Opening the Door:
A Discussion on Industry and Public Research Institute Collaboration
1. Introduction

The recent 2003 Federal Budget allocated money to review the scope for greater collaboration between industry and major public research institutes (PRIs), including universities, the CSIRO and Cooperative Research Centers (CRCs). Heather Ridout, Chief Executive Officer of the Australian Industry Group (Ai Group), speaking recently at the Australian Financial Review, Higher Education Summit, stated, “… industry’s top priority was to establish ‘richer and deeper relationships’ with the nation’s universities.” (Martin & Marshall, 2003, p.9)

This comes at a time when converging influences from a range of stakeholders in Organisation for Economic Co-operation and Development (OECD) countries are placing industry-public sector relationships under the spotlight and considering how outputs can be strengthened and better “… contribute directly to economic and social well-being.” (OECD, 2002, p.164). As a result, “… governments are (increasingly) under pressure to demonstrate that public investments in research are used efficiently and are generating returns” (OECD, 2002, p.164).

Australia has embarked on a journey as challenging as it is complex in building a sustainable knowledge economy for the future. Global measures of innovation generally rate Australia lower than we would choose to see ourselves in terms of business investment in R&D and other business innovation indicators. This is clearly undesirable due to the potential effects on economic growth. Yet there is an awareness and strong recognition in an increasing number of forums of the need for both industry and the public sector to increase their level of collaboration so as to boost Australia’s R&D performance relative to the OECD. The purpose of this brief paper is to explore one very important element of our developing knowledge economy – the collaborative research relationship between industry and the public sector.

One of the key areas on which Australia must now focus in developing an innovative economy with which to compete globally, is in strengthening relationships between industry and PRIs. It is paramount that industry continues to explore and develop strengthened relationships with PRIs in order to fund and develop a greater level of knowledge transfer and absorptive capacity between major contributors to our knowledge economy.

In an address as a keynote speaker at the RMIT Business Lecture Series (2002), Sir Professor Alec Broers, Vice Chancellor of Cambridge University, succinctly highlighted the need for knowledge; skill and technology transfer in his description of the Cambridge Network, a cluster that is being developed in order to:

“Bring together industrialists, universities, research organizations, bankers, venture capitalists, lawyers etc. to realise the full potential of the Cambridge region as a world class leader for the entrepreneurial application of science.” (Broers, 2002)

Around the world, industry and governments are facing many of the same challenges in developing innovative economies for the future as they attempt to harness the energy and creativity of the workforce to develop new approaches to operating. One of the key components of the innovation equation is the strength of the collaborative relationship between industry and the public sector.
To consider what both industry and PRIs require to boost collaborative R&D partnerships, Ernst & Young and RMIT Business conducted a series of interviews during late 2002 and early 2003 with those involved in a ‘hands-on’ capacity in the collaborative R&D space. The purpose of these interviews was to: (i) explore the effectiveness of the current interface between industry and the public sector and (ii) survey the strength of the collaborative relationships that are formed, considering both the positive, and less positive, aspects of these associations. It is hoped that the results of these interviews, which identified a number of broad themes common to both sides of the ‘fence’, will contribute to the development of public policy in support of such collaborative partnerships.

We believed that it was also important to consider the evolution of the innovation agenda overseas, and have provided a brief desktop review of some of the myriad of programs and initiatives currently operating in other countries. This paper compares these overseas initiatives to the Australian experience and support structure, including incentive and cooperative schemes. Our paper concludes with key contributions or themes for consideration in the further development of public policy to encourage greater cooperation between industry and PRIs.

Please note this paper focuses on the issues affecting the establishment of collaborative R&D relationships between industry and PRIs. The paper does not consider the commercial outcomes of such relationships when established, considering this matter to be worthy of a separate study. We have also chosen to focus mostly on technologically-based R&D, recognising that such R&D is a subset of the broader innovation environment.

2. Executive Summary

The industry-public sector collaborative relationship is an important foundation of our developing knowledge economy. Informal interviews with a range of industry and public sector practitioners working within collaborative processes explored how these relationships could continue to develop and improve.

It was generally agreed that three key areas could be further considered in the development of public policy to further strengthen collaborative relationships, these areas are:

- encouragement of PRI involvement in more collaborative projects with industry;
- enhanced skill development and improved understanding of commercialisation processes and IP recognition across both sectors; and
- a single, more obvious point of entry to PRIs, making it easy for industry to make the right connections.

The following section of the paper provides a brief discussion on many of the issues surrounding the collaborative process between industry and the public sector.
3. Background

OECD statistics for 2000 illustrate Australia’s relatively poor standing in terms of the global innovation and research agenda. In terms of industry-financed R&D as a percentage of GDP, Australia sits at 0.7%, whereas Sweden and Finland, considered to be the leaders in the development of innovative economies, sit at 2.4% and 2.6%, respectively. In terms of business enterprise spending on R&D ('BERD'), as a measure of research intensity, Australia rates below the OECD and EU averages. With a BERD intensity of 0.7%, Australia sits between the Czech Republic and Italy. Meanwhile, Sweden is at the top of the table with a BERD intensity of nearly 3%.

Table: National trends in industry-financed and business-performed R&D relative to GDP, 1990-2000

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<tr>
<th>Industry-Financed R&amp;D as a % of GDP</th>
<th>Business-performed R&amp;D as a % of GDP</th>
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<td>Mexico</td>
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Source: OECD, 2002, p.101

On a more positive note, these measures of R&D intensity indicate that collaboration between industry and the public sector is occurring in Australia and is growing. This is in line with global trends of greater collaboration between industry and PRIs, for as the OECD suggests:

“Businesses are eager to exploit research undertaken by the higher education and government sectors, the higher education sector is interested in obtaining funding for current and future research activities by commercializing its research effort and governments look to alliances that ensure that the economy benefits from public research” (OECD, 2000, p. 28).
It was this notion of collaboration that was discussed with participants in this study to sketch a picture of current collaborative relationships.

There are a plethora of other materials, policy papers and reports exploring the advance of the innovation agenda in Australia, articulating the need for more energy, clarity and resources to be focused on our development towards a knowledge economy. The Federal Government through its commitment to the innovation action plan, Backing Australia’s Ability, has focused considerable resources on the development of an innovative and knowledge-based economy.

A range of overlapping national activities contribute and include the Federal Government’s new process of defining national research priorities. This has resulted in the nomination of four areas of research focus for 2004 - an environmentally sustainable Australia, promoting and maintaining good health, frontier technologies for building and transforming Australian industries and safeguarding Australia (http://www.arc.gov.au).

The Federal Government through the Department of Education, Science and Technology (DEST) under the auspices of the Minister Brendan Nelson has undertaken a Review of Higher Education. The initial Crossroads paper on research highlighted the Federal Government’s drive to reform research undertaken in universities. In September 2002, the Federation of Australian Scientific and Technological Societies (FASTS) published ‘Australian Science: investing in the future’, outlining strategies for immediate change and a set of principles to increase participation in, and support for, science and technology. Many other contributions are being made to the debate about the nation’s capacity to become innovative and reap the benefits of our status as a developing knowledge nation.

In Australia, the taxation framework for R&D has remained relatively stable, although the value of the R&D Tax Concession has fallen from the 1980s (in part due to lower corporate tax rates) and a range of fiscal and financial incentives are used to promote innovation. It is acknowledged that R&D tax incentives are only one of a number of public policy initiatives that comprise the foundations of the Federal Government’s Backing Australia’s Ability innovation policy. Other policy initiatives have included the opening up of Australian markets to foreign investment through tax reforms and the extension of existing capital gains tax exemption on venture capital investments.

Similar to overseas, Australia is also developing clusters of research excellence bringing together industry, university, government and local community combinations under such schemes as National ICT Australia and the National Stem Cell Centre, both funded under the Federal Government’s Centres of Excellence initiative, Australian Research Council (ARC) Linkage grants and the CRC program. Many business enterprises are developing unique relationships with PRIs through these schemes.

A Higher Education Review, Business Higher Education Round Table (BHERT) submission states, “To gain the greatest possible economic and cultural advantage we need stronger interaction and cooperation between universities and business and industry and as appropriate, national and state government organizations” (BHERT, 2002, p. 13). The submission highlights the ‘urgent challenge’ in building relationships between industry and the public sector across industry, “… two way investments of time and resources, are becoming essential to understand, influence and improve interactions between both sectors” (BHERT, 2002, p.14).
The BHERT submission aptly lists a number of areas where increased involvement between the sectors could be canvassed and these were reflected in many of the interviews with participants. Key aspects to be addressed include:

- “How to expand the range of ways they (business and higher education and training) engage each other to enhance capacity for growth and development at regional state and national levels
- The need to develop new strategic partnerships and forms of involvement
- The need for new forms of university governance
- Staff and students within universities need to be encouraged in their efforts to engage with industry, and there needs to be an increased acceptance and rewarding of such efforts
- Better commercialization
4. Current Initiatives

This section of the paper briefly outlines some key research initiatives that have been adopted in the EU, the US, South Africa, Ireland, Israel and Canada to encourage collaboration between the sectors. Generally, the schemes are linked to innovative practices and entrepreneurial behaviour.

4.1 Overseas

In reviewing innovation and the various incentive schemes available to foster innovation, the European Commission, comments that: "Whilst analyzing the various incentive schemes, it has been apparent that innovation is an extremely difficult concept to define, within fiscal legislation…" (and generally) “… tax incentives related to innovation activities, may be offered as either reductions in the tax base or deductions in contribution" (European Commission, 2001, p. 10).

Although ‘innovation’ has been described as a difficult concept to define, a number of countries are tackling the development of support mechanisms for innovation through a broad range of fiscal and financial incentives. A brief description of some of these incentives follows.

Fiscal incentives can include a range of tax and other incentives, whilst financial incentives provide funding for targeted industries and programs. In general, countries with high performance in the area of innovation (for example, Finland, Sweden and Germany) “… do not use fiscal incentives, choosing instead to use financial incentives which prioritise key technological sectors and activities.” (European Commission, 2001, p. 13). Analysis suggests that, as a culture of innovation is entrenched in these countries, governments stimulate innovation through targeted funding of technology rather than introducing tax incentives to promote an increase in overall technological innovation.

Finland, which is near the top of the OECD innovation and R&D scales, promotes public funding of R&D through a technology development agency called Tekes. “Tekes is the principal promoter of R&D and the most important public financier of business R&D. Tekes provides funding to the research projects of universities academic institutions and research institutes, to long-term planning of R&D projects of companies and to the business R&D projects aiming at new products, production methods or services” (Tekes, 2001, p. 5). This is a similar role to the ARC and the various Federal Government departments that promote research and innovation (DEST and the Department of Industry, Tourism and Resources (DITR)).

In countries where performance in innovation is historically low (for example, Portugal, Spain and Italy), governments have generally adopted a range of fiscal stimuli to promote innovation across the whole economy. These countries have introduced various forms of tax incentives in order to encourage greater collaboration, either encouraging training and contracting of researchers or greater collaboration between industry and universities. Tax incentives which “…stand out as ‘good practice’ are the Italian tax credit for training: collaboration between universities/research institutes and companies; the Dutch tax incentive for hiring research personnel and the French tax deduction for spin off companies” (European Commission, 2001, p. 15).

As new technologies are developed and introduced to industry, it is important to ensure that the workforce is trained in order to achieve the maximum efficiencies from the introduction of the
technology. In Spain there is a specific tax incentive to train the workforce in the implementation and use of new and innovative technology. Public sector policy in Spain is also encouraging the uptake of the Internet both by industry and broader community, “…this expenditure is considered as training and will benefit from the training tax credit. This training tax incentive applies equally to all firms regardless of size or sector of operation” (European Commission, 2001, p. 82).

Other countries, such as Italy and France, have tax incentives for training but these are not directly targeting the development of innovative practices in the workplace. “The Italian tax credit system supports both the training and the hiring of specialised personnel to be employed in research activities in small to medium enterprises (SMEs). The aim is for firms to hire personnel from universities or public research organizations for up to four years, thereby gaining access to the knowledge and expertise of the individual researcher whilst developing a working relationship with the university” (European Commission, 2001, p.82).

Italy is also in the position of having a small number of doctorate degrees per head of population. To help address this issue, Italy provides industry a tax credit for scholarships for students undertaking PhDs. France, Spain, Belgium and the Netherlands have tax incentive programs of varied percentages for industry employment of researchers employed exclusively to work on R&D.

Other countries with well developed ‘technological development frameworks’ such as the US, France and the UK tend towards using a range of fiscal and financial incentives to stimulate innovation. In the US, there is a Research and Experimental (R&E) Tax Credit, which provides a tax credit for engagement in “qualified research and experimental activities whilst carrying on a trade or business” (European Commission, 2001, p.52). Included under the ordinary R&E tax credit is a category for cooperative research and university industry links, whereby “…a tax credit is allowed for certain basic research payments to universities and other qualified research organizations” (European Commission, 2001, p. 53).

The UK also has an incremental R&D tax incentive program and has extended the favourable tax treatment of SMEs to all companies, this incorporates “…a 50% credit on most current spending related to R&D, and where the company tax is exhausted the R&D losses can be surrendered for a payable tax credit.” To qualify “… activities must be creative or innovative work in the fields of science or technology and undertaken with a view to the extension of knowledge” (HM Treasury, Inland revenue, 2001, p. 18).

A recent EU Economic Policy Committee paper, ‘Report on Research and Development’, highlights that: “…interaction between the university sector and industry is one area, which is increasingly seen as a key element in the innovation system and involves a wider range of knowledge transfer processes has traditionally been recognised.” (EU Economic Policy Committee, 2002, p.18). More specifically in terms of public sector-industry relationships, the UK Government introduced in 1999 a new funding stream, Higher Education Reach Out to Business and the Community (HERBOC). This stream of funding “…enables Universities and Colleges of Education to develop links with business and the wider community that will enable higher education institutions (HEIs) to contribute to more effectively to economic growth and national competitiveness” (http://www.hero.ac.uk/business/higher_education_reach_out_to _541.cfm). Funds for this funding stream are expected to reach 60 million pounds per annum from 2003.
South Africa has a similar fund, the Technology and Human Resources for Industry Program (THRIP), which:

“…aims to improve the competitiveness of South African Industry by supporting, scientific research, technology development and technology diffusion activities and enhancing the quality and quantity of appropriately skilled people. The program is also designed to foster collaboration among industry, higher education institutions and the government, science engineering and technology institutions as a means of contributing to the removal of past inhibitions to joint activity among the three sectors.” (http://www.nrf.ac.za/thrip/about.asap)

Since the inception of this fund over 10 years ago, the South African government has committed over 1.15 billion Rand (approximately 235 million AUD) of industry and government funds to a number of research initiatives across the country.

Enterprise Ireland is a government body formed in 1998 as a one-stop shop for both Irish companies and those companies wishing to set up in Ireland. Enterprise Ireland provides assistance from venture capital to consultancy, early stage funding and export opportunities, with networked offices around the world. Ireland has an attractive company tax rate of 12.5% and has used this to great effect in attracting companies and developing an Irish technology industry. Ireland is progressively moving towards targeted incentives for industry with specific grants for industry and university collaborative projects.

Israel with a small population of approximately 6 million people has long been involved in the innovation agenda and has developed a range of incentives, which have encouraged businesses to develop globally. The government supports industrial competitive R&D projects and grants are on a sliding scale from 25% to 50% of R&D budget. This fund supports over 100 projects a year, from over 500 companies. In terms of generic R&D, the government grants up to 66% of the approved project budget, to support consortia comprised of industrial firms and academic institutions. The Israeli government has a variety of pre-seed and seed programs and is very keen to encourage international bilateral and multinational cooperation for industrial R&D, encouraging diffusion within an international framework, (http://www.tamas.gov.il)

Canada allows an R&D tax credit of 20% for large companies and 35% for SMEs described as “…one of the most generous tax credits in the world” (Government of Canada, Innovation Strategy, p.6). In Canada, key challenges include training the next generation of academics. In 2001, the Canadian Government invested $CAD 200 million as a one-off payment to support the indirect costs of research by PRIs. The returns from both public and industry investment is growing and:

“… universities need to focus on areas of excellence, train greater numbers of highly qualified people in the skills required by the private sector and government, and more aggressively seek out commercial applications for publicly funded research” (Government of Canada, Innovation Strategy, p.10).

The following table summaries some of the incentives for innovation policies available across the countries discussed above. The table illustrates that some countries have a number of incentives and some just a few to encourage the innovation process.
### Table 1: Tax Incentives for Business-Based Innovation

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<td>Share ownership in new/innovative firms</td>
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Source: adapted from (European Commission, 2001, p. 16) and other sources
4.2 Australia

There is currently a wide range of local approaches to the development of collaborative linkages between industry and PRIs, and it is acknowledged that there is not a 'one-size-fits-all' best approach to these collaborative efforts.

The key government schemes established to promote, foster and encourage industry/academic research partnerships are the ARC Linkage scheme and the CRC program.

- **Australian Research Council – Linkage Scheme** (http://www.arc.gov.au)

The ARC’s Linkage Scheme encourages public sector bodies and industry to conduct research through contributions and public funding via a competitive grants scheme. The grant program comprises two elements: Discovery and Linkage. Discovery projects are targeted towards individual pursuit and new knowledge or basic research, whilst Linkage projects take a more applied approach to research and are structured to involve industry.

Linkage Projects are available for researchers, who combine with an industry partner to undertake current and industry-focused research. These projects aim to:

- Encourage and develop long-term strategic research alliances between higher education institutions and industry in order to apply advanced knowledge to problems, or to provide opportunities to obtain national economic or social benefits.
- Support collaborative research on issues of benefit to regional and rural communities.
- Foster opportunities for postdoctoral researchers to pursue internationally competitive research in collaboration with industry, targeting those who have demonstrated a clear commitment to high quality research.
- Provide industry-orientated research training to prepare high-calibre postgraduate research students.
- Produce a national pool of world-class researchers to meet the needs of industry.

Both of these ARC schemes are extremely competitive with, on average, 25% of applications receiving funding. The review process is conducted by academic and industry peers from Australia and internationally. Due to their highly competitive nature, ARC grants are prestigious and are held in high regard by the Australian research community.

- **Cooperative Research Centres** (http://www.crc.gov.au)

Launched in May 1990, CRCs bring together researchers from universities, CSIRO and other government research institutions and industry in collaborative arrangements to support R&D and educational activities to achieve outcomes of national economic and social significance. In July 2002, there were 62 CRCs operating in a diversity of fields from Photonics, to Construction Innovation to the Australian Sheep Industry. CRCs emphasise the importance of developing
collaborative arrangements between researchers and industry in order to maximise the benefits of publicly funded research through to commercialisation.

Once again, this is a highly competitive program where only the best applicants, as judged by independent experts in the field, are selected. CRCs are managed by one institution, which then coordinates the involvement of industry and PRIs.

The Federal Government has committed $148.5 million to the CRC program for 2002/03. A comprehensive review of CRCs was conducted in 1998 and another review is currently underway. It is estimated that since the program’s inception in 1990, participants have contributed a total of $7,337 million in the form of in-kind and other contributions.

The recent Federal Budget announced that the CRC Program will be extended a further year to 2006/07.


The R&D Start Program is a merit-based program designed to assist Australian companies undertake R&D and commercialisation. The objectives of the R&D Start Grant component of the program are to:

- increase the number of R&D projects with high commercial potential that are undertaken by companies;
- foster greater commercialisation of the outcomes from R&D projects;
- foster collaborative R&D and related activities through companies working together, or working with PRIs; and
- increase the level of R&D and its commercialisation that provides benefit to Australia.

This program is run by AusIndustry and has a budget of $160 million for 2002/03. The recent Federal Budget announced that the R&D Start Program will be extended a further year to 2006/07. Start Graduate provides grants to companies with turnover of less than $50 million to engage a graduate on a specific R&D-related project that is undertaken in collaboration with a research institution. Projects can be up to two years in duration with applications assessed against the following merit criteria:

- management capability of the applicant;
- the extent to which projects would improve the adoption of appropriate technology or methodology; and
- the extent to which projects form or strengthen appropriate links between applicants and research institutions.

The R&D Tax Concession is a broad-based, market driven tax concession, which allows companies to deduct up to 125% of qualifying expenditure incurred on R&D activities when lodging their corporate tax return. The R&D Tax Concession supports research collaboration between industry and PRIs by, for example, allowing expenditure incurred by a company in contracting a PRI to undertake some eligible R&D activities on its behalf to qualify as R&D expenditure.

The R&D Tax Concession program also provides for the specific registration of registered research agencies (RRAs), which are typically PRIs capable of undertaking R&D activities in specific fields. The RRA process allows for the promotion of each RRA’s capabilities to companies, as well as providing for some concessions in relation to the treatment of expenditure incurred in engaging an RRA.

A 175% Premium Concession (for incremental R&D expenditure above a rolling three-year average R&D spend) and R&D Tax Offset (a cash rebate available for smaller companies with an annual R&D spend of up to $1 million) are also available. Introduced as part of Backing Australia’s Ability, the 175% Premium Concession is intended to encourage companies to increase their expenditure on R&D, whilst the R&D Tax Offset is designed to support smaller companies in a tax loss position that have previously been unable to realize an immediate benefit from the R&D Tax Concession. Both the 175% Premium Concession and R&D Tax Offset are available to support expenditure incurred by companies contracting PRIs.

• **Other Industry-Specific Support Measures**

There are other government programs available providing support to specific industry sectors and particular activities within these sectors – for example, the Automotive Competitiveness Investment Scheme, the TCF Strategic Investment Program and the Biotechnology Investment Fund.

As a further example, the Food Innovation Grants Program is a Federal Government initiative with the aim of significantly improving levels of innovation within the local food industry. The FIG program provides matching dollar-for-dollar support, with funding for the program totaling $34.7 million over five years.

The FIG program is intended to assist the food industry to improve innovation performance and increase investment in R&D. It also aims to improve rates of commercialisation of R&D and follow-through investment in the food industry.

The FIG program will also enable food businesses to undertake collaborative projects with local PRIs. Although not a mandatory requirement for FIG participation, research partners for industry could include PRIs supported by the Food Centres of Excellence Program, to which $11 million of FIG funding is being directed.
5. Comments from the Field

In embarking on a series of informal discussions to explore the notion of collaboration between PRIs and industry, we were fortunate to have access to a range of executive and senior managers from both industry and PRIs. Without exception, those interviewed were extremely generous with their time and were firmly committed to developing collaborative relationships. Whilst having experienced many of the pitfalls of collaborative partnerships, all participants were incredibly positive, and recognized the tremendous advantages and powerful outcomes that can be derived from successful collaboration. Participants came from universities, the CSIRO, government and from global businesses through to SMEs.

As an overall comment, it is worth noting that participants from both sides of the collaborative equation recognized the need for maturity in the enterprise or research group’s culture or approach to R&D, as a precursor to the development of successful collaborative outcomes. It is not until a business, in particular, has developed and committed to R&D as a driver of the core business that successful collaborative relationships tended to be developed. Further, participants agreed that, once they were working together in a collaborative relationship, it was imperative that all parties agreed from the outset on the research outcomes and process, in order for these collaborative relationships to develop to fruition.

5.1 Comments about incentive schemes

In discussions with both those in industry and with PRIs, there were a variety of perspectives and a number of broad comments, which emerged around the various incentives and schemes currently in existence.

Industry was clear in advocating simple incentive schemes, and was generally interested in developing collaborative partnerships with PRIs.

In considering government incentives for R&D, there was general agreement that the challenge was, in fact, to encourage more industry participants, particularly SMEs, to undertake a greater quantum of research. Further, it was considered that much of the research undertaken by industry, particularly at the SME-end of the spectrum, is applied in nature and is focused, for example, upon a relatively quick response to a client-driven demand for product or process improvements. It was suggested that companies usually carry out such R&D activities in-house and are less likely to need to work collaboratively.

In discussing the merits or otherwise of various incentive programs to encourage greater research in industry, it emerged that there is a belief that it is important that PRIs focus on ‘basic research’, as this research underpins much of industry’s applied research. Some of the larger enterprises were also involved in basic research programs to various degrees, and believed this to be important in steering the ongoing research and developmental needs of a particular industry. However, there was a caution from the PRI side that too much collaborative research activity was linked to the development stage, or ‘applied’, research. Yet others believed that a greater output of research, no matter in what category ‘basic’ or ‘applied’, collaborative or not, was to be encouraged across
industry. The success of the smaller and simpler ARC Linkage grant scheme for post graduate students scholarships would attest to this point.

Whilst recognizing that enterprises accessing government incentives are highly likely to already be undertaking R&D as a core activity of their business operations, industry participants commented that financial incentives can often encourage enterprises to undertake greater levels of R&D or to maintain existing levels during tougher economic times.

Existing schemes discussed by industry and PRIs representatives included the ARC Linkage, CRC, R&D Tax Concession and R&D Start programs. Comments provided in relation to these programs follow.

• **ARC Linkages Grant Scheme**

Industry was very complimentary about the ARC Linkage scheme. Industry perceived much value in this method of funding, whereby PRIs partner with industry bringing collaborative projects to fruition and encouraging industry and public sector bodies to work together.

Industry was encouraged by the bidding grant process, with industry now being represented on ‘expert panels’ involved in the decision making process. Further, industry supported the ongoing collaboration of these collaborative partnerships as long as the research arrangements were cost effective and the regulatory and reporting requirements were not overly complex and time consuming. Industry recognized the value of these partnerships but were also wary of many of the pitfalls in establishing these relationships and the barriers to operational success that these collaborative partnerships can involve.

• **Cooperative Research Centres**

There was an extremely mixed experience of CRCs amongst participants. It was generally agreed that CRCs work best when all participants are in alignment with a similar view of the world, and are working together with a genuine investment of effort towards commercial outcomes.

As a rule, the two main roles of industry in CRCs appeared to be: (i) as a silent partner, whereby industry buys a seat at the CRC table and has a watching brief on activities or (ii) as a pro-active participant helping to set the research agenda with the upfront and clear intention of capturing the benefit of the resulting intellectual property (IP). It was commented that there had been a changed climate within the CRC operating environment over the last 10 years and interactions between PRIs and industry have strengthened in most cases.

It was generally agreed that CRCs need strong engagement of industry to encourage research with a macro focus. It is felt important that individual CRCs build their reputations and set directions that bring both industry and PRIs together to develop new and groundbreaking research profiles and encourage commercialisation opportunities.

It was further commented that where CRCs were not successful in developing a research profile it was where they were attempting to keep everyone happy, thinly spreading limited resources, so the
various groups involved ended up competing, rather than often merging and aligning research priorities.

- **R&D Start Graduate**

Not many participants had heard of or had extensive knowledge of this program, yet alone applied for funds to employ a graduate. SMEs were usually advised of such schemes through their accountant or other business advisory services. Generally, the take up of this element of the R&D Start program has been low.

- **R&D Tax Concession**

In general, industry believed that the current R&D Tax Concession provided some support of BERD, but that a greater deduction would obviously be more attractive to those investing in research and likely to encourage greater levels of investment. Variations of the current R&D Tax Concession were discussed and included incentives based on R&D capability, R&D intensity and commercial success.

An R&D Tax Concession that primarily rewarded companies for employing and actively utilizing researchers received a lukewarm reception across the spectrum, mostly because it was felt that the numbers of researchers working on a project, or in a particular field, can be dependent on many variables. For example, one researcher in one industry may be an equivalent of 10 in another industry. As a result, the tax incentive may be unfairly skewed towards more resource-intensive companies and industries.

Another more palatable means of rewarding BERD was the R&D intensity model, where the more you spent on R&D relative to your turnover, the higher the tax deduction.

The other variation discussed would provide the ‘base’ 125% R&D Tax Concession during the R&D phase of a project and a higher rate of deduction, perhaps 175%, for successfully commercializing the results of the R&D project.

- **Other Comments**

Whilst it was acknowledged that industry-PRI collaborative research needs to be more commercially based given industries’ focus on the ‘bottom line’, it was thought that industry also needs to provide more opportunities and greater funding to underpin genuinely collaborative research programs. As well, in order to encourage industry to work with PRIs, industry participants stated that it must be easy for industry to approach and establish direct relationships. Good connections, which promote the benefits of research alignment, could be encouraged through the ongoing study of industry sectors and return on investment of various industry activities to further establish funding priorities indicating where we need to lift the research effort and where to value add.

There was also general acknowledgement that there was often no real alignment with PRI-based researchers focused on different career paths and aspirations to those in industry. Universities and those operating in this domain are traditionally used to operating within an educational context and indeed this is the core business of the university. The challenge is, therefore, for a university, for
example, to work with SMEs to multi-nationals where a different set of commercial imperatives take priority.

There was also a comment from a PRI representative about the lack of capital with which to fund specific needs in the commercialization process, such as business planning, undertaking adequate market research and establishing an appropriate IP management strategy. The representative suggested that existing sources of funds designed to cover R&D and some commercialization activities, for example the CRC program and pre-seed funds, failed to adequately cover some of the important activities listed above. As a result, in his mind a funding gap is apparent.

5.2 Further discussions on the state of play

At a recent Science Meets Parliament function (November, 2002), Mr. Bob Herbert, former Chief Executive of the Ai Group spoke of a need for “… consolidation of our scientific and technology endeavors; to capture great science and great ideas and connect them into genuine, sustainable economic benefit” (Bob Herbert, 2002, p. 2). Mr. Herbert advised of the formalizing of an alliance between CSIRO and the Ai Group to improve the linkage between science and Australian industry. He stated:

“The fact is that much of what industry needs to motivate already exist in our universities, research organizations, technology diffusion programs and networks and indeed within industry. The challenge is finding these resources in a fast and direct way, … in many instances they are hidden and inaccessible because of our inability to communicate across sectors or simply because there is no critical mass behind their marketing and promotion”. (Bob Herbert, 2002, p. 10)

Participants in this report discussed a number of other overlapping issues in regard to the collaborative process and these are summarized as follows.

5.2.1 Understanding and management of intellectual property (IP)

A main barrier to the success of collaborative research relationships is the ownership of IP developed from these projects. Many industries are well versed in IP ownership and are extremely reluctant to relinquish IP that they believe they have paid for no matter in what format or how heavily it is subsidized. The public sector, on the other hand, often has trouble in comprehending the full commercialization process, not understanding that, for example: “… A dollar’s worth of academic invention or discovery requires upwards of (US) $10,000 of private capital to market. Far from getting a free lunch, companies that license ideas from universities wind up paying over 99% of the innovation’s final cost” (The Economist Technology Quarterly, December 2002, p. 3).

Industry participants commented that PRIs were perceived as not being generally highly sophisticated in their management and understanding of IP. Different institutions enforce different ownership rules. Some staff in PRIs were unaware of, or lacked an understanding of, their institutional policies on IP. Other identified barriers included what are often lengthy contractual negotiations and subsequent obligations surrounding the collaborative process including commercial-
in-confidence caveats, which can often be in conflict with industry’s desire for a commercial pay-off and capital return from their investment in R&D.

PRIs spoke of their efforts at facilitation and education to assist staff to develop an understanding of IP and an appreciation of the commercialisation process – this included the appointment of external commercially experienced staff to further educate and advise academic and administrative staff. Some PRIs have set up or are in the process of reinvigorating commercial arms in order to give further focus to the commercialisation process. (It needs to be noted that many of these commercialization arms have performed poorly in the past, with relatively low ‘commercial’ success. Whilst changes to the structures, reporting lines, processes and staff (e.g. employing commercially experienced staff) of the commercialization arms will hopefully bring improvements to the rate of commercialization of PRI-developed IP, it is important that the PRIs set realistic performance targets. Establishing an acceptable rate of industry uptake of PRI-developed IP and achieving the desired level of financial return, particularly from a historically low base and in a competitive environment, is never going to be a short-term project.)

On the other side of the coin, industry described the inflexibility, levels of inertia (perhaps symptomatic of an ‘avoid risk’ versus ‘manage risk’ approach), and the resulting frustration in dealing with PRIs on IP issues. Representatives from industry described a general lack of efficiency in dealing with and understanding of IP within PRIs. One participant explained that in his experience, PRIs often believe that the technology and research component of the equation is more complex than the development and commercialisation phases of the process. Whereas, industry is adamant that it is what you do with the IP is what creates the ‘value’.

Indeed, this particular participant felt that, where commercialization arms existed, they were just as likely to be competing with industry in their attempts to commercialise technology. Rather than working with industry and leveraging the experience of their industry partners in taking technologies to market, this participant suggested that the commercialization arms attempted to apply what they had learnt from previous dealings with industry, typically with limited success. In his mind, the more this behavior continued, the less likely industry, in particular in the form of SMEs, would engage with the PRIs in collaborative commercial arrangements.

It was also felt that those dealing with industry in the public sector often did not have the power to make decisions which were then referred ‘up the line’, with lawyers brought in to deal with the management of the IP issues then clouding issues relating to the commercialisation process, resulting in delays and non-productive time.

The participants from industry generally believed that the management of IP in universities lacked an overall maturity and commercial focus. Yet, it is acknowledged that many PRIs are moving faster to develop skills in IP. Overall, more efficient models for managing IP relationships with industry need to be developed as a priority by the public sector.

5.2.2 From serendipity to networks

All participants agreed that the majority of interactions between industry and PRIs were brought about more through luck and personal connection rather than any formal networking structure. Both industry and public sector participants discussed the need for stronger engagement.
A range of mechanisms is being used by PRIs to encourage greater collaboration including: increasing the number of quality social and networking functions, using alumni, and professional development and training opportunities for industry. One PRI described a very deliberate strategy of connection, with an approach whereby key alliances with individual partners and government are proactively pursued and encouraged at all levels. All PRIs were conscious of the need to be actively involved in the development of State/Territory and Federal research agendas.

From an industry perspective, one global enterprise participant advised, in regard to colleagues at PRIs that, “We know them, but we work at knowing them”. It is a major focus to build these public sector relationships and influence the direction of industry/public sector research. Industry acknowledged that academics publicise better in their own ‘academic’ domain and many enterprises and industry sectors have a watching brief on what is happening within these academic domains. However, these enterprises, or industry sectors, often do not have the resources nor inclination to contribute to public sector research agendas, which are then often not directly relevant to an enterprise, or industry’s short-term sustainability.

As a positive example of the connection between industry and PRIs, one industry participant spoke of the close relationships that the Rural Research and Development Corporations (RRDCs) typically have with their respective primary sector areas – for example, dairy, grain, grape and wine, sugar and timber. The participant stated that the RRDC his company was involved with was very focused on industry needs (i.e. the important distinction between close-to-market research and longer-term strategic activities) and how these research streams should be funded from the mix of government and industry contributions.

It was generally agreed that there was a need for an increase in quality networking opportunities at all levels and this included a greater interaction with government bodies. Some industries had achieved this through their industry bodies, such as the Ai Group, AusBiotech, the Australian Information Industries Association and the Telecommunications Society of Australia. There was also an acknowledged need for a wider range of networking experiences both informal and formal to get people to talk to each other across the divide, encouraging collaboration, lateral-thinking and creativity at all levels in approaching and considering client and industry sectoral needs, and future collaborative partnerships.

Industry sent a very clear message that an increased involvement in quality networking opportunities should be encouraged but that industry is not interested in the political machinations and barriers which hinder the public sector’s ability to respond and work in developing partnerships. Industry described this inflexibility as the very element that quickly destroys industry’s goodwill in pursuing joint projects and partnerships with PRIs.

5.2.3 The face of the PRI

There was much discussion regarding the ease or otherwise by which industry can navigate around the public sector body and the quality of the information these bodies provide within the public domain. Many in industry believed that universities were not easy to approach with, for example, the structure of websites and information not intuitive to an external party. Other approaches into
university networks were often undertaken, through industry’s capacity to navigate via alumni networks, or through the commercial arms of PRIs.

Universities, on the other hand, generally believed that they had developed points of entry and advisory mechanisms that were relatively easy to navigate and that they had successfully channeled a large breadth of engagements through these structures. However, for many in industry it appears as if universities, in particular, have no front door for industry, just many closed windows.

It was acknowledged that the core business of the higher education institution is education. Yet the issue of ease of access, of industry linkages, emerged as an area which industry believed could be given further attention by public sector bodies, with the underlying premise of making it easy for industry to navigate around the public institution. PRIs should chase the research dollar more effectively.

It is anticipated that the results of this alliance will see greater collaboration between the public sector and industry, and may well provide a model for further engagement.

5.2.4 Students/young researchers interface with business

There was a general belief that younger researchers are now realising the necessity of gaining some business skills as they develop their research skills. For example, science and engineering students at many tertiary education institutions can now access units from a business degree to supplement their studies. However, in acknowledging that younger researchers are often more entrepreneurial in their studies and research activities, it still does not mean that all researchers are suited or interested in managing the commercialization process.

Many universities work collaboratively with industry to encourage student experiences within industry, through cadetship or cooperative year programs and placements. Discussion surrounding initiatives such as FASTS’ proposal regarding joint funding of 100 postdoctoral positions to work in industry to encourage diffusion between the sectors and to improve linkages, was generally well received but it was agreed that a multitude of initiatives at a number of levels are needed to promote diffusion between industry and PRIs, and funding for these types of initiatives should be shared.

5.2.5 The Ideas Bank: aiding the commercialisation process

Both sides of the collaborative fence suggested a need for some form of independent broker, which would identify ideas or research in need of a commercial partner, or of further development, thereby providing a matching service between industry and PRIs. This brokerage service could be undertaken or supported by government and could be developed in a similar structure to a patents database with links to related technologies. Further, it was suggested that the ideas bank could become a major source for events and networking.

There are already established databases, most by subscription, which endeavour to connect inventors and researchers with those interested in developing and commercialising products. This ideas bank, if developed at a national level and given support by the various stakeholders, could represent one consolidated national effort to build collaboration at a number of levels. Unlimited and
free access may also attract SMEs into using what would be a reputable and independent brokerage service.

The recently released Australian Industry InnovationXchange (http://www.innovationxchange.com.au) is an initiative that attempts to undertake much of the above. An initiative of the Ai Group, with funding from the Federal Government’s Innovation Access Program – Industry and ongoing support from three State governments, the InnovationXchange is intended to provide industry, PRIs and others involved in or supporting the innovation process with an “…integrated means for stimulating innovation, promoting and sharing ideas”. The use and evolution of InnovationXchange will be watched with interest.

In general, researchers in the public sector were categorized as wanting to research, with many not having a strong desire, or the skills, to take a product through the commercialisation process. Some researchers in the public sector do wish to be a part of the commercialisation process and acquire the skills to become involved. To support those who wish to be involved, some PRIs have established offices for commercialisation purposes, or employed commercialisation managers across faculties and departments and developed targeted training programs in order to further develop commercialisation skills in PRIs. (Of course, there are substantial costs associated with establishing and running a commercialisation arm, and it is likely that the PRIS will try to recover some or all of these costs through commercial transactions, thereby raising the cost for industry to access the R&D results.)

Government has assisted some universities in this process through the partial funding of commercialisation managers. In other organisations, such as the CSIRO, there is a very direct endeavour to improve skills in commercialisation through the recruitment of “…a small number of private-sector commercialisation specialists from fields such as venture capital to assist existing staff” (Woodhead Ben (2002), p. 57). These appointments have been made in order for CSIRO to achieve challenging commercialisation targets.

Again, industry comments reflected the belief that PRIs have not, in the past, had a strong understanding of the commercial imperatives involved in the commercialisation process, or a real understanding of the product-to-market process. Likewise industry needed a greater level of patience when research failed to make the expected discoveries when working with PRIs.

5.2.6 Encouraging industry and SMEs towards a culture of research

It was generally agreed that getting companies to do any research at all is a premium. There was particular concern regarding the enabling of SMEs to undertake research and access PRIs and other resources.

Overall, this was an area where all believed greater attention needs to be paid to grow the overall research effort. Both industry and PRIs pondered how SMEs could be best assisted and encouraged into research. It was suggested that government could be of more assistance in supporting start-ups and early-stage companies through incubators and other similar programs. Incubators are one model by which some SMEs are beginning to be better serviced, providing assistance in matching research and using incubators as a conduit to the technologies of university. It was further suggested that SMEs could be better supported by the PRIs infrastructure if there was a form of tax incentive to
encourage both PRIs and SMEs to work together to further develop research in, for example, emerging technologies.

One example could be an exchange program for staff working between the two sectors – SMEs could be encouraged through a greater level of tax incentive to work within the university for a while, and vice versa. Programs such as this may encourage more collaboration and exchange.

Further, discussions focused on the difficulties of PRIs in communicating with SMEs given the large disparities in the cohort, and of the difficulties SMEs have in communicating, or navigating themselves around PRIs. In late February 2003, AusIndustry in conjunction with Consultel, a private sector company launched, *Industry Techlink*, a broking service to provide SMEs with free access to a national network of technology specialists to assist SMEs with their technology needs. It will be interesting to monitor how appealing this service is to SMEs and how this broking service is used to locate the products and services SMEs require, as this broking service could be a model PRIs could adopt in encouraging SMEs to work with them.

### 5.2.7 Collaboration

Industry generally believed that PRIs needed to adopt a strong culture of focus in building collaborative partnerships with industry. Many industry participants could detail the inability of some PRIs to work within industry’s performance driven frameworks. Whilst in some cases longer term collaborative partnerships had encouraged a dissolving of operational barriers between industry and the public sector. The need for greater alignment between the sectors is problematic, yet not insurmountable. Industry representatives described the need for a greater ‘culture of focus’ within PRIs, and discussed the need for alignment at the commencement of collaborative projects and long-term partnerships as being paramount to the ongoing success of these relationships.

Industry participants commented that the manner in which interactions with research partners within PRIs developed often reflected the maturity of the enterprise and its commitment to research. This commitment cannot be just lip service but needs to be reflected in action. Similarly, industry needs to be engaged in all public policy debate and creative, lateral thinking encouraged. Comment was passed that whilst industry kept a watching debate on the recent setting of national research priorities, that industry was frequently more of a spectator than an active participant in the development of public policy regarding innovation.

Clearly this is an issue of interest on the global stage. The EU report on R&D, noted that:

> “Greater interaction between the university sector and industry is one area, which is increasingly seen as a key element in the innovation system and involves a wide range of knowledge transfer processes than has traditionally been recognised. Transfer can take place through the training of researchers who increase the absorptive capacity of the industry. It also involves training people in the skills required to apply the technologies. Moreover it takes diffusion of knowledge to industry through a variety of processes that vary from sector to sector and include spin-offs and licences.” (European Union, 2002, p. 18)
Collaborative partnerships and competitive funding are seen as key triggers in encouraging PRIs to focus on real world issues for an audience that is increasingly outcome focused, seeking value and encouraging involvement at a number of levels within organisations.

Irish universities have established strong research capabilities through the use of ‘champions’ who are commercially focused and switched on in terms of industry and are able to bridge the barriers between the two sectors. Universities need to be proactive, opportunistic and entrepreneurial in establishing relationships and working with industry. Companies and public sector bodies with successful research agendas often also use this model, with a champion able to influence the company’s strategy and build external connections. These connections can be developed through personnel mobility between the public and private sector, through networking and the development of clusters.

Australia needs to look further at international success stories such as the Irish and US for guidance on developing long term collaborative relationships between industry that benefit both the public sector research organisation and the industry partner.
6. Summary

Within this paper we set out to scope what was happening in the area of industry and public sector collaborative relationships. The generous contributions and discussions that ensued with those working in this area, confirmed that many are actively championing activities at a number of levels throughout industry and within the public sector.

In summary, it is apparent that a range of key areas need to be considered in the development of public policy to encourage and expand collaboration between industry and PRIs as listed below.

- **Encouragement of PRI involvement in more collaborative projects with industry**

  Industry and PRIs are responsible for proactively pursuing collaborative relationships and establishing a variety of alliances using a range of different public sector and industry funding mechanisms. PRIs also need to be encouraged to develop stronger research linkages with SMEs. Increasing the ability to network, discuss and nurture ideas and relationships between industry and PRIs using a range of formal and informal networks is one of the keys to developing an innovative economy with a focus on developing new and sustainable relationships and innovation outputs.

  There is also a need to consider greater fiscal and financial incentives to encourage and increase mobility and flexibility between the sectors. Many programs will, of course, be more attractive to large enterprises able to take advantage of funding and incentive opportunities, but a tax incentive may make this diffusion option more attractive to smaller enterprises.

- **Stronger skills development and understanding of commercialisation and IP across both sectors**

  PRIs need to better define the ‘commercial value’ of IP and acquire the skills to better manage the IP process. One approach to this acquisition of skills may be through the development of consortiums of institutions with similar needs to develop best practice approaches in consultation with the expertise of industry. PRIs also need to consider long-term royalty arrangements that benefit the staff member and the institution including profit sharing.

- **Single point of entry to PRIs – make it easy**

  PRIs need to give further consideration to how to make it easier for industry to communicate with them and vice versa. Government-managed and sponsored networks with membership from any size industry partner looking to support research may assist. A greater use of e-commerce might assist in this facilitation. In the UK, there are groups that meet monthly consisting of, for example, financiers, computer and marketing experts. The challenge is to encourage the participation of industry, especially SMEs, and to build networks to produced increased innovation outputs.

  This paper can only offer a brief snapshot of how collaborative relationships between industry and PRIs have performed and continue to evolve. However, it is important that we keep a watching brief and continue to consider and promote public policy in this area to ensure the development of future policies that support increased collaboration that benefits both industry and the public sector.
7. References

Australian Research Council: Http://www.arc.gov.au

AusIndustry: Http://www.ausindustr.gov.au

Broers, A., RMIT Business, Dean’s Lecture Series, 4 September 2002.

Cooperative Research Centres: Http://www.crc.gov.au

Enterprise Ireland, Http://www.enterpris-ireland.com


Goldsworthy, A., Higher Education in Australia the global imperative; submission to the Higher Education review, Business/Higher Education Round Table, 2002.


Higher Education and Research Opportunities in the UK: Http://www.hero.ac.uk/business/higher_education_reach_out_to_541.cfm


Israel: http://www.tamas.gov.il


South Africa, Technology and Human Resources for Industry Program (THRIP): www.nrf.ac.za/thrip/about.asap

Tekes Annual Review 2001, Tekes, Finland

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