GOVERNMENTS WORKING TOGETHER

NATIONAL INNOVATION AGENDA

DRIVING A STRONGER FUTURE FOR AUSTRALIA THROUGH A NEW NATIONAL APPROACH TO INNOVATION

Proposal
March 2007

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PROPOSAL

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Contents

Foreword

Australia is at a crossroads, with our strong economic performance and quality of life now facing imminent and unprecedented challenges and opportunities. The world economy is undergoing a major shift as economic powerhouses like China and India move into high-skilled, high value-added industries and more and more countries compete in global supply chains.

We also face a water crisis, the need to cut greenhouse gas emissions, coupled with rising energy costs and an ageing population, at a time when our workforce needs to be more productive, not less.

To keep us internationally competitive, to deal with these challenges, and to capitalise on opportunities that will continue to emerge from the changing nature of global competition, we need to massively boost Australia's innovation capabilities so we can better turn our new ideas into new products, services and solutions.

And we need to do this as a matter of national urgency, taking advantage of our current prosperity to invest in our future as a wealthy, healthy, safe, clean and smart nation.

Australian governments have recently made strong – and historic – progress in working together on a National Reform Agenda (NRA) to deliver a new wave of reform to boost productivity and increase workforce participation. With innovation becoming increasingly central to Australia's future prosperity, a powerful case exists for a new national approach to innovation that will sustain and enhance the NRA.

So after initial consultation with key stakeholders, and roundtables held around Victoria, the Victorian Government has developed a National Innovation Agenda (NIA) Proposal to drive a whole-of-Australia approach to strengthen our innovation system.

This Proposal has been developed as a basis for engagement between all stakeholders to build a shared national approach to innovation.

Australia has no shortage of innovative and creative people, but we lack a sufficiently cohesive and focused nationwide system to best turn their work into tangible economic gains. In fact, Australia is as much as 60% below the Organisation for Economic Co-operation and Development (OECD) average on various indicators of innovation-driven business growth.

While we are yet to model specific actions, simple estimates based on OECD figures suggest that if we lift our business expenditure on research and development (BERD) to the OECD average, this might add up to $45 billion annually to Australia's Gross Domestic Product (GDP) in the long run.

Ultimately, it is the market place that drives business and industry innovation. However, all governments have a responsibility to provide the best possible settings and support for an innovation-driven economy. Australian governments can and must ensure that our firms have the best possible environment in which to innovate.

The NIA proposed here is based around the five key themes that consistently emerged during our initial consultations:

→ Increase business innovation;

→ Provide the infrastructure to enable innovation;

→ Develop skills for the innovation economy;

→ Create a better regulatory environment for innovation; and

→ Forge better connections and collaborations.

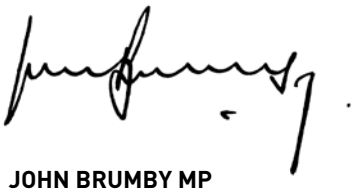
This NIA Proposal recognises that innovation can and does happen anywhere, not just in high-tech industries. It should be treated not as a research and development (R&D) or science and technology issue, but as a major economic strategy that must flow through all sectors of Australia from classrooms to workrooms to boardrooms. And your ideas are now sought to identify the most effective course of action.

The world is moving faster, more countries are stepping up their innovation systems and Australia's environmental, energy and demographic challenges now pose a serious threat to our quality of life.

The NIA provides a roadmap for governments to work together on giving Australians the best possible opportunity to build a new innovation culture that will create new levels of prosperity and higher standards of living for all Australians.

We will be seeking further discussion and ideas from government and industry stakeholders to develop an agreed NIA Proposal and suite of actions, including through an Innovation Forum to be held in 2007. We would then propose the final NIA be considered by collaborative State and Australian Government fora, and ultimately by the Council of Australian Governments (COAG).

HON STEVE BRACKS MP
Premier of Victoria



JOHN BRUMBY MP
Minister for Innovation

Key Points

- Innovation is a major driving force for economic growth, productivity and competitiveness in developed economies.
- Innovation is the key to our response to the challenges facing Australia and the international community – climate change, drought, energy, security and an ageing population.
- Many of Australia's competitor nations have recognised this and are investing significant new resources in developing their innovation capabilities.
- Australia's innovation system has been strengthened in recent years but, relative to other Organisation for Economic Co-operation and Development (OECD) economies, Australia's weaknesses relate to low levels of investment in business innovation and research and development (R&D), and very low levels of US patenting.
- Under-investment in innovation means that some innovative projects with potentially significant economic and social returns will not be undertaken, and others will be undertaken more slowly or on a smaller scale than is desirable from a wider social or economic perspective.
- An innovation economy is open and connected to the world. Australia generates less than two per cent of the world's new knowledge. Our readiness to adopt the 98 per cent of new knowledge developed overseas is critical to our international competitiveness.
- There will be substantial gains from a new focus on innovation. While we are yet to model specific actions, simple estimates based on OECD figures suggest that if we lift our business expenditure on research and development (BERD) to the OECD average, this might add up to $45 billion annually to Australia's Gross Domestic Product (GDP) in the long run.
- Average annual productivity gains due to economy-wide broadband adoption, a significant platform for innovation, could lead to Gross State Product (GSP) growth in Victoria of 0.82 per cent, peaking at $2.5 billion in 2008. For Australia, the benefits might equate to around $10 billion.
- The Productivity Commission notes that R&D produces large returns to the market sector (of around 85 to 180 per cent) through productivity increases that are not captured by the firms undertaking the R&D.
- Over the past year, Australian governments have made strong progress in working collaboratively in developing the National Reform Agenda (NRA). This work extends the National Competition Policy (NCP) reforms which commenced in the 1990s.
- The proposed National Innovation Agenda (NIA) builds on these platforms. It will add additional value, jobs and wealth to that created through the NRA.
- The NIA will aim to:
  - Grow the whole nation in a rapidly changing world; and
  - Position Australia as a regional hub of innovation.
- The NIA is intended to address five key areas for attention:
  - Increase business innovation;
  - Provide the infrastructure to enable innovation;
  - Develop skills for the innovation economy;
  - Create a better regulatory environment for innovation; and
  - Forge better connections and collaborations.
- The NIA will help position Australian industries to better respond to the new competitive paradigm of intense competition, constant change and increasing global integration.
- The NIA is about working collaboratively, between Australian governments and with industry and other stakeholders to ensure that Australia has the best possible environment in which our firms and industries can innovate.

Part One
Introduction

Australia must become an innovation leader. Our future prosperity and our ability to address the significant environmental and societal challenges that we face depend on this.

In recent years, Australia has enjoyed strong economic growth and one of the highest rates of productivity growth in the developed world, due to major waves of economic reform that have opened up the Australian economy and increased its competitiveness. As the pace of global change increases, the effect of these gains will evaporate. Continued reform is needed to secure ongoing gains in productivity and competitiveness.

Innovation is now the main force driving economic growth, productivity and competitiveness around the world.

Firms now locate all or part of the production process or service wherever the economic advantage is greatest. Significant reductions in the costs of transportation and communication have opened up new markets. Faster global communications mean that consumers learn about new ideas and products quicker than ever before. Businesses must have the awareness to continually create, evaluate and successfully exploit their new ideas to survive and prosper in this environment.

Innovation goes beyond improvements to products and services via research and development (often called product innovation). It can be incremental in nature and involve changes to production processes, service delivery and information management that better position all businesses – not just participants in high tech industries – to respond to customer needs (process innovation).

Innovative businesses benefit the whole economy by delivering:

- Added value;
- High quality jobs;
- Successful businesses;
- Better products and services for customers; and
- New, more environmentally friendly processes.

Defining innovation

Innovation is about change that adds value – finding new and better ways of working.

Innovation involves the generation and application of knowledge and ideas to add value and create wealth through new goods, services and processes.

Innovation is important for every industry in the economy. But the research, technology or skill intensity of innovation activities will vary between firms and industries.

An innovative business is one that is flexible and focused. It is fiercely competitive and actively collaborative. It seeks new opportunities and invests in the skills, research, design, production systems and market development to secure these opportunities.

An innovation economy is one that is open and forward looking. It invests in the skills, research, infrastructure and the strategic sectors that enable innovation such as ICT and design. And it manages risk and promotes entrepreneurship and an environment which enables innovative businesses to thrive.

An innovation economy worker continually invests in their skills, knowledge and creativity to create and deliver highly competitive and high-value added products and services.

For society, as well as underpinning economic and job growth, innovation delivers wider benefits through advances in community services such as health, education, communications and transport. Innovation will also be a key factor in addressing challenges associated with the environment.

Having been at the forefront of the global economic reform agenda, Australia must now position itself at the forefront of global innovation. To achieve this, we must fully develop Australia's capacity to trade our ideas on international markets, build the innovative capabilities of our people and businesses and create a national culture that encourages, facilitates and supports innovation.

What is the National Innovation Agenda?

The NIA aims to:

→ **Grow the whole nation in a rapidly changing world; and**

→ **Position Australia as a regional hub of innovation.**

The NIA builds on the recent reform agenda and presents Australian governments a timely challenge to significantly improve Australia's innovation performance or watch us slip behind our competitor nations.

The NIA invites participation in the development of a program of collective actions by Australian governments to boost productivity and maximise the outcomes of innovation for the national economy. The NIA seeks to engage industry and innovation institutions in developing and implementing these actions.

PAGE > 8

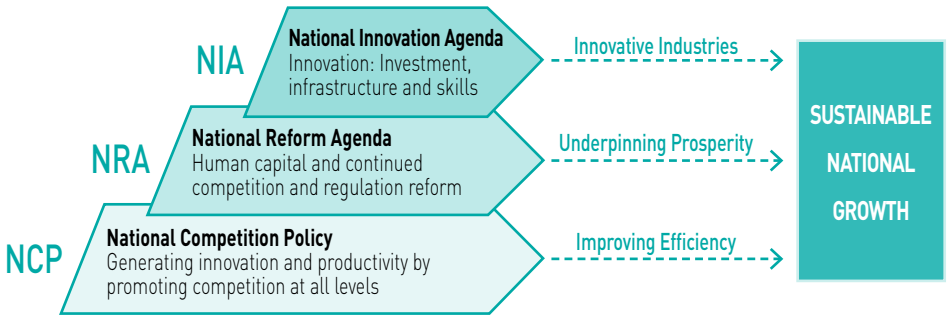
National Innovation Agenda

A new proposal to drive and sustain growth

Building on competition and regulation reform

Tackling innovation skills, infrastructure and investment

Builds on innovation investment by Australian Governments – e.g. Backing Australia's Ability (Commonwealth), STI Initiative (VIC), Smart State (QLD), STI 10 (SA), Knowledge ACT, Innovate WA, Biofirst (NSW), Innovation program (TAS), and R&I Fund (NT).



The NIA recognises Australia's innovation needs

As a small, open economy, Australia has different innovation requirements from large economies like the USA and the European Union.

For many small OECD countries, knowledge and technology from abroad have a larger impact on productivity than domestically developed knowledge and technology. However, domestic investment in science and innovation is critical, both to generate solutions to our specific problems and to enable the absorption of 'imported' knowledge, ideas and technology.[1]

With less than two per cent of the world's new knowledge developed in Australia and 98 per cent developed elsewhere[2], the NIA seeks to create a national innovation system that will continue to support the generation of knowledge, while ensuring that Australian businesses significantly improve their capacity to absorb knowledge, ideas and technologies from local and international sources.

The NIA emphasises the importance of bringing an international perspective to Australia's innovation agenda, with a major focus on building the innovation capabilities of our businesses. The NIA proposes five key areas for attention:

→ Increase business innovation;

→ Provide the infrastructure to enable innovation;

→ Develop skills for the innovation economy;

→ Create a better regulatory environment for innovation; and

→ Forge better connections and collaborations.

[1] OECD (2000) *A New Economy? The Changing Role of Innovation and Information Technology in Growth* .

[2] Based on DIIRD analysis (2006).

Why a National Innovation Agenda?

The OECD estimates that in advanced industrial economies, innovation and the exploitation of scientific discoveries and new technologies have accounted for 50 per cent of economic growth – and will become even more critical to the economic and social wellbeing of industrialised countries over the next two decades.[3]

The Business Council of Australia (BCA) argues that:

- Innovation is becoming increasingly significant in driving the productivity performance and international competitiveness of many developed economies.
- Increasing global competition, particularly from low-cost emerging economies, and the steadily increasing rate of global technological change means that competing through efficiencies delivered by structural reform and competition is no longer enough for many developed economies.
- More than ever before, developed economies are competing on the basis of unique value delivered through the application of knowledge in the production process.[4]

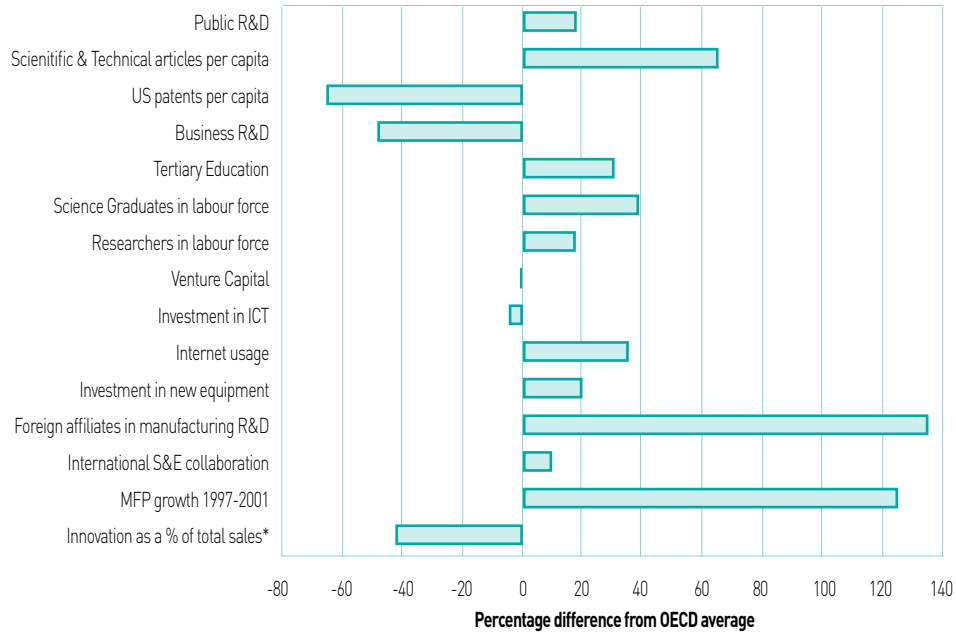
Australia's Innovation Performance

The Australian Government's Innovation Scorecard indicates that, while not leading in any category, Australia is performing strongly, relative to other OECD economies on productivity, scientific input and output, and workforce measures.

Australia's weaknesses relate to business performance, with low levels of investment in business innovation and R&D, and very low levels of US patenting. The Innovation Scorecard also highlights Australia's reliance on foreign companies for investment in manufacturing R&D. This identifies a competitive strength of Australia as a location for R&D, but also a significant weakness in R&D performance by local manufacturing firms.

The Scorecard points to the need to improve the Australian environment for business innovation and this therefore is the focus of the NIA.

Australian Innovation Scorecard 2004[5]



[3] See for example: OECD (February 2006) *Economic Policy Reforms: Going for Growth 2006* and OECD (January 2004) *Benchmarking Innovation Policy and Innovation Framework Conditions.*

[4] Business Council of Australia (March 2006) *New Concepts in Innovation: the keys to a growing Australia.*

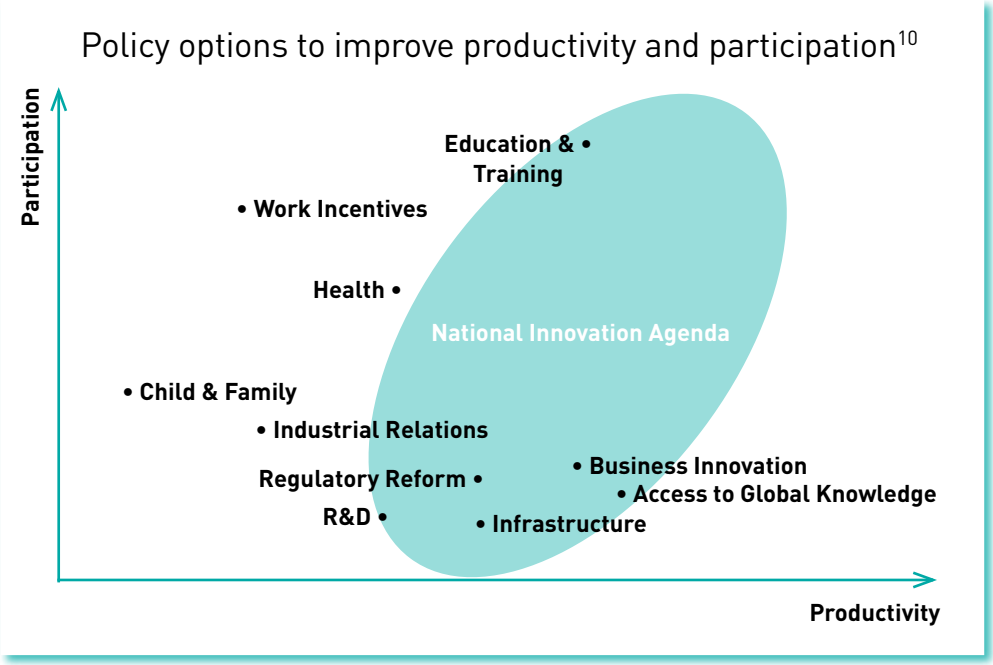
[5] Department of Education, Science and Training (2004) *Australian Innovation Scorecard.*

The gains could be significant

The gains to the economy from investing in innovation could be significant. The following are provided as indications of the potential size of the impact.

- The R&D component of innovation activity has been directly linked to productivity. Based on international comparisons, the OECD has estimated that a persistent increase of 0.1 percentage point in the share of BERD in GDP is associated with a long run increase of 1.2 per cent in output per working age person. Using this assumption, and putting aside a number of important caveats, a simple estimate suggests that lifting Australia's ratio of BERD to GDP to OECD average levels could be associated with a long-run addition of about $45 billion to Australia's annual GDP.[6]
- The Productivity Commission in its 2007 research report, *Public Support for Science and Innovation* noted that while confidence intervals are wide, empirical evidence adds weight to the hypothesis that R&D produces large returns to the market sector through productivity increases that are not captured by the firms undertaking R&D (ie. there are productivity 'spillovers' from R&D activity). The report finds returns between around 85 and 180 per cent.[7]
- New generation broadband is fundamental infrastructure in a successful innovation economy. The 2004 ACIL Tasman report, *Economic Impacts of Broadband Adoption in Victoria*[8] estimates that over a ten-year period to 2015, the average annual productivity gains due to economy-wide broadband adoption is 0.23 percentage points, with a peak of 0.35 percentage points in 2007 and 2008. Under the scenario that includes employment effects, this translates into an average annual contribution of broadband to GSP growth of 0.82 per cent, peaking at $2.5 billion in 2008. Should there be similar benefits for Australia, it would equate to around $10 billion.
- A large proportion of innovation economy workers hold postgraduate qualifications. Postgraduates have higher participation rates (85 per cent) and higher salaries than other workers. It has been estimated that the return to the economy from a postgraduate worker is $32,000 per annum higher than a bachelor degree holder.[9]

[6] Simple estimate, based on 2005-06 GDP and OECD 2003, *The sources of economic growth in the OECD countries*, p.88 .
[7] Productivity Commission Research Report (2007), *Public Support for Science and Innovation*, Overview, p.xx.
[8] ACIL Tasman, *Economic Impacts of Broadband Adoption in Victoria: Final Report*, for Multimedia Victoria, June 2004.
[9] Insight Economics, estimates provided, July 2006.



This figure illustrating the impact of policy options on increases in productivity and participation has been developed from a figure in **A Third Wave of National Reform** and the above data.

The figure is indicative of the scope and potential productivity benefits from actions undertaken as a result of the NIA.

[10] DTF analysis for the Treasurer of Victoria and the *A Third Wave of National Reform* (August 2005). Note that Business Innovation and Access to Global Knowledge has been added to the original diagram.

Why now?

Australian firms and industries are facing a new competitive paradigm. It is a paradigm that is characterised by constant change and increasing global integration.

The pace at which global integration is occurring is unprecedented. These changes are enabling new and highly able competitors to emerge. Firms from China, India and other newly industrialising nations are at the forefront of these changes. They are stripping away traditional sources of competitive differentiation and challenging firms, regions and countries to find new sources of competitive advantage.

Innovation has become increasingly important to every sector of the Australian economy, including resources, agriculture, manufacturing and service industries. Australia's large, profitable natural resources sector currently produces a significant share of export earnings. This sector is highly innovative, and depends on future innovation and infrastructure investment to maintain competitiveness. To continue to compete in manufacturing, Australia will need to innovate strongly, creating new high-tech manufacturing industries and upgrading traditional sectors.

Innovation is at the heart of creating competitive advantage in this environment. Yet Australian firms are not innovating enough.

Governments cannot make firms innovate, nor do they need to – the competitive market place in which they operate will do that. But governments can ensure that Australia has the best possible environment in which our firms and industries can innovate. We need to act now if Australian industry is to respond more actively to the global paradigm shift.

As a nation, we are facing significant challenges to our capacity to sustain our living standards and quality of life. Water, climate change and low emissions energy generation and consumption are among the significant environmental issues we must address if future generations are to enjoy today's quality of life. The ageing of the population with related health and workforce participation impacts is among the issues that we need to address. Innovation is a central element of our response.

We will not be able to sustain our quality of life and address these issues without new approaches and new technologies. We need to be innovative in the way we embrace these challenges, as governments, industries and communities. Proactively embracing these challenges will provide many opportunities for Australian businesses to strengthen their competitiveness, thereby underwriting future growth and exports.

Drivers of change

- Decreasing cost of information and communications.
- Rapid advances in the technological landscape – including digitalisation, biotechnologies, nanotechnologies and other new and emerging manufacturing technologies.
- The creation of demanding global supply and value chains where even inputs such as research and development are increasingly subjected to competitive forces.
- The liberalisation of product and labour markets.
- Deregulation of investment and financial flows.

Australian business innovation performance

The ABS Innovation in Australian Business survey[11] found that over the period 2004 to 2005, only 34 per cent of all Australian businesses undertook any innovation activity. Of those that were engaged in goods and services innovation, only 8 per cent undertook 'new to the world' activities; 15 per cent were undertaking activities that were new to Australia. Less than 1 per cent of innovating businesses reported introducing new operational or organisational/managerial processes that were 'new to the world'. However, for the majority of innovating firms (74 per cent), the most novel form of innovation activities were new only to the business. This suggests that firms were innovating to catch up rather than to get ahead. The survey highlighted the main barriers to innovation as:

- Cost factors, including the direct cost of innovation being too high, the degree of economic risk and the availability of finance;
- Market factors, including market dominance and lack of customer demand; and
- The availability of skilled personnel.

The *Fujitsu Innovation Index*[12], which looked at a small sample of large and fast growing firms in 2006, supported many of the 2004/05 findings. It also highlighted leadership and cultural issues as barriers to innovation.

[11] ABS (2006), *Innovation in Australian Business (2005)*, Cat 8158.0.

[12] Fujitsu (2006), *Igniting Innovation Performance, the Fujitsu Innovation Index 2006*. Survey of 178 large and fast growing companies in Australia and New Zealand .

Why this approach?

Government leadership is critical to improving Australia's innovation performance.

The OECD has noted that 'a high innovation performance is directly related to an active innovation policy – that is, policy has a key role to play in ensuring that new innovations are developed and technology properly diffused throughout the economy'.[13]

Smith and West point out that: '[I]nnovation rests on complex capabilities that extend well beyond those possessed by firms, and it requires long-term investment in conditions of great risk and uncertainty. These characteristics of innovation performance imply serious market and system failures. This is why successful innovating economies invariably possess successful public policy systems. Such systems tend to focus on knowledge creation and risk management'.[14]

Under-investment by firms in innovation means that some innovative projects with potentially significant economic and social returns to the broader community will not be undertaken, while others will be undertaken more slowly or on a smaller scale than is desirable from a wider social or economic perspective.

Government support for innovation aims to minimise these market and system failures by providing incentives for private sector investment in innovation. Governments can reduce the costs and risks for businesses undertaking innovation through measures such as incentives, supporting intellectual property rights, creating innovation-friendly regulatory environments and by being a customer that demands innovative solutions and services.

The success of the NCP demonstrates that a clear national policy and institutional framework is necessary for long-term reform. Developing a similar national framework through the NIA will achieve a more integrated approach to innovation, informed by an understanding of Australia's innovation system. This more integrated approach will provide better returns on public investment in innovation.

The benefits of a more integrated approach are supported by the findings of the recent Productivity Commission (PC) research report, *Public Support for Science and Innovation*. The PC noted that the increased involvement of governments in science and innovation policy increases the risk of coordination problems and noted its support for initiatives that seek to improve collaboration across jurisdictions[15] – such as the NIA.

In a federal system of government, there are always going to be areas of joint or overlapping responsibility and accountability. However, the further integration of Australia's economy with the global environment requires Australia's federal and state governments to develop policy mechanisms jointly. This will reduce duplication whilst addressing issues of scale, distance and fragmentation to better understand, utilise and integrate the innovation system. Regional and rural communities are also significant players in the innovation debate, and policy must take into account regional priorities.

Lessons from national reform

Previous reforms undertaken at the national level – such as the National Competition Policy – demonstrate three important lessons that also apply to the National Innovation Agenda:

- We need to take every opportunity to lift our sights and reach for new levels of prosperity.
- Major gains can be achieved through governments working together.
- National reform requires both strong leadership and a clear framework.

This approach recognises the respective strengths and roles of the Australian and State and Territory governments in supporting innovation and the development of an innovation economy.

[13] OECD (January 2004) *Benchmarking Innovation Policy and Innovation Framework Conditions.*

[14] Smith, K and West, J (2005) *Australia's Innovation Challenges: The key policy issues*, Submission to the House of Representative Standing Committee on Science and Innovation (HRSCSI) Inquiry into Pathways to Technological Innovation.

[15] Productivity Commission Research Report (2007), *Public Support for Science and Innovation*, p.363-364.

A recent Australian Treasury working paper, *Perspectives on Australia's Productivity Prospects*, notes that while the Australian economy is now more open, competitive and flexible as a result of the reforms of recent decades, 'the reforms themselves are likely to have lifted productivity levels in specific industries, rather than increasing the economy-wide productivity growth rate'.[16]

The NIA aims to take the reform agenda forward by building new capabilities and pursuing new opportunities that will underpin higher levels of productivity and economic growth. The role for governments in this agenda is more diffuse and complex than with previous reforms: there is no single action that will make the difference.

The NIA requires a portfolio of measures that are shared between Australian governments, industry and our innovation institutions. It will require ongoing commitment over the long term. However, the gains from the NIA are likely to be significant, compounding and self-sustaining – maturing Australia's business culture and skills to the point where we are at the forefront of global reform and acknowledged as one of the world's most innovative and competitive nations.

The regional innovation challenge

Improving the innovation performance of regional economies is essential to Australia's growth and competitiveness.

Innovation is already driving change in regional businesses and industries. Many of Australia's regions have strengths in industries in which higher levels of innovation will yield substantial benefits, including agriculture, food production, resource and environmental management, transport and distribution, tourism and design. There is potential to further boost business innovation at the regional level through clusters based around particular industries, research institutions or locations, and by capturing new opportunities in emerging areas such as the life sciences, green manufacturing and renewable resources.

Many regions also stand to reap significant benefits from forging new domestic and international connections, collaborations and partnerships.

While significant developments are taking place across regional Australia, many regional areas report particular challenges in securing new opportunities and realising the benefits from higher levels of investment in innovation. For example, regional businesses report difficulties in accessing world class innovation infrastructure and research, attracting and retaining skilled people, and obtaining access to capital.

Regional businesses attending Victoria's NIA roundtables identified inadequate ICT infrastructure as an ongoing barrier to greater innovation in many parts of Australia, adversely affecting the capacity of businesses to connect to the national and international marketplace, establish connections and collaborations, and attract supporting businesses to the region.

The need for closer collaboration between regional businesses and universities, TAFEs and research institutes is also important for driving innovation in a number of areas: raising awareness in regional communities of the innovation opportunities in particular industries, developing education and training programs that match the needs of regional industries, working together to attract skilled and talented people, and establishing networks around particular local areas of strength and advantage.

The NIA will help to ensure that the particular challenges and difficulties facing regional industries, businesses and communities are understood and addressed. Through the NIA, governments can help identify future industry opportunities that are likely to arise for regional areas – and the most efficient and effective use of national resources to take advantage of such opportunities. The NIA also presents a significant opportunity to identify, consolidate and coordinate regional innovation assets and activities at the national level.

[16] Davis, G and Rahman, J (September 2006) *Perspectives on Australia's Productivity Prospects*, Commonwealth Treasury Working Paper.

Lessons from other countries

Finland – an innovation success story[17]

Finland's national innovation system is now seen as one of the strongest in the world. To achieve this, Finland has focussed continuously on building its science, technology and innovation capabilities since the end of World War II.

Part of Finland's success was due to industrialisation by a few large corporations, with public and private sectors working in close co-operation in the early 1950s and 1960s. These corporations, led by Nokia, were responsible for Finland's emergence as a microelectronics and mobile communications leader in the 1990s. Today, the Finnish economy is highly clustered, particularly in areas of food, ICT, metals, construction and forestry. There are strong science and technology (S&T) links in these clusters.

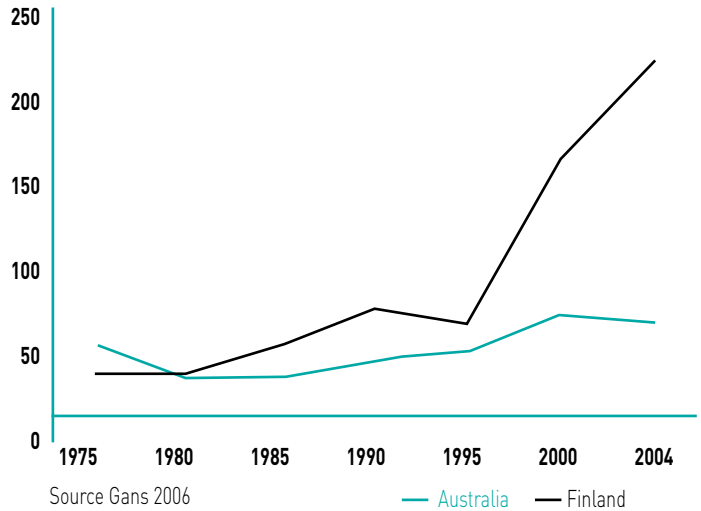
By the early 1980s, Finland had introduced a policy which sought to avoid the resistance to technology adoption that was happening elsewhere in Europe. Notably, the Finnish Government encouraged public debate aimed at gaining national consensus on a policy that would continually introduce new technologies into the Finnish economy – the main focus being on micro-electronics, biotechnology and material technologies. By the time the information revolution began to accelerate in the mid 1990s, Finland had the policies in place to take advantage of it.

During the 1980s, policy reform continued, Government continued to increase its support for R&D and there was a strong political commitment to the development of S&T policies. Business R&D investment also continued to grow.

Innovation and technology policies have been complemented by education and training reforms. Education in Finland is highly valued and is free across all three tiers. Firms also have a strong emphasis on training, and strong links with universities and polytechnics. The business sector is the largest employer of researchers, in stark contrast to Australia, where twice as many researchers work in universities than in industry.

Finland responded to the collapse of the Soviet Union, its major trading partner, by opening its economy to international trade and competition. At the same time the Government R&D budget increased and S&T policies were further refined. These actions enabled Finland to reverse a very deep recession where unemployment peaked at 20 per cent. From this point, innovation policy was further enhanced and refined – making Finland's economy highly competitive by inculcating a business environment more conducive to the exploitation of new technologies.

Innovation index



Source Gans 2006

Finland's innovation success story is the result of decades of effort. The key lessons are:

- The importance of building up a policy consensus about the development and direction of the economy;
- Commitment to the agreed policy plan despite political and economic challenges;
- Continuous improvement of the agreed policy to enhance the system; and
- The long lead times required to observe gains from economic reform and innovation.

Notably, Finland has benefited from the advantages of smallness – allowing for a flexible system with ease of communication, networking and the ability to gain consensus on policy and investment.

Finland has a long tradition of support for innovation; it used this to lift it out of the depths of recession in the early 1990s. We need to invest in innovation as a basis of our ongoing competitiveness. We have the opportunity to invest the dividends of our current prosperity for future generations. World-wide wealth is created through innovation and knowledge. Like Finland, Australia has an opportunity to be a leader.

We need to act quickly, as other countries are rapidly embracing these challenges, investing heavily in building their innovation capabilities. Examples of national approaches to innovation being adopted by other countries include the following:

- In February 2006, US President George Bush announced the American Competitiveness Initiative, which proposes to dramatically increase Federal Government investment over the next decade in science and technology, R&D and education. The American Competitiveness Initiative aims to invest US$137 billion over the next ten years for science and technology R&D at the national level. This would be equivalent to Australia providing around $860 million per annum in additional investment in science and technology R&D. It represents an increase in federal R&D investment of more than 50 per cent from 2001 levels. It includes US$50 billion to increase funding for research and US$86 billion for private sector R&D tax incentives.[18]
- The British Government has established a national framework for investment in science and innovation that acknowledges that successful nations will be those that can 'compete on high technology and intellectual strength, attracting the highest-skilled people and the companies which have the potential to innovate and to turn innovation into commercial opportunity.'[19]
- Germany recently announced new support to strengthen the innovativeness of small and medium enterprises (SMEs), including establishing a national Council for Innovation and Growth, and introducing initiatives aimed at facilitating stronger networking and closer collaboration between SMEs and research institutions. Federal funding for programs for innovative SMEs is due to rise from €458 million in 2005 to €673 million in 2009.
- Ireland has made its biggest ever state investment in local venture capital markets with a €175 million investment in the second round of the Seed and Venture Capital Program in June 2006. The Irish Government expects this investment to leverage an estimated €1 billion for investment in matched funds from the private sector in start-up, early-stage and development-stage businesses.
- South Korea has become a research and technology leader in Asia by adopting a strong emphasis on innovation, implementing national programs to promote and facilitate private sector R&D and innovation, and pursuing a continuous expansion of R&D and science and technology resources. South Korea has significantly boosted its innovation performance and is on track to becoming a global leader in technology and innovation.
- China continues to register the highest annual growth rate in the world and Chinese Vice-Premier Zeng Peiyan recently told the World Economic Forum's China Business Summit 2006 that such a pace cannot be sustained without innovation. Latest OECD estimates indicate that China is now the third largest R&D spender in the world, with annual overall R&D expenditure of around US$102.6 billion. This amounts to 33 per cent of US R&D spending and 91 per cent of Japan's R&D spending.[20]

[17] OECD (2005) *Innovation Policy and Performance: A Cross Country Comparison.*

[18] Details of the *American Competitiveness Initiative* are at www.whitehouse.gov/stateoftheunion/2006/aci/index.html

[19] Department of Trade and Industry and Department for Education and Skills (2004) *Science and Innovation Investment Framework 2004-2014*, HM Treasury, United Kingdom.

[20] OECD (2004 and 2005) *Main Science and Technology Indicators.*

The Way Forward

It is proposed that the NIA be developed and implemented through channels and structures that enable and facilitate collaboration between the Australian, State, and Territory Governments, business, unions and the education and research communities.

Through fora such as, but not limited to, the Council for the Australian Federation (CAF) and the Council of Australian Governments (COAG), we can develop a shared national approach to innovation. This recognises the importance and urgency of the Agenda and the need for collaboration to achieve its outcomes.

Part Two of the NIA Proposal outlines a framework based on five key areas consistently identified during discussion hosted in Victoria. It suggests possible ideas for action arising from extensive consultation amongst Victorian stakeholders. The framework and actions are not prescriptive. Rather, they are contestable proposals included here to generate further ideas, discussion and debate.

Part Two
The National Innovation Agenda

Productivity and competitiveness across the economy will be driven by building the innovative capabilities of Australian businesses and the platforms on which innovation and growth will occur.

The NIA recognises that:

- Collective action by Australian governments working collaboratively will deliver better outcomes;
- Some regions and jurisdictions have different innovation priorities reflecting different local conditions;
- Innovation can and does happen anywhere, not just in high-tech industries;
- High-tech industries do not dominate the economy of any OECD country and focussing our innovation efforts solely towards creating new high-tech industries will not deliver the higher levels of productivity growth and competitiveness Australia needs in the years ahead; and
- There is a need for the whole economy, not just parts of it, to embrace innovation.

A new emphasis on business innovation

Traditionally Australia's innovation focus has been directed towards advancing scientific research and knowledge and using that knowledge to address critical regional, national and international challenges. Given the relatively small size of our economy, Australia's achievements in this regard have been significant.

However, innovation is more than R&D – business and industry are the key players in converting knowledge and ideas into products and services for the local and global economy. Firms do not operate in isolation when they innovate. In the innovation supply chain, one company's innovative output is an innovation input to another firm. For example, the creation of a new motor car will include many hundreds of innovation inputs from both in-house and external sources – design, tooling, engineering, and safety systems.

Innovation is the main process by which Australian businesses can lift productivity and compete successfully in a global economy. Through investment in innovation, including R&D, businesses not only generate intellectual capital, but also improve their capacity to apply new knowledge and technologies. This combination improves their competitive advantage and maximises their return on investment.

At the firm level, investment in innovation delivers significant direct returns, including higher levels of workplace productivity, improved processes, reduced costs and the ability to provide a greater range and choice of products for customers. Innovative businesses are also more likely to boost profitability. The **2005 R&D and Intellectual Property Scorecard** shows that Australian firms that spend substantial amounts on innovation, including R&D, are outperforming other top companies on the stockmarket by returning nearly 10 per cent more to shareholders over five years.[21] The recent Fujitsu innovation survey found that 'those companies that measure innovation believe that it has contributed 33 per cent of any increase in customer satisfaction and 30 per cent of any increase in profitability over the past 12 months.'[22]

The BCA has called for 'an entirely new concept of business innovation to be embedded into the national culture – in government, economic policy, business strategy, workplaces and the community'.[23] The NIA endorses such an approach by making business innovation a core focus of national economic reform, and calling for a commitment to business innovation by all Australian governments into the priority areas of investment, infrastructure, regulation, skills and collaboration.

[21] Melbourne Institute of Applied Economic and Social Research, Intellectual Property Research Institute of Australia, IBISWorld and IP Australia (2005) *R&D and Intellectual Property Scorecard.*

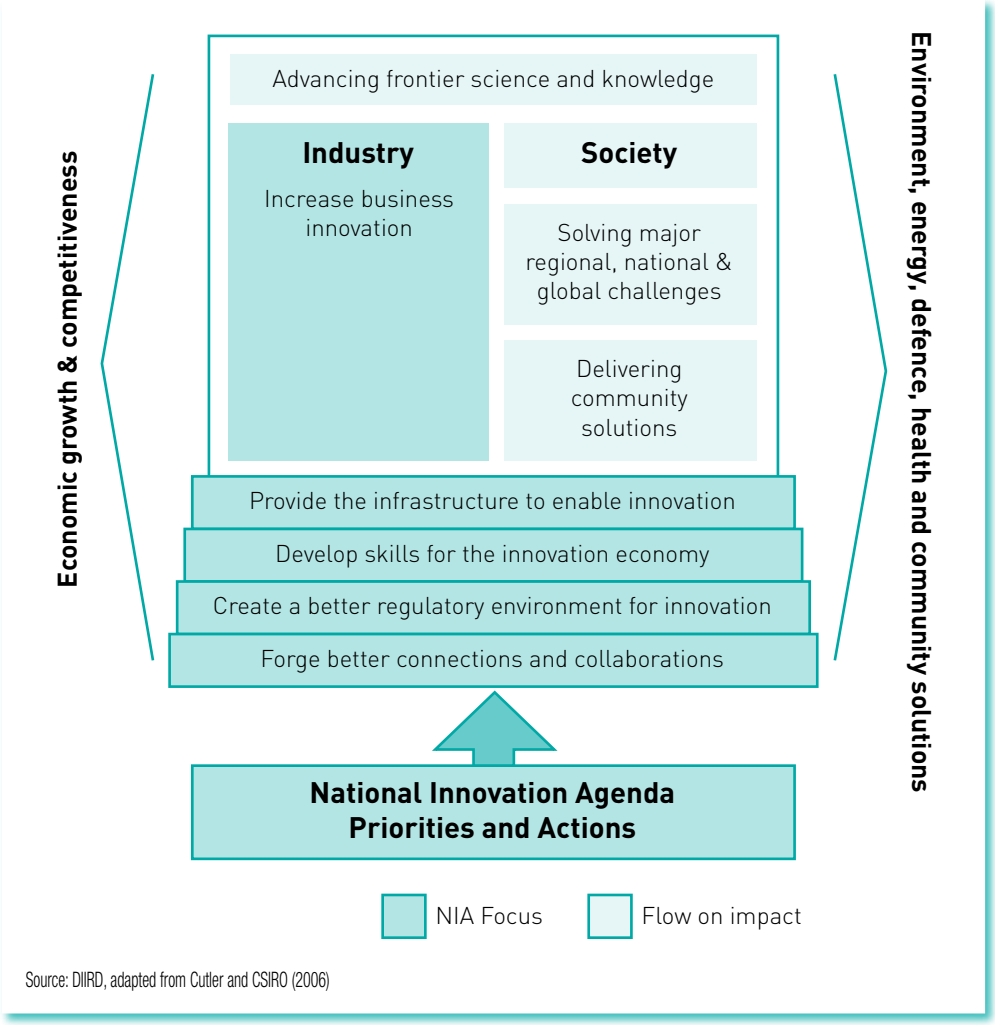
[22] Fujitsu, 2006, *Igniting Innovation Performance, the Fujitsu Innovation Index 2006.* Survey of 178 large and fast growing firms.

[23] Mr Steve Vamos, Chair, BCA Education, Skills and Innovation Task Force, Media Release, 13 March 2006.

National Innovation Agenda framework

The framework diagram below shows elements of Australia's innovation system. Activities that are industry-focussed generate economic growth and competitiveness, while activities that are society-focussed generate solutions for the social and environmental challenges facing Australia. These elements do not act in isolation from each other and are underpinned by four key areas for attention: innovation infrastructure, innovation economy skills, a supportive regulatory environment, and local and international collaborations and connections. The NIA will focus on these platforms, as well as enhancing the provision of direct support for business innovation.

The NIA is not about reducing investment in public science and R&D; rather it suggests maximising the benefits of innovation by boosting the innovative capabilities of Australian businesses. By proposing a new emphasis for Australia's innovation system towards increasing business innovation, the NIA will contribute to sustained economic growth and competitiveness. Actions agreed under the NIA could provide national innovation capability which could be deployed to address Australia's environmental and social challenges. The NIA can add additional impetus to the work that is already underway as a result of the National Research Priorities framework and also through other national collaborative programs, such as the NRA's focus on diabetes and obesity.



Source: DIIRD, adapted from Cutler and CSIRO (2006)

1 Increase business innovation

NIA Outcome: Increased investment by business in innovation

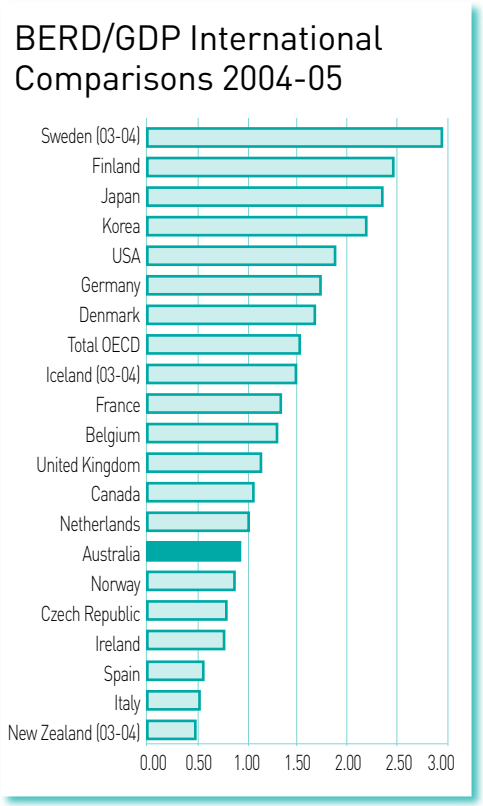
Firms and industries are the main drivers of innovation – and the decision to invest in innovation is one of many investment decisions faced by businesses as they seek to grow and remain competitive. These decisions are influenced by a range of factors including: general economic conditions, access to capital, availability of skilled personnel and infrastructure, cash flow, management culture, assessment of market opportunities and customer needs, and client demand as well as government programs and incentives.

Business innovation in Australia is at relatively low levels. Numerous studies over the past decade indicate that Australia does not have an effective national environment to encourage business investment in innovation.[24] There is a need to build a national culture that is supportive of business innovation and that recognises that innovation is risky and the outcomes are often uncertain. Failures should be expected and tolerated, but learned from.

Innovation goes beyond improvements to products via research and development and scientific breakthroughs. Innovation is often incremental in nature, and can involve changes in processes and systems that enable businesses to satisfy customer needs. Innovation is therefore critical to the competitiveness of all businesses, not just participants in high tech industries. Service industries not only display a high degree of innovation, but also offer great scope for ongoing innovation, leading to improved business performance.

As well as benefiting businesses and the economy, innovation can also have significant positive impacts on society more broadly through improvements in health and education, and our ability to respond to challenges associated with the environment. Advances in medical technology and treatments for illness and disease, for example, will continue to help Australians live healthier and longer lives, which, in turn, will help us address issues associated with ageing, workforce participation and productivity.

Improving the capacity of businesses, small and large, to adopt new technologies and knowledge is critical. Currently, only a small percentage of Australian firms are innovation leaders, and many businesses struggle to absorb new ideas, knowledge and technologies. Firm-level evidence from the OECD shows that technological change can bring significant productivity gains, but only when accompanied by organisational change, training and the upgrading of workforce and management skills.[25]



[24] See for example: OECD (January 2004) *Benchmarking Innovation Policy and Innovation Framework Conditions.*

[25] OECD (2000) *A New Economy? The Changing Role of Innovation and Information Technology in Growth.*

Doubts exist about the capacity of existing programs and incentives to substantially boost business investment in innovation and close the performance gap with middle-ranking OECD countries.

With more than $1,000 billion in privately managed investment capital in Australia, there is considerable potential to boost private support for innovation.[26] Australian governments need to consider what further steps can be taken to create an environment that makes investment in innovative activities a more attractive option.

NIA opportunities for reform	Ideas for consideration raised in stakeholder consultations
Maximise business investment in innovation	→ Identify and agree on ways to best stimulate business investment in innovation. → Streamline innovation support programs across jurisdictions to maximise access and reduce interaction costs. → Support activities to drive and encourage business innovation in regional areas.
Reduce the costs to business of accessing innovation information	→ Develop a national innovation diffusion strategy to enable industry to access trusted and expert information on appropriate technologies and innovation models.
Enhance mechanisms for greater private investment in innovation	→ Encourage and foster business innovation through mechanisms aimed at stimulating private capital supply. → Analyse and address issues which impede private sector investment in metropolitan and regional businesses.

[26] Smith, K and West, J 'Innovation can happen anywhere', *The Australian*, 27 September 2006.

2 Provide the infrastructure to enable innovation

NIA Outcome: New investment in innovation infrastructure

Innovation enabling infrastructure is a component of economic infrastructure that supports the generation, dissemination and commercialisation of knowledge. It can include research, development or demonstration facilities and equipment; libraries, archives, large complex databases and the mechanisms to access this knowledge; and physical infrastructure, such as communications, that supports global connections and competitiveness.

Research infrastructure that facilitates partnerships between research bodies and businesses provides a strong stimulus for innovation activity, leveraging higher levels of business investment in R&D, increasing the rate of technology transfer to industry and maximising industry return on investment. The success of initiatives such as the Victorian Government's Science, Technology and Innovation (STI) infrastructure program, Queensland's Smart State initiative and the Australian Government's Cooperative Research Centres (CRC) program demonstrate the economic benefits of innovation enabling infrastructure that supports industry requirements.

Governments also have the capacity to invest in large scale 'landmark' infrastructure that no single industry can afford or that may not be economically viable at an early stage of development. This infrastructure is critical to building scale in Australia's areas of strength and advantage. The new Australian Synchrotron in Victoria and the OPAL Reactor in New South Wales are good examples of such investments – projects that are well beyond the individual means of potential industry clients, universities and research bodies.

Australia's universities also provide critical innovation infrastructure for research, skills and knowledge diffusion. The infrastructure of many of Australia's universities is rundown or over-stretched and will require new investment to meet current and future demand.

The Australian Government's National Collaborative Research Infrastructure Strategy (NCRIS) is making an important contribution to providing the infrastructure necessary for world-class research. However, further action is needed to build upon NCRIS and create a whole-of-nation focus on innovation infrastructure.

A coordinated national approach will maximise the effectiveness of existing infrastructure, encourage higher levels of private investment and ensure that infrastructure is properly plugged into the industry pipelines that lead to effective commercialisation.

NIA opportunities for reform	Ideas for consideration raised in stakeholder consultations
Develop and implement a national innovation infrastructure plan	→ Building on the National Collaborative Research Infrastructure Strategy and other collaborative agreements, map and analyse innovation infrastructure needs and prepare a plan for the development of Australia's innovation infrastructure. → Recognise the variation in infrastructure needs of different locations, including those of regional Australia.
Invest in university research and teaching facilities	→ Increase public and private investment in university teaching and research facilities. → Investigate models for increasing philanthropic investment in research and teaching facilities.
Sustain investment in research infrastructure	→ Build on and extend the current National Collaborative Research Infrastructure Strategy. → Facilitate private investment in, and more effective and efficient management of, research infrastructure through the introduction of good practice principles and training.
Identify incentives and mechanisms to bolster private capital investment in innovation infrastructure	→ Strengthen the public-private partnership (PPP) model between government and business to ensure increased investment of private capital in a broader range of infrastructure projects essential for innovation. → Maximise opportunities for investment in innovation infrastructure projects.

3 Develop skills for the innovation economy

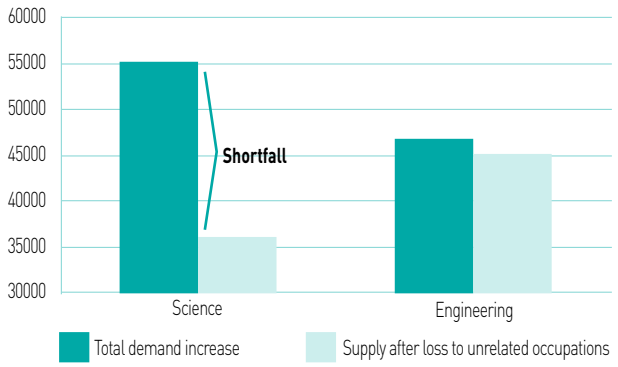
NIA Outcome: Increased availability of technical, innovation and business skills

Along with most OECD countries, Australia is facing significant shortfalls in science, engineering and technology (SET) skills. The ACTU has noted that Australia's SET skills base 'will be critical to the success of our manufacturing and services companies that compete for international business opportunities. And yet, not only do we have serious skills shortages in these disciplines, we rank 22 out of 23 OECD countries in terms of the growth in new science and engineering degrees'.[27] The Prime Minister's Science, Engineering and Innovation Council observed that 'the emergence of the knowledge-based economy means that the presence of a strong and excellent SET base is of central importance to the achievement of economic growth, new jobs and ... social and regional goals'.[28]

Skills in generating, integrating, adapting and applying new knowledge, technologies, processes and products are equally critical to driving innovation across the economy. The Australian Industry Group and the BCA have highlighted the growing importance of educating and training people with skills that contribute to business innovation in areas such as teamwork, creative thinking and problem-solving, cultural understanding, communication, business management and leadership.[29] There is also the need to provide greater incentives and opportunities for lifelong learning and for up-skilling and re-skilling existing workers.[30] The focus suggested here for the NIA complements the NRA's ongoing attention to human capital issues.

PAGE > 24

Supply of Graduates in Science and Engineering 2005-06 to 2012-13



Source: Audit of Science, Engineering and Technology Skills, DEST

Developing skills for innovation is a responsibility shared by governments, education and training institutions, research organisations, businesses, unions and individuals. The NIA endorses the call by the business community and others for a long-term strategy to secure the skills base for the innovation economy. The NIA will provide the impetus for a coordinated national approach to developing the skills needed for business innovation across the Australian economy – as well as ensuring that Australians can take up the high-skilled, high-value jobs of the future.

[27] Combet, G (December 2005) Repositioning *Australian Manufacturing in the Global Economy*, National Manufacturing Summit.

[28] Batterham, R (November 2000) *Australia's Innovation Future*, Paper prepared for the Prime Minster's Science, Engineering and Innovation Council.

[29] Business Council of Australia (March 2006) *New Concepts in Innovation: the keys to a growing Australia;* Allen Consulting (July 2006) *World Class Skills for World Class Industries: Employers Perspectives on Skilling in Victoria*, Report to the Australian Industry Group.

[30] See for example: Allen Consulting (2006), *op cit.*

NIA opportunities for reform	Ideas for consideration raised in stakeholder consultations
Increase supply of SET and innovation professionals.	→ Develop a coordinated national SET and innovation skills strategy to exploit opportunities in SET and innovation professions → Increase supply of SET and innovation professionals through targeted migration, the retention of international students and the promotion of global opportunities. → Improve curricula and enhance teaching capability to ensure sufficient secondary school completions in relevant subject areas to meet demand.
Boost SET, innovation and internationalisation skills of business.	→ Reduce barriers to, and provide incentives for business internships. → Increase international skill transfer opportunities for businesses. → Improve cross-cultural understanding and language skills.
Encourage life-long learning through technical training and re-skilling	→ Provide incentives to encourage business investment in skills and training. → Introduce full tax deductibility for individual investment in life-long learning.

4 Create a better regulatory environment for innovation

NIA Outcome: Reduced regulatory barriers to innovation activity and investment

Regulation can be a driver of innovation, particularly in areas such as health, safety and the environment, and may be required for the smooth introduction of new technologies. On the other hand, inefficient regulation can add to business costs, stifle innovation and create a business environment characterised by uncertainty and high risk. The productivity of research institutions may also be constrained by having to comply with and manage complex regulatory and funding requirements.

Australian governments have made significant progress on regulatory reform through the NCP and the NRA. Further national collaboration is needed to remove legislative barriers to leading edge research, eliminate regulatory differences between jurisdictions, and ensure that legislation can respond quickly to fast-moving and emerging areas of technology.

National action is also needed to ensure the effective management of intellectual property (IP), moving away from a protection regime that many see as cumbersome and costly,[31] towards approaches to IP management that provide greater opportunities for knowledge flow between research organisations and businesses.

Governments also have a responsibility to ensure that a progressive regulatory framework is balanced with ethical and safety considerations, and that there are high levels of community awareness and consultation around the development and use of new ideas and technologies.

NIA opportunities for reform	Ideas for consideration raised in stakeholder consultations
Reduce regulatory barriers to innovation.	→ Undertake a national review of regulatory barriers to innovation (including taxation and intellectual property). → Determine priorities and implement a national plan to reduce regulatory barriers to innovation. → Agree to principles and a mechanism for considering the appropriate regulatory frameworks for emerging technologies to provide greater clarity and certainty for the community, researchers, businesses and investors.
Take advantage of innovation-promoting regulation.	→ Provide clear and early signals about regulatory changes (eg environment) and incentives to enable firms to innovate in response to necessary regulation.

[31] House of Representative Standing Committee on Science and Innovation (June 2003) *Riding the Wave: The Case for Increasing Business Investment in R&D.*

5 Forge better connections and collaborations

NIA Outcome: A more connected and internationally engaged innovation system

Innovation generally occurs more rapidly and with greater intensity and effectiveness where there is a higher degree of collaboration.

Closer collaboration between the Australian, State and Territory governments is critical to fostering the transfer and application of knowledge across Australia, identifying priorities for investment, and ensuring that Australia's strengths and advantages are supported and developed.

Frameworks to support collaboration and knowledge transfer from a research environment into industrial and commercial applications are essential to building scale in Australia's areas of strength, developing new products, services and processes, and creating new business opportunities in Australia and overseas. The OECD **Going for Growth 2006** report recommended that Australia 'needs to strengthen industry-science linkages and increase the leverage effect of public R&D expenditure on private R&D investment through sustained emphasis on public/private partnerships for research and innovation'. The Going for Growth 2006 report also noted that Australia could enhance innovation in services industries by increasing opportunities for those sectors to access knowledge from public research institutes.[32]

Strategic international collaboration – between governments, researchers and businesses – is vitally important to a relatively small economy such as Australia. Building connections to international research centres, companies and markets is necessary to improve knowledge transfer and technology absorption, to keep pace with global developments and leading edge research, and to encourage overseas researchers, innovators and investors to engage with Australia.

NIA opportunities for reform	Ideas for consideration raised in stakeholder consultations
Commitment to collaboration by all Australian governments.	→ Identify and agree on appropriate performance indicators and measures to enable assessment of progress. → Commit to the development and implementation of a collaborative National Innovation Agenda.
Increase linkages and collaboration across Australia's innovation system.	→ Encourage increased industry-to-industry, industry-to-research organisation and research-to-research relationships across the spectrum of the innovation system. Actions include: • Consider the need for third stream funding for universities and research organisations to encourage and enable collaboration. • Build on and increase the availability of connection and intermediary services such as the InnovationXchange. • Programs aimed at building on the innovation strengths of regional cities and rural areas.
Facilitate access to world knowledge and promote Australian innovation capabilities internationally.	→ Increase support for Australian institutions and businesses that are engaged in strategic global alliances. → Continue efforts to attract foreign direct investment in innovative projects in Australia. → Provide greater coordination at the national level of international conferences, trade fairs and exhibitions. → Provide greater coordination of government overseas offices in knowledge trade and business development, thereby minimising duplication and maximising efficiency of information flows.

[32] OECD (2006) *Economic Policy Reforms: Going for Growth 2006.*

Next Steps

Victoria would like to work with all stakeholders to identify the best way forward for a national agenda, and to progress specific elements of the NIA Proposal as quickly as possible.

This Proposal has been prepared as the basis for consultations on the NIA and as such should not be seen as definitive or comprehensive. It is nonetheless soundly based and an appropriate starting point for focused discussions. An Innovation Forum will be held in 2007 to enable stakeholders to contribute to the final NIA Proposal, after which the final NIA would be presented for consideration by collaborative State and Australian Government fora, and ultimately by the Council of Australian Governments (COAG).

A website has been created to provide updates on progress in developing the NIA and all ideas are welcome. Please visit **www.diird.vic.gov.au/NIA** to register your interest.

NATIONAL INNOVATION AGENDA
PROPOSAL

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