

## Commonwealth government support for R&D

- 3.1 This chapter provides information about the Commonwealth government's expenditure on science and innovation, its expenditure on R&D by portfolio areas (and the major research agencies within those portfolios), the general nature of government sector expenditure (both Commonwealth and the states) and the key Commonwealth programs designed to influence R&D.

### Commonwealth government expenditure on science and innovation

- 3.2 The Commonwealth government's Budget for 2003-04 indicates that expenditure on science and innovation is expected to amount to \$5,426 million, made up of the following components:<sup>1</sup>
- \$1,372 million to be expended by the major Commonwealth research agencies;
  - \$890 million to be expended on science and technology support (including expenditure by the National Health and Medical Research Council and the Cooperative Research Centres);

---

1 The Hon Dr Brendan Nelson MP (Minister for Education, Science and Training), media release, 13 May 2003, *Science and Innovation*, Table 1 *Summary of Major Commonwealth Support for Science and Innovation through the Budget and Other Appropriations*; and Table 2 *Major Commonwealth Research Agencies, Budget Expenditures*.

- \$1,006 million on innovation support, which includes expenditure on the R&D tax concessions and the R&D START program; and
- \$2,158 million on higher education research (see Table 3.1 below).

Table 3.1: Summary of major Commonwealth support for science and innovation (\$m), 2003-04

<b>MAJOR COMMONWEALTH RESEARCH AGENCIES</b>	<b>\$M</b>
Defence Science and Technology Organisation (DSTO)	355
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	568
Other R&D agencies	449
<b>Sub-total</b>	<b>1372</b>
<b>SCIENCE AND TECHNOLOGY SUPPORT</b>	
NH&MRC and other health	378
Cooperative Research Centres	202
Rural	202
Energy and environment	63
Other science support	43
<b>Sub-total</b>	<b>890</b>
<b>INNOVATION SUPPORT</b>	
IR&D tax concession	484
R&D START	162
Other innovation support	354
<b>Sub-total</b>	<b>1006</b>
<b>HIGHER EDUCATION RESEARCH</b>	
Australian Research Council (ARC)	414
Other R&D support	1744
<b>Sub-total</b>	<b>2158</b>
<b>TOTAL COMMONWEALTH SUPPORT</b>	<b>5426</b>
%GDP	0.68

*Source:* Commonwealth Government Budget 2003-04, *Science and Innovation*, Table 1

3.3 It was noted in chapter 2 that Australia has a relatively high ratio of public sector R&D expenditure to GDP (see Table 2.1). The Commonwealth Department of Education, Science and Training told the committee that:

Commonwealth government financing of R&D [in 2000-01] reached an all-time high of \$3.9 billion—an increase of 13% over 1998-99.<sup>2</sup>

2 Commonwealth Department of Education, Science and Training, Submission No. 64, p. 2.

3.4 The information in Table 3.1 shows that Commonwealth expenditure in 2003-04 will increase even further, to \$5.4 billion.

3.5 Both the Industry Commission and its successor body (the Productivity Commission) found that the level of Commonwealth government support for R&D is high in international terms:

Whilst the level of direct support by Government through grants or loans is low by international standards it provides one of the highest overall levels of support when both direct and indirect support, through tax credits and concessions, is considered. Next to Canada, Australia provides one of the highest levels of support for non-defence business R&D.<sup>3</sup>

When all forms of assistance were accounted for, business R&D appeared to be more highly supported in Australia than in most other countries.<sup>4</sup>

Subsidy rates for R&D in Australia are generally comparable or more generous than those overseas, particularly when you look more closely at what looks like a beaut program overseas and you discover that it is quite selective in its application and so on.<sup>5</sup>

### **Expenditure on R&D by Commonwealth government research agencies**

3.6 The 2003-04 Budget shows anticipated expenditure of \$1,372 million on R&D by Commonwealth government research agencies, broadly distributed as follows:

- \$813 million (59% of the total) to be expended by research agencies within the Education, Science and Training portfolio;
- \$355 million (26% of the total) to be expended in the Defence portfolio;
- \$102 million (7%) to be expended within the Environment and Heritage portfolio; and
- \$96 million (7%) to be expended in the Industry, Tourism and Resources portfolio.

---

3 Industry Commission, *Report of Research and Development*, Canberra, 1995, quoted in Submission No. 50 (Australian Research Council), p. 8.

4 Productivity Commission, *Trade & Assistance Review 1999-2000*, p. 73.

5 Mr Gary Banks (Productivity Commission), Transcript, p. 481.

- 3.7 Table 3.2 shows this information in greater detail (by research agency within each portfolio area). Three agencies are collectively responsible for over 80% of the R&D expenditure of Commonwealth research agencies—they are the Commonwealth Scientific, Industrial and Research Organisation (CSIRO), the Defence Science and Technology Organisation (DSTO) and the Australian Nuclear Science and Technology Organisation (ANSTO).

Table 3.2: Commonwealth Budget outlays on R&D, by major research agencies, 2003-04

<b>AGRICULTURE, FISHERIES AND FORESTRY</b>	<b>\$M</b>
Australian Animal Health Laboratory	6
<b>DEFENCE</b>	
Defence Science and Technology Organisation	355
<b>EDUCATION, SCIENCE AND TRAINING</b>	
CSIRO	568
Australian Nuclear Science and Technology Organisation	219
Australian Institute of Marine Science	22
Anglo-Australian Telescope	4
<b>ENVIRONMENT AND HERITAGE</b>	
Antarctic Division	85
Bureau of Meteorology Research Centre	10
Environmental Research Institute of the Supervising Scientist	7
<b>INDUSTRY, TOURISM AND RESOURCES</b>	
Geoscience Australia	96
<b>TOTAL</b>	<b>1372</b>

*Source:* Commonwealth Government Budget 2003-04, *Science and Innovation*, Table 2.

## The general nature of government sector expenditure (both Commonwealth and the states), by sectors of the economy

- 3.8 The ABS figures on government sector R&D expenditure omit government expenditure on the business and higher education sectors—it therefore excludes Commonwealth government expenditure on higher education and on business R&D which, as shown in Table 3.1, is significant.<sup>6</sup>

6 Australian Bureau of Statistics (ABS), *Research and Experimental Development: Government and Private Non-profit Organisations 2000-01*, Cat. No. 8109.0, July 2002, Explanatory Notes p. 38: 'Public sector organisations mainly engaged in higher education (for example universities) are included in the Higher Education sector whilst those mainly engaged in trading or financial activities are included in the Business Enterprise sector'. The ABS adds that the figure for the Government sector excludes local government organisations 'as it is considered their contribution to total R&D activity would be minimal' (*ibid.*, p. 37).

3.9 Table 3.3 shows this sectoral expenditure for selected years: 1994-95, 1996-97, 1998-99, and 2000-01 (the most recent year for which ABS figures are available). The Table shows that all sectors of the economy are increasing their R&D expenditure. In volume terms, government expenditure on R&D in 2000-01 was 7% up on 1998-99, with the ABS finding that:

R&D expenditure by *Commonwealth* government organisations rose by \$218 million or 18%, while *state/territory* government organisations increased their R&D expenditure by \$81 million or 9%.<sup>7</sup>

Table 3.3: Gross expenditure on R&D [GERD] in Australia in recent years (\$m), by sectors

Sector	1994-95	1996-97	1998-99	2000-01
Business	3508.3	4234.7	4091.2	4825.3
<b>Government</b>				
-Commonwealth	1193.3	1266.6	1207.1	1428.8
-State/territory	782.8	797.7	862.8	943.6
<b>- Govt. total</b>	<b>1976.1</b>	<b>2064.3</b>	<b>2069.9</b>	<b>2372.4</b>
Higher education	1829.6	2307.6	2555.1	2774.6
Private non-profit	152.7	185.8	220.1	283.2
<b>Total</b>	<b>7466.7</b>	<b>8792.4</b>	<b>8936.4</b>	<b>10,251.4</b>

*Source:* ABS, *Research and Experimental Development, All Sector Summary, Australia 2000-01*, Cat. No. 8112.0, July 2002, p. 1.

3.10 The ABS found that the fields of research in which most government R&D expenditure took place were:

Agricultural sciences (\$664 million, or 32%), Biological sciences (\$255 million, or 12%), Earth sciences (\$207 million, or 10%), Medical and health sciences (\$189 million, or 9%), Applied sciences and technologies (\$188 million, or 9%) and General engineering (\$181 million, or 9%)...

[In terms of socioeconomic objectives] most government sector R&D expenditure (\$1,139 million or 55%) was directed toward Economic development. Of this, \$353 million (31%) was directed towards Plant production and primary products, \$237 million (21%) towards Animal production and primary products and \$237 million (21%) towards manufacturing. About 21% was directed towards

<sup>7</sup> *Newsletters: Science and Technology Statistics Update*, ABS Bulletin No. 7, December 2002, p. 7 (emphasis added).

Environment, 11% towards Society, 10% towards Defence, and 3% to Advancement of knowledge.<sup>8</sup>

## The key Commonwealth programs influencing business R&D

- 3.11 A major expansion of the Commonwealth government's R&D programs was announced in January 2001 with the release of the program called *Backing Australia's Ability*, which was the outcome of the National Innovation Summit, held in February 2000, and the Chief Scientist's report, *The Chance to Change*, issued in November 2000.<sup>9</sup>
- 3.12 *Backing Australia's Ability* reflected the Commonwealth government's view that:
- ... investment in science and innovation is an investment in Australia's economic and social prosperity. New knowledge and new ways of doing science enables us to push the boundary of what is possible with our resources and help build solutions to issues in areas such as health, the environment and industrial development.<sup>10</sup>
- 3.13 The most significant R&D support programs are described in the following section, with specific programs identified by bold text where they first appear.

## Programs to promote awareness of R&D support measures

- 3.14 Under the government's Online Strategy, a **Business Entry Point** (BEP) has been established to facilitate industry access to information about government support. It provides:
- ... a consolidated point of online access for business at all levels and areas of government through its website; facilitates the take-up of e-commerce by Australian businesses and the Government's agencies; enables transactions online; and reduces the compliance burden for businesses.<sup>11</sup>

---

8 Australian Bureau of Statistics (ABS), *Year Book Australia 2002 -Science and Innovation, R&D expenditure, General government sector*, Cat. No. 1301.0, pp. 1-2.

9 *Backing Australia's Ability*, Commonwealth Government 2001, p. 2.

10 Prime Minister The Hon John Howard MP, Address to the Committee for Economic Development of Australia, 20 November 2002.

11 Commonwealth Department of Industry, Tourism and Resources, Submission No. 38, p. 20.

3.15 As a complement to BEP, Industry Online includes the Department of Industry, Tourism and Resources (DITR) and AusIndustry Internet sites and the AusIndustry hotline. This provides businesses with access to accurate up-to-date information on policy and programs administered by DITR, and information about the Government and its work.<sup>12</sup> In addition, AusIndustry has taken specific steps to improve knowledge of the government programs in regional and rural Australia:

A year ago we set up 14 one-person offices in regional centres around Australia, with the explicit aim of increasing awareness and accessibility. That initiative seems to be going very well.<sup>13</sup>

### Programs to promote awareness of innovation

3.16 *Backing Australia's Ability* established a **National Innovation Awareness Program** (with \$35 million funding) 'to raise understanding of the importance and commercial potential of science and technology.' The program is administered by DITR and the Commonwealth Department of Education, Science and Training (DEST).<sup>14</sup>

3.17 The **Innovation Access Program - Industry** commenced in June 2001 and assists industry to innovate more readily by increasing access by Australian researchers and firms to global research and technologies. DITR gave as an example:

... the recently announced InnovationXchange, established by the Australian Industry Group, with the support of the Program, [which] will assist Australian industry to access information from around Australia and overseas on the latest research and innovations in both hard and soft technologies, education and training resources, commercialisation resources and Government programs.<sup>15</sup>

---

12 *ibid.*

13 Mr Drew Clarke (Industry, Research and Development Board), Transcript, p. 495.

14 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

15 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 20.

3.18 Another aspect of the Innovation Access Program is the **Technology Advisory Service (TAS)**, which:

... will provide practical access to technology for day-to-day and short-term problem solving to all small and medium enterprises.<sup>16</sup>

3.19 Also, the Commonwealth government has joined the governments of New South Wales, Victoria, Queensland, South Australia, and the Australian Capital Territory in the **National Australian Technology Showcase (ATS)** which is:

... a national and international campaign designed to promote leading-edge Australian technology and the skills of the companies that produce them.<sup>17</sup>

### **Programs to encourage innovation in particular industry sectors**

3.20 The Commonwealth Department of Industry, Tourism and Resources (DITR) stated that:

Finding competitive advantage may rely increasingly on collaborative processes, through market-led networks, clusters and other linkages which industry can foster. **Action Agendas** are industry-driven, and aim to position specific industry sectors to realize the opportunities of international markets and new technologies, overcome impediments and barriers, and encourage sustainable economic development and national growth.<sup>18</sup>

3.21 The **Automotive Competitiveness and Investment Scheme (ACIS)** encourages firms to conduct R&D in Australia through a 45% allowance on expenditure and 'there are also generous allowances for plant and equipment acquired for R&D'.<sup>19</sup> The ACIS program commenced in January 2001 and provides 'import duty credits to registered automotive industry participants on a quarterly basis'—it is estimated to cost \$586 million in 2002-03.<sup>20</sup>

---

16 *ibid.*

17 AusIndustry, *Summary of AusIndustry Products*, 5 February 2003.

18 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 20.

19 *ibid.*, p. 17.

20 AusIndustry, *Summary of AusIndustry Products*, 5 February 2003.



- 3.22 The **Pharmaceuticals Industry Investment Program (PIIP)**:  
... partially compensates participating manufacturers for the reduced prices they receive under the Pharmaceutical Benefits Scheme, in return for their commitment to undertake activities, such as R&D, in Australia.<sup>21</sup>
- 3.23 The **Textile, Clothing and Footwear Strategic Investment Program** 'encourages the industry to invest and innovate to enhance its competitiveness'.<sup>22</sup>
- 3.24 The **Shipbuilding Innovation Scheme**:  
... is aimed at encouraging the development of an internationally competitive shipbuilding industry in Australia [and] pays a benefit of 50% of eligible R&D capped at 2% of eligible construction costs.<sup>23</sup>
- 3.25 The **Biotechnology Innovation Fund (BIF)** program commenced in May 2001 and its funding was doubled in *Backing Australia's Ability* to \$16 million for 2002-2003.<sup>24</sup> The program is administered by the Industry, Research and Development Board (IRDB) which stated that the program:  
... builds on Australia's competitive strengths in biotechnology by providing support at the critical "proof of concept" stage of development. Attracting capital to fund this stage of an innovation in this sector, because of the long commercialisation lead times, can be difficult and is often a substantial impediment to realising the commercial potential of an innovation... 94 projects are being supported to the tune of \$21.2 million.<sup>25</sup>
- 3.26 The IRDB stated that the BIF program:  
... fits in very nicely where the market failure was perceived to be: how does a start-up biotech actually get itself to the level where it might attract investment?... [The BIF program] is an example of a very targeted merit program that plugs a current hole in the marketplace.<sup>26</sup>

---

21 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*

22 *ibid.*

23 *ibid.*

24 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9. Also AusIndustry, *Summary of AusIndustry Products*, 5 February 2003.

25 Industry, Research and Development Board, Submission No. 66, p. 3.

26 Mr Drew Clarke (Industry, Research and Development Board), Transcript, p. 502.

## Programs to promote R&D through tax concessions

- 3.27 *Backing Australia's Ability* established a **175% Tax Concession Premium** for additional R&D and **R&D Tax Rebate** for small companies. These supplement the ongoing **125% R&D Tax Concession** (administered jointly by the IRDB within DITR, and by the Australian Tax Office).<sup>27</sup>
- 3.28 The R&D Tax Concession (which was first introduced in 1985) 'is the government's principal initiative to increase the amount' of BERD.<sup>28</sup> It is 'a broad-based, market driven incentive that supports much of the industrial R&D in Australia'<sup>29</sup> and:
- ... allows companies incorporated in Australia, public trading trusts and partnerships of eligible companies, to deduct up to 125% of eligible expenditure on R&D activities when lodging their corporate tax returns... To attract the tax concession deduction, annual eligible R&D expenditure must exceed \$20,000. Where R&D is contracted to either an approved Registered Research Agency or a Cooperative Research Centre (CRC) this expenditure threshold is waived.<sup>30</sup>
- 3.29 The IRDB stated that 'at 30 June 2002, 3,565 companies were registered for the tax concession for the 2000-01 financial year with reported R&D expenditure totalling \$5.2 billion'.<sup>31</sup> The new measures introduced in 2001-02 included the following:
- a 175% Premium (Incremental) Tax Concession for additional investment in R&D. By December 2002, 67 companies had registered for the premium, involving \$49 million of R&D.<sup>32</sup> A company is eligible 'to receive the 175% Premium Tax Concession, for labour costs associated with R&D, if its ratio of R&D spending to turnover exceeds the average of the previous three years';<sup>33</sup>

---

27 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

28 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 15.

29 Industry, Research and Development Board, *op.cit.*, p. 4.

30 ABS, *Year Book Australia 2002 – Science and Innovation*, Department of Industry, Science and Resources, Cat No. 1301.0, p. 1.

31 Industry, Research and Development Board, *op.cit.*

32 Dr Laurie Hammond (Industry, Research and Development Board), Transcript, p. 500.

33 Council for Knowledge, Innovation, Science and Engineering, Victoria, Submission No. 29, Attachment B, p. 5.

- the R&D Tax Offset is available 'for small innovative companies, particularly those in tax-loss, to enable them to 'cash out' their R&D tax deductions'.<sup>34</sup> It is available:
  - ... to all companies with an annual turnover of less than \$5 million who spend up to \$1 million per annum on R&D. These small companies... [are] eligible to receive a rebate equivalent to the value of the R&D Tax Concession. The government expects up to 1,300 companies [to] take advantage of the rebate, claiming around \$13 million associated with R&D expenditure of around \$30 million;<sup>35</sup>
- 'A new R&D plant/asset depreciation regime that allows a 125% deduction for effective life depreciation of assets used in R&D activities on a pro-rata basis'; and
- 'new requirements for R&D Plans... [marking] an important step in reinforcing the need for companies to think strategically about their R&D activities'.<sup>36</sup>

### Grant programs to specifically encourage R&D

- 3.30 Grant programs to specifically encourage R&D include START, the Cooperative Research Centres (CRC) program, and the Australian Research Council's Strategic Partnerships with Industry Research and Training (SPIRT) Grants.<sup>37</sup> The latter two programs are separately described in this chapter.
- 3.31 The **START** program commenced in 1996 and is administered by the IRDB. It 'provides grants and loans to complement business expenditure for R&D'.<sup>38</sup> It encourages early stage companies. It is 'a merit-based program designed to assist Australian industry to undertake R&D and its commercialisation through a range of grants and loans'.<sup>39</sup> *Backing Australia's Ability* provided \$535 million additional funding for START.<sup>40</sup>

---

34 Industry, Research and Development Board, Submission No. 66, p. 4.

35 Council for Knowledge, Innovation, Science and Engineering, Victoria, *op.cit.*, p. 5.

36 Industry, Research and Development Board, *op.cit.*

37 Council for Knowledge, Innovation, Science and Engineering, Victoria, Submission No. 29, Attachment B, p. 3: 'Both Programs encourage collaborative research, the former effectively subsidising research performed on behalf of industry participants or firms contracting the Centres to undertake specific projects, the latter assisting in funding university research in collaboration with industry partners.'

38 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 16.

39 Information obtained from the web site of AusIndustry:  
[www.ausindustry.gov.au/content/azindex.cfm](http://www.ausindustry.gov.au/content/azindex.cfm), accessed on 20 February 2003.

40 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

3.32 The key features of START are:

- it is an appropriate complement to the R&D Tax Concession program;<sup>41</sup>
- all of the START programs are taxable;<sup>42</sup>
- the program is generic and competitive and is capped at \$180 million per annum;<sup>43</sup> and
- grants of up to \$15 million are available, although they typically range between \$50,000 and \$5 million.<sup>44</sup>

3.33 START is intended to run to 2006. Over the last five years, it has provided assistance to about 1,000 companies. The IRDB stated that:

... interest in the program has accelerated significantly with the Board approving 374 grants to the value of \$357.5 million in financial years 2000/01 and 2001/02... [Further,] 65% of projects have been successfully completed and only 5% of projects have failed to be completed.<sup>45</sup>

3.34 The START program comprises:

- **Core START**, for companies with turnover under \$50 million per annum. Funding is provided 'on a matching basis and assessed against the strategic value and level of risk to the firm, together with the likely spill-over benefits of the R&D';<sup>46</sup>
- **START Plus**, for companies with turnover over \$50 million per annum [assessed similarly to Core START];
- **START Premium**, providing further assistance for high quality projects.<sup>47</sup> These are 'strategic, high-risk projects involving large companies/consortia, and repayable as a royalty if the project proceeds'. Also, there are:

... concessional loans for companies employing under 100 to commercialise innovation—the scheme provides 50% of the project costs with interest waived

---

41 Industry, Research and Development Board, *op.cit.*, p. 2.

42 Council for Knowledge, Innovation, Science and Engineering, Victoria, *op.cit.*

43 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 16.

44 ABS, *Year Book Australia 2002 – Science and Innovation*, Department of Industry, Science and Resources, *op. cit.*, p. 2.

45 Industry, Research and Development Board, *op.cit.*

46 Council for Knowledge, Innovation, Science and Engineering, Victoria, *op.cit.*, p. 3.

47 *ibid.*

in the first three years and then charged at 40% of the Commonwealth Bank Index Rate;<sup>48</sup>

- **START Graduate**, to help companies with turnover under \$50 million employ a graduate on a R&D project [in collaboration with research institutions]; and
- **Concessional Loans**, for small companies with less than 100 employees.<sup>49</sup>

### Pre-seed programs

3.35 *Backing Australia's Ability* provided a **PreSeed Fund** (administered by DITR) to assist in commercialising research from universities and public sector research agencies.<sup>50</sup> The Fund commenced in 2001 and 'is a ten year, equity-based program'.<sup>51</sup> It 'establishes venture capital funds to invest in projects or companies spinning out from universities or Commonwealth public sector research agencies. The funds will be managed by private sector venture capital fund managers'.<sup>52</sup> The Commonwealth government is contributing \$72.7 million over ten years 'to a total pool of over \$100 million... [to be] managed by four fund managers'.<sup>53</sup> The funds 'will invest up to \$1 million in each selected project or company'.<sup>54</sup>

### Programs to help firms get their products to the market place

3.36 Programs that help firms get their products to the market place include **Commercialising Emerging Technologies** (COMET) and **Building on IT Strengths** (BITS).

#### Commercialising Emerging Technologies (COMET)

3.37 *Backing Australia's Ability* included a provision to double the funding for the COMET Program (which is administered by DITR) to help firms get their products to the market place.<sup>55</sup> The program is 'largely centred around mentoring as it is delivered by private sector Business Advisers located around Australia'.<sup>56</sup> The program commenced in

48 *ibid.*

49 ABS, *Year Book Australia 2002*.

50 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

51 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 16.

52 Industry, Research and Development Board, *op.cit.*, p. 5.

53 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*

54 *ibid.*

55 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

56 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*

1999 and runs until June 2005. It began as a \$30 million three-year initiative and was extended in 2001 by a further \$40 million.

3.38 COMET is 'targeted at small, start up companies trying to commercialise innovative technologies'<sup>57</sup> and:

... offers a tailored package of support for such things as business planning, market research and intellectual property strategies, to improve the potential for successful commercialisation.<sup>58</sup>

3.39 To date, the program has achieved:

... capital raisings of nearly \$100 million; 104 COMET customers have either commenced manufacture or launched their product onto the market; 23 have entered into licence agreements; 81 have formed strategic or joint venture alliances; and 82 have entered commercial agreements for the distribution, manufacturing or market release of their product.<sup>59</sup>

3.40 The IRDB stated that COMET:

... is sometimes perceived in the market as a granting program that comes with a bit of advice. I think it is better characterised as an advice and support program that comes with a bit of granting. An applicant for COMET has certain criteria in terms of being a start-up company. If they are successful in getting into the program—[and] it is highly competitive—they get a business adviser assigned to them... [to encourage efforts] to make them an attractive prospect for further investment.<sup>60</sup>

### **Building on Information Technology Strengths (BITS)**

3.41 The \$158 million **BITS** program, administered by the Commonwealth Department of Communications, Information Technology and the Arts (DCITA), provides support to ICT start-up companies including through business incubation centres.<sup>61</sup> The BITS Incubator Program aims:

---

57 Industry, Research and Development Board, *op.cit.*, p. 2.

58 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 16.

59 Industry, Research and Development Board, *op.cit.*, pp. 2-3.

60 Mr Drew Clarke (Industry, Research and Development Board), Transcript, p. 497.

61 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

... to improve the rate of commercialisation of ICT ideas and R&D by establishing incubators to increase the success rate of new business formation in the Australian ICT industries sector. The funding allows incubator managers to assist incubates at a critical stage of their development when they may not be well served by venture capital markets.<sup>62</sup>

- 3.42 Incubators can provide up to \$450,000 in assistance to start-up companies through services, seed funding or a combination of both. Up to mid-2002, 158 companies were accepted for incubation and 31 companies have 'graduated' from the program.<sup>63</sup>

### Programs to encourage venture capital

- 3.43 *Backing Australia's Ability* provided support for venture capital through the **Pooled Development Funds** and **Innovation Investment Funds**.<sup>64</sup>

#### Pooled Development Funds (PDF) Program

- 3.44 The PDF program was established in 1992 and its object was amended in 1999 'to develop, and demonstrate the potential of, the market for providing patient equity capital (including venture capital) to SMEs'.<sup>65</sup> PDFs are private companies:

... that raise capital from investors and use it to take equity in Australian SMEs. In return, PDFs and their shareholders are taxed at a lower rate on income generated through PDF activities.<sup>66</sup>

- 3.45 The program is administered by the PDF Registration Board. The estimated total customer base in 2002- 2003 is 130 companies, and the Commonwealth's contribution is estimated to be \$5 million:

Since its inception, registered PDFs have invested over \$550 million in Australian companies. During 2001-02, PDFs provided over \$81 million to assist Australian companies to grow.<sup>67</sup>

---

62 Commonwealth Department of Education, Science and Training, *BITS Incubator Program, Annual Report 2001-02*, p. 3.

63 *ibid.*, p. 2.

64 Commonwealth Department of Education, Science and Training, Submission No. 64, pp. 8-9.

65 *Pooled Development Funds Registration Board Annual Report 2001-2002*, Canberra, 2002, p. 6.

66 *ibid.*, p. 3.

67 *AusIndustry Products Summary*, available online at: [www.ausindustry.gov.au](http://www.ausindustry.gov.au), accessed on 26 May 2003.

## Innovation Investment Fund (IIF) Program

- 3.46 The IIF program commenced in 1998 and is administered by the IRDB. It was established:

... to promote the development of an Australian venture capital market for early stage, technology-based companies. The Commonwealth, in partnership with the private sector, establishes venture capital funds to invest in small technology-based companies.<sup>68</sup>

[The IIF program] has two prongs. The companies that get the investment clearly are immediate beneficiaries but the broader objective is about demonstrating to the venture capital market that early-stage assets are a class worth entering. One of the performance indicators for IIF is other venture capitalists emerging in the same space without the need for the Commonwealth funds to go through.<sup>69</sup>

- 3.47 The Department of Industry, Tourism and Resources (DITR) noted that:

... the government has licensed nine private sector capital funds as IIF funds to support the provision of early stage capital to new technology based firms. In total, the program is providing \$358.4 million of early stage capital, of which the Commonwealth is contributing \$220.7 million and the private sector \$137.7 million.<sup>70</sup>

[To date] \$138.9 million has been invested in 55 companies. Of this total, \$34.5 million was invested in 31 companies during financial year 2001-02. The Commonwealth Government contributed \$22 million towards these investments.<sup>71</sup>

- 3.48 In the 2001-02 financial year IIF program investments were made in the following sectors:

\$5.1 million in five companies in the internet sector;  
\$10.0 million in eight companies in the information technology (IT)/software, telecommunications sector;  
\$15.4 million in 14 companies in biosciences; and \$4.0 million

---

68 Industry, Research and Development Board, *op.cit.*, p. 4.

69 Mr Drew Clarke (Industry, Research and Development Board), Transcript, p. 502.

70 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 16.

71 Industry, Research and Development Board, *op.cit.*, p. 4.



in four companies in other industries including environment, engineering and building materials.<sup>72</sup>

- 3.49 The **Renewable Energy Equity Fund (REEF)** program provides venture capital and managerial advice for small, innovative renewable energy companies. In return for the provision of capital, the fund manager acquires a part-ownership of the company and usually a seat on the Board of Directors.<sup>73</sup>
- 3.50 The program is administered by the IRDB (on behalf of the Australian Greenhouse Office) and is:
- ... a specialist renewable energy venture capital fund modelled on the Innovation Investment Fund program. There are five investee companies in the REEF program representing investments totalling \$6 million.<sup>74</sup>

### Programs to foster collaboration between publicly funded research institutions and private industry

- 3.51 Programs to foster collaboration between publicly funded research institutions and private industry include the **Cooperative Research Centres Program**, the **Major National Research Facilities Program**, and the **Centres of Excellence Program**.

#### Cooperative Research Centres (CRC) program

- 3.52 The CRC program was launched in May 1990 to:
- ... bring together researchers and research users from universities, the public sector and business. They undertake long-term, collaborative R&D ventures of substantial quality and size that contribute to national objectives.<sup>75</sup>
- 3.53 *Backing Australia's Ability* provided \$227 million in additional funding for the CRC program (administered by DEST) over three years from 2003-04 to 2005-06.<sup>76</sup> In July 2001, there were 64 established CRCs;<sup>77</sup> however, this number increased to 75 in the recent selection round.<sup>78</sup> Each CRC is funded for seven years and the CRCs cover the

---

72 *ibid.*

73 Information obtained from the web site of AusIndustry: [www.ausindustry.gov.au/content/azindex.cfm](http://www.ausindustry.gov.au/content/azindex.cfm), accessed on 20 February 2003.

74 Industry, Research and Development Board, *op.cit.*, p. 5.

75 Cooperative Research Centres Committee, Exhibit No. 8, *2002 CRC Compendium*, p. vii.

76 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

77 Department of Agriculture, Fisheries and Forestry, Australia, Submission No. 76, p. 9.

78 *Australian R&D Review*, December 2002, p. 5.

environment (winning \$145 million or 30% of the total \$478 million allocated), agricultural and rural based manufacturing (winning \$122 million or 26% of the total), medical science and technology (winning \$81 million or 17% of the total), mining and energy (winning \$68 million or 14% of the total), information and communication technology (winning \$46 million or 10% of the total), and manufacturing technology (winning \$15 million or 3% of the total).<sup>79</sup>

### Major National Research Facilities program

3.54 The Department of Education, Science and Training outlined the purpose and nature of this program in the following way:

Some forms of R&D can only be conducted using large facilities and in some cases government-sponsored arrangements are required to provide infrastructure that can be shared between firms, and between basic research and commercial uses. The **Major National Research Facilities** (MNRF) program is an example of a mechanism to address this type of impediment. The MNRF program is funded through *Backing Australia's Ability* and is providing \$155 million to support 15 leading-edge facilities. Other major facilities are supported through the CSIRO and the Australian Nuclear Science and Technology Organisation.<sup>80</sup>

### Centres of Excellence

3.55 The Department of Education, Science and Training stated that *Backing Australia's Ability* also provides \$176 million to establish World Class Centres of Excellence in Biotechnology [administered by DITR and the ARC] and Information and Communications Technology [administered by DCITA and the ARC], with strong industry participation.<sup>81</sup> The eight Centres of Excellence will receive ARC funds of \$90 million over five years.<sup>82</sup>

### Research and Development Corporations (RDCs)

3.56 While not specifically designed as a program to foster collaboration between public research institutions and private industry, the RDC framework is:

---

79 *ibid.*

80 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9. (emphasis added).

81 *ibid.*

82 *Australian R&D Review, op.cit.*, p. 6.

... one of the longest-standing and most successful government commitments to innovation in any industry and has also been recognised as world's best practice.<sup>83</sup>

- 3.57 There are currently 14 RDCs, which invested a total of \$360 million on R&D in 2001-02, 56% (\$200 million) of which was spent in public research institutions and 26% (\$94.5 million) in private sector organisations.<sup>84</sup>

### Skills programs

- 3.58 To improve the quantity and quality of graduate scientists, especially the likely skill requirements in key innovation areas, *Backing Australia's Ability*:

... provided \$151 million to create an additional 2000 university places each year – with priority given to ICT, mathematics and science. This will rise to 5470 places by 2005. This initiative strengthens our national skills base while meeting employers' needs for high calibre graduates in these fields.

The government is also providing universities \$25 million over three years from 2000-01 for the Science Lectureship initiative, a competitive grants scheme to assist universities or consortia of institutions, in partnership with industry to develop innovative approaches to science-related education, including the establishment of university lectureships and innovative course development...

[And] policies have been initiated aimed at improving life-long learning at Postgraduate level. Over the five years to 2005-06 the government will lend an estimated \$995 million to postgraduate students through the Postgraduate Education Loans scheme (PELS). PELS operates in a similar way to the

---

83 Commonwealth Department of Agriculture, Fisheries & Forestry – Australia (AFFA), *Innovating Rural Australia 2002: research and development corporation outcomes*, p. 11.

84 AFFA, Supplementary information provided to the committee, March 2003, *RDC R&D expenditure 2001-02 by research providers*. The RDCs include ten statutory corporations: cotton, dairy, fisheries, forest and wood products, grains, grape and wine, land and water, rural industries, sugar and tobacco. There are also industry owned RDCs in meat and livestock, horticulture, wool and pork. The RDC R&D expenditure in public research institutions in 2001-02 was allocated as follows: CSIRO 13% (\$47 million); State Governments 27% (\$95.5 million); Universities 16% (\$57.6 million); CRCs 4% (\$14.7 million).

existing Higher Education Contribution Scheme for undergraduate students.<sup>85</sup>

### Australian Research Council (ARC) Grants program

3.59 The ARC is 'the key provider of agency support for university research' and provides 'about half of all national competitive grant support'.<sup>86</sup> It administers the Commonwealth Government's direct investment in higher education research through the **National Competitive Grants Program**. The ARC *Discovery* programs 'fund individual researchers and projects' and the ARC *Linkage* programs 'help to broker partnerships between researchers and industry, government and community organisations as well as the international community'.<sup>87</sup> The ARC stated that:

At any one time the ARC is supporting 4,000-5,000 high quality research projects, across its two main funding programs – *Discovery* and *Linkage*. On average, each *Discovery* project involves six researchers and by the end of the project delivers 14 journal articles or books. Three per cent deliver a patent by the end of the project. On average each *Linkage* project involves six researchers and by the end of the project delivers five journal articles or books. 30% deliver a patent or have a patent pending by the end of the project.<sup>88</sup>

3.60 The Department of Education, Science and Training stated that the ARC *Linkage* program:

... encourages and develops long-term strategic research alliances between higher education institutions and industry, and fosters opportunities for postdoctoral researchers to pursue internationally competitive research in collaboration with industry. Major publicly-funded research organisations such as CSIRO, are also being further encouraged to engage and expand links with industry.<sup>89</sup>

---

85 Commonwealth Department of Education, Science and Training, *op.cit.*, pp. 8-9.

86 Australian Research Council, Submission No. 50, pp. 1-2.

87 Information obtained from the Australian Research Council web site: [www.arc.gov.au/about\\_arc/default.htm](http://www.arc.gov.au/about_arc/default.htm), accessed on 13 May 2003.

88 Australian Research Council, Submission No. 50, p. 12.

89 Commonwealth Department of Education, Science and Training, *op.cit.*, p. 9.

## Programs to encourage R&D by Australian-based overseas companies

3.61 **Invest Australia** (within DITR) encourages overseas companies to base R&D activities in Australia. It utilises:

... investment specialists, in key locations around the world, [who] work with Australian staff and State and Territory Governments to market the competitive advantages of investing in Australia and identifying potential investors. Invest Australia also provides continued support to assist companies considering expansion within Australia.<sup>90</sup>

## Conclusion

3.62 The Commonwealth government's R&D programs that are described in this chapter are broad and extensive, meriting the description of a very 'diverse suite of measures'.<sup>91</sup> The programs that are specifically geared to SMEs include COMET, BIF, IIF, Pre-seed funding, and START.<sup>92</sup> The introduction of such programs shows that 'R&D policy, over time, and certainly since the Industry Commission's 1995 report, has evolved in ways that much better meets the needs of SMEs'.<sup>93</sup> As many of the programs are relatively new and are still bedding-down, the full effects of the R&D programs are yet to be realised.

---

90 Commonwealth Department of Industry, Tourism and Resources, *op.cit.*, p. 20.

91 Mr Gary Banks (Productivity Commission), Transcript, p. 482.

92 Prof. Don Nicklin (Industry, Research & Development Board), Transcript, p. 493.

93 Mr Gary Banks (Productivity Commission), *op.cit.*



