ATSE

Increasing the Innovation Dividend from Emerging Technologies

WORKSHOP REPORT
Issues, Findings and Recommendations

OCTOBER 2011

Contents

Workshop details

The workshop, a feature of ATSE's broad strategic focus on prosperity through innovation, was held at Customs House, Brisbane on 23 August 2011. The one-day workshop involved more than 50 participants, including senior representatives from government, industry (large companies and SMEs, particularly from the biotech, energy and ICT sectors), academia, PSROs and potential funding agencies. For details, including the Workshop Programme, please see (http://atse.org.au/atse-in-action/tackling-issues).

Acknowledgements

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The University Of Queensland AUSTRALIA | AIBN Australian Institute for Bioengineering and Nanotechnology

Communiqué

Increasing the innovation dividend from emerging technologies

A key challenge for Australia is to drive national prosperity through innovation. Australia is ranked high on scientific publications but very low on measures of innovation, for example the extent of triadic patenting[1] and on collaboration between publicly funded research organisations and industry, particularly small-medium enterprises (SMEs).

The Communiqué was developed at an ATSE workshop, held on the 23 August 2011 in Brisbane, and is based upon discussions and views expressed by the workshop delegates[2,3]. The Workshop recommendations in this Communiqué call for a substantial upgrade of support for the Australian innovation system and the need to increase significantly the level of innovation in Australia.

SUMMARY

1 Make innovation more attractive, especially for SMEs

Innovation is about risk-taking and driving new products and services through to the market place. The more we do, the better we get. Further steps should be taken by Government to encourage SMEs to engage in innovative activities. This will require training, the fostering of an innovative management culture and financial incentives to encourage companies to be innovative and lift productivity through the application of new technologies. There is room for braver processes than those currently in place, under which small companies would receive unmatched non-refundable grants for proof-of-concept work, potentially along the lines of the US Small Business Innovation Research (SBIR) scheme.

2 Change the incentives for Australia's world-class researchers

There is a need to change the incentives for Australia's researchers to reward collaboration with end-users and commercialisation of research. At present, Australia has a strong focus on measurement of readily quantifiable parameters, as in the Excellence in Research Australia (ERA) initiative. ERA is dominated by academic publications and it has become the prime determiner of university status and likely future funding and driver for academic recognition and appointments. Australia excels with academic publications on any measure in terms of number and quality – proof that what gets measured gets done. There is an urgent need for a complementary measure that recognises and rewards activities that lead to increased innovation by adoption of the inventive output of Public Sector Research Organisations (PSROs).This could be filled by an Excellence in Innovation Australia (EIA) initiative.

3 Improve innovation skills

Australia needs to develop, in both its public-sector researchers and those in industry, a better understanding of the innovative process and the ability to collaborate to ensure that the results of inventive public-sector research are fully captured. This collaboration should involve training periods in other organisations to foster relationships and understanding of goals.

1 Triadic patent families are a set of patents taken at the European Patent Office (EPO), the Japanese Patent Office (JPO) and the US Patent and Tradmark Office (USPTO).

2 This communiqué does not reflect the views of all workshop delegates.

3 For workshop details see rear.

RECOMMENDATIONS

1 Make innovation more attractive, especially for SMEs

Financial incentives

- A complementary scheme to Commercialisation Australia should be implemented to enable proof-of-concept to be established – for example, introduction of a variation of the US Small Business Innovation Research (SBIR) scheme or a government procurement-based 'Innovative Purchasing' scheme.
- The R&D Tax Incentive should be extended to cover productivity improvements through deployment of new technology.
- Accelerated depreciation on investments to bring new-to-the-market products into service should be adopted as a similar option to a model adopted abroad, where a tax holiday of up to 10 years is granted for new initiatives.
- Members of superannuation funds should be given the choice to select an option that would target some funds going into an 'Innovation for Australia' fund of funds, which could be used to further the efforts of Commercialisation Australia and provide ongoing support for successful innovative projects receiving initial support under government schemes.
- Government innovation policies should be consistent to provide surety for industry and public-sector research organisations (PSROs) and maintained irrespective of the electoral cycle.

Procurement

- Government procurement should be used more boldly as a market pull lever to encourage and foster innovation in Australia. For example:
  1. Target a small percentage (for example, five per cent) that must include innovation that is new to the market.
  2. Revisit offset schemes, such as those in the 1980s, that enabled existing SMEs to enter international supply chains through multinational suppliers that were required to work with Australian industry.
  3. Insist NBN Co develop and enforce a local content provision in its procurement policy, so its multinational suppliers prove they are working with Australian resident SMEs for some proportion of hardware and software provision.

Incubation

- Consideration should be given to models of incubation other than the establishment of start-up companies. SMEs engaged in the development of new technology should be encouraged to consolidate to achieve critical mass and, where appropriate, to work with larger companies. Favourable taxation treatment of share transfers associated with such developments should occur.

2 Change the incentives for Australia's world-class researchers

- The extent of application of Australia's publicly funded R&D for commercial, environmental or social outcomes should be measured and the funding formula to public-sector research institutions be modified to reflect success in the application of research. A program like the proposed 'Excellence in Innovation Australia' scheme should be adopted as a complementary measure to the Excellence in Research Australia (ERA) to recognise and reward activities that lead to increased innovation.
- Collaboration should be incentivised and rewarded. Universities, in particular, should be rewarded for fostering collaboration, via mechanisms such as Third Stream funding, with this being a significant factor in staff assessment and promotion.

- Greater use of intermediaries should be implemented to facilitate linkage between industry and PSROs.
- Universal contracts for collaborative R&D between industry and PSROs should be developed with the accent being on minimising the transaction cost and overcoming the risk-averse attitude of PSROs.
- The scope and budget of Government R&D support programs should be extended and research resource allocation processes should be made far more efficient and rapid.
- Modest funding (for example, $50 million) should be provided for partnerships similar to the UK Knowledge Transfer Partnerships (KTPs) which are directed to SMEs. Ways to foster the existence of trusted intermediaries who can assist in bridging the gap between researchers and industry should be examined.
- Tax disincentives preventing researchers from participating in the profits flowing from innovation should be removed.

3 Improve innovation skills

- Skills training for SMEs in fostering of innovation should be substantially extended, possibly using industry associations as vehicles for penetration of appropriate sectors.
- Public-sector research agencies should be encouraged to have their staff spend sabbaticals in industry.
- Tax incentives or other measures should be developed to improve the attractiveness for skilled expatriates with experience in fostering innovation to return to Australia.

The Workshop

Issues addressed

- A key challenge for Australia is to drive national prosperity through innovation. The decline in Australian productivity threatens to constrain the high quality of life that Australians currently enjoy. Australia can be a more prosperous country if ways can be found to stimulate innovation in all sectors, particularly in the development and application of emerging technologies. This challenge is made greater by a pressing need to introduce 'green energy' generation technologies and a strong currency induced by the resources sector that is rendering many industries internationally uncompetitive.
- Although Australia's academic publication record significantly exceeds OECD average, triadic patents lag well behind. Australia also lags well behind other leading countries in terms of collaboration between firms and universities (see 2011 ATSE Communiqué *Strengthening links between industry and public sector research organisations*[4]) and ranks even lower on the scale of international collaboration. There is a need to significantly increase the level of innovation in Australia and encourage Australian researchers to facilitate the application of research.

Workshop objectives

- The ATSE workshop *Increasing the innovation dividend from emerging technologies* sought to explore how innovation can be encouraged in emerging technologies (particularly in the IT, biotech and energy sectors) and how its role can be optimised to enhance competitiveness and maintain prosperity and high living standards in Australia. This workshop, which reviewed the current status and sought to determine ways to increase the dividend from this investment, was particularly timely given that Federal and State Governments are actively interested in increasing innovation in Australia.
- The workshop, a feature of ATSE's broad strategic focus on prosperity through innovation, was held at Customs House, Brisbane, on 23 August 2011 and co-sponsored by the Australian Institute for Bioengineering and Nanotechnology (AIBN) of the University of Queensland. The one-day workshop involved more than 50 participants, with representatives from SMEs, industry, government, research and finance sectors. For further details please see the Workshop Programme, Workshop Discussion Paper[5] or the Workshop Communiqué[6].

Workshop structure

- The one-day workshop involved more than 50 participants, including senior representatives from government, industry (large companies and SMEs, particularly from the biotech, energy and ICT sectors), academia, public-sector research organisations and potential funding agencies (including private capital, superannuation and health funds).
- Through presentations, a panel and break-out discussion sessions, the workshop addressed the challenges and opportunities for emerging technologies in the energy, biotechnology and IT sectors in Australia and how they could contribute to increased productivity and prosperity. Some of the more successful initiatives adopted in other parts of the world were discussed.
- This Workshop Report reflects the views expressed by the workshop delegates, but not all delegates. Following the workshop, a draft communiqué was developed based on the presentations and comments made at the workshop. Delegates were then invited to comment on the draft; comments received were considered in developing this final communiqué.
- The overarching objective of the recommendations herein is to significantly increase the level of innovation in Australia.

4 http://www.atse.org.au/atse-in-action/82/273-strengthening-links-between-industry-and-public-research-sector-organisations
5 The lead author of the Workshop Discussion Paper 'Increasing the innovation dividend from emerging technologies' was Dr Robert Hobbs FTSE.
6 http://atse.org.au/atse-in-action/tackling-issues

Findings & Recommendations

1 Make innovation more attractive, especially for SMEs

Innovation is about risk-taking and driving through to the market place. The more we do, the better we get. Further steps should be taken by Government to encourage SMEs to engage in innovative activities. This will require training, the fostering of an innovative management culture and financial incentives to encourage companies to be innovative and to lift productivity by applying new technologies. There is room for a SBIR-type process where small companies receive unmatched non-refundable grants for proof-of-concept work. Support to reinvigorate technology intermediaries, access to infrastructure and incubation facilities and a targeting of government procurement to foster innovation should also be considered.

FINANCING

There is no one-size-fits-all model for financing emerging technologies. There are varying degrees of capital intensity and different timelines. Since 2007 the venture capital (VC) system has had difficulty in attracting investment funds and can be considered to be 'broken'; investment by Australian VCs is down to one-third of its 2007 peak. Superannuation funds are more risk-averse, experiencing downward pressure on fees and no longer investing in funds-of-funds. The consequence is that there is little funding available for technology start-ups. In the present financial climate, adaptation by existing companies is seen as the main opportunity for innovation, rather than start-ups of breakthrough technologies. Risk/reward perceptions need to change and long-term thinking must be encouraged. A source of unmatched funding is required to form a bridge for proof-of-concept work until venture capital can be attracted. Tax holidays for new initiatives and encouragement of superannuation fund members to invest in an 'Innovation for Australia' fund of funds should be considered.

Proof of technical concept funding: a similar scheme to the Small Business Innovation Research (SBIR) scheme

Commercialisation Australia is a good initiative, albeit covering one part of the commercialisation process. There is, however, room for much braver schemes to be established in Australia to support SMEs. Government could revisit proof-of-concept programs and leverage existing schemes and investments. Any such scheme should vest the management of projects firmly in the industrial sector and assist in getting an innovative idea to the stage where it can be picked up by Commercialisation Australia. Closer examination of international demand-side programs (such as the Small Business Innovation Research (SBIR) scheme, the Small Business Technology Transfer (STTR) scheme, Knowledge Transfer Partnerships, Rolls Royce University Technology Centre) is required to ascertain which schemes, if any, could be profitably applied in Australia. For example, a variation of the US SBIR scheme could be considered, where SMEs receive non-refundable monetary support for early-stage, proof-of-concept activities and are then eligible for Commercialisation Australia support or participation in 'Innovative Purchasing' schemes.

New funding models to support R&D in emerging industries

New funding models need to be developed; a 'Future Industries Venture Fund' similar to the Building Australia Fund could be established to support R&D in emerging industries, government would need to provide support through incentives or other arrangements. Opportunities to better attract international funding should also be explored.

Superannuation funding

Superannuation is Australia's implicit 'Wealth Fund'. A superannuation 'Fund of Funds' should be examined as a venture capital source for SMEs. Members should be given the choice to select an option that would target some funds going into 'Innovation for Australia' to support emerging technologies into the market place. For example, as Government legislates a mandatory increase in the minimum employer superannuation contribution, Government could at the same time legislate that trustees offer the option that a certain minimum percentage of the fund be allocated to emerging Australian industries.

Taxation incentives for productivity improvements & investment in emerging technologies

Recent changes to the R&D Tax Incentive are good, but they should go further. Companies that demonstrate improvements to productivity, particularly through the deployment of new technology, should have access to tax incentives. Similarly, taxation incentives for sophisticated investors should be introduced to encourage venture philanthropy and investment in risky businesses or the VC funds investing in them. Many countries have a tax holiday of up to 10 years for new initiatives. This does not incur cost to government nor imply revenue forgone, even if some ventures become highly profitable as they do in countries that operate this scheme. There are other ways of tackling the same line, such as accelerated depreciation on investments to bring new to the market products into service, including biotech and health products.

Financing is important. Though this is recognised in many existing schemes, there is room for improvement.

Recommendations

- A complementary scheme to Commercialisation Australia should be implemented to enable proof-of-concept to be established – for example, introduction of a variation of the US Small Business Innovation Research (SBIR) scheme or a government procurement-based 'Innovative Purchasing' scheme.
- The R&D Tax Incentive should go further and be better targeted to where the R&D investment has led or will lead to innovation and be extended to cover productivity improvements through deployment of new technology.
- Accelerated depreciation on investments to bring new-to-the-market products into service should be adopted as a similar option to a model adopted abroad, where a tax holiday of up to 10 years is granted for new initiatives.
- Members of superannuation funds should be given the choice to select an option that would target some funds going into an 'Innovation for Australia' fund of funds, which could be used to further the efforts of Commercialisation Australia and provide ongoing support for successful innovative projects receiving initial support under government schemes.
- Government innovation policies should be consistent to provide surety for industry and PSROs and maintained irrespective of the electoral cycle. Less complex administration procedures are also important.

PROCUREMENT

A reinvigoration of government procurement should be encouraged to foster Australian innovation. Government procurement has long been recognised as a major market pull lever for encouraging and fostering innovation and already favours a certain percentage sourced in Australia. There is room for a much braver approach that targets a small percentage (for example, five per cent) that must include innovation that is new to the market.

Recommendation

- Government procurement should be used more boldly as a market pull lever to encourage and foster innovation in Australia. For example:
  1 Target a small percentage (for example, five per cent) that must include innovation that is new to the market.
  2 Revisit offset schemes, such as those in the 1980s that enabled existing SMEs to enter international supply chains through multinational suppliers which were required to work with Australian industry.
  3 Insist NBN Co develop and enforce a local content provision in its procurement policy, whereby its multinational suppliers work with Australian resident SMEs for some proportion of hardware and software provision.

INCUBATION AND INFRASTRUCTURE

There is a need for access to technology intermediaries and access to legal and financial expertise needs to be improved and promoted. Start-up companies with limited funds require access to infrastructure to assist prototyping and early stage development of their technologies; they would be assisted if this was provided less expensively and in a timely fashion. Government and PSROs both have a role to play in making infrastructure available to industry. PSROs should develop improved infrastructure access models to assist SMEs and start-ups. High-cost infrastructure in PSROs – especially where this has been funded under the National Collaborative Infrastructure Strategy (NCRIS) – should be made available to industry, particularly SMEs, at marginal cost.

Incubators have been helpful in nurturing start-up companies, but large companies could also nurture them by providing access to expertise, market pull and preferential purchasing. Industry should be encouraged to do this and identify what incentives, if any, would help the process. Access to technology intermediaries has traditionally been usefully provided by incubators, linking SMEs with larger companies, and also legal and financial expertise, but in recent years the use of intermediaries has fallen away primarily due to cost. Government could consider how this type of support could be reinvigorated, one model could be the expansion of the program provided by Commercialisation Australia, consideration should be given to other mechanisms too.

Recommendations

- Consideration should be given to models of incubation other than the establishment of start-up companies. SMEs engaged on the development of new technology should be encouraged to consolidate to achieve critical mass and, where appropriate, to work with larger companies. Favourable taxation treatment of share transfers associated with such developments should occur.
- Access to infrastructure in PSROs for early stage development of technologies should be made easier and at marginal cost to industry, especially SMEs.
- Consideration should be given of other models of incubation, for example consolidation of and special treatment for SMEs and SMEs working with larger companies, especially on taxation treatment of share transfers.
- Access to technology intermediaries, as well as legal and financial advice, should be improved, perhaps by further development of the support programs provided by Commercialisation Australia.

2 Change the incentives for Australia's world-class researchers

There is a need to change the incentives for Australia's researchers by maintaining funding and reward for academic publication but also rewarding collaboration with end-users and commercialisation of research. Australia excels with academic publications on any measure in terms of number and quality – proof that what gets measured gets done. This must change. Australia should adopt a complementary measure to the ERA, 'Excellence in Innovation Australia'.

Innovation impact

There is a need to change the incentives for Australia's researchers to maintain funding and reward for publication but also reward collaboration with end-users and commercialisation of research. At present, Australia has a strong focus on measurement of output measures (e.g. Excellence in Research Australia (ERA)). However, ERA is dominated by publications and it has become a determiner of funding, university status, academic recognition and appointments. Australia excels with academic publications on any measure in terms of number and quality – proof positive that what gets measured gets done. On the other hand the level of triadic patenting, a measure of commercialisation, is very low. This must change.

It is essential that an impact measure be included in research quality evaluation. Australia should adopt a complementary measure, 'Excellence in Innovation Australia', that recognises and rewards activities that lead to increased innovation by adoption of the inventive output of PSROs. The establishment of an EIA would broaden the current focus in universities on 'publish or perish' to a greater recognition of the importance of innovation.

Recommendation

- The extent of application of Australia's publicly funded R&D for commercial, environmental or social outcomes should be measured and the funding formula to public-sector research institutions be modified to reflect success in the application of research. A program like the proposed 'Excellence in Innovation Australia' scheme should be adopted as a complementary measure to the Excellence in Research Australia (ERA), to recognise and reward activities that lead to increased innovation.

Collaboration amd partnerships

Innovation involves collaboration throughout the complete value chain from invention to the marketplace. Thus several companies might be involved as well as several research organisations and innovation intermediaries that facilitate bridging the gap between the various parties have an important role to play.

In the case of research organisations it is recognised that the innovation dividend from international collaboration is higher than national collaboration so government policy needs to encourage broad based international collaboration.

Knowledge transfer into established companies, rather than start-ups, is an effective path to commercialisation. Innovation intermediaries established and built up, would foster demand pull. The innovation dividend from international collaboration is higher than national collaboration so government policy needs to encourage broad based international collaboration.

The CRC Program is often heralded as the most successful measure for fostering collaborative activities; it was noted that there is an opportunity for it to be enhanced by considering a possible combined scheme involving the ARC linkage grants.

CSIRO is targeting and achieving increases in external engagement. There is a need for further improvements however across all sectors

Universities should provide further dual track positions to enable academics to move in and out of industry and industry placement schemes for academics. Adjunct positions could also be offered to wide range of senior industry R&D professional. Universities could also ensure PhD students have experience in industry, make short-term stays in industry a requirement for academic advancement in appropriate disciplines and establish industry/international industry Fellowships. Universities could employ experienced business development and SME people in research groups. Universities should support complementary measures to ERA to increase collaboration with industry. This is explored in detail the ATSE *Strengthening links between industry and public sector research organisations* Workshop Communiqué[7].

The UK's Knowledge Partnerships (targeting SMEs) and the "Third Stream Funding" where Universities are rewarded for teaching, research and collaboration with industry or other users of their research are often regarded as useful mechanisms to improve collaboration and successful innovation.
While commercialisation is currently supported to a limited extent in PSROs, it can be improved, especially in moving away from the "no risk" approach seen in many universities. In addition pooling of resources between universities should be considered to improve their commercialisation initiatives.

Recommendations

- Collaboration should be incentivised and rewarded. Universities, in particular, should be rewarded for fostering collaboration, via mechanisms such as Third Stream funding, with this being a significant factor in staff assessment and promotion.
- Greater use of intermediaries should be implemented to facilitate linkage between industry and PSROs
- Universal contracts for collaborative R&D between industry and PSROs should be developed with the accent being on minimising the transaction cost and overcoming the risk-averse attitude of PSROs.
- The scope and budget of Government R&D support programs should be extended to make it possible for decisions on funding to be made in days rather than months or years.
- Modest funding (e.g. $50 million) should be provided for Partnerships similar to the UK Knowledge Transfer Partnerships (KTPs) which are directed to SMEs. Ways to foster the existence of trusted intermediaries who can assist in bridging the gap between researchers and industry should be examined.
- Tax disincentives preventing researchers from participating in the profits flowing from innovation should be removed.

Access to intellectual property

It was noted that fragmented IP ownership can be a major impediment to public/private collaboration. To address this, the concept of IP repositories could be developed, whereby SMEs can access technologies that they can use and free up to the point that the technologies are commercially successful. It was also suggested that pathways to better use Australian IP could be achieved by easing the strictures some PSROs place on research translation. Universities should consider pooling their commercialisation resources and must provide greater support for patents and commercial success in their application.

7 http://atse.org.au/atse-in-action/tackling-issues

Culture change

A culture of innovation must be instilled in Australia. Universities should assist the culture change required to shift from publication to application including reward systems for collaboration, for example by changing promotional requirements in appropriate areas to reward entrepreneurship or collaborative behaviour. Government could provide targeted support to industry organisations to develop innovation awareness programs, much as in earlier decades when programs were developed to foster exports.

3 Improve innovation skills

Australia needs to develop, in both its public-sector researchers and those in industry, a better understanding of the innovative process and the ability to collaborate to ensure that the results of inventive public sector research are fully captured. This collaboration should extend to both sides spending training periods with the other to foster relationships and understanding of goals.

Fostering innovation requires a public-sector research workforce that is attuned to working with the end-users of research as well as a receptive environment in industry. Managing the innovation process requires specific skills that have been honed by experience. Other countries (especially the US) develop managers with appropriate skill sets. It is in Australia's interests to create attractive conditions to encourage expatriate Australians who have worked in innovative ventures to return. Equally, it is important to provide those managing innovation with appropriate career paths and to develop training programs them which develop appropriate innovation management skills.

Recommendations

- Skills training for SMEs in fostering of innovation should be substantially extended, possibly using industry associates as a vector for penetration of appropriate sectors
- Public sector research agencies should be encouraged to have their staff spend sabbaticals in industry.
- Tax incentives or other measures should be developed to improve the attractiveness for skilled expatriates with experience in fostering innovation to return to Australia.

4 Key issues: biotechnology, energy and IT sectors

The workshop considered three technology sectors in particular. Key issues for these sectors are outlined below.

Biotechnology sector

Although there are large numbers of biotechnology companies, most are very small, leading to fragmentation of skills, experience and finance; mergers and acquisitions need to be encouraged. There are some success stories but these are mostly 'one-off'.

There is very little investor support for building companies rather than developing single products. One product does not make a company and the mindset of resorting to start-ups rather than expanding an existing company's product range needs to change. It was suggested that licensing to current SMEs should be encouraged, rather than resorting to new start ups in the same field.

International pharmaceutical companies with diminishing pipelines will be looking for deals but many Australian start-up companies are not yet 'deal-ready' due to inadequate funding. Delegates identified that there is a gap for proof of technical concept funding, as addressed in *Section 1*.

There could be an opportunity for the Federal Government to provide additional funds to current schemes (for example the Proof of Concept scheme in Queensland) in the States, thus preventing duplication of bureaucratic resources and costs.

Energy sector

In meeting Australia's future energy requirements there is a need for a portfolio response, where cost must be balanced with security and environmental impact (for further detail see the 2010 ATSE Report *Low Carbon Energy*). Energy sector R&D should be focused on enabling technologies best suited to Australia's unique opportunities and challenges (for example energy storage, electric vehicles, smart grids, large distributed system stability and solar technologies).

Energy technologies tend to be capital intensive, therefore existing large companies will be required to facilitate commercialisation. The resources industry requires technology developers, ideally local, to assist in resolving their technical problems. Delegates also noted that for the electricity sector one third of emissions abatement will be readily and more economically achievable from energy efficiency.

IT sector

Big changes are occurring in enabling technologies in the IT sector e.g. cloud computing, mobility, huge data bases and data mining, crowdsourcing and green computing; there are opportunities for SMEs to develop new business models based on these trends.

There is a growing shortage of skilled people in the IT sector, the current skills shortage stands at 14,500 and is forecasted to grow to 25,000 by 2020; this must be addressed.

The current focus of the NBN is on construction, it was suggested that some of the investment should be directed towards the applications which will use the NBN and that some contracts should be directed towards SMEs and start-ups. There could be more opportunities for Australian SMEs to participate in the construction of the network and future contracts should encourage large multinationals to foster and incorporate technologies from Australian SMEs where possible.

Role of ATSE

Delegates agreed that the Academy should play a leading role in advising Government, industry and public sector research organisations on ways to increase innovation in Australia, including ways to achieve a greater innovation dividend from emerging technologies. Key areas where the Academy could contribute include: identifying skills gaps, examining ways to bridge the industry/PSRO attitudinal gap, helping the IT industry to engage with other industry sectors such as agriculture and initiating a study to explore how technology intermediaries can be reinvigorated.

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About ATSE

The Australian Academy of Technological Sciences and Engineering (ATSE) is an independent, non-government organisation, promoting the development and adoption of existing and new technologies that will improve Australia's competiveness, economic and social wellbeing, and environmental sustainability.

ATSE, one of Australia's four learned Academies, was founded in 1976 to recognise and promote the outstanding achievement of Australian scientists, engineers and technologists. It consists of some 800 Fellows, including 19 Foreign Fellows, drawn from the wide spectrum of the applied sciences.

The strategic priorities of ATSE are to:

- Provide a national forum for discussion and debate on critical issues of Australia's future, ensuring a valuable source of technological sciences and engineering based advice to government, academe, industry and the community.
- Improve education in the technological sciences and engineering through programs such as STELR (Science and Technology Education Leveraging Relevance) Project. This is a national secondary school science education initiative of ATSE.
- Promote technological sciences and engineering linkages globally and to foster technology transfer through its international program.
- Champion excellence in the technological sciences and engineering.

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The Australian Academy of Technological Sciences and Engineering (ATSE)

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