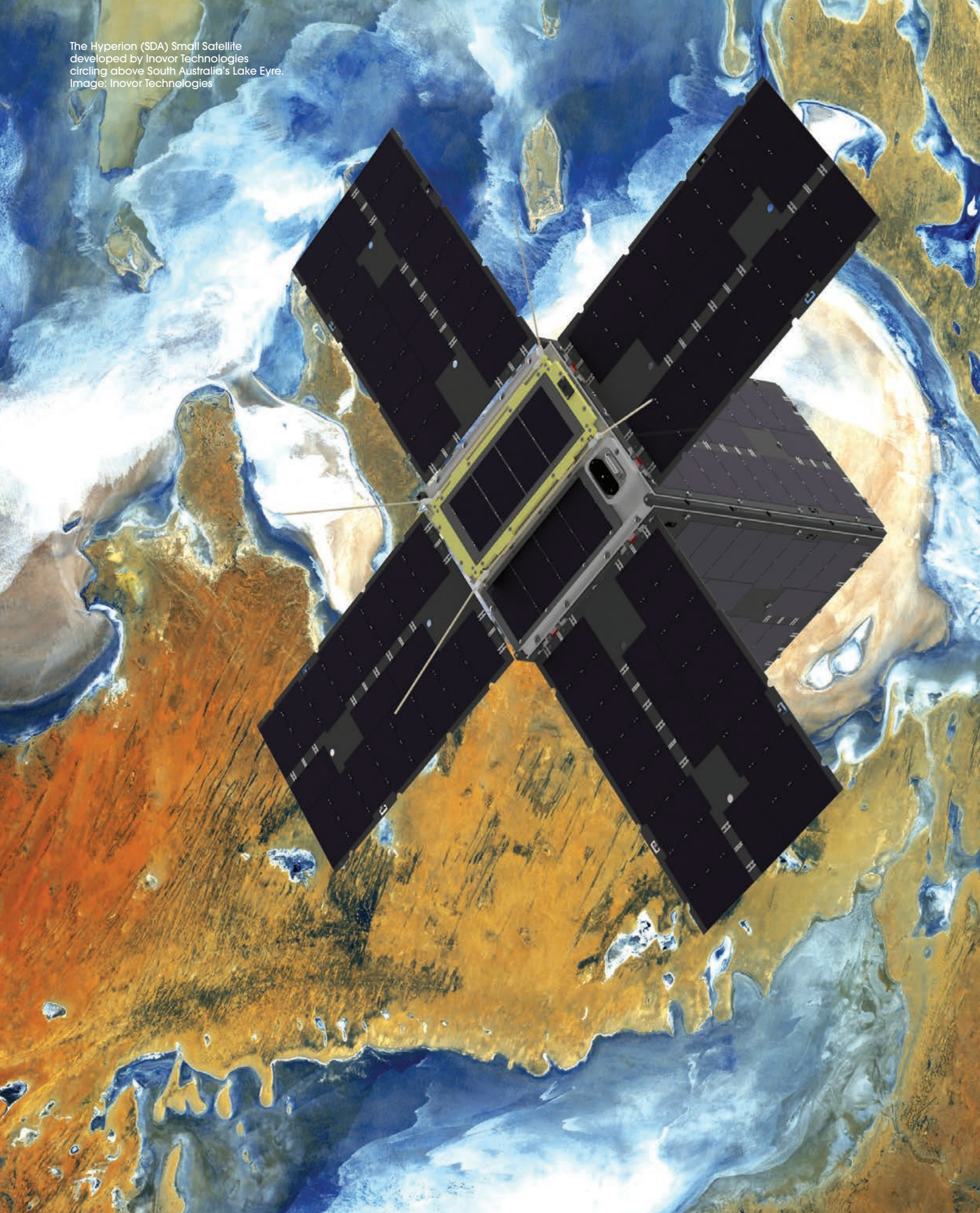
Goal

Create a globally competitive South Australian space industry that is exporting products and services directly and through international partnerships.

Goal

Significantly increase the level of external investment in the South Australian space sector.

The Hyperion (SDA) Small Satellite developed by Inovor Technologies circling above South Australia's Lake Eyre. Image: Inovor Technologies



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