# Submission to Productivity Commission Study of Public Support for Science and Innovation in Australia

## Overview

Current policy approaches to innovation lack a strategically integrated whole-of-government focus. Specifically, an integrated governance and funding focus which works through broader policy frameworks that have regard to building long-term national competitive strength is required.

Initiatives under Backing Australia's Ability I and II and ongoing related initiatives[1] have created the foundation through which an effective *integrated policy frameworks* approach can be developed.

It is proposed that the establishment of a National Council would be best placed to develop and coordinate the implementation of this *integrated policy frameworks* challenge.

Action on this front needs to be a national priority.

## Sustaining prosperity

Sustained prosperity is no accident but a result of hard won reforms put in place years in advance to tackle entrenched problems and strategic weaknesses working against long-term economic prosperity.

Australia faces formidable economic challenges over the coming decades including population ageing, the rapidly emerging economic power of countries and regional blocs and the profound shift in global competition increasingly dominated by knowledge intensive products and services. Catalysed by rapid technological advances, wealth has become highly mobile and economic activity networked globally. Australia is embedded in these changes and in the context of a small open economy faces complex policy challenges with no simple reform fixes.

The Organisation for Economic Cooperation and Development has estimated that innovation is a key driver for economic growth in developed countries, with at least 50% of growth directly attributed to it. This figure is indicative of the growing importance innovation is playing as we face new constraints to growth. Innovation, however, poses unique challenges and as stated in a special report on innovation in Business Week, 'there's no simple on switch.' 'Building effective innovation systems takes synchronisation from the centre and requires cross-boundary collaboration and structural changes.'[2] In the context of an *integrated policy frameworks* approach, this does not advocate a policy environment of micromanagement, picking winners or the bureaucratisation of the innovation process – elements that would lead, in fact, to our economic demise. Rather, it highlights the strategic need to understand better how the creative and dynamic force of people and economic organisation work through the very diverse range of institutional structures and program level processes and the need to design better policy solutions to invest in the full range of economic and social capabilities required to lock economic prosperity over the long-term.

## Scoping the innovation policy challenge

Innovation begins and ends with people – capabilities, creativity and decisions. It is about generating, diffusing and transforming knowledge and capabilities in the goal of driving internationally competitive outcomes across the economy. In business it's the ability to fulfil needs and solve problems for customers in superior ways to competitors and 'does not necessarily involve

[1] For example: Report of the Taskforce on Reducing Regulatory Burdens on Business, Australian Government, January 2006.

[2] *The World's Most Innovative Companies*, Business Week, April 24, 2006.

technology and technological knowledge nor the creation of new knowledge.'[3] Rapid evolution of information, communication and transport technologies, however, play a fundamental role in enabling both technological and non-technological innovations (eg. ITC innovations which catalyse and partner with non-technological innovations in the services sector). These enabling type 'general use' technologies make possible new kinds of wealth creation, scientific discovery and organisational structure – the global revolution is ongoing. This is reflected in 'global markets which are increasingly dominated by a greater dependence on knowledge, information, high skill levels and an increasing need for and ready access to all of these.'[4] Gaining competitive advantage in this technology embedded knowledge economy increasingly requires multi-sector and cross-disciplinary solutions demanding more effective collaboration and funding solutions between business, finance, R&D and government.

The 'national innovation system', functioning akin to a socio-economic ecosystem, is the context in which innovation occurs. This ecosystem-type reality roots innovation policy in broader policy frameworks, including our Federal-State system of government,[5] which have regard to building national competitive strength. Driving innovation nationally, therefore, demands 'effective social and economic mechanisms and institutions to provide sustained investment in capabilities to manage collaboration and cope with risk and uncertainty and their implications for business development.'[6]

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**R&D and the innovation policy focus**

In general terms innovation policy has commonly operated with a very narrow definition of innovation as it relates to R&D and its commercialisation. Innovation, however, covers a wide range of economic activities that give rise to both R&D outputs and outputs not traditionally associated with R&D. In fact, 'in all sectors of the Australian economy at least 30% of firms are innovating over any 3-year time period.'[7]

This does not diminish the importance of R&D nor of the fundamental and pervasive role played by the scientific community. It does highlight the importance of 'knowledge infrastructure in creating, maintaining and diffusing generic and scientific knowledge bases that support innovation problem-solving'[8] across the economy, including the provision of government support. Assessing priorities in developing and effectively investing in knowledge infrastructure requires an integrated approach to policy design and emerging economic pressures.

What also needs to be better understood is that only some of the outcomes of innovation policy are directly reflected in profits of private sector firms and direct investment returns on publicly funded R&D. Some are delivered in open markets and some are non-market outcomes, in the sense that markets may not exist or inadequately meet national interest needs. They may also be delivered over the long-term or by a series of complex market and non-market interactions.

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[3] *New Focus Needed on Business Innovation*, Business Council of Australia, March 2006

[4] Don Scott-Kemmis (2005) *Innovation Systems in Australia*, Innovation Systems Research network (ISRN), Working Paper

[5] Refer: Business Council of Australia (2006) Reshaping Australia's Federation: A New Contract for Federal-State Relations

[6] Keith Smith and Jonathan West (2005) *Australia's Innovation Challenges: Building an effective national innovation system*, Submission to the House of Representatives Standing Committee on Science and Innovation into Pathways to Technological Innovation, pp.1-2

[7] Australian Bureau of Statistics 2005, *Innovation in Australian Business 2003*, 8158.0, Canberra

[8] Smith and West (2005) pp.2

The complex role Government plays in facilitating innovation requires policy makers across portfolios to take a longer-term integrated view in assessing policy outcomes. This includes core policy areas related to competition, industry, education, science, environment, health and tax. The objective of strategic policy partnering being to broker solutions which offer superior provision for business and R&D than is currently being offered, for example:

- New performance measures and outcome criteria linked to longer-term economic and social policy objectives;
  - The value proposition of publicly funded R&D and innovation is cumulative but highly diffuse and unpredictable, making investment return very difficult to assess and poorly reflected in econometric modelling. More extensive and detailed sector specific and inter-sectorial data sets are required and assessed using robust insights from an endogenous growth perspective combined with skilled judgement focused on an *integrated policy frameworks* approach.[9,10]
- Greater attention paid to how venture capital and private equity infrastructure can be incorporated into more holistically designed policy solutions which better support collaborative needs across the spectrum of networks, clusters and more formal partnership type arrangements.
  - With privately managed investment funds in Australia rapidly exceeding $1000 billion and a 90% increase in Foreign Direct Investment over the last five years[11], the issue is not a lack of investment capital but in the way we understand, structure and coordinate policy solutions to facilitate greater access to capital for innovation needs.[12,13]
- Re-evaluation of the dramatic shift to a short-term cost recovery principle of publicly funded R&D, including associated returns on intellectual property (IP).[14]
  - This shift is indicative of a value chain approach where value is generated as risk decreases and 'market failure' is loosely used to justify government interventions.[15] This approach has emerged as a response to a legitimate concern but suffers short-sightedness and needs re-evaluation in the context of our long-term national objectives.

These examples highlight the essential task of integrating new economic perspectives emerging from the last decade of innovation studies in the context of developing an *integrated policy*

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[9] For sectorial research on intellectual property refer: Eric Iverson (2003) Norwegian Small and Medium Sized Enterprises and the Intellectual Property Rights System: Exploration and Analysis, Study commissioned by the World Intellectual Property Organisation, WIPO Publication Number: 890

[10] For sectorial research on industry refer: Don Scott-Kemmis, Magnus Holmen, Antonio Balaguer, Robert Dalitz, Kevin Bryant, Alan J. Jones and Judy Matthews (2005) *No Simple Solutions: How Sectoral Innovation Systems can be Transformed*, Key findings from the Australian Innovation Systems (AUSIS) Project, Australian National University

[11] 2006 World Investment Report, United Nations Conference on Trade and Development (UNCTAD)

[12] Refer: Keith Smith and Jonathan West (2005) *Australia's Innovation Challenges: Building an effective national innovation system*, Submission to the House of Representatives Standing Committee on Science and Innovation into Pathways to Technological Innovation

[13] Refer: Jonathan West (2004) 'Financing Innovation: Markets and the Structure of Risk', *Innovating Australia*, edited by Ian Marsh, CEDA, Growth 53, April, pp. 12-34

[14] In the context of academic patenting see: Iversen, E, M Gulbrandsen, A Klitkou,(2007) *A baseline for the impact of academic patenting legislation in Norway*, Scientometrics, Vol. 70, No. 2. (forthcoming)

[15] Refer: Catherine Livingstone, Submission to Productivity Commission Study of Public Support for Science and Innovation in Australia, August 2006

*frameworks* approach to innovation. Richard Lipsey in his recent book, *Economic Transformations*, has dealt with this challenge admirably.[16]

**National Council Proposal**

In taking an *integrated policy frameworks approach* to innovation, it is not sufficient to delegate responsibility to one or two Ministries who have primary innovation roles. It is proposed that a permanent National Council be established under the Prime Minister's Science, Engineering and Innovation Council (PMSEIC), with a permanent secretariat based out of the Department of the Prime Minister and Cabinet. The National Council would need a high level of independence with a clear mandate and power. This may best be served through a statutory type arrangement.

In addressing long-term impediments to growth, it would be essential for the National Council to work closely with the Council of Australian Governments (COAG) and the newly created COAG Reform Council. The National Council would also need to work closely with key innovation stakeholders across industry, finance, science, government and the not-for-profit sectors and encourage the development of emerging innovation bodies such as the Society for Knowledge Economics. Governance structures which encourage broad based focused input would also need to be established where wider community concerns and sustainability challenges can be addressed. This could take the form, for example, of problem orientated and solutions focused innovation themes which are able to engage stakeholders through a range of targeted mechanisms, such as think-tanks, specialist analysis, working groups and consultations, providing a vital information base for achieving National Council objectives. Organising ongoing stakeholder input through practical innovation themes, which evolve and change over time, provides a flexible platform to systematically and effectively integrate the best of our national capabilities and insights.

Checks would need to be put in place that effectively recognise and mediate institutions and powerful interest groups furthering their own special interests to the detriment of achieving economy wide objectives. Further, innovation reforms face portfolio environments characterised by highly charged sensitivities, strict accountabilities and strong top-down policy directives. This is reinforced by strict performance measures against narrowly defined portfolio outcomes. These bureaucratic environments encourage silo type tendencies that work against the development of more effective policy solutions across portfolio boundaries. There needs to be mechanisms put in place which can systematically identify and address impediments to developing and implementing policy solutions that require cross-portfolio collaboration. Mechanisms also need to be put in place which ensure a coordinated step-by-step approach which evolves over time rather than having a cascading trend of changes taking place with limited or no whole-of-government strategic focus.

These changes require top-down driven cultural adjustments which can be fed very effectively by coordinated Ministerial support. Further, currently the Australian Public Service, as a source of innovative whole-of-government policy thinking, is under-appreciated in the rush to embed strict vertical accountabilities. Traditional silo thinking paves the road to our economic demise.

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[16] Richard G. Lipsey, Kenneth I. Carlaw, and Clifford T. Bekar, (2005) *Economic Transformations: General Purpose Technologies and Long-term Economic Growth*. Oxford: Oxford University Press