

Business engagement with researchers

- 7.1 Modern manufacturing must be driven by innovation, which often develops from pure research, mostly done by publicly funded research institutions. The main ones are the universities, which receive \$5.8 billion from the Australian Government, and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) which receives \$0.7 billion.¹

CSIRO

- 7.2 CSIRO is Australia's national science agency.² Around \$180 million of its \$1 billion budget is directed towards activities related to manufacturing.³ When it appeared before the committee, CSIRO had six research flagships geared towards issues of national importance.⁴ The Australian Government's 2007 Industry Statement announced a new flagship is being established on Niche Manufacturing, particularly nanotechnology, at a cost of \$36 million over four years from 2007-08.

1 Budgeted amounts for 2007-08. A total of \$0.2 billion is also allocated to fund the Australian Nuclear Science and Technology Organisation and the Australian Institute of Marine Science.

2 One of the world's largest research agencies, CSIRO has assisted the primary and manufacturing sectors since 1926. Its breakthroughs include atomic absorption spectroscopy, biological control of rabbits, gene shears, plastic banknotes and improved contact lenses.

3 Dr R Hill, CSIRO, *Transcript*, 22 March 2007, p. 1.

4 These flagship programmes (Energy Transformed, Food Futures, Light Metals, Preventative Health, Water for a Healthy Country and Wealth from Oceans) are described in CSIRO, *Submission no. 50*, pp. 15-18. New Climate Adaptation and Mining Down Under flagships were also announced in the 2007-08 Budget.

7.3 Most evidence accumulated by the committee was favourable towards the CSIRO's research capability, with the main area for improvement being liaison with companies for the commercialisation of the research.⁵

7.4 Research should be relevant as well as high quality. CSIRO told the committee that the majority of their research agenda is responding to industry requests or needs:

It may not be industry coming to us directly, but our analysis of the market and opportunities and trying to anticipate where the end use will be or the impact. That drives what we do more than people sitting around in a back room with propellers on their heads thinking up great ideas that no-one can use. That may have been a legitimate criticism many years ago, but that has not been the case for many years in the CSIRO.⁶

7.5 Some of CSIRO's research is done directly for private companies and charged accordingly. Other projects are conducted jointly with them.

7.6 Of course, not all CSIRO research is, or should be, at the behest of business. An important part of CSIRO's work is undertaking research which has a longer time scale than that usually held by private companies and on 'areas that the general community and business have not yet identified as important'.⁷ Furthermore, in some cases, CSIRO research conclusions may appear more credible if they are independently funded rather than funded by a company or industry.⁸

7.7 While a minority of witnesses were critical,⁹ the committee heard of many examples of good cooperation between CSIRO, industry and other agencies. For example, Science Industry Australia (SIA) said:

At times CSIRO assistance has been critical in helping SGE [a significant global supplier of chromatography components] learn new technologies. Sometimes this assistance has been in the form of specific development projects and just as importantly at other times has been through informal advice.¹⁰

5 See, for example, Council of Textile and Fashion Industries of Australia Limited, *Submission no. 17*, p. 2. Praise also came from other textile manufacturers, such as the Australian Council of Wool Exporters and Processors, *Submission no. 22*, p. 8; the Geelong Manufacturing Council, *Submission no. 25*, p. 6; and Mr B Manwaring, Bruck Textiles, *Transcript*, 8 February 2007, p. 16.

6 Dr R Hill, CSIRO, *Transcript*, 22 March 2007, p. 3.

7 CSIRO, *Submission no. 50*, p. 13.

8 CSIRO, *Submission no. 50*, p. 12.

9 Dr J Raff, Starpharma, stated 'There is far less collaboration going on now between organisations like CSIRO and the industry than there was', *Transcript*, 15 March 2007, p. 11.

10 Science Industry Australia (SIA), *Submission no. 7*, p. 16.

7.8 Although the majority of evidence suggested CSIRO had good relations with business, there is still more to do. An Australian Bureau of Statistics (ABS) survey showed that only three per cent of innovating businesses collaborate with a 'government agency' (presumably mostly CSIRO).¹¹

7.9 SIA commented:

Yesterday I went to the CSIRO and I found out about something I did not even know they were working on. It was actually going to be very valuable to me, and it was only through a conversation – a general one – that that came up. So that is an example.¹²

7.10 CSIRO itself referred to:

Very strong feedback from industry that in many cases the last thing it needed was more technology. What they wanted was the ability to see how technology could impact upon their business ... They want organisations like the CSIRO to open the doors more to their facilities and ...[show] what they are doing and how they can help We obviously are not communicating well enough.¹³

7.11 The Industry Statement 2007 comments:

Links between businesses and public research organisations can be weak ... in many cases business and research cultures do not fit easily together.¹⁴

7.12 However, a number of groups commented that CSIRO was improving its communication. The National Manufacturing Forum (NMF) pointed out that:

Steps are being taken by CSIRO to improve the way it engages with industry, particularly SMEs [small and medium enterprises], and leverage its extensive international networks to better advantage.¹⁵

7.13 CSIRO's desire to form close links with business was evidenced by;

- an internal audit of their operations in the past 18 months to ensure a more formalised approach to industry involvement.

11 ABS, *Innovation in Australian Business 2005*, Cat. no. 8158.0, p. 28.

12 Dr H Fraval, SIA, *Transcript*, 2 March 2007, p. 6.

13 Dr R Hill, CSIRO, *Transcript*, 22 March 2007, p. 4.

14 *Industry Statement 2007*, p. 20.

15 NMF, 'Strategic actions to boost Australian manufacturing', *Exhibit*, no. 22, p. 25.

- 'roadshows' where industry is invited along for networking;¹⁶
- sector advisory committees which represent, in the case of manufacturing, typically CEOs from the manufacturing industry;
- six 'sector advisory councils', one of which is for manufacturing, chaired by an associate director from the Australian Industry Group.¹⁷
- meetings between the leaders of industry action agendas and CSIRO to explore how CSIRO can become even more heavily engaged;¹⁸ and
- its 'Australian Growth Partnerships' proposal for contingent loans.¹⁹

7.14 The 2007 Industry Statement announced two initiatives to improve liaison. Firstly, one task of the new Australian Industry Productivity Centres will be connecting business with leading technology experts in CSIRO. Secondly, the Intermediary Access Programme will fund services to link up to 150 SMEs with possible technology partners including CSIRO.

7.15 CSIRO have 'spun off' 60 companies in the last ten years, such as Gene Shears²⁰, with a market capitalisation of around \$1.3 billion in early 2007.²¹ In some cases CSIRO staff work with the spin-off company, often on secondment, and sometimes through a services agreement with CSIRO.²²

7.16 Some strong criticism of CSIRO's own commercialisation came from Dr John Raff, deputy chairman, Starpharma, who claimed CSIRO:

Were given a mission to go out there and raise money and do their own commercialisation. As a result, they completely alienated, competed with and did all sorts of things to companies.²³

16 Mr G Redden, CSIRO, *Transcript*, 22 March 2007, p. 9 and CSIRO, *Submission no. 50*, pp. 3-4. Over three-quarters of attendees were more likely to collaborate with CSIRO after attending.

17 CSIRO, *Submission no. 50*, p. 5.

18 Mr G Redden, CSIRO, *Transcript*, 22 March 2007, p. 9.

19 The plan for HECS-like loans was submitted to the House of Representatives Standing Committee on Science and Innovation, who in their June 2006 report, *Pathways to Technological Innovation*, recommended the government give consideration to the proposal.

20 In 1986, CSIRO scientists Jim Haseloff and Wayne Gerlach found that they could create bits of genetic material, called 'hammerhead ribozymes' or 'gene shears' that could selectively cut out bits of unwanted or harmful DNA. These could be used to prevent DNA from a virus producing the protein causing symptoms of diseases. In 1989 Gene Shears Pty Ltd was formed by CSIRO to commercialise the technique. Among potential uses are fighting HIV/AIDS, minimising crop and livestock disease, therapy against genetically inherited diseases, and prevent scarring after angioplasty. Source: Questacon.

21 Dr R Hill, *Transcript*, 22 March 2007, p. 3; The spin-off companies are listed in CSIRO, *Submission no. 50*, pp. 7-9.

22 CSIRO, *Submission no. 50*, p. 19.

23 Dr J Raff, Starpharma, *Transcript*, 15 March 2007, p. 13.

7.17 CSIRO rejected this criticism, stating:

It is not the role of CSIRO to crowd out business, just as it is not CSIRO's role to provide subsidies to business.²⁴

7.18 CSIRO said their motives for undertaking research included commercial viability, intellectual challenge, public importance, match to their capabilities, contribution to Australian industry and accordance with their established priorities.²⁵

7.19 CSIRO's own commercialisation is a minority of the commercialisation of CSIRO research. More often CSIRO will judge that its staff may not be the people with the best business and marketing skills and so commercialisation is mostly done by private companies, perhaps paying CSIRO a royalty or giving them a minority equity stake.

7.20 Furthermore, a lot of CSIRO research is adopted by companies without ever appearing to be formally 'commercialised'. CSIRO explained:

In fact, the majority of our work is involved in what you might call incremental innovation. We do tactical or strategic collaborative work with industry [usually on a 'fee for service' basis] and the outcome is the transfer of that technology, which disappears, if you like, in some senses into the company.²⁶

7.21 It was noted by one witness that 'the CSIRO has good linkages overseas'.²⁷ However, the committee also heard claims that the CSIRO's overseas linkages are *too* close. It was accused of engaging in activity with overseas manufacturers in preference to working with local manufacturers on the basis that the overseas work was more lucrative.²⁸

7.22 CSIRO rejected these claims. While there are many cases where collaboration with overseas companies is in the national interest, CSIRO has an approach whereby:

If we believe that doing business with an offshore company will disadvantage Australian companies, we will decline.²⁹

24 CSIRO, *Submission no. 50*, p. 14.

25 CSIRO, *Submission no. 50*, p. 20.

26 Dr R Hill, CSIRO, *Transcript*, 22 March 2007, p. 3.

27 Mr T Strasser, private capacity, *Transcript*, 29 August 2006, p. 38.

28 Mr B Manwaring, Bruck Textiles, *Transcript*, 8 February 2007, p. 16 and Mr L Black, Melba Industries, *Transcript*, 8 February 2007, p. 17.

29 CSIRO, *Submission no. 50*, p. 21.

Conclusions

- 7.23 The committee commends CSIRO's pure and applied research work which has made a substantial contribution to moving Australian manufacturing towards innovative high-skill manufacturing. In setting research priorities, CSIRO appear to take appropriate notice of the views of business.
- 7.24 While the committee commends CSIRO for the steps it has taken to improve its liaison with business, more needs to be done to ensure Australian firms are able to take full advantage of CSIRO's research.

Recommendation 16

- 7.25 **The committee recommends that CSIRO receive additional funding to employ more staff dedicated to liaising with individual (especially small and medium-sized) businesses, business organisations and the new Australian Industry Productivity Centres. The liaison officers should inform potential partners of relevant work within CSIRO and seek information on possible future CSIRO work that could lead to developing new products and processes useful to Australian manufacturers.**

Universities

- 7.26 Australian universities are a major venue for research. Without downplaying the importance of teaching, the opportunity for research is one of the main attractions of an academic career. While university research covers the whole gamut of intellectual endeavour, many areas have the potential to generate insights that can be harnessed for new manufactured products or improved procedures for manufacturing. And as a UK study pointed out:

Unlike corporate or government-owned research facilities, university laboratories are constantly being refreshed by the arrival of clever new brains.³⁰

- 7.27 The committee heard little criticism of the quality of pure research by Australian universities. The concern was about the work needed to bridge

30 Lambert Review of Business-University Collaboration, *Final Report*, December 2003.

what SIA termed the 'innovation gap' between the pure research done by academics and the product development done by commercial firms.³¹ Similarly, the Australian Electrical and Electronic Manufacturers' Association (AEEMA) emphasised the importance of intermediate stages between research and commercialisation. These include 'product realisation', (identifying how the research could meet a business or consumer need) and 'prototyping' (constructing an example of the product that meets that need). They suggested Japanese electronic manufacturers focused on these stages while:

Australia's greatest weakness in innovation continues to be product realisation.³²

- 7.28 An ABS survey showed that only two per cent of innovating businesses collaborate with a university.³³ But the lack of linkages between business and academia is not just an Australian issue. The OECD have commented that:

Formalising knowledge transfer between universities and industry is of growing importance even in countries where industry-science relations are strong. As a result, a third stream of funding is now being earmarked for knowledge transfer activities at universities.³⁴

- 7.29 The traditional view of universities was that they were filled with unworldly tenured dons, besotted with esoteric pure research, who viewed industry with disinterest, if not disdain. This has obviously changed in recent decades. However views differ about where academics' incentives now do, and should, lie.

- 7.30 Mr Tony Strasser suggested there were inherent conflicts for academics in pursuing more applied work:

Academic tenure is based on publishing and citations. Sometimes that works against the need for secrecy in some elements in order to commercialise intellectual property I have certainly heard of cases where some IP has been lost because it has been put in the public domain and picked up by the first one to market.³⁵

31 SIA, *Submission no. 7*, pp. 2-3.

32 Australian Electrical and Electronic Manufacturers' Association (AEEMA), *Submission no. 19*, p. 8.

33 ABS, *Innovation in Australian Business 2005*, Cat. no. 8158.0, p. 28.

34 OECD *Science, Technology and Industry Outlook 2006*, p. 51.

35 Mr T Strasser, private capacity, *Transcript*, 29 August 2006, p. 42. The Australian Academy of Technological Sciences and Engineering (AATSE) argued that 'the proposed Research Quality Framework Model favours Research Quality over Research Impact and this will have the effect

- 7.31 On the other hand, the committee received some evidence that Australian universities are becoming *too* focused on their own *applied* research (at least partly because of pressure to attract funding from outside government). SIA warns that universities:
- Engage in the commercialisation of their ideas with government support through start-up and spin-off companies. This can act as an impediment to the flow-through of ideas to industry.³⁶
- 7.32 A common view expressed to the committee was that many academics lack business experience.³⁷ This is unlikely to change, and indeed it is right that academics focus their energies on the areas in which they have expertise. Of course, most universities have some academics in business schools with knowledge of project evaluation, marketing and other business skills, but they are busy teaching these skills rather than applying them to the work of their colleagues in the science and engineering faculties.
- 7.33 The gap between ‘town and gown’ is shown by the relatively low level of collaboration between universities and business. It was noted that:
- Only 8% of firms had cooperative arrangements for their innovation activities, and of these about one-third had these arrangements with universities.³⁸
- 7.34 There are cases where universities and industry are trying to bridge the gap between them. The Australian Industry Group told the committee of a project it is conducting on improving the links.³⁹
- 7.35 The Government is also trying to assist, by establishing the Business-Industry-Higher Education Collaboration Council in 2004 and the Collaboration and Structural Reform Fund in 2005. The Australian Industry Productivity Centres foreshadowed in the 2007 Industry Statement will help connect business with academic technology experts.
- 7.36 Better relations might be secured by exchanges of staff, and short-term secondments, between universities and businesses.⁴⁰ Another possible area

of rewarding academics and institutions that pursue academic outcomes over engagement with industry’, as they felt had happened in the UK; *Submission no. 15*, no. 5.

36 SIA, *Submission no. 7*, p. 4.

37 For example, Associate Professor S Barkoczy, private capacity, *Transcript*, 15 March 2007, p. 34. See also the discussion with representatives from SIA, *Transcript*, 2 March 2007, p. 5.

38 AATSE, *Submission no. 15*, p. 3.

39 Dr P Burn, Australian Industry Group, *Transcript*, 29 August 2006, p. 7.

40 AATSE, *Submission no. 15*, no. 4. They suggested that overseas universities seemed to engage in more of this interaction.

for fruitful cooperation between higher education institutions and business is the sharing of specialised equipment.⁴¹

Conclusions

7.37 While the primary focus of university research should remain independent basic research to push out the frontiers of knowledge, there is scope for better cooperation between universities and industry. In some cases this might lead to university researchers doing more applied work with more obvious commercial applications. In some cases they might learn from the experience of TAFEs in working with industry. However, universities should not be placed under funding pressure so that they feel a need to undertake commercial research to fund basic research and teaching.

Recommendation 17

7.38 **The committee urges universities to consider appointing more ‘industry liaison officers’ to facilitate contacts between universities and local industry (including via the new Australian Industry Productivity Centres). They could look for opportunities to share equipment and arrange short-term secondments in both directions.**

Commercial research centres

7.39 The Cooperative Research Centres (CRC) programme was introduced in 1990. It supports applications for partnership arrangements between researchers (mostly universities and CSIRO) and users (mostly private companies) that can commercialise the research. The programme also provides educational opportunities.

7.40 In 2006-07, 57 CRCs were operational, with CSIRO a partner in 49 of them.⁴² On average the Australian government has contributed about a quarter of the funding for CRCs, at a cost in 2005-06 of around \$200 million. As this is actually higher than the contribution by industry, the potential subsidy can be quite high. It is notable that in similar schemes

41 National Manufacturing Forum (NMF), *Exhibit no. 22*, October 2006; Dr J Wells, RMIT University, *Transcript*, 28 August 2006, p. 21.

42 Dr R Hill, CSIRO, *Transcript*, 22 March 2007, p. 4.

in the US and Scandinavia industry is required to contribute at least half of the cost.⁴³

7.41 CRC proposals are currently selected by the CRC committee advised by an expert advisory panel against the following four broad selection criteria:

- outcomes will contribute substantially to Australia's industrial, commercial and economic growth;
- path to adoption will deliver identified outcomes;
- collaboration has the capability to achieve the intended results; and
- funding sought will generate a return and represents good value.

7.42 Each CRC is run by a CEO reporting to a board of directors with a majority representation by research users. Since 2004 CRCs are expected to be incorporated entities producing annual reports.

7.43 The CRC programme shifted in 2004 towards a greater emphasis on industrial and commercial objectives and away from social and environmental research. The Productivity Commission found strong support for a return to the original objectives, on the grounds this was more likely to lead to funding of worthwhile projects that would not otherwise be undertaken.

7.44 Those involved in the programme indicate a high level of satisfaction, although there have so far been few companies 'spun off' from the programme. There are concerns that they are not suitable for SMEs.⁴⁴

7.45 An evaluation by the Allen Consulting Group in 2005 concluded that CRCs provide a good return:

For every \$1 spent by the Commonwealth Government on the CRC Programme, GDP is cumulatively \$0.60 higher than it would have been had that \$1 instead been allocated to general government expenditure.⁴⁵

7.46 The NMF was sympathetic to the concept of CRCs but commented:

43 Information in this and the following paragraph is from Productivity Commission, *Public Support for Science and Innovation*, 2007, pp 441-62. A full list of CRCs operating in 2005-06 is given in the last of these pages, Figure 1, xxviii and pp. 441-62.

44 QMI Solutions noted 'the CRC scheme is particularly prohibitive to SME participation. With long-term (7 year) commitments and big dollar investments CRCs are only attractive to large enterprise'. *Submission no. 10*, p. 1. This view was supported by Dr J Wells, RMIT University, *Transcript*, 28 August 2006, p. 3.

45 Allen Consulting, *The Economic Impact of Cooperative Research Centres in Australia*, 2005, p. vii.

Despite some recognised successes, there are strong indicators that industry support of CRCs is patchy, and that the organisational and management arrangements used in many CRCs fail to maximise the potential of their collaboration. This may be due to a perceived imbalance in the funding for R&D on one hand and commercialisation on the other.⁴⁶

Conclusions

- 7.47 The committee believes that the commercial research centres fulfil a useful role in facilitating collaborative research between companies and research institutions. It notes the concerns expressed about their focus shifting unduly to immediately commercial projects and regards these concerns as worthy of further consideration. It would also be worthwhile examining the scope for a greater involvement by smaller companies in CRCs.

Clusters

- 7.48 A cluster is a geographic concentration of interconnected companies, specialised suppliers, service providers, firms in related industries, training institutions and support organisations within a local area or region. One mark of a successful cluster is that its value as a whole is greater than the sum of its parts.
- 7.49 There are many long-established clusters that have developed and maintained their position because of the availability of some key resource or position.⁴⁷ Some clusters remain in the area where the item produced was first invented.⁴⁸ In the case of some other clusters, there appears no obvious reason for them to develop in a particular location but once established they act as a magnet for skilled people in that industry, and supporting industries, and so remain a prime location.⁴⁹ Sometimes one

46 NMF, 'Strategic actions to boost Australian manufacturing', *Exhibit, no. 22*, p. 28.

47 For example, Sweden developed expertise in speciality steel products due to its iron ore deposits and in timber products due to its forests.

48 For example, over five centuries after Gutenberg invented the printing press, around half the world's printing presses were still being manufactured in central Germany.

49 For example, Hollywood has such a concentration of actors, writers, directors, cinematographers, producers, costume and set designers, lighting specialists and so forth that it remains the leading centre for film production despite relatively high costs.

cluster can give rise to a (seemingly unrelated) cluster.⁵⁰ Recently clusters have developed based on new technologies, often around universities.⁵¹

- 7.50 The importance of such clusters was emphasised to the committee by Professor Mark Dodgson, director of the Technology and Innovation Management Centre, University of Queensland—appearing in a private capacity:

Innovation does not happen in the confines of individual firms; it occurs through the interaction between firms and it is often assisted by labour mobility between those firms.⁵²

- 7.51 The literature suggests clusters can take considerable time to develop but are then long-lasting.⁵³ In some cases, once clusters have emerged, governments have encouraged them by funding more educational facilities and supporting infrastructure. But some attempts by governments to *create* clusters have been less successful.⁵⁴

- 7.52 A reading of the international literature suggests there are no Australian manufacturing clusters of global significance. But this need not always be the case. There are some clusters developing which may grow to world, or at least regional, importance. One of the most promising of which the committee heard is a cluster of scientific instrument manufacturers in Melbourne.⁵⁵ The committee also visited areas with emerging clusters associated with the maritime industry around Fremantle. Around

50 For example, a golf equipment cluster in Carlsbad, southern California emerged because the nearby aerospace cluster created a pool of engineers and casting factories. Basel's success as a cluster for the pharmaceuticals industry partly reflects its former importance in the dye industry.

51 For example, Silicon Valley in California (headquarters to leading IT companies such as Apple, eBay, Google and Yahoo!) and Silicon Fen around Cambridge.

52 Prof M Dodgson, private capacity, *Transcript*, 19 October 2006, p. 13. Greater emphasis on clusters was also recommended by Dr V Beck, Australian Academy of Technological Sciences and Engineering, *Transcript*, 28 August 2006, p. 47; Australian Manufacturing Workers' Union, *Submission no. 34*, p. 23; and Australian Electrical and Electronic Manufacturers' Association, *Submission no. 19*, p. 4. AEEMA noted that the action agenda for the electronics industry refers to 'industry collaboration through clusters to address the high level of industry fragmentation'. The OECD comment that 'innovation is often found in geographically based clusters of firms, universities and public research organisations which bring together producers and users, learners and teachers'; *OECD Science, Technology and Industry Outlook 2006*, p. 75.

53 M Porter, 'Clusters and the new economics of competition', *Harvard Business Review*, November 1998.

54 Michael Porter, the Harvard academic regarded as the leading writer on clusters, concludes 'government policy will be far more likely to succeed in reinforcing an existing or nascent cluster than in trying to promote an entirely new one, however tempting that might be for national prestige', *The Competitive Advantage of Nations*, Free Press, New York, 1990, p. 655.

55 SIA, *Submission no. 7*, p. 15.

Newcastle the committee heard of the HunterNET engineering cluster and a defence industry cluster and The Geelong Manufacturing Council described a carpet manufacturing cluster in their region.⁵⁶

- 7.53 There would appear to be substantial scope for further development of clusters within Australia. For example, there are an increasing number of businesses located around north-west Sydney, but they appear to have relatively little interaction with the nearby Macquarie University.⁵⁷

Conclusions

- 7.54 Geographic clusters of companies in related businesses are more likely to become internationally competitive than companies operating in isolation. It is unlikely a government alone could develop a cluster from scratch, but industry programmes could usefully build on existing clusters of expertise.
- 7.55 Clusters may help to facilitate participation in global supply chains. This has proven successful in countries such as Ireland (Galway's IT cluster) and the US (Silicon Valley and Route 128, both IT clusters). Invest Australia and the Australian Industry Productivity Centres could encourage potential foreign investors to link up with research organisations and join industry networks in the region (such as HunterNet) to facilitate the development of clusters. It is important that attracting foreign investment per se is not the ultimate goal but ensuring that it is integrated into the Australian manufacturing sector in a way which brings maximum benefit.
- 7.56 The CRCs discussed above could be the basis for clusters to develop as they already bring together industry and research institutions. Regional universities could specialise in research in areas in which local firms are involved. The Industry Capability Network could also play a role.

56 Mr D Peart, Geelong Manufacturing Council, *Transcript*, 28 August 2006, p. 51.

57 Professor R Green, private capacity, *Transcript*, 14 November, p. 17.

