



The Epsilon Foundation
Executive Cell
B R I E F

23rd April 2008

The Secretary
Senate Standing
Parliament House
PO Box 6100
CANBERRA ACT 2600

Dear Sir,

RE: Submission to the Inquiry into the current state of Australia's space science & industry sector

Introduction

1. We are simply here to move forward, to reach for the stars and beyond. The word “impossible” does not exist in our vocabulary and as such we need to have aspirations to reach a higher goal. Space science is an important area of science that the government, and ultimately Australia, should endeavour to expand and explore. Whilst there is a *decadal plan for space science* being drafted by the academy of science it does not call for the development of a National Space Agency. Apart from Mexico we are the only country ranked in the top 25 by gross domestic product without a space program. We need to rise with the tide and follow with the international expansion of space science and therefore set a world-class standard that will take us into space and beyond. If we as humans can send people to the moon, time the landing to the precision to the fraction of a second, then what is stopping us from achieving what we really want to achieve?

2. Overall even science in Australia is poorly funded by the government. There needs to a more tangible solution, there is one in sight. The issues we face into the future are constantly changing the way we do business and the government needs to be more proactive and have self-awareness in its involvement to develop a smarter Australia to expand our technical and intellectual capabilities. This document will cover principles regarding further expansion of space science and industry in Australia and the inherit benefits of focusing in such an area of science.

3. The formation of a National Space Agency would provide such a solution. While it is a rather ambitious plan, it is more realistic than we think. Benefits include:

- national collaboration of space science projects,
- national co-ordination of space science organisation,
- effective management of economic resources,
- non reliance of other international space agencies and space infrastructure,
- expanding space science capabilities both national and international,
- expanding space industry sector,

- expansion of global telecommunication satellite networks,
- educational and employment benefits of expanding and retaining intellectual and technical capabilities,
- national security benefits in monitoring and maintaining our own space systems and,
- expanding defence force capabilities both in peace time and war.

4. We should only concentrate and dedicate our energy on the positive outcomes of the development of such an agency. Then we would have provided a tangible solution to space science and industry sector in Australia. Space has become part of our daily lives for example the efficiency of world-wide communications and meteorology. Space science is simply not just about space exploration but also using it to expand activities on a global scale. Where would we be without satellites? We should be asking ourselves what the losses of not investing in space science are?

Economic benefits

5. Already we are seen as a world leader in space technology, such as the development in hypervelocity aerodynamics. We have developed high performance wind tunnels and are able to provide tangible solutions to implement this technology. Future developments including the construction of small hypersonic vehicles, which could be used for advanced space launch and recovery. The benefits of such technological advances are that it is economical whilst providing significant long-term results.

6. Investment into space science in Australia would provide substantial to significant economic benefits to both the private sector and government level on a medium to long term basis. Projects could be designed in Australia, keeping costs to a minimum and be exported to align with international projects. Australian space industry could co-ordinate projects centrally and be contracted to provide critical technology as part of an international space effort. The development of such a centralised space agency would be set above world-class standards and will increase foreign investors wanting to do business with Australia.

7. Further, allowing the private sector to fund and run such projects with direction and policy from the National Space Agency will reduce funding and the reliance on government. Projects could be set for longer term without the risk of political intervention. For example, if the government were to fund a project for 4 years, but the funding needed is projected for 10 years, when the government funding is cut, the project either becomes inactive or on standby and the economic resources for that project would have been totally wasted in that scenario. Development of a private or commercial based space firm would provide longer-term solutions in space science without the need to be dependant on change of policy or government.

10. Whilst government funding for such a project is encouraged, it should only be limited to the preliminary stages of the project helping to get it off its feet initially. Funding thereafter should be sought from the private sector and/or foreign investments. The reliance of government funding limits the growth and development potential of any long-term project. Examples include the abolishment of the National Space office in 1996 because other industry sectors were providing equal or greater results. Though there are existing programs that are achieving the required outcome

for space science, a consistent centralised agency with the combination of other space industry sectors would provide significant benefit because it is less demanding on economic resources and having the access of shared resources reduces costs quite substantially.

11. In Japan for example through the merger of three previously independent organisations they formed the Japan Aerospace Exploration Agency. Through the combined efforts of those organisations they were able to build JAXA Kibo, which is the largest module for the international space station. We only need to see what other countries are doing and use them a reference point to understand the potential that can be achieved.

11. Others areas that can provide constant flowing revenue is the subject of leasing satellites. Although the short-term ability to build and launch satellites is costly, we need to think about the long-term capital that can be gained from this. We would no longer need to lease satellites from foreign countries and also utilisation of our own satellites to fulfil the national strategic objectives in terms of security, national to international meteorological and navigation requirements and also the varied commercial benefits seen through spatial use of telecommunications systems such as those utilised by the Optus satellite network.

12. Having world-class facilities available, we could significantly capitalise on the market by leasing them out to the private space industry sector specifically those from overseas investments. Simply by providing the infrastructure, it would be more convenient for countries to lease or hire out our facilities to conduct either their own or a combined space project.

13. Through clever and informative promotional marketing, Australia could become the next international gold mine for space science. The stream of foreign investors would then be pouring in and will allow Australia to develop a better relationship with the international community and also provide mutual support for collaboration of international space science projects.

14. We must make a conscious choice whether furthering our knowledge is worth more than what money can ever offer. We must decide whether the future of Australia resides in knowledge or simply economic progression.

Employment

15. The devoted resources to space science would open up new employment opportunities. We would further expand our intellectual and technical capabilities in our people, by fostering this development we would create a smarter Australia. It would align with the government objective of reducing unemployment levels and maintaining retention levels specifically in the areas of science and engineering.

16. To cover all aspects of such an agency, some of the employment opportunities that would be available include:

- A. Professional, Engineering and Scientific which would account for 60%
 - 1. Accounting,
 - 2. Aerospace Engineering,

3. Biology,
 4. Computer Engineering,
 5. Computer Science,
 6. General Engineering,
 7. Meteorology,
- B. Administrative and Management which would account for 24%
1. Administrative Specialist,
 2. Budget Analyst,
 3. Contract Specialist,
 4. Information Technology Specialist,
 5. Public Affairs Specialist,
- C. Clerical and Administrative Support which would account for 7%
1. Accounting Technician,
 2. Clerk-Typist,
 3. Management Assistant,
 4. Office Automation Clerk,
 5. Procurement Clerk,
 6. Secretary,
- D. Technical and Medical Support which would account for 9%
1. Electronics Technician,
 2. Engineering Technician,
 3. Meteorological Technician,
- E. Trades and Labour which would account for less than 1%
1. High Voltage Electrician,
 2. Instrument Maker,
 3. Model Making,
 4. Utility Systems Repair,

17. This would create specialist employment positions for skilled Australians, such skills could be adopted through Australian education institutions. With such possibilities available to the younger generation, the realisation of their dreams can be achieved in Australia. Most of our intellectual and technically minded people are going overseas because the lifestyle and money is much more attractive than Australia, hence if we concentrated on opening up employment areas in space science we will be not have a problem with retaining our skill capabilities.

As shown above there is a myriad of employment positions that can be created and filled. The possibilities are endless.

Education

18. One of the major benefits from space science is education of the general population to the broader workings of the universe. With resources devoted to such a move, our children and students will be able to align with the international academic community in a stream of scientific areas. This will boost our understanding and introduce a modern and revolutionised education system where science will become the main focus. Investment into such an area would increase the Australian public awareness into the developments in space science and by doing so create public interest in space again.

19. The drive will endeavour to create a smarter Australia with obvious social and economic benefits including increasing public awareness in the promotion and understanding of space science. This will provide a leap ahead with the general population aspiring to reach for the stars. Education will set the benchmark and dissolve any cultural limiting beliefs of what we can't achieve as opposed to what we can achieve.

20. With the introduction of space science into the education curriculum we will further create interest by enabling the younger generation to have the opportunity to pursue their desired career path in this field of science. The government should continue to explore this area and not be too concerned with the economics required. Space science is an investment in the future of our children giving them higher aspirations to improve their quality of life by allowing them to pursue a career in sciences and engineering

21. Retaining skills within Australia is an important aspect, by providing a world-class education platform, we will be able to create and expand employment opportunities thereby reducing the need to import foreign skills to fill vacant positions. Our talent will remain in Australia and will work towards the common interests of our nation. Space science is source of a large number of highly skilled space agencies jobs. For example, in Europe space science employs about 35 000 people directly, and estimates for the indirect employment that it creates approaches about 400 000.

22. Once Australia has been established as a leader in space science, foreign interest would be sought, providing Australia with long-term investment, essentially allowing for the development of a smarter, more prosperous and wealthy nation. Foreign investment to improve space science education will include more teacher and educators and with that the support infrastructures that follow will add little or no cost to the Australian Government.

National Security

23. The Australian Defence Organisation relies heavily on its communications network in order to fulfil Australian strategic requirements for short-long term security both within its borders and across the Asia-pacific region to the Middle-Eastern theatre. The continued demand for defence needs to be match with hardware capabilities. These capabilities are a priority area that the government needs to be

concerned with as it has large ramifications on the defence capabilities in all theatres of peace-keeping and warlike operations.

24. The reliance of technical capabilities and use the space technology is critical to operations of the ADF. Therefore, having foreign owned space-dependant infrastructure should be critical to the policies the government makes on leasing foreign owned equipment. It would not be in our best interest to use foreign space-dependant technology for the long-term, as it will affect overall securities measures being implemented on our communication networks. Such examples could include electronic interception and eavesdropping on our satellite networks. A loss of satellite communication could have catastrophic effects to our national security. This area should be fully monitored and administered to ensure and maintain system integrity.

25. Space warfare is evolving to a stage where space communications systems are open to exploitation. For example in 2007 The Tamil Tigers Liberation Front a separatist group in Sri Lanka, which has been classified as a terrorist group in 32 countries has moved up from routine sea piracy to a space-based one. They have been accused of illegally using Intelsat satellites to beam radio and television broadcasts internationally.

26. We need to take control of our own space systems in order to detect such a compromise and implement security measures to protect our own communication networks. To fully integrate our procedures we need to be dependant on Australian-owned space technology. Therefore a centralised agency that deals with all matters both military and civilian should be established to co-ordinate all space related matters.

International collaboration

27. With the current development of the international space station underway, we need to provide more contribution to the international effort in space. Australia needs to have a clear presence in space in order to fulfil international commitments which in turn will provide longevity to peace and security as humans across the globe have united to aspire to a higher goal of space.

28. A national space agency could co-ordinate and communicate all Australian efforts towards space science through to agencies such as the European Space Agency and the NASA. Rather than working in competition with each other we could work as a collaborated international effort creating components or system parts contributing to larger scale projects.

29. Australia would set world-class standards in research and development and thus, could become a leader in peace both on earth and in space. This would be a noble and honourable goal that Australia should constantly seek to explore. Australia could be targeted to establish an international space agency. Would that be something that we could benefit from?

Short Term 5 Year Plan

30. The initial cost and setup for such an agency would be rather costly; however the long term capital both in economy and knowledge far out weighs the initial investment. It should be seen that such an agency, given the right people who can produce results, are able to obtain such a goal in less than 4 years.

31. Other options include establishment of a volunteer board that could review co-ordinate and manage all space related matters on a national level. This board would have powers given through legislation to be able to carry out their duties to the fullest potential. The board would soon have an official office established which would in turn become the National Space Agency.

32. We should also consider allowing a private entity to establish such an agency. This would reduce government funding and allow keen investors to follow this pursuit. The company could provide long-term projection and goals and should be given the power to co-ordinate all space related matters. The organisation that would be established would be non-profit.

33. Public awareness campaigns would be run to gain public interest. This interest would in turn create demand for pursuit of space in the private sector, followed by increase awareness of space science in our education system.

Medium Term 5-10 Year Plan

34. By this stage the space agency would have already been established. Our education system would start to produce the intellectually and technically minded individuals to fulfil national space science positions. The co-ordination of space projects would be taken on an international level where Australia is starting to demonstrate world-class potential.

35. We would have a wide variety of infrastructure built, including aeronautic training facility, and an upgrade to the CSRIO space science facilities. Our younger generation would deeply be involved in pursuing a career in space science and Australia is seen as a gold mine for investments in space. The limitless potential of what others thought was not possible is starting to prove to become a more worthy investment than what was initially thought.

Long Term 10 Years and beyond

36. We now have the capability to build and launch our own satellites, foreign interests has increased significantly, with ESA, NASA and the Japan Aerospace Exploration Agency (JAXA) pouring investment and funds into Australia. Our dark skies and large land mass is perfect to conduct any space project this has been proven in the past such as ESA's first deep space ground station that opened in Western Australia in 2002.

37. We can now have the confidence to launch and recover space vehicles on a daily basis; space for many would just be a flight away. The brilliant minds of Australia will take space beyond the next level for interstellar travel. We have orbiting platforms where we can further our study into space science in the comfort of being in space.

Conclusion

The principles outlined in this document have clearly defined logical reasoning, beyond any doubt of the inherent benefits of investing in space science. It calls for this to be conducted through the establishment of a National Space Agency which would co-ordinate all space related matters both civilian and military on a national and international level.

The economic benefits long-term are quite significant with increase public demand both from national and international levels. The private sector would be producing results and exporting components to combine with international space projects and increase the employment of intellectually and technically minded individuals. The education system will have higher aspirations with the younger generation pursuing a goal beyond the boundaries of our planet.

Our national security requirements would be fulfilled as the ability to build and launch our own space systems would be in line with our strategic objectives. Further on we could extend our capabilities globally relying on own systems in order to carry out the requirements needed for national security.

Australia will become a smarter nation with significant international interest. The wealth generated would allow Australia to continue developments in other areas of concern thereby being a world leader in facilitating science, education, health, and research and setting a benchmark for other nations to aspire to. The common goal for space science will develop a much more rewarding and friendly relationship with our neighbours and our differences would be set a side to pursue something much greater.

Even without government support, this is my mission in life and I will continue to do so with due diligence and commitment. The drive for success and the leap beyond the boundaries of our own planet is a dream for some but I will bring it to reality. If one man such as Richard Branson and his Virgin group could create space tourism that could take thousands of people into space, then what is the limitless potential that one nation could achieve? Look to the stars for guidance, we have been doing this for thousands of years, so why stop now. I hope you consider this proposal favourably.

The stars are just the beginning of my playground...

With kind regards,

Jake Bui
Managing Director
Founder
23rd Apr 08

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