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# **RESEARCH AND EXPERIMENTAL DEVELOPMENT, BUSINESSES** AUSTRALIA

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## INQUIRIES

For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070 or Fiona Manson on Perth (08) 9360 5213.

## NOTES

### INTRODUCTION

This release presents summary statistics on Research and Experimental Development (R&D) undertaken by Australian businesses during the financial year ended 30 June 2009.

Users should refer to the Explanatory and Technical Notes for further contextual information when interpreting these results.

### ADDITIONAL DATA

More detailed data, including time series data, are available in spreadsheet format (data cubes) on the ABS website <[www.abs.gov.au](http://www.abs.gov.au)>. See the Downloads page for this issue (cat. no. 8104.0).

### DATA QUALITY

When interpreting the results in this release it is important to take into account factors that may affect the reliability of estimates. These factors are described in the Non-sampling error section of the Technical Note.

This release includes revised data for the 2006–07 and 2007–08 reference periods. Refer to the Revisions section of the Technical Note for details.

Brian Pink  
Australian Statistician

## ABBREVIATIONS

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<b>\$'000</b>	thousand dollars
<b>\$b</b>	billion (thousand million) dollars
<b>\$m</b>	million dollars
<b>ABS</b>	Australian Bureau of Statistics
<b>ACT</b>	Australian Capital Territory
<b>ANZSIC06</b>	<i>Australian and New Zealand Standard Industrial Classification, 2006 Edition</i>
<b>ANZSRC</b>	Australian and New Zealand Standard Research Classification
<b>ASRC</b>	Australian Standard Research Classification
<b>ATO</b>	Australian Taxation Office
<b>Aust.</b>	Australia
<b>BERD</b>	business expenditure on R&D
<b>excl.</b>	excluding
<b>FOR</b>	Fields of Research
<b>GDP</b>	gross domestic product
<b>GSP</b>	gross state product
<b>n.e.c.</b>	not elsewhere classified
<b>NSW</b>	New South Wales
<b>NT</b>	Northern Territory
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PYE</b>	person years of effort
<b>Qld</b>	Queensland
<b>R&amp;D</b>	research and experimental development
<b>SA</b>	South Australia
<b>SEO</b>	socio-economic objective
<b>Tas.</b>	Tasmania
<b>Vic.</b>	Victoria
<b>WA</b>	Western Australia

## MAIN FEATURES

### BUSINESS RESOURCES DEVOTED TO RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D)

During 2008–09, expenditure on R&D by Australian businesses was \$16,858 million.

Business expenditure on R&D (BERD) increased by 13% in current price terms and 9% in chain volume terms from 2007–08.

Business human resources devoted to R&D in 2008–09 totalled 53,556 person years of effort (PYE), an increase of 5% from 2007–08.

### BUSINESS RESOURCES DEVOTED TO R&D

		2004-05	2005-06	2006-07	2007-08	2008-09
<b>Expenditure on R&amp;D</b>						
Current prices						
Value	\$m	8 676	10 434	r12 639	r14 907	16 858
Dollar change	\$m	907	1 758	2 205	2 268	1 951
Percentage change	%	12	20	21	18	13
Chain volume measures(a)						
Value	\$m	9 665	11 132	13 444	15 467	16 858
Dollar change	\$m	703	1 467	2 312	2 024	1 391
Percentage change	%	8	15	21	15	9
<b>Human resources devoted to R&amp;D</b>						
Value	PYE	40 458	43 686	r46 462	r50 863	53 556
PYE change	PYE	3 028	3 228	2 776	4 401	2 693
Percentage change	%	8	8	6	9	5

r revised

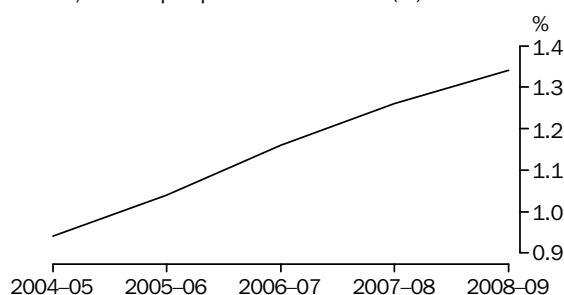
(a) The reference year for chain volume measures is 2008–09. See Explanatory Notes 30 and 31 for details.

Subsequent expenditure figures and supporting commentary relate to current price terms.

### BERD and gross domestic product (GDP)

BERD as a proportion of GDP increased between 2007–08 and 2008–09, moving from 1.26% to 1.34%.

### BERD, as a proportion of GDP(a)



(a) See Explanatory Note 28 and 29 for details.

The following table shows BERD/GDP ratios for Organisation for Economic Co-operation and Development (OECD) countries. Although Australia's BERD/GDP ratio for 2008–09 remained below the Total OECD ratio of 1.63%, its growth from 2007–08 (0.08 percentage points) was greater than the growth in the Total OECD ratio (0.05 percentage points).

## MAIN FEATURES *continued*

*BERD and gross domestic product (GDP) continued*

### BERD/GDP RATIOS OF OECD COUNTRIES (a)(b)(c)

	2004-05	2005-06	2006-07	2007-08	2008-09
	%	%	%	%	%
Sweden	2.67	2.62	2.79	2.66	2.78
Finland	2.42	2.47	2.46	2.51	2.77
Japan	2.38	2.54	2.63	2.68	2.69
Korea	2.06	2.15	2.33	2.45	2.54
Switzerland	2.14	na	na	na	2.21
United States of America	1.76	1.80	1.86	1.92	2.01
Denmark	1.69	1.68	1.66	1.78	1.91
Austria	1.53	1.71	1.74	1.79	1.89
Germany	1.74	1.72	1.77	1.77	1.85
Iceland	na	1.43	1.59	1.47	1.45
<b>Australia</b>	<b>0.94</b>	<b>1.04</b>	<b>1.16</b>	<b>1.26</b>	<b>1.34</b>
Luxembourg	1.43	1.35	1.42	1.32	1.32
Belgium	1.28	1.25	1.29	1.32	1.32
France	1.36	1.30	1.32	1.29	1.27
United Kingdom	1.06	1.06	1.08	1.15	1.10
Canada	1.18	1.15	1.11	1.04	1.00
Ireland	0.81	0.82	0.83	0.85	0.93
Czech Republic	0.78	0.89	1.01	0.95	0.91
Netherlands	1.03	1.01	1.01	0.97	0.89
Norway	0.87	0.82	0.82	0.88	0.87
Portugal	0.28	0.31	0.47	0.62	0.76
Spain	0.58	0.60	0.67	0.71	0.74
Italy	0.52	0.55	0.55	0.61	0.60
New Zealand	na	0.48	na	0.51	na
Hungary	0.36	0.41	0.48	0.49	0.53
Turkey	0.13	0.20	0.22	0.30	0.32
Slovak Republic	0.25	0.25	0.21	0.18	0.20
Mexico	0.17	0.19	0.19	0.18	na
Poland	0.16	0.18	0.18	0.17	0.19
Greece	0.17	0.18	0.18	0.16	na
<b>Total OECD</b>	<b>1.47</b>	<b>1.50</b>	<b>1.55</b>	<b>1.58</b>	<b>1.63</b>

na not available

- (a) Except for Australia, the BERD/GDP ratios shown for OECD countries are sourced from *Main Science and Technology Indicators, 2010/1*, OECD. Ratios for Australia have been calculated using the most recent ABS values for BERD and GDP. See Explanatory Notes 28 and 29.
- (b) BERD/GDP ratios for some countries are projected or estimated as per the OECD source table.
- (c) Countries are ranked by the most recent available BERD/GDP ratio.

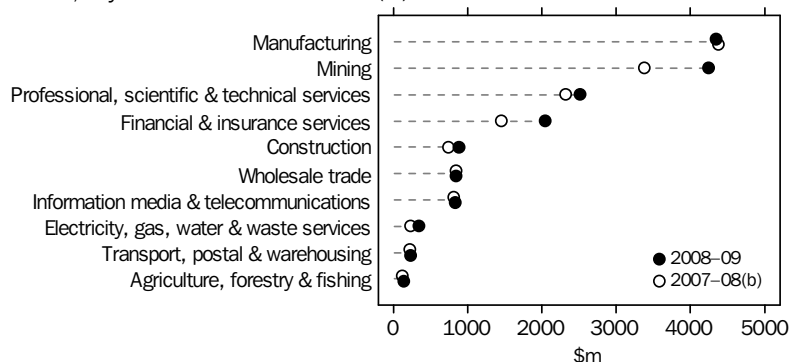
## BUSINESS EXPENDITURE ON R&D (BERD)

### INDUSTRY

Manufacturing and Mining were the largest contributors to BERD in 2008–09, contributing \$4,348 million (26%) and \$4,243 million (25%), respectively. Professional, scientific and technical services (\$2,510 million or 15%) and Financial and insurance services (\$2,040 million or 12%) were the next largest contributors. Combined, these four industries accounted for almost 80% of total BERD.

Of all industries, Mining (up \$860 million) reported the largest dollar increase in BERD from 2007–08, followed by Financial and insurance services (up \$587 million). Both these industries showed increases of more than two percentage points in their proportional share of total BERD, while Manufacturing showed a decrease of more than three percentage points in its share. All other industries showed changes in their proportional share of total BERD of less than one percentage point.

BERD, by selected industries(a)



(a) Ranked by 2008–09 BERD.

(b) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

### EMPLOYMENT SIZE

In 2008–09, businesses with 200 or more employees made the largest contribution to BERD (\$11,985 million or 71%), followed by businesses with 20–199 employees (\$2,895 million or 17%).

Businesses with 200 or more employees accounted for almost 80% (\$1,541 million) of the total dollar growth in BERD between 2007–08 and 2008–09. Businesses with 20–199 employees showed the smallest dollar growth from 2007–08 (up \$31 million).

The largest percentage increase in BERD was recorded for businesses with 5–19 employees, at 27%. This compares to increases of 16%, 15% and 1% for businesses with 0–4, 200 or more and 20–199 employees, respectively.

### TYPE OF EXPENDITURE

The distribution of BERD across type of expenditure components remained relatively stable in 2008–09 compared to 2007–08. As in previous years, BERD in 2008–09 was mainly comprised of Current expenditure (\$16,014 million or 95% of total BERD). Current expenditure was in turn comprised of \$10,265 million in Other current expenditure and \$5,749 million in Labour costs.

Capital expenditure in 2008–09 totalled \$844 million. From 2007–08, capital expenditure on Land, buildings and other structures increased by more than half (55%), up from \$133 million to \$206 million. The dollar increase for expenditure on Land, buildings and other structures was more than triple that for Other capital expenditure over the same period.

## BUSINESS EXPENDITURE ON R&D (BERD) *continued*

### TYPE OF EXPENDITURE

*continued*

In 2008–09, the industry with the highest level of Labour costs as a proportion of its BERD was Education and training (59%), followed by Professional, scientific and technical services and Health care and social assistance (both 53%). The industry with the lowest level of Labour costs as a proportion of its BERD in 2008–09 was Mining, at 16%.

### SOURCE OF FUNDS

The Business sector was the main source of BERD funds in 2008–09, with \$15,943 million (95%) coming from Own funds and \$313 million (2%) from Other business.

Commonwealth government and Overseas sources were the next largest funders of BERD, at \$345 million (2%) and \$189 million (1%), respectively.

Own funds was the only source of funds to show an increase in its proportional share of total BERD in 2008–09 (up from 93% of total BERD in 2007–08).

As for 2007–08, businesses in the Health care and social assistance and Professional, scientific and technical services industries had the lowest proportions of self-funded research in 2008–09, at 50% and 80%, respectively. For all other industries, more than 90% of expenditure on R&D was self-funded by businesses.

### LOCATION OF EXPENDITURE

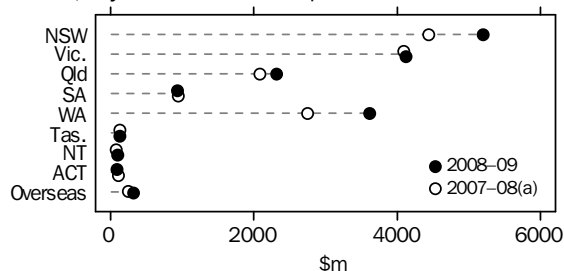
Location of expenditure relates to the region in which the R&D activity was performed; see also Explanatory Note 25. New South Wales (NSW) and Victoria continued to record the highest levels of BERD in 2008–09, at \$5,204 million (31%) and \$4,122 million (24%), respectively.

Western Australia (WA) reported the largest dollar growth (up \$860 million) and percentage growth (up 31%) in BERD from 2007–08. The Mining industry increased its BERD in WA by \$819 million from 2007–08, representing 95% of the overall WA increase. For 2008–09, Mining was also the dominant industry in WA in terms of contribution to level, making up 69% of WA BERD.

The second largest dollar growth in BERD from 2007–08 was for NSW (up \$760 million). The industry driving this growth was Financial and insurance services (up \$581 million and representing 76% of the overall NSW increase). Compared to 2007–08, this industry has overtaken Manufacturing to be the largest contributor to NSW BERD in 2008–09, accounting for 28%, while Manufacturing accounts for 21%.

Decreases in BERD from 2007–08 were reported for the Australian Capital Territory and South Australia. Only small percentage increases (1%) were reported for Victoria and Tasmania.

BERD, by location of expenditure



(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

## BUSINESS EXPENDITURE ON R&D (BERD) *continued*

### LOCATION OF EXPENDITURE *continued*

In terms of proportional share of total BERD, WA increased its share by three percentage points from 2007–08 (accounting for 21% of total BERD in 2008–09), while Victoria showed a decrease of almost three percentage points over the same period. The second highest increase in proportional share of BERD was for NSW (up one percentage point to 31%).

### *BERD and gross state product (GSP)*

WA and Victoria continued to record the highest levels of BERD as a proportion of GSP in 2008–09, at 2.13% and 1.41% respectively. WA also experienced the largest increase in its BERD/GSP ratio from 2007–08, rising from 1.77% to 2.13%. The only other locations to show increases in BERD/GSP ratios are NSW, Queensland and the Northern Territory.

### BERD, by location of expenditure—proportion of GSP(a)

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT
	%	%	%	%	%	%	%	%
2006–07	1.14	1.32	0.82	1.18	1.50	0.49	0.76	0.41
2007–08	1.16	1.45	0.94	1.23	1.77	0.60	0.51	0.45
2008–09	1.29	1.41	0.95	1.18	2.13	0.59	0.59	0.36

(a) See Explanatory Note 28 for details.

### TYPE OF ACTIVITY

In 2008–09, the majority of BERD was directed into Experimental development (\$10,206 million or 61%) and Applied research (\$5,692 million or 34%). Experimental development showed the largest dollar growth between 2007–08 and 2008–09 (up \$925 million), however had the smallest percentage increase (10%) and was the only type of activity to show a decrease in its proportional share of BERD.

From 2007–08, BERD directed into Strategic basic research, Applied research and Pure basic research increased by 19%, 18% and 17%, respectively.

### FIELD OF RESEARCH

Accounting for 80% of BERD in 2008–09 were the research fields of Engineering (\$9,118 million or 54%) and Information and computing sciences (\$4,407 million or 26%). These two research fields also showed the largest changes in proportional share of total BERD from 2007–08; although the overall distribution of BERD across research fields remained relatively stable.

### SOCIO-ECONOMIC OBJECTIVE (SEO)

The distribution of BERD across the SEO sectors of Defence, Economic development, Society, Environment and Expanding knowledge remained relatively stable between 2007–08 and 2008–09.

At the SEO division level, Manufacturing accounted for the largest share of BERD in 2008–09, at \$4,495 million or 27%. Mineral resources (excluding energy resources) and Energy SEOs reported the next highest levels of BERD, at \$2,640 million (16%) and \$2,582 million (15%), respectively.

Of all SEO divisions, Manufacturing showed the largest change in proportional share of total BERD, down four percentage points from 31% in 2007–08.



## BUSINESS EXPENDITURE ON R&D (BERD) *continued*

FOREIGN OWNERSHIP Wholly Australian owned businesses made the largest contribution to BERD at \$7,764 million (46% of BERD) and also reported the largest dollar growth from 2007–08, up \$1,111 million.

### BERD, by level of foreign ownership(a)

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2006–07(b)	2007–08(b)	2008–09	2006–07(b)	2007–08(b)	2008–09
	\$'000	\$'000	\$'000	%	%	%
Wholly Australian owned (0%)	5 803 383	6 652 859	7 764 025	45.9	44.6	46.1
Greater than 0% and less than 10%	712 611	774 734	1 032 868	5.6	5.2	6.1
10% to 50%	1 510 613	2 090 013	2 213 283	12.0	14.0	13.1
Greater than 50%	4 612 677	5 389 378	5 848 301	36.5	36.2	34.7
<b>Total</b>	<b>12 639 284</b>	<b>14 906 984</b>	<b>16 858 477</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

(a) A definition of foreign ownership was not provided in the survey and data were accepted as reported.

(b) 2006–07 and 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

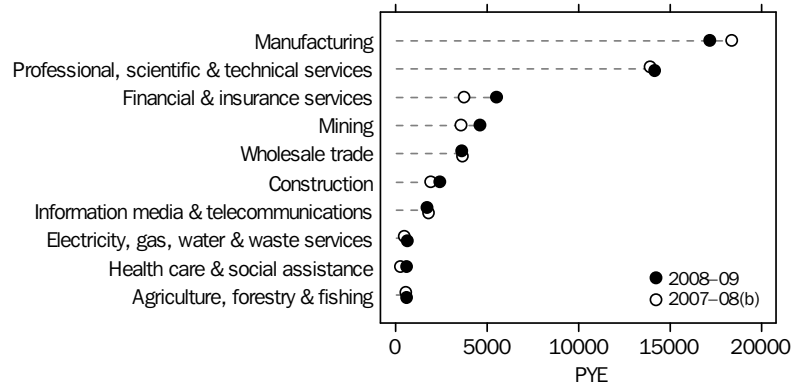
# BUSINESS HUMAN RESOURCES DEVOTED TO R&D

## INDUSTRY

In 2008–09, Manufacturing and Professional, scientific and technical services were the main contributors to total human resources devoted to R&D, at 17,181 (32%) and 14,155 (26%) person years of effort (PYE), respectively. While Manufacturing remained the largest industry contributor from 2007–08, it recorded the largest absolute decrease in PYE (down 1,204 PYE) and the largest decrease in proportional share of total PYE (down four percentage points from 36%).

The largest absolute increase in PYE from 2007–08 was recorded by Financial and insurance services (up 1,773 PYE), followed by Mining (up 1,036 PYE). These two industries also recorded the largest increases in proportional share of total PYE from 2007–08.

BUSINESS HUMAN RESOURCES DEVOTED TO R&D, by selected industries(a)



(a) Ranked by 2008–09 total human resources devoted to R&D.  
 (b) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

## EMPLOYMENT SIZE

In 2008–09, businesses with 200 or more employees accounted for the largest proportion of total human resources devoted to R&D in 2008–09, at 59% (or 31,521 PYE). This employment size group also recorded the largest increase in proportional share of total PYE (up one percentage point) and the largest absolute growth in PYE (up 2,259 PYE) from 2007–08.

Businesses with 0–4 employees showed the largest percentage increase in PYE (up 17% to 1,673 PYE), but remains the lowest contributing group to total PYE (at 3%).

As for expenditure on R&D, the 20–199 employment size grouping was the only group to decrease its proportional share of PYE devoted to R&D from 2007–08, down two percentage points. This group was also the only group to record a decrease in absolute terms, down 189 PYE.

## TYPE OF RESOURCE

Researchers continued to be the most dominant type of human resource devoted to R&D (50% of total PYE) in 2008–09, and reported the largest absolute growth from 2007–08 (up 1,031 PYE to 26,941 PYE). Technicians reported the next highest growth over the same period, up 915 PYE to 17,561 PYE.

## BUSINESS HUMAN RESOURCES DEVOTED TO R&D *continued*

### FOREIGN OWNERSHIP

In 2008–09, as for business expenditure on R&D, wholly Australian owned businesses made the largest contribution to human resource effort at 28,343 PYE (53%) and also contributed the largest increase in human resource effort devoted to R&D (up 1,826 PYE) from 2007–08.

### BUSINESS HUMAN RESOURCES DEVOTED TO R&D, by level of foreign ownership(a)

	HUMAN RESOURCES DEVOTED TO R&D			PROPORTION OF TOTAL HUMAN RESOURCES DEVOTED TO R&D		
	2006–07(b)	2007–08(b)	2008–09	2006–07(b)	2007–08(b)	2008–09
	PYE	PYE	PYE	%	%	%
Wholly Australian owned (0%)	24 088	26 517	28 343	51.8	52.1	52.9
Greater than 0% and less than 10%	2 472	2 686	3 032	5.3	5.3	5.7
10% to 50%	4 893	4 333	4 918	10.5	8.5	9.2
Greater than 50%	15 009	17 326	17 263	32.3	34.1	32.2
<b>Total</b>	<b>46 462</b>	<b>50 863</b>	<b>53 556</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

(a) A definition of foreign ownership was not provided in the survey and data were accepted as reported.

(b) 2006–07 and 2007–08 data have been revised. See the Revisions section of the Technical Note for details.



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	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2006–07(a)	2007–08(a)	2008–09	2006–07(a)	2007–08(a)	2008–09
	\$'000	\$'000	\$'000	%	%	%
<b>Employment size</b>						
0–4 persons	412 272	484 638	560 740	3.3	3.3	3.3
5–19 persons	1 061 014	1 115 071	1 418 325	8.4	7.5	8.4
20–199 persons	2 356 837	2 863 759	2 894 738	18.6	19.2	17.2
200 or more persons	8 809 161	10 443 516	11 984 674	69.7	70.1	71.1
<b>Type of expenditure</b>						
Capital expenditure						
Land, buildings & other structures	101 386	133 118	206 224	0.8	0.9	1.2
Other capital expenditure	690 520	615 079	637 984	5.5	4.1	3.8
<i>Total</i>	791 906	748 197	844 208	6.3	5.0	5.0
Current expenditure						
Labour costs	4 359 803	5 145 312	5 749 099	34.5	34.5	34.1
Other current expenditure	7 487 575	9 013 475	10 265 170	59.2	60.5	60.9
<i>Total</i>	11 847 378	14 158 787	16 014 269	93.7	95.0	95.0
<b>Source of funds</b>						
Own funds	11 574 282	13 911 525	15 943 460	91.6	93.3	94.6
Other business	292 172	345 308	313 497	2.3	2.3	1.9
Commonwealth government	416 148	389 742	344 630	3.3	2.6	2.0
State and local government	71 511	39 222	27 696	0.6	0.3	0.2
Other Australian(b)	43 783	29 607	40 314	0.3	0.2	0.2
Overseas	241 388	191 580	188 880	1.9	1.3	1.1
<b>Location of expenditure</b>						
New South Wales	4 025 614	4 444 569	5 204 198	31.9	29.8	30.9
Victoria	3 458 242	4 089 576	4 121 902	27.4	27.4	24.5
Queensland	1 718 509	2 092 506	2 323 031	13.6	14.0	13.8
South Australia	844 573	945 759	932 488	6.7	6.3	5.5
Western Australia	2 080 780	2 756 288	3 616 593	16.5	18.5	21.5
Tasmania	105 078	134 170	135 795	0.8	0.9	0.8
Northern Territory	108 760	80 702	101 476	0.9	0.5	0.6
Australia Capital Territory	94 020	109 785	93 327	0.7	0.7	0.6
Overseas	203 708	253 631	329 667	1.6	1.7	2.0
<b>Type of activity</b>						
Pure basic research	73 550	75 257	87 908	0.6	0.5	0.5
Strategic basic research	653 190	733 578	872 290	5.2	4.9	5.2
Applied research	4 149 496	4 817 183	5 692 165	32.8	32.3	33.8
Experimental development	7 763 048	9 280 967	10 206 114	61.4	62.3	60.5
<b>Total expenditure on R&amp;D</b>	<b>12 639 284</b>	<b>14 906 984</b>	<b>16 858 477</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

(a) 2006–07 and 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

(b) Includes funding from Joint business/government, Higher education and Private non-profit organisations.

BUSINESS EXPENDITURE ON R&D, by industry: values and proportions—2006–07 to 2008–09(a)

	EXPENDITURE ON R&D			PROPORTION OF TOTAL EXPENDITURE ON R&D		
	2006–07(a)	2007–08(a)	2008–09	2006–07(a)	2007–08(a)	2008–09
	\$'000	\$'000	\$'000	%	%	%
Agriculture, forestry & fishing	124 132	118 827	146 319	1.0	0.8	0.9
Mining	2 772 885	3 383 161	4 242 774	21.9	22.7	25.2
Manufacturing	3 835 696	4 373 558	4 348 440	30.3	29.3	25.8
Electricity, gas, water & waste services	148 976	233 267	344 398	1.2	1.6	2.0
Construction	485 088	740 466	881 998	3.8	5.0	5.2
Wholesale trade	840 918	840 568	841 935	6.7	5.6	5.0
Retail trade	93 486	65 338	88 356	0.7	0.4	0.5
Accommodation & food services	np	17 132	26 782	np	0.1	0.2
Transport, postal & warehousing	179 975	221 170	234 178	1.4	1.5	1.4
Information media & telecommunications	797 693	814 501	828 865	6.3	5.5	4.9
Financial & insurance services	1 109 327	1 453 445	2 040 093	8.8	9.8	12.1
Rental, hiring & real estate services	39 722	69 442	79 691	0.3	0.5	0.5
Professional, scientific & technical services	2 015 334	2 314 536	2 510 330	15.9	15.5	14.9
Administrative & support services	70 301	110 769	58 600	0.6	0.7	0.3
Public administration & safety	np	5 328	9 135	np	—	0.1
Education & training	7 780	5 205	9 956	0.1	—	0.1
Health care & social assistance	42 046	56 706	74 908	0.3	0.4	0.4
Arts & recreation services	12 181	26 661	32 826	0.1	0.2	0.2
Other services	44 687	56 904	58 893	0.4	0.4	0.3
<b>Total</b>	<b>12 639 284</b>	<b>14 906 984</b>	<b>16 858 477</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2006–07 and 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS EXPENDITURE ON R&D, by industry—by employment size—2007–08 and 2008–09(a)

	0–4 persons	5–19 persons	20–199 persons	200 or more persons	Total expenditure on R&D
	\$'000	\$'000	\$'000	\$'000	\$'000
2008–09					
Agriculture, forestry & fishing	7 916	22 379	75 147	40 877	146 319
Mining	107 763	288 539	284 406	3 562 066	4 242 774
Manufacturing	122 688	192 325	938 472	3 094 955	4 348 440
Electricity, gas, water & waste services	10 280	19 745	111 004	203 369	344 398
Construction	5 280	36 765	124 091	715 862	881 998
Wholesale trade	23 220	71 349	163 292	584 074	841 935
Retail trade	7 411	13 040	16 636	51 269	88 356
Accommodation & food services	1 870	np	5 593	np	26 782
Transport, postal & warehousing	3 037	6 260	11 023	213 858	234 178
Information media & telecommunications	15 700	24 689	45 815	742 661	828 865
Financial & insurance services	11 939	37 116	60 051	1 930 987	2 040 093
Rental, hiring & real estate services	13 992	np	17 662	np	79 691
Professional, scientific & technical services	212 633	642 280	973 035	682 382	2 510 330
Administrative & support services	2 590	12 958	14 271	28 781	58 600
Public administration & safety	np	1 921	3 160	np	9 135
Education & training	np	4 994	1 210	np	9 956
Health care & social assistance	3 490	20 288	12 859	38 271	74 908
Arts & recreation services	np	1 811	12 408	np	32 826
Other services	np	14 667	24 603	np	58 893
<b>Total</b>	<b>560 740</b>	<b>1 418 325</b>	<b>2 894 738</b>	<b>11 984 674</b>	<b>16 858 477</b>
2007–08 (a)					
Agriculture, forestry & fishing	7 611	18 530	55 792	36 894	118 827
Mining	94 632	132 497	500 207	2 655 825	3 383 161
Manufacturing	107 986	200 011	806 816	3 258 745	4 373 558
Electricity, gas, water & waste services	7 551	6 248	67 713	151 755	233 267
Construction	4 828	24 281	106 372	604 985	740 466
Wholesale trade	14 837	63 624	146 375	615 732	840 568
Retail trade	4 727	13 266	18 103	29 242	65 338
Accommodation & food services	np	—	np	np	17 132
Transport, postal & warehousing	2 287	6 086	10 912	201 885	221 170
Information media & telecommunications	10 349	22 618	49 320	732 214	814 501
Financial & insurance services	19 384	19 395	48 111	1 366 555	1 453 445
Rental, hiring & real estate services	13 827	np	10 762	np	69 442
Professional, scientific & technical services	181 984	552 659	964 653	615 240	2 314 536
Administrative & support services	2 664	11 151	16 006	80 948	110 769
Public administration & safety	np	np	np	np	5 328
Education & training	1 827	1 656	1 722	—	5 205
Health care & social assistance	3 925	15 040	20 403	17 338	56 706
Arts & recreation services	np	np	14 328	np	26 661
Other services	np	15 767	22 482	np	56 904
<b>Total</b>	<b>484 638</b>	<b>1 115 071</b>	<b>2 863 759</b>	<b>10 443 516</b>	<b>14 906 984</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.



BUSINESS EXPENDITURE ON R&D, by industry—by employment size: **proportions**—  
2007–08 and 2008–09(a)

	0–4 persons	5–19 persons	20–199 persons	200 or more persons	Total expenditure on R&D
	%	%	%	%	%
2008–09					
Agriculture, forestry & fishing	5.4	15.3	51.4	27.9	100.0
Mining	2.5	6.8	6.7	84.0	100.0
Manufacturing	2.8	4.4	21.6	71.2	100.0
Electricity, gas, water & waste services	3.0	5.7	32.2	59.1	100.0
Construction	0.6	4.2	14.1	81.2	100.0
Wholesale trade	2.8	8.5	19.4	69.4	100.0
Retail trade	8.4	14.8	18.8	58.0	100.0
Accommodation & food services	7.0	np	20.9	np	100.0
Transport, postal & warehousing	1.3	2.7	4.7	91.3	100.0
Information media & telecommunications	1.9	3.0	5.5	89.6	100.0
Financial & insurance services	0.6	1.8	2.9	94.7	100.0
Rental, hiring & real estate services	17.6	np	22.2	np	100.0
Professional, scientific & technical services	8.5	25.6	38.8	27.2	100.0
Administrative & support services	4.4	22.1	24.4	49.1	100.0
Public administration & safety	np	21.0	34.6	np	100.0
Education & training	np	50.2	12.2	np	100.0
Health care & social assistance	4.7	27.1	17.2	51.1	100.0
Arts & recreation services	np	5.5	37.8	np	100.0
Other services	np	24.9	41.8	np	100.0
<b>Total</b>	<b>3.3</b>	<b>8.4</b>	<b>17.2</b>	<b>71.1</b>	<b>100.0</b>

2007–08 (a)					
Agriculture, forestry & fishing	6.4	15.6	47.0	31.0	100.0
Mining	2.8	3.9	14.8	78.5	100.0
Manufacturing	2.5	4.6	18.4	74.5	100.0
Electricity, gas, water & waste services	3.2	2.7	29.0	65.1	100.0
Construction	0.7	3.3	14.4	81.7	100.0
Wholesale trade	1.8	7.6	17.4	73.3	100.0
Retail trade	7.2	20.3	27.7	44.8	100.0
Accommodation & food services	np	—	np	np	100.0
Transport, postal & warehousing	1.0	2.8	4.9	91.3	100.0
Information media & telecommunications	1.3	2.8	6.1	89.9	100.0
Financial & insurance services	1.3	1.3	3.3	94.0	100.0
Rental, hiring & real estate services	19.9	np	15.5	np	100.0
Professional, scientific & technical services	7.9	23.9	41.7	26.6	100.0
Administrative & support services	2.4	10.1	14.4	73.1	100.0
Public administration & safety	np	np	np	np	100.0
Education & training	35.1	31.8	33.1	—	100.0
Health care & social assistance	6.9	26.5	36.0	30.6	100.0
Arts & recreation services	np	np	53.7	np	100.0
Other services	np	27.7	39.5	np	100.0
<b>Total</b>	<b>3.3</b>	<b>7.5</b>	<b>19.2</b>	<b>70.1</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)

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(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

	CAPITAL EXPENDITURE			CURRENT EXPENDITURE			Total expenditure on R&D
	Land, buildings & other structures	Other capital expenditure	Total	Labour costs	Other current expenditure	Total	
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	
2008–09							
Agriculture, forestry & fishing	7 953	9 218	17 171	44 900	84 248	129 148	146 319
Mining	88 613	111 298	199 911	666 588	3 376 275	4 042 863	4 242 774
Manufacturing	58 194	212 733	270 927	1 717 161	2 360 352	4 077 513	4 348 440
Electricity, gas, water & waste services	12 570	30 134	42 704	60 176	241 518	301 694	344 398
Construction	2 418	8 809	11 227	255 353	615 418	870 771	881 998
Wholesale trade	7 076	27 376	34 452	398 132	409 351	807 483	841 935
Retail trade	504	5 626	6 130	32 787	49 439	82 226	88 356
Accommodation & food services	np	np	1 298	11 379	14 105	25 484	26 782
Transport, postal & warehousing	np	np	34 901	56 276	143 001	199 277	234 178
Information media & telecommunications	1 587	16 511	18 098	194 439	616 328	810 767	828 865
Financial & insurance services	1 743	75 008	76 751	833 373	1 129 969	1 963 342	2 040 093
Rental, hiring & real estate services	527	6 971	7 498	25 217	46 976	72 193	79 691
Professional, scientific & technical services	20 576	77 296	97 872	1 334 429	1 078 029	2 412 458	2 510 330
Administrative & support services	437	4 833	5 270	29 977	23 353	53 330	58 600
Public administration & safety	np	np	3 127	3 142	2 866	6 008	9 135
Education & training	—	np	np	5 911	np	np	9 956
Health care & social assistance	np	np	6 737	39 548	28 623	68 171	74 908
Arts & recreation services	70	np	np	15 961	np	np	32 826
Other services	574	6 474	7 048	24 350	27 495	51 845	58 893
<b>Total</b>	<b>206 224</b>	<b>637 984</b>	<b>844 208</b>	<b>5 749 099</b>	<b>10 265 170</b>	<b>16 014 269</b>	<b>16 858 477</b>
2007–08 (a)							
Agriculture, forestry & fishing	6 997	7 922	14 919	38 392	65 516	103 908	118 827
Mining	24 731	95 884	120 615	530 905	2 731 641	3 262 546	3 383 161
Manufacturing	38 943	233 290	272 233	1 772 038	2 329 286	4 101 325	4 373 558
Electricity, gas, water & waste services	7 512	21 986	29 498	41 630	162 139	203 769	233 267
Construction	8 608	9 660	18 268	193 382	528 816	722 198	740 466
Wholesale trade	13 470	30 243	43 713	393 055	403 799	796 855	840 568
Retail trade	138	2 521	2 659	39 506	23 173	62 679	65 338
Accommodation & food services	np	np	822	np	np	16 310	17 132
Transport, postal & warehousing	1 361	30 051	31 412	58 867	130 891	189 758	221 170
Information media & telecommunications	1 359	16 663	18 022	189 824	606 655	796 479	814 501
Financial & insurance services	1 390	45 526	46 916	513 298	893 231	1 406 529	1 453 445
Rental, hiring & real estate services	366	9 978	10 344	20 103	38 994	59 098	69 442
Professional, scientific & technical services	21 866	86 218	108 084	1 240 305	966 147	2 206 452	2 314 536
Administrative & support services	np	np	10 230	47 139	53 400	100 539	110 769
Public administration & safety	np	np	1 984	np	np	3 344	5 328
Education & training	np	np	np	3 120	np	np	5 205
Health care & social assistance	np	np	7 298	22 276	27 132	49 408	56 706
Arts & recreation services	36	np	np	10 820	np	np	26 661
Other services	1 293	7 344	8 636	21 777	26 491	48 268	56 904
<b>Total</b>	<b>133 118</b>	<b>615 079</b>	<b>748 197</b>	<b>5 145 312</b>	<b>9 013 475</b>	<b>14 158 787</b>	<b>14 906 984</b>

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(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS EXPENDITURE ON R&D, by industry—by type of expenditure:  
proportions—2007–08 and 2008–09(a)

	CAPITAL EXPENDITURE			CURRENT EXPENDITURE			Total expenditure on R&D
	Land, buildings & other structures	Other capital expenditure	Total	Labour costs	Other current expenditure	Total	
	%	%	%	%	%	%	
2008–09							
Agriculture, forestry & fishing	5.4	6.3	11.7	30.7	57.6	88.3	100.0
Mining	2.1	2.6	4.7	15.7	79.6	95.3	100.0
Manufacturing	1.3	4.9	6.2	39.5	54.3	93.8	100.0
Electricity, gas, water & waste services	3.6	8.7	12.4	17.5	70.1	87.6	100.0
Construction	0.3	1.0	1.3	29.0	69.8	98.7	100.0
Wholesale trade	0.8	3.3	4.1	47.3	48.6	95.9	100.0
Retail trade	0.6	6.4	6.9	37.1	56.0	93.1	100.0
Accommodation & food services	np	np	4.8	42.5	52.7	95.2	100.0
Transport, postal & warehousing	np	np	14.9	24.0	61.1	85.1	100.0
Information media & telecommunications	0.2	2.0	2.2	23.5	74.4	97.8	100.0
Financial & insurance services	0.1	3.7	3.8	40.8	55.4	96.2	100.0
Rental, hiring & real estate services	0.7	8.7	9.4	31.6	58.9	90.6	100.0
Professional, scientific & technical services	0.8	3.1	3.9	53.2	42.9	96.1	100.0
Administrative & support services	0.7	8.2	9.0	51.2	39.9	91.0	100.0
Public administration & safety	np	np	34.2	34.4	31.4	65.8	100.0
Education & training	—	np	np	59.4	np	np	100.0
Health care & social assistance	np	np	9.0	52.8	38.2	91.0	100.0
Arts & recreation services	0.2	np	np	48.6	np	np	100.0
Other services	1.0	11.0	12.0	41.3	46.7	88.0	100.0
<b>Total</b>	<b>1.2</b>	<b>3.8</b>	<b>5.0</b>	<b>34.1</b>	<b>60.9</b>	<b>95.0</b>	<b>100.0</b>
2007–08 (a)							
Agriculture, forestry & fishing	5.9	6.7	12.6	32.3	55.1	87.4	100.0
Mining	0.7	2.8	3.6	15.7	80.7	96.4	100.0
Manufacturing	0.9	5.3	6.2	40.5	53.3	93.8	100.0
Electricity, gas, water & waste services	3.2	9.4	12.6	17.8	69.5	87.4	100.0
Construction	1.2	1.3	2.5	26.1	71.4	97.5	100.0
Wholesale trade	1.6	3.6	5.2	46.8	48.0	94.8	100.0
Retail trade	0.2	3.9	4.1	60.5	35.5	95.9	100.0
Accommodation & food services	np	np	4.8	np	np	95.2	100.0
Transport, postal & warehousing	0.6	13.6	14.2	26.6	59.2	85.8	100.0
Information media & telecommunications	0.2	2.0	2.2	23.3	74.5	97.8	100.0
Financial & insurance services	0.1	3.1	3.2	35.3	61.5	96.8	100.0
Rental, hiring & real estate services	0.5	14.4	14.9	28.9	56.2	85.1	100.0
Professional, scientific & technical services	0.9	3.7	4.7	53.6	41.7	95.3	100.0
Administrative & support services	np	np	9.2	42.6	48.2	90.8	100.0
Public administration & safety	np	np	37.2	np	np	62.8	100.0
Education & training	np	np	np	59.9	np	np	100.0
Health care & social assistance	np	np	12.9	39.3	47.8	87.1	100.0
Arts & recreation services	0.1	np	np	40.6	np	np	100.0
Other services	2.3	12.9	15.2	38.3	46.6	84.8	100.0
<b>Total</b>	<b>0.9</b>	<b>4.1</b>	<b>5.0</b>	<b>34.5</b>	<b>60.5</b>	<b>95.0</b>	<b>100.0</b>

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(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS EXPENDITURE ON R&D, by industry—by source of funds—2007–08 and  
2008–09(a)

	Own funds	Other business	Commonwealth government	State & local government	Other Australian(b)	Overseas	Total expenditure on R&D
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
2008–09							
Agriculture, forestry & fishing	138 673	255	4 213	np	np	—	146 319
Mining	4 166 610	np	5 788	np	—	np	4 242 774
Manufacturing	4 156 161	43 410	109 949	1 572	2 431	34 917	4 348 440
Electricity, gas, water & waste services	335 454	np	3 242	1 615	np	np	344 398
Construction	875 037	3 157	3 486	np	np	np	881 998
Wholesale trade	770 449	np	17 522	183	np	13 974	841 935
Retail trade	87 711	np	np	—	—	—	88 356
Accommodation & food services	np	np	—	—	—	—	26 782
Transport, postal & warehousing	233 370	np	np	—	—	—	234 178
Information media & telecommunications	825 151	np	2 222	—	np	—	828 865
Financial & insurance services	2 033 160	3 992	1 280	np	np	np	2 040 093
Rental, hiring & real estate services	77 135	np	543	—	—	np	79 691
Professional, scientific & technical services	2 019 731	147 463	176 297	14 858	28 783	123 198	2 510 330
Administrative & support services	57 601	np	472	np	—	—	58 600
Public administration & safety	np	—	np	—	—	—	9 135
Education & training	9 063	np	np	np	—	—	9 956
Health care & social assistance	37 534	7 914	14 978	np	np	2 012	74 908
Arts & recreation services	30 034	np	1 646	np	—	—	32 826
Other services	54 969	1 617	1 900	np	np	np	58 893
<b>Total</b>	<b>15 943 460</b>	<b>313 497</b>	<b>344 630</b>	<b>27 696</b>	<b>40 314</b>	<b>188 880</b>	<b>16 858 477</b>

2007–08 (a)							
Agriculture, forestry & fishing	108 170	np	5 781	2 992	np	—	118 827
Mining	3 249 478	np	7 479	np	—	—	3 383 161
Manufacturing	4 138 001	57 390	115 468	3 568	1 867	57 264	4 373 558
Electricity, gas, water & waste services	221 059	2 083	5 016	4 326	np	np	233 267
Construction	723 215	8 210	6 457	np	—	np	740 466
Wholesale trade	739 507	np	22 237	202	np	14 712	840 568
Retail trade	63 300	np	902	np	—	np	65 338
Accommodation & food services	np	—	np	—	—	—	17 132
Transport, postal & warehousing	218 817	1 828	np	np	—	—	221 170
Information media & telecommunications	808 410	np	3 098	np	—	np	814 501
Financial & insurance services	1 443 831	3 856	5 489	np	np	np	1 453 445
Rental, hiring & real estate services	63 317	2 644	2 343	np	—	np	69 442
Professional, scientific & technical services	1 880 155	71 743	203 075	19 434	25 414	114 715	2 314 536
Administrative & support services	110 364	np	np	np	—	—	110 769
Public administration & safety	5 328	—	—	—	—	—	5 328
Education & training	np	np	179	—	—	—	5 205
Health care & social assistance	40 340	3 604	7 704	np	np	1 495	56 706
Arts & recreation services	24 663	np	np	np	np	—	26 661
Other services	51 884	np	2 984	—	np	—	56 904
<b>Total</b>	<b>13 911 525</b>	<b>345 308</b>	<b>389 742</b>	<b>39 222</b>	<b>29 607</b>	<b>191 580</b>	<b>14 906 984</b>

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(b) Includes funding from Joint business/government, Higher education and Private non-profit organisations.

BUSINESS EXPENDITURE ON R&D, by industry—by source of funds: **proportions**—  
2007–08 and 2008–09(a)

	<i>Own funds</i>	<i>Other business</i>	<i>Commonwealth government</i>	<i>State &amp; local government</i>	<i>Other Australian (b)</i>	<i>Overseas</i>	<i>Total expenditure on R&amp;D</i>
	%	%	%	%	%	%	%
<b>2008–09</b>							
Agriculture, forestry & fishing	94.8	0.2	2.9	np	np	—	100.0
Mining	98.2	np	0.1	np	—	np	100.0
Manufacturing	95.6	1.0	2.5	—	0.1	0.8	100.0
Electricity, gas, water & waste services	97.4	np	0.9	0.5	np	np	100.0
Construction	99.2	0.4	0.4	np	np	np	100.0
Wholesale trade	91.5	np	2.1	—	np	1.7	100.0
Retail trade	99.3	np	np	—	—	—	100.0
Accommodation & food services	np	np	—	—	—	—	100.0
Transport, postal & warehousing	99.7	np	np	—	—	—	100.0
Information media & telecommunications	99.6	np	0.3	—	np	—	100.0
Financial & insurance services	99.7	0.2	0.1	np	np	np	100.0
Rental, hiring & real estate services	96.8	np	0.7	—	—	np	100.0
Professional, scientific & technical services	80.5	5.9	7.0	0.6	1.1	4.9	100.0
Administrative & support services	98.3	np	0.8	np	—	—	100.0
Public administration & safety	np	—	np	—	—	—	100.0
Education & training	91.0	np	np	np	—	—	100.0
Health care & social assistance	50.1	10.6	20.0	np	np	2.7	100.0
Arts & recreation services	91.5	np	5.0	np	—	—	100.0
Other services	93.3	2.7	3.2	np	np	np	100.0
<b>Total</b>	<b>94.6</b>	<b>1.9</b>	<b>2.0</b>	<b>0.2</b>	<b>0.2</b>	<b>1.1</b>	<b>100.0</b>

<b>2007–08 (a)</b>							
Agriculture, forestry & fishing	91.0	np	4.9	2.5	np	—	100.0
Mining	96.0	np	0.2	np	—	—	100.0
Manufacturing	94.6	1.3	2.6	0.1	—	1.3	100.0
Electricity, gas, water & waste services	94.8	0.9	2.2	1.9	np	np	100.0
Construction	97.7	1.1	0.9	np	—	np	100.0
Wholesale trade	88.0	np	2.6	—	np	1.8	100.0
Retail trade	96.9	np	1.4	np	—	np	100.0
Accommodation & food services	np	—	np	—	—	—	100.0
Transport, postal & warehousing	98.9	0.8	np	np	—	—	100.0
Information media & telecommunications	99.3	np	0.4	np	—	np	100.0
Financial & insurance services	99.3	0.3	0.4	np	np	np	100.0
Rental, hiring & real estate services	91.2	3.8	3.4	np	—	np	100.0
Professional, scientific & technical services	81.2	3.1	8.8	0.8	1.1	5.0	100.0
Administrative & support services	99.6	np	np	np	—	—	100.0
Public administration & safety	100.0	—	—	—	—	—	100.0
Education & training	np	np	3.4	—	—	—	100.0
Health care & social assistance	71.1	6.4	13.6	np	np	2.6	100.0
Arts & recreation services	92.5	np	np	np	np	—	100.0
Other services	91.2	np	5.2	—	np	—	100.0
<b>Total</b>	<b>93.3</b>	<b>2.3</b>	<b>2.6</b>	<b>0.3</b>	<b>0.2</b>	<b>1.3</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

(b) Includes funding from Joint business/government, Higher education and Private non-profit organisations.

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Overseas	Total expenditure on R&D
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
2008–09										
Agriculture, forestry & fishing	33 191	10 360	29 714	10 795	41 304	17 329	np	—	np	146 319
Mining	694 840	56 709	642 816	248 648	2 512 275	19 974	64 146	1 086	2 280	4 242 774
Manufacturing	1 109 770	1 625 960	475 469	297 439	583 446	57 206	np	np	150 224	4 348 440
Electricity, gas, water & waste services	89 534	113 148	61 851	15 391	47 760	np	—	np	np	344 398
Construction	201 336	208 485	354 269	31 379	84 056	499	np	np	538	881 998
Wholesale trade	334 922	338 067	66 460	32 952	44 238	np	np	4 540	17 406	841 935
Retail trade	21 059	50 554	4 527	4 656	6 067	np	np	—	1 054	88 356
Accommodation & food services	1 280	8 960	7 898	np	np	np	np	—	np	26 782
Transport, postal & warehousing	62 241	91 620	45 618	13 683	15 106	np	np	np	—	234 178
Information media & telecommunications	294 746	np	26 353	10 397	5 740	np	—	1 539	675	828 865
Financial & insurance services	1 472 559	382 317	61 876	61 676	39 137	np	—	np	22 343	2 040 093
Rental, hiring & real estate services	21 532	47 528	4 769	np	3 633	—	—	—	np	79 691
Professional, scientific & technical services	767 359	620 937	509 742	182 772	221 674	21 275	2 514	56 233	127 824	2 510 330
Administrative & support services	27 450	17 811	5 682	4 922	1 979	—	np	np	np	58 600
Public administration & safety	5 382	np	—	np	np	np	np	—	—	9 135
Education & training	4 394	1 746	2 436	np	745	np	—	—	np	9 956
Health care & social assistance	38 588	26 921	3 324	702	4 874	—	—	—	499	74 908
Arts & recreation services	9 543	10 174	9 473	np	—	np	—	np	np	32 826
Other services	14 472	20 253	10 754	8 797	3 942	np	—	np	501	58 893
<b>Total</b>	<b>5 204 198</b>	<b>4 121 902</b>	<b>2 323 031</b>	<b>932 488</b>	<b>3 616 593</b>	<b>135 795</b>	<b>101 476</b>	<b>93 327</b>	<b>329 667</b>	<b>16 858 477</b>

## 2007–08 (a)

Agriculture, forestry & fishing	27 682	6 464	20 560	13 715	28 226	17 326	3 945	—	909	118 827
Mining	637 516	176 559	568 766	246 916	1 693 362	18 608	36 730	np	np	3 383 161
Manufacturing	1 105 465	1 721 346	409 551	386 637	526 404	46 843	np	np	112 324	4 373 558
Electricity, gas, water & waste services	101 810	33 148	46 185	10 883	24 878	np	—	np	880	233 267
Construction	159 444	168 341	322 031	54 422	30 212	np	np	np	np	740 466
Wholesale trade	336 900	310 883	76 295	43 405	56 825	1 430	np	np	9 754	840 568
Retail trade	20 466	32 137	4 793	3 346	3 566	np	228	np	547	65 338
Accommodation & food services	np	np	5 269	np	np	np	np	—	np	17 132
Transport, postal & warehousing	61 655	97 169	38 179	7 687	np	np	—	np	np	221 170
Information media & telecommunications	234 218	485 037	38 777	19 573	21 492	np	—	np	3 232	814 501
Financial & insurance services	891 827	336 981	69 590	20 157	121 422	—	—	np	np	1 453 445
Rental, hiring & real estate services	18 159	34 689	5 747	np	6 092	np	—	—	—	69 442
Professional, scientific & technical services	737 136	581 646	461 012	120 539	222 161	24 151	3 363	60 096	104 433	2 314 536
Administrative & support services	52 817	42 661	9 607	np	3 785	—	np	np	np	110 769
Public administration & safety	2 656	np	—	—	np	np	—	—	np	5 328
Education & training	2 672	778	np	np	np	—	—	np	np	5 205
Health care & social assistance	26 517	20 318	5 036	1 393	3 031	np	—	—	np	56 706
Arts & recreation services	np	np	np	np	—	—	—	np	np	26 661
Other services	15 432	25 358	6 190	6 755	2 260	np	—	—	np	56 904
<b>Total</b>	<b>4 444 569</b>	<b>4 089 576</b>	<b>2 092 506</b>	<b>945 759</b>	<b>2 756 288</b>	<b>134 170</b>	<b>80 702</b>	<b>109 785</b>	<b>253 631</b>	<b>14 906 984</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS EXPENDITURE ON R&D, by industry—by location of expenditure:  
proportions—2007–08 and 2008–09(a)

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Overseas	Total expenditure on R&D
	%	%	%	%	%	%	%	%	%	%
2008–09										
Agriculture, forestry & fishing	22.7	7.1	20.3	7.4	28.2	11.8	np	—	np	100.0
Mining	16.4	1.3	15.2	5.9	59.2	0.5	1.5	—	0.1	100.0
Manufacturing	25.5	37.4	10.9	6.8	13.4	1.3	np	np	3.5	100.0
Electricity, gas, water & waste services	26.0	32.9	18.0	4.5	13.9	np	—	np	np	100.0
Construction	22.8	23.6	40.2	3.6	9.5	0.1	np	np	0.1	100.0
Wholesale trade	39.8	40.2	7.9	3.9	5.3	np	np	0.5	2.1	100.0
Retail trade	23.8	57.2	5.1	5.3	6.9	np	np	—	1.2	100.0
Accommodation & food services	4.8	33.5	29.5	np	np	np	np	—	np	100.0
Transport, postal & warehousing	26.6	39.1	19.5	5.8	6.5	np	np	np	—	100.0
Information media & telecommunications	35.6	np	3.2	1.3	0.7	np	—	0.2	0.1	100.0
Financial & insurance services	72.2	18.7	3.0	3.0	1.9	np	—	np	1.1	100.0
Rental, hiring & real estate services	27.0	59.6	6.0	np	4.6	—	—	—	np	100.0
Professional, scientific & technical services	30.6	24.7	20.3	7.3	8.8	0.8	0.1	2.2	5.1	100.0
Administrative & support services	46.8	30.4	9.7	8.4	3.4	—	np	np	np	100.0
Public administration & safety	58.9	np	—	np	np	np	np	—	—	100.0
Education & training	44.1	17.5	24.5	np	7.5	np	—	—	np	100.0
Health care & social assistance	51.5	35.9	4.4	0.9	6.5	—	—	—	0.7	100.0
Arts & recreation services	29.1	31.0	28.9	np	—	np	—	np	np	100.0
Other services	24.6	34.4	18.3	14.9	6.7	np	—	np	0.9	100.0
<b>Total</b>	<b>30.9</b>	<b>24.5</b>	<b>13.8</b>	<b>5.5</b>	<b>21.5</b>	<b>0.8</b>	<b>0.6</b>	<b>0.6</b>	<b>2.0</b>	<b>100.0</b>
2007–08 (a)										
Agriculture, forestry & fishing	23.3	5.4	17.3	11.5	23.8	14.6	3.3	—	0.8	100.0
Mining	18.8	5.2	16.8	7.3	50.1	0.6	1.1	np	np	100.0
Manufacturing	25.3	39.4	9.4	8.8	12.0	1.1	np	np	2.6	100.0
Electricity, gas, water & waste services	43.6	14.2	19.8	4.7	10.7	np	—	np	0.4	100.0
Construction	21.5	22.7	43.5	7.3	4.1	np	np	np	np	100.0
Wholesale trade	40.1	37.0	9.1	5.2	6.8	0.2	np	np	1.2	100.0
Retail trade	31.3	49.2	7.3	5.1	5.5	np	0.3	np	0.8	100.0
Accommodation & food services	np	np	30.8	np	np	np	np	—	np	100.0
Transport, postal & warehousing	27.9	43.9	17.3	3.5	np	np	—	np	np	100.0
Information media & telecommunications	28.8	59.6	4.8	2.4	2.6	np	—	np	0.4	100.0
Financial & insurance services	61.4	23.2	4.8	1.4	8.4	—	—	np	np	100.0
Rental, hiring & real estate services	26.1	50.0	8.3	np	8.8	np	—	—	—	100.0
Professional, scientific & technical services	31.8	25.1	19.9	5.2	9.6	1.0	0.1	2.6	4.5	100.0
Administrative & support services	47.7	38.5	8.7	np	3.4	—	np	np	np	100.0
Public administration & safety	49.8	np	—	—	np	np	—	—	np	100.0
Education & training	51.3	14.9	np	np	np	—	—	np	np	100.0
Health care & social assistance	46.8	35.8	8.9	2.5	5.3	np	—	—	np	100.0
Arts & recreation services	np	np	np	np	—	—	—	np	np	100.0
Other services	27.1	44.6	10.9	11.9	4.0	np	—	—	np	100.0
<b>Total</b>	<b>29.8</b>	<b>27.4</b>	<b>14.0</b>	<b>6.3</b>	<b>18.5</b>	<b>0.9</b>	<b>0.5</b>	<b>0.7</b>	<b>1.7</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)

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(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS EXPENDITURE ON R&D, by industry—by type of activity—2007–08 and 2008–09(a)

	<i>Pure basic research</i>	<i>Strategic basic research</i>	<i>Applied research</i>	<i>Experimental development</i>	<i>Total expenditure on R&amp;D</i>
	\$'000	\$'000	\$'000	\$'000	\$'000
2008–09					
Agriculture, forestry & fishing	1 601	7 888	62 082	74 748	146 319
Mining	4 857	170 309	1 837 470	2 230 138	4 242 774
Manufacturing	27 313	234 407	1 242 969	2 843 751	4 348 440
Electricity, gas, water & waste services	1 454	23 127	153 756	166 061	344 398
Construction	1 836	21 721	253 594	604 847	881 998
Wholesale trade	5 473	24 995	236 611	574 856	841 935
Retail trade	329	4 832	40 671	42 524	88 356
Accommodation & food services	—	—	2 808	23 974	26 782
Transport, postal & warehousing	1 003	6 556	62 081	164 538	234 178
Information media & telecommunications	1 032	23 493	75 788	728 552	828 865
Financial & insurance services	3 400	144 036	533 840	1 358 817	2 040 093
Rental, hiring & real estate services	488	2 217	14 116	62 870	79 691
Professional, scientific & technical services	28 596	183 724	1 074 010	1 224 000	2 510 330
Administrative & support services	1 167	2 986	29 262	25 185	58 600
Public administration & safety	—	np	5 415	np	9 135
Education & training	np	np	2 674	6 461	9 956
Health care & social assistance	7 810	9 572	34 492	23 034	74 908
Arts & recreation services	np	7 818	10 646	np	32 826
Other services	1 077	3 513	19 880	34 423	58 893
<b>Total</b>	<b>87 908</b>	<b>872 290</b>	<b>5 692 165</b>	<b>10 206 114</b>	<b>16 858 477</b>
2007–08 (a)					
Agriculture, forestry & fishing	1 092	11 749	49 712	56 274	118 827
Mining	8 435	175 159	1 327 605	1 871 962	3 383 161
Manufacturing	25 693	218 202	1 151 260	2 978 403	4 373 558
Electricity, gas, water & waste services	831	13 496	99 859	119 081	233 267
Construction	3 673	14 990	160 018	561 785	740 466
Wholesale trade	3 143	26 850	231 005	579 569	840 568
Retail trade	1 085	10 371	23 907	29 976	65 338
Accommodation & food services	—	—	1 020	16 112	17 132
Transport, postal & warehousing	386	21 212	74 146	125 426	221 170
Information media & telecommunications	1 043	20 496	150 268	642 693	814 501
Financial & insurance services	2 242	39 036	489 589	922 578	1 453 445
Rental, hiring & real estate services	651	2 837	19 303	46 651	69 442
Professional, scientific & technical services	23 997	162 123	942 076	1 186 340	2 314 536
Administrative & support services	619	3 168	43 596	63 386	110 769
Public administration & safety	—	np	2 463	np	5 328
Education & training	np	np	1 635	2 754	5 205
Health care & social assistance	1 934	7 482	27 790	19 500	56 706
Arts & recreation services	np	np	8 450	np	26 661
Other services	372	3 203	13 481	39 848	56 904
<b>Total</b>	<b>75 257</b>	<b>733 578</b>	<b>4 817 183</b>	<b>9 280 967</b>	<b>14 906 984</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.



	<i>Pure basic research</i>	<i>Strategic basic research</i>	<i>Applied research</i>	<i>Experimental development</i>	<i>Total expenditure on R&amp;D</i>
	%	%	%	%	%
2008–09					
Agriculture, forestry & fishing	1.1	5.4	42.4	51.1	100.0
Mining	0.1	4.0	43.3	52.6	100.0
Manufacturing	0.6	5.4	28.6	65.4	100.0
Electricity, gas, water & waste services	0.4	6.7	44.6	48.2	100.0
Construction	0.2	2.5	28.8	68.6	100.0
Wholesale trade	0.7	3.0	28.1	68.3	100.0
Retail trade	0.4	5.5	46.0	48.1	100.0
Accommodation & food services	—	—	10.5	89.5	100.0
Transport, postal & warehousing	0.4	2.8	26.5	70.3	100.0
Information media & telecommunications	0.1	2.8	9.1	87.9	100.0
Financial & insurance services	0.2	7.1	26.2	66.6	100.0
Rental, hiring & real estate services	0.6	2.8	17.7	78.9	100.0
Professional, scientific & technical services	1.1	7.3	42.8	48.8	100.0
Administrative & support services	2.0	5.1	49.9	43.0	100.0
Public administration & safety	—	np	59.3	np	100.0
Education & training	np	np	26.9	64.9	100.0
Health care & social assistance	10.4	12.8	46.0	30.7	100.0
Arts & recreation services	np	23.8	32.4	np	100.0
Other services	1.8	6.0	33.8	58.5	100.0
<b>Total</b>	<b>0.5</b>	<b>5.2</b>	<b>33.8</b>	<b>60.5</b>	<b>100.0</b>

2007–08 (a)					
Agriculture, forestry & fishing	0.9	9.9	41.8	47.4	100.0
Mining	0.2	5.2	39.2	55.3	100.0
Manufacturing	0.6	5.0	26.3	68.1	100.0
Electricity, gas, water & waste services	0.4	5.8	42.8	51.0	100.0
Construction	0.5	2.0	21.6	75.9	100.0
Wholesale trade	0.4	3.2	27.5	68.9	100.0
Retail trade	1.7	15.9	36.6	45.9	100.0
Accommodation & food services	—	—	6.0	94.0	100.0
Transport, postal & warehousing	0.2	9.6	33.5	56.7	100.0
Information media & telecommunications	0.1	2.5	18.4	78.9	100.0
Financial & insurance services	0.2	2.7	33.7	63.5	100.0
Rental, hiring & real estate services	0.9	4.1	27.8	67.2	100.0
Professional, scientific & technical services	1.0	7.0	40.7	51.3	100.0
Administrative & support services	0.6	2.9	39.4	57.2	100.0
Public administration & safety	—	np	46.2	np	100.0
Education & training	np	np	31.4	52.9	100.0
Health care & social assistance	3.4	13.2	49.0	34.4	100.0
Arts & recreation services	np	np	31.7	np	100.0
Other services	0.7	5.6	23.7	70.0	100.0
<b>Total</b>	<b>0.5</b>	<b>4.9</b>	<b>32.3</b>	<b>62.3</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)  
 np not available for publication but included in totals  
 where applicable, unless otherwise indicated

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS EXPENDITURE ON R&D, by field of research(a): values and proportions—2007–08 and 2008–09(b)

	EXPENDITURE ON R&D		PROPORTION OF TOTAL EXPENDITURE ON R&D	
	2007–08(b)	2008–09	2007–08(b)	2008–09
	\$'000	\$'000	%	%
Mathematical sciences	19 008	24 327	0.1	0.1
Physical sciences	28 976	19 221	0.2	0.1
Chemical sciences	227 566	273 379	1.5	1.6
Earth sciences	211 030	196 425	1.4	1.2
Environmental sciences	127 048	171 767	0.9	1.0
Biological sciences	99 843	73 342	0.7	0.4
Agricultural & veterinary sciences	329 550	361 604	2.2	2.1
Information & computing sciences	3 741 091	4 407 485	25.1	26.1
Engineering	8 252 917	9 118 212	55.4	54.1
Technology	718 139	807 491	4.8	4.8
Medical & health sciences	849 637	938 374	5.7	5.6
Built environment & design	190 233	319 252	1.3	1.9
Education	7 928	12 768	0.1	0.1
Economics	12 737	12 229	0.1	0.1
Commerce, management, tourism & services	78 639	100 862	0.5	0.6
Studies in human society	np	np	np	np
Psychology & cognitive sciences	2 646	4 088	—	—
Law & legal studies	1 416	5 199	—	—
Studies in creative arts & writing	6 151	9 448	—	0.1
Language, communication & culture	1 471	1 627	—	—
History & archaeology	np	np	np	np
<b>Total</b>	<b>14 906 984</b>	<b>16 858 477</b>	<b>100.0</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Based on the 2008 edition of the ANZSRC. See Explanatory Notes 26 and 27 for further details.

(b) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS EXPENDITURE ON R&D, by socio-economic objective(a): values and proportions—2007–08 and 2008–09(b)

	EXPENDITURE ON R&D		PROPORTION OF TOTAL EXPENDITURE ON R&D	
	2007–08(b)	2008–09	2007–08(b)	2008–09
	\$'000	\$'000	%	%
<b>Defence</b>	286 795	259 388	1.9	1.5
<b>Economic development</b>				
Plant production & plant primary products	178 789	168 542	1.2	1.0
Animal production & animal primary products	108 400	126 310	0.7	0.7
Mineral resources (excl. energy resources)	2 205 801	2 640 399	14.8	15.7
Energy	2 039 919	2 582 057	13.7	15.3
Manufacturing	4 575 763	4 495 071	30.7	26.7
Construction	896 198	1 066 697	6.0	6.3
Transport	382 242	423 477	2.6	2.5
Information & communication services	1 928 312	2 035 500	12.9	12.1
Commercial services & tourism	1 690 369	2 341 944	11.3	13.9
Economic framework	31 427	32 687	0.2	0.2
<i>Total</i>	<i>14 037 219</i>	<i>15 912 682</i>	<i>94.2</i>	<i>94.4</i>
<b>Society</b>				
Health	402 174	436 844	2.7	2.6
Education & training	25 675	37 855	0.2	0.2
Law, politics & community services	13 144	12 076	0.1	0.1
Cultural understanding	13 527	15 111	0.1	0.1
<i>Total</i>	<i>454 521</i>	<i>501 885</i>	<i>3.0</i>	<i>3.0</i>
<b>Environment</b>	123 709	174 920	0.8	1.0
<b>Expanding Knowledge</b>	4 739	9 602	—	0.1
<b>Total</b>	<b>14 906 984</b>	<b>16 858 477</b>	<b>100.0</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)

(a) Based on the 2008 edition of the ANZSRC. See Explanatory Notes 26 and 27 for further details.

(b) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

	HUMAN RESOURCES DEVOTED TO R&D			PROPORTION OF TOTAL HUMAN RESOURCES DEVOTED TO R&D		
	2006–07(a)	2007–08(a)	2008–09	2006–07(a)	2007–08(a)	2008–09
	PYE	PYE	PYE	%	%	%
<b>Employment size</b>						
0–4 persons	1 329	1 436	1 673	2.9	2.8	3.1
5–19 persons	5 922	6 428	6 815	12.7	12.6	12.7
20–199 persons	12 787	13 737	13 548	27.5	27.0	25.3
200 or more persons	26 423	29 262	31 521	56.9	57.5	58.9
<b>Type of resource</b>						
Researchers	24 771	25 910	26 941	53.3	50.9	50.3
Technicians	14 821	16 646	17 561	31.9	32.7	32.8
Other staff	6 869	8 306	9 054	14.8	16.3	16.9
<b>Total human resources devoted to R&amp;D</b>	<b>46 462</b>	<b>50 863</b>	<b>53 556</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

(a) 2006–07 and 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

	HUMAN RESOURCES DEVOTED TO R&D			PROPORTION OF TOTAL HUMAN RESOURCES DEVOTED TO R&D		
	2006–07(a)	2007–08(a)	2008–09	2006–07(a)	2007–08(a)	2008–09
	PYE	PYE	PYE	%	%	%
Agriculture, forestry & fishing	516	570	615	1.1	1.1	1.1
Mining	2 897	3 589	4 625	6.2	7.1	8.6
Manufacturing	17 527	18 385	17 181	37.7	36.1	32.1
Electricity, gas, water & waste services	472	483	643	1.0	1.0	1.2
Construction	1 174	1 929	2 421	2.5	3.8	4.5
Wholesale trade	3 556	3 686	3 637	7.7	7.2	6.8
Retail trade	508	448	423	1.1	0.9	0.8
Accommodation & food services	np	67	139	np	0.1	0.3
Transport, postal & warehousing	603	595	575	1.3	1.2	1.1
Information media & telecommunications	1 846	1 812	1 736	4.0	3.6	3.2
Financial & insurance services	2 913	3 752	5 525	6.3	7.4	10.3
Rental, hiring & real estate services	183	288	284	0.4	0.6	0.5
Professional, scientific & technical services	13 154	13 938	14 155	28.3	27.4	26.4
Administrative & support services	377	523	358	0.8	1.0	0.7
Public administration & safety	np	34	47	np	0.1	0.1
Education & training	66	38	80	0.1	0.1	0.1
Health care & social assistance	273	296	620	0.6	0.6	1.2
Arts & recreation services	48	119	166	0.1	0.2	0.3
Other services	278	310	328	0.6	0.6	0.6
<b>Total</b>	<b>46 462</b>	<b>50 863</b>	<b>53 556</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2006–07 and 2008–09 data have been revised. See the Revisions section of the Technical Note for details.

	0–4 persons	5–19 persons	20–199 persons	200 or more persons	Total human resources devoted to R&D
	PYE	PYE	PYE	PYE	PYE
2008–09					
Agriculture, forestry & fishing	34	101	280	199	615
Mining	25	197	483	3 920	4 625
Manufacturing	296	1 205	4 593	11 087	17 181
Electricity, gas, water & waste services	13	63	166	401	643
Construction	26	181	370	1 844	2 421
Wholesale trade	89	409	944	2 195	3 637
Retail trade	34	135	112	141	423
Accommodation & food services	5	7	42	85	139
Transport, postal & warehousing	13	38	54	470	575
Information media & telecommunications	90	198	315	1 134	1 736
Financial & insurance services	36	139	331	5 019	5 525
Rental, hiring & real estate services	44	40	117	84	284
Professional, scientific & technical services	869	3 741	5 301	4 243	14 155
Administrative & support services	19	99	101	139	358
Public administration & safety	np	16	16	np	47
Education & training	np	47	7	np	80
Health care & social assistance	15	70	84	451	620
Arts & recreation services	np	15	65	np	166
Other services	np	115	167	np	328
<b>Total</b>	<b>1 673</b>	<b>6 815</b>	<b>13 548</b>	<b>31 521</b>	<b>53 556</b>

2007–08 (a)					
Agriculture, forestry & fishing	33	95	288	154	570
Mining	30	98	681	2 779	3 589
Manufacturing	300	1 226	4 545	12 314	18 385
Electricity, gas, water & waste services	19	39	135	290	483
Construction	28	143	321	1 437	1 929
Wholesale trade	66	404	819	2 397	3 686
Retail trade	33	131	130	154	448
Accommodation & food services	np	—	np	46	67
Transport, postal & warehousing	10	37	85	463	595
Information media & telecommunications	43	178	366	1 226	1 812
Financial & insurance services	40	129	227	3 357	3 752
Rental, hiring & real estate services	35	70	89	94	288
Professional, scientific & technical services	729	3 633	5 564	4 012	13 938
Administrative & support services	14	82	69	358	523
Public administration & safety	np	np	np	np	34
Education & training	8	19	11	—	38
Health care & social assistance	14	31	135	117	296
Arts & recreation services	np	np	77	np	119
Other services	np	100	169	np	310
<b>Total</b>	<b>1 436</b>	<b>6 428</b>	<b>13 737</b>	<b>29 262</b>	<b>50 863</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS HUMAN RESOURCES DEVOTED TO R&D, by industry—by employment size:  
proportions—2007–08 and 2008–09(a)

	0–4 persons	5–19 persons	20–199 persons	200 or more persons	Total human resources devoted to R&D
	%	%	%	%	%
2008–09					
Agriculture, forestry & fishing	5.5	16.5	45.6	32.4	100.0
Mining	0.5	4.3	10.4	84.8	100.0
Manufacturing	1.7	7.0	26.7	64.5	100.0
Electricity, gas, water & waste services	2.0	9.8	25.8	62.4	100.0
Construction	1.1	7.5	15.3	76.2	100.0
Wholesale trade	2.4	11.2	26.0	60.4	100.0
Retail trade	8.1	32.0	26.5	33.3	100.0
Accommodation & food services	3.9	5.1	30.4	60.7	100.0
Transport, postal & warehousing	2.3	6.7	9.4	81.6	100.0
Information media & telecommunications	5.2	11.4	18.1	65.3	100.0
Financial & insurance services	0.7	2.5	6.0	90.8	100.0
Rental, hiring & real estate services	15.4	13.9	41.1	29.6	100.0
Professional, scientific & technical services	6.1	26.4	37.5	30.0	100.0
Administrative & support services	5.4	27.7	28.2	38.8	100.0
Public administration & safety	np	34.7	33.0	np	100.0
Education & training	np	59.0	8.6	np	100.0
Health care & social assistance	2.4	11.3	13.6	72.7	100.0
Arts & recreation services	np	8.7	38.8	np	100.0
Other services	np	35.0	51.1	np	100.0
<b>Total</b>	<b>3.1</b>	<b>12.7</b>	<b>25.3</b>	<b>58.9</b>	<b>100.0</b>

2007–08 (a)					
Agriculture, forestry & fishing	5.8	16.7	50.5	27.0	100.0
Mining	0.8	2.7	19.0	77.5	100.0
Manufacturing	1.6	6.7	24.7	67.0	100.0
Electricity, gas, water & waste services	3.9	8.1	28.0	60.0	100.0
Construction	1.4	7.4	16.6	74.5	100.0
Wholesale trade	1.8	10.9	22.2	65.0	100.0
Retail trade	7.5	29.3	28.9	34.3	100.0
Accommodation & food services	np	—	np	69.6	100.0
Transport, postal & warehousing	1.7	6.2	14.3	77.8	100.0
Information media & telecommunications	2.4	9.8	20.2	67.6	100.0
Financial & insurance services	1.1	3.4	6.1	89.5	100.0
Rental, hiring & real estate services	12.2	24.2	30.8	32.8	100.0
Professional, scientific & technical services	5.2	26.1	39.9	28.8	100.0
Administrative & support services	2.6	15.7	13.1	68.5	100.0
Public administration & safety	np	np	np	np	100.0
Education & training	21.5	48.7	29.8	—	100.0
Health care & social assistance	4.6	10.5	45.5	39.5	100.0
Arts & recreation services	np	np	64.1	np	100.0
Other services	np	32.3	54.3	np	100.0
<b>Total</b>	<b>2.8</b>	<b>12.6</b>	<b>27.0</b>	<b>57.5</b>	<b>100.0</b>

— nil or rounded to zero (including null cells)

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

BUSINESS HUMAN RESOURCES DEVOTED TO R&D, by industry—by type of resource—2007–08 and 2008–09(a)

	Researchers	Technicians	Other staff	Total human resources devoted to R&D
	PYE	PYE	PYE	PYE
2008–09				
Agriculture, forestry & fishing	186	229	201	615
Mining	1 240	1 883	1 502	4 625
Manufacturing	8 415	5 411	3 356	17 181
Electricity, gas, water & waste services	236	258	149	643
Construction	944	1 008	469	2 421
Wholesale trade	1 929	1 236	472	3 637
Retail trade	159	184	80	423
Accommodation & food services	89	33	18	139
Transport, postal & warehousing	257	230	88	575
Information media & telecommunications	1 084	497	156	1 736
Financial & insurance services	3 569	1 348	608	5 525
Rental, hiring & real estate services	157	85	42	284
Professional, scientific & technical services	8 049	4 480	1 626	14 155
Administrative & support services	128	167	63	358
Public administration & safety	14	26	6	47
Education & training	45	29	7	80
Health care & social assistance	200	294	126	620
Arts & recreation services	55	72	39	166
Other services	187	92	48	328
<b>Total</b>	<b>26 941</b>	<b>17 561</b>	<b>9 054</b>	<b>53 556</b>
2007–08 (a)				
Agriculture, forestry & fishing	167	244	159	570
Mining	1 047	1 381	1 161	3 589
Manufacturing	8 996	5 941	3 449	18 385
Electricity, gas, water & waste services	223	171	90	483
Construction	751	837	340	1 929
Wholesale trade	1 945	1 213	527	3 686
Retail trade	172	212	64	448
Accommodation & food services	24	36	7	67
Transport, postal & warehousing	240	219	136	595
Information media & telecommunications	971	630	211	1 812
Financial & insurance services	2 466	944	342	3 752
Rental, hiring & real estate services	136	112	40	288
Professional, scientific & technical services	8 097	4 254	1 587	13 938
Administrative & support services	283	180	61	523
Public administration & safety	10	23	2	34
Education & training	22	12	4	38
Health care & social assistance	150	104	42	296
Arts & recreation services	39	44	36	119
Other services	172	88	49	310
<b>Total</b>	<b>25 910</b>	<b>16 646</b>	<b>8 306</b>	<b>50 863</b>

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.



BUSINESS HUMAN RESOURCES DEVOTED TO R&D, by industry—by type of resource:  
**proportions—2007–08 and 2008–09(a)**

	Researchers	Technicians	Other staff	Total human resources devoted to R&D
	%	%	%	%
2008–09				
Agriculture, forestry & fishing	30.2	37.2	32.6	100.0
Mining	26.8	40.7	32.5	100.0
Manufacturing	49.0	31.5	19.5	100.0
Electricity, gas, water & waste services	36.7	40.1	23.1	100.0
Construction	39.0	41.7	19.4	100.0
Wholesale trade	53.0	34.0	13.0	100.0
Retail trade	37.6	43.5	18.9	100.0
Accommodation & food services	63.7	23.3	12.9	100.0
Transport, postal & warehousing	44.7	40.1	15.3	100.0
Information media & telecommunications	62.4	28.6	9.0	100.0
Financial & insurance services	64.6	24.4	11.0	100.0
Rental, hiring & real estate services	55.3	30.0	14.8	100.0
Professional, scientific & technical services	56.9	31.7	11.5	100.0
Administrative & support services	35.8	46.6	17.6	100.0
Public administration & safety	30.6	55.7	13.6	100.0
Education & training	56.0	35.6	8.3	100.0
Health care & social assistance	32.2	47.4	20.3	100.0
Arts & recreation services	33.1	43.4	23.5	100.0
Other services	57.1	28.2	14.7	100.0
<b>Total</b>	<b>50.3</b>	<b>32.8</b>	<b>16.9</b>	<b>100.0</b>
2007–08 (a)				
Agriculture, forestry & fishing	29.3	42.8	27.9	100.0
Mining	29.2	38.5	32.3	100.0
Manufacturing	48.9	32.3	18.8	100.0
Electricity, gas, water & waste services	46.1	35.3	18.6	100.0
Construction	38.9	43.4	17.6	100.0
Wholesale trade	52.8	32.9	14.3	100.0
Retail trade	38.4	47.4	14.2	100.0
Accommodation & food services	36.6	53.5	9.9	100.0
Transport, postal & warehousing	40.4	36.8	22.8	100.0
Information media & telecommunications	53.6	34.8	11.6	100.0
Financial & insurance services	65.7	25.2	9.1	100.0
Rental, hiring & real estate services	47.1	38.9	14.0	100.0
Professional, scientific & technical services	58.1	30.5	11.4	100.0
Administrative & support services	54.1	34.3	11.6	100.0
Public administration & safety	27.9	66.0	6.2	100.0
Education & training	57.1	32.5	10.5	100.0
Health care & social assistance	50.6	35.1	14.2	100.0
Arts & recreation services	32.7	37.0	30.2	100.0
Other services	55.5	28.5	15.9	100.0
<b>Total</b>	<b>50.9</b>	<b>32.7</b>	<b>16.3</b>	<b>100.0</b>

(a) 2007–08 data have been revised. See the Revisions section of the Technical Note for details.

## EXPLANATORY NOTES

### INTRODUCTION

**1** The statistics presented in this release have been compiled from data collected from businesses in the *Survey of Research and Experimental Development (R&D)* in respect of the year ended 30 June 2009.

**2** The survey was conducted by the Australian Bureau of Statistics (ABS) via mail questionnaire and achieved a response rate of 95%.

### DEFINITION OF R&D

**3** R&D as collected by the ABS is defined in accordance with the Organisation for Economic Co-operation and Development (OECD) standard as 'creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications'. Although outside the economic boundary of R&D as defined by the OECD, R&D performed overseas by Australian businesses is included in these data.

**4** For a more comprehensive interpretation of the definition of R&D, see the OECD publication *The Measurement of Scientific and Technological Activities: Proposed Standard Practice for Surveys of Research and Experimental Development - Frascati Manual 2002*.

**5** Data providers report and self-classify R&D survey information based on their interpretation of OECD/ABS definitions. The ABS makes every effort to ensure correct and consistent interpretation and reporting of these data and applies consistent processing methodologies. See also the Reliability of statistics and Revisions sections of the Technical Note.

### FRAME

**6** The source of the frame for the *Survey of R&D, Businesses* is the ABS Business Register (ABSBR). The ABSBR records information about statistical units and is used to create the frames for most ABS economic collections.

#### *Statistical units defined on the ABSBR*

**7** Statistical units are those entities from which statistics are collected, or about which statistics are compiled. In ABS economic statistics, the statistical unit is generally the business.

**8** The ABS uses an economic statistics units model on the ABSBR to describe the characteristics of businesses, and the structural relationships between related businesses. Within large, complex and diverse businesses, the units model is also used to define reporting units that can provide data to the ABS at suitable levels of detail.

**9** The units model allocates businesses to one of two sub-populations. The vast majority of businesses are in what is called the Australian Taxation Office (ATO) Maintained Population (ATOMP), while the remaining businesses are in the ABS Maintained Population (ABSMP). Together these two sub-populations make up the ABSBR population.

**10** Most businesses and organisations in Australia need to obtain an Australian Business Number (ABN) and are then included on the whole-of-government register of businesses, the Australian Business Register (ABR), which is maintained by the ATO. Most of these businesses have simple structures; therefore, the unit registered for an ABN will satisfy ABS statistical requirements. For these businesses, the ABS has aligned its statistical units structure with the ABN unit. The businesses with simple structures constitute the ATOMP, and the ABN unit is used as the statistical unit for ABS economic collections.

**11** For the population of businesses where the ABN is not suitable for ABS statistical requirements, the ABS maintains its own units structure through direct contact with each business. These businesses constitute the ABSMP. This population consists typically of large, complex and diverse businesses. For businesses in the ABSMP, statistical units comprise the Enterprise Group, the Enterprise and the Type of Activity Unit (TAU). The range of activities across the Enterprise Group can be very diverse. The TAU represents a

## EXPLANATORY NOTES *continued*

Statistical units defined on the ABSBR *continued*

grouping of one or more business entities within the Enterprise that cover all of the operations within an industry subdivision and for which a basic set of financial production and employment data can be reported.

**12** The current economic statistics units model was introduced into the ABS in mid 2002, to better use the information available as a result of The New Tax System (TNTS). For more information please refer to the *Information Paper: Improvements in ABS Economic Statistics [Arising from The New Tax System], 2002* (cat.no.1372.0).

**13** Statistical units for the *Survey of R&D, Businesses* consist of ABNs for the ATOMP and TAUs from the ABSMP, except for a small number of cases where unit splitting occurs.

Unit splitting

**14** In cases where a TAU is deemed to have significant activities applying to more than one industry subdivision, the TAU is split for statistical purposes and the 'TAU splits' become the statistical units. TAU splits were implemented in the R&D survey for the first time in the 2005–06 cycle, and were applied for previous cycles according to the revision rules outlined in the Technical Note.

SCOPE AND COVERAGE

**15** The *Survey of R&D, Businesses* aims to be a complete enumeration of businesses within the Australian business sector (i.e. all businesses and the private non-profit institutions mainly serving them) with intramural expenditure on R&D of \$100,000 or more during the reference period.

**16** Intramural expenditure is defined as expenditure for R&D performed by the statistical unit regardless of the source of funds. Expenditures made outside the statistical unit but in support of intramural R&D are included; for example, payments for analytical work, engineering or specialised services which form part of an R&D project performed by the statistical unit. R&D funded by the statistical unit but performed wholly by another on their behalf (extramural R&D) is excluded. For further information, refer to the OECD *Frascati Manual 2002*.

**17** The ABS identifies businesses for inclusion in the survey if the business:

- reported expenditure on R&D in previous surveys;
- applied for an AusIndustry administered R&D Tax Concession and/or grant for industry R&D;
- indicated expenditure on R&D of \$100,000 or more in the reference year, via a coverage questionnaire; or
- were identified through other sources such as newspapers, journals, research compendia, etc. as likely to have expenditure on R&D.

Changes to survey scope

**18** Prior to the 2005–06 cycle, the *Survey of R&D, Businesses* included all Australian businesses with intramural expenditure on R&D (regardless of the expenditure value) with the exception of businesses mainly engaged in agriculture, forestry and fishing. From 2005–06, the survey scope was adjusted to:

- include businesses classified to Division A (Agriculture, forestry and fishing) of the Australian and New Zealand Standard Industrial Classification (ANZSIC); and
- exclude businesses with expenditure on R&D of less than \$100,000 in the reference period (i.e. introduction of an expenditure based scope cut-off).

**19** Strong growth in the number of businesses performing R&D and the inclusion of Division A resulted in the implementation of the scope cut-off. This approach was taken to enable continued release of detailed R&D statistics within available resources.

**20** The impact of the two scope changes on key survey estimates was relatively minor due to the changes largely 'offsetting' each other; as such, estimates for previous reference periods were not recalculated (or backcast) based on the new scope.

## EXPLANATORY NOTES *continued*

*Changes to survey scope  
continued*

**21** It is estimated the scope cut-off has resulted in total business expenditure on R&D being understated by less than 1%. Users should, however, exercise caution when comparing estimates for businesses with 0–4 employees prior to 2005–06, as the majority of units with expenditure below \$100,000 fell into this employment size range. Most affected were estimates for human resources devoted to R&D.

INDUSTRY CLASSIFICATION

**22** The statistics in this release are classified to industry in accordance with the *Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006* (cat. no. 1292.0).

**23** Each ABN unit/TAU is classified by the ABS to the industry in which it mainly operates. For the purposes of the *Survey of R&D, Businesses*, in accordance with standards set out in the *OECD Frascati Manual 2002*, for cases where an Enterprise Group sets up a dedicated research unit, that unit is classified to the predominant industry of the group rather than to Scientific research services (ANZSIC 6910).

EMPLOYMENT SIZE

**24** For output purposes, businesses are classified to employment size ranges based on data reported in the survey. Businesses were asked to report the number of persons working for the business during the last pay period in June 2009.

LOCATION OF EXPENDITURE

**25** Location of expenditure relates to the region(s) in which the business reported having performed R&D during the reference period. This may not be the head office location of the business.

TYPE OF ACTIVITY (TOA),  
FIELD OF RESEARCH (FOR)  
AND SOCIO-ECONOMIC  
OBJECTIVE (SEO)

**26** TOA, FOR and SEO statistics presented in this release have been collected and compiled based on the *Australian and New Zealand Standard Research Classification (ANZSRC), 2008* (cat. no. 1297.0).

**27** Some businesses may have experienced difficulty in classifying their R&D projects to TOA, FOR and SEO. See also the Reliability of statistics and Revisions sections of the Technical Note.

GROSS DOMESTIC PRODUCT  
(GDP) AND GROSS STATE  
PRODUCT (GSP)

**28** The most recent GDP and GSP values available were used to calculate the R&D expenditure/GDP and R&D expenditure/GSP ratios presented in this issue. These values are referenced in the tables below.

### GROSS DOMESTIC PRODUCT, current prices

	2004–05	2005–06	2006–07	2007–08	2008–09
	\$m	\$m	\$m	\$m	\$m
Gross Domestic Product	925 864	1 000 787	1 091 327	1 181 750	1 254 651

Source: *Australian National Accounts: National Income, Expenditure and Product, Jun 2010* (cat. no. 5206.0), released 1 September 2010.

### GROSS STATE PRODUCT, current prices

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
2006–07	352 162	261 200	209 173	71 725	138 688	21 249	14 339	22 791
2007–08	381 720	281 504	223 450	76 905	155 449	22 261	15 879	24 582
2008–09	402 334	291 637	243 901	78 986	169 950	23 176	17 168	25 969

Source: *Australian National Accounts, State Accounts, 2008–09* (cat. no. 5220.0). Reissue released December 2009.

## EXPLANATORY NOTES *continued*

- GROSS DOMESTIC PRODUCT (GDP) AND GROSS STATE PRODUCT (GSP) *continued***
- 29** GDP is estimated by the ABS according to the recently updated international standards *System of National accounts, 2008* (2008 SNA) and is not directly comparable to GDP from countries where these standards have not been applied.
- CHAIN VOLUME MEASURES**
- 30** The chain volume measures appearing in this release are annually reweighted chain Laspeyres indexes referenced to the current price values in a chosen reference year (currently 2008–09). They can be thought of as current price values re-expressed in (i.e. based on) the prices of the previous year and linked together to form continuous time series. They are formed in a multi-stage process of which the major steps are described in Section 15 of the *Information Paper: Australian National Accounts, Introduction of Chain Volume Measures and Price Indexes* (cat. no. 5248.0).
- R&D deflators*
- 31** With the implementation of 2008 SNA, deflators used to calculate the chain volume measure of expenditure on R&D were revised to: better capture changes in the unit value of labour used in the production of R&D services; and to increase and refine the number of products included in the deflators. The revised deflators have been used for Business R&D statistics from the 2007–08 survey cycle.
- UPCOMING RELEASES**
- 32** Upcoming ABS releases of R&D statistics include:  
*Research and Experimental Development, All Sector Summary, Australia, 2008–09* (cat. no. 8112.0), to be released 11 October 2010.
- OTHER RELATED RELEASES**
- 33** Users may also wish to refer to the following ABS releases:  
*Australian and New Zealand Standard Research Classification (ANZSRC), 2008* (cat. no. 1297.0)  
*Innovation in Australian Business, 2008–09* (cat. no. 8158.0)  
*Microdata: Business Longitudinal Database, Expanded CURF, Australia, 2004–05, 2005–06 and 2006–07* (cat. no. 8168.0.55.001)  
*Research and Experimental Development, Government and Private Non-Profit Organisations, Australia, 2008–09* (cat. no. 8109.0)  
*Research and Experimental Development, Higher Education Organisations, Australia, 2008* (cat. no. 8111.0)  
*Selected Characteristics of Australian Business, 2008–09* (cat. no. 8167.0)  
*Summary of IT Use and Innovation in Australian Business, 2008–09* (cat. no. 8166.0)
- 34** Relevant OECD publications include:  
*Main Science and Technology Indicators 2010/1*  
*The Measurement of Scientific and Technological Activities: Proposed Standard Practice for Surveys of Research and Experimental Development - Frascati Manual 2002*
- ABS WEBSITE**
- 35** Other information relating to R&D and Innovation (including data cubes in spreadsheet format) can be found on the ABS website <[www.abs.gov.au](http://www.abs.gov.au)>. See the Innovation, Science and Technology theme page under Topics @ a Glance/Industry.
- ROUNDING**
- 36** Where figures have been rounded, discrepancies may occur between the sum of the component items and totals.

## TECHNICAL NOTE DATA QUALITY

### NON-SAMPLING ERROR

**1** Non-sampling errors may arise as a result of errors in the reporting, recording or processing of data. These errors can be introduced through inadequacies in the questionnaire, treatment of non-response, inaccurate reporting by data providers, errors in the application of survey procedures, incorrect recording of answers and errors in data capture and processing.

**2** The extent to which non-sampling error affects the results is difficult to measure. Every effort is made to minimise non-sampling error by careful design and testing of the collection instrument, the use of efficient operating procedures and systems, and the use of appropriate methodologies.

#### *Reliability of statistics*

**3** When interpreting the statistics in this release, the reliability and comparability of the estimates may be affected by the following specific non-sampling errors:

- Many businesses provided estimates due to a lack of separately recorded data on R&D activity.
- Some businesses may not have reported data as per the definition of R&D used in this survey. This is potentially a result of slight differences in the survey definition of R&D and those used in: industry R&D schemes for the allocation of grants; and the AusIndustry administered R&D Tax Concession scheme for tax deductibility for specific R&D activities.
- Data were self-classified by businesses to Type of activity, Field of research and Socio-economic objective at the time of reporting. Some businesses may have experienced difficulty in classifying their R&D projects. The ABS makes every effort to ensure correct and consistent interpretation and reporting of these data by applying consistent processing methodologies.
- The estimation method for R&D related overhead costs varied across businesses and reference periods.

#### *Treatment of non-response*

**4** For non-responding businesses that had reported R&D activity in the 2007–08 survey, data for 2008–09 was imputed using the previous cycle data.

**5** For non-responding businesses that did not report R&D activity in the previous cycle, data were not imputed. These businesses are not expected to have significant levels of R&D activity.

### REVISIONS

**6** Revisions to previous cycle data occur on discovery of:

- errors in reported data, typically a result of the specific non-sampling errors outlined in the Reliability of statistics section above; and
- newly identified R&D performers who indicated they had significant levels of R&D in earlier years (details are collected and used to revise previously released estimates).

**7** Revisions are applied up to two cycles prior to the current cycle, but only where the impact on:

- R&D expenditure is equal to \$5 million or more;
- Human resources devoted to R&D is equal to 25 PYE or more; or
- Published level data is of proportional significance.

**8** In processing 2008–09 data, revisions were applied to 2006–07 and 2007–08 estimates. Users are advised to refer to the most recently released data cubes, as revisions must be taken into consideration when interpreting results, particularly when comparing estimates over time.

## GLOSSARY

<b>Applied research</b>	Original work undertaken primarily to acquire new knowledge with a specific application in view. It is undertaken either to determine possible uses for the findings of basic research or to determine new ways of achieving some specific and predetermined objectives.
<b>Capital expenditure</b>	Expenditure on the acquisition of fixed tangible assets such as land, buildings, vehicles, plant, machinery and equipment which is attributable to R&D activity.
<b>Current expenditure</b>	Expenditure on direct labour costs, materials, fuels, rent and hiring, repairs and maintenance, data processing etc. and the proportion of expenditure on general services and overheads which is attributable to R&D activity.
<b>Commonwealth government funds</b>	As a source of R&D funding, this includes: R&D grants; and payments for R&D projects carried out on contract for Commonwealth government organisations.
<b>Employees</b>	Persons who worked for a private or public employer and received pay for the reference period in the form of wages or salaries, a commission while also receiving a retainer, tips, piece rates or payment in kind. Persons who operated their own incorporated business with or without hiring employees are also included as employees.
<b>Experimental development</b>	Systematic work, using existing knowledge gained from research or practical experience, which is directed to producing new materials, products, devices, policies, behaviours or outlooks; to installing new processes, systems and services; or to improving substantially those already produced or installed.
<b>Field of research (FOR)</b>	The FOR classification allows R&D activity to be categorised according to the methodology used in the R&D, rather than the activity of the unit performing the R&D or the purpose of the R&D. The FOR reflects the field in which the research was undertaken and is based on the processes and techniques used.
<b>Human resources devoted to R&amp;D</b>	The effort of researchers, technicians and other staff directly involved with R&D activity. Overhead staff (e.g. administrative and general service employees such as personnel officers, janitors, etc.) whose work indirectly supports R&D, are excluded.
<b>Joint business/government funds</b>	As a source of R&D funding, this includes R&D funding raised via industry levies.
<b>Labour costs</b>	Expenditure relating to: wages and salaries; overtime earnings; penalty payments; shift allowances; employer contributions into superannuation; fringe benefits and payroll taxes; severance, termination and redundancy payments; workers' compensation premiums/costs; provisions for employee entitlements; salaries and fees of directors and executives; retainers and commissions of persons who received a retainer; bonuses; annual and other types of paid leave.
<b>Location</b>	The region(s) in which the business performed the R&D. This may not be the head office location of the business.
<b>Other business funds</b>	As a source of R&D funding, this includes payments for R&D projects carried out on contract for other businesses located in Australia. Transfers from related entities are only included if they specifically relate to R&D being undertaken (by the reporting business) on behalf of the related entity.
<b>Other current expenditure</b>	All other non-staff expenditures including: materials, fuels and other inputs; rent, leasing and hiring expenses; repair and maintenance expenses; payments to outside organisations for use of specialised testing facilities or for analytical work, engineering or other specialised services in support of R&D projects carried out by the business; commission and consultant expenses for research projects carried out by the business (except direct labour costs); software for own account produced as part of R&D; and the proportion of expenditure on general services and overheads which is attributable to R&D activity.

## GLOSSARY *continued*

<b>Other staff</b>	Skilled and unskilled craftpersons, secretarial and clerical staff directly associated with R&D activity.
<b>Overseas funds</b>	As a source of R&D funding, this includes grants and payments for R&D projects carried out on contract for overseas organisations. Transfers from related entities are only included if they specifically relate to R&D being undertaken (by the reporting business) on behalf of the related entity.
<b>Overseas location</b>	Includes R&D performed overseas, but controlled by the Australian business. This includes analytical work, engineering or other specialised services performed by another organisation which are part of an R&D project being performed by the Australian business.
<b>Own funds</b>	Includes all funding for R&D sourced from the business itself, including: equity; borrowings; retained earnings; and non-R&D specific transfers from related entities.
<b>Person years of effort</b>	One person year of effort is equal to a full time employee whose time is wholly devoted to R&D for a whole year.
<b>Pure basic research</b>	Experimental and theoretical work undertaken to acquire new knowledge without looking for long term benefits other than the advancement of knowledge.
<b>R&amp;D activity</b>	Systematic investigation or experimentation involving innovation or technical risk, the outcome of which is new knowledge, with or without a specific practical application, or new or improved products, processes, materials, devices or services. R&D activity extends to modifications to existing products/processes. R&D activity ceases and pre-production begins when work is no longer experimental.
<b>Researchers</b>	Those involved with the conception and/or development of new products/processes (e.g. executives and directors involved in the planning or management of scientific and technical aspects of R&D projects; and software developers/programmers). They exclude executives and directors concerned primarily with budgets and human resources rather than project content.
<b>Socio-economic objective (SEO)</b>	The SEO classification allows R&D activity to be categorised according to the intended purpose or outcome of the research, rather than the processes or techniques used in order to achieve this objective. The SEO reflects the dominant beneficiary or beneficiaries of the research output.
<b>State and local government funds</b>	As a source of R&D funding, this includes: R&D grants; and payments for R&D projects carried out on contract for state and local government organisations.
<b>Strategic basic research</b>	Experimental and theoretical work undertaken to acquire new knowledge directed into specified broad areas into the expectation of practical discoveries. It provides the broad base of knowledge necessary for the solution of recognised practical problems.
<b>Technicians</b>	Those performing technical tasks in support of R&D activity, normally under the direction and supervision of a researcher. These tasks include preparation of experiments, taking records, preparation of charts and graphs, etc.
<b>Type of activity</b>	This classification allows R&D activity to be categorised according to the type of research effort, namely, pure basic research, strategic basic research, applied research and experimental development.









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