

# governance of the innovation system

Innovation plays a key role in driving productivity and broader prosperity. This raises questions of governance in the innovation system. National government has an important role in providing leadership, but it shares the system with other public and private players and must frame its activities against this wider picture.

This chapter examines how the national government might best execute its particular strategic role within the innovation system and, in so doing, mobilise and coordinate the efforts of the many parties with an interest in the community's innovation-fuelled prosperity.

Government possesses a unique ability to influence and view the overall innovation system. As well as its direct role in supporting innovation in both the public and private sectors, government also plays a key role in structuring those markets within which innovation occurs through regulation of market operations and industry structures. Effective policies are those that facilitate a robust and well-functioning national innovation system which optimises the *flows* of innovation based on the nation's investment in *stocks*.

## Crucial governance roles within the innovation system

In examining the role of government in a national innovation system, Ian Marsh posits three crucial governance roles<sup>1</sup>:

<sup>1</sup> Marsh, I., *The politics of regional economic strategies*, unpublished paper, October 2006.

## Figure 18: Critical government roles within a national innovation system

### (i) Leadership:

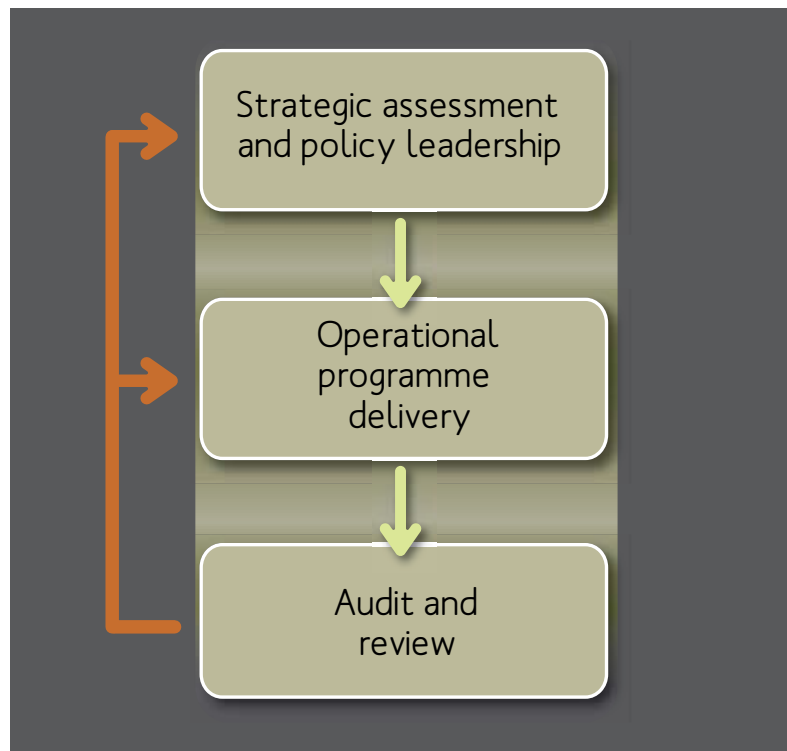
strategic scanning and foresight, leading to the establishment of national priorities and the articulation of desirable outcomes.

### (ii) Execution:

the formulation of the rules (regulation) and of the programs to deliver outcomes. Government's indisputable role in rule making means that it also plays a key role in 'market design' (whether overt or covert).

### (iii) Review:

the ongoing process of monitoring outcomes and impact. At an institutional level, this is a function of governance arrangements and public accountability.



Source: Marsh, I., *The politics of regional economic strategies*, unpublished paper, October 2006.

This provides a useful framework within which to examine current and possible institutional arrangements.

In considering any governance framework it is important to note that:

- The innovation agenda does and must touch on the whole range of government concerns and cuts across bureaucratic silos. This invites, and indeed requires, a 'whole of government' approach and framework.
- Specialised roles and functions within the innovation system need to be counterbalanced by the capability to take a helicopter view, and to address and resource cross-cutting, platform issues.
- To date it has been difficult to assemble an overall view of the footprint of innovation in Australia. What is needed is an ability to examine the mix of activities and capabilities as a portfolio, and to coordinate government responses.

### Step 1: Leadership

To provide effective national leadership on innovation the government must have clear goals and strategies, and a process for arriving at them. An institutional structure is needed to coordinate

and focus the role of government within the innovation system.<sup>1</sup> In studying governance of national innovation systems, the OECD has commented on the increasing need for more coherent innovation policy agendas which span ministerial boundaries and encompass a broad range of policy areas.

The OECD study points to a range of barriers to coherence in national innovation systems, including policy silos within government, ‘short-termism’ in resource allocation, and fragmentation and complexity of innovation resources within government. At a time when globalisation, structural change and ‘big’ problems such as climate change and energy security are posing new challenges, many countries are finding their innovation policy-making and institutional frameworks ill-equipped for the new paradigm.

*A common problem for many Governments is that they use yesterday’s institutions to meet tomorrow’s problems<sup>2</sup>.*

To achieve the coherence, flexibility and responsiveness necessary for effective innovation policy, the national government requires a ‘central brain’ that is well informed, can take the overview and assume strategic leadership. Specifically the issues that such a body should address are:

- the need for, and ability to provide, a ‘helicopter’ view of the overall innovation ecology of the country;
- the importance of developing consensus and support around strategic directions and priorities for Australian innovation policy;
- the importance of a ‘whole of government’ perspective on innovation to inform the decision making and resource allocation of central government agencies and to inform inter-jurisdictional decision-making frameworks involving Australia’s federal structures; and
- how to achieve co-ordination without centralisation which could lead to an erosion of diversity and an inadequate range of innovation activities.

A great number of submissions called for the creation of some peak ‘Innovation Council’ to fulfil this role.<sup>3</sup> The only current such body

<sup>1</sup> The OECD has noted that innovation policy requires co-ordinated, strategic action involving a number of portfolios – “it builds upon its horizontal role by providing a strategic framework across ministerial and institutional boundaries to ensure innovation and adaptation within the context of sustainable social and economic development”. OECD, *Governance of Innovation Systems – Volume 1 a synthesis report*, pp. 19–20. 2005.

<sup>2</sup> *Ibid.* p. 30

<sup>3</sup> E.g. Council for Humanities, Arts and Social Sciences – Submission no. 481; Society for Knowledge Economics – Submission no. 522; CSIRO – Submission no. 217; Marceau, Jane – Submission no. 297; Andrews, Peter – no. 431; Australian Industry Group – Submission no. 265; Innovation Research Network – Submission no. 332; FASTS – Submission no. 549; Innovation Research Universities Australia – Submission no. 95; Business Council of Australia – Submission no. 390.

is the Prime Minister's Science, Engineering and Innovation Council (PMSEIC). This is a large council, comprising mainly representational membership that works essentially on an issues-based agenda, supported by ad hoc working groups and the Office of the Chief Scientist. As such it is not designed to inform strategic co-ordination and leadership functions across the whole of government.

To provide a broader perspective, and considered advice to national government, the Panel favours replacement of PMSEIC with a new and differently-focused National Innovation Council. Such a council would, like its predecessor, be chaired by the Prime Minister in recognition of the importance and whole-of-government nature of the issues.

### **A new National Innovation Council**

The functions of the National Innovation Council would be:

- custodianship of the proposed national innovation priorities, their application in directing investment and resource allocation decisions, and their evolution and focus over time;
- periodic review of the national innovation investment portfolio;
- promotion of robust linkages across government, and between levels of government, especially with regard to cross-cutting issues and capabilities;
- scanning for emerging opportunities or challenges, and the avoidance of surprises;
- issuing an annual Statement on Innovation, including findings from evaluation reviews conducted in the preceding year;
- identifying and advising on innovation options or opportunities which could be addressed through the government's role in market design, competition policy and pro-active market regulation;
- oversight of national information policies and their particular application to public sector information and information generated by publicly funded activity; and
- appropriate international linkages and relationships that should be pursued.

It is important to be explicit about what functions the Council would *not* perform. The NIC would not:

- administer programs;
- conduct detailed innovation research; or
- conduct evaluation and review of specific programs.

In the interests of effectiveness and transparency, the outcomes of Council deliberations, but not its proceedings, should be published.

The Council needs to be significantly smaller than the current PMSEIC (12 ministerial members plus 19 other members). Members should be appointed primarily on the basis of individual merit, but taking into account their overall experience and links within the sector. The Council should include people with the ability to take a strategic overview and provide advice on the shape of the overall innovation system and the Government's investment in it. It should be outward looking in evaluating the global environment and advising on Australia's priorities for both domestic action and international engagement. The Council should encompass a diversity of views and include key sectors within the innovation system (eg universities, the research sector, business etc). The Council should also include key ministers involved in leading the government's innovation agenda, along with the Chief Scientist.

A useful adjunct to the Council, and a means to broaden the perspectives of Council deliberations, would be the creation of an International Innovation Advisory Panel to the Council, drawing on eminent Australians who live and work abroad. Such a Panel might meet once a year. The establishment of such a Panel would recognise the importance of internationalising Australia's innovation system, and co-opt the participation of key global players from Australia's diaspora of expatriate talent.

### **An Office of Innovation Assessment**

The functions proposed for the new National Innovation Council will require the support of a high-level, highly talented secretariat. Such a group, with the skills commensurate with the recommended function of the new Council, does not currently exist, although a partial analogue is provided by the erstwhile Australian Science and Technology Council which was disbanded by a former government in the 1990s. To undertake this role, establishment of an Office of Innovation Assessment is proposed.

This office should be small and nimble, with planned turnover of staff to maintain freshness. It is important that such a group does not develop 'a life of its own' with entrenched positions. A significant proportion of staff should be seconded from other areas of government, including State and Territory governments, and from academia and the private sector. The Director of the Office would undertake the role of the Advocate for Government Innovation within government, as proposed in Chapter 10.

*Recommendation 12.1: The Prime Minister's Science, Engineering and Innovation Council be replaced by a new National Innovation Council, chaired by the Prime Minister, and supported by a small but high level Office of Innovation. An International Innovation Advisory Panel be formed to provide advice to the Council on international engagement.*

The Prime Minister's National Innovation Council would function as the 'central brain' of a dynamic national innovation system. It would draw upon, and synthesise, the strategic perspectives from a range of bodies including the network of Industry Innovation Councils,<sup>1</sup> Innovation Australia, the Academies, major industry groups, Universities Australia, other tertiary representative groups and the major public sector research agencies.

This last group represents a key critical mass and capability within the national innovation system. Our major public sector research agencies (including CSIRO, the Defence Science and Technology Organisation (DSTO), ANSTO and AIMS) are split across a number of portfolios and together have control of over \$1.5 billion annually in government funds for research. There is currently no formal coordination of their activities and, while they do often work collaboratively, this largely happens on an ad hoc basis. Arguably our current research effort lacks co-ordination and is too fragmented for a small country. New research initiatives in a range of climate change related areas could exacerbate the problem.

### **Research Coordination Council**

In order to more effectively coordinate our national research effort and to provide a source of coordinated advice to the National Innovation Council, a Research Coordination Council should be established. The National Research Infrastructure Committee, suggested in Chapter 5, should be a sub-committee of this Council. In addition to major statutory research bodies, the Council should include other key public sector research bodies that may sit within government departments such as the National Measurement Institute and Geoscience Australia.

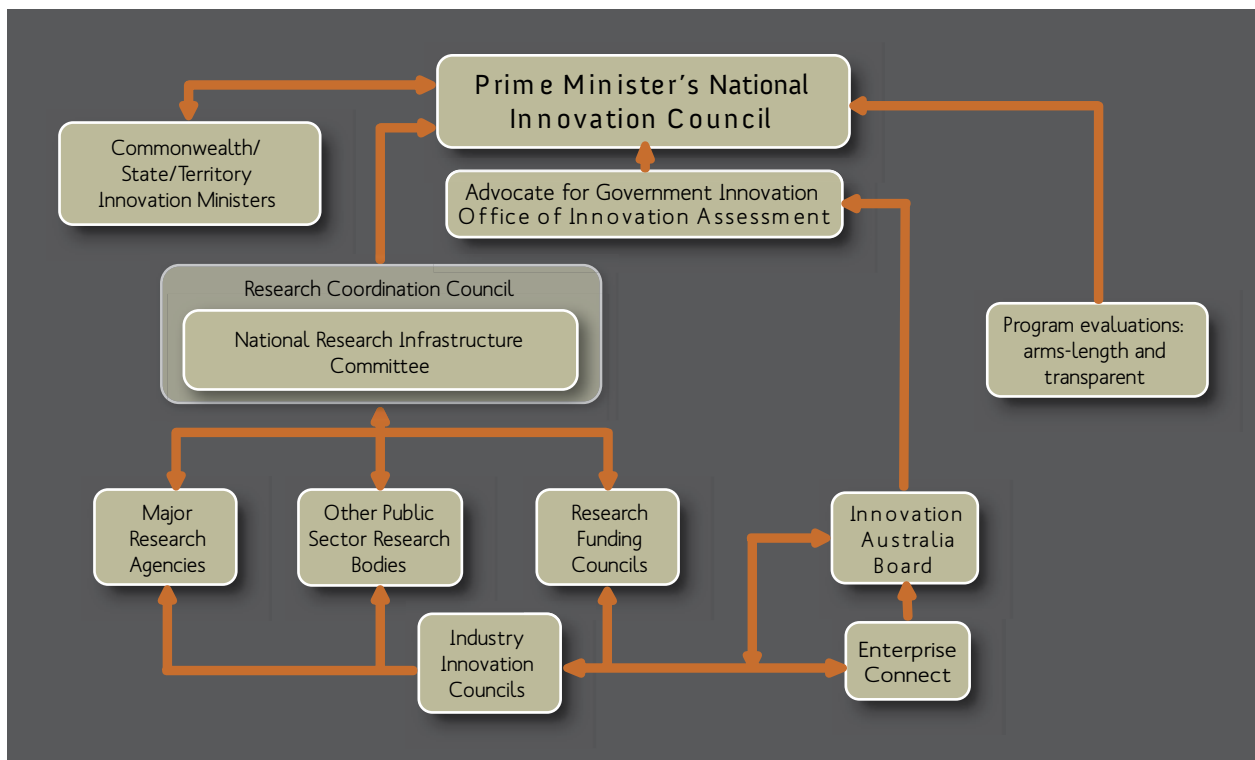
The Council should also include the major research funding bodies, ie the ARC and the NHMRC. While they do not directly undertake research, between them they award \$1.2 billion annually in research funds, largely to universities and medical research institutes, and they have strong influence over the national research program.

<sup>1</sup> The Minister for Innovation, Industry, Science and Research has announced the establishment of Industry Innovation Councils (Councils) later in 2008 covering a number of industry groups. Membership will draw on the knowledge and expertise of innovation leaders from business, unions and professional organisations, science and research agencies, and government (Commonwealth, State and Territory). The Councils will have a role in championing innovation in industry, building stakeholder links and advising the Minister on priority innovation issues.

*Recommendation 12.2: To more effectively coordinate the innovation activities of public sector research agencies and to provide a source of coordinated advice to the National Innovation Council, a Research Coordination Council should be established.*

The broad structural relationships within the proposed governance framework are set out in Figure 19.

**Figure 19: Proposed governance framework**



## Step 2: Execution

The regulation aspects of the government's role in innovation are covered in Chapter 7. This section deals with governance mechanisms for the delivery and coordination of programs and activities that support innovation. Effective governance and coordination is needed both across Australian Government programs and between Australian Government, State and Territory programs and activities.

### Australian Government programs and activities

The Australian Government's 2008–09 Science and Innovation Budget Tables show budgeted Commonwealth expenditure on science and innovation for the 2008–09 year as totalling \$6.37 billion. Of this,

\$4.36 billion is to be spent through the Innovation, Industry Science and Research portfolio, while over \$2 billion is to be spent by ten other portfolios, the largest being Health and Ageing (\$625 million); Defence (\$394 million); Resources, Energy and Tourism (\$324 million); and Agriculture, Fisheries and Forestry (\$259 million).

Within the 11 portfolios there is a multiplicity of agencies that deliver innovation programs including the ARC, NHMRC, Rural Research and Development Corporations, DSTO, Innovation Australia and numerous agencies delivering a growing number of programs related to climate change. Following the 2007 election the new Government created a portfolio for innovation and research, thus, we hope, signalling an intention to bring some much needed coherency into government decision-making on these issues.

Currently each portfolio pursues its research and innovation agenda largely independently. Budget bids, funding allocations and delivery mechanisms are all addressed largely within agency silos. Despite a significant financial contribution to research in the former government's *Backing Australia's Ability* packages, they did not include effective institutional mechanisms to support a coherent whole-of-government approach. Mechanisms such as national research priorities were introduced but achieved only limited impact in ensuring coherence across the national government research effort.

One might ask why the ARC has not enjoyed the level of funding increases over recent years that have flowed to the NHMRC. It is hard to assess whether this was the product of conscious priority-setting rather than more effective lobbying, or a better budget strategy by one group over another. Even more pertinently, one might point to the inconsistency of more than doubling funding for the NHMRC's competitive grant programs while not increasing the funds (which come from a different portfolio) for infrastructure and overheads to support these grants. Such outcomes highlight the lack of an overall strategic approach and of effective coordination.

The coordination challenge is to ensure a whole-of-government innovation framework across agencies. Moves in some areas, like the suggestion for a new policy council over the rural R&D corporations, would facilitate horizontal policy coordination, but wider action is required. There have also been suggestions to more closely align the ARC and the NHMRC with the aim of improving co-ordination and possibly reducing overheads. Centralising all these functions is not realistic. What is important is a coherent framework for these activities, so a consistent application of priorities and policy principles can be proposed by the National Innovation Council and considered by Government.

While it will include key Ministers, the National Innovation Council will be an advisory body to Government. Key decisions will still be taken through the established processes of Cabinet consideration. To ensure that a coherent approach flows through into these decision-making processes the Panel suggests that the Minister for Innovation, Industry, Science and Research should be a joint signatory to any proposal from across government significantly bearing on the national innovation agenda.

*Recommendation 12.3: The Minister for Innovation should be a joint signatory to any Cabinet proposals from across government significantly bearing on the national innovation agenda, to ensure coordination.*

### **Consolidate delivery of industry programs through Innovation Australia**

The Panel believes that, as far as possible, there should be a bias against any proliferation of new program delivery bodies, and a consolidation where possible. As a general principle, industry-facing programs should be administered within the Department of Innovation, Industry, Science and Research and through Innovation Australia in particular. This would promote a user-centric framework, and enable better bundling of support options around industry or firm needs.<sup>1</sup> What needs to be stressed is that program policy responsibility can still reside with relevant line agencies, as, for example, would be the case with innovation or R&D programs established in connection with climate change or the environment.

Innovation Australia uses an existing Australia-wide network of offices and staff (AusIndustry) which streamlines access and means lower transaction costs for the firm and the government. Just as Centrelink has been established as the pre-eminent whole-of-government delivery agency for assistance to individuals, Innovation Australia, through AusIndustry, should play this role for the business sector.

*Recommendation 12.4: Innovation Australia should be the single major agency responsible for delivering innovation program support for firms. Such programs would be delivered through the AusIndustry network.*

<sup>1</sup> The former Senator George Campbell highlighted the desirability of a greater user focus in his recent comment that we have 'a raft of different products in pigeonholes so your project has to fit the pigeonhole otherwise you don't get the funding. You need to change the approach [and] have the capacity to say to companies: 'We can tailor our support to your product, rather than you tailoring your product to meet our support requirements.' *Sydney Morning Herald*, 23 June 2008

### Commonwealth, State and Territory coordination

A further key challenge to effective governance and coordination is presented by the fragmented approach to innovation policy and programs inherent in our federal system of government. The Panel was asked to examine the scope for simplifying and reducing program duplication and ensuring that any innovation support provided is well-targeted and easy to access. To achieve this it asked the Inter-Governmental Working Group (IWG) to examine all relevant Australian Government and State and Territory innovation programs. (For full report see Annex 9).

The IWG analysed industry innovation programs across Australia to inform the Panel about where support is being directed (see Box 7). It found that 69 percent of programs are delivered by the states and territories but 90 percent of the financial support is provided through Australian Government programs. Furthermore, it was found that most support was directed to research and development and funded by the Australian Government and that State and Territory programs were more tailored to the needs of local constituencies.

#### Box 7: Main findings of the Intergovernmental Working Group

- Two hundred and twenty one programs supporting innovation in firms were identified, comprising 31 percent Australian Government and 69 percent State and Territory Governments. Australian Government programs account for 90 percent of the total expenditure for these programs, which is approximately \$3.7 billion per annum.
- There is some apparent intra- and inter-jurisdictional overlap in programs but this is neither systemic nor likely to have a significant impact. Many programs are targeted to leverage off other programs.
- Most programs are at the early phases of the research commercialisation chain (R&D and early commercialisation).
- Only 36 percent of the programs have been reviewed. Many programs have unclear and/or unmeasurable KPIs.
- Only 10 percent of Australian Government and 28 percent of State and Territory programs have on-line application processes.

Of particular concern is the relatively low level of program evaluation and the small amount of online access for firms and others seeking access to program advice.

Submissions noted a large number of government innovation programs. This may complicate access, particularly as programs are delivered by a range of government departments. Many firms,

especially SMEs, are not aware of programs for which they may be eligible, or where to find information on options. Application processes are seen as too lengthy, cumbersome and/or expensive when weighed against potential gains.

There was strong support for an integrated, national innovation strategy and a governance platform to manage current issues with the program suite. Some submissions advocated a ‘one-stop-shop’ approach to providing information on government support, with communication and promotion seen to be an important part of the solution.

The IWG proposed *A Framework of Principles for Innovation Interventions* (See Box 8 and Annex 9) to enhance consistency in approach and support the overall accessibility and efficiency of the suite of interventions across Australia. The underlying intent of the Framework is to maximise the effectiveness of individual and collective actions by governments in support of the development of the National Innovation System. It has a particular focus on ensuring that the suite of interventions reflect and respond to changes in demand-side needs and priorities, and improve coordination and consistency across jurisdictions.

*Recommendation 12.5: The Australian Government and State and Territory governments should adopt a framework of principles for innovation interventions (as set out in this Review) to enhance consistency in approach across governments and improve the overall accessibility and efficiency of the suite of interventions.*

*Recommendation 12.6: That governments review the existing suite of programs and develop any new programs in the light of these principles. All program proposals should contain clear ex ante evaluation criteria, and provide for the provision or collection of relevant base line data before program implementation. Design principles and rules should be applied consistently. (See proposed design principles in Chapter 4 and Annex 4).*

*Recommendation 12.7: That senior government officials develop a collaborative mechanism to oversee the agreed approach and report periodically to relevant Australian Government and State and Territory ministers.*

*Recommendation 12.8: That common metrics, performance indicators and mechanisms for collecting and sharing data be developed and adopted by all jurisdictions.*

*Recommendation 12.9: That governments together develop a single mechanism (such as a web portal) for providing information to clients about access to the full range of Australian and State and Territory government innovation programs.*

#### **Box 8 Framework Principles for Innovation Interventions**

1. Supports the development and effectiveness of the national innovation system.
2. Reflects and responds to demand-side needs and priorities.
3. Rationale for intervention and role of government is clearly identified.
4. The best placed jurisdiction(s) is/are responsible for design and delivery.
5. Innovation risk is assessed, accepted and incorporated into initiative design.
6. Initiatives are well designed with clarity about:
  - Purpose;
  - Expected outcome;
  - Key performance indicators;
  - Evaluation processes;
  - Return on investment (financial, economic or social); and
  - User/target.
7. Initiatives evaluated for impact on regional/national innovation system.

### Strengthening of innovation data collection

Innovation policy development and program design is enhanced by longitudinal data collection to identify the impact of interventions on firms and their growth. The Review process revealed that the available data and research findings on innovation in Australia were a constraint on the ability to analyse the impact of interventions.

The Australian Bureau of Statistics (ABS) should be the key innovation data collection agency and in recent years has increased its collection of data on innovation in Australian business. It has strategies to merge different data sets to enhance its advice — for example, the Business Characteristics Survey which brings together the collection of business characteristics and innovation data. It is critical that data collections are long term and not broken due to funding cuts. It is also important that data collections on innovation by the ABS are able to be compared to those in other countries. Finally, it is important that the data collections are available to policy areas and research institutions to model impacts and thereby enhance interventions.

*Recommendation 12.10: The Australian Bureau of Statistics should be resourced to ensure the longevity and international consistency of innovation data collections and their availability to facilitate effective policy development. The National Innovation Council should advise where additional data collection is required to produce its Annual Statement on Innovation.*

## Step 3: Review

### Reporting on innovation

One of the most problematic areas in innovation policy is the development of broadly based and meaningful measures for reporting and monitoring.<sup>1</sup> As a general comment, most traditional measures have focussed on supply-side, input parameters. There is less coverage of firm performance and the diffusion of innovation, or measures to link innovative behaviour with social, economic or environmental impacts. The most difficult to measure aspects of the health of an innovation system are the relative robustness of linkages, relationships and information flows. In many areas qualitative assessments are needed in addition to quantitative ones.

In carrying out its proposed reporting functions, the National Innovation Council should drive hard for improved frameworks for

<sup>1</sup> At the Roundtable on Targets and Measurements there was a general agreement about the extent of the difficulties.

monitoring and reporting and, as set out earlier, should produce an annual Statement on Innovation to report on trends in the national innovation system. On the science and technology front, the US provides exhaustive and illuminating global trend data in the National Science Board's biennial science and technology indicators. The UK has probably made the most progress in developing a balanced scorecard framework for monitoring innovation, and a draft Australian version of this scorecard is at Annex 12. This could be further developed by the Office of Innovation Assessment.

**Recommendation 12.11: *An Annual Statement on Innovation should be prepared by the National Innovation Council and incorporate a clear set of framework indicators. (An initial proposal for these indicators is set out in Annex 12).***

### **Evaluation and Review functions**

Rigorous review processes are important to underpin public and industry confidence in the integrity of programs. Program evaluations should be transparent and undertaken from an independent standpoint.

In its 2007 Report on *Public Support for Science and Innovation*, the Productivity Commission found that:

*Governance arrangements relating to business programs need to change. Options include:*

- *shifting responsibility for commissioning program evaluations to an independent third party or establishing an inter-departmental working group to oversee such evaluations; and*
- *requiring full public disclosure of the results and recommendations and a timely response on the action to be taken.*<sup>1</sup>

We also note that the Department of Finance and Deregulation has embarked on a process of 'arms length' review of major groups of Commonwealth programs.

The Panel agrees with the principle that evaluations should be published and openly available. The same principles that apply to financial audit and risk management functions should apply to evaluation of innovation programs. Independence is only secured by the review function being at 'arm's length' from the administering body. This does not mean that delivery agencies should not do their own performance evaluation – they should, but these should

<sup>1</sup> Productivity Commission, *Public Support for Science and Innovation*, p. 421. 2007.

be supplemented by periodic independent reviews that are publicly released.

*Recommendation 12.12: The Australian Government, with the guidance of the National Innovation Council, should establish rigorous and consistent evaluation processes for innovation programs in line with the principle that the function should be carried out on an arms-length and transparent basis.*

In view of work underway on these issues in the Department of Finance and Deregulation, the Panel has not made a specific recommendation as to who should undertake these evaluations, but notes that the Department's responsibility for the Budget would provide an unhelpful conflict or bias.

Performance evaluations should be based on *ex ante* evaluation criteria and the best available evidence base. Where evaluations find inadequate data, it should be a requirement that action is mandated to address data deficiencies.

It is desirable that programs be evaluated not only against their specific policy objectives and program parameters, but also reviewed – within appropriate timeframe intervals – for their continued relative effectiveness compared with complementary or related programs. Review processes should be conducted to provide robust feedback loops to both the policy sponsors of programs as well as to the delivery agencies. Robust review processes, together with complementary and ongoing strategic assessment processes, are necessary to support policy innovation and to avoid the moral hazard of capture by vested interests.<sup>1</sup>

Finally, it is important that there be a clear separation between evaluation processes and central government budget processes. Clearly budgetary processes should be informed by, and reflect the outcomes of evaluations but they should not, in principle, stand in the place of evaluations. Apparently arbitrary program terminations undermine industry confidence in policy settings and introduce undesirable levels of uncertainty and risk. Changes with retrospective impacts are particularly undesirable.

In addition to having effective evaluation mechanisms, policy makers need to be well informed about the evolution of the national innovation system and how it compares with those in other countries. The Panel, in conducting this Review, was in many

<sup>1</sup> *Ibid*

cases constrained by the lack of both data and research findings concerning the Australian innovation system. In other countries this shortcoming has been recognised and independent innovation research centres have been created to undertake research on the innovation system, provide independent advice to government and offer meeting places where private sector practitioners can interact with each other, policymakers and academics.<sup>1</sup> The Panel sees merit in establishing such a centre in Australia. It would develop skilled researchers, comprehensive databases and cutting edge methods for research on both the innovation process, broadly defined, and specialised questions of key national importance.

*Recommendation 12.13: A National Centre for Innovation Research should be established to advance knowledge of the innovation system through high quality, independent research which is strongly relevant to policy and practice.*

The Panel proposes a broad agenda for the future of innovation policy in Australia and advocates immediate action to address key needs and opportunities. An effective governance system will be critical in bringing together all the elements into a coherent national approach that maximise the value of public investment in innovation. The institutional framework proposed above is designed to provide the leadership required to ensure effective agenda setting, prioritisation, implementation and policy learning. With a vibrant agenda and strong policy leadership we can truly look forward to an innovative and prosperous future.

<sup>1</sup> In the UK, DIUS, in conjunction with the ESRC, TSB and NESTA, has funded the establishment of such a centre and this is regarded by the British Government as a key dimension of their innovation strategy.