



Australian Government

Department of Innovation, Industry, Science and Research

# REVIEW OF THE NATIONAL INNOVATION SYSTEM

[innovation.gov.au/innovationreview](http://innovation.gov.au/innovationreview)

# A CALL FOR SUBMISSIONS

FEBRUARY 2008

***an opportunity to contribute***

I am pleased to invite you to contribute to this important initiative by the Australian Government. There are few subjects more central and fundamental to Australia's economic, social and environmental future than innovation. What we do now will shape this future, and future possibilities.

Our terms of reference are broad. They recognise that innovation and creative problem solving involves looking at those drivers of productivity and competitiveness within firms and industries which underpin our national prosperity. They involve looking at better ways to deliver public and community services. We also need to look at mobilising innovative capabilities around major national challenges such as climate change, population health and future energy needs.

We need to look at how we promote a culture supportive of fresh ideas and risk taking. We also need to look at how we better support the diffusion and take up of new technologies and innovative processes across industries and the community.

Finally, as an advanced but relatively small economy we need to consider our national innovation priorities within the global context. How might we best focus our efforts for good outcomes for Australia over the decades ahead?

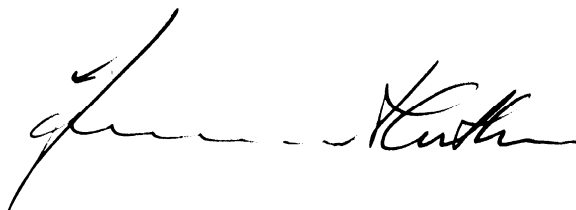
With this call for contributions the Review Panel is posing some of the key questions we are now inviting you to consider and comment on. In early March we will travel around Australia for public meetings to open up discussion. We would like submissions to the review to be lodged before 30 April 2008.

In parallel, the Panel will be reviewing the considerable amount of existing work and thinking on the subject, and initiating special workshops and roundtables on particular key issues for our inquiry. These workshops will provide an opportunity to solicit the contribution of domain experts in specific areas. Finally, we will be promoting and supporting public forums with inspiring and informed thinkers to encourage robust discussion across the community. In this we will also be able to draw on the dialogue generated around the Australia 2020 Summit in April.

To register interest in participating in forums and being kept abreast of our activities and progress simply email [innovationreview@innovation.gov.au](mailto:innovationreview@innovation.gov.au). For general information about the Review you can consult our website [www.innovation.gov.au/innovationreview](http://www.innovation.gov.au/innovationreview).

An *innovative Australia* depends on our collective effort and I invite you to contribute to and share in this challenge.

Yours sincerely



Dr Terry Cutler  
Chairman  
Review of the National Innovation System

*Review of the National Innovation System*  
**Australia's innovation challenge**

As Australians, we think of ourselves as inventive and resourceful people. However, the world is changing. The pace of change is rapid.

Competition is fierce, especially for talent.

Low cost manufacturing, footloose multinational companies seeking attractive markets, and the growth in innovative services have raised the stakes for all countries.

Some of the drivers for change include:

- the shift from in-house R&D laboratories to networks of 'open innovation';
- the rise of globally networked operations and 'cyber-infrastructure';
- the rise of user-generated innovation and demand-driven searches for applicable knowledge and solutions;
- the dominance of service industries in advanced economies;
- the internationalisation of more and more activity;
- a major lift in investment by many national and regional governments in education and research infrastructure;
- the shifting dynamics of global competition, especially with the surge of activity from countries like Brasil, Russia, India and China; and
- the increased sense of urgency around finding solutions to global and national challenges like climate change, future energy sources, water supply, and a healthy population.

The innovation goal posts keep shifting. Standing still means going backward.

We need a capacity for innovating that addresses our emerging national challenges. We need a capacity for innovating that can evolve over time and respond to changing circumstances. Innovating is an open-ended process, and the challenge never ends.

***What emerging global developments will the Australian innovation system need to respond to over the next ten years and beyond?*** The Panel would like respondents to focus on developments that may currently be under-reported, or have specific bearing on some particular aspect of innovation policy. The flip-side is to ask "*what assumptions underpinning current policy programmes are of diminishing importance and are being overtaken by changes in our operating environment?*".

In contributing to this Review, we invite your forward-looking responses. The ultimate question is what sort of outcomes we want to secure for Australia over the next ten years, and beyond. Against such goals, what do we need to be doing now?

## What is innovation?

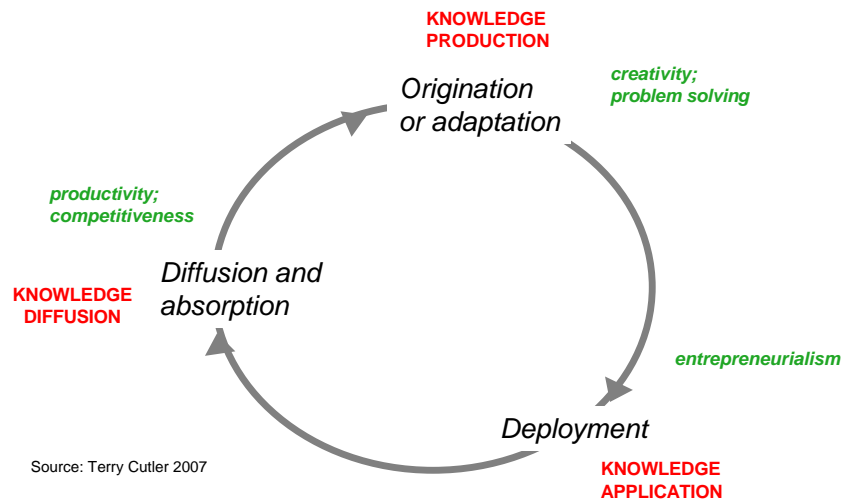
Innovation is a term that is in danger of being over-worked and over-hyped.

*Innovation* is commonly described as “creating value by doing things differently” or as “creating value through doing something in a novel way”. From this viewpoint we can only identify innovation after the event.

If we are going to influence innovation outcomes, therefore, we need an active appreciation of the dynamic processes associated with innovation that *lead to change*. Thus we can describe *innovating* and *being innovative* as the creative problem solving designed to produce practical outcomes. The outcome of this process is the introduction of novel solutions to real problems, needs or opportunities.

There are three facets to innovation:

- the origination of new knowledge and ideas – *knowledge production*;
- the deployment of ideas within a real world context – *knowledge application*; and
- the diffusion of this applied knowledge and its adaptation in use – *knowledge diffusion and absorption*. These elements combine to form a virtuous and open-ended cycle of learning and responsiveness to new inputs and challenges.



We need to invest in the capabilities required around each element, as well as investing in the linkages and flows between them. The elements of innovation involve both ‘stock’ and ‘flows’: stocks of knowledge and capability, and the flows of the innovation capital around these. It can further be argued that resources applied to innovation should be regarded as *investment* in the future, not as expenditure.

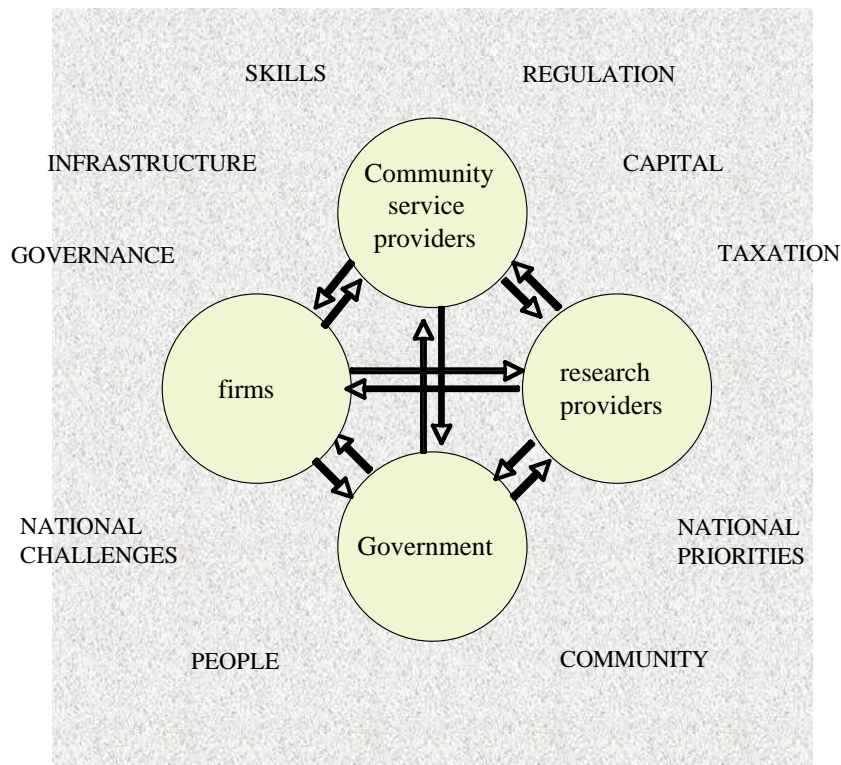
## **What is a national innovation system?**

For any country, innovation policy and programmes have a triple bottom line:

- (i) industry innovation, and market changes to increase productivity and improve competitiveness;
- (ii) innovations and changes in public policies and service delivery around the production of public goods; and
- (iii) innovations and changes to address societal and environmental aspirations and challenges through the mobilisation of private and public sector capabilities around these challenges.

Thus the pursuit of innovation involves change processes within a societal or community context. It is about promoting *purposeful* and meaningful change within this complex system. This engages both the private and public sectors, and how they work together.

A *national* innovation system is the sum of multiple and inter-dependent institutions, players and roles.



Commentators on innovation, including advisers to this Review, suggest that an Innovation System performs some core functions. These include:

- the identification of opportunities;
- the creation and distribution of knowledge and capabilities;
- mobilising resources, including the supporting and financing of development and production capacities;
- managing risk and uncertainty; and
- building and maintaining infrastructures.

We then need to ask how well individual national systems perform these functions, and look for systemic points of weakness or failure. Such systemic weaknesses frequently involve:

- Inadequate infrastructure provision for transport, communication, research and development facilities.
- Inadequate institutional development and evolution, both formal and informal.
- Capability and learning problems.
- Structural adjustment issues and transitional problems in economic change, often arising from technology 'lock in'.
- Networking and collaboration problems.
- Heterogeneity versus specialisation.
- Imbalances within and across the innovation system.

Government has a central interest in a robust innovation system because such a system is a public good in its own right. Government also has an interest in promoting the pursuit of innovation within the private sector where such activity enhances the national good. Moreover, it behoves government to be innovative in the conduct of its own affairs and in the delivery of public services.

A national innovation system incorporates regional and sectoral clusters of activity. This is why the Review is putting a spotlight on the relative roles of the Commonwealth and our States and Territories within the innovation system.

Within a globalised economy, a national innovation system also needs to be positioned within a global innovation ecosystem. How do we best *internationalise* our innovation system and capabilities?

Review of the National Innovation System

## **Shaping Australia's future through innovation**

Innovation, and the subject matter of this review, can be summed up in seven deceptively simple questions.

**“Can we imagine a better world? Are we asking the right questions?”**

*This question focuses our attention on the generation of novel and fresh ideas. Producing new knowledge and approaches involves pushing boundaries, and questioning the status quo.*

**“How do we solve the big challenges we face as a country, an industry or as a community?”**

*Outcome oriented research and inquiry is the only response to the big challenges confronting us as Australians and global citizens. How do we do this better? How do we increase business investment in innovation?*

**“Could we do everyday things better?”**

*This question focuses our attention on creative problem solving; everywhere, by anyone. How can we continually increase value? This question invites us to build on our national ‘can do’ culture.*

**“How do we get more firms and organisations to use the best available tools and techniques, from anywhere around the world, in what they do?”**

*This is about putting innovation to work. It addresses the diffusion of knowledge and techniques across whole industries and communities. Do we have the skills and training to take up this innovation challenge?*

**“How do we make it easy for people to use tools or apply ideas in novel ways?”**

*This involves expanding on the work of others, so people need the freedoms to use and adapt other people's tools or ideas. What are the barriers to adaptation and novel applications?*

**“How do we educate and equip our people to be creative and innovative, life-long?”**

*This is about how we, as a country, build and nurture human and social capital. It is about building skills.*

**“As a relatively small country, how does Australia prioritise its innovation efforts to make the most of what it has or can do?”**

*None of us can do everything; so how do we decide on what we should concentrate? How do we balance our priorities across the claims of industry, research, and the community.*

Considering these questions, have we got the best possible action framework in Australia to address them – now, and into the future? This is what shaping a national innovation system is all about. This is why we need to keep improving, systematically.

Your contribution is invited.

What do these questions mean for you or your organisation? We are interested in receiving submissions containing your insights, providing concrete examples of issues and data drawn from experiences of what does or does not work within the various facets of a national innovation system. We would like you to highlight, from your perspective, where there may be weaknesses in the system, or inhibiting factors. We would value your insights into how things might be done better.

To assist you in framing responses, we have begun to tease out some of the implications and possible requirements arising from these basic questions. In considering their impacts, you might also like to refer to the terms of reference for this Review, which are attached.

## **Elaborating on the questions around innovation**

### **1. "Can we imagine a better world? Are we asking the right questions?"**

<i>This question involves ...</i>	<i>and affects</i>	<i>requiring</i>
<i>breakthrough ideas and knowledge generation through vision, imagination and curiosity.</i>	<i>all parts of the innovation system, but especially the universities, research institutes and Public Research Agencies.</i>	<i>research capacity supported by the right funding levels and the appropriate funding models. It also requires knowledge and research infrastructures, including 'cyberinfrastructure'.</i>
	<i>...our networks, and our linkages with people and institutions tackling similar issues.</i>	<i>... tools to help us frame the right questions to ask.</i>

### **2. "How do we solve the big challenges we face as a country, an industry or as a community?"**

<i>This question involves ...</i>	<i>and affects</i>	<i>requiring</i>
<i>outcome oriented research, and development work. It often needs to involve a broad spectrum of activities and players, working collaboratively.</i>	<i>the way we deal with distinctively Australian challenges, and how we derive <b>an innovation dividend</b> from essential expenditures.</i>	<i>strategic leadership, the marshalling of diverse and broadly-based capabilities for critical mass, and productive collaborations and partnerships.</i>
		<i>There is a requirement to prioritise our efforts around the best use of available resources to create value.</i>

### **3. "Could we do everyday things better?"**

<i>This question involves ...</i>	<i>and affects</i>	<i>requiring</i>
<i>creative problem solving and the application of ingenuity.</i>	<i>everyone, everywhere, and promotes the continual enhancement of capabilities and productivity.</i>	<i>responsiveness to customer and user needs, organisational learning, skilled human capital, demanding citizens and users, and a creative culture.</i>
<i>Realising that secure, well-paid jobs depends on continual innovation.</i>		<i>Workplaces that encourage innovation, creativity and design.</i>

**4. “How do we get more firms and organisations to use the best available tools and techniques, from anywhere around the world, in what they do?”**

*This question involves ...*

*the take-up of new technologies and tools, effective information flows, and the internationalisation of our National Innovation System.*

*and affects*

*the diffusion of innovation, promoting competitiveness, better service delivery and greater productivity. It also affects the way we think about procurement – being smart buyers of goods and services.*

*requiring*

*awareness, the capability to be receptive to new things, and the skills to absorb new knowledge.*

*These requirements will be supported by, amongst other things, extension and intermediary services, training, information and communications infrastructure.*

*It requires access and connections to the 98% of global knowledge and innovation developed elsewhere in the world. It may require the establishment of standards, access to shared facilities, or metrology services.*

**5. “How do we make it easy for people to use tools or apply ideas in novel ways?”**

*This question involves ...*

*adaptation in use. It also involves customisation, modifications, and systems integration.*

*and affects*

*the way we extend and improve upon the work of others. It also affects the way we think about regulation.*

*requiring*

*a shift of mindset from ‘best practice’ to ‘next practice’, driving new value and returns on investment. It requires open access to information, and the freedoms to use and adapt knowledge.*

**6. “How do we educate and equip our people to be creative and innovative, life-long?”**

*This question involves ...*

*a superb education system, the availability of training, and the promotion of population health.*

*and affects*

*our human and social capital, and the delivery of public services.*

*requiring*

*investment in education and learning, healthcare and cultural infrastructure.*

*Workplaces that encourage innovation, creativity and design.*

*Capital investment and capital markets that value and are geared to support human capital.*

**7. “As a relatively small country, how does Australia prioritise its innovation efforts to make the most of what it has or can do?”**

*This question involves ...*

*and affects*

*requiring*

*understanding how innovation can deal with the challenges we face, including our demographics and dependence on natural resources.*

*the extent of national specialisations, internationalisation, programme portfolios and collaborations.*

*holding everyone accountable for their role in the Australian innovation challenge, risk management, and solid evaluation and governance frameworks.*

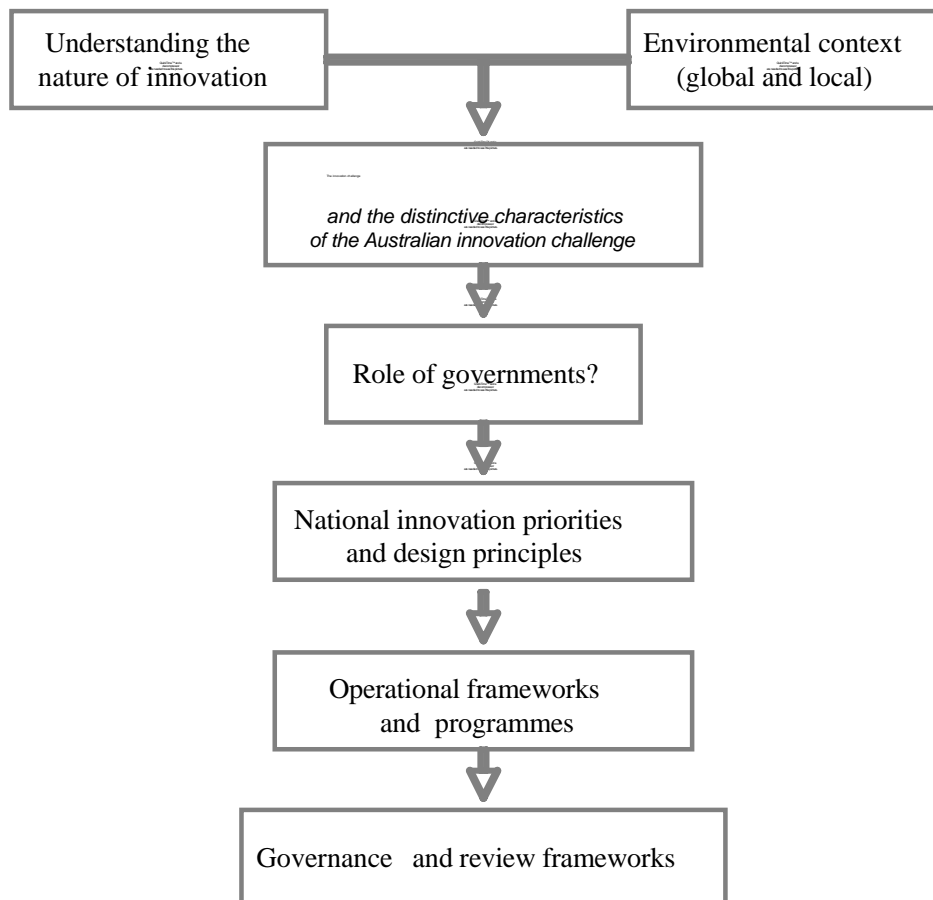
*Priority setting, the establishment of robust operating principles, and rigorous programme design criteria.*

*The balance between competing research institutions and the economies of scale to support extensive research platforms.*

*New metrics of performance, valuing future options, and novel incentive systems.*

The Review includes two specific programme reviews – of the R&D Tax Concession and the Cooperative Research Centres Programme. We welcome comments on how these programmes could be adjusted, within the context of the overall innovation system and having regard to other programme options, to help create a more effective portfolio of innovation support mechanisms. We need to look at the R&D Tax Concession within the broader context of the impact of the overall tax system, and look at the CRCs within the overall spectrum of collaboration vehicles.

The inquiries during this Review will be brought together in a *Green Paper* for Government, possibly reporting along the following lines:



## ***Participating in the Review process***

The Review panel will appreciate receiving submissions that are forward-looking, combining honest appraisals, useful evidence, with fearless proposals. We would encourage interested parties to commission, where appropriate, the right sort of research to support representations.

The Review team is aware of the great volume of previous studies and reports, and materials submitted to other inquiries. The Review Secretariat is trawling this material to capture the insights and lessons. We would discourage the further re-cycling of such material in new submissions. The Review Secretariat is available to discuss what sort of submissions would be most useful.

### ***The terms of engagement***

As a general principle all submissions will be placed on the Review website, as will discussion papers and other material developed as the Review progresses.

The Review Panel will not accept submissions by organisations submitted wholly on a confidential basis. Where the nature of the material dictates, however, submissions may append material marked Confidential and severable from the covering submission.

The Review Panel will accept confidential submissions from *individuals* where those individuals can argue credibly that publication might compromise their ability to express forthright viewpoints.

Please note that any request made under the *Freedom of Information Act 1982* for access to any material marked confidential will be determined in accordance with that Act.

In the interests of transparency and full disclosure, **all submissions must be prefaced by a Declaration of any Interests and Affiliations relating to the subject of the Review and the representations submitted.** These declarations will be published along with the submission.

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Please forward written submissions to

*Review of the National Innovation System – Submission*  
Secretariat to the Expert Panel  
Review of the National Innovation System  
Department of Innovation, Industry, Science and Research  
GPO Box 9839  
CANBERRA, ACT 2601

Or email to: [innovationreview@innovation.gov.au](mailto:innovationreview@innovation.gov.au)

**The deadline for submissions is 30 April 2008. Earlier submissions are welcomed.**

Submissions will be placed on the [innovation.gov.au/innovationreview](http://innovation.gov.au/innovationreview) website.

Enquiries should be directed to [innovationreview@innovation.gov.au](mailto:innovationreview@innovation.gov.au)

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## **The Review's Terms of Reference**

*"The Government is committed to building a strong national innovation system, in recognition of the vital role innovation plays in productivity and economic growth, and in meeting the challenges Australia faces.*

*In this context, the Government has appointed an expert panel to review the national innovation system and the coherence and effectiveness of existing Government support for innovation.*

*The Panel will identify gaps and weaknesses in the innovation system and develop proposals to address them. In particular, it will:*

- Identify a set of principles to underpin the role and participation of the public sector in innovation.*
- Develop a set of national innovation priorities to complement the national research priorities, ensuring the objectives of research programs and other innovation initiatives are complementary.*
- Identify regulatory and other barriers to innovation and recommend ways to minimise these.*
- Examine the scope for simplifying and reducing program duplication and ensuring that any support provided is well-targeted and easy to access.*
- Consider the appropriateness, effectiveness and efficiency of the Research and Development (R&D) Tax Concession Scheme in promoting innovation and make recommendations to improve innovation outcomes.*
- Consider ways to improve the governance of the national innovation system to support higher expectations of government agencies and industry.*
- Assess the appropriateness, effectiveness and efficiency of the Cooperative Research Centres (CRC) Program and make recommendations to improve innovation outcomes.*

*In conducting the review the Panel is to have regard to relevant reports and studies, including the Productivity Commission's Report on Public Support for Science and Innovation. The Panel is to consult nationally and provide a 'Green Paper' to the Government detailing policy options by 31 July 2008. The Green Paper will be released for public comment and used as the basis for the development of a Government 'White Paper'. "*

22 January 2008