

Connecting Knowledge, People and Markets

- 5.1 This chapter examines:
- options for the management of knowledge and intellectual property (IP);
 - knowledge transfer through engagement between publicly funded research institutions (PFRIs) and businesses; and
 - knowledge transfer through business to business collaborations and linkages.
- 5.2 Three consensus issues have emerged from evidence relating to knowledge management and transfer.
- 5.3 **Consensus Issue 1** – Appropriate management of knowledge and IP (i.e. knowing when to share knowledge, and when to use appropriate informal or formal mechanisms for the protection of IP) is required to support innovation. Despite a robust IP legislative framework, evidence suggests that:
- PFRIs need to adopt a more strategic and consistent approach to IP management; and
 - some public and private sector organisations experience difficulties with the process, cost and enforcement of formal IP protection.
- 5.4 **Consensus Issue 2** – Public sector engagement with industry is a key element to innovation, facilitating knowledge transfer through linkages and collaborations. Evidence suggests that public sector engagement with the private sector could be enhanced by:

- addressing structural and cultural incompatibilities between public and private sector organisations which act as impediments to establishing linkages; and
 - the provision of designated or third stream funding to public sector organisations to support outreach activities.
- 5.5 **Consensus Issue 3**— Linkages and collaboration between businesses is important in supporting and facilitating innovation. Evidence suggests that proximity matters, and that business collaborations can be encouraged through appropriate support for the development of industry clusters.

Intellectual Property Management

- 5.6 The importance of appropriate and effective management of IP has been emphasised in evidence. Protecting and increasing the value of IP is complex and can be achieved either through informal non-legislative means (i.e. trade secrets or confidentiality agreements) or formal legislative means (i.e. patents, trade marks, designs and plant breeders' rights).
- 5.7 The choice between formal or informal means of IP protection is influenced by a range of factors including sector specific factors, time to market, the availability of resources and the nature of the IP itself.¹
- 5.8 As noted by Mr Scott-Kemmis with regard to intellectual property and patents:

In most cases the capacity to capture the returns to innovation has more to do with a firm's overall competitive capacity and perhaps their speed to market than with their control of IP. In some sectors, such as pharmaceuticals and instruments, patenting plays a key role in appropriation but this is not the general rule.²

1 GRP Technology, *Submission No. 45*, p. 8; Australian Academy of Technological Sciences and Engineering, *Submission No. 49*, p. 5; Department of Industry, Tourism and Resources, *Submission No. 82*, pp. 19-20; Flavourtech, *Submission No. 84*, p. 2; AWS Clinical Waste, *Submission No. 63*, p. 3.; Mr D Scott-Kemmis, *Submission No. 98*, p. 8.

2 Mr D Scott-Kemmis, *Submission No. 98*, p. 8.

- 5.9 The Australian Bureau of Statistics (ABS) *Innovation in Australian Business* survey found that informal methods of IP protection were used by 36.6 per cent of innovating businesses, while formal methods were used by 21.5 per cent.³

Informal Intellectual Property Protection

- 5.10 A number of submissions highlighted a range of informal non-legislative strategies for protecting IP, including confidentiality agreements.⁴ AWS Clinical Waste advised that patents were not an effective form of protection for its technology due to the resources, time and money required and also because the 'technology has developed too fast for the patent process to be relevant'.⁵ Instead, AWS found that:

Confidentiality is vitally important to AWS and protection of our intellectual property has been through copyright of documents, drawings, software, illustrations and other IP, more along the lines of corporations such as Microsoft and Coca Cola rather than through patents.⁶

- 5.11 While emphasising that IP is its greatest asset, Flavourtech explained its preference for an informal approach to IP protection. With regard to patents Flavourtech stated:

Their principal value seems to be as a deterrent. If it ever came to having to defend a patent in court the strategy will have, in a sense, already failed. The main function of patents is to reassure customers and to deter competitors. The size of our company relative to that of any adversary could be a significant disadvantage if wanting to pursue any patent infringements. The danger is that we could find ourselves spending all management time in court instead of running the business.⁷

3 Australian Bureau of Statistics, *2003 Innovation in Australian Business* (ABS 8158.0), p. 57.

4 GRP Technology, *Submission No. 45*, p. 8; Australian Academy of Technological Sciences and Engineering, *Submission No. 49*, p. 5; Flavourtech, *Submission No. 84*, p. 2; AWS Clinical Waste, *Submission No. 63*, p. 3.

5 AWS Clinical Waste, *Submission No. 63*, p. 3.

6 AWS Clinical Waste, *Submission No. 63*, p. 3.

7 Flavourtech, *Submission No. 84*, p. 2.

- 5.12 Instead, Flavourtech explained that it employs confidentiality agreements with all customers, and advised that no substantive interaction occurs until a confidentiality agreement is in place.⁸
- 5.13 Evidence also noted that the strategies of continued research and development (R&D) were often commercially more relevant and successful than the legislative approach.⁹

Formal Intellectual Property Protection

- 5.14 Formal IP protection in Australia (including patents, trade marks, designs and plant breeders' rights) is granted through IP Australia, an Australian Government agency in the Industry, Resources and Tourism portfolio. Describing the incentives to innovation provided by formal IP protection, the Department of Industry, Tourism and Resources (DITR) explained:

The main purpose of a patent system is to stimulate industrial invention and innovation by granting limited monopoly rights to inventors in return for full disclosure to the public of the invention, thereby increasing public availability of information on new technology.¹⁰

- 5.15 Applications for patents must be filed with the Patent Office, which forms part of IP Australia. Applications must fully describe the invention and state the scope of the desired patent rights. To be patentable, the claims must satisfy threshold tests relating to novelty and usefulness as prescribed under the *Patents Act 1990*.¹¹
- 5.16 Processing an application involves a number of stages including:
- receiving the application;
 - processing formalities;
 - examination;
 - acceptance;
 - opposition hearing if requested;
 - patent grant; and
 - fees for renewal.¹²

8 Flavourtech, *Submission No. 84*, p. 2.

9 KCS Pty Ltd, *Submission No. 24*, p. 7; Australian Academy of Technological Sciences and Engineering, *Submission No. 49*, p. 5; Flavourtech, *Submission No. 84*, p. 2; AWS Clinical Waste, *Submission No. 63*, p. 3.

10 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 17.

11 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 17.

12 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18.

- 5.17 In Australia, a **standard patent** lasts for up to 20 years, with a possible five year extension for pharmaceuticals. Annual fees are payable from the fifth year and increase from the fifth anniversary to the twentieth anniversary.¹³
- 5.18 IP rights are granted by each country independently and have effect only in that country.¹⁴ However, Australia is a signatory to a number of international treaty agreements which can reduce the complexity of the international application process. Two such treaties/agreements are the Patent Cooperation Treaty (PCT) and the Trade Related Aspects of Intellectual Property Agreement (TRIPS).
- 5.19 PCT provides a means of commencing patent applications in all 126 signatory countries. IP Australia acts as the receiving office, the international search authority and international preliminary examining authority under the PCT.¹⁵
- 5.20 The multilateral TRIPS agreement requires:
... minimum standards for IP protection for countries to become members of the World Trade Organisation and the World Intellectual Property Organisation (WIPO).¹⁶
- 5.21 In addition, IP Australia cooperates with a number of international bodies to ensure that the Australian IP system is closely aligned to international IP systems, thereby streamlining processes.

Issues Relating to the Australian Intellectual Property System

- 5.22 Submissions highlighted a range of issues relating to the current IP system in Australia. These issues include:
- a perceived lack of strategic and consistent IP management in Publicly Funded Research Institutions (PFRIs); and

13 Department of Industry, Tourism and Resources, *Submission No. 82*, pp. 17, 18; IP Australia, accessed 15 December 2005, *The Patents Guide: The Basics of the Patent System in Australia Explained*, p. 9, <ipaaustralia.gov.au>.

14 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 16; Dr I Heath (IP Australia), *Transcript of Evidence*, 28 November 2005, p. 25.

15 IP Australia, accessed 22 December 2005, <ipaaustralia.gov.au>.

16 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 16.

- specific problems with patent application and registration processes including:
 - ⇒ timeframes associated with patent application and registration;
 - ⇒ cost burden of patent application, registration and maintenance;
- concerns with Australia's IP schemes and the underlying legislative/regulatory framework, including:
 - ⇒ the cost and effectiveness of IP protection and enforcement;
 - ⇒ the effect of the current IP legislative framework on competition; and
- the lack of an adequate IP skills base.

Intellectual Property Management in Publicly Funded Research Institutions

- 5.23 Australia's approach to protecting IP originating from its PFRIs allows ownership of IP emerging from Government funded research to be retained by the institution in receipt of the research funds.¹⁷
- 5.24 The NHMRC also noted the 2001 *National Principles of Intellectual Property Management for Publicly Funded Research*, explaining that:
- The main focus of the National Principles is to assist researchers, research managers and their research institutions, in ensuring that they have access to best practices for the identification, protection and management of IP, and therefore, to maximise the national benefits and returns from public investment in research.¹⁸
- 5.25 However, beyond this framework, the specifics of IP management within individual PFRIs are determined on the basis of internal institutional/organisational policies.¹⁹
- 5.26 While it is recognised that PFRIs need the flexibility to 'develop their own IP policy to reflect the agency's IP and management processes'²⁰,

17 National Health and Medical Research Council, *Submission No. 81*, p. 6.

18 National Health and Medical Research Council, *Submission No. 81*, p. 6.

19 La Trobe University, *Submission No. 35*, p. 5; University of Melbourne, *Submission No. 52*, p. 6; Rural Research and Development Corporation Chairs Committee, *Submission No. 54*, p. 11; National Health and Medical Research Council, *Submission No. 81*, p. 6; Defence Science and Technology Organisation, *Submission No. 83*, p. 8.

20 Queensland Government, *Submission No. 74*, p. 4.

it has been argued that overall management of IP could be improved with greater consistency of IP management policies across PFRIIs.²¹

5.27 Specifically, it has been suggested that improvements in PFRII IP management can be achieved with regard to the following:

- assessment and maintenance of existing IP;
- the strategic screening and identification of IP commercial opportunities; and
- the clarity of IP ownership, especially when commercialisation of IP follows on from collaborative undertakings.²²

5.28 Evidence has suggested that PFRIIs need to adopt a more strategic and analytical approach with identification of IP commercial opportunities. As one company specialising in the commercialisation of IP assets from research institutes observed:

After reviewing the patent portfolios of major research organisation[s] we found many patents that have little commercial potential continue to be advanced through the costly patenting process. Often patents are maintained for the wrong reasons, such as maintaining inventor vanity, boosting commercialisation statistics or purely through lack of commercial assessment.²³

5.29 Evidence has highlighted the dilemma facing researchers in PFRIIs as a result of tension between the desire to publish research results in academic literature and the risk associated with premature disclosure of new IP that might compromise its commercial value.²⁴ The Department of Education, Science and Training (DEST) concluded that:

The critical issue, however, is that researchers, their institutions and their commercial partners need to take a

21 Australian and New Zealand Association for the Advancement of Science, *Submission No. 2*, p. 2; Department of Education, Science and Training, *Submission No. 20*, p. 16; KCA, *Submission No. 27*, p. 6; Group of Eight, *Submission No. 62*, p. 6; Australian Innovation Association, *Submission No. 72*, p. 8; Council for Humanities, Arts and Social Sciences, *Submission No. 77*, Attachment 1, p. 32.

22 Memtec, *Submission No. 42*, pp. 5-6; GBC Scientific Equipment, *Submission No. 76*, p. 7; National Health and Medical Research Council, *Submission No. 81*, p. 7.

23 QPSX, *Submission No. 47*, p. 4.

24 Australian and New Zealand Association for the Advancement of Science, *Submission No. 2*, p. 2; Department of Education, Science and Training, *Submission No. 20*, p. 15; Mr S Jeffrey, *Submission No. 23*, p. 3.

strategic approach to patenting and licensing, to ensure that they do not close off the opportunity to patent through premature publication, nor impede the innovation process by creating excessive secrecy around an idea, discovery or invention.²⁵

- 5.30 The Australian and New Zealand Association for the Advancement of Science (ANZAAS), noted that promotion pathways in universities remain heavily influenced by publications, but acknowledged that commercial outcomes were increasingly recognised. ANZAAS suggested that incentives for academics to pursue IP commercialisation could be enhanced by a more consistent assessment regime for 'non-published achievement'.²⁶
- 5.31 Recent amendments to Australia's IP system have included the provision of a 12-month grace period to protect a patent application against invalidation by self-publication or prior public use of the invention.²⁷
- 5.32 With regard to ownership of IP a number of submissions stated that PFRIs need to give early consideration to appropriate co-ownership provisions. Some submissions emphasised the importance of rewarding individual researchers or research teams.²⁸ It was suggested that full or partial transfer of IP rights from the research institution to individual researchers or research teams might be a means to promote innovation.²⁹
- 5.33 Evidence also indicated that when IP has been developed in collaboration with private industry, IP co-ownership agreements need to be established at the outset.³⁰ Submissions from a number of PFRIs and research funding agencies indicated that they have already adopted this approach, emphasising the need to negotiate IP

25 Department of Education, Science and Training, *Submission No. 20*, p. 15.

26 Australian and New Zealand Association for the Advancement of Science, *Submission No. 2*, p. 2.

27 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 19.

28 Australian Geoscience Council, *Submission No. 71*, p. 9; Australian Innovation Association, *Submission No. 72*, p. 8.

29 Biomedical Consulting Services Pty Ltd, *Submission No. 16*, p. 4; Professor T Cole, *Submission No. 40*, p. 3.

30 Australian Research Council, *Submission No. 19*, p. 6; Australian Geoscience Council, *Submission No. 71*, p. 9; Department of Industry, Tourism and Resources, *Submission No. 82*, p. 19.

ownership rights on a case by case basis in advance of embarking on a collaborative project.³¹

- 5.34 To ensure that individual researchers and private industry partners' interests are addressed, some submissions called for consistent IP guidelines for all PFRIs.³²
- 5.35 Evidence has suggested that an effective system of identifying IP assets held within PFRIs might enhance opportunities for the development of IP with commercial potential.³³
- 5.36 In this regard the Queensland Government noted that:
- A whole-of-government IP register is currently in development to record significant IP assets within agencies. Industry will be able to access this register to assess opportunities and value-add to Queensland Government-developed IP.³⁴
- 5.37 Submissions from two companies suggested that the opportunities for commercialisation of IP generated from PFRIs could be enhanced if access to IP emerging from PFRAs was made more readily available to domestically based private enterprise.³⁵

Committee Comment

- 5.38 On the basis of evidence, the Committee considers that there is scope for PFRIs to adopt a more strategic approach to IP management based upon clear and consistent IP management guidelines.
- 5.39 As noted earlier, guidance on IP management best practice for PFRIs is provided by the *National Principles of Intellectual Property Management for Publicly Funded Research*. Specific arrangements for managing IP within individual PFRIs are determined by internal institutional policies.

31 For example see Meat and Livestock Australia, *Submission No. 4*, p. 5; National Health and Medical Research Council, *Submission No. 81*, p. 7.

32 Knowledge Commercialisation Australia, *Submission No. 27*, p. 6; Group of Eight, *Submission No. 62*, p. 6; Australian Innovation Association, *Submission No. 72*, p. 8; Council for Humanities, Arts and Social Sciences, *Submission No. 77*, Attachment 1, p. 32.

33 Australian Innovation Association, *Submission No. 72*, p. 8; Queensland Government, *Submission No. 74*, p. 4.

34 Queensland Government, *Submission No. 74*, p. 4.

35 Environment Research and Information Consortium Pty Ltd, *Submission No. 28*, p. 10; DSTC Pty Ltd, *Submission No. 69*, p. 5.

- 5.40 The Committee recognises that IP management is complex. Difficulties can arise in determining the appropriate timing and means of IP disclosure, and also in determining equitable IP ownership arrangements and IP management and protection.
- 5.41 With regard to universities, the Committee notes that the issue of IP management was considered in the 2004 BCA and Australian Vice-Chancellors' Committee (AVCC) commissioned report, *Building Effective Systems of the Commercialisation of University Research*. This advocates the need for a clear policy or framework on the ownership and management of IP policies.³⁶
- 5.42 While generally supportive of the calls for more consistent IP guidelines for PFRIs, the Committee recognises that flexibility across PFRIs is also important. Therefore, the Committee maintains that PFRIs must take the initiative in developing IP guidelines suited to their endeavours.
- 5.43 While appreciating the critical importance of IP protection, the Committee does not consider that Government intervention to establish guidelines is an appropriate response. Instead, the Committee strongly urges PFRIs to work together to develop internal policies and appropriate guidelines.

Patent Application Processes

- 5.44 A number of submissions advocated the use of formal IP protection through the patent process, identifying this as an important factor in successful commercialisation of technological innovation.³⁷
- 5.45 In addition to confirming the uniqueness of a new product, process or service and indicating to the market that an enterprise has a monopoly position, Memtec listed some of the benefits of patenting for businesses. These included:
- [providing a] basis for capital raising and other financial dealings;

36 Business Council of Australia/ Australian Vice-Chancellors' Committee, The Allen Group Consulting, 2004, *Building Effective Systems of the Commercialisation of University Research*, pp. 70-71.

37 Ampcontrol, *Submission No. 37*, p. 1; Care-Free Water Conditioners Australia, *Submission No. 50*, p. 1; Proteome Systems, *Submission No. 55*, p. 1; Memtec, *Submission No. 42*, p. 3; Australian Geoscience Council, *Submission No. 71*, p. 9; Cooperative Research Centre CAST, *Submission No. 75*, p. 3; Department of Industry, Tourism and Resources, *Submission No. 82*, p. 16; Defence Science and Technology Organisation, *Submission No. 83*, p. 8.

- licensing (especially cross-licensing) to other companies or overseas associates;
 - various commercial agreements including the establishment of joint ventures;
 - employee incentives and rewards;
 - publicity and marketing;
 - product promotion; and
 - applications for government grants and other funding.³⁸
- 5.46 Some submissions, however, were critical of the patent application process administered by IP Australia, raising concerns with regard to the timeframes and costs associated with patent application, registration and maintenance.³⁹
- 5.47 Acknowledging the significant timeframes and costs sometimes associated with the IP application and registration process, DITR noted:
- Processing an application for an IPR [intellectual property right] involves a significant number of stages over a significant period of time. Each of these processing stages involves a number of sub-stages many of which attract separate fees. The process until grant of a standard patent can take up to 5 years.⁴⁰
- 5.48 With regard to anticipated timeframes, IP Australia provides information on timeframes in its Customer Service Charter and provides regularly updated data on current response times.⁴¹
- 5.49 Other submissions have argued that the costs of registering and maintaining patents are too high, especially for PFRIs and organisations attempting to build an IP portfolio.⁴²
- 5.50 For example, Proteome Systems highlighted:
- To establish value and be able to use [it] to springboard into profitable businesses, there needs to be a means for

38 Memtec, *Submission No. 42*, p. 4.

39 ATP Innovations, *Submission No. 6*, p. 2; Biomedical Consulting Services Pty Ltd, *Submission No. 16*, pp. 2-3; AmpControl, *Submission No. 37*, p. 1-2; Proteome Systems, *Submission No. 55*, p. 1; Australian Information Industry Association, *Submission No. 60*, p. 4; Australian Geoscience Council, *Submission No. 71*, p. 9.

40 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18.

41 IP Australia, accessed 24 February 2006, <ipaustalia.gov.au>.

42 Australian Information Industry Association, *Submission No. 60*, p. 4; Proteome Systems, *Submission No. 55*, p. 1; Australian Geoscience Council, *Submission No. 71*, p. 9.

affordably building strong patent portfolios. Currently this does not exist in Australia.⁴³

5.51 The schedule of fees for lodging and maintaining a standard patent is shown in Table 5.1.

Table 5.1 Schedule of Standard Patent Fees

Application Process	Maintenance	Cost (\$)
Filing – in paper form		320
Filing – online		290
Request for an examination		340
Request where there is an Australian IPER*		240
Acceptance of an application		140
... and if more than 20 claims, \$20 for each claim in excess of 20		20 each
Annual maintenance fees (from the 5 th anniversary of filing date)	5 th anniversary	180
	6 th anniversary	200
	7 th anniversary	250
	8 th anniversary	300
	9 th anniversary	350
	10 th anniversary	400
	11 th anniversary	450
	12 th anniversary	500
	13 th anniversary	550
	14 th anniversary	600
	15 th anniversary	650
	16 th anniversary	700
	17 th anniversary	800
	18 th anniversary	900
	19 th anniversary	1000
	If term extended \$1200 for each anniversary during the period of extension	1200

* IPER—International Preliminary Examination Report

Source IP Australia, accessed 3 May 2006, <ipaustralia.gov.au>.

43 Proteome Systems, *Submission No. 55*, p. 1.

5.52 Based on these application and maintenance fees, IP Australia indicated that:

The estimated cost of an Australian standard patent including attorney fees is about \$5 000 to \$8 000. Maintenance fees over a 20 year term would be a further \$8 000.⁴⁴

5.53 Several submissions suggested that PFRIs in particular lack the resources to pursue and maintain appropriate patent protection, especially given the high risk nature of the IP and potentially lengthy timeframes associated with commercialisation process and eventual returns on investment.⁴⁵

5.54 To alleviate this cost burden, Biomedical Consulting Services (BCS) suggested that Government assistance with patenting costs might be useful, stating:

Such programs would be extremely useful if implemented on a competitive basis here in Australia, where proposals could be submitted to an expert review panel who would assess the commercial potential of the invention and recommend funding of patenting costs in the nominated countries.⁴⁶

5.55 An alternative approach was advocated by ATP Innovations, which suggested that the Australian Government should consider:

... establishing an IP maintenance line of credit. This would allow universities to call on this line of credit to pay for IP maintenance and protection costs until such time as the IP is assigned to commercial partners. At this time once the commercial transaction has been completed the line of credit loans would be paid back.⁴⁷

5.56 With regard to the costs associated with the innovation process, DITR stated in its submission:

As in many other countries, Australia encourages easier entry into the IP system, particularly by SMEs, by minimising the official fees charged early on in the process when the commercial value of the innovation is uncertain and so funding may be difficult. Higher official fees are then charged

44 IP Australia, accessed 3 May 2006, <ipaaustralia.gov.au>.

45 ATP Innovations, *Submission No. 6*, p. 2; Biomedical Consulting Services, *Submission No. 16*, pp. 1-2.

46 Biomedical Consulting Services Pty Ltd, *Submission No. 16*, pp. 2-3.

47 ATP Innovations, *Submission No. 6*, p. 2.

later in the IPR's life if the innovation is sufficiently successful commercially. The patent maintenance fee structure set out in the Patents legislation is designed to encourage patent holders in all technologies to relinquish patents for which a commercial advantage is no longer gained.⁴⁸

5.57 In addition, DITR further noted that:

The patent attorney charges make up the major component of the costs associated with obtaining and maintaining a patent in Australia.⁴⁹

Innovation Patent

5.58 DITR also noted that the Australian Government has implemented a number of cost-reducing initiatives, including the introduction of the innovation patent particularly to assist SMEs to access the patent process.⁵⁰

5.59 The innovation patent is a second tier system, directed to lower level and incremental inventions which may not meet the higher inventive threshold requirements of the standard patent system. In addition, an innovation patent can be obtained more quickly and is less costly than a standard patent.⁵¹

5.60 The schedule of fees for lodging and maintaining an innovation patent is shown in Table 5.2.

5.61 Dr Ian Heath, Director General of IP Australia, informed the Committee of the progress of innovation patents:

We have done some small reviews of the innovation patent. It has not been around for very long. It was introduced in 2001. Our early assessment is that it has been relatively successful, given its purpose – that is, the users of it have largely been small enterprises and it has largely been used for incremental improvements.⁵²

48 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18.

49 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18.

50 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18.

51 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18; IP Australia, accessed 21 December 2005, <ipaaustralia.gov.au>.

52 Dr I Heath (IP Australia), *Transcript of Evidence*, 28 November 2005, pp. 19-20.

Table 5.2 Schedule of Innovation Patent Fees

Application Process	Maintenance	Cost (\$)
Filing – in paper form		180
Filing – online		150
Request for an examination by 3 rd Party (if required) – fee payable by 3 rd party or patentee		145
Annual maintenance fees (from the 2 nd anniversary of filing date)	2 nd anniversary	100
	3 rd anniversary	100
	4 th anniversary	100
	5 th anniversary	165
	6 th anniversary	200
	7 th anniversary	235

Source IP Australia, accessed 3 May 2006, <ipaaustralia.gov.au >.

5.62 IP Australia informed the Committee that although the innovation patent has been successful in assisting the target market (i.e. SMEs), the uptake of the innovation patent to date has not been encouraging. At this early stage, it has been difficult for IP Australia to identify the reason for the modest uptake of the innovation patent.⁵³

Committee Comment

5.63 The Committee notes that a number of submissions highlighted difficulties with regard to the timeframes and costs associated with obtaining IP protection through formal mechanisms.⁵⁴ The Committee also recognises recent positive steps taken by the Australian Government to assist in reducing the cost of IP protection, including minimising fees in the early stage of the process and the introduction of the innovation patent.

5.64 The relatively small volume of evidence which focused on innovation patents⁵⁵ suggests that perhaps the use of the innovation patent has

53 Dr I Heath (IP Australia), *Transcript of Evidence*, 28 November 2005, p. 20.

54 ATP Innovations, *Submission No. 6*, p. 2; Biomedical Consulting Services, *Submission No. 16*, pp. 1-2; Proteome Systems, *Submission No. 55*, p. 1; Australian Information Industry Association, *Submission No. 60*, p. 4; Australian Geoscience Council, *Submission No. 71*, p. 9.

55 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18; Drs C Lawson and C Pickering, *Submission No. 93*, p. 14; Barokes Wines, *Submission No. 94*, pp. 2-4; Dr I Heath (IP Australia), *Transcript of Evidence*, 28 November 2005, pp. 19-20.

not been considered by many businesses or PFRIs as a means of protecting IP.

- 5.65 The Committee recognises that it is incumbent on businesses and PFRIs (specifically TTOs or similar) to identify which IP needs to be protected and the most appropriate IP protection strategies. The Committee strongly urges universities and industry to consider the use of innovation patents to reduce the costs of IP protection.
- 5.66 The Committee recommends that IP Australia review the use of the innovation patent at the end of 2006 to determine the level of uptake, its effectiveness in reducing costs for SMEs and possible strategies to improve and/or promote the system.

Recommendation 6

The Committee recommends that IP Australia implement strategies to promote the uptake of the innovation patent, and report to the Australian Government Minister for Industry by 30 June 2007 on the following:

- **the increased level of uptake for the innovation patent; and**
- **the effectiveness of the innovation patent in reducing costs for small to medium sized enterprises.**

Intellectual Property—Protection and Enforcement

- 5.67 A number of submissions highlighted difficulties relating to existing IP schemes and IP protection and enforcement. Specifically two issues have emerged:
- the high costs of protecting and enforcing IP against infringements, particularly in some overseas countries; and
 - the potentially anti-competitive nature of Australia's current IP legislative and regulatory framework.
- 5.68 The validity of a patent can be challenged in court anytime after it has been granted. In addition, an opposition to grant procedure can occur

in the period between IP Australia accepting the application as appropriate, and when a patent is sealed or granted.⁵⁶

- 5.69 The opposition to grant procedure entails the Commissioner of Patents re-examining the patent on the grounds that the invention is not new or obvious. If either party disagrees with the decision, they can file an appeal with the Federal Court of the Administrative Appeals Tribunal depending on the nature of the decision.⁵⁷
- 5.70 A number of submissions noted the high costs involved when a third party opposes the granting of a patent. Costs result from lost commercial opportunities and revenue due to legal costs and uncertainty regarding validity and ownership.⁵⁸ For example, CHAMP Ventures noted:
- IP and patents are important as a baffler to competitors – they are often a necessity unless companies have the largest marketing budgets and distribution channels, but they are not the be all and end all. A legal fight with a multi-national corporate would sink most small, entrepreneurial companies.⁵⁹
- 5.71 One submission claimed that under certain circumstances larger organisations with significant resources and established product lines will legally challenge the validity of a patent specifically with the intention of exhausting the more limited resources of smaller competitors, thereby preventing others from competing with an existing product line or lines.⁶⁰
- 5.72 Barokes Wines expressed its concern regarding the potential for ‘delaying tactics’ to be employed in opposition proceedings lodged through IP Australia’s patent office, stating:

The procedures set down in the legislation enable a third party to challenge or oppose the grant of the patent at any time during its eight year term. This means that a third party could oppose a patent and drag out the proceedings, making

56 *Patent Oppositions*, IP Australia information sheet, p. 1, accessed 15 December 2005, <ipaustrialia.gov.au>.

57 *The Patents Guide: The Basics of the Patent System in Australia Explained*, IP Australia, p. 8, accessed 15 December 2005, <ipaustrialia.gov.au>.

58 CHAMP Ventures, *Submission No. 59*, p. 5; Barokes Wines, *Submission No. 94*, p. 3; Mr K Schnepf (KCS Pty Ltd), *Transcript of Evidence*, 4 August 2005, p. 66.

59 CHAMP Ventures, *Submission No. 59*, p. 5.

60 Barokes Wines, *Submission No. 94*, p. 3.

the proceedings more expensive and the ownership of the patent less valuable. If the Patent Office or the patentee tried to stop this delaying strategy, the third party could simply file a new challenge or opposition at the Patent Office. This would recommence the proceedings.⁶¹

5.73 To address this issue, Barokes Wines suggested:

... that there be a window of six months from the certification of the innovation patent for a party to oppose or challenge the patent at the Patent Office.⁶²

5.74 Other submissions identified another way in which IP can inhibit innovation. This tactic involves obtaining control over a new patent with no intention of developing it further, but specifically to prevent competition with existing and established product lines.⁶³

5.75 When questioned by the Committee regarding the validity of these claims, IP Australia explained that it was aware that IP positions can be used defensively or offensively stating:

... companies work very hard on developing what they would term a patent position, and they use that both offensively and defensively, as I would describe it – offensively to push their own particular commercial venture and defensively to tie up space where they think competitors might move somewhere near them and they will take up patents to do it. The deeper your pockets, the more you can do that. I am describing it neither as a good thing nor as a bad thing, but I think it is true that if you have a lot of money you can do more things in society in this world than if you have little money. There is certainly a behaviour there.⁶⁴

5.76 Evidence also highlighted the significant costs and challenges associated with enforcing IP where there have been infringements, particularly overseas.⁶⁵ One company stated: 'Lord help you if you

61 Barokes Wines, *Submission No. 94*, p. 4.

62 Barokes Wines, *Submission No. 94*, p. 4.

63 Dr R Rowe, *Submission No. 26*, p. 2; Australian Cotton Cooperative Research Centre, *Submission No. 57*, p. 8; GBC Scientific Equipment, *Submission No. 76*, p. 6.

64 Dr I Heath (IP Australia), *Transcript of Evidence*, 28 November 2005, pp. 14-15.

65 For examples see Haddon Perceptions, *Submission No. 12*, p. 4; AmpControl, *Submission No. 37*, p. 1; Memtec, *Submission No. 42*, p. 4; GRP Technology, *Submission No. 45*, p. 6; Mr B Williams and Dr R Vaughan, *Submission No. 46*, p. 1; Mr K Schnepf (KCS Pty Ltd), *Transcript of Evidence*, 4 August 2005, p. 66.

actually have to defend any of these things. It is simply like throwing money into a shredder'.⁶⁶

5.77 In particular, problems with IP protection for Australian innovation in China were emphasised. Some submissions suggested that there is a need for Chinese authorities to more rigorously enforce IP legislation.⁶⁷

5.78 GRP Technology suggested that Austrade needs 'to put on retainer the best Chinese legal firm who understands how to get results in the IP area'.⁶⁸

5.79 In its submission, GRP Technology also listed a range of alternative strategies to protect Australian IP overseas. These included:

- confidentiality agreements;
- licensing manufacturers to sell rebranded product in countries that are not marketed to;
- manufacturing parts of the product in different countries (e.g. producing the labour intensive part of a product in countries where labour is relatively inexpensive); and
- using complex and costly tooling to limit counterfeiting.⁶⁹

5.80 Another issue that was raised with regard to Australia's IP framework relates to the importance of achieving a balance between the anti-competitive nature of IP legislation and the assumed benefits derived through the promotion of economic benefits. Drs Charles Lawson and Catherine Pickering suggested that Australia's IP schemes have not been subjected to 'a rigorous assessment according to the requirements of the *Competition Principles Agreement*'. They further explained:

This requires those seeking to justify the restriction remain in place or be imposed [to] *demonstrate* that the benefits of restricting competition to the community as a whole outweigh the costs, and that the objectives of the statutory intellectual property privileges can only be achieved by restricting competition.⁷⁰

66 GRP Technology, *Submission No. 45*, p. 4.

67 Haddon Perceptions, *Submission No. 12*, p. 4; GRP Technology, *Submission No. 45*, p. 13.

68 GRP Technology, *Submission No. 45*, p. 6.

69 GRP Technology, *Submission No. 45*, p. 8.

70 Drs C Lawson and C Pickering, *Submission No. 93*, p. 1.

- 5.81 In addition, the submission also argued that Australia's adoption of more stringent patent standards than the minimum standards required by the World Trade Organisation's trade related aspects of intellectual property agreements (TRIPs) had not been subject to adequate analysis, and may not represent an optimal IP framework for Australia.⁷¹

Committee Comment

- 5.82 The Committee notes concerns expressed regarding the costs and other difficulties associated with defending IP and enforcing IP rights against infringement. Specifically, the Committee is concerned with reports suggesting that larger organisations can misuse the patent process. This has the effect of limiting the ability of smaller businesses to compete in the market and potentially impeding innovation.
- 5.83 Enforcement of IP is a complex issue set in a framework which includes IP legislation itself, the legal system and its processes, court procedures and international obligations such as TRIPS. While IP Australia indicated that addressing these issues is beyond the scope of its activities as the regulatory authority⁷², the Committee believes that some action is required.
- 5.84 With regard to IP protection and the enforcement of IP rights in Australia, the Committee notes the consideration given to these issues by the Advisory Council on Intellectual Property (ACIP) in 1999.⁷³ This led ACIP to make a series of recommendations regarding the IP enforcement system in Australia which resulted in some new awareness raising initiatives and amendments to the *Patents Act 1990*.⁷⁴
- 5.85 Despite these changes, the Committee notes that concerns regarding the defence of IP and the enforcement of IP rights have persisted, particularly with regard to the potential abuse and misuse of the IP system by organisations with more resources. Therefore the Committee recommends that as a priority ACIP again review

71 TRIPs: agreement on Trade Related Aspects of Intellectual Property Rights, Drs C Lawson and C Pickering, *Submission No. 93*, p. 9.

72 Dr I Heath (IP Australia), *Transcript of Evidence*, 28 November 2005, p. 15.

73 The Advisory Council on Intellectual Property is an independent body appointed by the government, and advises the Federal Minister for Industry, Tourism and Resources on intellectual property matters and the strategic administration of IP Australia.

74 Advisory Council on Intellectual Property, *Review of Enforcement of Industrial Property Rights*, March 1999.

Australia's IP system as it relates to the protection and enforcement of IP in Australia. This review should determine whether additional amendments or actions can be implemented that will reduce the capacity for abuse and misuse of the IP system.

Recommendation 7

The Committee recommends that the Attorney-General request the Advisory Council on Intellectual Property to review Australia's intellectual property system to determine the capacity for reduction in the misuse of the system.

- 5.86 The Committee also notes the concern expressed in submissions that IP protection legislation is not enforced in many countries, notably China.⁷⁵ While IP legislation in China is compatible with that of other nations, enforcement is not rigorous. The Committee recognises that this issue needs to be addressed by the Chinese Government both at a national and local level.
- 5.87 The Committee recommends that the Australian Government, in its trade negotiations with China, pursue the issue of IP enforcement.

Recommendation 8

The Committee recommends that the Australian Government, through the Department of Foreign Affairs and Trade, pursue the enforcement of intellectual property legislation during trade and diplomatic negotiations with China.

- 5.88 In addition, the Committee urges Australian businesses to use non-legislative strategies such as those suggested by GRP Technology⁷⁶ to overcome poor IP legislation enforcement in overseas jurisdictions.
- 5.89 With regard to consideration of the anti-competitive nature of Australia's IP system, the Committee notes suggestions that IP

⁷⁵ Haddon Perceptions, *Submission No. 12*, p. 4; GRP Technology, *Submission No. 45*, p. 13.

⁷⁶ GRP Technology, *Submission No. 45*, p. 8.

legislation needs to be reviewed again according to the requirements of the *Competition Principles Agreement*.⁷⁷ This issue was also raised in a recent Productivity Commission report.⁷⁸ In response to this issue the Productivity Commission advocated:

In the Commission's view, it is important that intellectual property laws continue to be scrutinised to ensure that they are not unduly restrictive. Retention of a legislation review mechanism, including provision for periodic re-review ... would give effect to this requirement.⁷⁹

5.90 The legislative review mechanism referred to by the Productivity Commission is a commitment given by the Australian Government and all state/territory governments under the National Competition Policy (NCP)⁸⁰ to review and change legislation that restricts competition.

5.91 Under the legislative review mechanism:

Governments agreed that legislation should not restrict competition unless it could be shown that:

- the benefits of the restriction to the community as a whole outweigh the costs; and

77 Drs C Lawson and C Pickering, *Submission No. 93*, p. 2; 7.

78 Productivity Commission Inquiry Report 2005, *Review of National Competition Policy Reforms*, No. 33, p. 285. The Productivity Commission report also discusses the work of the Intellectual Property and Competition Review Committee which, in September 2000, made recommendations to limit anti-competitive behaviour. In March 2006, the Intellectual Property Laws Amendment Bill 2006 was introduced to the Parliament to give effect to some of the recommendations from that review. However the Bill, if passed, does not address the Productivity Commission's concerns that there should be ongoing reviews of Intellectual Property legislation.

79 Productivity Commission Inquiry Report 2005, *Review of National Competition Policy Reforms*, No. 33, p. 285.

80 National Competition Council, accessed 4 May 2006, <ncc.gov.au>. Governments initiated a national approach to competition policy reform in October 1992 when they established an Independent Committee of Inquiry into a National Competition Policy for Australia. This led to the development of a NCP and the implementation of a number of reforms including: the extension of the provisions of the *Trade Practices Act 1974* prohibiting anti-competitive activities of businesses; the introduction of competitive neutrality so privately owned businesses can compete with those owned by Government on an equal footing; the review and reform of all laws that restrict competition unless it can be demonstrated that the restrictions are in the public interest; the development of a national access regime to enable competing businesses to use nationally significant infrastructure (such as airports, electricity cables, gas pipelines and railway lines); and specific reforms to the gas, electricity, water and road transport industries.

- the objectives of the legislation can be achieved only by restricting competition.⁸¹

5.92 The Committee supports the Productivity Commission findings and considers that the IP system and its justification in relation to the *Competition Principles Agreement* should be specifically considered under the legislative review mechanism.

Recommendation 9

The Committee recommends that the Australian Government review Intellectual Property legislation according to National Competition Policy Agreements and establish an Intellectual Property legislation system of periodic re-review.

Intellectual Property Management Skill Base

5.93 Numerous submissions noted a general lack of knowledge and understanding of the IP legislation, processes and systems. For example, the Council for Humanities, Arts and Social Sciences (CHASS) noted these views regarding universities:

Many focus group participants saw intellectual property (IP) as a minefield. Ownership, protection and student IP were reported as causing many commercial ventures to falter. Respondents said they did not know the best way to protect their ideas, whether by taking a patent, or being first to market, or applying it for public good.⁸²

5.94 This lack of knowledge is most evident during the patent application process where specific skills are required to prepare patent applications. To address this issue, DITR noted that many applicants choose to use the services of a patent attorney to pursue application.⁸³

81 National Competition Council, accessed 4 May 2006, <ncc.gov.au>.

82 Council for Humanities, Arts and Social Sciences, *Submission No. 77*, Attachment 1, p. 32.

83 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 18.

- 5.95 Similarly, Park Bench Technology argued that the laws on IP, copyright, breach of confidence and patents are 'not easy to use or enforce' and suggested that Licensing Executives be approached to assist.⁸⁴
- 5.96 In addition, Memtec advocated the appointment of a:
- ... qualified and knowledgeable person within the company whose sole responsibility is to manage the IP assets of the company, in particular, to interface with the company's patent attorney and be able to provide precise instructions to the firm as required.⁸⁵
- 5.97 The Queensland Government outlined an initiative to increase general awareness about IP, particularly during the early stages. It is currently:
- ... developing an online IP training program that will be available to all Qld Govt employees and will include relevant case studies to highlight IP issues.⁸⁶
- 5.98 Some submissions also suggested that advice on IP management be provided by the Australian Government. BCS suggested:
- It would be significantly more cost effective for the various PFRIs (and the government) to have access to a centralised resource, funded by the government, staffed with experience lawyers and people with the necessary legal/technology transfer skills to provide assistance in the preparation and review of such documents, at no cost to the PFRIs. The savings would be substantial.⁸⁷
- 5.99 A number of strategies have recently been implemented by IP Australia to improve awareness and skills. These include:
- establishing an internet IP portal to provide information and access to all areas of IP and coordinate IP inquiries falling under different portfolio responsibilities;
 - boosting tertiary and research sector awareness programs, including seminars, a supporting web-site 'IP Professor' which provides a lecture data base, lecture materials and case studies;

84 Park Bench Technology, *Submission No. 15*, p. 2.

85 Memtec, *Submission No. 42*, pp. 3-4.

86 Queensland Government, *Submission No. 74*, p. 4.

87 Biomedical Consulting Services, *Submission No. 16*, p. 3.

- incorporating IP into education curricula through 'InnovatED', a program which includes a teachers web-site with lesson plans, a students web-site which allows users to 'meet' real people working with IP, an educational CD-ROM game;
 - establishing an IP research centre at Melbourne University to provide independent multi-disciplinary input into IP policy formulation on matters such as IP management, enforcement, and valuation and protection costs; and
 - introducing an IP Toolbox, a practical self-help workbook format manual (with accompanying CD ROM software) designed to provide business advisers and SMEs with a working understanding of IP issues and business related concepts.⁸⁸
- 5.100 Many of the issues raised in the inquiry are being addressed by the awareness and skills initiatives being offered by IP Australia.

Knowledge Transfer—Linkages and Collaborations

- 5.101 A large number of submissions have recognised that knowledge transfer is a critical component of innovation, and that developing linkages and collaborations⁸⁹ between organisations and industry sectors is therefore crucial.⁹⁰
- 5.102 Describing the importance of linkages to innovation, the Australian Business Foundation (ABF) noted:

... world economic growth is being increasingly dominated by knowledge-intensive goods and services and a key element for competing in knowledge-based economies is the

88 IP Australia, accessed 21 December 2005, <ipaustalia.gov.au>.

89 Department of Education, Science and Training, *Submission No. 20*, p. 22. **Linkages**: the myriad ways in which industry interacts with the research sector, often involving multifaceted communications and relationship. **Collaborations**: partnership, affiance or network involving public sector researchers and the private sector, aimed at a mutually beneficial, clearly defined outcome. The components essential for successful collaboration are trust, cooperation and mutual benefit. Australian Bureau of Statistics, *2003 Innovation in Australian Businesses (ABS 8158.0)*, p. 84. **Collaboration**: active joint participation with other organisations that involves sharing of technical or commercial risk.

90 For example see Biomedical Consulting Services, *Submission No. 16*, p. 3; Australian Research Council, *Submission No. 19*, p. 4; Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, pp. 7-11; R. Taylor and Associates, *Submission No. 34*, p. 2; Australian Institute for Marine Science, *Submission No. 65*, p. 7. Mr S Fenton-Jones, *Submission No. 78*, p. 1.

‘interconnectedness’ or linkages between individual firms, research, education and financial institutions and government that serve to diffuse and capitalise on this distinctive knowledge.⁹¹

- 5.103 Several submissions outlined the benefits of establishing research and market linkages. These include:
- facilitating critical mass of expertise infrastructure and resources;
 - transfer of knowledge between disciplines;
 - enabling a variety of pathways to market;
 - sharing objectives, costs and risks; and
 - speed to capitalise on emerging opportunities.⁹²
- 5.104 Linkages and collaborations range from informal interactions and partnerships between individuals, ‘often developed through consultancy or contract work’⁹³, to more formal strategic collaborations between organisations. These may be formed between private industry and research institutions, including PFRI or between private enterprises.

Publicly Funded Research Agencies—Linkages and Collaborations

- 5.105 A majority of the evidence relating to publicly funded research agencies (PFRA) outreach activities noted that a key issue for collaboration is ensuring that small to medium enterprises (SMEs) can access PFRA’s research and IP.
- 5.106 All of the PFRA’s who provided evidence expressed a desire to collaborate with SMEs and outlined products and services that they have put in place to facilitate linkages.⁹⁴

91 Australian Business Foundation, *Submission No. 64*, p. 7.

92 Queensland Government, *Submission No. 74*, p. 7 and p. 8; GBC Scientific Equipment, *Submission No. 76*, p. 13; Department of Industry, Tourism and Resources, *Submission No. 82*, p. 31; Mr A Newton (Rural Research and Development Chairs Committee), *Transcript of Evidence*, 23 May 2005, p. 19.

93 Department of Education, Science and Training, *Submission No. 20*, p. 17.

94 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*; Australian Institute for Marine Science, *Submission No. 65*; Australian Nuclear Science and Technology Organisation, *Submission No. 70*; Defence Science and Technology Organisation, *Submission No. 83*.

- 5.107 Emphasising the importance of PFRA linkages with SMEs, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) noted:

SMEs are the growth engine of the Australian economy. They make a disproportionately large contribution to economic growth, exports and to industrial development in Australia. They have accounted for 70 per cent of jobs growth over the past decade and contribute approximately 30 per cent to Australia's GDP. Not only are SMEs intrinsically important to Australia, but they are also a natural vehicle to translate R&D into market impact. SMEs are an important distribution channel, or pathway for Australian science to have impact.⁹⁵

- 5.108 CSIRO also suggested that technology transfer and innovation could be enhanced if PFRAs engaged with SMEs more deeply and strategically on larger scale projects.⁹⁶ CSIRO advocated that such projects should be:

... driven by the needs of SMEs – market pull as opposed to science push ... PFRAs have valuable intellectual property and know-how that could help certain tech-based export-oriented SMEs become more successful. PFRAs and universities have a desire to work deeply with SMEs in this fashion ... Many SMEs have expressed a desire for this level of interaction as well ... Furthermore, CSIRO carries out longer term, higher risk industrial research, which Australian SMEs cannot perform because of their small size, offering a very complementary partner to the SMEs.⁹⁷

- 5.109 A number of businesses (including SMEs and larger companies) indicated that they had benefited from collaborations with PFRAs, with some indicating that IP for innovative technologies had originated in PFRAs.⁹⁸ Flavourtech provided a positive view of its collaborations with PFRAs and universities stating:

95 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 8.

96 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 9.

97 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 10.

98 Care Free Water Conditioners, *Submission No. 50*, p. 1; SIA, *Submission No. 61*, p. 13; BAE Systems, *Submission No. 66*, p. 1; Flavourtech, *Submission No. 84*, p. 3.

Collaboration with institutions such as CSIRO, University of Sydney and Charles Sturt University has been an important part of Flavourtech's R&D effort. This aspect of our R&D culture has many benefits and is to be maintained.⁹⁹

- 5.110 In contrast, a small number of submissions expressed concerns regarding the shift into commercialisation as part of PFRAs' activities.¹⁰⁰ The Environmental Research and Information Consortium (ERIC) argued that PFRAs are competing with private industry in providing R&D and commercial services, to the detriment of private industry.¹⁰¹

Barriers to Collaboration—Publicly Funded Research Agencies

- 5.111 From evidence provided to the inquiry the main barriers to PFRAs engaging with private industry are due to incompatibilities with organisational objectives, structures and operating environments.¹⁰²

- 5.112 With regard to incompatibilities in organisational objectives, Professor Cole argued that there is a mismatch between research in Australia and market relevance, stating:

Market relevance of the knowledge being produced in Australia is abysmally low – enhanced by other weaknesses in research focus relative to market opportunity.¹⁰³

- 5.113 Professor Cole also noted difficulties that SMEs have experienced when engaging with PFRAs, due to a lack of financial flexibility in PFRAs:

Of importance is the flexibility with which the commercialising companies can interact with the research sector and, especially, its publicly funded infrastructure. In the pre-competitive phase, the technical and commercial risks are still very high for companies. Encouraging effective innovation, especially within the SME-dominated industry of Australia, cannot take place if access is at full-cost recovery

99 Flavourtech, *Submission No. 84*, p. 3.

100 Roach Industries, *Submission No. 3*, p. 3; Environment Research and Information Consortium, *Submission No. 28*, p. 1.

101 Environment Research and Information Consortium, *Submission No. 28*, p. 1.

102 CCST Metrics for Research Commercialisation Working Group, *Submission No. 7*, p. 2; Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, pp. 10-11; Professor T Cole, *Submission No. 40*, pp. 4-5.

103 Professor T Cole, *Submission No. 40*, p. 4.

compared with the more generous academic access regimes that have existed in, for example, MNRF [Major National Research Facilities Program] and university-based facilities.¹⁰⁴

5.114 In its submission CSIRO identified three structural impediments to larger scale PFRA/SME collaborations. These were summarised in the following way:

Firstly, successful SMEs cannot afford to invest (or choose not to invest) in larger scale continuing R&D ... Partnering with a PFRA or university may help enhance the SME's innovation and commercialisation prospects, but the opportunity costs are often too high. Such large-scale collaborative projects are beyond the financial capacity of SMEs to fund out of their cash reserves, and are not the types of investment that private equity or venture capital firms typically make. Venture capital funds and the private sector have a risk/reward profile that prevents them from investing in collaborations between SMEs and PFRAs or universities.

Secondly, PFRAs and universities have a desire to work deeply with SMEs, but do not have the financial flexibility to subsidise the work ... PFRAs and universities have high fixed costs and a business model that requires a certain level of external earnings in order to maintain operations ... Tight financial budgets make it nearly impossible for PFRAs to forego contract research revenue and instead share in the risk/reward with SMEs.

Thirdly, existing mechanisms of funding collaboration do not go far enough ... Because Commercial Ready requires an SME to fund 50 percent of a funded project, however, Commercial ready does not provide strong enough incentives for SMEs to collaborate with PFRAs/universities on new large scale collaborations that will meaningfully impact the growth of the SME.¹⁰⁵

104 Professor T Cole, *Submission No. 40*, p. 5.

105 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, pp. 10-11.

5.115 The CSIRO indicated that it has developed a proposal to bridge the gap that ‘currently prevents high potential technology based export oriented SMEs from participating in large scale demand-driven collaborations with PFRAs and universities.’¹⁰⁶

5.116 The proposal advocates the introduction of a new Government funded program called Australian Growth Partnerships (AGP). CSIRO explained that the scheme would provide:

... funds directly to selected SMEs to engage in large scale collaborations with Australia’s leading providers of R&D services. In order for th[ese] type of co-development projects to occur, a fund would be created that selects and funds high potential proposals on a competitive basis.¹⁰⁷

5.117 CSIRO stressed that the AGP model is not a grant explaining that:

Financial models suggest that AGP could be a self-sufficient program in five to seven years. Similar to the HECS model [Higher Education Contribution Scheme], star SMEs that benefit from participating in the program would repay the funds back to the program. SMEs that do not benefit from the program are not required to contribute back to the program. ... The likelihood of success and the potential recuperation of funds would be one of the factors used in selecting proposals for funding.

In addition to AGP’s recuperation through licence fees and royalties, governments would also achieve increased payroll taxes and income taxes from the successful SMEs.¹⁰⁸

Publicly Funded Research Agency Outreach Activities

5.118 Evidence to the inquiry from PFRAs have indicated a range of different approaches to promote linkages with private enterprise, including SMEs. While not an exhaustive list, approaches that have been adopted include:

- the implementation of programs and initiatives specifically designed to support PFRA and business partnerships (e.g. CSIRO’s

106 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 11.

107 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 11.

108 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 12.

National Flagships Initiative¹⁰⁹ and the Defence Science and Technology Organisation's (DSTO's) **Industry Alliances**¹¹⁰);

- the establishment of commercialisation offices and TTOs to promote IP commercialisation opportunities and facilitate engagement with businesses (e.g. DSTO's **Technology Transfer Advisory Group**¹¹¹ and **Access ANSTO**¹¹²); and
- the simplification of contract systems to make it easier for SMEs to engage with PFRAs by reducing the complexity of routine, low risk contracts and streamlining approval processes (e.g. CSIRO's **FastTrack**¹¹³).

5.119 Other than descriptive information provided by the PFRAs on their own outreach initiatives, the inquiry received little evidence from third parties regarding the operation and effectiveness of specific outreach initiatives.¹¹⁴

Intermediaries

5.120 The role of intermediaries (i.e. organisations or initiatives that act as an independent third party to broker partnerships and collaborations) are viewed as very effective means of connecting researchers with investors and industry partners.¹¹⁵

5.121 In its submission, the Australian Institute for Commercialisation (AIC) outlined a number of products and services which it believes

109 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 8.

110 Defence Science and Technology Organisation, *Submission No.83*, p. 2.

111 Defence Science and Technology Organisation, *Submission No. 83*, p. 6.

112 Australian Nuclear Science and Technology Organisation, *Submission No. 70*, p. 7.

113 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 10.

114 Comments received in relation to PFRA outreach activities were supportive of most initiatives. For example QPSX, *Submission No. 47*, p. 4; Care-Free Water Conditioners Australia, *Submission No. 50*, p.1; Mr R Taylor (Robert Taylor and Associates), *Transcript of Evidence*, 5 August 2005, p. 50. However, i3 Aerospace Technologies, *Submission No. 1*, p. 8 was critical of Defence Science and Technology Organisation's Capability Demonstrator Program and Unsolicited Proposal Gateway.

115 Australian Institute for Commercialisation, *Submission No. 29*, p. 5; Australian Electrical and Electronic Manufacturers' Association, *Submission No. 30*, p. 4; Robert Taylor and Associates, *Submission No. 34*, p. 1; Australian Academy of Technological Sciences and Engineering Ltd., *Submission No. 49*, p. 5; Australian Institute for Marine Science, *Submission No 65*, p. 7. 5.1 Examples of intermediaries provided in the evidence included organisations such as the Australian Institute for Commercialisation and KCA, and schemes such as the Australian Industry Group's InnovationXChange.

fill 'gaps in the spectra of commercialisation support'.¹¹⁶ These included the AIC's **TechFast program** which, with support from DITR, is currently undergoing a national pilot and gives assistance to companies by providing:

- linkages to appropriate expertise from research organisations;
- services and support downstream to commercialise these opportunities; and
- identification of potentially useful IP residing within PFRIs.¹¹⁷

5.122 In its submission, the AIC provided examples of two SMEs (i.e. Vortex Insect Control Holdings and Merino Pty Ltd) that had benefited from its TechFast program.

5.123 Describing the role of KCA, Robert Taylor and Associates explained:

On the supply side members of Knowledge Commercialisation Australasia (KCA) are central to the achievement of effective knowledge commercialisation outcomes from the university and public research sector in Australia.

Members operate as deal makers and facilitators between the knowledge supply side and multiple groups of potential customers and service providers locally, nationally and internationally.¹¹⁸

5.124 **InnovationXChange** is 'a not-for-profit, commercially neutral organisation that has been created to help potential business partners come together for mutual benefit'.¹¹⁹ DITR described InnovationXchange as providing:

... a secure, managed environment for the connection of insights and opportunities between firms, universities and governments...¹²⁰

5.125 Both CSIRO and ATSE have advocated that greater industry and government support to fund increased activities of intermediaries would be beneficial.¹²¹

116 Australian Institute for Commercialisation, *Submission No. 29*, p. 11.

117 Australian Institute for Commercialisation, *Submission No. 29*, p. 15.

118 Robert Taylor and Associates, *Submission No. 34*, p. [1].

119 InnovationXchange Network, accessed 28 February 2006, <ixc.com.au>.

120 InnovationXchange Network, accessed 28 February 2006, <ixc.com.au>.

Committee Comment

- 5.126 The Committee considers that the outreach activities undertaken by the CSIRO, DSTO and the Australian Nuclear Science and Technology Organisation (ANSTO) are positive and productive initiatives to facilitate innovation and commercial outcomes. While the Committee recognises that some of these outreach initiatives have only recently been established, it strongly urges PFRAs to undertake regular reviews and when necessary to refine these activities to ensure that outcomes are maximised.
- 5.127 The Committee notes little evidence was received from SMEs and private industry on PFRA outreach activities. Anecdotal evidence from inspections and informal discussions suggests there may be a reluctance to speak publicly due to commercial in confidence issues or, for fear of jeopardising future relationships and business opportunities in a specialised market area.
- 5.128 Some evidence to the inquiry suggested that PFRAs should not pursue commercialisation outcomes as this potentially represents unfair competition to private industry.¹²² The Committee does not endorse this view. While commercialisation may not be the core function of PFRAs, there remains a role for research agencies to engage in commercialisation where appropriate.
- 5.129 In addition, the Committee considers that CSIRO's implementation of the contract simplification system, FastTrack, may provide a practical means of strengthening opportunities for SMEs to engage with PFRAs by reducing the administrative burden and prohibitive financial barriers. Therefore the Committee strongly urges other PFRAs to adopt similar practices.
- 5.130 Intermediaries, such as the TechFast program and the InnovationXchange, also appear promising and the Committee looks forward to the results of the formal reviews at the completion of the pilot programs.

121 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 15; Australian Academy of Technological Sciences and Engineering, *Submission No. 49*, p. 5.

122 Roach Industries, *Submission No. 3*, p. 3; Environment Research and Information Consortium, *Submission No. 28*, p. 1.

- 5.131 A further promising development is CSIRO's proposal for an Australian Growth Partnerships program. The Committee is strongly supportive of this proposals objective of increasing collaborations between PFRAs and high potential technology based export-oriented SMEs.
- 5.132 The proposal has been submitted to DITR for consideration and the Committee recommends it receives urgent attention given the importance of establishing dynamic linkages and partnerships as a pathway to commercialisation.

Recommendation 10

The Committee recommends that the Australian Government give priority consideration to the Commonwealth Scientific and Industrial Research Organisation's proposal for an Australian Growth Partnerships program to engage small to medium enterprises in demand driven collaborations with publicly funded research agencies.

Universities—Linkages and Collaborations

- 5.133 Some of the issues identified in submissions relating to university linkages and collaborations are similar to those raised in relation to PFRAs. However, due to an increased emphasis on university outreach activities in recent times, there are also a number of specific issues which warrant further attention.

The Changing Role of Australian Universities

- 5.134 Universities are traditionally centres of both teaching and research. More recently, universities are playing an increasingly active 'third stream' role – transferring knowledge, skills and innovation for public and private benefit (also called 'third arm' activities).
- 5.135 The two main drivers for universities taking on this third role have been identified as:
- a shift in government policy placing emphasis on university income derived from private funding; and

- an increase in market opportunities as a result of the growth of the knowledge-based economy.¹²³
- 5.136 The majority of universities have embraced the role of technology transfer, with many of Australia's larger universities establishing TTOs or similar structures to facilitate the transfer of knowledge via linkages with private industry or other research institutions and to provide a focus for the commercialisation of IP.¹²⁴
- 5.137 However, some evidence to the inquiry has identified challenges faced by universities in this new environment. Concern was expressed by a number of submissions regarding the limited ability (even in the best case scenario) for universities to derive a substantial proportion of income from the commercialisation of IP.¹²⁵
- 5.138 As noted by ATP Innovations, a technology commercialisation centre jointly owned by four of Australia's leading universities¹²⁶:
- The reality is that for most universities (even those with large research outputs), commercialisation of institutional IP provides relatively modest financial returns to the institutions in the short term and this is mainly derived through licensing opportunities. It is worth noting that international comparisons ... also indicate that most universities only derive modest returns on these activities and this is not isolated to Australia.¹²⁷
- 5.139 Similarly, the Group of Eight also stated in its submission:
- The high-risk nature of investing in commercial activities means that there is often conflict between the expectations governments have about the commercialisation of university R&D and the prudential environment in which universities operate. This conflict would be removed if governments

123 M Gallagher, *The Emergence of Entrepreneurial Public Universities in Australia*, Department of Education, Training and Youth Affairs, 2000, p. 5.

124 For example see ATP Innovations, *Submission No. 6*, p. 2; Melbourne Ventures, *Submission No. 21*, p. 1; La Trobe University, *Submission No. 35*, p. 3.

125 For example see ATP Innovations, *Submission No. 6*, pp. 1-2; Professors K Smith and J West, *Submission No. 18*, p. 10; SIA, *Submission No. 61*, p. 14; Group of Eight, *Submission No. 62*, p. 2.

126 ATP Innovations is jointly owned by the Australian National University, the University of New South Wales, the University of Sydney and the University of Technology Sydney.

127 ATP Innovations, *Submission No. 6*, pp. 1-2.

matched their enthusiasm for improved commercial outcomes with funding targeted for this purpose.¹²⁸

Barriers to Collaboration—Universities

5.140 As with PFRAAs, some evidence to the inquiry identified incompatibilities with university organisational objectives, structures and operating environments as the main barrier to engaging effectively with private industry.

5.141 For example, the company Memtec stated:

... the main reason for problems [between universities and commercial enterprises], is the completely different expectations, culture, agendae ... of each party to the relationship. For example, researchers at universities aim to publish results of research during and after the project. A commercial enterprise aims for strict confidentiality and exclusive access to the results of research to enable a competitive advantage to be gained.¹²⁹

5.142 Other evidence has highlighted differing timeframes for commercialisation, IP ownership issues, and rigid legal and financial systems in universities as impediments to collaboration with private enterprise.¹³⁰

5.143 In order to simplify university engagement with private enterprise, the University of Melbourne suggested that:

Government agencies such as DEST or [DITR] could co-sponsor with the AVCC a review of research contracts between industry and universities with a view to developing nationally agreed templates ...¹³¹

5.144 In addition, a significant volume of evidence noted that while governments have expected universities to take on third stream activities, additional 'third stream' funding to support these activities has not been offered.¹³²

128 Group of Eight, *Submission No. 62*, p. 5.

129 Memtec, *Submission No. 42*, p. 5.

130 Dr J Yencken and Professor Emeritus M Gillin, *Submission No. 41*, p. 3; Council for Humanities, Arts and Social Sciences, *Submission No. 77*, Attachment 1, p. 33; Dr M Bradley (ATP Innovations), *Transcript of Evidence*, 18 May 2005, p. 48.

131 University of Melbourne, *Submission No. 52*, p. 2.

132 KCA, *Submission No. 27*, p. 7; La Trobe University, *Submission No. 35*, pp. 3-4; University of Melbourne, *Submission No. 52*, p. 3; Group of Eight, *Submission No. 62*, pp. 4-5;

- 5.145 KCA expressed concern in its submission regarding the consequence of not providing additional funds for commercialisation activities, stating:

DEST provides universities with considerable support whether directly or through related agencies in both research and teaching supported funding. However, the lack of specific funding for commercialisation means that for many institutions they must make the decision whether to engage in commercialisation and to divert funding from the core mission of research and teaching.¹³³

- 5.146 KCA concluded that government funding to support university commercialisation activities in the range of 3–5 per cent of university research expenditure would:

... help lift knowledge transfer performance across all areas including industry contract research through to licensing arrangements through to the formation of university spin-off companies and various permutations of these.¹³⁴

Third Stream Funding

- 5.147 With regard to improving the linkages and collaborations between businesses and universities, several submissions referred to the outcomes of the 2003 *Lambert Review of Business – University Collaboration* (UK).¹³⁵ Specifically, evidence to the inquiry emphasised the strong support given for third stream funding to promote knowledge transfer from universities to the private sector by the *Lambert Review*.¹³⁶
- 5.148 In the United Kingdom (UK) third stream funding has been offered to universities through the **Higher Education Reach Out for Business and Community** (HEROBC) scheme.¹³⁷ The HEROBC scheme was

Australian Innovation Association, *Submission No. 72*, p. 10; Council for Humanities, Arts and Social Sciences, *Submission No. 77*, Attachment 1, p. 33.

¹³³ KCA, *Submission No. 27*, p. 7.

¹³⁴ KCA, *Submission No. 27*, p. 7.

¹³⁵ HM Treasury, 2003, *Lambert Review of Business-University Collaboration*, accessed 3 May 2006, <hm-treasury.gov.uk>.

¹³⁶ For example see KCA, *Submission No. 27*, p. 2; Australian Institute for Commercialisation, *Submission No. 29*, p. 29; La Trobe University, *Submission No. 35*, p. 2; University of Melbourne, *Submission No. 52*, p. 3; Go8, *Submission No. 62*, p. 4.

¹³⁷ KCA, *Submission No. 27*, p. 6; Australian Institute for Commercialisation, *Submission No. 29*, p. 29; La Trobe University, *Submission No. 35*, p. 2; Professor T Cole, *Submission*

introduced in the UK in 1999. Under HEROBC, higher education institutions in the UK were invited to apply for funds which 'enable universities and colleges of higher education to develop links with business and the wider community'.¹³⁸

5.149 There have been two rounds of HEROBC funding to date (1999 and 2000), which have resulted in a funding commitment of over £400 million.¹³⁹

5.150 In England¹⁴⁰, third stream funding provided through HEROBC has been complemented by the introduction of **Higher Education Innovation Fund** (HEIF) which has awarded a total of £171 million over 2004–05 and 2005–06 to support:

... knowledge transfer, entrepreneurship training, corporate spin-outs, seed venture funding and transferring knowledge into business and the community.¹⁴¹

5.151 A 2006 evaluation of the HEIF concluded that:

... third stream activity has been much improved within higher education institutions and their business and community partners as a result of the funding.¹⁴²

Committee Comment

5.152 The Committee recognises that challenges remain in fostering collaboration between universities and the private sector. The Committee is also aware of the significant attention committed to developing strategies to address these challenges and enhance engagement between universities and the private sector.

5.153 In 2004, the BCA/AVCC report *Building Effective Systems of the Commercialisation of University Research* identified the need to build

No. 40, p. 3; University of Melbourne, *Submission No. 52*, p. 3; Group of Eight, *Submission No. 62*, p. 4.

138 Higher Education and Research Opportunities in the United Kingdom, accessed 1 March 2006, <hero.ac.uk>.

139 Department of Education, Science and Training, *Submission No. 20*, p. 17.

140 Institutional funding for higher education in the UK is devolved, with separate educational development agencies in England, Scotland, Wales and Northern Ireland. The Higher Education Innovation Fund (HEIF) is administered through the Higher Education Funding Council for England (HEFCE) and is therefore only available in England.

141 Professor T Cole, *Submission No. 40*, p. 3.

142 Office of Science and Technology, *Higher Education Innovation Fund – Summary Evaluation of the First Round (2001-05)*, 2006, p. 1.

‘effective partnerships in research commercialisation between the universities, business and finance provider.’¹⁴³

- 5.154 Evidence received does suggest that universities are facing real challenges in developing partnerships for research commercialisation. However, there are some positive initiatives including the establishment and evolving role of TTOs in many universities (although smaller universities may face greater hurdles in providing this type of assistance).
- 5.155 One university suggested the development of nationally agreed templates for research contracts between industry and universities.¹⁴⁴ While supportive of this concept, the Committee disputes that there is a role for the Australian Government to co-sponsor a project such as this, and refers to the success of *FastTrack* which was developed by CSIRO in response to an identified need.
- 5.156 Therefore, the Committee urges the universities to take a collaborative approach among themselves to recognise the financial benefits of agreed national contract templates, and undertake to develop such templates through the coordinating body of the AVCC.
- 5.157 The Committee also notes a number of recent initiatives introduced by the Australian Government, including the establishment of the **Business-Industry-Higher Education Collaboration Council** (BIHECC) and the **Collaboration and Structural Reform (CASR) Fund**, to support greater collaboration between universities and other organisations and industry.
- 5.158 BIHECC was formally established in July 2004¹⁴⁵ to advise the Minister for Education, Science and Training on ways to improve communication between business/industry and higher education sectors. The Australian Government has allocated \$200 000 in funding for the Council over 2005 and 2006.¹⁴⁶
- 5.159 The key priorities of BIHECC include:
- coordinating the selection of business/industry/university collaboration projects for funding from the Collaboration and Structural Reform (CASR) Fund;

143 Business Council of Australia and Australian Vice-Chancellors' Committee, Allen Consulting Group, *Building Effective Systems of the Commercialisation of University Research*, August 2004, Executive Summary, p. viii.

144 University of Melbourne, *Submission No. 52*, p. 2.

145 Department of Education, Science and Training, *Higher Education Report 2004-05*, p. 10.

146 Department of Education, Science and Training, *Higher Education Report 2004-05*, p. 10.

- development of strategies to encourage greater industry/business involvement in the higher education sector; and
 - facilitation of involvement of small and medium enterprises in collaborative arrangements.¹⁴⁷
- 5.160 The CASR Fund of \$36.6 million was established by the Australian Government in early 2005. It provides competitive funds to:
- ... foster collaboration between universities and other universities, business, industry, professional associations, community groups or other relevant organisations, and to encourage innovation within the higher education sector.¹⁴⁸
- 5.161 The first round of successful CASR Fund projects (ten in total) was announced by the Minister for Education, Science and Training in August 2005.¹⁴⁹ Expressions of interest for a second round of CASR Fund proposals closed on 29 May 2006.¹⁵⁰
- 5.162 The Committee is encouraged by the establishment of the BIHECC and welcomes the establishment of the CASR Fund. The Fund will provide a valuable means of encouraging university linkages, including improved linkages with industry and businesses.
- 5.163 With regard to the call from universities for third stream funding, the Committee is cognisant of the pressures placed on universities as a result of changing roles and the greater emphasis on knowledge transfer and commercialisation activities. While third stream funding models such as the UK's HEROBC and HEIF schemes provide a framework for consideration, the Committee realises that any overseas funding model will need to be adapted and refined to reflect Australia's specific needs and higher education structure.
- 5.164 The Committee considers that if Australian universities believe third stream funding is required, then a more comprehensive cost-benefit based business case needs to be developed. The business case should consider returns on investment and the potential advantages and disadvantages of various third stream funding models for Australia. Detailed consideration needs to be given to the implementation of third stream funding models, particularly the means for determining funding awards.
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147 Department of Education, Science and Training, accessed 21 January 2006, <dest.gov.au>.

148 *Our Universities: Backing Australia's Future*, Policy document, May 2003, p. 39.

149 Department of Education, Science and Training, accessed 4 May 2006, <dest.gov.au>.

150 Department of Education, Science and Training, accessed 30 May 2006, <dest.gov.au>.

- 5.165 Therefore, the Committee recommends that the Australian Government direct the BIHECC (as the national body which has been established to foster greater collaboration between the business and higher education sectors), or other appropriate entity, to examine and develop the business case for third stream funding to universities.

Recommendation 11

The Committee recommends that the Australian Government request the Business Industry Higher Education Collaboration Council to examine and develop the business case for third stream funding to universities.

University Linkage and Collaboration Programs

- 5.166 Much of the collaborative research conducted in Australian universities is supported by the **CRC Program** or the **ARC Linkage Projects Scheme**.

Cooperative Research Centres (CRC) Program

- 5.167 In recognition of the need to develop stronger linkages between research institutions and market, DEST established the CRC program in 1990. Total Government funding provided for the CRC program from 2001 to 2011 amounts to approximately \$1.8 billion.¹⁵¹
- 5.168 The program places a strong emphasis on the importance of collaborative arrangements to:
- ... forge closer links between Australian industry and researchers ... from universities, the public sector (including CSIRO) and industry. The close interaction between researchers and end users of research at all stages is a key feature of CRCs.¹⁵²

151 Department of Education, Science and Training, accessed 4 May 2006, <backingaus.innovation.gov.au>.

152 Department of Education, Science and Training, *Submission No. 20*, p. 25.

- 5.169 There have been nine selection rounds for the program, with a total of 158 successful applications (including renewals) resulting in 99 actual centres. In each funding round, applicants seek funding for a term of seven years.
- 5.170 Fifty-nine CRCs are currently in operation in the following broad areas:
- manufacturing technology;
 - information and communication technology;
 - mining and energy;
 - agriculture and rural based manufacturing;
 - environment; and
 - medical science and technology.¹⁵³
- 5.171 In 2003, an Australian Government commissioned review concluded that a more 'investment-focused' CRC program with greater emphasis on 'new business development' would better meet the program's objectives.¹⁵⁴ This resulted in a shift of emphasis away from CRCs catering for both commercial and public-good outcomes, to CRCs with a focus on commercial outcomes and economic growth in more recent funding rounds.¹⁵⁵
- 5.172 Much of the evidence received in relation to the CRC program was supportive of the initiative, indicating that the program has facilitated the development of improved linkages between the higher education sector and private enterprise.¹⁵⁶
- 5.173 In particular, some submissions highlighted the importance of the strong participation of end-users in the adoption process¹⁵⁷, with the

153 Cooperative Research Centres, accessed 3 November 2005, <crc.gov.au>.

154 Department of Education, Science and Training, *Evaluation of the Cooperative Research Centres Programme*, July 2003, Report Summary.

155 Cooperative Research Centre Committee, *Submission No. 11*, p. 2.

156 See for example Cooperative Research Centre Committee, *Submission No. 11*, p. 4; Australian Cotton Cooperative Research Centre, *Submission No. 57*, p. 2; Mr R Taylor (Robert Taylor and Associates), *Transcript of Evidence*, 5 August 2005, p. 42.

157 Cooperative Research Centre Association, *Submission No. 48*, p. 8; Australian Cotton Cooperative Research Centre, *Submission No. 57*, p. 3; Cooperative Research Centre for Cast Metals Manufacturing, *Submission No. 75*, p. 2.

CRC for Cast Metals Manufacturing noting that it is 'one of the great strengths of CRCs'.¹⁵⁸

- 5.174 A number of submissions were supportive of the recent changes to the CRC program, expressing the view that the increased focus on commercial outcomes was appropriate and that the requirement for all new CRCs to be incorporated entities was operationally more functional (i.e. requiring a board with an independent chair) and would lead to improved commercial outcomes.¹⁵⁹
- 5.175 Some evidence expressed concern regarding the sustainability of CRC activities following cessation of Australian Government funding through the program. In this regard, the CRC guidelines recommend that individual CRCs develop a wind-up strategy in consultation with all participants and with the governing board's approval.¹⁶⁰
- 5.176 The Chair of the CRC Committee, Dr Geoffrey Vaughan, explained the importance of CRC activity continuing beyond funding provided under the program, stating:
- The sustained activity comes from the hope that, after a funding cycle or even two or three funding cycles, there will be continuity in the outcomes from that centre.¹⁶¹
- 5.177 Dr Mark Sceats noted that the development of a 'graduation mechanism' for successful CRCs had been debated within the CRC community since 1991, stating:
- ... no mechanism has ever emerged. The only mechanism to graduate is either voluntarily, or by the loss of a bid [for the next CRC funding round]. It is not a system that allows for consultation and finesse.¹⁶²
- 5.178 DSTC (a company that has operated incorporated ICT CRCs since 1992 and has over a 13 year period participated in four ICT-based CRCs) explained that following an unsuccessful bid for CRC funding under the ninth round of the Program, the company is in a funding 'no man's land' stating:

158 Cooperative Research Centre for Cast Metals Manufacturing, *Submission No. 75*, p. 2.

159 Cooperative Research Centre Committee, *Submission No. 11*, p. 3; Dr M Sceats, *Submission No. 23*, p. 12.

160 *Cooperative Research Centre Program Wind-up Guidelines for CRCs*, June 2005, pp. 3-4.

161 Dr G Vaughan (Cooperative Research Centre Committee), *Transcript of Evidence*, 4 August 2005, p. 23.

162 Dr M Sceats, *Submission No. 23*, p. 17.

We do not qualify for funding from the Australian Research Council (ARC) which targets research in higher education institutes and we do not qualify for funding under the Department of Industry's Commercial Ready program as we are a non-tax paying entity. DSTC and other CRCs have generated a wealth of commercially exploitable IP and commercialisation models, but our research programs have nowhere to go when CRC funding ceases and it's possible that the benefit associated with each CRC will be lost to the nation.¹⁶³

Australian Research Council (ARC) Linkage Projects

5.179 The ARC Linkage projects represent another Australian Government program that specifically targets knowledge transfer through supporting the formation of linkages and collaborations. The ARC advised that Linkage projects encourage:

... the formation of long-term alliances between university researchers and industry, government and community organisations (otherwise known as partner organisations). These alliances facilitate the transfer of skills and ideas as a basis for securing commercial and other benefits from research'.¹⁶⁴

5.180 To be considered for funding under this scheme applications from Australian universities must include at least one collaborating organisation which may be a private sector organisation, a private non-profit organisation or a government agency.¹⁶⁵

5.181 Linkage Project funding are awarded for one to five years, with grants typically ranging from \$20 000 to \$500 000 per annum.¹⁶⁶ In the 2004 funding rounds, 532 projects received a total of \$119.9 million of funding from the ARC.¹⁶⁷

5.182 The ARC outlined the role that the scheme plays in encouraging research and business linkages by highlighting the private partner contributions (in cash or in-kind) to Linkage Projects grants in 2004:

163 DSTC Pty Ltd, *Submission No. 69*, p. 14.

164 Australian Research Council, *Submission No. 19*, p. 9.

165 Australian Research Council, *Linkage Projects: Funding Rules for Funding commencing in 2006*, Appendix 2.

166 Australian Research Council, *Linkage Projects: Funding Rules for Funding commencing in 2006*, pp. 9-10.

167 Australian Research Council, *Submission No. 19*, p. 9.

Approximately 59 per cent of the total partner contributions ... was provided by private companies or industry partners. This is important given the relatively low level (compared to the OECD average) of Business Expenditure on Research and Development as indicated in figures provided by the Australian Bureau of Statistics.¹⁶⁸

- 5.183 Although relatively few submissions commented on the ARC Linkage Projects, those that did were generally supportive of the program.¹⁶⁹

Committee Comment

- 5.184 The Committee considers that both the CRC program and the ARC's Linkage Projects offer effective means for universities to build linkages with other organisations including private enterprise.
- 5.185 However, as CRCs are sector or project specific, there are research areas (both in universities and in industry) which are outside the scope of current CRC activities and which are therefore not able to access the linkage benefits of this program. The Committee recognises this, and notes that the selection of CRCs appropriately target areas of national priority.
- 5.186 While it is the role of Government to provide a framework of opportunities, it is also incumbent on universities (and on industry) to pursue greater collaboration where there are market opportunities. In this regard, the Committee notes that there are other mechanisms beyond CRCs which also facilitate collaborative ventures, in particular the ARC Linkages Projects and the newly established CASR Fund.
- 5.187 Some evidence to the inquiry raised the issue of a graduation mechanism for post CRC funding.¹⁷⁰ Given the requirement for the CRCs themselves to develop appropriate wind-up strategies well in advance of the end of the funding period¹⁷¹, the Committee is not persuaded by the call for a more prescriptive or staged graduation mechanism.

168 Australian Research Council, *Submission No. 19*, p. 9.

169 Council for Humanities, Arts and Social Sciences, *Submission No. 77*, p. 26; Mr M Bradley (ATP Innovations), *Transcript of Evidence*, 18 May 2005, p. 48; Mr H Hawthorn (ATP Innovations), *Transcript of Evidence*, 18 May 2005, p. 48.

170 Dr M Sceats, *Submission No. 23*, p. 17; DSTC Pty Ltd, *Submission No. 69*, p. 14.

171 Cooperative Research Centres, accessed 4 May 2006, <crc.gov.au>.

- 5.188 Similarly the Committee notes evidence relating to the ‘no man’s land’ position of some CRC spin-off companies in relation to funding. However, the Committee is not persuaded by calls for a designated government program to support the activities of CRCs or their spin-off companies if they have failed to secure continued funding through the CRC program. The Committee considers that the business strategy of a spin-off company must take into account life beyond the CRC funding.

Business to Business Collaborations

- 5.189 Research undertaken by industry accounts for approximately fifty per cent of R&D in Australia.¹⁷² Therefore, there are many instances where technologies are developed and commercialised solely within the private sector, making effective linkages between businesses crucial.¹⁷³
- 5.190 A key finding from the ABS business innovation survey for 2003 was that 27 per cent of innovating businesses were involved in some form of active collaboration. While 25 per cent of innovating businesses reported collaborations with other businesses, less than seven per cent reported collaborations with universities, governments and research institutions.¹⁷⁴
- 5.191 The ABS innovation survey of 2003 also found that collaborative arrangements were most likely to be formed between businesses from within a 100 kilometre distance rather than with businesses from elsewhere in Australia or from overseas.¹⁷⁵
- 5.192 Business to business collaborations range in size from alliances between two or more businesses, to industry-wide strategic collaborations such as those fostered under Australian Government initiated **Industry Action Agendas**.
- 5.193 Industry Action Agendas (Action Agendas), announced by the Australian Government in 1997, were described by DITR as:

172 *Building Effective Systems for the Commercialisation of University Research*, The Allen Consulting Group, Australian Vice-Chancellors’ Committee/Business Council of Australia, August 2004, p.1. The report also states that twenty-five per cent of R&D is performed by PFRAs and another twenty-five per cent by universities.

173 Mr D Scott-Kemmis, *Submission No. 99*, p. 6.

174 Australian Bureau of Statistics, *2003 Innovation in Australian Business (ABS 8158.0)*, pp. 37-38.

175 Australian Bureau of Statistics, *2003 Innovation in Australian Business (ABS 8158.0)*, pp. 38-39.

... long term industry strategies to assist industries to identify their strengths, weaknesses, and to map new opportunities to achieve sustainable development and export growth. They are a partnership between government and industry sectors that provide a comprehensive insight faced by particular sectors. Action Agendas can identify commercialisation issues at a sectoral level.¹⁷⁶

- 5.194 During the development phase of an Action Agenda, key industry leaders are assisted by policy makers in the relevant Government departments to develop a vision for the industry and a pathway to enable them to achieve that vision. Often industry leaders may identify impediments, such as skill shortages, regulatory hurdles or industry fragmentation. Recommendations to overcome these difficulties are jointly developed by industry and Government. Some Government assistance is provided in the following one to two years of implementation.
- 5.195 Most of the evidence on Action Agendas received by the Committee focused on specific recommendations arising from the Action Agendas, rather than commenting on the value of the support mechanism in general.
- 5.196 DITR claimed in its submission that Action Agendas have led to an increase in the industry's innovation capacity and resulted in a substantial increase in investment in R&D and commercialisation by industry noting 'over \$600 million has been committed by Action Agenda industries in support of CRCs'.¹⁷⁷
- 5.197 In addition to the Action Agendas, in 2004 the Australian Government announced the **Industry Cooperative Innovation Program** (ICIP). ICIP, administered by DITR through AusIndustry, provides \$25 million of merit-based funding to:
- ... support cooperative innovation projects by firms to develop and use new technologies, with priority being given to projects meeting strategic industry needs including those identified through an Action Agenda ... ICIP will assist in building collaboration activity to strengthen the innovation capacity of an industry sector.¹⁷⁸

176 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 11.

177 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 11.

178 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 10.

5.198 The program is to be funded until 2011. Specific projects are to be conducted by a consortium of three or more entities (that is, they cannot be made up only of industry representative associations), on behalf of an industry.¹⁷⁹ In its submission to the inquiry, DITR informed the Committee that funding for the program is to be provided in two streams:

Stream A will provide funds for small scale projects that explore sectoral innovation opportunities and paths to enhance sectoral innovation capacity; and Stream B will provide funds for major cooperative strategic sectoral innovation projects.¹⁸⁰

5.199 As the ICIP scheme has only recently been launched, with the successful applications for the first round being announced in December 2005, there was very little evidence to the inquiry regarding the scheme. However, in its submission, the Australian Electrical and Electronic Manufacturers' Association (AEEMA) stated that:

The response of our industry grouping to the recently announced Industry Cooperative Innovation Program ... has been very favourable.¹⁸¹

5.200 In addition to linkages between businesses within Australia, a number of submissions also emphasised that export is an essential goal for most Australian businesses due to the limited size of the domestic market.¹⁸²

5.201 Accessing the international market frequently requires the establishment of commercial collaboration with overseas companies or large multinationals.¹⁸³ The Queensland Department of State Development and Innovation explained:

In many cases, established firms that are capable of providing expertise and experience of [international] markets, regulatory environments and distribution channels are not

179 Department of Industry, Tourism and Resources, accessed 7 November 2005, <industry.gov.au>.

180 Department of Industry, Tourism and Resources, *Submission No. 82*, p. 10.

181 Australian Electrical and Electronic Manufacturers' Association, *Submission No. 30*, p. 3.

182 Citrix Systems Australasia R&D, *Submission No. 5*, p. 5; Australian Institute for Commercialisation, *Submission No. 29*, p. 24; GRP Technology, *Submission No. 45*, p. 6.

183 Citrix Systems Australasia R&D, *Submission No. 5*, p. 5; CEA Technologies, *Submission No. 8*, p. 8; Department of Communications, Information Technology and the Arts, *Submission No. 87*, p. 5.

available in Australia, making international alliance more attractive.¹⁸⁴

- 5.202 Similarly, Austrade, the Australian Government's principal trade and international business facilitation agency, explained that 'a local partner is an invaluable source of information on local conditions, the local culture and the local business climate.'¹⁸⁵ Austrade also emphasised that many of these linkages were initially developed through personal contact either at international conferences, seminars and trade shows, or visits overseas to specifically seek out partners.

Clusters

- 5.203 As noted previously, a key finding of the ABS business innovation survey was that geographical proximity is an important determinant for businesses seeking to establish collaborations. The AIC stated in its submission:

Proximity matters. Localisation promotes fluidity of ideas, the very food for a knowledge ecosystem. For that reason, policies which bring together industry and science should, for the most part, be locally or regionally based.¹⁸⁶

- 5.204 A large volume of evidence was received generally supporting the establishment of research and business linkages, and industry specific networks, primarily (though not exclusively) through the promotion of geographical collocation in knowledge precincts or technology parks.¹⁸⁷
- 5.205 The concept of **clusters**, geographical concentrations of interconnected public and/or private sector groups, has attracted worldwide attention from academics and policymakers since the introduction of the concept in 1990 by Professor Michael Porter of Harvard University.

184 Queensland Government, *Submission No. 74*, p. 8.

185 Austrade, *Submission No. 68*, p. 7.

186 Australian Institute for Commercialisation, *Submission No. 29*, p. 30.

187 Clusters Asia Pacific, *Submission No. 17*; Australian Institute for Commercialisation, *Submission No. 29*, pp. 30-32. Australian Electrical and Electronic Manufacturers' Association, *Submission No. 30*, p. 4; University of Sunshine Coast, *Submission No. 31*, p. 3; La Trobe University, *Submission No. 35*, p. 4; Australian Academy of Technological Sciences and Engineering Ltd., *Submission No. 49*, p. 4.

- 5.206 Professor Porter's concept is based on the premise that clusters form a critical mass of resources which promotes both competition and cooperation.¹⁸⁸
- 5.207 Mr Alan Newton, Executive Manager of the Rural Research and Development Corporation Chairs Committee (RDC), explained:
- The whole idea of a cluster is that you develop not only an industry but you link in with technological capabilities, you link in with education and get an established platform in your domestic market and then you go global.¹⁸⁹
- 5.208 Clusters Asia Pacific further explained that clusters are 'a connectivity mechanism at a number of levels.' These include:
- engaging otherwise unconnected researchers;
 - engaging researchers with the 'right' type of companies i.e. those capable of taking research to the market; and
 - linking Australian companies with overseas companies with a significant place in global markets.¹⁹⁰
- 5.209 Evidence to the inquiry identified a number of Australian industry clusters for example, South Australia's water industry alliance, the wine industry cluster and the scientific instrument manufacturing industry cluster.¹⁹¹ A number of submissions also highlighted the important role for state and local governments in promoting the development of regional and local clusters.¹⁹²

188 M E Porter, *The Competitive Advantage of Nations*, Macmillan, London, 1990, p. 151.

189 Mr A Newton (Rural Research and Development Corporation Chairs Committee), *Transcript of Evidence*, 23 May 2005, p. 19.

190 Clusters Asia Pacific, *Submission No. 17*, p. 10.

191 Clusters Asia Pacific, *Submission No. 17*, pp. 6-7; Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission No. 32*, p. 14; SIA, *Submission No. 61*, p. 20; Mr A Newton (Rural Research and Development Corporation Chairs Committee), *Transcript of Evidence*, 23 May 2005, p. 19.

192 Clusters Asia Pacific, *Submission No. 17*, p. 10; Queensland Government, *Submission No. 74*, p. 9; Tasmanian Government, *Submission No. 86*, pp. 9-11; Australian Electrical and Electronic Manufacturers' Association, *Submission No. 30*, p. 5; ACT Minister for Economic Development and Business, *Submission No. 85*, p. 1; Sutherland Shire Council, *Submission No. 92*, p. 3.

5.210 In demonstrating the potential benefits of clustering, several submissions provided information on successful international cluster models.¹⁹³ Clusters Asia Pacific argued that:

... if the Australian Government is serious about research collaboration and commercialisation, it should develop a detailed cluster policy.¹⁹⁴

Committee Comment

5.211 The Committee recognises that collaboration between businesses is a crucial factor in supporting and enhancing innovation. Given the collective importance of collaboration to facilitate technology interchanges, skill development and commercialisation outcomes, the Committee considers that there is a definite role for government in ensuring appropriate frameworks and opportunities are in place to maximise a dynamic interconnected system of linkages between businesses.

5.212 The Committee is encouraged by the high levels of participation from a range of industries in developing and implementing Action Agendas.¹⁹⁵ In addition, the Committee welcomes the establishment of AusIndustry's ICIP to encourage the development of collaboration between businesses.

5.213 The Committee also considers that clusters and similar networks are potentially effective mechanisms of establishing linkages and collaborations. However, the Committee notes that a review of the literature on clusters and on the development of Australian clusters concluded:

... clusters cannot easily be artificially 'manufactured' ... Effective clusters are 'natural' clusters, their naturalness only becomes apparent in hindsight, and there are many factors which contribute to their success or failure.

193 Clusters Asia Pacific, *Submission No. 17*, pp. 8-10; Australian Institute for Commercialisation, *Submission No. 29*, pp. 30-31.

194 Clusters Asia Pacific, *Submission No. 17*, p. 3.

195 Department of Industry, Tourism and Resources, accessed 2 March 2006, <industry.gov.au>. As of March 2006 there are 36 Action Agendas at various stages of development and implementation.

However actions by governments, such as strategic investment in research organisations with the necessary critical mass, can help to make clusters sustainable.¹⁹⁶

- 5.214 The Committee also notes evidence to the inquiry that emphasises the role of state/territory and local governments and industry to the development of clusters. Therefore, the Committee considers that state/territory and local governments and industry (via Action Agendas or industry associations) should take the lead in bringing together major focal points of R&D activity and innovation to drive cluster development.
- 5.215 The Committee notes that the New Zealand Government has recently introduced a program to encourage the development of clusters. The Cluster Development Program is administered by New Zealand's trade and economic development agency, New Zealand Trade and Enterprise, which advises:
- This funding is for facilitating clusters with significant growth potential. A total grant of up to \$50 000 (plus GST) is available to contract a cluster facilitator to significantly progress the cluster's development. The funding represents less than 50 per cent of the cost of a facilitator.¹⁹⁷
- 5.216 The Committee has identified the need for a funded cluster development program to encourage the development of clusters in Australia. The Committee recommends that DITR and DEST examine the structure and implementation of New Zealand's initiative to determine whether it can be adapted to suit the Australian context.

Recommendation 12

The Committee recommends that the Australian Government introduce a funded cluster development program to encourage the Australia-wide development of clusters which bring together innovation in research, business and education.

196 Department of Education, Science and Training, *Mapping Australian Science and Innovation: Main Report*, 2003, p. 280.

197 New Zealand Trade and Enterprise, accessed 15 November 2005, <nzte.govt.nz>.