



Science & Technology AUSTRALIA

**Submission:
Review of Space Industry
Capability**

24 August 2017

Dear Dr Megan Clark AC and members of the Expert Reference Group,

Thank you for the opportunity to submit this response on behalf of Science & Technology Australia's 68,000+ members.

The opportunities afforded Australia in expanding our space industry are vast, and we are proud to be a part of this important conversation.

We hope that the opportunities afforded this nation through the expansion of our space industry are recognised across the STEM sector and beyond, and STA would welcome the opportunity to help shape the way it is supported.

We wish the Expert Reference Group all the best as they shape a long-term plan for this sector, and invite them to reach out to STA if we can provide any additional assistance during this process.

We eagerly anticipate a strong and ambitious direction for the Australian space industry following this review, and will work hard to ensure its success as stakeholders in the science and technology sectors in Australia.

Yours sincerely,



Jim Piper
President, Science & Technology
Australia



Kylie Walker
CEO, Science & Technology
Australia

Background

This review comes at a critical juncture for Australia with rapidly declining costs for entry to space, as well as dramatically improving capability of the small-scale 'cubesats' that can be launched. The opportunity to take full advantage of this technology, and to meet the needs of our increasing reliance on space has never been greater.

It is the view of Science & Technology Australia, representing more than 68,000 STEM professionals, that the opportunities for this nation in the commercialisation of space are considerable. The sector as a whole represents \$3-4 billion annually, a figure that has grown at a yearly average of 9.5% over nearly two decades to 2015. This indicates it could be a significant and continued economic driver for the nation as a whole.

More specifically, the nature of space commercialisation involves advanced manufacturing that can harness and further stimulate the transition to an Industry 4.0 economy. Advanced Australian industries are strong, but without a space-sector focus to continue to drive innovation, they will only have a temporary comparable advantage over other nations. A focus on space has seen growth in manufacturing, and indeed development of entirely new industries, in nations of comparable industrial sophistication to Australia. An successful example that Australia could easily emulate is the United Kingdom, which developed the UK Space Agency, which has nurtured a sector now returning over £9 billion to their economy annually.

Australia has a large and sparsely populated landmass requiring high cadence monitoring of moisture levels for farming, heatmaps for bushfire season as well as monitoring of areas for resource extraction through near-real-time evaluation of dispersed infrastructure. In other words, Australia represents a classic use-case for numerous, high resolution and multi-wavelength cubesats. We cannot rely on other nation's facilities to deliver on these needs – to best realise the opportunities for our specific situation we need to optimise our space sector in a coordinated manner.

We currently purchase required space imagery / data from other nations, which was a reasonable approach when that information played only a minor role in our national security and economic well-being. However with our growing reliance on this data, securing access to these facilities for the future should be considered a priority, as there is risk in reliance on others providing this information so vital to nationally significant work.

Response to Specific Matters in the Review

Australia is sophisticated, high-tech economy, with several world-class large industries and significant numbers of supporting businesses. The capability of our relevant university and government laboratories is world class and ideally placed to contribute to an Australian space industry.

The rapidly evolving nature of space technologies would play strongly to Australia's smaller-scale industries, with demand for specific solutions driven by the larger businesses. Our significant adoption of Industry 4.0 and 3D printing solutions would ensure that we could quickly and, for a time, uniquely build upon our advanced manufacturing base. This technological lead will erode without coordinated, and continual, focus by a national space agency on driving through industrial ready solutions.

Australia has one of the most advanced astrophysical capabilities in the world, resulting in significant capability to create, optimise and utilise multiwavelength imagery both from the ground as well as space. These skillsets and partnerships with industry have been developed over decades and represent a unique upstream capability that a space agency would foster and further enhance the existing industrial collaborations.

Currently, this globally recognised expertise is fragmented across university, national observatories and international projects making it challenging to bring together a critical mass of experience to spin-off existing solutions into new satellite-technologies.

Downstream, resource extraction, large-scale agriculture, fisheries and more represent highly valuable economic sectors that currently rely on space monitoring and could be greatly enhanced with focussed space-development.

One of the big challenges the space industry would face, as a smaller industry, is not having that single point of contact to bring everything together. STA believes that coordination across the sector must be made a priority, and would support this as a way the Review can make a meaningful impact to enable a long-term, national approach.

Australia also has strong capability in physics, materials science and engineering that is critical to a space industry, and the opportunity to utilise this to a greater extent is exciting for the sector.

It is also important to look to other international partners when considering issues of governance and structure. Globally, there are six main space agencies:

- **CNSA**, the Chinese National Space Agency
- **ESA**, the European Space Agency, a consortium of national space agencies of several European countries
- **ISRO**, the Indian Space Research Organization
- **JAXA**, the Japanese space agency
- **NASA**, the American space agency
- **Roscosmos**, the Russian space agency

It is expected that an Australian Space agency would have a different mix of roles compared to these agencies.

Setting up a standalone space agency would have an impact on the wide research budget. As such, the Australian environment may be best suited to a distributed model with one existing national agency such as CSIRO, ANSTO, or DST Group being the host. It may be beneficial for this agency to then have distributed nodes across the country to bring together relevant capability and coordination from stakeholders in academia, industry and government.

Alignment with the defence industry strategy and the Australian Government Western Sydney Airport aerospace planning would also be beneficial during this process.

Standalone entities in Australia have not had good track records of endurance and achieving critical mass to be sustainable, as we have seen with the Synchrotron and ANSTO, and other similar examples in the STEM sector.

As such, it is STA's belief that a distributed model with a focus on collaboration and effective coordination would suit a growing Australian space industry best.