Australian Institute for Commercialisation

ideas → opportunities → outcomes

The Australian Institute for Commercialisation

Submission to Review of the National Innovation System

I. Response to the Issues Paper

April 2008

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Declaration of Interests and Affiliations

The Australian Institute for Commercialisation (AIC) is a national, not-for-profit organisation established in 2002 to assist in the commercialisation of Australian research and know-how. Its vision is to enhance Australia's future economic prosperity, environment, and lifestyle by improving our national ability to take innovative ideas to market.

The AIC's sole shareholder is the Queensland Minister for Tourism, Regional Development, and Industry. Reporting to an independent board of directors, the AIC works nationally with Australian industry, research organisations, and governments to create high value jobs, exports, and wealth by taking innovative ideas to market.

The AIC is chartered to work within the innovation system, and as a predominantly publicly-funded body generally operates in areas of market failure. In 2008, the AIC delivers services for the Australian, Queensland, South Australian, Victorian, and Tasmanian governments. The AIC declares its interest to continue to see strong government support for strengthening the innovation system in order to build a more prosperous Australia.

AIC capabilities

Since its inception, the AIC has been active as a policy advocate in matters relating to innovation. Such advocacy is not based on academic research; rather, it is based on the AIC's hands-on experience in devising and delivering innovation services and programs, typically though not exclusively on behalf of government agencies. Because the AIC is independent and not for profit, one of the roles it serves is the function of an 'honest broker'.

The AIC's core competencies are:

- Extensive innovation networks across Australia, including the research sector
- Relationship with the federal and all state governments
- Know-how and skills in technology transfer
- Experience and track record as an innovation intermediary
- Ability to facilitate collaboration across stakeholder sectors
- Ability to offer independent innovation policy advice based on its track record of service delivery at the coal-face

The AIC has pioneered a number of programs that have helped to address failures in the innovation system and that have improved the transfer of knowledge and IP from supplier institutions (such as governments and research organisations) into the user community (typically SMEs).

These programs include:

- **Commercialisation Bootcamps and Ideas2Market**, professional development programs aimed at researchers and business owners respectively, to assist them to understand the importance of IP, its potential value, and the steps they can take to generate that value.

- **TechFast**, a market-pull R&D collaboration program that works with SMEs to identify know-how from the research community or other organisations to solve the SME's business challenges or improve their innovation. Following identification of appropriate IP, the AIC assists these organisations to establish collaborations and to manage the translation and uptake process.

- **Government Innovation Services,** helping government agencies to commercialise IP, typically the ICT underpinning government processes (for instance, in hospitals or management of public housing), and more recently to help simplify the transfer of IP between jurisdictions by introducing a transfer framework and protocol, and managing the information sharing and collaboration process. These services can bring efficiencies to governments and improve the services they deliver by improving their management and use of intellectual assets.

- **Technology Clinics**, roundtables focussed on technological innovation outcomes, bringing together government stakeholders across agencies and/or jurisdictions, the research sector, and industry partners in order to establish early collaboration in a typical domain area (for instance, energy or health), align research to needs, and to better prepare industry for the procurement process that may follow. By enabling collaboration between the three sectors, Technology Clinics provide the vehicle for matching research ability with industry needs and for supporting the development and or implementation of effective R&D policy.

In response to "A Call for Submissions", February 2008, and in the interests of providing as much information as quickly as possible, and in a digestible format, the AIC has structured its submission into multiple parts:

I. Response to the Issues Paper (this paper)
II. Facilitating collaborative R&D
III. Innovation in government
IV. Market-based services for innovating companies

This paper, I - Response to the Issues Paper, attempts to align its comments broadly with the questions raised in the call.

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

A better world, presumably one with shared economic outcomes, social justice, and a sustainable environment, will come by finding solutions that are able to solve current day challenges. Unsatisfactory solutions inevitably involve compromises that favour one outcome at the expense of another. Burning coal may deliver a great economic outcome, but only at the expense of environmental damage; developing and using clean coal can deliver both. It requires innovation.

In delivering its programs, the AIC has observed numerous failures in the innovation system. Many of these are well known, and include the lack of 'soft infrastructure' that enables collaboration between research, government and industry stakeholders; the lack of capital for development of proof of concept and early stage demonstration projects, compounded by the small venture capital industry in Australia; the perceived lack of appropriate skills and know-how; and an industry culture that (in comparison with other advanced economies) seems to avoid deep collaboration with customers, supplier, and research providers. These are detailed later in this submission.

Innovation requires novel ideas, and research organisations are one obvious source where such ideas are discovered. Too frequently, discussion around the contribution of such institutions to innovation focuses on the IP that they create, but such language can easily overlook the know-how and implicit knowledge that the researchers themselves embody. IP is too often seen as packaged ideas sitting on a shelf, or knowledge that can be patented or copyrighted; in fact, IP is often embodied in the skills, networks, and know-how of people.

Innovation vocabulary is also often misleading. For example, the term "commercialisation" is too frequently equated with a linear conversion process, initiated and led by discovery through research, or of IP taken to markets through a start up company process. We disagree with this very narrow definition and instead prefer the broader usage – familiar to

business - of bringing a product, service, or process to a market where it creates value. To do so successfully typically requires knowledge transfer, exchange, or diffusion.
To the AIC, “innovation” is the process of creating value through application of a novel idea so it creates value to others. Simply put, innovation involves both invention and commercialisation. It involves a creative step and an application step that are often intertwined. The creative step (“knowledge production”) entails coming up with a new idea, perhaps sourced from research, or pool of IP (the supply side). Other, certainly more common, sources of ideas are customers, suppliers, or employees. The commercialisation step (“knowledge application”) entails developing that idea to create a product or service, improve a process, or perhaps, develop a business. Such development must ultimately yield value to some user. The ‘circle’ is closed (“knowledge diffusion”) when absorption of the use results in adaptation of the original idea and leads to additional innovation.

Because research attempts to answer the big questions, and come up with big ideas, excellence in research is widely agreed to be fundamental to innovation. Statistics show that research is rarely the major source of ideas for business. However, it is the potential of research to answer fundamental questions, and to develop solutions to problems (and in the process create new ideas), that make research so vital to a healthy innovation system. Excellence in research underpins Australia’s innovation system, and builds national capacity and develops skills. However, in evaluating which research warrants public funds, care should be taken to ensure that the peer review process does not penalise researchers who have been involved in the translation of their research to practical application (or commercialisation, in a broad sense). The AIC has been contacted by several researchers whose publication records had been curtailed, either because of contracted research to the private sector that limited publication because of concerns about early disclosure, or because of time spent on commercialisation activities (such as research translation in the health sector). As a result of their reduced publication records, these researchers’ applications for new research funding were refused by their peers who equated research publication record and citations with ‘research excellence’. Clearly, efforts to develop proof of concept or to apply research should be regarded as measures that are equal in status with publication in this process.

We also suggest that a portion of research funding be made available for demonstration, proof of concept, or translation to practical application. Lack of such funding prevents industry being able to assess whether the research is relevant to possible market needs. Proof of concept funding can also allow useful implicit knowledge to find its expression in tangible form where it can be better evaluated and recognised. ARC Linkage Grants are

frequently cited as helping applied research find expression in this way, but such Grants are awarded for use-inspired research, and fail to address the need for prototypes or proof of concept models in many applications. The AIC itself has been involved in three ARC Linkage Grants, but all have been proposed by researchers and are still theoretical in nature.

Furthermore, the AIC would advocate balancing the academic peer review process with community or industry representatives for research that is usage inspired. The binary choice between 'public good' research or research with commercialisation potential is false logic – it is not a case of either/or, there can be both. Much 'public good' research has commercialisation potential when considered in the broad sense of the word. For example, the *Antarctic Climate & Ecosystems (ACE) CRC* has developed science and IP that is of interest to the shipping industry and insurance companies – a fact not originally obvious, or of relevance, to the researchers themselves, who considered themselves as serving the public good.

We also believe there may be justification for a more rigorous search process, even including market research, to ensure that research funds are not wasted or spent solving problems that have already been solved elsewhere, perhaps unbeknown to the research applicant.

As noted above, a key requirement for research to result in innovation is its application to create something novel and of value. This requires a diverse and quite different skill set than the inventive or creative skills associated with the first (creative) step. Where those skills are found outside the research organisation, **access** to the IP or know-how must be provided for innovation to occur. There is wide debate around the free dissemination of IP by universities, the 'democratisation of science', and of open access, for such access can spawn new and often greater research. The AIC recognises there is no single answer, but while publication of research contributes to growth of the innovation ecosystem, it will not always be the strongest path to innovation, and when it is, it is often a very indirect one in which the innovation value might be mostly reaped outside Australia.

However, quite aside from this debate, access to IP held within public institutions, such as research organisations or governments, is usually neither free nor easy. Intermediary organisations, such as the AIC, have proven effective in developing relationships with both the supply and demand sides to provide effective access and support knowledge transfer. Across five states, since 2005, the AIC's TechFast program has helped to execute 45 collaborative R&D agreements, involving 35 SMEs and 26 research organisations. Many more SMEs and research organisations have been involved and benefited, but have not

executed formal agreements. Some of these agreements have resulted in significant new product developments. The Commonwealth's $3 million public investment in the TechFast service so far has directly generated a further $14 million of committed R&D by TechFast participating businesses that would not have otherwise occurred. More importantly, this relates entirely to collaborative activity between SMEs and research organisations.

The first pilot of the TechFast program was reviewed by an independent reviewer from the University of Queensland Business School in 2006. The reviewer writes:

> *"The AIC's TechFast program has bridged a gap between SMEs and research organisations. As such it should be seen as a demonstration program, and judged accordingly. Of 27 companies analysed from the first TechFast pilot program, some sixteen instances of knowledge transfer occurred and twelve technology transfers. This sharing of intellectual capital between research organisations and companies, initiated through TechFast, will create an economic bonus to the national economy well beyond the simple transfer of a piece of intellectual property. This is a cultural change that Australia must embrace if we are to shake the international perception as 'good innovators, but poor commercialisers'.*
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> *Comparisons with programs in the UK, Denmark, Germany, France, and Ireland confirm a consistent policy flaw; that innovative market-pull programs are rarely furnished with the resources to create the opportunity for success that more traditional technology transfer programs receive. Innovative programs need to be viewed like innovative products. They need time to gain traction in the market. Establishing such programs with a sunset clause is self-defeating and is limiting the supply of innovative products to the market.*
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> *These are successful companies with solid turnover and growth. The profile of these companies is vastly different from those involved in technology push knowledge transfer, with an average turnover prior to their involvement in TechFast of $7.8 million per annum, and average employee numbers of 32. These are companies that have the resources, experience and industry standing to diffuse the innovations that result from the knowledge exchange rapidly.*
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> *Following the TechFast intervention, five new agreements with international distributors/agents were established, two new international offices were established, at least 12 new staff were employed, and a number of new outsourcing arrangements established. In terms of new equity funding one company won $1.7 million over three years, another achieved $2.1million and plans to raise an additional $5 million. Examples of grants won following the TechFast intervention include a $64,000 COMET grant and another grant totalling $240,000.*
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> *Other improvements reported by these companies were: successfully winning grants, a greater focus on innovation, and 'strengthened ties with our partners as it looked like we were trying to*

innovate'. Two of the companies also reported that they had helped the research organisations gain access to commercial revenue as well as helping them gain experience in commercialisation."

The fact that the intermediary relationships are both independent and untethered is their key strength. They enable the entire innovation system to be scoured for know-how. A tethered relationship, such as that offered by the business development office of a university, can only offer a point to multi-point relationship, and thus a restricted pool of IP, knowledge and facilities. TechFast does not displace the role of the university business development office; it works through it and strengthens it by bringing industry to the front door and also providing assistance to help it negotiate the range of issues that arise during the project planning and negotiation stages with industry. Unfortunately, except in the case of large businesses, the AIC's experience is that neither the supply side nor the demand side value independent and untethered relationships sufficiently to pay full cost for them upfront because the actual value is difficult to initially quantify. The role of the intermediary is to try and find opportunities that bring parties together, which in most cases is impossible to guarantee. When (tethered) access is provided through the offices of universities and CSIRO, it is publicly funded. The AIC argues this should also be the case for untethered access provided to SMEs by independent intermediaries as well, at least until the industry culture understands the rewards of deeper collaboration with the research sector.

Governments are the largest employer in Australia, and they too have access to vast intellectual assets that can be applied 'for a better world'. Those assets are frequently untapped as a source of new ideas. The potential of government to work on the supply side of the innovation equation has not been widely recognised. In this respect, the activities of the Government Innovation Services unit of the AIC in working with nearly ten Queensland Government departments to identify IP, encourage collaboration with both industry and other jurisdictions, and in developing commercialisation and R&D collaboration frameworks, is noteworthy. It brings improved service delivery and cost efficiencies to the agencies involved. It is dealt with more fully in a separate AIC submission III.

2. How do we solve the big challenges we face as a country?

Such a leading question deserves the obvious answer upfront: innovation.

If the big challenges are known, then the right questions can be posed, and if suitably motivated the supply side can provide services to discover an answer. The AIC first coined the term 'market-pull commercialisation', and developed the process of research

commercialisation beginning with an existing company with a known business problem or challenge. Considering commercialisation in its broadest sense as the second step in innovation, it is far easier for an innovation to succeed when there is a known market or customer set demanding the solution. Existing companies are better placed to understand their customer needs. Likewise, solving the big challenges we face as a country, an industry, or as a community entails articulating those challenges in a language understood by those who can set about solving them, and finding and funding the right collaborations so they can be solved in a timely, cost-effective, and low risk manner. Collaboration underpins innovation, for it can bring together the supply and demand sides, together with service providers with the correct sets of skills. Connectedness is vital to encourage the flow and application of ideas.

The impact of climate change is one of the biggest challenges facing Australia. Our 'cleantech' sector is attempting to respond to some of those challenges. Yet there are parallels with the Australian biotech industry in the early 1980's: a number of undercapitalised, single product companies operating in an isolated context. One venture capitalist familiar with the sector has used the label 'cottage industry' to characterise it. The policy challenge is to build scale and connectivity, and to develop sufficiently strong value chains so that the problems created by climate change can be addressed ***and*** a strong local industry with globally competitive products and services emerges. Policy responses in the case of the biotech industry included expanding the amount of investment and skills in research; incubators; support for industry associations; tax concessions for venture capital; and the encouragement of clusters. However, the development of the biotech industry continues to be stymied by its very long supply chains, and the lack of a major global pharmaceutical company headquartered in Australia.

The cleantech sector in Australia arguably has a greater opportunity now than did biotech in the 80's: where they exist, supply chains are shorter, and there are no multinational companies that demonstrably dominate the sector. In addition, there are much stronger and more urgent government responses globally to the immediate challenge, as well as a growing recognition of the role of government procurement in building a new industry. An emissions trading scheme will also provide pricing and market certainty, thus reducing development risk. The sector should also, in time, be able to look to the mining and infrastructure industries as immediate clients. However, a strong "soft infrastructure" to encourage collaboration and to help connect the pieces in the value chain still needs to be developed. Here, government can play a strong catalytic role both to develop the missing

soft infrastructure, to support the supply side, and to use its own demand pull as a driving force.

The availability of proof-of-concept funding to bridge the “commercialisation chasm” is also crucial if more start up firms are to bring products to market in the cleantech sector. Policies such as favourable tax treatment of investment capital, and schemes such as the SBIR in the US have proven effective in other jurisdictions.

Similarly, the AIC’s TechFast program, in which the government co-funds collaboration between small-firms and research organisations, has proven effective in increasing the “deal flow” between small enterprises and the publicly funded research sector (and in fact resurrecting “dormant deals” that floundered because of initial miscommunication or mistrust between the two parties). As noted above, however, it does require research capability and IP that is expressed in terms amenable to the industry partner, often as a proof of concept or demonstrator. TechFast is a good example of how ‘market-pull commercialisation’ can build the technological capacity of Australian industry, and leverage Australian and overseas sources of IP or skills within research and its associated knowledge base. Nearly 50 collaboration deals between small industries and the research sector have been established through TechFast, many in the area of environmental services. For example, TechFast has worked with firms such as Biolytix Pty Ltd, a grey-water recycling company, Remediate Pty Ltd, a soil remediation company, and RST Pty Ltd, an environmentally-friendly dust suppression company, to establish collaborations with the public research sector that are resulting in meaningful product outcomes. TechFast is more fully described in a separate AIC submission II.

Due to renewed interest from government agencies nationally to consider innovative techniques to improve productivity, service delivery outcomes and reduce unnecessary duplication and therefore cost, the AIC is also working to enable effective intellectual property sharing across jurisdictions.

For example, in working to help improve innovation within the Queensland government, the AIC has embedded staff within government agencies to identify innovative IP and evaluate such IP for sharing with other agencies and government jurisdictions, or for transfer to industry for commercialisation. Over 60 licences to transfer IP out of a variety of agencies (including Health, Mines and Energy, Environmental Protection Agency, Emergency Services, and Community Services) have so far been signed. Such IP is often software, but it is not the code that has value (it is typically discarded and rewritten), it is the business

processes embodied by the code. These have helped nurture the growth of numerous small companies, predominantly in the ICT sector, and brought savings of several million dollars to the agencies involved.

However, innovation across the system *per se* is rarely an operating objective of an individual agency. Generally lacking is an overarching whole of government innovation policy. Thus one agency might be tasked to assist the development, for instance, of a local electronics industry; while another responsible for procurement, for instance, of a synchrotron, might find its cheapest and lowest cost solution offshore. The objective in procurement is generally to minimise risk, maintain probity, achieve rapid implementation, and least cost: none of which are conducive to nurturing innovation. This is highly unfortunate, since the government spend on infrastructure and other forms of procurement completely dwarfs the limited funds in Australia available for venture capital investment.

Such lack of coordinated policy action and operational mechanisms between departments can mitigate against innovation, particularly where procurement can be instrumental to meeting challenges. We believe an overarching, whole of government commitment to invest in new technologies to solve national challenges such as climate change is required. However, a policy commitment is rarely sufficient alone; resources and a management program, perhaps modelled on the AIC's Collaborative R&D Framework to align early development between the demand and supply sides, are also vital to ensure our nation's challenges are successfully addressed through innovation.

3 Could we do everyday things better?

Doing everyday things better requires a culture where innovation is encouraged and mistakes, if made with good intention, are celebrated and learned from. Just as in organisations, such a mindset requires the right culture, leadership from the top, and programs to build capability and skills.

There are parallels between the quality movement of the 1980's and the innovation movement of today. Both sought to do everyday things better, the first through process, the latter through application of novel ideas. Just as the quality movement of the 1980's required company Board leadership, so too does innovation. Unfortunately, many Australian company directors and their umbrella organisation have not caught on to the paradigm shift, instead focussing excessively on governance. Are Australians taught at an early enough age to value innovation, or science and technology? Organisational leaders who embrace innovation are

needed, because the evidence is very clear that innovative organisations have higher profit and higher shareholder value than those that do not. The place to start is at the top, and the simplest first step is to encourage company boards to place innovation and collaboration as a standing item on the boardroom agenda, as a balance to the focus on risk (which is normally already on the agenda).

Skills are also an essential component for people to 'do everyday things' better. The AIC has educated hundreds of entrepreneurs in its 'Ideas2Market' series of classes, and hundreds of researchers in its 'Commercialisation Bootcamps'. These classes help in the knowledge application, or deployment, process of the innovation cycle. Although the economic return has not been measured, we have a file of testimonials that attest to the need for such programs, and the outcomes that result. The separate AIC submission IV on 'Market-based services for innovating companies' provides more details.

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?

Sometimes known as the "2 per cent problem", how to access foreign research or technologies is considered to be important in the development of new innovation. It is certainly important in the research realm for discovery.

Innovation does not of course require local discovery, and tools and techniques from offshore are routinely used to develop innovative products and services in Australia. As opposed to research where markets in IP are problematic because much IP is implicit and intangible, the marketplace works quite effectively for the diffusion of marketed products and services from overseas that are 'integration ready'.

Many experts maintain that innovation is local. Collaboration is certainly easier on a local basis. International collaboration is difficult to establish, nurture, and monetise. The AIC's approach to facilitating international collaboration during the commercialisation phase of innovation is to build deep networks with like-minded international organisations charged with economic development in their home countries. Global Connect (based in San Diego) and Torino Wireless (Turin, Italy) are two examples of research and industry networks where the AIC is able to cost-effectively seek and transfer knowledge across borders. The AIC is currently engaged with SIRIM in Malaysia to implement a local version of TechFast there. Spill-overs from TechFast and other AIC activities also contribute to the AIC's broad networks and increase its global reach.

In 2004, the AIC established Expatriate Connect, an on-line matching resource intended to exploit the business skills and capabilities of Australian-connected individuals overseas for the benefit of Australian firms without the experience of offshore connections. There is certainly interest – over 500 export motivated Australian companies have registered and used the system, as have over 2500 mentors with in-market experience that are interested in assisting Australian companies. As a result, numerous local Australian firms have been able to access information and prepare for their entry into international markets. Our experience has been that expatriates in particular are very willing to assist innovative Australian firms, provided such firms are properly prepared with reasonable requests, and are respectful of the time contribution required. However, over four years, no effective commercial business model has emerged to properly support the Expatriate Connect platform and network, suggesting the need for public support if it is to be scaled and truly effective.

There are no incentives for a firm to undertake demonstration or commercialisation activities, unless the firm believes a clear market demand either exists or can be established. Start up companies generally lack established distribution channels and contact with customer networks, and therefore will be poor at estimating potential market demand, while small existing firms frequently lack adequate information on markets. The AIC has found its secondary market research available to such firms has helped their decision making process with regards to pricing, competitive intelligence, and the unique value proposition of their innovation. Unfortunately, the majority of small firms do not know what they don't know, and often avoid market research or environmental scanning.

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

Making it easy for people to use tools or apply ideas implies they have access to tools, rights of use, and enabling skills.

Many SMEs have told the AIC that access to physical university infrastructure – labs, computers, and specialised equipment – is difficult. While some centres within universities are set up to offer their services to outside companies, there is a lack of a standardised, organised process that makes it easy for such physical interaction to occur. Issues such as liability insurance, support, maintenance, physical access, and even processing of client invoices cause difficulties for individual university labs to offer a service, even if they wanted to. At a structural level there are few incentives for research organisations and individual researchers to pursue industry engagement. Those that do so of their own accord (particularly commercialisation and research offices) appear too focused on reaping short-

term transactional gain rather than on building longer-term collaborative relationships. The limited government support for industry engagement results in short term opportunism. The AIC is currently studying this problem through client interviews as part of a policy paper for a state government.

Silos make innovation difficult. Responsibility for innovation within government should not be quarantined within a Department of Regional Development or Department of Innovation and Industry. Governments themselves are part of Porter's "demanding customer" set. They can (a) demand innovation through procurement and (b) lead through best practice IP management and commercialisation themselves.

With respect to the latter function, the role of the AIC in facilitating collaboration between government agencies is described in a separate AIC submission III. On a pilot basis, the AIC has established a national information and IP sharing strategy (and IP register) across several government jurisdictions to improve the transfer of innovative developments between governments themselves and with industry. Innovations (often using ICT technologies) that government agencies apply to their own business practices, data management and information sharing can streamline and improve services, enable cost savings, strengthen government procurement, and result in stronger collaborations with industry. For example, the AIC has transferred a web-based portal developed in a community services agency in one state into another, formalising the transfer process to remove support and liability issues as barriers preventing transfer. The licence yielded immediate revenue of $1M for the supply agency, and saved considerably more in avoided costs for the receiving agency, as well as reducing time to market.

Collaboration is essential for innovation and breaking down silos. The AIC's R&D Technology Clinic process can make it easy for all stakeholders – industry, governments, and researchers – to share ideas and understanding around particular domain areas. Many stakeholders do not engage beyond their own silos. For example, in investigating a potential R&D program to improve the Police Department's capability for surveillance of high density urban areas, the process revealed the Transport Department had recently installed its own CCTV camera network (to monitor nearby roads). Unfortunately, data interoperability requirements were not considered at the time of original design, so data could not easily be exchanged. The same installation would also be of value to the City Council and to the Emergency Services department as well. Such silos can be broken down by activities such as Technology Clinics, and result in much more innovative outcomes.

In addition, early involvement of research providers and industry in roundtable sessions that discuss agency needs can lead to targeted development that is early enough to remove risk and satisfy some of the requirements for the procurement cycle as well. For example, new hospital wards in Queensland, managed by the New Capital Works Group of Queensland Health, will benefit from innovations fostered under the AIC's Collaborative R&D framework, and prove a simpler route to market for such innovations, because of the collaborative development that precedes procurement.

Another barrier that prevents people applying ideas in novel ways is lack of capital to do so. Some commentators believe there is a shortage of venture capital; venture capitalists believe there is a shortage of potential deals. The true answer is that deals are either not properly presented, or have too high a risk for a venture capital firm to consider. Most are simply too "early stage" i.e. the risk is too high for the price that can be paid, and the transaction costs of (smaller) early stage deals is not worth the effort of due diligence. Suggestions to shift the risk-reward curve could include:

- Include a 'tick-the-box' question on superannuation investment forms, asking whether the superannuant wishes 0.1 per cent of their funds to be allocated to more risky, but potentially higher rewarding early stage investments, and as context, point out that typical fees on superannuation assets are of the order of 1.5 per cent per year. If this were achieved across the board, it would quadruple the institutional funds available each year for early stage investments.
- Examine the tax impediments to commercialisation. We recommend Prof. Cameron Rider's excellent report for IPRIA on this issue. For example, the 'continuity of ownership' test often prevents tax relief being made available later from losses incurred in the start-up phase of companies.
- Improve the skills of those responsible for government procurement, to consider ways to reduce the risk of involving small or start up firms in the process; and to demand an 'innovation dividend' of large firms that tend to dominate procurement, particularly in infrastructure.

Anecdotal evidence suggests that Australia-wide the angel community now plays a bigger investment role than venture capitalists in preparing firms for market entry. Angels, and associated programs, such as the Queensland government's Mentoring for Growth program that uses pro-bono business advisors, are able to provide free advice to help suggest strategies for firm growth, principally to firms that are still too "early stage" for venture capital

to consider. The AIC's skills programs, such as its Commercialisation Bootcamps for the research sector, or Ideas2Market for business entrepreneurs, help to increase supply side understanding of pitching for capital. Other services provided at low cost by the AIC, and in some cases subsidised by government, such as market research, help to reduce the risk by showing if intellectual property is properly differentiated and providing competitive intelligence not normally available to the start up.

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

The AIC's experience of equipping people to be creative and innovative is through its flagship "Commercialisation Bootcamps" and "Ideas2Market" programs, through the numerous innovation workshops it is asked to address, and through working alongside SMEs daily to help achieve their innovation outcomes. Programs like TechFast also increase industry awareness and adoption of open innovation practices. We also host a schools science officer to build links between schools and industry, to encourage more young students to pursue technical careers, and to better equip teachers to help motivate their students. We have evidence from these programs of how individuals have been able to build innovative companies applying the lessons they learned.

We also see a particular need to involve entities responsible for government procurement in programs that help them to understand the risks involved in innovation, and to develop practices to mitigate those risks. We also observe that collaboration skills among researchers and research organisation business offices are sometimes found wanting.

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

Australia is spending enormous sums on building infrastructure such as roads, and it appears that in the future equally large sums will be spent to mitigate the effects of climate change, improve water supplies, and to correct the problems in the health system. Given the entire venture capital industry is dwarfed by these investments, one way to prioritise innovation efforts is quite simple: follow the money. The separate AIC submissions on II. Connectivity and Collaboration and III. Innovation in Government describe suggestions for aligning the innovation supply side with the money trail so that local industry is the beneficiary and innovation dividends remain onshore.

However, a strategy of ‘following the money’ risks ignoring the impact that innovation can achieve in solving national priorities in other social and environmental domains, where ‘money’ may be lacking. Such domains are often being addressed within government agencies, thus it is critical that innovation is championed there as well. Whole of government policies relating to innovation are therefore required to encourage policy coherence across departments and to ensure that innovation stretches into them as well. Pro-innovation governance should be required of agency leadership. Lack of such policies can lead to duplication between agencies. Similarly, we can point to small firms developing innovative products that are being nurtured by one government department responsible for economic development, but that are simultaneously precluded (because of their size and the perceived risk) from participating in large infrastructure spends by other government departments working within the same jurisdiction. We would note that the ‘new federalism’ agenda and the ‘national innovation’ agenda both have collaboration at their core. They both entail the sharing of risks, responsibility, and ultimately, ideas. Innovation springs from such.

CONCLUSION

This submission has suggested a number of practical measures that could strengthen the Australian innovation system. The AIC is convinced, based on the evidence from its programs, that the Australian government will reap a better return from its innovation investment if more money is allocated to market pull mechanisms generally and the "translational" part of research funding programs in particular. Broadly, we recommend:

1. Extending the innovation paradigm deeply into government agencies, both on the supply side as a source of novel but proven IP (particularly ICT) both for other agencies and industry, and on the demand side through its public procurement activities. Policy coherence is required across government for the former; programs are required to reduce the risk of innovation in the latter. The AIC’s Government Innovation Services Unit is at the leading edge of such activity with a number of agencies.
2. Scale up collaboration between the research sector, government and industry through market-pull independent intermediary programs such as TechFast, to build human capital and improve the diffusion and exchange of knowledge that breeds innovation.
3. Build national skills and capacity in creativity, collaboration, and entrepreneurship, and make available the right tools to increase the chances of success.