REVIEW OF THE NATIONAL INNOVATION SYSTEM

Venturousaustralia

- *building strength in innovation*

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A Response by

Australian Academy of Technological Sciences and Engineering

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Venturousaustralia - building strength in innovation

The Australian Academy of Technological Sciences and Engineering[1] (ATSE) welcomes the report on the Review of the National Innovation System, entitled "Venturousaustralia - building strength in innovation". The report has many sound recommendations that are supported by ATSE. This Review will provide a timely signal to government and industry in Australia that the nation needs to reinvigorate and better fund innovation, which has seen government funding diminish considerably in the past decade.

The response from the Academy is focussed on those areas where there are either omissions or where further development is required of the recommendations contained in the Report. The Academy's response is based on comments received from a number of Fellows, including some input from key leaders in industry.

In general terms, ATSE considers that the report is perhaps too focused on assisting public sector research and that inadequate attention has been paid to new mechanisms likely to support a strong focus on innovation in Australian industry, to encourage industry to expand its expenditure on R&D significantly and to promote collaboration between industry and research providers. The primary policy goal should be to promote structural and cultural change through the achievement of much more dynamic innovation in industry, firms and government. ASTE considers that the report does not adequately address the deficiencies of previous policy frameworks. In a number of key areas related to industry, ATSE believes that the recommendations require further development if we are to achieve the innovation objectives.

The Academy notes that the Report follows on from earlier reviews (for example, "The Chance to Change") highlighting the importance of innovation to the Australian economy. ATSE is clearly of the view that time has now come for a significant effort to support innovation in Australia. Furthermore, ATSE is prepared to assist in the further development of innovation policies arising from this Review and in the implementation of the associated framework.

[1] ATSE, founded in 1976, is an independent, non-government organization, consisting of more than 750 eminent Australian Fellows that promotes the development and adoption of existing and new technologies that will improve and sustain our society and economy.

SUMMARY

While ATSE supports the broad thrust of the "Venturousaustralia - building strength in innovation", the Academy considers that the following matters deserve further attention:

- The Academy supports the introduction of the proposed tax credit scheme; this should be done as a matter of urgency. Consideration should be given to providing additional credits to those organisations that undertake collaboration with publicly funded research institutions (PFRIs) and that undertake innovation in the national priorities areas.
- While the Report comments on the desirability of collaboration between research providers and industry, identifying preferred mechanisms of collaboration and support for such mechanisms should be a priority task for the new National Innovation Council.
- ATSE strongly supports the Competitive Innovation Grants Program, but questions the requirement to repay grants from royalties because of administrative requirements which will make the cost benefit questionable.
- There are high costs and risks in later stages of technological innovation. Government needs to recognise that increasing the rewards or reducing the risks is the critical issue in administering the innovation/ promotion programs recommended by the Review.
- The Academy considers that the proposed National Innovation Priorities should be subjected to a more extensive foresighting approach.
- The Academy supports that public sector research be fully funded and that the level of government support for R&D be lifted to international standards and that this be achieved over a five-year time frame.
- The Academy is concerned that the Excellence in Research for Australia is focused principally on competitive grant income and publications in highly ranked journals. The ERA must have a reward component to foster collaborative links that will enhance innovation.
- While broadly supporting the proposed governance framework, the Academy considers that an Innovation Committee of Cabinet should be constituted to focus on the development of strategic initiatives for innovation and the allocation of funding for national innovation priorities and to coordinate the many departments involved in innovation. This would be advised by the National Innovation Council.
- ASTE believes that there might be merit in mirroring overseas practice in establishing a statutory body in Australia to be responsible for funding both research and industry support related to innovation.
- ATSE calls for an increase the numbers of science, technology, engineering and mathematics (STEM) graduates from Australian universities by mechanisms such as reducing fees in these disciplines in recognition of the key roles that these graduates play in innovation.
- ATSE calls for a 10-year strategic plan to increase Australian innovation.

1. Taxation Measures (Recommendations Chapter 8)

The Academy strongly supports that the tax concession scheme be changed to a tax credit basis for private sector R&D and recommends that the legal definitions be tightened to ensure the expenditure claimed is truly for innovation, research and development. This is necessary to contain the costs to government and to apply some quality control. The 50% refundable tax credits for non-tax paying firms is expected to adequately replace Commercial Ready grants if this can be implemented with urgency.

Australia has a poor performance in Business Expenditure on R&D (BERD) in comparison to OECD countries. Given the current financial climate, R&D expenditure is always the first cost cutting exercise by industry, as companies focus on revenue generation, and this causes loss of momentum and experienced R&D staff. Experience has shown that those companies that have maintained or strengthened their R&D activity during economic downturns are the ones most able to compete effectively when the eventual upturn occurs. Accordingly, appropriate encouragement should be given to companies to make this investment.

While the implementation of a tax credit scheme is expected to increase BERD, this may not be sufficient to increase the levels of innovation significantly. There is a need to actively encourage deep and widespread active collaboration between industry and PFRIs; this aspect is covered below.

Consideration should be given to setting targets for BERD, ensuring policies are implemented to support the achievement of such targets and monitoring performance against the targets. Furthermore, consideration could be given to providing additional credits to those organisations that undertake collaboration with PFRIs and that undertake innovation in the national priorities areas.

2. Collaboration between Industry and PFRI (Recommendations 9.3 & 9.5)

It is observed that only a small fraction of firms undertake expenditure on R&D, and of those, an even smaller fraction undertake collaboration with PFRIs. While the Report comments on the desirability of collaboration and proposes the use of vouchers (Recommendation 9.5), the absence of any detailed discussion on other novel mechanisms (including ones already trialled abroad) is a weakness of the report. Identifying preferred mechanisms of collaboration and support for such mechanisms, in the priority areas identified for innovation, should be a priority task for the new National Innovation Council. There is every sense that those in industry want to collaborate, but find the PFRIs jungle impenetrable. Clearly the present mechanisms (CRCs, ARC Linkage grants, RIRDC grants) are less than ideally effective. ATSE calls for a new class of research funding through the establishment of a mechanism to fund collaborative research for projects that are smaller (and involve shorter time frames) than a CRC, but bigger than Australian Research Council (ARC) Linkage grant funding provided.

ATSE also supports the emphasis in the Report on the importance of international links, increased support for entrepreneurial companies and the minimisation of the 'silo' mentality in relation to innovation.

Furthermore, the proposed Excellence in Research for Australia (ERA) model may be counter-productive to collaboration; this is covered in No. 7 below.

3. Support for Innovation (Recommendation 9.1)
ATSE strongly supports the Competitive Innovation Grants Program but questions the requirement to repay grants from royalties or other revenues because of administrative requirements which will make the cost benefit questionable.

4. Innovation Risk (Recommendations Chapter 9)
ATSE considers it essential to recognise the high costs and risks in later stages of technological innovation, and that it is necessary to provide assistance measures that will address this need. Industry will innovate if its perception is that the reward is adequate relative to the risk assumed. ATSE recommends the Government recognise that increasing the rewards or reducing the risks is the critical issue in administering the innovation/ promotion programs recommended by the Review.

5. Research Priorities (Recommendation 11.1)
While ATSE it is sympathetic to the National Innovation Priorities indicated in the report, the list of priorities does not appear to exhibit any coherency. The Academy considers that these should be subjected to a more extensive foresighting approach, which would include input from various bodies. Consideration must be given to those sectors where Australia has an excellent innovation performance and where there are strong research resources to underpin continued innovation in these sectors. A priority would be to develop a strategic national intelligence capability that explores critical emerging issues through horizon scanning, technology roadmaps and foresight – and provides findings that can be understood and acted on. The National Innovation Priorities must contain a portfolio of priorities representing a range in the risk- reward spectrum.

6. Public Sector R&D (Recommendations 6.1 & 6.4)
The Academy strongly supports the recommendations that public sector research be fully funded (other reviews have said this, but it needs to be restated and acted upon) and that public sector R&D should at least match the proportion of GDP that was allocated in the mid 1990s. Further, the Academy considers that this latter goal should be achieved over a time frame of five years. The level will need to be adjusted to keep pace with the activities of Australia's principal international competitors. A review after five years would be appropriate.

7. Excellence in Research for Australia, ERA (Recommendation 6.2)
The Academy is, in principle, supportive of the ERA being used as a mechanism to distribute research funding to universities (including block research funds). However, the Academy is concerned that the ERA is focused principally on publications in highly ranked journals and competitive research grant income. This will reward academics for producing publications

and gaining ARC/NHMRC grants alone. The ERA must have a reward component to foster collaborative links that will enhance innovation. Unless there are tangible rewards for collaboration, it will not happen.

8. Governance Framework (Recommendations 12.1 and 12.2)

Given the importance of innovation to the nation's prosperity and social wellbeing and given the nation's recent poor innovation performance, ASTE believes that the proposed framework should be enhanced to provide an appropriate framework to achieve a significant change in performance. The Academy considers that an Innovation Committee of Cabinet should be constituted to focus on the development of strategic initiatives for innovation and the allocation of funding for national innovation priorities and to coordinate the many departments involved in innovation. Such a committee must include treasury/finance. This would elevate innovation to an appropriately high level of government consideration. It would also reflect that innovation policy is relevant to a wide range of ministries and is central to employment and economic development. Such a high-level committee would ensure the achievement of coherence and consensus.

The National Innovation Council, chaired by the Prime Minister and comprising key influential forces in the sector including business, should provide the Innovation Committee of Cabinet with the overview, foresight and policy input that it requires for its decision-making and submissions to full Cabinet and thereby support the preparation of the Government's program. The Council must focus on strategic and policy matters and it should play a strong advisory role to Government.

The National Innovation Council may need to be supported by a series of Standing Committees in areas such as industry innovation, higher education research and skills development (including the proposed Research Co-ordination Council). Such an arrangement would go some way to offset the reduced number of representative bodies which are currently members of PMSEIC should it be replaced by a National Innovation Council.

Faced with similar challenges to improve innovation performance, the Scandinavian countries have developed new institutions to promote and support research and innovation and to play a transformational role. One important characteristic, such as TEKES in Finland, Vinnova in Sweden and the Technology Strategy Board in the UK, is that they have a high degree of operational independence within broad agreed strategies and highly consultative arrangements. ASTE considers there is merit in these bodies and recommends consideration be given to the establishment of a statutory body in Australia to be responsible for funding both research and industry support related to innovation.

The Academy believes that the definition of the strategic roles of the various councils, boards, and committees, their inter-relationship and the expertise and seniority of the members of these bodies will be critical factors in achieving a successful national innovation system for Australia. ATSE strongly recommends that considerable planning goes into the development of the governance framework and that reference is made to international experience in this area.

9. STEM graduates in fostering innovation (Recommendation 5.3)
While the Report proposes that steps be taken to address workforce shortages (including graduates into teaching), there is no recognition of the primary role that graduates with science, technology, engineering and mathematics (STEM) backgrounds play in innovation. Those overseas countries now leading the innovation race have high outputs of STEM graduates per head of population and a significant proportion of these are from applied disciplines. Two recent reviews of engineering have said that Australia's per capita production of engineers is low by developed country standards. Specific recommendations need to be developed to address this shortage. ATSE calls for an increase the numbers of STEM graduates from Australian universities by mechanisms such as reducing fees in these disciplines.

10. Planning Horizon
While suggesting setting up a mechanism for planning and overview, the Report does not identify an orderly planned approach with goals to be achieved in a set time frame. Without a clearly defined endpoint, it is likely that the various bodies will become talk-fests rather than managers of properly thought-out programs. ATSE calls for the development and regular review of a 10-year strategic plan to increase Australian innovation to be added to the functions of the proposed National Innovation Council.

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