



## **Advice to the Australian Government**

The Space Industry Innovation Council was established to recognise the importance of the Space sector to Australia. The Council developed the following advice during 2010 to the Australian Government.

### **The Space Policy Unit and the Australian Space Research Program (ASRP)**

There is no question at all that the Australian Government's renewed interest in space activities has been very well received in Australia and internationally. The Space Policy Unit is already making its mark and is rapidly establishing itself as an authoritative contact and coordination point on space matters for the Commonwealth. This coordination is helping to identify commercial opportunities within the industry and for space products and services that support other industries. Importantly, a sound relationship seems to have been developed with the national security community which remains a key actor in Australia's space engagement; the Council is very conscious of the benefits of leveraging both civil and defence resources for achieving the desired outcomes.

The first round of the ASRP has produced four creditable projects and the Council looks forward to the selection of equally meritorious winners in subsequent funding rounds. Finally, against the context of the recently released US space policy which calls for nations friendly to the US, including Australia, to collaborate and co-invest in new space capabilities and the December 2009 announcement that the UK will establish a space agency; development of an Australian space policy is timely and has the potential to deliver considerable national benefit. We are particularly encouraged by the new US policy's commitment to strengthened inter-agency partnerships, as the Council has judged that an aligned whole-of-Government approach to space capability and services in Australia will be essential if the space sector here is to realise its potential to the local economy.

The Council notes that the funding for both the SPU and the ASRP is time limited. Given Australia's profound and growing dependence on space-based services, and the modest but real space industry development opportunities which have been identified since the Council was established, assured, long term funding for both activities is essential.

### **Finding 1**

The money invested in creating the Space Policy Unit in the Department of Innovation, Industry, Science and Research and the Australian Space Research Program is timely and delivering good results now, showing potential for sustainable expansion in the future.

#### **Recommendation 1.1**

**That the Space Policy Unit be established as a permanent element of the Department of Innovation, Industry, Science and Research.**

### **Recommendation 2.1**

**That the Australian Space Research Program be converted into an ongoing funded space capability development program.**

#### **Australia's Dependency on Space Infrastructure and Services**

Nations and people across the world are increasingly reliant on services delivered from space - telecommunications, precision timing and navigation through systems such as the US Global Positioning System (GPS), and remote sensing/earth observation - through a plethora of government and privately owned satellites.

Assured and secure access is assumed and taken for granted. Unfortunately, the space environment itself, although seemingly vast, is crowded, especially in the low earth orbits (out to 1000km). Orbital slots and the frequencies associated with them, including for earth stations, are limited resources which are essential for Australia's access to space for remote sensing and telecommunications. Australia's engagement with the international organisations which manage these resources must be carried out with the primary aim of assuring Australia's access to space and with reference to a national space policy. Furthermore, indiscriminate and ill-planned human activities in space can lead to collisions and the creation of fields of debris, which unless carefully monitored and managed may result in some orbits being unusable by humans perhaps for hundreds of years.

There is poor appreciation within government about Australia's dependencies on space, about the fragility of the space environment and about the associated vulnerabilities for national security, for operational agencies such as the Bureau of Meteorology which support disaster risk reduction and climate monitoring, and for the economy more broadly. This creates risks around both policy making and delivery of essential space services. Yet Australia is exceptionally well-placed geographically to contribute to systems which better monitor the natural and human space environment. These systems would fill important coverage gaps in the US global Space Situational Awareness (SSA) system and would also provide opportunities to develop existing research strengths in radioastronomy and ionospheric physics (from which is derived the Jindalee Over-the-Horizon Radar system) to the benefit of local industry and also the international community.

### **Finding 2**

Australia needs to play a more substantive role internationally insofar as space-based services are concerned, in order to enhance the security of data supply of which our country depends. This should occur through innovation, through appropriate investment in space-based capability, and via whole-of-government attention to dependence risks and to spectral access. Such actions will have the further benefit of showcasing Australia as a meaningful contributor rather than simply a passive beneficiary of international data exchange.

### **Recommendation 2.1**

**That the issue of Australia's dependence on space-based infrastructure and services be referred to the Attorney-General, as the Minister responsible for critical infrastructure protection coordination, for assessment of measures necessary to**

**assure Government that the critical dependencies are both understood and risk managed.**

#### **Recommendation 2.2**

**That Australia move to strengthen its relationships with the international space community in order to both build own resilience towards the security of data supply, and demonstrate a responsible and reliable approach to the space-based services in which Australia participates on behalf of others.**

### **Finding 3**

The Council is not confident that the Australian Government, as a whole has sufficient understanding of our country's critical dependence on space-based services and on the importance of taking active measures to understand and protect the space environment. With some notable exceptions, this comment applied to the media, to industry and to the wider community as well.

#### **Recommendation 3.1**

**That Government take deliberate steps to identify the relevant cadre of staff members across public agencies which use or have policy impact on space capability, including at senior levels, and ensure that their skill sets and understanding of space matters are maintained and enhanced.**

### **Building Space Industry Capacity and Capability**

A useful way to characterise the space industry is to divide it into two elements - the 'upstream' which is about the design, manufacture, launch and operation of satellites, and the 'downstream' which is about the development and use of applications, products and services which satellites enable. International experience suggests that for every dollar spent on upstream activities, six dollars are generated in downstream activities.

With the notable exception of Optus in the satellite communications field, Australian companies have almost no involvement in upstream activities. Like most other nations, Australia treats the GPS system as a free good and makes downstream use of it in myriad applications. In remote sensing, until recently, Australia has been content to obtain data under international agreements or through commercial contracts and to value-add downstream. The 2009 Defence White Paper however placed high priority on improving ISR through acquisition of a synthetic aperture radar (SAR) satellite, and Council understands the Department of Defence is planning such an acquisition for late in this current decade.

Reliable data on the value of all elements of the current Australian space industry do not exist. One recent well-informed estimate places the all-sector Australian space workforce at 5,000 people<sup>1</sup> and the overall industry revenue was judged to have been around \$1.37 billion annually in 2006-07<sup>2</sup>. These measures, however, do not capture the critical nature of the space

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<sup>1</sup> *Australia's Place in Space: Towards a National Space Policy*, B. Biddington and R. Sach, Kokoda Foundation, June 2010, p78

<sup>2</sup> *The Value of Spatial Information*, ACIL-Tasman, March 2008

sector which permits or enables the work of many millions of others. What is clear is that the industry is fragmented with all segments struggling to develop and sustain critical mass.

The Council has identified three areas ripe for investment and industry development. The first is to request that the NBN satellite ground segment have robust Australian industry participation. The second is a program to augment the integrity and therefore the utility of the GPS signal across the nation, via an SBAS payload on a communications satellite (eg. as an adjunct to the NBN procurement, or on the approaching Optus satellite procurement). Mining, agriculture, all forms of transport and the utilities sectors would all derive substantial benefit from such an investment, and very valuable space sector experience and capability will also be gained. The third is preparatory work that is essential if Australia, as foreshadowed in the 2009 Defence White Paper, is to become more self-reliant in earth observation with a capacity to contribute to the imagery repositories of friendly nations, notably the United States.

#### **Finding 4**

Space industry development opportunities exist in Australia, mostly in the ground segment of satellite systems, in sensor payloads, and in downstream applications. These opportunities build on existing industry capability and experience and stand to benefit all areas of the national economy. Preparatory studies and associated upstream work need to be started in order for Australia to be able to acquire and bring into service a SAR earth observation satellite in the 2020 timeframe. The security and value of dual-use (defence + civil) SAR technology has already been demonstrated internationally, and the Council advises that Australia urgently investigate the benefits/issues surrounding dual-use or multi-use operation for this sovereign acquisition.

##### **Recommendation 4.1**

**That the opportunity for robust Australian industry participation in the ground segment of the NBN satellite procurement be explored.**

##### **Recommendation 4.2**

**That the potential to include an Australian PNT augmentation payload or weather sensor be explored now in the context of major investments already contemplated by Government or industry, including procurement of the satellite communications component of the NBN as well as plans to make better use of space-based precision timing and navigation capabilities.**

##### **Recommendation 4.3**

**That a series of studies be undertaken to begin to understand the organisational, technical and other issues associated with the acquisition and successful introduction into service of an Australian owned and operated 'dual use' Synthetic Aperture Radar satellite in the 2010 timeframe.**

The Space Industry Innovation Council is committed to raising the profile of Australia's space dependency and our industry strengths and supports the development of a national space policy.