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Pathways to Technological Innovation

House of Representatives
Standing Committee on Science and Innovation

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Foreword

When the Committee undertook to inquire into pathways to technological innovation, it sought to bring together a series of successful case studies and look at the obstacles faced in commercialising research, with a view to making recommendations on fine-tuning Government policies to support innovation. The intention was to consider the impediments that these successful innovators overcame on the path to commercialisation.

However, from discussions with researchers and entrepreneurs and from reading the case studies submitted to the inquiry, it became apparent this approach would only provide part of the picture.

Many successful innovators experienced a smooth pathway to developing their product and finding markets. These are the success stories and they are documented in other publications such as the 2005 report of the Prime Minister's Science Engineering and Innovation Council Working Group, Growing Technology-Based SMEs. These stories are heartening and affirm the calibre of Australian innovation and the strength of some aspects of the Government's innovation support framework.

In addition to these positive case studies though, submissions were made illuminating a range of issues which might impact on the path from technological innovation to commercialisation. From this evidence, a number of difficulties were identified and the Committee heard a different set of stories about innovation that is hampered because of gaps in the innovation support system.

It is apparent from this range of evidence, and the two sets of stories, that some pathways to innovation are well developed and relatively smooth for the Australian entrepreneur or innovating business or research institution. Other pathways are, however, less well formed and the Committee has focussed on the consensus issues from those seeking to innovate in Australia.

Drawing on the consensus issues raised in the evidence to the Committee, the report makes recommendations about improving linkages and collaborations between the public and private sectors, fostering a more entrepreneurial culture in Australia, and better publicising the range of innovation assistance available.

Other recommendations relate to addressing gaps in the assistance available and removing blocks to innovation— access to start-up funding and later stage commercialisation activities such as marketing; proof of concept funding; cultural, promotional and structural issues which may discourage academics from the commercialisation path; and Government procurement policies.

The recommendations are the result of extensive evidence and discussions with a wide range of industries, Government departments, universities and research agencies, peak bodies and individuals with experience in innovation. I thank those who contributed to the inquiry and those who allowed the Committee to visit their premises and see firsthand many of the processes of innovation. At times the inquiry took members of the Committee into technical scientific areas and I thank my colleagues for their dedication to the issues and commitment to grappling with the complexities of innovation. I also thank the Secretariat for its work on venture capital and other specialised areas of tax and corporations law.

Today innovation is recognised as the multitude of pathways that encompass all types of basic research, new technologies and improvements in business processes, from their initiation through to commercialisation or community uptake. Innovation is also recognised as vital to Australia's economic future as it is a means of impacting on long-run economic growth, improving health and social well-being, and addressing environmental threats.

The Committee commends the substantial Australian Government investment made to innovation through Backing Australia's Ability ($3 billion from 2001 to 2006, and an additional $8.3 billion from 2006 to 2011), and recent announcements in the 2006–07 Budget which boost the opportunities for venture capitalists at the early stage of commercialisation, and inject new life into the National Health and Medical Research Council. Given the importance of innovation to Australia's long-run economic performance, there is however always room for improvement.

This report seeks to make a contribution to building a nation that values innovation, addressing gaps in innovation support and removing impediments which may stifle innovation. Through implementation of the recommendations of this report, the Committee hopes that some pathways to technological innovation

will be made easier, thereby strengthening Australia's pathway to increased growth and global competitiveness.

I hope that this report will encourage a broader look at the overall balance of Australia's innovation policy, including issues such as the focus on research intensive R&D. In addition, I hope that policy makers and economists will consider the metrics needed to measure 'successful' innovation, including a broader view of what 'success' may mean given the multitude of pathways and outcomes that innovation now embraces.

Mr Petro Georgiou MP
Chair

Membership of the Committee

Chair	Mr Petro Georgiou MP
Deputy Chair	Mr Harry Quick MP
Members	Mr Anthony Byrne MP (to 10 May 2005)
	Mr Chris Hayes MP
	(from 11 May 2005)
	Mr Harry Jenkins MP
	Dr Dennis Jensen MP
	The Hon Jackie Kelly MP
	The Hon Roger Price MP
	Mr David Tollner MP
	The Hon Danna Vale MP
	Dr Mal Washer MP

Committee Secretariat

Secretary	Dr Anna Dacre
Inquiry Secretary	Dr Alison Clegg
Research Officers	Dr Lea Hill
	Ms Rachelle Mitchell
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	Mr Danny Miletic

Terms of Reference

The House of Representatives Standing Committee on Science and Innovation is to inquire into Australian technological innovation and pathways to commercialisation, with particular reference to examples of successful Australian technological innovations that demonstrate strategies to overcome potential impediments and factors determining success.

Innovation is the path of conceiving, developing and implementing ideas through to the generation of products, process and services. It gives economic value to a nation's knowledge.

To assist in its inquiry, the Committee seeks to compile a series of case studies of successful technological innovations, and the pathways to commercialisation. Submissions are sought detailing successful examples of Australian technological innovations. Submissions are also sought with particular reference to successful innovations, on issues such as:

- pathways to commercialisation;
- intellectual property and patents;
- skills and business knowledge;
- capital and risk investment;
- business and scientific regulatory issues;
- research and market linkages;
- factors determining success; and
- strategies in other countries that may be of instruction to Australia.

List of Abbreviations

ABF	Australian Business Foundation
ABS	Australian Bureau of Statistics
ACDS	Australian Council of Deans of Science
ACIP	Advisory Council on Intellectual Property
ACS	Australian Computer Society Inc
AEEMA	Australian Electrical and Electronic Manufacturers' Association
AFC	Australian Film Commission
AFTRS	Australian Film, Television and Radio School
AGC	Australian Geoscience Council
AGP	Australian Growth Partnerships
AIA	Australian Innovation Association
AIC	Australian Institute for Commercialisation
AIG	Australian Industry Group
AIIA	Australian Information Industry Association
AIMS	Australian Institute of Marine Science
ANSTO	Australian Nuclear Science and Technology Organisation
ANTA	Australian National Training Authority
ANZAAS	Australian and New Zealand Association for the Advancement

	of Science
ARC	Australian Research Council
ATO	Australian Taxation Office
ATSE	Australian Academy of Technological Sciences and Engineering
AVCC	Australian Vice-Chancellors' Committee
BAA	Backing Australia's Ability
BCA	Business Council of Australia
BERD	Business Expenditure on Research and Development
BIF	Biotechnology Innovation Fund
BIHECC	Business–Industry–Higher Education Collaboration Council
CASR	Collaboration and Structural Reform (Fund)
CCST	Coordinating Committee on Science and Technology
CHASS	Council for Humanities, Arts and Social Sciences
COMET	Commercialising Emerging Technologies
CRC	Cooperative Research Centre
CRP	Commercial Ready Program
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCITA	(Australian Government) Department of Communications, Information Technology and the Arts
DEST	(Australian Government) Department of Education, Science and Training
DITR	(Australian Government) Department of Industry, Tourism and Resources
DSTO	(Australian Government) Defence Science and Technology Organisation
EMDG	Export Market Development Grant

ESVCLP	Early Stage Venture Capital Limited Partnerships
EU	European Union
FMA	Financial Management Accountability (Act 1997)
GEM	Global Entrepreneurship Monitor
GDP	Gross Domestic Product
HECS	Higher Education Contribution Scheme
HEFCE	Higher Education Funding Council for England (UK)
HEIF	Higher Education Innovation Fund (UK)
HEROBC	Higher Education Reach Out for Business and Community (Scheme)
ICGS	Integrated Company Growth Services
ICIP	Industry Cooperative Innovation Program
ICT	Information and Communications Technology
IGS	Institutional Grants Scheme
IIF	Innovation Investment Fund
IP	Intellectual Property
IR&D	Industry Research and Development
ISIC	International Standard Industrial Classification
KCA	Knowledge Commercialisation Australasia
MBA	Masters of Business Administration
MLA	Meat and Livestock Australia
MRI	Medical Research Institute
NCGP	National Competitive Grants Program
NCP	National Competition Policy
NCVER	National Centre for Vocational Education Research

NHMRC	National Health and Medical Research Council
NIAS	National Innovation Awareness Strategy
NIC	National Innovation Council
NIQTL	National Institute of Quality Teaching and Leadership
NRP	National Research Priority
OECD	Organisation of Economic Cooperation and Development
PCT	Patent Cooperation Treaty
PDF	Pooled Development Funds
PFRA	Publicly Funded Research Agencies
PFRI	Publicly Funded Research Institutes
PMSEIC	Prime Minister's Science, Engineering and Innovation Council
PSF	Pre-Seed Fund
R&D	Research and Development
RDC	Rural Research and Development Corporation Chairs Committee
ROI	Return on Investment
RQF	Research Quality Framework
RTS	Research Training Scholarships
SBEP	Small Business Entrepreneurship Program
SBIR	Small Business Innovation Research (USA)
SET	Scientific, Engineering and Technical
SIA	Science Industry Australia
SME	Small to Medium Enterprise
TPP	Technological Product and Process Innovation

TRIPS	Trade Related Aspects of Intellectual Property Agreement
UK	United Kingdom
US(A)	United States of America
VCLP	Venture Capital Limited Partnership
VET	Vocational Education and Training
WIPO	World Intellectual Property Organisation

List of Recommendations

3 Innovation and Commercialisation Policy and Program Framework

Recommendation 1

The Committee recommends that the Australian Government better promote the assistance that is available for businesses to locate the most appropriate innovation support programs.

Increased promotion to be considered includes:

- the provision of prominent links in all publicity materials and on Australian Government innovation websites to program assistance available through AusIndustry initiatives and the National Innovation Council website; and
- disseminating promotional information and liaising more closely with industry organisations and peak bodies.

Recommendation 2

The Committee recommends that the Australian Government Department of Education, Science and Training establish a working group to improve the coordination of Australia's innovation policy framework.

Specifically the working group should consider initiatives to:

- further strengthen cross-portfolio dialogue to enhance the whole-of-government understanding of innovation policy needs; and
- improve cross-portfolio program coordination, so as to ensure continuity of support throughout the innovation process.

4 Human Capital—Knowledge and Skills

Recommendation 3

The Committee recommends that the Department of Education, Science and Training, in conjunction with the Australian Vice-Chancellors' Committee and publicly funded research agencies:

- conduct a study into jurisdictional, promotion, mobility and cultural issues in publicly funded research agencies and universities which may impede an entrepreneurial culture and innovation; and
- develop options for universities and publicly funded research agencies to provide governance structures and incentives which encourage business and entrepreneurial skills and commercial outcomes within these organisations.

Recommendation 4

The Committee recommends that the Department of Education, Science and Training expand its annual *Australian Science and Innovation System: A Statistical Snapshot* to include the following data:

- the number of students with combined science, engineering, technology/business/commerce degree qualifications;
- state and territory breakdowns of science, engineering, technology graduates;
- breakdown by subject and qualification of the number of foreign citizens with science, engineering, technology qualifications graduating from Australian universities; and
- science, engineering, technology graduate workforce participation rates.

Recommendation 5

The Committee recommends that the Australian Government establish a dedicated whole-of-government taskforce to develop a series of measures targeting the early development of entrepreneurial skills in the education system (including the early school years) and the broader community. To inform the development of these measures, the Committee recommends that the taskforce draw upon the expertise of educators, researchers and industry specialists.

5 Connecting Knowledge, People and Markets

Recommendation 6

The Committee recommends that IP Australia implement strategies to promote the uptake of the innovation patent, and report to the Australian Government Minister for Industry by 30 June 2007 on the following:

- the increased level of uptake for the innovation patent; and
- the effectiveness of the innovation patent in reducing costs for small to medium sized enterprises.

Recommendation 7

The Committee recommends that the Attorney-General request the Advisory Council on Intellectual Property to review Australia's intellectual property system to determine the capacity for reduction in the misuse of the system.

Recommendation 8

The Committee recommends that the Australian Government, through the Department of Foreign Affairs and Trade, pursue the enforcement of intellectual property legislation during trade and diplomatic negotiations with China.

Recommendation 9

The Committee recommends that the Australian Government review Intellectual Property legislation according to National Competition Policy Agreements and establish an Intellectual Property legislation system of periodic re-review.

Recommendation 10

The Committee recommends that the Australian Government give priority consideration to the Commonwealth Scientific and Industrial Research Organisation's proposal for an Australian Growth Partnerships program to engage small to medium enterprises in demand driven collaborations with publicly funded research agencies.

Recommendation 11

The Committee recommends that the Australian Government request the Business Industry Higher Education Collaboration Council to examine and develop the business case for third stream funding to universities.

Recommendation 12

The Committee recommends that the Australian Government introduce a funded cluster development program to encourage the Australia-wide development of clusters which bring together innovation in research, business and education.

6 Life Cycle Support and Funding for Innovation and Commercialisation

Recommendation 13

The Committee recommends that the Australian Government introduce a funded proof of concept scheme, based on the Group of Eight Innovation Stimulation Fund proposal and providing the following for university research projects with high potential for commercial outcomes:

- matched Australian Government and university funding investment in the suggested ratio of 3:1;
- a maximum funding per project of $100 000; and
- funded for an initial three year period to a maximum Australian Government investment of $45 million.

Recommendation 14

The Committee recommends that the Australian Government implement additional support mechanisms to specifically assist the progression of innovation through pathways other than the formation of start-up companies.

Recommendation 15

The Committee recommends that the Australian Government assess the revenue implications and potential economic returns of extending the R&D Tax Concessions eligibility to include Australian based subsidiaries of multinational companies.

Recommendation 16

The Committee recommends that the Australian Government Department of Industry, Tourism and Resources extend the support available to provide for later stage commercialisation activities, such as market identification, marketing and sales strategies.

This support may be provided either by extending the range of activities eligible under the Commercial Ready Program or by establishing alternative mechanisms of assistance which are compliant with World Trade Organisation and other trade agreement conditions.

Recommendation 17

The Committee recommends that the Australian Department of Industry, Tourism and Resources conduct a formal review by 30 June 2007 of the effectiveness of the Commercial Ready Program, giving particular consideration to the following possible program amendments:

- extending eligibility to spin-off companies from publicly funded research institutions;
- extending eligibility to Australian-based subsidiaries of foreign owned companies; and
- reducing the co-contribution requirements and increasing the turnover thresholds.

Recommendation 18

The Committee recommends that the Australian Government:

- direct all Government agencies to report publicly on what proportion of the 10 per cent purchasing from small to medium enterprises, which is set out in Australian Government Procurement Guidelines, is directed toward technological innovation; and
- investigate mechanisms to encourage Government procurement of technological innovation from Australian small to medium enterprises where available.