



THE HON WARREN SNOWDON MP  
Minister for Defence Science and Personnel

- 4 JUN 2008

Ms Maria Vamvakinou MP  
Chair  
Standing Committee on Industry, Science and Innovation  
Parliament House  
PO Box 6021  
Canberra ACT 2600

Dear Ms <sup>Maria</sup> Vamvakinou

Thank you for your letter of 28 April 2008 inviting the Minister for Defence, the Hon Joel Fitzgibbon, to provide a submission to your Inquiry into research in Australian universities. As this matter falls within my portfolio responsibilities, your correspondence has been passed to me for response.

The principal focus of your inquiry is the challenges Australian universities face in recruiting, training and retraining their research staff.

Defence has put significant effort into developing close links with Australia's universities at various levels including the researcher communities and research faculties of our universities.

The research community is a valuable conduit of advice and counsel for various Groups within Defence. Groups that are particularly heavy users of research staff in our Universities include the Intelligence, Security and International Policy Group, and the Defence Science and Technology Organisation (DSTO).

Our universities research community adds significant value to the work and operations of the Department of Defence in a number of areas including:

- a source of advice and expertise in fundamental and basic research in areas that are relevant to Defence needs;
- independent strategic and international policy advice; and
- a source of skilled graduates.

The depth and breadth of engagement is perhaps best illustrated by outlining the approach adopted by DSTO.

As a strategic engagement mechanism, DSTO has established Centres of Expertise in a number of Australian universities. These centres focus on specific research and technology areas that are of interest to DSTO and that are areas of strengths within those Universities. There are currently eight Centres of Expertise in the following focus areas:

- Energetic Materials – Flinders University;
- Systems Integration – University of South Australia;
- Defence Autonomous and Uninhabited Vehicle Systems – University of Sydney;
- Phased Array and Microwave Radar – University of Adelaide;
- Photonics – University of Adelaide;
- Helicopter Structures and Diagnostics – University of New South Wales;
- Aerodynamic Loading – Royal Melbourne Institute of Technology; and
- Structural Mechanics – Monash University.

Research Agreements are another mechanism used by DSTO to leverage research expertise within a university over short time frames. Current projects cross research areas such as autonomous vehicles, hypersonics, aircraft structures and aerodynamics, submarine technologies, radar and imaging, photonics, and human factors, including physiology and psychology. Specific examples include:

- a project with the University of Adelaide to investigate the use of piezoelectric sensors clusters to measure damage and deflections in aerospace structures; and
- a study with the University of NSW (ADFA) to identify and evaluate the tools and techniques used by defence in capability planning and development.

DSTO pursues an active program of funding undergraduate and postgraduate scholarships, and postdoctoral fellowships with Universities. These scholarships and fellowships are used to encourage undergraduate students to pursue studies in a field relevant to DSTO or to provide stipends, and in some cases a contribution to project costs, to postgraduate students or postdoctoral fellows to work on projects of interest to Defence.

DSTO also operates a Summer Vacation program, which provides work experience for university students to undertake a three month research project at a DSTO site, and an Industry Experience Placement program for tertiary students who are required to undertake practical work experience as a formal requirement of their degree. The successful candidates complete a fixed term project at a DSTO site.

DSTO also runs a continuing education initiative with Australian universities which is focussed on skilling DSTO's current defence scientists and researchers. The initiative utilises university lecturers and research staff to further develop and train DSTO personnel to ensure their skills and knowledge remain relevant and current throughout their careers.

Research agreements and scholarships are also used by other Groups within the Defence as mechanisms to engage the research faculties of Universities.

Turning to the specific issues your Inquiry is considering. Globalisation is a significant factor in levelling the international economic playing field and Australian Universities, Australia's publicly funded research organisations such as DSTO and CSIRO, and Australian industry are in a fierce global competition to attract and retain the best and the brightest in graduate students and postdoctoral scholars.

Australia has conducted a successful campaign to attract international secondary and undergraduate students to this country. Education services are amongst Australia's major exports and have significant potential for further growth.

The missing piece of the jigsaw from this success story, however, has been Australia's less robust performance in growing its existing graduate and postgraduate research and scholar base, and attracting and retaining overseas graduate students and post graduate scholars in all disciplines but particularly in mathematics and science.

The degree of global competition that is taking place in this area is highlighted in data published by the US National Academy of Sciences which shows that from 1988 to 2001 world publishing in science and engineering increased by more than 40 percent but with most of that increase coming from Western Europe, Japan and several emerging East Asian and South East Asian countries (South Korea, China, Singapore and Taiwan).

Countries are alert to the important role university research staff can perform in lifting overall research and development and innovation performance. Overseas countries and their universities are increasingly offering a range of inducements to attract post graduates and post doctoral scholars.

- For example, the United Kingdom has introduced the Highly Skilled Migrant Programme and has recently increased the number of work permits issued in this category.
- The European Union countries offer collaborative projects, funding and job opportunities while the European Union itself has created the Researcher's Mobility Portal to facilitate networking.

- In the United States there are calls to dramatically lift the numbers of new graduate fellowships offered each year; provide a federal tax credit to encourage firms to promote life long learning among its practicing scientists and engineers; and improve visa processing.

In my view, Australia has little choice but to compete for these valuable resources and a co-ordinated effort involving Government at Commonwealth, State and Territory levels, Australia's universities, industry and our publicly funded research organisations is required.

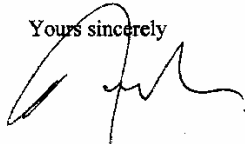
In developing a co-ordinated campaign consideration should be given to providing adequate remuneration, which I understand is very low by industry and public sector standards as discussed in the Group of Eight submission to the Review of the National Innovation System<sup>1</sup>, and in the Productivity Commission Research Report on Public Support for Science and Innovation, which shows declining academic salaries in relative terms over most of the last 25 years<sup>2</sup>. An ability to move seamlessly in and out of the university system into industry and our publicly funded research organisations without compromising their service or superannuation entitlements would allow researchers to broaden their individual skills and share their knowledge base with Australian industry and public sector. In addition augmentation of Australia's current scholarship and fellowship arrangements, both in terms of numbers and value, is warranted.

In developing a co-ordinated campaign we must be sensitive to the security aspects of competing for overseas talent particularly in the areas of defence and national security but this should not act as a disincentive or discourage talented researchers from applying.

Thank you for the opportunity to contribute into this important Inquiry and I wish you and your colleagues well in developing your final report.

I have sent a copy of this submission to my colleagues the Hon Julia Gillard MP, Deputy Prime Minister, Minister for Education, Minister for Employment and Workplace Relations, Minister for Social Inclusion, and Senator the Hon Kim Carr, Minister for Innovation, Industry, Science and Research, for their information.

Yours sincerely



WARREN SNOWDON

<sup>1</sup> *Adding to Australia's Capacity: The role of research universities in innovation*; A submission from the Group of Eight to the Review of the National Innovation System; April 2008;

[http://www.innovation.gov.au/innovationreview/Documents/372-Group\\_of\\_Eight.pdf](http://www.innovation.gov.au/innovationreview/Documents/372-Group_of_Eight.pdf)

<sup>2</sup> *Public Support for Science and Innovation*; Productivity Commission Research Report; March 2007;

<http://www.pc.gov.au/study/science/docs/finalreport>