

Queensland Government submission to
**The House of Representatives Standing Committee on
Industry, Science and Innovation**
Inquiry into
**Australia's International Research
Collaborations**
(January 2010)

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This submission incorporates contributions from the Department of Employment, Economic Development and Innovation (DEEDI), the Department of Environment and Resource Management (DERM) and Queensland Health

Terms of Reference

On 25 November 2009 the Minister for Innovation, Industry, Science and Research, Senator the Hon Kim Carr, asked the House of Representatives Standing Committee on Industry, Science and Innovation to undertake an inquiry into Australia's international research collaboration. The Committee has inquired into and will report on Australia's international research engagement, with particular reference to:

1. The nature and extent of existing international research collaborations.
2. The benefits to Australia from engaging in international research collaborations.
3. The key drivers of international research collaboration at the government, institutional and researcher levels.
4. The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these.
5. Principles and strategies for supporting international research engagement.

Overview

This submission supports the review of Australia's international research engagement. It argues that enhanced international engagement in science and innovation requires specific initiatives that will improve the coordination and alignment of international relationships, policies and programs.

The Queensland Government's Smart State Vision is about building a knowledge economy that contributes to a better living standard for all Queenslanders. The vision pays specific attention to important issues for Queensland including climate change and sustainable development, health and wellbeing, food and crops; and to strategic priority industry sectors such as biotechnology, environmental technologies, information and communication technologies and advanced manufacturing.

The Queensland Government has undertaken a proactive policy development agenda placing research and innovation in a central role. To address priority areas highlighted in the Toward Q2: Tomorrow's Queensland targets the Queensland Government is investing over \$83 million via the Smart Futures Fund. The Government has already committed over \$3.6 billion in science and technology, research and development, education, innovation and commercialisation since 1998.

The Queensland Government is committed to supporting Queensland researchers and innovators that seek to build collaborative networks, projects and initiatives with international knowledge partners in order to:

- provide access to critical research infrastructure and networks
- build critical mass, research expertise and capacity, and
- present opportunity to address global challenges and influence change.

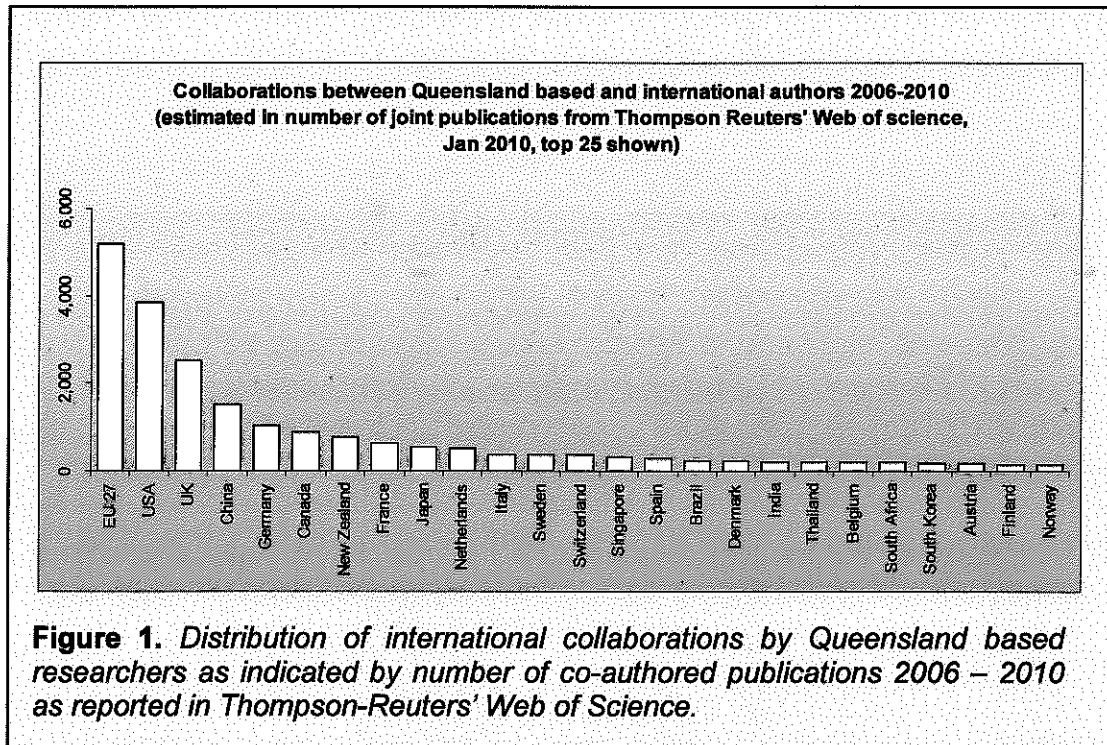
While the benefits of international collaborations are widely acknowledged, Queensland researchers face many challenges in initiating and sustaining these activities. Such challenges are common across Australia and could be alleviated through a range of measures that:

- foster greater mobility and capacity building through existing and new programs,
- build flexibility and improve alignment of funding mechanisms where international collaborations are involved, and
- coordinate Australia's international engagement and priority setting.

Coordination of international engagement is necessary to ensure that Australian research and innovation activities are of global standing and impact. Without effective coordination of international relationships, joint research programs and agreements, there is a risk that investments made by the Commonwealth, State and Territory governments may not deliver optimal returns.

1. The nature and extent of existing international research collaborations

International collaborations are a critical element of a successful research and innovation system. The Queensland Government values international engagement by the State's researchers and institutions and supports participation by Queensland based researchers in a variety of collaborations across a number of fields. Queensland researchers maintain a broad network of international research collaborations across Europe, North America and Asia (Figure 1).



The Queensland Government and its agencies have developed strategic alliances with various national and sub-national governments and research institutions that enhance the State's investments in research and innovation. Examples of these alliances include (but are not limited to) the Queensland Government and:

- *the State of Washington, USA*
- *the Smithsonian Institution, USA*
- *the Ministry of Science and Technology, Republic of India*
- *the Ministry of Science and Technology and the Chinese Academy of Sciences, the People's Republic of China*
- *the Walker Institute for Climate System Research University of Reading and the Met Office Hadley Centre for Climate Change, UK, and*
- *the State of North Rhine Westphalia, Germany.*

Queensland has a dedicated unit within Government that is tasked with advancing strategic knowledge alliances with global knowledge partners. The unit manages high level bilateral relationships in science and innovation. This group was established to ensure Queensland researchers and innovators have priority access to key strategic and high level international knowledge networks, partnerships, science infrastructure and research programs.

The Queensland Government operates a number of competitive grant programs that support these relationships as well as other international collaborations of strategic value (Table 1). These programs range from initiatives to foster dialogue and information exchange, researcher mobility and exchanges of personnel through to support for scoping activities and establishment of large jointly funded research and innovation projects.

Table 1. Examples of Queensland Government programs that support international research collaborations

Program	Targeted country/region	Program overview and outcomes
Queensland International Fellowships	priority to Europe, North America and Asia	Launched in 2008, this 4 year program enables Queensland based researchers to travel overseas and undertake collaborate research with a leading international knowledge partner
Queensland-Smithsonian Institution Fellowships	Principally USA	Enables Queenslanders to undertake a collaborative research project at the Smithsonian institution each year. Since 2001, 24 Queenslanders have had the opportunity to undertake a research project at the Smithsonian
Indo-Queensland Science and Technology Program	India	A 3 year joint program to be launched early 2010 comprising early career fellowships, researcher visits and joint research projects that are co-funded and jointly selected by the Queensland and Indian Governments
Queensland-China Science and Technology Program	China	A 3 year program launched early 2010 comprising early career fellowships, researcher visits and collaborative research projects that are jointly funded by the Queensland and Chinese governments
Queensland – UK Climate Change Fellowship	United Kingdom	To be launched in 2010, this program will support reciprocal exchanges of scientists between the Queensland Climate Change Centre of Excellence and the Met Office Hadley Centre for Climate Change
Queensland - China Climate Change Fellowship Program	China	Supports reciprocal exchanges of climate scientists and policy researchers between China and Queensland
National and International Research Alliances Program	priority to Europe, North America and Asia-Pacific	Grants between \$200,000 and \$2 million over one to three years.
Senior Clinical Research Fellowships	All	Queensland Health supports 6 fellows annually under this agency's Health and Medical Research Program.
More information on these programs is available at: http://www.deedi.qld.gov.au/information-about/science.htm		

Mobility programs such as fellowships and exchange programs are established in order to facilitate development of collaborative relationships between Queensland based researchers and innovators and their international counterparts. At present, the Queensland International Fellowships and the Queensland-Smithsonian Institution Fellowships will provide support for more than 60 years of collective research effort by Queenslanders. To date, this effort has been applied to researching topics as diverse as the impacts of climate change on the environment; development of renewable fuel technologies, innovative medical procedures, the study of museum collections and the management of tropical diseases.

Queensland Government researchers are also strongly engaged in the South East Asia and South Pacific regions on development related collaborative projects. Agri-Science Queensland is involved in over 40 projects with the Australian Centre for International Agriculture Research (ACIAR), the Crawford foundation and the Australian Agency for International Development (AusAID).

2. The benefits to Australia from engaging in international research collaborations

Even though Australia is recognised as a global high achiever in relative terms, the output of our researchers remains a small percentage of the total knowledge created globally. International collaboration is therefore essential in accessing the knowledge required to achieve the economic, social and environmental goals of both National and State governments. Specific benefits of engaging in international research collaborations are numerous and include:

Provide access to critical research infrastructure and networks

Australia cannot match the level of investment that countries or regions such as the United States and Europe provide for research, development and deployment of research infrastructure and technologies. However, supportive mechanisms that enable access to 'big science' infrastructure such as EMBL¹, or CERN and the expertise that resides in their associated networks can help consolidate and inform research investments made in Australia.

Australia's partners are increasingly developing global capabilities through enhanced regional networks (i.e. the European Union, ASEAN², and South America), inter-regional cooperation, and other forms of multilateral cooperation and information exchange. The benefits of engaging in multilateral, bilateral and regional research and innovation networks are that they build Australia's profile, demonstrate capacity for knowledge generation, exchange and innovation. As a consequence, international alliances can increase the benefit of Australia's investments in science and innovation.

Build critical mass, research expertise and capacity

Active engagement with international researcher networks is one mechanism that can help gather scientific talent, wherever it resides globally, around a challenge or opportunity of significance to Australia. Benefits to accessing a larger and academically more diverse mix of expertise are not confined to elevating the professional status and credibility of domestic researchers. Enhanced capacity, as a

¹ EMBL: European Molecular Biology Laboratory, CERN: European Organization for Nuclear Research.

² ASEAN: Association of Southeast Asian Nations.

result of a more engaged research and innovation system, translates to more scientific breakthroughs and technologies that are of benefit to Australia.

Many Australian institutions and researchers have strong international standing in their respective fields, which help to promote inbound international collaborations and increases the interest of overseas researchers in collaborating with Australia. As a consequence there are broader benefits to collaboration such as improved training and skills development opportunities for domestic participants and an enhanced capacity to attract and retain skilled experts, technical staff and postgraduate students from overseas.

As this enhanced capacity builds momentum, research excellence and innovation, so do the prospects of ongoing investments by international partners in Australian R&D, businesses and industries.

Present opportunity to address global challenges and influence change

When confronting global challenges such as climate change or pandemics, established research collaborations with other leading research groups assist scientists to better understand these phenomena and their impacts on both regional and global levels. Access to information that contributes to the development of effective domestic mitigation and adaptation options enables the development of policy responses that will significantly contribute to the global challenges presented by changes in climate.

Collaboration between the Queensland Climate Change Centre of Excellence (QCCCE) and the Walker Institute in the United Kingdom has allowed Queensland to access global climate modelling expertise that has provided a better understanding of the impacts of climate on agricultural crops in Queensland, the impacts of flooding and drought risk on water resources and the impact of other such extreme events on businesses.

3. The key drivers of international research collaboration at the government, institutional and researcher levels

Strategic vision

The Queensland Government's *Smart State Strategy – Queensland's smart future 2008-2012*, has a strong international dimension because access to global knowledge and expertise are known drivers of innovation. The commitment by the Queensland Government to invest in world-class research, science infrastructure and people creates a supportive environment for development of high quality education and training systems, research excellence, knowledge creation and active transfer of leading edge technologies.

Excellence

In common with most other nations, Australian researchers collectively contribute a small fraction of global research output. Access to global sources of knowledge and expertise is therefore critical where domestic science and innovation agendas seek to foster leading-edge research, knowledge transfer and skills development.

As governments in Europe, Asia and North America invest in ever larger multilateral and supra-national science initiatives (programs and infrastructure), countries such as Australia will be increasingly called to demonstrate their collective expertise and define their value proposition. In this context, current efforts across Australia to align

research funding with research excellence are likely to not only shape the formation of domestic research consortia, but also have resultant flow on impacts with respect to the focus and function of new international research consortia.

Co-investment and resources

Improving national productivity and competitiveness is a major policy challenge for many countries and sub-national governments. As shown in the 2008 Cutler Innovation Review, there is strong evidence for the linkage between innovation and productivity growth. Innovation performance is heavily influenced by the ability to access the world's stock of knowledge, wherever it may reside, and utilise this knowledge in new and productive ways.

In recognition of the benefits that collaboration with international knowledge partners provide, coupled with the cost of conducting some forms of research, the Queensland Government actively supports co-investment in research activities with international academic and/or industry partners. This strategy reduces the financial risks associated with funding large scale research projects, improves the quantum and quality of the research outcomes, and enhances the potential return on government investment in research.

4. The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these

While National and State governments can establish frameworks to facilitate collaboration with international knowledge partners, research agencies must be in a position to develop these opportunities in a timely manner. Queensland Government researchers cite significant impediments to the establishment and maintenance of international research collaborations as a result of:

- difficulty in accessing Commonwealth funding for international travel
- risks associated with the assessment of joint projects involving multiple international funding agencies, and
- lack of coordination between Commonwealth and State governments with respect to funding of both national and sub-national research priorities.

The following practical measures may address these issues:

Foster greater mobility and capacity building through existing and new programs

- Identify institutional and program barriers to mobility to ensure that Australian public sector researchers have access to mobility programs through Commonwealth project grants, fellowship programs, scholarship and training schemes.
- Prioritise participation by Australian early-career researchers in Commonwealth funding programs that support research collaboration with international knowledge partners, and
- Standardise international travel and overseas living allowances across all Commonwealth research grants and programs (for project collaborators and post graduate students).

Build flexibility and improve alignment of funding mechanisms where international collaborations are involved

- Ensure agile seed-funding programs exist to support the pursuit and development of new international research collaborations, and
- Mitigating the risks associated with the assessment of joint projects involving multiple international funding agencies by improving alignment in the assessment of competitive research grants where joint funding processes exist and/or where acceptable peer review processes operate internationally.

Coordinate Australia's international engagement and priority setting

- Ensure that the development of strategic and reciprocal partnerships with overseas governments, program owners and institutions occurs in consultation with relevant State governments and agencies ;
- Give priority to strategic international partnerships that support Australian access to international research facilities as well as encourage use of domestic facilities by leading international researchers and groups; and
- Identify where Australian expertise resides, and/or is best applied, in order to facilitate bilateral and multilateral arrangements to facilitate research and knowledge transfer activities of standing and impact.

5. Principles and strategies for supporting international research engagement

International collaborations are a critical element of a successful research and innovation system. Queensland's investment in research and innovation is underpinned by programs that enable Queenslanders to access international networks, knowledge partnerships, science infrastructure and research programs. In doing so, the Queensland Government's programs seek to achieve the following strategic objectives:

- Enhance the quality and impact of research undertaken in Queensland by supporting research activities that involve international knowledge partners.
- Support the international mobility of Queensland based researchers as a means of enhancing their skills, knowledge base and prospects for collaboration with international partners, and
- Attract leading international experts to visit, and work with, Queensland based researchers, industries or other key stakeholders.

These objectives are replicated in other Commonwealth and State based programs that support research organisations to develop and maintain leading-edge international collaborations. Alignment of funding programs and coordination of activities at both national and sub-national levels is necessary to ensure the development of internationally engaged research consortia of global standing and impact. Without effective coordination and consultation between the Commonwealth and State governments on investments being made in bilateral relationships, joint research programs and agreements to access international science infrastructure, there is a risk that investments made by different levels of government may not deliver optimal returns.

Existing bodies such as the Commonwealth, State and Territory Advisory Council on Innovation (CSTACI), or another research specific advisory body, could provide a platform from which better coordination of Australia's international research collaborations might be achieved.