Australian Government

Department of Education, Science and Training

REVIEW OF CLOSER COLLABORATION BETWEEN UNIVERSITIES AND MAJOR PUBLICLY FUNDED RESEARCH AGENCIES

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FOREWORD

The creativity and productivity of the Australian National Innovation System (NIS) is the key to its recent and ongoing success. As our NIS grows, it increasingly shows itself able to tackle more and more complex scientific problems spanning the entire spectrum of scientific research from the most basic to the most directly applied.

It is through promoting collaboration that innovation can be best achieved in increasingly complex scientific research in the future. It is the resulting innovation, encompassing multiple research disciplines and organisations, which will see Australian science remain relevant and globally competitive for future generations. The test for this Committee has been to bring a unified understanding to what is an enormously complex research and funding system in a manner that respects and protects the unique and complex nature of that system.

The recent history of the NIS is one of change. This current Review has been exposed to a number of examples of organisations clarifying their research objectives and lines of accountability in order to maintain a close and positive relationship with government and the other major funding sources. As more and more multidisciplinary research becomes our focus it will become increasingly important for researchers to work together to achieve a larger scale in their research efforts.

The commitment of these organisations and people to research and development in Australia is especially positive and we thank all of them for giving us an insight into the workings of the NIS. The further development of existing collaboration between individual researchers is the very best foundation from which to promote greater collaboration across the NIS.

I would also like to thank the members of the Committee. It is their personal views, as well as their willingness to learn more about different parts of the system, that have given us the broadest and most productive perspective possible.

The Committee also thanks the secretariat for working tirelessly to facilitate the review as well as providing a unique insight into the machinations of the NIS and its funding models.

Finally the Committee wishes to thank the Hon. Dr Brendan Nelson, Minister for Education, Science and Training at whose instigation this review has taken place. Without his desire for ongoing reform of the NIS many opportunities to foster and develop collaboration would continue to be missed. It is the ever present momentum of reform which will ensure that a diverse system never becomes complacent or introverted and remains always on the lookout for opportunities to move into the future.

Donald McGauchie
Chairman

Glossary

ABL	ANSTO Business Lab
ADF	Australian Defence Force
AIMS	Australian Institute of Marine Science
AIMS@JCU	AIMS affiliation with James Cook University
ANSTO	Australian Nuclear Science and Technology Organisation
ANU	Australian National University
ARC	Australian Research Council
AVCC	Australian Vice Chancellors' Committee
AWRI	The Australian Wine Research Institute
BD&C	Business Development and Commercialisation
B–HERT	Business–Higher Education Round Table
CRC	Cooperative Research Centre
CRIs	Crown Research Institutes
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEST	Department of Education, Science and Training
DSTO	Defence Science and Technology Organisation
GRDC	Grains Research Development Corporation
ICT	Information Communication Technology
IP	intellectual property
MNRF	Major National Research Facility
NHMRC	National Health and Medical Research Council
NIS	National Innovation System
NRIC	National Research Infrastructure Council
NRPs	National Research Priorities
NZ	New Zealand
OECD	Organisation for Economic Cooperation and Development
PFRAs	Publicly Funded Research Agencies
R&D	research and development
RDCs	Rural Research and Development Corporations
SMEs	small to medium enterprises
SRC	Strategic Research Council
TFA	Triennium Funding Agreement
WALABI	South Australian Department of Water, Land and Biodiversity Conservation

SUMMARY

The *Review of Closer Collaboration Between Universities and Major Publicly funded Research Agencies* investigated a range of collaborative activities between Publicly Funded Research Agencies (PFRAs) and universities. The Review also considered different approaches and models for closer collaboration, commercialisation and funding involving the four major PFRAs, the 38 universities and industry.

The Review has found that the current level of collaboration is extensive between PFRAs and universities, particularly at the individual researcher level. However, there is an opportunity to enhance the level of collaboration at the organisational and higher strategic level.

This report addresses issues under the four key themes of Collaboration, Strategic Coordination, Funding Models and Route to End Use. Submissions commenting on these issues have been received from key stakeholders as well as other government and non-government agencies, individuals and academic societies. Based on input to the Review, the Committee has considered and assessed the relevant issues and made statements **(bolded text in the report)** and explicit recommendations (outlined below).

Recommendations

The importance of co-location

Co-location, cluster formation, international and national networking, sharing of infrastructure, co-investment in infrastructure and research, are critical for collaboration. Of these, the Committee considers that co-location is one of the most effective drivers of collaboration.

When considering co-location, PFRAs and universities should therefore examine the synergies that can be exploited. They should, for example, take into account regional roles and expertise, the potential for linkage between industry and the science base, non-market factors such as complementarity of skills, infrastructure and research focus, the potential for public–private partnerships as well as the supply of skills and scientific and technical knowledge.

The Committee supports the Commonwealth Scientific and Industrial Research Organisation (CSIRO) policy of property holding consolidation over the next decade, with specific co-location initiatives to create scale, focus and collaboration with universities and associated industry partners. If co-location is not possible, the Committee sees benefit in continuing to enhance capability for real time communication by investment in broadband infrastructure from existing Australian Government programmes such as the Systemic Infrastructure Initiative.

Recommendation 1:

Prior to any major capital expenditure by a Publicly Funded Research Agency or university, co-location with an appropriate research provider will be the default position. Any exception to this position must be justified through reporting instruments to government.

Strategic coordination

Challenges remain in fostering science and innovation collaboration and linkages, especially between publicly funded research providers and industry. There is growing recognition that highly productive research and innovation, capable of generating new business ideas, transforming existing industries and addressing pressing national problems, is most likely to occur when research excellence is promoted, linked and coordinated.

Collaboration across the National Innovation System (NIS) and specifically between PFRAs and universities, would be enhanced through a coordinated national approach to developing and implementing research policy, including ways to address priorities, scope and identify research requirements to achieve critical mass for issues of national importance. An

overarching independent advisory council could assist in setting the broad research policy direction for universities and PFRAs, funding bodies (for example, the Australian Research Council (ARC), National Health and Medical Research Council (NHMRC) and Rural Research and Development Corporations (RDCs)) as well as industry, ensuring a multidisciplinary and multi-institutional approach is adopted.

Existing councils and bodies such as the ARC, NHMRC and the RDCs perform key roles in supporting their research constituency through provision of competitive research grants, information and advice on national and international developments in research and research management, and developing associated policy advice to the Australian Government as it impacts on their constituency. However, there is no one body that has responsibility or expertise to consider and provide comprehensive advice to government on research and research funding mechanisms, as an input to policy development and national decision making.

Utilising a broad approach, coordination at the higher level will allow consolidated advice to be provided to the Australian Government across its suite of public programmes, research providers and other sectors in the NIS. The capacity for periodic reporting to government on progress against priorities and in relation to collaborative outcomes could also be incorporated.

The Committee concludes that a new advisory body, the Strategic Research Council (SRC) should be established to provide the Australian Government with this overarching strategic policy assessment and advice. Importantly, the SRC would complement and build on the roles of existing advisory bodies and councils. Specifically, the SRC should meet periodically to take a 'Team Australia' view to set broad research policy direction and coordination across the different organisations; utilise a systems approach to provide independent consolidated advice on cross-boundary issues to Ministers; oversee the implementation of and monitor progress for, National Research Priorities (NRPs), including any changes to either the existing NRPs or the introduction of new NRPs; and assist in development of policy aimed at a more unified approach to global markets.

Recommendation 2:

The Australian Government establish a Strategic Research Council to enhance collaboration and coordination across the research system.

Maintaining block funding arrangements

The Review received submissions commenting on the current funding arrangements for PFRAs and universities. They emphasised the critical role of block funding in supporting and maintaining different missions and objectives. For PFRAs, block funding supports large scale and long term mission-driven research as well as infrastructure and emergency response capabilities. For universities, block funding supports broad ranging research and research training in accordance with their own strategic judgments.

There was little support in submissions for changing the current block funding arrangements. The way research is funded and in turn performed is an important driver of different research outcomes. The Committee agrees that a plurality of funding approaches is critical to an effective innovation system. The Review process has revealed overwhelming support for maintaining differentiation in the NIS via existing block funding arrangements.

The need for a performance framework

The Committee contends that a broad approach to measuring quality and relevance, using a core set of measures, could be developed under a review process. Such an

approach could build on the recommendation[1] of the Chief Scientist for the development of a new set of outcome-orientated performance measures for CSIRO, the Australian Institute for Marine Science (AIMS) and the Australian Nuclear Science and Technology Organisation (ANSTO). This could also provide a means for comparing the research of different organisations and funding programmes (as opposed to measures for funded initiatives and projects) more easily and rigorously.

Whilst acknowledging that the Defence Science and Technology Organisation (DSTO) already undertakes some peer review of its technology areas, the Committee believes that DSTO, the Australian Defence Force (ADF), and the Australian Government would benefit from a more systematic and regular peer review process for DSTO.

Specifically, the Committee suggests that an expert group be established to investigate further, in consultation with stakeholders, ways of delivering a robust and reliable high level assessment of quality research outputs without undue demands on cost or time. Any framework should build on existing data collection within the system rather than creating new and costly processes.

Recommendation 3:

A performance measurement framework be introduced as a priority for Publicly Funded Research Agencies, universities and other science-based organisations and funding programmes. An expert group be convened to develop core performance measures relevant to all sectors.

A new funding approach

Any change to the funding system should recognise existing core research missions as driven by the respective funding models. The Committee's view is that there is potential to enhance collaboration beyond the scope of current programmes and, at the same time, more strategically link excellence to priorities such as the NRPs.

PFRAs and universities need to work collaboratively in a cooperative as well as a competitive way. It is proposed that a new externally managed contestable fund be established, drawing on the benefits of existing funding models, which complements and does not duplicate current collaborative programmes.

The proposed fund would be underpinned by a coordinated strategy, overseen by the SRC. Wherever relevant, a broad range of research groups and stakeholders, including the social sciences and humanities, would necessarily contribute to direction setting.

Recommendation 4:

A contestable Collaboration Fund be established to finance world-class Centres of Excellence. The Fund would be open to joint applications from Publicly Funded Research Agencies–university–industry or other non-public sector research organisations as partners.

A route to end use

A prescriptive intellectual property (IP) management regime imposed on organisations to direct behaviour is not in the long term interests of either the research sector or the nation. Almost all submissions highlighted the need for a clear set of principles or policy for IP management. The Committee, however, concludes that the existing framework *National Principles for IP Management for Publicly Funded Research* released in 2001, is not widely recognised, understood or utilised, which might reflect a need for the Department of Education, Science and Training (DEST), ARC, NHMRC and other appropriate government agencies to communicate the existence and intent of these Principles.

[1] Department of Education, Science and Training 2002, *Review of the External Earnings Targets Policy Applying to CSIRO, ANSTO and AIMS, Canberra.*

Because universities and PFRAs often expend significant energy on detailed up-front negotiation on IP before commencing a collaborative activity, it might be timely for an expert group to assist in reconsidering the National Principles by, for example, adding a qualifier or new principle such as:

> Intellectual property, generated as a result of collaborative research, should be divided according to the relative inputs of the various collaborators. The inputs must be measured by their demonstrable relevance to the generated property. Consideration should be given to better utilisation of existing commercial arbitration and mediation mechanisms to handle any resulting disputes.

Recommendation 5:

An expert group reconsider the *National Principles of Intellectual Property Management for Publicly Funded Research,* including ways to publicise the Principles more widely to encourage greater utilisation.

Conclusion

As a result of this Review the Committee has been provided with a diverse range of opinions, issues, suggestions and options about the role, operation and responsibilities of PFRAs and universities in the NIS. The Committee has also been provided with many alternative propositions and recommendations to enhance the already extensive collaboration occurring between PFRAs and universities. The Committee's recommendations to the Australian Government, which if implemented over the next 10 years, should lead to improved outcomes in how research is conducted in Australia through:

- Better overall coordination of strategic advice to government on where Australia's research effort and funding could be best utilised for greater return or benefit.
- Improved ways to address emerging national and international issues or technologies by establishing a new fund specifically to bring together the best researchers in multidisciplinary teams from PFRAs, universities, industry and other organisations to create the necessary scale and focus.
- Creation of critical mass through the appropriate co-location of research facilities and infrastructure in a more systematic manner.

The Committee has also identified a number of other issues which it believes would further improve the conduct and outcomes of research across the NIS. The Committee encourages the Australian Government and the broader research community to consider these conclusions and findings in order to make incremental improvements across the research system over the suggested timeframe.

BACKGROUND

Improved research outcomes are critical for the Australian Government's overall science and innovation policy objectives. These can be achieved from more efficient use of resources through enhanced critical mass and strengthened institutional performance. These objectives were identified by the Prime Minister in his speech to the Committee for Economic Development of Australia on 20 November 2002.[2] Importantly, the Prime Minister reiterated the role of science and innovation in producing new ideas to underpin Australia's long term economic and social prosperity.

During 2002, the Australian Government conducted a comprehensive review of Australia's higher education system, releasing the report *Our Universities: Backing Australia's Future* in May 2003.[3] This report provides a vision and strategic framework for Australia's higher education sector over the next decade. A key outcome of the higher education review was the commissioning of three wide-ranging reviews of the research and research funding system in Australia: the *Taskforce on Research Infrastructure;* the *Evaluation of Knowledge and Innovation Reforms;* and *The Review of Closer Collaboration between Universities and Major Publicly Funded Research Agencies* (the Research Collaboration Review).

The Research Collaboration Review covered the major Publicly Funded Research Agencies (PFRAs) including the Australian Institute of Marine Science (AIMS), the Australian Nuclear Science and Technology Organisation (ANSTO), the Defence Science and Technology Organisation (DSTO) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). The Review also involved consideration of alternative funding models and PFRA access to research funding provided by the Australian Research Council (ARC) and National Health and Medical Research Council (NHMRC). An independent Committee was established by the Minister for Education, Science and Training, the Hon. Dr Brendan Nelson MP, on 26 May 2003. The Terms of Reference and details of the Review Committee are at Attachment A (and on the Review web site at <www.dest.gov.au/collaboration>).

The key objectives of the Review, in considering models for closer collaboration, commercialisation and funding, were to improve research outcomes from more efficient use of resources through enhanced critical mass and strengthened institutional performance.

The Committee released an issues paper on 23 July 2003 to initiate the consultation process. The Committee was pleased with the response to its issue paper. Submissions came from a wide range of stakeholders including all PFRAs, the key funding bodies, more than half the universities, university groups, individuals, government and non-government institutions and industry. A total of 57 submissions were received. The issues paper and submissions can be found on the Review web site. The submissions are listed at Attachment B.

Members of the Committee also conducted a series of focused stakeholder consultations over a number of months including site visits and meetings with particular groups and broader round table meetings. The consultation process provided valuable insight to a range of views whilst also allowing both the Committee and participants to test ideas and theories.

In conjunction with other reviews and the mapping of Australian science and innovation, the Research Collaboration Review will contribute to the implementation of *Backing Australia's Future* and to the Australian Government's deliberations on future policy for Australian science and innovation.

[2] Available at <http://www.pm.gov.au/news/speeches/2002/speech1996.htm>

[3] See <www.backingaustraliasfuture.gov.au/>