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Industrial R&D Statistics by Region 1994 to 2003

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Highlights

- ▶ Business enterprise R&D expenditures as a percentage in Canada rose from .99% in 1994 to 1.10% 2003 see table below.

| Business enterprise R&D (BERD), by region, 1994 -2003 | | | | | | | | | | |
|---|---------------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| | millions of dollars | | | | | | | | | |
| Atlantic Canada | 125 | 131 | 133 | 107 | 121 | 122 | 132 | 162 | 157 | 147 |
| Quebec | 2,056 | 2,277 | 2,393 | 2,519 | 2,764 | 3,047 | 3,642 | 4,155 | 4,057 | 4,115 |
| Ontario | 4,112 | 4,320 | 4,256 | 4,833 | 5,394 | 5,799 | 6,903 | 7,944 | 7,048 | 7,066 |
| Manitoba and Saskatchewan | 172 | 169 | 152 | 171 | 176 | 227 | 208 | 260 | 251 | 209 |
| Alberta | 509 | 491 | 524 | 546 | 618 | 491 | 591 | 718 | 767 | 779 |
| British Columbia | 591 | 602 | 538 | 564 | 608 | 714 | 973 | 1,080 | 1,086 | 1,075 |
| Total | 7,564 | 7,990 | 7,996 | 8,739 | 9,681 | 10,398 | 12,449 | 14,319 | 13,366 | 13,390 |
| BERD to Gross Domestic Product¹ ratio, by region, 1994-2003 | | | | | | | | | | |
| | percentage | | | | | | | | | |
| Atlantic Canada | 0.27 | 0.27 | 0.27 | 0.21 | 0.23 | 0.21 | 0.21 | 0.25 | 0.23 | 0.20 |
| Quebec | 1.21 | 1.28 | 1.33 | 1.34 | 1.41 | 1.45 | 1.62 | 1.80 | 1.66 | 1.62 |
| Ontario | 1.32 | 1.31 | 1.26 | 1.34 | 1.43 | 1.42 | 1.57 | 1.75 | 1.47 | 1.43 |
| Manitoba and Saskatchewan | 0.34 | 0.32 | 0.26 | 0.29 | 0.29 | 0.36 | 0.31 | 0.38 | 0.35 | 0.28 |
| Alberta | 0.58 | 0.53 | 0.53 | 0.51 | 0.58 | 0.42 | 0.41 | 0.47 | 0.51 | 0.46 |
| British Columbia | 0.59 | 0.57 | 0.49 | 0.49 | 0.53 | 0.59 | 0.74 | 0.81 | 0.79 | 0.74 |
| Total | 0.99 | 0.99 | 0.96 | 0.99 | 1.06 | 1.06 | 1.16 | 1.30 | 1.16 | 1.10 |

1. GDP Source: CANSIM table 384-0002

- ▶ Each province or region experienced growth in R&D spending during the ten year period. Quebec led by doubling its R&D expenditures from two billion to four billion. British Columbia recorded an 82.1% increase and Ontario, the largest R&D performer, showed a 71.8% increase. Manitoba and Saskatchewan, shown together in this report, grew by 21.4% while the Atlantic region increased by 17.3%. Despite increased industrial R&D spending over the period the BERD to GDP ratio declined in Atlantic Canada and Manitoba and Saskatchewan.
- ▶ Two regions, Quebec and British Columbia, increased their share of total industrial R&D spending. Industrial R&D performed in Quebec and British Columbia represented 27.2% and 7.8% respectively in 1994, compared to 31% and 8.0% in 2003. All other regions decreased, Atlantic Canada from 1.7% in 1994 to 1.1% in 2003, from 54.3% to 52.8% for Ontario, from 2.3% to 1.6% for Manitoba and Saskatchewan and from 6.7% to 5.8% in Alberta.
- ▶ Growth of full-time R&D personnel in Canada was 47.4% during the period 1994-2003. Quebec once again led this growth with a 73.8% increase, followed by Ontario at 43.6% and British Columbia at 29.4%. Both Manitoba and Saskatchewan and the Atlantic Region recorded declines in their R&D personnel of -5.6% and -1.5% respectively. Ontario accounted for almost half (49%) of all full-time-equivalent R&D personnel in both 1994 and 2003.
- ▶ Despite consistent increases in R&D spending and personnel, the number of companies performing R&D fell between 1994 and 1997. In February 1994, a change was made to the income Tax Act which set an 18 month time limit for claiming a deduction under the Scientific Research and Experimental Development program (SR&ED)¹. As a consequence, an increased flow of SR&ED claims were submitted in 1994 and 1995. The decline observed is mainly explained by a return to levels of claims existing prior to 1994. A continuous growth can be observed since 1997. Overall growth between 1994 and 2002 was 10%, but was not spread equally among the provinces or regions. Only Quebec, at 44%, and Ontario with 8%, recorded increases in the nine year period. In fact, Quebec was the only province which showed consistent growth over the entire period. Counts for companies with less than 200 employees increased from 1994 to 2002 while counts declined in companies with 200 or more employees. Only companies spending less than twenty five thousand dollars a year on R&D saw a decline in the number of performers between 1994 and 2002.
- ▶ Counts for 2003 are excluded in Tables 1 through 16 because SR&ED tax credit applications continue to be processed by CRA at the time of printing. Although data values were projected for these outstanding firms, estimations of the number of R&D performers are especially sensitive when allocated to the provinces. Expenditures and personnel data, while also projected, should not be influenced to the same degree as the counts. Nevertheless this data should be considered preliminary.

1. "Before February 22, 1994, a taxpayer had to file a T661 form with the return of income for a taxation year in order to make a deduction under subsection 37(1) for that year in respect of SR&ED expenditures incurred at any time. Therefore, a capital expenditure that met certain requirements could be deducted under the subsection 37(1) pool even if it was acquired several years before the deduction was made." (Canada Revenue Agency, Application Policy number SR&ED 95-05).

Foreword

The purpose of this working paper is to provide regional data on business enterprise research and development (R&D) activity. The degree of details is strictly limited due to confidentiality restraints imposed by the Statistics Act. Data are presented on R&D expenditures and personnel, by country of control, data source, employment size and R&D size.

Innovation is essential to economic progress. Properly applied in developing new products and services, innovation may also conserve resources, preserve the environment, and add to our quality of life. The innovation process involves a number of elements concerned with the generation, dissemination and application of new knowledge: R&D to provide new ideas; education and information services to develop the required personnel; and design, engineering and marketing services to incorporate the new ideas into the production and distribution systems.

R&D statistics, therefore, measure only part of the effort necessary for innovation. However, R&D is at the heart of the innovation process.

While R&D is also carried out by other sectors, such as governments and universities, industrial R&D is most clearly linked to technological innovation and, hence, economic growth. Canada does not, of course, rely only on domestic R&D for new ideas and innovation. A great deal of information comes from abroad in the form of information embodied in new machinery and equipment, in the minds of scientists and engineers, in scientific and technical journals, and in designs, drawings, tooling and manufacturing specifications. Some data are presented on the acquisition of R&D from abroad, but much of the flow of technological information cannot be measured.

In many ways it is more efficient to acquire the results of R&D performed by others since the cost of securing such information is usually less than the cost of duplicating it. However, some domestic R&D is necessary not only to ensure that new inventions are appropriate to Canadian production and marketing conditions, but also to ensure that foreign R&D can be properly assimilated, i.e., understood and adapted. It also provides Canadian firms with a better bargaining position for exchanges of technological information. Domestic performance of R&D is therefore necessary, even if we wish only to be effective imitators and adapters.

Statistics Canada has collected data on R&D in Canadian industry for 49 years. Maintaining the continuity and comparability of these data over time is of considerable importance. This working paper is a summary of provincial industrial R&D activities. It presents historical and current statistical information on industrial research and development activities for the years 1994 to 2003.

In 1999 a new methodology was introduced for estimating R&D expenditures for the smaller companies in the business sector. The new approach substitutes the use of administrative data from the Canada Revenue Agency (CRA), in place of survey data, for any firm funding or performing less than \$1 million worth of R&D. This enabled the elimination of over 10,000 survey form mail-outs, thus reducing survey reporting burden.

Firms that perform or fund R&D in Canada apply for a tax credit to the CRA, under the Scientific Research and Experimental Development (SR&ED) program. Under the current regulations, the filing must take place within 18 months of the expenditure. Once the claims are submitted, they are processed and forwarded to Statistics Canada. This means that data can arrive up to two years after the expenditure was made.

For this reason, modifications were made for our estimation system beginning with the 2003 survey. Data for outstanding administrative records have been estimated thereby reducing the previous understatement of R&D and in particular R&D employment counts. The new estimation system has projected data for more than 2,000 firms. The estimation of these records is also reflected in the 2004 planned expenditures and the 2005 spending intentions. Counts are not presented for the 2003 year, as they will be highly affected by future revisions.

This report was prepared by Robert Schellings, Subject Matter Manager of Science, Innovation and Electronic Information Division.

Counts of industrial R&D performers, by region

| Table 1. Counts of industrial R&D performers by data source, Canada and the regions | | | | | | | | | | |
|--|--------------|---------------|---------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Region / Data source | | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f |
| Canada ¹ | Survey | 1,147 | 1,260 | 977 | 938 | 915 | 982 | 1,118 | 1,269 | 1,253 |
| | CRA | 9,985 | 9,511 | 8,828 | 8,711 | 8,869 | 8,985 | 9,731 | 10,818 | 11,019 |
| | Total | 11,132 | 10,771 | 9,805 | 9,649 | 9,784 | 9,967 | 10,849 | 12,087 | 12,272 |
| Atlantic Canada | Survey | 76 | 81 | 65 | 71 | 78 | 87 | 106 | 103 | 91 |
| | CRA | 387 | 437 | 475 | 444 | 458 | 417 | 396 | 371 | 354 |
| | Total | 463 | 518 | 540 | 515 | 536 | 504 | 502 | 474 | 445 |
| Quebec | Survey | 364 | 390 | 328 | 308 | 322 | 343 | 399 | 435 | 438 |
| | CRA | 3,354 | 3,420 | 3,536 | 3,540 | 3,694 | 3,819 | 4,194 | 4,665 | 4,906 |
| | Total | 3,718 | 3,810 | 3,864 | 3,848 | 4,016 | 4,162 | 4,593 | 5,100 | 5,344 |
| Ontario | Survey | 608 | 665 | 523 | 522 | 519 | 545 | 615 | 701 | 698 |
| | CRA | 3,484 | 3,210 | 2,845 | 2,889 | 2,926 | 2,950 | 3,197 | 3,694 | 3,741 |
| | Total | 4,092 | 3,875 | 3,368 | 3,411 | 3,445 | 3,495 | 3,812 | 4,395 | 4,439 |
| Manitoba and Saskatchewan | Survey | 102 | 100 | 87 | 89 | 87 | 90 | 96 | 100 | 96 |
| | CRA | 441 | 382 | 318 | 312 | 310 | 309 | 336 | 343 | 346 |
| | Total | 543 | 482 | 405 | 401 | 397 | 399 | 432 | 443 | 442 |
| Alberta | Survey | 118 | 126 | 109 | 99 | 92 | 101 | 98 | 113 | 113 |
| | CRA | 875 | 808 | 702 | 656 | 660 | 665 | 711 | 741 | 630 |
| | Total | 993 | 934 | 811 | 755 | 752 | 766 | 809 | 854 | 743 |
| British Columbia | Survey | 170 | 163 | 120 | 123 | 126 | 143 | 164 | 163 | 156 |
| | CRA | 1,403 | 1,231 | 945 | 865 | 814 | 821 | 894 | 1,001 | 1,041 |
| | Total | 1,573 | 1,394 | 1,065 | 988 | 940 | 964 | 1,058 | 1,164 | 1,197 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

| Table 2. Counts of industrial R&D performers by country of control, Canada and the regions | | | | | | | | | | |
|---|--------------|---------------|---------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Region / Country of control | | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f |
| Canada ¹ | Canada | 10,573 | 10,208 | 9,272 | 9,109 | 9,316 | 9,542 | 10,414 | 11,644 | 11,884 |
| | Foreign | 559 | 563 | 533 | 540 | 468 | 425 | 435 | 443 | 388 |
| | Total | 11,132 | 10,771 | 9,805 | 9,649 | 9,784 | 9,967 | 10,849 | 12,087 | 12,272 |
| Atlantic Canada | Canada | 433 | 483 | 507 | 470 | 482 | 445 | 429 | 404 | 384 |
| | Foreign | 30 | 35 | 33 | 45 | 54 | 59 | 73 | 70 | 61 |
| | Total | 463 | 518 | 540 | 515 | 536 | 504 | 502 | 474 | 445 |
| Quebec | Canada | 3,551 | 3,641 | 3,671 | 3,662 | 3,848 | 4,009 | 4,412 | 4,915 | 5,196 |
| | Foreign | 167 | 169 | 193 | 186 | 168 | 153 | 181 | 185 | 148 |
| | Total | 3,718 | 3,810 | 3,864 | 3,848 | 4,016 | 4,162 | 4,593 | 5,100 | 5,344 |
| Ontario | Canada | 3,739 | 3,535 | 3,081 | 3,102 | 3,187 | 3,249 | 3,573 | 4,159 | 4,205 |
| | Foreign | 353 | 340 | 287 | 309 | 258 | 246 | 239 | 236 | 234 |
| | Total | 4,092 | 3,875 | 3,368 | 3,411 | 3,445 | 3,495 | 3,812 | 4,395 | 4,439 |
| Manitoba and Saskatchewan | Canada | 488 | 428 | 354 | 352 | 351 | 347 | 378 | 386 | 387 |
| | Foreign | 55 | 54 | 51 | 49 | 46 | 52 | 54 | 57 | 55 |
| | Total | 543 | 482 | 405 | 401 | 397 | 399 | 432 | 443 | 442 |
| Alberta | Canada | 945 | 881 | 757 | 700 | 694 | 712 | 759 | 806 | 695 |
| | Foreign | 48 | 53 | 54 | 55 | 58 | 54 | 50 | 48 | 48 |
| | Total | 993 | 934 | 811 | 755 | 752 | 766 | 809 | 854 | 743 |
| British Columbia | Canada | 1,497 | 1,328 | 1,006 | 934 | 882 | 910 | 996 | 1,106 | 1,152 |
| | Foreign | 76 | 66 | 59 | 54 | 58 | 54 | 62 | 58 | 45 |
| | Total | 1,573 | 1,394 | 1,065 | 988 | 940 | 964 | 1,058 | 1,164 | 1,197 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

Table 3. Counts of industrial R&D performers by employment size – Canada¹

| Employment size ² | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f |
|------------------------------|-----------------------|---------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | number of enterprises | | | | | | | | |
| 0 – 9 | 4,812 | 4,472 | 4,133 | 3,937 | 3,816 | 3,802 | 4,185 | 4,782 | 5,177 |
| 10 – 19 | 1,857 | 1,799 | 1,594 | 1,577 | 1,643 | 1,717 | 1,842 | 2,106 | 2,168 |
| 20 – 49 | 1,915 | 1,909 | 1,776 | 1,724 | 1,835 | 1,949 | 2,109 | 2,337 | 2,281 |
| 50 – 99 | 970 | 993 | 882 | 962 | 1,031 | 977 | 1,076 | 1,196 | 1,125 |
| 100 – 199 | 644 | 644 | 570 | 586 | 581 | 663 | 738 | 773 | 708 |
| 200 – 499 | 445 | 466 | 429 | 453 | 471 | 464 | 482 | 475 | 441 |
| 500 – 999 | 222 | 204 | 158 | 171 | 157 | 158 | 177 | 176 | 155 |
| 1,000 – 1,999 | 124 | 135 | 132 | 121 | 122 | 121 | 127 | 131 | 114 |
| 2,000 – 4,999 | 93 | 101 | 88 | 75 | 80 | 73 | 72 | 70 | 60 |
| > 4,999 | 50 | 48 | 43 | 43 | 48 | 43 | 41 | 41 | 43 |
| Total | 11,132 | 10,771 | 9,805 | 9,649 | 9,784 | 9,967 | 10,849 | 12,087 | 12,272 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

2. Employment size is based on total employment in Canada.

Table 4. Counts of industrial R&D performers by employment size – Atlantic Canada

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f |
|------------------------------|--------------------------|------------|------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | number of establishments | | | | | | | | |
| 0 – 9 | 209 | 241 | 277 | 240 | 232 | 205 | 192 | 192 | 191 |
| 10 – 19 | 66 | 72 | 72 | 73 | 71 | 80 | 71 | 54 | 53 |
| 20 – 49 | 63 | 71 | 74 | 72 | 83 | 67 | 72 | 61 | 55 |
| 50 – 99 | 33 | 45 | 37 | 51 | 50 | 39 | 37 | 41 | 36 |
| 100 – 199 | 24 | 20 | 25 | 20 | 25 | 35 | 39 | 30 | 28 |
| 200 – 499 | 19 | 26 | 21 | 29 | 29 | 26 | 19 | 24 | 25 |
| 500 – 999 | 22 | 15 | 9 | 12 | 18 | 24 | 38 | 37 | 24 |
| 1,000 – 1,999 | 11 | 9 | 11 | 10 | 11 | 10 | 16 | 14 | 14 |
| 2,000 – 4,999 | 15 | 17 | 12 | 6 | 12 | 15 | 15 | 18 | 11 |
| > 4,999 | 1 | 2 | 2 | 2 | 5 | 3 | 3 | 3 | 8 |
| Total | 463 | 518 | 540 | 515 | 536 | 504 | 502 | 474 | 445 |

1. Employment size is based on total employment in Canada.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

Table 5. Counts of industrial R&D performers by employment size – Quebec

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f |
|------------------------------|--------------------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | number of establishments | | | | | | | | |
| 0 – 9 | 1,381 | 1,443 | 1,492 | 1,490 | 1,444 | 1,435 | 1,620 | 1,817 | 2,070 |
| 10 – 19 | 663 | 680 | 672 | 668 | 731 | 749 | 812 | 975 | 1,029 |
| 20 – 49 | 710 | 722 | 753 | 708 | 783 | 904 | 974 | 1,048 | 1,085 |
| 50 – 99 | 374 | 381 | 380 | 403 | 455 | 439 | 487 | 544 | 510 |
| 100 – 199 | 243 | 245 | 244 | 239 | 249 | 291 | 325 | 339 | 324 |
| 200 – 499 | 165 | 166 | 165 | 177 | 187 | 182 | 194 | 194 | 163 |
| 500 – 999 | 79 | 73 | 56 | 65 | 59 | 61 | 74 | 77 | 65 |
| 1,000 – 1,999 | 49 | 48 | 50 | 49 | 47 | 46 | 47 | 44 | 43 |
| 2,000 – 4,999 | 26 | 28 | 30 | 23 | 29 | 23 | 30 | 36 | 27 |
| > 4,999 | 28 | 24 | 22 | 26 | 32 | 32 | 30 | 26 | 28 |
| Total | 3,718 | 3,810 | 3,864 | 3,848 | 4,016 | 4,162 | 4,593 | 5,100 | 5,344 |

1. Employment size is based on total employment in Canada.

Table 6. Counts of industrial R&D performers by employment size – Ontario

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f |
|------------------------------|--------------------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | number of establishments | | | | | | | | |
| 0 – 9 | 1,616 | 1,426 | 1,290 | 1,251 | 1,249 | 1,232 | 1,376 | 1,651 | 1,803 |
| 10 – 19 | 672 | 648 | 539 | 536 | 506 | 563 | 588 | 714 | 712 |
| 20 – 49 | 681 | 673 | 589 | 604 | 648 | 647 | 694 | 838 | 790 |
| 50 – 99 | 377 | 370 | 297 | 356 | 368 | 362 | 407 | 418 | 416 |
| 100 – 199 | 274 | 272 | 232 | 240 | 234 | 267 | 299 | 324 | 273 |
| 200 – 499 | 202 | 213 | 192 | 198 | 203 | 192 | 211 | 201 | 209 |
| 500 – 999 | 103 | 98 | 77 | 90 | 79 | 81 | 92 | 91 | 87 |
| 1,000 – 1,999 | 68 | 74 | 68 | 58 | 63 | 63 | 66 | 77 | 69 |
| 2,000 – 4,999 | 51 | 57 | 45 | 41 | 50 | 47 | 41 | 40 | 39 |
| > 4,999 | 48 | 44 | 39 | 37 | 45 | 41 | 38 | 41 | 41 |
| Total | 4,092 | 3,875 | 3,368 | 3,411 | 3,445 | 3,495 | 3,812 | 4,395 | 4,439 |

1. Employment size is based on total employment in Canada.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

| Table 7. Counts of industrial R&D performers by employment size – Manitoba & Saskatchewan | | | | | | | | | |
|--|--------------------------|------------|------------|------------|------------|------------|-------------------|-------------------|-------------------|
| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r |
| person-years | number of establishments | | | | | | | | |
| 0 – 9 | 217 | 177 | 144 | 122 | 122 | 115 | 135 | 140 | 154 |
| 10 – 19 | 78 | 64 | 46 | 48 | 58 | 49 | 56 | 57 | 57 |
| 20 – 49 | 86 | 88 | 76 | 78 | 64 | 72 | 74 | 83 | 72 |
| 50 – 99 | 45 | 42 | 43 | 53 | 41 | 39 | 39 | 44 | 45 |
| 100 – 199 | 31 | 29 | 27 | 24 | 35 | 44 | 43 | 35 | 36 |
| 200 – 499 | 27 | 32 | 28 | 34 | 30 | 27 | 26 | 23 | 16 |
| 500 – 999 | 22 | 15 | 13 | 17 | 18 | 20 | 26 | 24 | 27 |
| 1,000 – 1,999 | 22 | 19 | 14 | 14 | 15 | 14 | 16 | 21 | 19 |
| 2,000 – 4,999 | 12 | 14 | 11 | 9 | 12 | 14 | 14 | 14 | 13 |
| > 4,999 | 3 | 2 | 3 | 2 | 2 | 5 | 3 | 2 | 3 |
| Total | 543 | 482 | 405 | 401 | 397 | 399 | 432 | 443 | 442 |

1. Employment size is based on total employment in Canada.

| Table 8. Counts of industrial R&D performers by employment size – Alberta | | | | | | | | | |
|--|--------------------------|------------|------------|------------|------------|------------|-------------------|-------------------|-------------------|
| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r |
| person-years | number of establishments | | | | | | | | |
| 0 – 9 | 535 | 467 | 415 | 365 | 335 | 379 | 391 | 437 | 380 |
| 10 – 19 | 133 | 132 | 102 | 100 | 122 | 113 | 125 | 126 | 115 |
| 20 – 49 | 140 | 130 | 115 | 115 | 109 | 110 | 124 | 107 | 99 |
| 50 – 99 | 57 | 68 | 56 | 60 | 57 | 39 | 49 | 64 | 40 |
| 100 – 199 | 42 | 40 | 36 | 41 | 44 | 40 | 39 | 40 | 35 |
| 200 – 499 | 27 | 38 | 29 | 31 | 35 | 31 | 33 | 30 | 28 |
| 500 – 999 | 19 | 14 | 22 | 15 | 17 | 19 | 20 | 21 | 14 |
| 1,000 – 1,999 | 19 | 22 | 14 | 14 | 16 | 20 | 12 | 12 | 14 |
| 2,000 – 4,999 | 14 | 17 | 15 | 9 | 12 | 10 | 11 | 11 | 12 |
| > 4,999 | 7 | 6 | 7 | 5 | 5 | 5 | 5 | 6 | 6 |
| Total | 993 | 934 | 811 | 755 | 752 | 766 | 809 | 854 | 743 |

1. Employment size is based on total employment in Canada.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

| Table 9. Counts of industrial R&D performers by employment size – British Columbia | | | | | | | | | |
|---|--------------------------|--------------|--------------|------------|------------|------------|-------------------|-------------------|-------------------|
| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r |
| person-years | number of establishments | | | | | | | | |
| 0 – 9 | 843 | 716 | 532 | 486 | 438 | 442 | 477 | 550 | 587 |
| 10 – 19 | 248 | 203 | 161 | 151 | 152 | 161 | 189 | 180 | 207 |
| 20 – 49 | 235 | 231 | 171 | 155 | 154 | 154 | 174 | 203 | 186 |
| 50 – 99 | 95 | 98 | 81 | 82 | 86 | 77 | 86 | 100 | 92 |
| 100 – 199 | 62 | 59 | 44 | 42 | 32 | 46 | 52 | 52 | 51 |
| 200 – 499 | 38 | 41 | 37 | 35 | 35 | 36 | 29 | 32 | 30 |
| 500 – 999 | 20 | 11 | 7 | 9 | 13 | 14 | 18 | 15 | 15 |
| 1,000 – 1,999 | 13 | 16 | 13 | 10 | 10 | 13 | 14 | 11 | 12 |
| 2,000 – 4,999 | 10 | 12 | 9 | 11 | 10 | 11 | 12 | 14 | 9 |
| > 4,999 | 9 | 7 | 10 | 7 | 10 | 10 | 7 | 7 | 8 |
| Total | 1,573 | 1,394 | 1,065 | 988 | 940 | 964 | 1,058 | 1,164 | 1,197 |

1. Employment size is based on total employment in Canada.

| Table 10. Counts of industrial R&D performers by size of R&D expenditures – Canada¹ | | | | | | | | | |
|---|-----------------------|---------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ² | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r |
| in thousands of \$ | number of enterprises | | | | | | | | |
| 0 – 24 | 2,787 | 2,603 | 2,446 | 2,387 | 2,131 | 2,031 | 1,982 | 2,047 | 2,094 |
| 25 – 49 | 1,818 | 1,728 | 1,690 | 1,599 | 1,699 | 1,659 | 1,694 | 1,866 | 1,948 |
| 50 – 99 | 1,956 | 1,893 | 1,753 | 1,765 | 1,814 | 1,808 | 2,037 | 2,277 | 2,389 |
| 100 – 199 | 1,766 | 1,670 | 1,454 | 1,483 | 1,565 | 1,625 | 1,885 | 2,115 | 2,182 |
| 200 – 399 | 1,195 | 1,190 | 1,015 | 964 | 1,044 | 1,163 | 1,272 | 1,492 | 1,411 |
| 400 – 999 | 853 | 871 | 630 | 639 | 708 | 791 | 975 | 1,107 | 1,077 |
| 1,000 – 1,999 | 331 | 364 | 357 | 337 | 326 | 366 | 402 | 467 | 456 |
| 2,000 – 9,999 | 322 | 342 | 343 | 354 | 374 | 394 | 453 | 524 | 510 |
| > 9,999 | 104 | 110 | 117 | 121 | 123 | 130 | 149 | 192 | 205 |
| Total | 11,132 | 10,771 | 9,805 | 9,649 | 9,784 | 9,967 | 10,849 | 12,087 | 12,272 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

2. Size of R&D is based on total R&D expenditures in Canada.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

Table 11. Counts of industrial R&D performers by size of R&D expenditures – Atlantic Canada

| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r |
|--------------------------|--------------------------|------------|------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| in thousands of \$ | number of establishments | | | | | | | | |
| 0 – 24 | 123 | 137 | 165 | 146 | 137 | 117 | 96 | 89 | 88 |
| 25 – 49 | 63 | 93 | 96 | 80 | 97 | 88 | 72 | 61 | 69 |
| 50 – 99 | 85 | 86 | 91 | 93 | 83 | 83 | 91 | 82 | 83 |
| 100 – 199 | 66 | 59 | 66 | 61 | 69 | 63 | 66 | 64 | 58 |
| 200 – 399 | 44 | 54 | 43 | 47 | 47 | 50 | 44 | 47 | 35 |
| 400 – 999 | 30 | 34 | 23 | 22 | 29 | 22 | 34 | 33 | 24 |
| 1,000 – 1,999 | 16 | 18 | 17 | 16 | 18 | 19 | 20 | 14 | 11 |
| 2,000 – 9,999 | 19 | 14 | 17 | 23 | 26 | 24 | 36 | 40 | 34 |
| > 9,999 | 17 | 23 | 22 | 27 | 30 | 38 | 43 | 44 | 43 |
| Total | 463 | 518 | 540 | 515 | 536 | 504 | 502 | 474 | 445 |

1. Size of R&D is based on total R&D expenditures in Canada.

Table 12. Counts of industrial R&D performers by size of R&D expenditures – Quebec

| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 ^r | 2002 ^r |
|--------------------------|--------------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|
| in thousands of \$ | number of establishments | | | | | | | | |
| 0 – 24 | 947 | 940 | 901 | 1,029 | 1,011 | 946 | 920 | 975 | 1,040 |
| 25 – 49 | 676 | 648 | 721 | 705 | 749 | 757 | 806 | 912 | 999 |
| 50 – 99 | 654 | 698 | 706 | 764 | 761 | 792 | 923 | 1,054 | 1,133 |
| 100 – 199 | 591 | 595 | 589 | 550 | 592 | 648 | 780 | 846 | 888 |
| 200 – 399 | 353 | 402 | 410 | 327 | 351 | 429 | 463 | 551 | 525 |
| 400 – 999 | 252 | 268 | 262 | 215 | 265 | 281 | 344 | 355 | 350 |
| 1,000 – 1,999 | 100 | 109 | 118 | 102 | 104 | 119 | 132 | 141 | 141 |
| 2,000 – 9,999 | 89 | 97 | 101 | 99 | 122 | 124 | 148 | 174 | 175 |
| > 9,999 | 56 | 53 | 56 | 57 | 61 | 66 | 77 | 92 | 93 |
| Total | 3,718 | 3,810 | 3,864 | 3,848 | 4,016 | 4,162 | 4,593 | 5,100 | 5,344 |

1. Size of R&D is based on total R&D expenditures in Canada.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

Table 13. Counts of industrial R&D performers by size of R&D expenditures – Ontario

| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r |
|--------------------------|--------------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|
| in thousands of \$ | number of establishments | | | | | | | | |
| 0 – 24 | 846 | 762 | 694 | 652 | 503 | 518 | 503 | 550 | 525 |
| 25 – 49 | 575 | 545 | 511 | 473 | 504 | 464 | 493 | 525 | 536 |
| 50 – 99 | 689 | 653 | 593 | 567 | 607 | 578 | 628 | 724 | 786 |
| 100 – 199 | 674 | 593 | 497 | 572 | 585 | 616 | 679 | 803 | 819 |
| 200 – 399 | 484 | 459 | 363 | 387 | 447 | 456 | 515 | 628 | 603 |
| 400 – 999 | 377 | 391 | 251 | 289 | 319 | 361 | 435 | 501 | 513 |
| 1,000 – 1,999 | 156 | 173 | 157 | 162 | 159 | 170 | 197 | 237 | 224 |
| 2,000 – 9,999 | 209 | 212 | 214 | 217 | 220 | 219 | 240 | 274 | 279 |
| > 9,999 | 82 | 87 | 88 | 92 | 101 | 113 | 122 | 153 | 154 |
| Total | 4,092 | 3,875 | 3,368 | 3,411 | 3,445 | 3,495 | 3,812 | 4,395 | 4,439 |

1. Size of R&D is based on total R&D expenditures in Canada.

Table 14. Counts of industrial R&D performers by size of R&D expenditures – Manitoba and Saskatchewan

| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 | 2000 ^r | 2001 ^r | 2002 ^r |
|--------------------------|--------------------------|------------|------------|-------------------|-------------------|------------|-------------------|-------------------|-------------------|
| in thousands of \$ | number of establishments | | | | | | | | |
| 0 – 24 | 151 | 133 | 136 | 102 | 94 | 90 | 90 | 80 | 79 |
| 25 – 49 | 81 | 74 | 50 | 67 | 62 | 63 | 52 | 66 | 61 |
| 50 – 99 | 81 | 66 | 49 | 46 | 64 | 59 | 81 | 63 | 72 |
| 100 – 199 | 63 | 56 | 47 | 62 | 52 | 48 | 59 | 66 | 73 |
| 200 – 399 | 54 | 47 | 31 | 23 | 31 | 38 | 38 | 44 | 32 |
| 400 – 999 | 36 | 26 | 14 | 19 | 15 | 17 | 23 | 32 | 32 |
| 1,000 – 1,999 | 18 | 24 | 21 | 22 | 16 | 13 | 15 | 18 | 17 |
| 2,000 – 9,999 | 42 | 36 | 33 | 35 | 40 | 38 | 39 | 38 | 36 |
| > 9,999 | 17 | 20 | 24 | 25 | 23 | 33 | 35 | 36 | 40 |
| Total | 543 | 482 | 405 | 401 | 397 | 399 | 432 | 443 | 442 |

1. Size of R&D is based on total R&D expenditures in Canada.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

| Table 15. Counts of industrial R&D performers by size of R&D expenditures – Alberta | | | | | | | | | |
|--|--------------------------|------------|------------|------------|------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f |
| in thousands of \$ | number of establishments | | | | | | | | |
| 0 – 24 | 286 | 261 | 239 | 190 | 179 | 168 | 160 | 153 | 152 |
| 25 – 49 | 156 | 153 | 127 | 128 | 117 | 131 | 124 | 145 | 87 |
| 50 – 99 | 166 | 138 | 123 | 128 | 124 | 126 | 142 | 134 | 130 |
| 100 – 199 | 133 | 142 | 119 | 103 | 120 | 103 | 132 | 149 | 127 |
| 200 – 399 | 102 | 90 | 74 | 75 | 87 | 96 | 98 | 92 | 82 |
| 400 – 999 | 63 | 59 | 33 | 40 | 40 | 51 | 64 | 75 | 57 |
| 1,000 – 1,999 | 29 | 35 | 36 | 28 | 24 | 28 | 18 | 30 | 29 |
| 2,000 – 9,999 | 39 | 32 | 32 | 38 | 35 | 35 | 43 | 42 | 40 |
| > 9,999 | 19 | 24 | 28 | 25 | 26 | 28 | 28 | 34 | 39 |
| Total | 993 | 934 | 811 | 755 | 752 | 766 | 809 | 854 | 743 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 16. Counts of industrial R&D performers by size of R&D expenditures – British Columbia | | | | | | | | | |
|---|--------------------------|--------------|--------------|------------|------------|------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f |
| in thousands of \$ | number of establishments | | | | | | | | |
| 0 – 24 | 413 | 355 | 308 | 267 | 207 | 192 | 213 | 200 | 209 |
| 25 – 49 | 258 | 212 | 184 | 145 | 169 | 156 | 146 | 156 | 196 |
| 50 – 99 | 278 | 249 | 188 | 167 | 173 | 168 | 173 | 220 | 185 |
| 100 – 199 | 239 | 225 | 136 | 133 | 144 | 147 | 169 | 187 | 218 |
| 200 – 399 | 165 | 150 | 97 | 106 | 80 | 96 | 117 | 130 | 136 |
| 400 – 999 | 115 | 106 | 48 | 59 | 50 | 73 | 87 | 117 | 104 |
| 1,000 – 1,999 | 38 | 33 | 38 | 33 | 34 | 42 | 44 | 41 | 42 |
| 2,000 – 9,999 | 44 | 39 | 37 | 46 | 51 | 56 | 73 | 71 | 60 |
| > 9,999 | 23 | 25 | 29 | 32 | 32 | 34 | 36 | 42 | 47 |
| Total | 1,573 | 1,394 | 1,065 | 988 | 940 | 964 | 1,058 | 1,164 | 1,197 |

1. Size of R&D is based on total R&D expenditures in Canada.

❖ Companies with multi-establishments are included in each applicable region. Therefore regional components will not add to Canada total.

Business enterprise R&D activities (BERD), by region

Table 17. BERD by data source – Canada and the regions

| Region / Data source | | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
|---------------------------|--------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | in millions of \$ | | | | | | | | | |
| Canada ¹ | Survey | 6,345.8 | 6,838.7 | 6,986.2 | 7,723.0 | 8,570.5 | 9,199.2 | 11,058.6 | 12,700.3 | 11,763.4 | 11,652.4 |
| | CRA | 1,221.4 | 1,151.8 | 1,009.7 | 1,016.4 | 1,111.6 | 1,200.4 | 1,391.0 | 1,619.9 | 1,603.1 | 1,738.8 |
| | Total | 7,567.2 | 7,990.5 | 7,996.0 | 8,739.5 | 9,682.1 | 10,399.7 | 12,449.6 | 14,320.2 | 13,366.5 | 13,391.1 |
| Atlantic Canada | Survey | 84.5 | 82.9 | 88.4 | 62.1 | 71.9 | 77.7 | 82.5 | 112.9 | 114.9 | 102.7 |
| | CRA | 40.8 | 48.3 | 44.4 | 44.6 | 49.1 | 44.0 | 49.6 | 49.5 | 41.8 | 44.2 |
| | Total | 125.2 | 131.2 | 132.8 | 106.7 | 121.0 | 121.6 | 132.1 | 162.4 | 156.7 | 146.9 |
| Quebec | Survey | 1,678.7 | 1,886.0 | 1,975.9 | 2,156.5 | 2,351.1 | 2,595.0 | 3,109.7 | 3,553.2 | 3,459.5 | 3,433.6 |
| | CRA | 377.5 | 390.6 | 417.6 | 362.2 | 412.9 | 451.8 | 532.3 | 601.5 | 597.2 | 681.2 |
| | Total | 2,056.2 | 2,276.6 | 2,393.4 | 2,518.7 | 2,764.0 | 3,046.8 | 3,641.9 | 4,154.7 | 4,056.7 | 4,114.8 |
| Ontario | Survey | 3,618.8 | 3,873.0 | 3,894.1 | 4,422.4 | 4,946.1 | 5,323.9 | 6,353.2 | 7,279.3 | 6,373.3 | 6,352.6 |
| | CRA | 492.8 | 446.8 | 361.8 | 410.4 | 448.1 | 474.9 | 550.0 | 665.1 | 674.3 | 713.1 |
| | Total | 4,111.6 | 4,319.8 | 4,255.9 | 4,832.8 | 5,394.2 | 5,798.9 | 6,903.2 | 7,944.4 | 7,047.6 | 7,065.7 |
| Manitoba and Saskatchewan | Survey | 125.8 | 130.1 | 123.9 | 139.7 | 142.7 | 190.3 | 169.8 | 214.5 | 203.1 | 167.1 |
| | CRA | 46.3 | 39.2 | 27.6 | 31.7 | 33.1 | 36.3 | 38.5 | 45.3 | 48.3 | 41.8 |
| | Total | 172.1 | 169.3 | 151.6 | 171.4 | 175.8 | 226.5 | 208.3 | 259.8 | 251.4 | 209.0 |
| Alberta | Survey | 409.1 | 401.3 | 457.2 | 475.8 | 539.9 | 406.0 | 493.3 | 612.6 | 679.5 | 693.7 |
| | CRA | 99.7 | 89.3 | 66.6 | 69.7 | 78.2 | 84.6 | 97.4 | 105.8 | 87.8 | 84.9 |
| | Total | 508.8 | 490.6 | 523.8 | 545.5 | 618.1 | 490.5 | 590.8 | 718.4 | 767.3 | 778.6 |
| British Columbia | Survey | 428.9 | 465.4 | 446.7 | 466.6 | 518.9 | 605.6 | 850.1 | 927.4 | 932.7 | 902.2 |
| | CRA | 161.7 | 136.8 | 91.4 | 97.2 | 89.5 | 108.1 | 122.7 | 152.4 | 153.7 | 173.2 |
| | Total | 590.6 | 602.3 | 538.1 | 563.9 | 608.3 | 713.7 | 972.8 | 1,079.7 | 1,086.4 | 1,075.4 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

Table 18. BERD by country of control – Canada and the regions

| Region / Country of control | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|-----------------------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | in millions of \$ | | | | | | | | | |
| Canada ¹ | 5,319.9 | 5,613.2 | 5,452.4 | 5,711.0 | 6,466.4 | 7,070.4 | 8,781.8 | 10,095.0 | 9,010.5 | 8,886.7 |
| Foreign | 2,247.3 | 2,377.3 | 2,543.6 | 3,028.4 | 3,215.7 | 3,329.3 | 3,667.8 | 4,225.2 | 4,356.0 | 4,504.4 |
| Total | 7,567.2 | 7,990.5 | 7,996.0 | 8,739.5 | 9,682.1 | 10,399.7 | 12,449.6 | 14,320.2 | 13,366.5 | 13,391.1 |
| Atlantic Canada | 112.1 | 116.8 | 118.7 | 87.9 | 93.9 | 96.2 | 97.7 | 97.7 | 104.1 | 96.4 |
| Foreign | 13.2 | 14.4 | 14.1 | 18.8 | 27.0 | 25.5 | 34.3 | 64.7 | 52.6 | 50.5 |
| Total | 125.2 | 131.2 | 132.8 | 106.7 | 121.0 | 121.6 | 132.1 | 162.4 | 156.7 | 146.9 |
| Quebec | 1,465.7 | 1,599.5 | 1,538.1 | 1,524.1 | 1,730.1 | 2,006.2 | 2,399.3 | 2,743.9 | 2,578.3 | 2,607.2 |
| Foreign | 590.5 | 677.1 | 855.4 | 994.7 | 1,033.9 | 1,040.6 | 1,242.6 | 1,410.8 | 1,478.4 | 1,507.6 |
| Total | 2,056.2 | 2,276.6 | 2,393.4 | 2,518.7 | 2,764.0 | 3,046.8 | 3,641.9 | 4,154.7 | 4,056.7 | 4,114.8 |
| Ontario | 2,755.5 | 3,007.2 | 2,919.7 | 3,187.9 | 3,588.5 | 3,809.6 | 4,845.9 | 5,660.3 | 4,757.5 | 4,723.1 |
| Foreign | 1,356.1 | 1,312.6 | 1,336.2 | 1,644.8 | 1,805.6 | 1,989.3 | 2,057.4 | 2,284.1 | 2,290.1 | 2,342.6 |
| Total | 4,111.6 | 4,319.8 | 4,255.9 | 4,832.8 | 5,394.2 | 5,798.9 | 6,903.2 | 7,944.4 | 7,047.6 | 7,065.7 |
| Manitoba and Saskatchewan | 132.4 | 128.0 | 123.6 | 125.5 | 134.5 | 178.3 | 161.0 | 198.3 | 184.7 | 156.7 |
| Foreign | 39.7 | 41.3 | 28.0 | 45.9 | 41.3 | 48.3 | 47.3 | 61.5 | 66.7 | 52.3 |
| Total | 172.1 | 169.3 | 151.6 | 171.4 | 175.8 | 226.5 | 208.3 | 259.8 | 251.4 | 209.0 |
| Alberta | 411.7 | 401.5 | 402.9 | 364.1 | 445.8 | 374.6 | 456.6 | 537.2 | 520.3 | 497.0 |
| Foreign | 97.1 | 89.1 | 120.9 | 181.4 | 172.2 | 115.9 | 134.1 | 181.2 | 247.0 | 281.6 |
| Total | 508.8 | 490.6 | 523.8 | 545.5 | 618.1 | 490.5 | 590.8 | 718.4 | 767.3 | 778.6 |
| British Columbia | 439.8 | 359.4 | 349.0 | 420.9 | 472.7 | 604.7 | 820.9 | 857.2 | 865.5 | 806.1 |
| Foreign | 150.7 | 242.8 | 189.0 | 142.9 | 135.6 | 108.9 | 152.0 | 222.5 | 220.8 | 269.3 |
| Total | 590.6 | 602.3 | 538.1 | 563.9 | 608.3 | 713.7 | 972.8 | 1,079.7 | 1,086.4 | 1,075.4 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

Table 19. BERD by employment size – Canada¹

| Employment size ² | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | in millions of \$ | | | | | | | | | |
| 0 – 9 | 485.9 | 449.8 | 431.4 | 391.2 | 402.6 | 411.1 | 476.5 | 568.5 | 581.6 | 631.9 |
| 10 – 19 | 362.0 | 346.8 | 272.7 | 265.8 | 270.3 | 310.9 | 331.0 | 409.1 | 419.5 | 485.7 |
| 20 – 49 | 541.2 | 545.6 | 508.8 | 522.3 | 589.3 | 631.8 | 772.5 | 953.9 | 975.5 | 1,010.3 |
| 50 – 99 | 474.9 | 494.4 | 473.3 | 493.4 | 599.9 | 587.2 | 780.8 | 1,144.9 | 1,144.9 | 1,041.6 |
| 100 – 199 | 517.1 | 606.9 | 617.1 | 677.6 | 688.4 | 779.1 | 1,082.5 | 1,307.6 | 1,183.3 | 1,033.9 |
| 200 – 499 | 561.8 | 679.1 | 760.7 | 880.6 | 883.7 | 1,081.9 | 1,025.1 | 1,252.7 | 1,235.2 | 1,233.8 |
| 500 – 999 | 673.6 | 754.6 | 783.3 | 838.9 | 921.7 | 775.2 | 1,136.5 | 1,270.2 | 1,258.6 | 1,314.4 |
| 1,000 – 1,999 | 780.1 | 865.0 | 914.3 | 908.4 | 1,089.4 | 1,471.5 | 1,488.0 | 1,610.3 | 1,862.1 | 1,933.1 |
| 2,000 – 4,999 | 723.6 | 704.5 | 599.8 | 668.0 | 802.2 | 879.0 | 1,135.0 | 1,262.7 | 1,299.6 | 2,645.0 |
| > 4,999 | 2,447.1 | 2,543.8 | 2,634.7 | 3,093.1 | 3,434.6 | 3,472.0 | 4,221.9 | 4,540.5 | 3,406.3 | 2,061.6 |
| Total | 7,567.2 | 7,990.5 | 7,996.0 | 8,739.5 | 9,682.1 | 10,399.7 | 12,449.6 | 14,320.2 | 13,366.5 | 13,391.1 |

1. Canada totals include the Yukon, Northwest and Nunavut territories.

2. Employment size is based on total employment in Canada.

Table 20. BERD by employment size – Atlantic Canada

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-------------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | in millions of \$ | | | | | | | | | |
| 0 – 9 | 17.0 | 15.5 | 18.0 | 13.0 | 13.9 | 13.0 | 13.4 | 14.2 | 13.1 | 13.3 |
| 10 – 19 | 12.2 | 13.0 | 10.1 | 9.7 | 8.0 | 11.2 | 12.0 | 8.7 | 6.7 | 9.3 |
| 20 – 49 | 23.1 | 21.5 | 22.3 | 31.4 | 30.7 | 28.2 | 34.2 | 30.4 | 30.8 | 13.9 |
| 50 – 99 | 10.6 | 15.1 | 13.9 | 14.0 | 18.8 | 11.7 | 14.5 | 26.2 | 20.8 | 35.0 |
| 100 – 199 | 5.0 | 7.9 | 8.0 | 12.8 | 11.2 | 16.7 | 16.1 | 15.1 | 22.4 | 10.7 |
| 200 – 499 | 8.8 | 7.3 | 3.4 | 3.9 | 5.8 | 12.1 | 7.9 | 14.6 | 26.7 | 22.2 |
| 500 – 999 | 4.2 | 2.7 | 8.8 | 7.2 | 12.0 | 4.2 | 10.7 | 17.2 | 7.0 | 12.0 |
| > 999 | 44.4 | 48.1 | 48.4 | 14.5 | 20.7 | 24.6 | 23.2 | 35.9 | 29.2 | 30.5 |
| Total | 125.2 | 131.2 | 132.8 | 106.7 | 121.0 | 121.6 | 132.1 | 162.4 | 156.7 | 146.9 |

1. Employment size is based on total employment in Canada.

Table 21. BERD by employment size – Quebec

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
|------------------------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | in millions of \$ | | | | | | | | | |
| 0 – 9 | 161.9 | 165.2 | 177.5 | 156.1 | 175.1 | 165.8 | 199.9 | 224.1 | 240.3 | 265.0 |
| 10 – 19 | 103.6 | 108.6 | 110.5 | 97.2 | 111.0 | 110.9 | 115.8 | 150.7 | 149.2 | 175.8 |
| 20 – 49 | 137.5 | 160.1 | 173.0 | 165.1 | 209.4 | 235.3 | 265.9 | 322.6 | 344.2 | 354.5 |
| 50 – 99 | 111.0 | 126.0 | 129.3 | 121.4 | 155.9 | 141.8 | 210.2 | 299.3 | 333.3 | 312.0 |
| 100 – 199 | 150.2 | 177.5 | 166.2 | 163.5 | 215.7 | 205.8 | 446.5 | 364.2 | 288.2 | 288.6 |
| 200 – 499 | 192.7 | 172.4 | 195.0 | 223.2 | 211.5 | 279.4 | 315.6 | 351.4 | 314.1 | 379.3 |
| 500 – 999 | 212.7 | 293.2 | 298.3 | 277.6 | 309.0 | 262.0 | 377.0 | 470.7 | 442.5 | 380.8 |
| 1,000-1,999 | 233.9 | 235.8 | 315.5 | 386.1 | 433.5 | 634.5 | 477.4 | 499.9 | 688.1 | 677.7 |
| 2,000-4,999 | 226.1 | 208.6 | 176.6 | 148.8 | 152.4 | 150.4 | 339.7 | 501.4 | 338.8 | 407.9 |
| > 4,999 | 526.6 | 629.1 | 651.5 | 779.8 | 790.4 | 860.8 | 893.9 | 970.3 | 917.9 | 873.3 |
| Total | 2,056.2 | 2,276.6 | 2,393.4 | 2,518.7 | 2,764.0 | 3,046.8 | 3,641.9 | 4,154.7 | 4,056.7 | 4,114.8 |

1. Employment size is based on total employment in Canada.

Table 22. BERD by employment size – Ontario

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
|------------------------------|-------------------|----------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | in millions of \$ | | | | | | | | | |
| 0 – 9 | 139.6 | 121.9 | 112.1 | 108.1 | 109.6 | 112.6 | 129.6 | 170.0 | 187.0 | 194.0 |
| 10 – 19 | 156.1 | 154.2 | 106.0 | 109.4 | 103.0 | 122.6 | 123.8 | 161.7 | 171.0 | 200.8 |
| 20 – 49 | 237.4 | 237.8 | 208.9 | 211.6 | 241.3 | 239.3 | 299.1 | 429.9 | 426.4 | 483.4 |
| 50 – 99 | 219.0 | 221.7 | 182.8 | 230.7 | 292.7 | 307.1 | 403.9 | 586.3 | 546.4 | 459.1 |
| 100 – 199 | 287.4 | 312.1 | 339.1 | 358.4 | 333.9 | 403.4 | 463.1 | 724.2 | 615.0 | 552.2 |
| 200 – 499 | 292.6 | 367.2 | 410.0 | 442.3 | 451.1 | 507.8 | 531.4 | 626.0 | 644.2 | 645.2 |
| 500 – 999 | 266.8 | 336.5 | 370.8 | 396.8 | 433.9 | 431.7 | 513.5 | 463.1 | 592.1 | 657.2 |
| 1,000 – 1,999 | 434.7 | 481.7 | 486.1 | 459.9 | 536.6 | 659.8 | 697.3 | 818.2 | 880.0 | 876.8 |
| 2,000 – 4,999 | 323.7 | 331.5 | 224.7 | 391.8 | 472.6 | 593.2 | 594.0 | 576.4 | 712.7 | 1,941.1 |
| > 4,999 | 1,754.3 | 1,755.2 | 1,815.4 | 2,123.9 | 2,419.5 | 2,421.5 | 3,147.6 | 3,388.6 | 2,272.8 | 1,056.0 |
| Total | 4,111.6 | 4,319.8 | 4,255.9 | 4,832.8 | 5,394.2 | 5,798.9 | 6,903.2 | 7,944.4 | 7,047.6 | 7,065.7 |

1. Employment size is based on total employment in Canada.

Table 23. BERD by employment size – Manitoba and Saskatchewan

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| person-years | in millions of \$ | | | | | | | | | |
| 0 – 9 | 24.2 | 20.5 | 19.9 | 17.3 | 20.1 | 22.4 | 26.2 | 28.9 | 26.1 | 26.5 |
| 10 – 19 | 11.3 | 9.4 | 6.0 | 4.9 | 5.2 | 7.0 | 11.1 | 14.9 | 16.2 | 13.2 |
| 20 – 49 | 22.1 | 24.1 | 19.3 | 18.8 | 9.0 | 11.0 | 12.8 | 17.0 | 20.2 | 17.8 |
| 50 – 99 | 23.4 | 25.9 | 34.1 | 27.0 | 31.1 | 17.8 | 22.2 | 15.8 | 25.6 | 16.6 |
| 100 – 199 | 16.6 | 16.4 | 16.7 | 30.7 | 40.9 | 30.2 | 23.9 | 16.1 | 16.5 | 19.2 |
| 200 – 499 | 28.3 | 19.0 | 17.2 | 16.5 | 15.1 | 39.3 | 25.3 | 84.4 | 34.5 | 33.1 |
| 500 – 999 | 15.4 | 17.8 | 10.3 | 29.1 | 19.4 | 31.0 | 33.1 | 31.2 | 39.1 | 33.6 |
| 1,000 – 1,999 | 20.3 | 25.4 | 17.1 | 17.4 | 14.3 | 9.2 | 25.6 | 37.0 | 27.5 | 26.7 |
| > 1,999 | 10.6 | 10.9 | 10.9 | 9.8 | 20.7 | 58.5 | 28.1 | 14.4 | 45.8 | 22.4 |
| Total | 172.1 | 169.3 | 151.6 | 171.4 | 175.8 | 226.5 | 208.3 | 259.8 | 251.4 | 209.0 |

1. Employment size is based on total employment in Canada.

Table 24. BERD by employment size – Alberta

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| person-years | in millions of \$ | | | | | | | | | |
| 0 – 9 | 51.6 | 47.9 | 42.9 | 39.3 | 31.5 | 40.5 | 44.6 | 57.1 | 40.5 | 48.0 |
| 10 – 19 | 32.2 | 26.6 | 17.7 | 17.9 | 21.0 | 24.8 | 24.1 | 27.4 | 26.1 | 25.0 |
| 20 – 49 | 41.0 | 34.0 | 31.0 | 33.3 | 37.6 | 37.1 | 46.1 | 41.0 | 47.5 | 39.7 |
| 50 – 99 | 29.0 | 32.4 | 29.8 | 31.5 | 23.3 | 19.3 | 23.4 | 44.1 | 31.8 | 51.4 |
| 100 – 199 | 26.8 | 30.9 | 51.4 | 44.2 | 50.8 | 55.0 | 59.4 | 76.3 | 99.5 | 51.6 |
| 200 – 499 | 12.6 | 16.6 | 21.4 | 53.7 | 48.0 | 51.4 | 45.8 | 52.9 | 63.1 | 67.6 |
| 500 – 999 | 25.7 | 15.7 | 29.0 | 73.9 | 66.6 | 33.0 | 51.4 | 80.9 | 40.1 | 15.4 |
| 1,000 – 1,999 | 60.7 | 81.8 | 57.5 | 34.5 | 40.0 | 31.4 | 15.2 | 86.5 | 107.9 | 165.0 |
| > 1,999 | 229.3 | 204.7 | 243.0 | 217.2 | 299.3 | 197.9 | 280.8 | 252.3 | 310.8 | 315.0 |
| Total | 508.8 | 490.6 | 523.8 | 545.5 | 618.1 | 490.5 | 590.8 | 718.4 | 767.3 | 778.6 |

1. Employment size is based on total employment in Canada.

Table 25. BERD by employment size – British Columbia

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
|------------------------------|-------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| person-years | in millions of \$ | | | | | | | | | |
| 0 – 9 | 91.0 | 78.4 | 60.8 | 57.1 | 51.9 | 56.3 | 62.7 | 74.1 | 74.6 | 85.0 |
| 10 – 19 | 45.2 | 34.8 | 22.3 | 26.7 | 21.7 | 34.0 | 43.9 | 45.4 | 50.3 | 61.7 |
| 20 – 49 | 79.5 | 68.0 | 54.2 | 62.2 | 61.3 | 80.8 | 114.5 | 113.0 | 106.4 | 101.0 |
| 50 – 99 | 81.8 | 73.2 | 83.4 | 68.7 | 78.1 | 89.6 | 106.5 | 173.1 | 187.1 | 167.6 |
| 100 – 199 | 31.1 | 62.2 | 35.6 | 68.1 | 35.8 | 67.9 | 73.4 | 111.6 | 141.6 | 111.5 |
| 200 – 499 | 26.6 | 96.5 | 113.7 | 141.0 | 152.3 | 191.9 | 99.1 | 123.3 | 152.7 | 86.4 |
| 500 – 999 | 148.9 | 88.7 | 66.0 | 54.0 | 80.9 | 13.3 | 150.7 | 207.1 | 137.7 | 215.2 |
| 1,000 – 1,999 | 25.3 | 34.9 | 31.1 | 6.2 | 59.0 | 126.5 | 262.8 | 156.0 | 149.6 | 176.0 |
| 2,000 – 4,999 | 23.7 | 25.5 | 15.9 | 36.1 | 34.1 | 29.6 | 25.5 | 43.7 | 35.3 | 9.5 |
| > 4,999 | 37.4 | 40.1 | 55.1 | 43.7 | 33.2 | 23.7 | 33.7 | 32.4 | 51.0 | 61.4 |
| Total | 590.6 | 602.3 | 538.1 | 563.9 | 608.3 | 713.7 | 972.8 | 1,079.7 | 1,086.4 | 1,075.4 |

1. Employment size is based on total employment in Canada.

Table 26. BERD by size of R&D expenditures – Canada¹

| Size of R&D ² | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
|--------------------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| in thousands of \$ | in millions of \$ | | | | | | | | | |
| 0 – 24 | 33.4 | 31.7 | 29.6 | 29.1 | 26.7 | 25.2 | 25.4 | 26.4 | 28.0 | 27.3 |
| 25 – 49 | 64.9 | 61.8 | 60.8 | 57.7 | 61.2 | 60.0 | 61.1 | 67.9 | 70.8 | 73.0 |
| 50 – 99 | 139.3 | 135.9 | 124.7 | 125.8 | 129.8 | 129.5 | 146.5 | 163.6 | 172.6 | 188.1 |
| 100 – 199 | 248.0 | 236.1 | 203.7 | 208.9 | 220.8 | 230.9 | 267.1 | 300.2 | 310.8 | 328.9 |
| 200 – 399 | 333.6 | 333.6 | 286.0 | 271.0 | 291.3 | 325.7 | 357.7 | 421.1 | 396.5 | 473.4 |
| 400 – 999 | 527.6 | 543.3 | 392.6 | 391.7 | 429.7 | 478.6 | 600.6 | 687.5 | 659.8 | 702.4 |
| 1,000 – 1,999 | 448.5 | 503.2 | 505.2 | 480.3 | 463.6 | 514.8 | 560.9 | 653.2 | 635.6 | 652.2 |
| 2,000 – 9,999 | 1,314.6 | 1,370.5 | 1,342.6 | 1,436.5 | 1,599.6 | 1,686.3 | 1,882.4 | 2,204.3 | 2,147.5 | 2,039.3 |
| > 9,999 | 4,457.3 | 4,774.6 | 5,050.7 | 5,738.5 | 6,459.5 | 6,948.7 | 8,547.9 | 9,795.9 | 8,944.9 | 8,906.4 |
| Total | 7,567.2 | 7,990.5 | 7,996.0 | 8,739.5 | 9,682.1 | 10,399.7 | 12,449.6 | 14,320.2 | 13,366.5 | 13,391.1 |

1. Canada totals include the Yukon, Northwest and Nunavut territories.

2. Size of R&D is based on total R&D expenditures in Canada.

| Table 27. BERD by size of R&D expenditures – Atlantic Canada | | | | | | | | | | |
|---|-------------------|-------------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 ^r | 1995 ^r | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| in thousands of \$ | in millions of \$ | | | | | | | | | |
| 0 – 24 | 1.4 | 1.5 | 2.1 | 1.8 | 1.6 | 1.4 | 1.2 | 1.0 | 1.2 | 1.1 |
| 25 – 49 | 2.2 | 3.3 | 3.4 | 2.9 | 3.4 | 3.0 | 2.6 | 2.2 | 2.5 | 2.4 |
| 50 – 99 | 6.1 | 6.1 | 6.4 | 6.8 | 5.7 | 5.6 | 6.5 | 5.8 | 6.0 | 6.6 |
| 100 – 199 | 9.2 | 8.4 | 9.5 | 8.0 | 9.6 | 8.9 | 9.5 | 9.0 | 8.5 | 8.0 |
| 200 – 399 | 11.8 | 14.5 | 11.6 | 13.2 | 12.5 | 13.7 | 11.5 | 12.9 | 9.3 | 11.0 |
| 400 – 999 | 17.4 | 18.3 | 15.1 | 14.8 | 18.4 | 13.1 | 19.5 | 19.8 | 15.3 | 14.7 |
| 1,000 – 1,999 | 19.0 | 23.0 | 21.7 | 19.6 | 21.5 | 21.4 | 19.9 | 14.5 | 8.7 | 14.3 |
| 2,000 – 9,999 | 36.0 | 34.7 | 22.6 | 32.8 | 33.6 | 38.5 | 37.1 | 69.7 | 72.0 | 40.7 |
| > 9,999 | 22.1 | 21.4 | 40.4 | 7.0 | 14.6 | 15.9 | 24.4 | 27.4 | 33.3 | 48.4 |
| Total | 125.2 | 131.2 | 132.8 | 106.7 | 121.0 | 121.6 | 132.1 | 162.4 | 156.7 | 146.9 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 28. BERD by size of R&D expenditures – Quebec | | | | | | | | | | |
|--|-------------------|----------------|----------------|----------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| in thousands of \$ | in millions of \$ | | | | | | | | | |
| 0 – 24 | 11.7 | 11.9 | 11.3 | 12.9 | 13.1 | 11.9 | 12.1 | 13.0 | 13.9 | 14.8 |
| 25 – 49 | 24.2 | 22.9 | 25.9 | 25.2 | 26.8 | 27.2 | 28.8 | 33.0 | 36.2 | 39.5 |
| 50 – 99 | 46.5 | 49.9 | 50.5 | 54.1 | 54.1 | 56.1 | 66.5 | 75.2 | 81.6 | 92.4 |
| 100 – 199 | 82.8 | 83.1 | 81.9 | 77.3 | 83.4 | 90.8 | 108.8 | 119.4 | 124.9 | 144.6 |
| 200 – 399 | 97.2 | 111.8 | 115.2 | 91.2 | 98.8 | 121.0 | 128.6 | 155.3 | 146.4 | 180.9 |
| 400 – 999 | 155.2 | 164.4 | 162.7 | 129.0 | 155.7 | 161.5 | 210.4 | 219.2 | 210.9 | 225.6 |
| 1,000 – 1,999 | 122.3 | 137.9 | 156.1 | 140.7 | 143.7 | 162.8 | 173.2 | 197.6 | 196.6 | 228.8 |
| 2,000 – 9,999 | 267.3 | 310.4 | 297.0 | 302.9 | 378.6 | 419.5 | 486.3 | 618.6 | 607.0 | 549.1 |
| > 9,999 | 1,248.9 | 1,384.2 | 1,492.9 | 1,685.3 | 1,809.7 | 1,996.1 | 2,427.2 | 2,723.4 | 2,639.3 | 2,639.1 |
| Total | 2,056.2 | 2,276.6 | 2,393.4 | 2,518.7 | 2,764.0 | 3,046.8 | 3,641.9 | 4,154.7 | 4,056.7 | 4,114.8 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 29. BERD by size of R&D expenditures – Ontario | | | | | | | | | | |
|---|-------------------|----------------|----------------|----------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| in thousands of \$ | in millions of \$ | | | | | | | | | |
| 0 – 24 | 10.0 | 9.3 | 8.2 | 8.1 | 6.4 | 6.6 | 6.7 | 7.1 | 7.1 | 6.5 |
| 25 – 49 | 20.5 | 19.8 | 18.5 | 17.2 | 18.5 | 17.1 | 18.1 | 19.7 | 19.7 | 18.5 |
| 50 – 99 | 49.2 | 47.1 | 42.4 | 41.0 | 44.2 | 42.2 | 44.9 | 52.1 | 57.4 | 60.0 |
| 100 – 199 | 94.7 | 84.7 | 69.2 | 81.1 | 82.7 | 88.0 | 97.2 | 115.2 | 116.6 | 115.7 |
| 200 – 399 | 135.6 | 127.6 | 102.7 | 110.4 | 124.1 | 126.8 | 145.4 | 177.7 | 168.9 | 202.1 |
| 400 – 999 | 229.1 | 247.8 | 155.4 | 179.0 | 193.1 | 218.5 | 269.0 | 313.5 | 318.1 | 336.6 |
| 1,000 – 1,999 | 203.0 | 223.1 | 210.6 | 217.3 | 207.1 | 226.0 | 270.7 | 328.4 | 306.4 | 310.8 |
| 2,000 – 9,999 | 740.5 | 770.1 | 753.3 | 778.7 | 839.0 | 821.3 | 892.3 | 1,062.1 | 1,066.4 | 1,069.8 |
| > 9,999 | 2,629.0 | 2,790.5 | 2,895.8 | 3,399.9 | 3,879.2 | 4,252.4 | 5,159.1 | 5,868.6 | 4,986.9 | 4,945.6 |
| Total | 4,111.6 | 4,319.8 | 4,255.9 | 4,832.8 | 5,394.2 | 5,798.9 | 6,903.2 | 7,944.4 | 7,047.6 | 7,065.7 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 30. BERD by size of R&D expenditures – Manitoba and Saskatchewan | | | | | | | | | | |
|---|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 ^r | 2002 ^r | 2003 ^p |
| in thousands of \$ | in millions of \$ | | | | | | | | | |
| 0 – 24 | 1.8 | 1.6 | 1.7 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 0.8 |
| 25 – 49 | 2.9 | 2.6 | 1.8 | 2.4 | 2.2 | 2.2 | 1.8 | 2.4 | 2.2 | 2.3 |
| 50 – 99 | 5.7 | 4.7 | 3.5 | 3.3 | 4.5 | 4.2 | 5.8 | 4.7 | 5.2 | 4.7 |
| 100 – 199 | 8.5 | 7.9 | 6.5 | 8.8 | 7.3 | 7.0 | 8.4 | 9.4 | 10.4 | 8.8 |
| 200 – 399 | 14.8 | 12.8 | 9.0 | 6.7 | 8.7 | 10.2 | 10.2 | 12.7 | 9.5 | 10.3 |
| 400 – 999 | 22.3 | 16.2 | 10.2 | 10.8 | 7.4 | 10.1 | 14.1 | 18.9 | 19.6 | 16.4 |
| 1,000 – 1,999 | 22.1 | 30.8 | 26.3 | 26.4 | 19.3 | 14.9 | 17.8 | 21.2 | 25.3 | 23.9 |
| 2,000 – 9,999 | 65.7 | 64.3 | 63.8 | 62.9 | 91.1 | 101.9 | 90.5 | 86.3 | 84.2 | 70.9 |
| > 9,999 | 28.3 | 28.3 | 28.8 | 48.9 | 34.2 | 74.8 | 58.6 | 103.1 | 93.9 | 71.0 |
| Total | 172.1 | 169.3 | 151.6 | 171.4 | 175.8 | 226.5 | 208.3 | 259.8 | 251.4 | 209.0 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 31. BERD by size of R&D expenditures – Alberta | | | | | | | | | | |
|---|-------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| in thousands of \$ | in millions of \$ | | | | | | | | | |
| 0 – 24 | 3.3 | 3.0 | 2.9 | 2.0 | 2.1 | 1.9 | 1.8 | 1.8 | 1.8 | 1.4 |
| 25 – 49 | 5.6 | 5.6 | 4.4 | 4.7 | 4.1 | 4.7 | 4.5 | 5.1 | 3.1 | 3.2 |
| 50 – 99 | 11.6 | 9.9 | 8.6 | 9.0 | 8.8 | 9.1 | 10.0 | 9.9 | 9.1 | 7.2 |
| 100 – 199 | 19.4 | 20.1 | 17.5 | 14.3 | 16.9 | 15.0 | 19.2 | 20.7 | 18.5 | 19.7 |
| 200 – 399 | 28.7 | 25.5 | 20.0 | 20.3 | 24.0 | 26.7 | 28.0 | 26.0 | 23.7 | 24.0 |
| 400 – 999 | 38.4 | 35.0 | 19.9 | 22.9 | 25.9 | 31.4 | 38.7 | 45.2 | 33.9 | 34.3 |
| 1,000 – 1,999 | 33.1 | 44.5 | 43.2 | 31.3 | 29.0 | 35.0 | 22.4 | 37.2 | 40.9 | 26.9 |
| 2,000 – 9,999 | 100.7 | 78.6 | 96.3 | 120.5 | 124.7 | 121.1 | 131.5 | 129.9 | 116.3 | 121.8 |
| > 9,999 | 268.0 | 268.4 | 311.0 | 320.5 | 382.6 | 245.6 | 334.6 | 442.5 | 520.0 | 540.2 |
| Total | 508.8 | 490.6 | 523.8 | 545.5 | 618.1 | 490.5 | 590.8 | 718.4 | 767.3 | 778.6 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 32. BERD by size of R&D expenditures – British Columbia | | | | | | | | | | |
|--|-------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| in thousands of \$ | in millions of \$ | | | | | | | | | |
| 0 – 24 | 4.9 | 4.2 | 3.5 | 3.1 | 2.5 | 2.2 | 2.5 | 2.4 | 2.8 | 2.7 |
| 25 – 49 | 9.2 | 7.5 | 6.7 | 5.2 | 6.2 | 5.7 | 5.3 | 5.5 | 7.1 | 7.1 |
| 50 – 99 | 19.8 | 17.8 | 13.1 | 11.6 | 12.3 | 12.2 | 12.8 | 16.0 | 13.3 | 17.3 |
| 100 – 199 | 33.1 | 31.5 | 19.1 | 19.1 | 20.6 | 21.3 | 24.0 | 26.4 | 32.0 | 32.1 |
| 200 – 399 | 44.6 | 41.4 | 27.6 | 29.1 | 22.9 | 27.1 | 33.7 | 36.2 | 38.5 | 45.1 |
| 400 – 999 | 64.7 | 61.6 | 29.3 | 35.2 | 29.1 | 43.5 | 48.9 | 71.0 | 62.1 | 74.8 |
| 1,000 – 1,999 | 48.9 | 43.9 | 47.3 | 45.0 | 42.9 | 54.8 | 57.0 | 54.1 | 57.8 | 47.6 |
| 2,000 – 9,999 | 104.4 | 112.5 | 109.7 | 138.7 | 132.5 | 183.9 | 244.7 | 237.6 | 201.7 | 187.0 |
| > 9,999 | 261.0 | 281.8 | 281.7 | 276.8 | 339.2 | 363.0 | 544.0 | 630.5 | 671.2 | 661.7 |
| Total | 590.6 | 602.3 | 538.1 | 563.9 | 608.3 | 713.7 | 972.8 | 1,079.7 | 1,086.4 | 1,075.4 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 33. BERD concentration – Canada | | | | | | | | | | |
|--|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Enterprises | 1994 | | 1995 | | 1996 | | 1997 ^f | | 1998 ^f | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 1,651.4 | 21.8 | 1,912.0 | 23.9 | 2,055.7 | 25.7 | 2,457.8 | 28.1 | 2,878.9 | 29.7 |
| Top 10 | 2,110.8 | 27.9 | 2,359.5 | 29.5 | 2,512.9 | 31.4 | 2,950.4 | 33.8 | 3,480.8 | 36.0 |
| Top 25 | 2,966.3 | 39.2 | 3,123.9 | 39.1 | 3,279.9 | 41.0 | 3,845.5 | 44.0 | 4,415.3 | 45.6 |
| Top 50 | 3,673.8 | 48.5 | 3,854.0 | 48.2 | 4,012.2 | 50.2 | 4,658.9 | 53.3 | 5,281.6 | 54.6 |
| Top 75 | 4,106.6 | 54.3 | 4,331.0 | 54.2 | 4,513.7 | 56.4 | 5,156.0 | 59.0 | 5,801.6 | 59.9 |
| Top 100 | 4,416.2 | 58.4 | 4,668.3 | 58.4 | 4,863.8 | 60.8 | 5,511.1 | 63.1 | 6,180.9 | 63.8 |
| Total | 7,567.2 | 100.0 | 7,990.5 | 100.0 | 7,996.0 | 100.0 | 8,739.5 | 100.0 | 9,682.1 | 100.0 |

| Table 33. (continued) BERD concentration – Canada | | | | | | | | | | |
|--|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Enterprises | 1999 ^f | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 2,887.7 | 27.8 | 3,778.4 | 30.3 | 3,794.0 | 26.5 | 2,567.6 | 19.2 | 2,317.5 | 17.3 |
| Top 10 | 3,544.4 | 34.1 | 4,513.4 | 36.3 | 4,503.4 | 31.4 | 3,248.7 | 24.3 | 3,083.9 | 23.0 |
| Top 25 | 4,620.3 | 44.4 | 5,695.7 | 45.8 | 5,795.0 | 40.5 | 4,680.9 | 35.0 | 4,529.8 | 33.8 |
| Top 50 | 5,566.8 | 53.5 | 6,747.2 | 54.2 | 7,012.6 | 49.0 | 6,029.8 | 45.1 | 6,036.2 | 45.1 |
| Top 75 | 6,157.3 | 59.2 | 7,428.1 | 59.7 | 7,846.8 | 54.8 | 6,875.5 | 51.4 | 6,900.3 | 51.5 |
| Top 100 | 6,584.0 | 63.3 | 7,918.5 | 63.6 | 8,455.9 | 59.0 | 7,466.0 | 55.9 | 7,511.3 | 56.1 |
| Total | 10,399.7 | 100.0 | 12,449.6 | 100.0 | 14,320.2 | 100.0 | 13,366.5 | 100.0 | 13,391.1 | 100.0 |

| Table 34. BERD concentration – Atlantic Canada | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1994 | | 1995 | | 1996 | | 1997 ^f | | 1998 ^f | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 36.5 | 29.2 | 38.3 | 29.2 | 46.2 | 34.8 | 26.5 | 24.8 | 27.8 | 22.9 |
| Top 10 | 52.8 | 42.1 | 50.9 | 38.8 | 58.7 | 44.2 | 37.0 | 34.7 | 41.0 | 33.9 |
| Top 25 | 72.9 | 58.2 | 72.1 | 55.0 | 81.3 | 61.2 | 55.2 | 51.8 | 62.1 | 51.3 |
| Top 50 | 90.8 | 72.5 | 89.8 | 68.5 | 97.7 | 73.6 | 71.6 | 67.1 | 80.3 | 66.4 |
| Top 75 | 99.2 | 79.2 | 99.6 | 75.9 | 105.6 | 79.5 | 79.6 | 74.7 | 90.2 | 74.6 |
| Top 100 | 105.1 | 83.9 | 106.9 | 81.5 | 111.3 | 83.8 | 85.8 | 80.4 | 96.7 | 79.9 |
| Total | 125.2 | 100.0 | 131.2 | 100.0 | 132.8 | 100.0 | 106.7 | 100.0 | 121.0 | 100.0 |

| Table 34. (continued) BERD concentration – Atlantic Canada | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1999 ^f | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 29.9 | 24.6 | 25.9 | 19.6 | 35.5 | 21.9 | 38.6 | 24.6 | 37.9 | 25.8 |
| Top 10 | 41.6 | 34.2 | 39.0 | 29.5 | 54.1 | 33.3 | 58.8 | 37.5 | 52.1 | 35.5 |
| Top 25 | 63.9 | 52.6 | 63.1 | 47.8 | 86.9 | 53.5 | 93.8 | 59.9 | 84.2 | 57.3 |
| Top 50 | 83.2 | 68.4 | 85.7 | 64.9 | 115.0 | 70.8 | 119.5 | 76.3 | 107.9 | 73.4 |
| Top 75 | 92.6 | 76.1 | 97.8 | 74.1 | 128.3 | 79.0 | 131.0 | 83.6 | 119.7 | 81.4 |
| Top 100 | 99.3 | 81.7 | 105.5 | 79.9 | 136.6 | 84.1 | 137.1 | 87.5 | 126.9 | 86.3 |
| Total | 121.6 | 100.0 | 132.1 | 100.0 | 162.4 | 100.0 | 156.7 | 100.0 | 146.9 | 100.0 |

| Table 35. BERD concentration – Quebec | | | | | | | | | | |
|--|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 545.1 | 26.5 | 637.9 | 28.0 | 647.1 | 27.0 | 768.2 | 30.5 | 790.3 | 28.6 |
| Top 10 | 770.3 | 37.5 | 900.8 | 39.6 | 930.2 | 38.9 | 1,092.9 | 43.4 | 1,160.6 | 42.0 |
| Top 25 | 1,098.8 | 53.5 | 1,255.0 | 55.1 | 1,312.1 | 54.8 | 1,483.5 | 58.9 | 1,587.9 | 57.4 |
| Top 50 | 1,314.6 | 64.0 | 1,461.6 | 64.2 | 1,552.3 | 64.9 | 1,737.2 | 69.0 | 1,849.3 | 66.9 |
| Top 75 | 1,410.2 | 68.6 | 1,565.9 | 68.8 | 1,653.8 | 69.1 | 1,847.2 | 73.3 | 1,974.9 | 71.4 |
| Top 100 | 1,476.8 | 71.9 | 1,633.2 | 71.7 | 1,723.3 | 72.0 | 1,920.8 | 76.3 | 2,063.6 | 74.7 |
| Total | 2,056.2 | 100.0 | 2,276.6 | 100.0 | 2,393.4 | 100.0 | 2,518.7 | 100.0 | 2,764.0 | 100.0 |

| Table 35. (continued) BERD concentration – Quebec | | | | | | | | | | |
|--|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1999 | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 893.2 | 29.3 | 1,011.3 | 27.8 | 1,025.5 | 24.7 | 964.8 | 23.8 | 940.1 | 22.8 |
| Top 10 | 1,306.0 | 42.9 | 1,493.8 | 41.0 | 1,435.9 | 34.6 | 1,355.4 | 33.4 | 1,334.8 | 32.4 |
| Top 25 | 1,732.9 | 56.9 | 1,989.5 | 54.6 | 2,046.7 | 49.3 | 1,951.8 | 48.1 | 1,969.9 | 47.9 |
| Top 50 | 2,030.0 | 66.6 | 2,381.8 | 65.4 | 2,566.4 | 61.8 | 2,433.1 | 60.0 | 2,445.5 | 59.4 |
| Top 75 | 2,168.9 | 71.2 | 2,552.3 | 70.1 | 2,797.9 | 67.3 | 2,691.1 | 66.3 | 2,687.5 | 65.3 |
| Top 100 | 2,263.0 | 74.3 | 2,665.3 | 73.2 | 2,947.4 | 70.9 | 2,853.7 | 70.3 | 2,839.2 | 69.0 |
| Total | 3,046.8 | 100.0 | 3,641.9 | 100.0 | 4,154.7 | 100.0 | 4,056.7 | 100.0 | 4,114.8 | 100.0 |

| Table 36. BERD concentration – Ontario | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 1,354.8 | 33.0 | 1,500.5 | 34.7 | 1,611.7 | 37.9 | 1,892.9 | 39.2 | 2,317.4 | 43.0 |
| Top 10 | 1,657.7 | 40.3 | 1,774.2 | 41.1 | 1,880.1 | 44.2 | 2,215.2 | 45.8 | 2,654.7 | 49.2 |
| Top 25 | 2,125.8 | 51.7 | 2,213.7 | 51.2 | 2,323.5 | 54.6 | 2,727.7 | 56.4 | 3,146.6 | 58.3 |
| Top 50 | 2,524.5 | 61.4 | 2,636.2 | 61.0 | 2,738.0 | 64.3 | 3,176.4 | 65.7 | 3,594.1 | 66.6 |
| Top 75 | 2,744.6 | 66.8 | 2,873.8 | 66.5 | 2,972.2 | 69.8 | 3,437.8 | 71.1 | 3,873.3 | 71.8 |
| Top 100 | 2,903.6 | 70.6 | 3,036.3 | 70.3 | 3,132.4 | 73.6 | 3,611.9 | 74.7 | 4,056.7 | 75.2 |
| Total | 4,111.6 | 100.0 | 4,319.8 | 100.0 | 4,255.9 | 100.0 | 4,832.8 | 100.0 | 5,394.2 | 100.0 |

| Table 36. (continued) BERD concentration – Ontario | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1999 | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 2,265.0 | 39.1 | 3,013.1 | 43.6 | 3,004.5 | 37.8 | 1,915.5 | 27.2 | 1,725.3 | 24.4 |
| Top 10 | 2,668.8 | 46.0 | 3,376.2 | 48.9 | 3,483.5 | 43.8 | 2,418.8 | 34.3 | 2,280.2 | 32.3 |
| Top 25 | 3,275.2 | 56.5 | 4,033.8 | 58.4 | 4,190.7 | 52.8 | 3,272.6 | 46.4 | 3,247.2 | 46.0 |
| Top 50 | 3,806.6 | 65.6 | 4,607.0 | 66.7 | 4,870.0 | 61.3 | 3,980.9 | 56.5 | 3,957.8 | 56.0 |
| Top 75 | 4,149.1 | 71.5 | 4,978.4 | 72.1 | 5,340.4 | 67.2 | 4,439.2 | 63.0 | 4,435.8 | 62.8 |
| Top 100 | 4,369.8 | 75.4 | 5,226.4 | 75.7 | 5,679.9 | 71.5 | 4,757.2 | 67.5 | 4,783.9 | 67.7 |
| Total | 5,798.9 | 100.0 | 6,903.2 | 100.0 | 7,944.4 | 100.0 | 7,047.6 | 100.0 | 7,065.7 | 100.0 |

| Table 37. BERD concentration – Manitoba and Saskatchewan | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 35.1 | 20.4 | 35.3 | 20.9 | 38.3 | 25.3 | 52.6 | 30.7 | 47.8 | 27.2 |
| Top 10 | 56.7 | 32.9 | 55.7 | 32.9 | 57.3 | 37.8 | 75.7 | 44.2 | 74.3 | 42.3 |
| Top 25 | 90.9 | 52.8 | 90.5 | 53.4 | 90.4 | 59.6 | 111.1 | 64.9 | 118.3 | 67.3 |
| Top 50 | 117.9 | 68.5 | 121.3 | 71.6 | 118.8 | 78.4 | 139.1 | 81.1 | 145.8 | 82.9 |
| Top 75 | 133.2 | 77.4 | 136.4 | 80.6 | 130.6 | 86.2 | 150.3 | 87.7 | 155.7 | 88.6 |
| Top 100 | 142.3 | 82.7 | 145.0 | 85.6 | 137.4 | 90.7 | 156.2 | 91.2 | 161.3 | 91.7 |
| Total | 172.1 | 100.0 | 169.3 | 100.0 | 151.6 | 100.0 | 171.4 | 100.0 | 175.8 | 100.0 |

| Table 37. (continued) BERD concentration – Manitoba and Saskatchewan | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1999 | | 2000 | | 2001 ^r | | 2002 ^r | | 2003 ^p | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 72.3 | 31.9 | 48.1 | 23.1 | 90.1 | 34.7 | 64.1 | 25.5 | 48.5 | 23.2 |
| Top 10 | 103.6 | 45.7 | 77.0 | 37.0 | 118.4 | 45.6 | 97.9 | 38.9 | 72.0 | 34.5 |
| Top 25 | 157.6 | 69.6 | 131.0 | 62.9 | 167.6 | 64.5 | 153.0 | 60.8 | 118.3 | 56.6 |
| Top 50 | 189.6 | 83.7 | 164.8 | 79.1 | 202.5 | 78.0 | 193.1 | 76.8 | 157.3 | 75.3 |
| Top 75 | 202.4 | 89.3 | 178.8 | 85.9 | 220.7 | 84.9 | 213.5 | 84.9 | 176.0 | 84.2 |
| Top 100 | 209.3 | 92.4 | 186.4 | 89.5 | 231.5 | 89.1 | 224.6 | 89.3 | 185.9 | 88.9 |
| Total | 226.5 | 100.0 | 208.3 | 100.0 | 259.8 | 100.0 | 251.4 | 100.0 | 209.0 | 100.0 |

| Table 38. BERD concentration – Alberta | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 186.1 | 36.6 | 174.4 | 35.6 | 165.6 | 31.6 | 216.7 | 39.7 | 261.4 | 42.3 |
| Top 10 | 255.7 | 50.2 | 246.9 | 50.3 | 254.4 | 48.6 | 282.3 | 51.8 | 343.9 | 55.6 |
| Top 25 | 332.6 | 65.4 | 318.1 | 64.9 | 351.2 | 67.0 | 370.8 | 68.0 | 446.1 | 72.2 |
| Top 50 | 379.1 | 74.5 | 362.7 | 73.9 | 412.1 | 78.7 | 437.5 | 80.2 | 510.3 | 82.6 |
| Top 75 | 404.5 | 79.5 | 390.4 | 79.6 | 443.6 | 84.7 | 468.2 | 85.8 | 538.2 | 87.1 |
| Top 100 | 421.7 | 82.9 | 408.5 | 83.3 | 461.7 | 88.1 | 484.7 | 88.8 | 554.5 | 89.7 |
| Total | 508.8 | 100.0 | 490.6 | 100.0 | 523.8 | 100.0 | 545.5 | 100.0 | 618.1 | 100.0 |

| Table 38. (continued) BERD concentration – Alberta | | | | | | | | | | |
|---|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1999 | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 192.1 | 39.2 | 254.4 | 43.1 | 264.4 | 36.8 | 254.7 | 33.2 | 276.0 | 35.4 |
| Top 10 | 232.0 | 47.3 | 301.7 | 51.1 | 345.3 | 48.1 | 371.0 | 48.4 | 407.2 | 52.3 |
| Top 25 | 307.3 | 62.6 | 385.0 | 65.2 | 466.1 | 64.9 | 524.5 | 68.4 | 548.7 | 70.5 |
| Top 50 | 367.5 | 74.9 | 450.6 | 76.3 | 545.3 | 75.9 | 611.7 | 79.7 | 635.8 | 81.7 |
| Top 75 | 398.0 | 81.1 | 485.3 | 82.1 | 586.2 | 81.6 | 653.1 | 85.1 | 675.1 | 86.7 |
| Top 100 | 416.5 | 84.9 | 504.3 | 85.4 | 611.7 | 85.1 | 679.2 | 88.5 | 697.5 | 89.6 |
| Total | 490.5 | 100.0 | 590.8 | 100.0 | 718.4 | 100.0 | 767.3 | 100.0 | 778.6 | 100.0 |

| Table 39. BERD concentration – British Columbia | | | | | | | | | | |
|--|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 174.9 | 29.6 | 181.6 | 30.1 | 149.3 | 27.8 | 143.7 | 25.5 | 199.3 | 32.8 |
| Top 10 | 227.4 | 38.5 | 247.1 | 41.0 | 228.4 | 42.5 | 219.0 | 38.8 | 266.6 | 43.8 |
| Top 25 | 312.9 | 53.0 | 339.0 | 56.3 | 329.4 | 61.2 | 323.1 | 57.3 | 367.2 | 60.4 |
| Top 50 | 368.6 | 62.4 | 396.0 | 65.8 | 389.5 | 72.4 | 392.2 | 69.6 | 444.1 | 73.0 |
| Top 75 | 401.0 | 67.9 | 430.7 | 71.5 | 425.7 | 79.1 | 436.4 | 77.4 | 486.6 | 80.0 |
| Top 100 | 423.0 | 71.6 | 452.1 | 75.1 | 447.8 | 83.2 | 462.9 | 82.1 | 513.5 | 84.4 |
| Total | 590.6 | 100.0 | 602.3 | 100.0 | 538.1 | 100.0 | 563.9 | 100.0 | 608.3 | 100.0 |

| Table 39. (continued) BERD concentration – British Columbia | | | | | | | | | | |
|--|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Establishments | 1999 | | 2000 ^r | | 2001 ^r | | 2002 ^r | | 2003 ^p | |
| | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % | in millions of \$ | % |
| Top 5 | 239.9 | 33.6 | 355.2 | 36.5 | 306.8 | 28.4 | 276.6 | 25.5 | 320.1 | 29.8 |
| Top 10 | 305.6 | 42.8 | 451.9 | 46.5 | 427.6 | 39.6 | 403.7 | 37.2 | 431.8 | 40.2 |
| Top 25 | 413.1 | 57.9 | 586.2 | 60.3 | 625.4 | 57.9 | 618.1 | 56.9 | 628.2 | 58.4 |
| Top 50 | 500.1 | 70.1 | 694.5 | 71.4 | 749.9 | 69.5 | 755.7 | 69.6 | 749.9 | 69.7 |
| Top 75 | 550.1 | 77.1 | 762.5 | 78.4 | 819.5 | 75.9 | 831.2 | 76.5 | 816.4 | 75.9 |
| Top 100 | 583.7 | 81.8 | 805.2 | 82.8 | 869.1 | 80.5 | 881.9 | 81.2 | 863.2 | 80.3 |
| Total | 713.7 | 100.0 | 972.8 | 100.0 | 1,079.7 | 100.0 | 1,086.4 | 100.0 | 1,075.4 | 100.0 |

Table 40. BERD by major NAICS¹ industry – Canada²

| Industry | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
|--|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | in millions of \$ | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 55.9 | 58.1 | 62.9 | 60.5 | 52.5 | 69.5 | 76.8 | 92.2 | 101.3 | 89.4 |
| Mining and oil and gas extraction | 191.8 | 201.6 | 197.1 | 189.3 | 153.7 | 134.1 | 182.2 | 214.4 | 222.7 | 227.1 |
| Utilities | 224.4 | 206.4 | 233.6 | 185.4 | 217.6 | 196.3 | 187.2 | 171.4 | 129.2 | 121.4 |
| Construction | 27.2 | 24.3 | 23.5 | 37.3 | 25.6 | 35.1 | 44.7 | 51.4 | 44.1 | 40.1 |
| Manufacturing | 4,528.5 | 4,976.5 | 5,116.7 | 5,788.6 | 6,504.9 | 7,077.1 | 8,563.6 | 9,282.7 | 8,155.4 | 7,992.1 |
| Services | 2,539.3 | 2,523.7 | 2,362.3 | 2,478.4 | 2,727.8 | 2,887.5 | 3,395.2 | 4,508.0 | 4,713.8 | 4,921.0 |
| Total | 7,567.2 | 7,990.5 | 7,996.0 | 8,739.5 | 9,682.1 | 10,399.7 | 12,449.6 | 14,320.2 | 13,366.5 | 13,391.1 |

1. North American Industry Classification System.

2. Canada totals include the Yukon, Northwest and Nunavut Territories.

Table 41. BERD by major NAICS¹ industry – Atlantic Canada

| Industry | 1994 | 1995 | 1996 | 1997 ^r | 1998 ^r | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
|--|-------------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | in millions of \$ | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 5.1 | 5.0 | 5.1 | 3.2 | 2.2 | 2.0 | 3.1 | 2.0 | 2.3 | 2.1 |
| Mining and oil and gas extraction | X | 2.2 | X | X | 1.4 | X | X | X | 2.0 | X |
| Utilities | X | X | X | X | X | 0.7 | 3.9 | 3.8 | X | 1.7 |
| Construction | 0.7 | X | X | X | X | X | X | X | X | X |
| Manufacturing | 52.7 | 56.7 | 57.0 | 55.2 | 70.1 | 68.5 | 60.5 | 83.8 | 69.7 | 76.5 |
| Services | 62.5 | 66.5 | 65.3 | 47.3 | 46.4 | 48.3 | 60.7 | 69.3 | 77.2 | 64.5 |
| Total | 125.2 | 131.2 | 132.8 | 106.7 | 121.0 | 121.6 | 132.1 | 162.4 | 156.7 | 146.9 |

1. North American Industry Classification System.

| Table 42. BERD by major NAICS¹ industry – Quebec | | | | | | | | | | |
|--|-------------------|----------------|----------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Industry | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 ^r | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| | in millions of \$ | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 8.8 | 10.6 | 12.8 | 12.1 | 12.6 | 16.8 | 22.7 | 26.6 | 35.9 | 37.3 |
| Mining and oil and gas extraction | 16.6 | 19.2 | 10.8 | X | 2.8 | X | 2.3 | X | X | X |
| Utilities | X | X | X | X | X | X | X | X | X | X |
| Construction | X | X | X | X | X | X | X | X | X | X |
| Manufacturing | 1,200.2 | 1,371.3 | 1,434.1 | 1,551.0 | 1,639.7 | 1,810.6 | 2,136.4 | 2,452.7 | 2,386.6 | 2,408.5 |
| Services | 683.4 | 724.2 | 810.2 | 825.1 | 962.5 | 1,086.3 | 1,357.6 | 1,542.5 | 1,508.3 | 1,545.1 |
| Total | 2,056.2 | 2,276.6 | 2,393.4 | 2,518.7 | 2,764.0 | 3,046.8 | 3,641.9 | 4,154.7 | 4,056.7 | 4,114.8 |

1. North American Industry Classification System.

| Table 43. BERD by major NAICS¹ industry – Ontario | | | | | | | | | | |
|---|-------------------|----------------|----------------|----------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|
| Industry | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| | in millions of \$ | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 22.4 | 20.3 | 26.4 | 20.8 | 19.0 | 23.2 | 18.0 | 25.2 | 25.3 | 25.0 |
| Mining and oil and gas extraction | X | 21.6 | 18.1 | 30.0 | 29.1 | 24.8 | 26.6 | 19.9 | 12.1 | 27.2 |
| Utilities | X | X | X | X | X | X | X | 51.8 | 11.9 | 9.1 |
| Construction | X | X | X | X | X | X | X | 19.8 | 17.5 | 14.4 |
| Manufacturing | 2,801.6 | 3,041.3 | 3,085.4 | 3,581.2 | 4,097.8 | 4,452.6 | 5,418.0 | 5,698.6 | 4,862.9 | 4,711.1 |
| Services | 1,179.7 | 1,170.8 | 1,008.6 | 1,115.1 | 1,166.9 | 1,215.2 | 1,361.2 | 2,129.1 | 2,117.9 | 2,278.9 |
| Total | 4,111.6 | 4,319.8 | 4,255.9 | 4,832.8 | 5,394.2 | 5,798.9 | 6,903.2 | 7,944.4 | 7,047.6 | 7,065.7 |

1. North American Industry Classification System.

| Table 44. BERD by major NAICS¹ industry – Manitoba and Saskatchewan | | | | | | | | | | |
|---|-------------------|--------------|--------------|--------------|-------------------|--------------|-------------------|-------------------|-------------------|-------------------|
| Industry | 1994 | 1995 | 1996 | 1997 | 1998 ^r | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| | in millions of \$ | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 2.8 | 6.2 | 4.3 | 6.9 | 3.6 | 3.1 | 5.6 | 8.1 | 9.1 | 4.0 |
| Mining and oil and gas extraction | 4.2 | 5.2 | 3.4 | 21.9 | X | 9.5 | 6.0 | 12.4 | 32.7 | 15.6 |
| Utilities | X | X | X | X | X | X | X | X | X | X |
| Construction | X | X | X | X | 0.2 | X | X | X | X | X |
| Manufacturing | 78.8 | 88.1 | 70.0 | 61.1 | 76.5 | 117.7 | 108.5 | 160.8 | 116.4 | 111.1 |
| Services | 83.9 | 67.3 | 72.0 | 79.8 | 87.3 | 94.3 | 80.5 | 76.2 | 90.0 | 75.2 |
| Total | 172.1 | 169.3 | 151.6 | 171.4 | 175.8 | 226.5 | 208.3 | 259.8 | 251.4 | 209.0 |

1. North American Industry Classification System.

| Table 45. BERD by major NAICS¹ industry – Alberta | | | | | | | | | | |
|---|-------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| Industry | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 ^r | 2002 ^r | 2003 ^p |
| | in millions of \$ | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 3.9 | 4.5 | 3.7 | 2.4 | 4.0 | 9.4 | 7.6 | 6.6 | 7.3 | 6.0 |
| Mining and oil and gas extraction | 137.6 | 137.8 | 155.0 | 117.8 | 101.4 | 84.3 | 128.5 | 160.5 | 155.6 | 172.5 |
| Utilities | 2.2 | X | X | X | X | X | X | 0.5 | 0.6 | X |
| Construction | 1.9 | X | X | X | X | X | X | 1.8 | 1.9 | X |
| Manufacturing | 157.9 | 157.2 | 202.9 | 259.1 | 298.0 | 219.1 | 265.7 | 309.3 | 288.6 | 282.4 |
| Services | 205.4 | 188.2 | 159.7 | 163.0 | 212.5 | 177.1 | 187.1 | 239.6 | 313.3 | 315.4 |
| Total | 508.8 | 490.6 | 523.8 | 545.5 | 618.1 | 490.5 | 590.8 | 718.4 | 767.3 | 778.6 |

1. North American Industry Classification System.

| Table 46. BERD by major NAICS¹ industry – British Columbia | | | | | | | | | | |
|--|-------------------|--------------|--------------|--------------|--------------|--------------|-------------------|----------------|-------------------|-------------------|
| Industry | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^r | 2001 | 2002 ^r | 2003 ^p |
| | in millions of \$ | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 12.9 | 11.5 | 10.6 | 15.1 | 11.0 | 14.9 | 19.7 | 23.4 | 21.4 | 14.8 |
| Mining and oil and gas extraction | 10.9 | 15.6 | X | 12.8 | 12.4 | 10.8 | X | 17.5 | 17.8 | X |
| Utilities | X | X | 5.5 | 5.3 | X | X | X | 5.6 | 5.0 | X |
| Construction | X | X | X | 2.1 | X | X | 9.1 | 5.1 | 4.2 | 4.3 |
| Manufacturing | 236.7 | 261.2 | 267.2 | 280.7 | 322.5 | 407.0 | 574.1 | 576.9 | 430.8 | 402.1 |
| Services | 322.4 | 306.7 | 246.4 | 247.7 | 251.8 | 266.3 | 348.0 | 451.2 | 607.1 | 641.7 |
| Total | 590.6 | 602.3 | 538.1 | 563.9 | 608.3 | 713.7 | 972.8 | 1,079.7 | 1,086.4 | 1,075.4 |

1. North American Industry Classification System.

R&D personnel by industry and by region

| Table 47. Total R&D personnel by industry – Canada¹, total and professional | | | | | | | | | | |
|---|-----------------------|---------------|---------------|---------------|---------------|---------------|-------------------|---------------|-------------------|---------------|
| Industry | 1994 | | 1995 | | 1996 | | 1997 ^f | | 1998 ^f | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 721 | 309 | 782 | 321 | 729 | 287 | 732 | 316 | 655 | 285 |
| Mining and oil and gas extraction | 1,187 | 661 | 1,304 | 723 | 1,184 | 641 | 886 | 507 | 802 | 444 |
| Utilities | 1,351 | 740 | 1,331 | 748 | 1,404 | 765 | 1,178 | 687 | 954 | 583 |
| Construction | 563 | 317 | 514 | 272 | 466 | 261 | 404 | 245 | 419 | 236 |
| Manufacturing | 43,040 | 25,897 | 45,181 | 27,405 | 46,010 | 28,442 | 49,445 | 31,555 | 51,273 | 32,855 |
| Services | 32,021 | 18,935 | 32,900 | 19,506 | 29,551 | 18,103 | 30,003 | 18,656 | 31,834 | 20,285 |
| Total | 78,883 | 46,859 | 82,012 | 48,975 | 79,344 | 48,499 | 82,648 | 51,966 | 85,937 | 54,688 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

| Table 47. (continued) Total R&D personnel by industry – Canada¹, total and professional | | | | | | | | | | |
|---|-----------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|
| Industry | 1999 ^f | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 754 | 320 | 807 | 359 | 951 | 423 | 1,005 | 419 | 1,070 | 443 |
| Mining and oil and gas extraction | 775 | 403 | 730 | 385 | 850 | 398 | 681 | 355 | 661 | 354 |
| Utilities | 961 | 588 | 1,005 | 582 | 982 | 575 | 918 | 522 | 946 | 562 |
| Construction | 545 | 302 | 727 | 456 | 968 | 579 | 778 | 355 | 754 | 362 |
| Manufacturing | 53,383 | 34,245 | 60,790 | 39,574 | 61,569 | 38,927 | 58,668 | 36,248 | 59,253 | 35,381 |
| Services | 34,421 | 22,136 | 40,257 | 25,914 | 50,318 | 32,607 | 51,358 | 32,790 | 53,609 | 33,694 |
| Total | 90,839 | 57,994 | 104,316 | 67,270 | 115,638 | 73,509 | 113,408 | 70,689 | 116,293 | 70,796 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

Table 48. R&D personnel by industry – Atlantic Canada, total and professional

| Industry | 1994 | | 1995 | | 1996 | | 1997 ^f | | 1998 ^f | |
|--|-----------------------|------------|--------------|------------|--------------|------------|-------------------|------------|-------------------|------------|
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 62 | 30 | 76 | 23 | 79 | 29 | 64 | 34 | 51 | 22 |
| Mining and oil and gas extraction | 19 | 9 | 25 | 13 | 11 | 8 | 6 | 4 | 18 | 13 |
| Utilities | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 12 | 7 |
| Construction | 9 | 6 | 15 | 6 | 7 | 6 | 8 | 4 | 10 | 4 |
| Manufacturing | 634 | 284 | 688 | 307 | 720 | 339 | 678 | 340 | 922 | 448 |
| Services | 904 | 575 | 1,037 | 631 | 887 | 484 | 816 | 479 | 791 | 433 |
| Total | 1,630 | 906 | 1,843 | 982 | 1,706 | 868 | 1,574 | 863 | 1,804 | 927 |

Table 48. (continued) R&D personnel by industry – Atlantic Canada, total and professional

| Industry | 1999 ^f | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
|--|-----------------------|------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 44 | 19 | 55 | 19 | 40 | 14 | 41 | 17 | 41 | 14 |
| Mining and oil and gas extraction | 11 | 10 | 20 | 12 | 15 | 11 | 18 | 13 | 13 | 12 |
| Utilities | 13 | 6 | 77 | 29 | 45 | 18 | 21 | 9 | 11 | 5 |
| Construction | 11 | 3 | 35 | 12 | 47 | 15 | 46 | 15 | 6 | 1 |
| Manufacturing | 792 | 386 | 783 | 404 | 795 | 356 | 709 | 339 | 753 | 368 |
| Services | 863 | 514 | 1,011 | 604 | 1,160 | 768 | 1,190 | 803 | 1,084 | 766 |
| Total | 1,734 | 938 | 1,981 | 1,080 | 2,102 | 1,182 | 2,025 | 1,196 | 1,908 | 1,166 |

| Table 49. R&D personnel by industry – Quebec, total and professional | | | | | | | | | | |
|---|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Industry | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 155 | 70 | 170 | 82 | 195 | 83 | 207 | 95 | 241 | 120 |
| Mining and oil and gas extraction | 158 | 72 | 188 | 94 | 116 | 73 | 79 | 59 | 42 | 23 |
| Utilities | 847 | 485 | 871 | 501 | 850 | 488 | 744 | 437 | 695 | 432 |
| Construction | 210 | 119 | 166 | 86 | 180 | 88 | 168 | 100 | 184 | 103 |
| Manufacturing | 13,153 | 7,384 | 13,832 | 7,501 | 14,398 | 8,081 | 14,790 | 8,344 | 15,368 | 8,710 |
| Services | 9,208 | 5,345 | 10,086 | 5,940 | 10,653 | 6,335 | 10,596 | 6,335 | 11,462 | 7,115 |
| Total | 23,731 | 13,475 | 25,313 | 14,204 | 26,392 | 15,148 | 26,584 | 15,370 | 27,992 | 16,503 |

| Table 49. (continued) R&D personnel by industry – Quebec, total and professional | | | | | | | | | | |
|---|-----------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|
| Industry | 1999 | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 244 | 108 | 322 | 142 | 386 | 168 | 451 | 190 | 520 | 242 |
| Mining and oil and gas extraction | 46 | 25 | 29 | 16 | 30 | 14 | 49 | 28 | 51 | 24 |
| Utilities | 675 | 416 | 673 | 417 | 726 | 423 | 698 | 395 | 726 | 430 |
| Construction | 255 | 129 | 283 | 134 | 362 | 210 | 354 | 157 | 423 | 186 |
| Manufacturing | 16,255 | 9,060 | 18,856 | 10,747 | 18,679 | 9,831 | 18,597 | 9,930 | 19,561 | 9,961 |
| Services | 13,019 | 8,150 | 14,904 | 9,330 | 18,306 | 11,200 | 18,932 | 11,404 | 19,946 | 11,652 |
| Total | 30,494 | 17,888 | 35,067 | 20,786 | 38,489 | 21,846 | 39,081 | 22,104 | 41,227 | 22,495 |

| Table 50. R&D personnel by industry – Ontario, total and professional | | | | | | | | | | |
|--|-----------------------|---------------|---------------|---------------|-------------------|---------------|---------------|---------------|---------------|---------------|
| Industry | 1994 | | 1995 | | 1996 ^f | | 1997 | | 1998 | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 260 | 93 | 233 | 87 | 227 | 59 | 195 | 65 | 163 | 52 |
| Mining and oil and gas extraction | 162 | 68 | 177 | 94 | 196 | 80 | 174 | 86 | 201 | 105 |
| Utilities | 440 | 215 | 382 | 207 | 451 | 217 | 345 | 186 | 156 | 80 |
| Construction | 199 | 111 | 207 | 107 | 155 | 92 | 150 | 91 | 116 | 72 |
| Manufacturing | 24,056 | 15,367 | 25,112 | 16,427 | 25,396 | 16,786 | 28,330 | 19,590 | 29,013 | 20,069 |
| Services | 13,709 | 8,320 | 14,142 | 8,319 | 11,996 | 7,609 | 12,710 | 8,268 | 13,273 | 9,000 |
| Total | 38,826 | 24,174 | 40,253 | 25,241 | 38,421 | 24,843 | 41,904 | 28,286 | 42,922 | 29,378 |

| Table 50. (continued) R&D personnel by industry – Ontario, total and professional | | | | | | | | | | |
|--|-----------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|
| Industry | 1999 | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 189 | 70 | 145 | 73 | 236 | 100 | 237 | 73 | 271 | 74 |
| Mining and oil and gas extraction | 172 | 86 | 175 | 97 | 212 | 131 | 87 | 51 | 143 | 91 |
| Utilities | 174 | 94 | 140 | 60 | 143 | 92 | 114 | 68 | 138 | 84 |
| Construction | 157 | 110 | 267 | 228 | 418 | 295 | 236 | 111 | 207 | 103 |
| Manufacturing | 30,219 | 20,851 | 34,066 | 23,838 | 34,441 | 23,959 | 33,519 | 22,418 | 33,216 | 21,707 |
| Services | 13,877 | 9,330 | 16,574 | 11,205 | 21,701 | 14,989 | 21,318 | 14,504 | 22,538 | 14,839 |
| Total | 44,788 | 30,541 | 51,367 | 35,501 | 57,151 | 39,566 | 55,511 | 37,225 | 56,513 | 36,898 |

| Table 51. R&D personnel by industry – Manitoba and Saskatchewan, total and professional | | | | | | | | | | |
|--|-----------------------|--------------|--------------|--------------|--------------|------------|--------------|------------|--------------|------------|
| Industry | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 38 | 12 | 64 | 15 | 49 | 23 | 56 | 28 | 43 | 21 |
| Mining and oil and gas extraction | 42 | 24 | 42 | 25 | 37 | 18 | 53 | 32 | 27 | 15 |
| Utilities | 19 | 13 | 26 | 11 | 27 | 12 | 20 | 17 | 22 | 19 |
| Construction | 22 | 12 | 16 | 8 | 13 | 7 | 10 | 6 | 6 | 2 |
| Manufacturing | 1,063 | 505 | 1,189 | 575 | 930 | 426 | 867 | 413 | 947 | 459 |
| Services | 1,099 | 550 | 995 | 526 | 908 | 437 | 909 | 439 | 894 | 433 |
| Total | 2,283 | 1,116 | 2,332 | 1,160 | 1,964 | 923 | 1,915 | 935 | 1,939 | 949 |

| Table 51. (continued) R&D personnel by industry – Manitoba and Saskatchewan, total and professional | | | | | | | | | | |
|--|-----------------------|--------------|--------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Industry | 1999 | | 2000 | | 2001 ^r | | 2002 ^f | | 2003 ^p | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 36 | 14 | 53 | 26 | 43 | 21 | 38 | 16 | 32 | 14 |
| Mining and oil and gas extraction | 31 | 16 | 26 | 16 | 44 | 19 | 28 | 12 | 28 | 13 |
| Utilities | 19 | 16 | 28 | 23 | 19 | 16 | 26 | 18 | 19 | 16 |
| Construction | 5 | 2 | 16 | 5 | 7 | 3 | 25 | 16 | 20 | 15 |
| Manufacturing | 1,190 | 682 | 1,264 | 653 | 1,465 | 610 | 1,133 | 548 | 1,108 | 553 |
| Services | 962 | 494 | 962 | 492 | 902 | 484 | 1,020 | 558 | 948 | 516 |
| Total | 2,243 | 1,224 | 2,349 | 1,215 | 2,480 | 1,153 | 2,270 | 1,168 | 2,155 | 1,127 |

| Table 52. R&D personnel by industry – Alberta, total and professional | | | | | | | | | | |
|--|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Industry | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 45 | 23 | 61 | 23 | 41 | 22 | 30 | 15 | 25 | 12 |
| Mining and oil and gas extraction | 675 | 421 | 725 | 429 | 789 | 445 | 467 | 280 | 423 | 244 |
| Utilities | 12 | 11 | 9 | 8 | 9 | 8 | 7 | 6 | 4 | 4 |
| Construction | 36 | 18 | 31 | 18 | 30 | 19 | 33 | 22 | 50 | 19 |
| Manufacturing | 1,459 | 741 | 1,511 | 877 | 1,613 | 938 | 1,928 | 1,149 | 1,974 | 1,221 |
| Services | 2,588 | 1,634 | 2,447 | 1,536 | 2,074 | 1,282 | 1,902 | 1,133 | 2,228 | 1,326 |
| Total | 4,815 | 2,848 | 4,784 | 2,891 | 4,556 | 2,714 | 4,367 | 2,605 | 4,704 | 2,826 |

| Table 52. (continued) R&D personnel by industry – Alberta, total and professional | | | | | | | | | | |
|--|-----------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Industry | 1999 | | 2000 ^f | | 2001 ^f | | 2002 ^f | | 2003 ^p | |
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 50 | 21 | 45 | 23 | 48 | 33 | 45 | 23 | 31 | 21 |
| Mining and oil and gas extraction | 423 | 220 | 372 | 177 | 458 | 177 | 434 | 223 | 383 | 197 |
| Utilities | 4 | 2 | 5 | 2 | 7 | 3 | 9 | 6 | 8 | 3 |
| Construction | 13 | 5 | 26 | 13 | 33 | 20 | 34 | 19 | 26 | 14 |
| Manufacturing | 1,570 | 1,107 | 1,641 | 1,120 | 1,835 | 1,185 | 1,551 | 1,096 | 1,455 | 1,020 |
| Services | 2,247 | 1,421 | 2,434 | 1,493 | 2,933 | 1,742 | 3,079 | 1,924 | 2,843 | 1,805 |
| Total | 4,307 | 2,776 | 4,523 | 2,828 | 5,314 | 3,160 | 5,152 | 3,291 | 4,746 | 3,060 |

Table 53. R&D personnel by industry – British Columbia, total and professional

| Industry | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
|--|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 158 | 80 | 177 | 91 | 138 | 71 | 180 | 79 | 132 | 58 |
| Mining and oil and gas extraction | 131 | 67 | 147 | 68 | 35 | 17 | 107 | 46 | 91 | 44 |
| Utilities | 31 | 14 | 41 | 19 | 65 | 38 | 60 | 39 | 65 | 41 |
| Construction | 86 | 51 | 78 | 47 | 81 | 49 | 35 | 22 | 53 | 36 |
| Manufacturing | 2,657 | 1,608 | 2,830 | 1,711 | 2,948 | 1,870 | 2,850 | 1,719 | 3,041 | 1,942 |
| Services | 4,463 | 2,485 | 4,185 | 2,550 | 3,030 | 1,954 | 3,062 | 1,998 | 3,178 | 1,974 |
| Total | 7,526 | 4,305 | 7,458 | 4,486 | 6,297 | 3,999 | 6,294 | 3,903 | 6,560 | 4,095 |

Table 53. (continued) R&D personnel by industry – British Columbia, total and professional

| Industry | 1999 | | 2000 ^r | | 2001 ^r | | 2002 ^r | | 2003 ^p | |
|--|-----------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. | Total | Prof. |
| | full time equivalents | | | | | | | | | |
| Agriculture, forestry, fishing and hunting | 191 | 88 | 187 | 76 | 197 | 87 | 193 | 100 | 174 | 78 |
| Mining and oil and gas extraction | 92 | 46 | 108 | 67 | 91 | 46 | 65 | 28 | 43 | 17 |
| Utilities | 76 | 54 | 82 | 51 | 42 | 23 | 50 | 26 | 44 | 24 |
| Construction | 104 | 53 | 100 | 64 | 101 | 36 | 83 | 37 | 72 | 43 |
| Manufacturing | 3,350 | 2,154 | 4,175 | 2,809 | 4,350 | 2,986 | 3,159 | 1,917 | 3,160 | 1,772 |
| Services | 3,452 | 2,226 | 4,372 | 2,790 | 5,315 | 3,423 | 5,818 | 3,597 | 6,249 | 4,116 |
| Total | 7,265 | 4,621 | 9,024 | 5,857 | 10,096 | 6,601 | 9,368 | 5,705 | 9,742 | 6,050 |

Table 54. Total R&D personnel by country of control

| Region / Country of control | | 1994 | 1995 | 1996 ^f | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|-----------------------------|--------------|-----------------------|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | full time equivalents | | | | | | | | | |
| Canada ¹ | Canada | 61,427 | 63,779 | 60,886 | 62,605 | 64,840 | 68,865 | 80,325 | 90,186 | 87,852 | 89,066 |
| | Foreign | 17,456 | 18,233 | 18,458 | 20,043 | 21,097 | 21,974 | 23,991 | 25,452 | 25,556 | 27,227 |
| | Total | 78,883 | 82,012 | 79,344 | 82,648 | 85,937 | 90,839 | 104,316 | 115,638 | 113,408 | 116,293 |
| Atlantic Canada | Canada | 1,523 | 1,690 | 1,586 | 1,409 | 1,560 | 1,578 | 1,747 | 1,777 | 1,702 | 1,567 |
| | Foreign | 107 | 153 | 120 | 165 | 244 | 156 | 234 | 325 | 323 | 341 |
| | Total | 1,630 | 1,843 | 1,706 | 1,574 | 1,804 | 1,734 | 1,981 | 2,102 | 2,025 | 1,908 |
| Quebec | Canada | 19,476 | 20,737 | 20,710 | 20,328 | 21,459 | 23,899 | 26,903 | 29,928 | 30,678 | 32,780 |
| | Foreign | 4,255 | 4,576 | 5,682 | 6,256 | 6,533 | 6,595 | 8,164 | 8,561 | 8,403 | 8,447 |
| | Total | 23,731 | 25,313 | 26,392 | 26,584 | 27,992 | 30,494 | 35,067 | 38,489 | 39,081 | 41,227 |
| Ontario | Canada | 28,207 | 29,917 | 28,546 | 30,510 | 30,942 | 31,709 | 38,289 | 43,946 | 41,229 | 41,156 |
| | Foreign | 10,619 | 10,336 | 9,875 | 11,394 | 11,980 | 13,079 | 13,078 | 13,205 | 14,282 | 15,357 |
| | Total | 38,826 | 40,253 | 38,421 | 41,904 | 42,922 | 44,788 | 51,367 | 57,151 | 55,511 | 56,513 |
| Manitoba and Saskatchewan | Canada | 1,935 | 1,879 | 1,665 | 1,641 | 1,700 | 1,940 | 1,955 | 2,081 | 2,011 | 1,872 |
| | Foreign | 348 | 453 | 299 | 274 | 239 | 303 | 394 | 399 | 259 | 283 |
| | Total | 2,283 | 2,332 | 1,964 | 1,915 | 1,939 | 2,243 | 2,349 | 2,480 | 2,270 | 2,155 |
| Alberta | Canada | 4,268 | 4,277 | 3,955 | 3,755 | 3,919 | 3,605 | 3,841 | 4,557 | 4,382 | 3,899 |
| | Foreign | 547 | 507 | 601 | 612 | 785 | 702 | 682 | 757 | 770 | 847 |
| | Total | 4,815 | 4,784 | 4,556 | 4,367 | 4,704 | 4,307 | 4,523 | 5,314 | 5,152 | 4,746 |
| British Columbia | Canada | 5,946 | 5,250 | 4,416 | 4,952 | 5,244 | 6,126 | 7,585 | 7,891 | 7,849 | 7,790 |
| | Foreign | 1,580 | 2,208 | 1,881 | 1,342 | 1,316 | 1,139 | 1,439 | 2,205 | 1,519 | 1,952 |
| | Total | 7,526 | 7,458 | 6,297 | 6,294 | 6,560 | 7,265 | 9,024 | 10,096 | 9,368 | 9,742 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

Table 55. Total R&D personnel, by employment size – Canada¹

| Employment size ² | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-----------------------|---------------|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | full time equivalents | | | | | | | | | |
| 0 – 9 | 9,107 | 8,593 | 7,747 | 7,235 | 7,173 | 7,281 | 8,283 | 9,732 | 10,612 | 11,314 |
| 10 – 19 | 5,988 | 5,929 | 4,924 | 4,793 | 4,978 | 5,550 | 6,116 | 7,712 | 7,974 | 8,836 |
| 20 – 49 | 8,479 | 8,936 | 8,129 | 8,129 | 9,071 | 10,121 | 11,994 | 14,198 | 14,384 | 15,135 |
| 50 – 99 | 6,296 | 6,865 | 6,617 | 7,034 | 7,977 | 7,856 | 10,108 | 12,663 | 11,913 | 11,680 |
| 100 – 199 | 6,306 | 6,869 | 7,084 | 8,059 | 7,668 | 8,709 | 10,353 | 12,530 | 11,604 | 10,146 |
| 200 – 499 | 6,652 | 6,993 | 7,294 | 7,766 | 8,474 | 10,184 | 10,408 | 12,135 | 11,275 | 11,724 |
| 500 – 999 | 5,713 | 7,251 | 7,133 | 6,994 | 7,208 | 5,485 | 8,933 | 9,862 | 9,358 | 9,634 |
| 1,000 – 1,999 | 6,121 | 5,993 | 6,717 | 6,609 | 7,745 | 9,869 | 9,563 | 9,505 | 11,616 | 11,761 |
| 2,000 – 4,999 | 5,761 | 5,991 | 5,709 | 5,915 | 6,538 | 8,248 | 8,271 | 8,079 | 8,310 | 13,624 |
| > 4,999 | 18,460 | 18,592 | 17,990 | 20,114 | 19,105 | 17,536 | 20,287 | 19,222 | 16,362 | 12,439 |
| Total | 78,883 | 82,012 | 79,344 | 82,648 | 85,937 | 90,839 | 104,316 | 115,638 | 113,408 | 116,293 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

2. Employment size is based on total employment in Canada.

Table 56. Total R&D personnel, by employment size – Atlantic Canada

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-----------------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | full time equivalents | | | | | | | | | |
| 0 – 9 | 337 | 392 | 398 | 346 | 358 | 348 | 328 | 359 | 309 | 320 |
| 10 – 19 | 186 | 237 | 191 | 169 | 182 | 249 | 254 | 199 | 169 | 203 |
| 20 – 49 | 332 | 334 | 349 | 390 | 435 | 339 | 458 | 397 | 406 | 295 |
| 50 – 99 | 142 | 253 | 229 | 239 | 305 | 194 | 238 | 389 | 312 | 410 |
| 100 – 199 | 99 | 91 | 135 | 204 | 168 | 275 | 295 | 223 | 294 | 205 |
| 200 – 499 | 100 | 92 | 48 | 42 | 78 | 157 | 105 | 219 | 345 | 233 |
| 500 – 999 | 33 | 26 | 55 | 69 | 100 | 16 | 119 | 90 | 22 | 48 |
| 1,000 – 1,999 | 51 | 41 | 22 | 42 | 53 | 39 | 94 | 60 | 29 | 35 |
| > 1,999 | 350 | 377 | 279 | 73 | 125 | 117 | 90 | 166 | 139 | 159 |
| Total | 1,630 | 1,843 | 1,706 | 1,574 | 1,804 | 1,734 | 1,981 | 2,102 | 2,025 | 1,908 |

1. Employment size is based on total employment in Canada.

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-----------------------|---------------|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| person-years | full time equivalents | | | | | | | | | |
| 0 – 9 | 2,882 | 3,005 | 2,993 | 2,794 | 2,735 | 2,747 | 3,174 | 3,542 | 4,127 | 4,541 |
| 10 – 19 | 2,014 | 2,121 | 2,054 | 1,902 | 2,119 | 2,118 | 2,154 | 2,895 | 2,996 | 3,413 |
| 20 – 49 | 2,561 | 2,895 | 3,038 | 2,932 | 3,483 | 4,060 | 4,471 | 5,145 | 5,404 | 6,089 |
| 50 – 99 | 1,770 | 2,065 | 2,230 | 2,029 | 2,483 | 2,396 | 3,130 | 4,272 | 4,366 | 4,127 |
| 100 – 199 | 1,793 | 1,991 | 2,079 | 2,285 | 2,248 | 2,705 | 3,046 | 3,657 | 3,542 | 3,775 |
| 200 – 499 | 2,758 | 1,975 | 2,098 | 2,111 | 2,084 | 2,996 | 3,552 | 3,830 | 3,305 | 3,782 |
| 500 – 999 | 1,718 | 3,258 | 2,854 | 2,928 | 3,312 | 2,378 | 3,766 | 4,348 | 3,973 | 3,800 |
| 1,000 – 1,999 | 1,873 | 1,537 | 2,160 | 2,562 | 2,767 | 4,306 | 2,545 | 2,467 | 4,379 | 3,989 |
| 2,000 – 4,999 | 2,263 | 2,243 | 2,534 | 2,308 | 2,194 | 2,389 | 3,899 | 3,322 | 1,874 | 2,009 |
| > 4,999 | 4,099 | 4,223 | 4,352 | 4,733 | 4,567 | 4,399 | 5,330 | 5,011 | 5,115 | 5,702 |
| Total | 23,731 | 25,313 | 26,392 | 26,584 | 27,992 | 30,494 | 35,067 | 38,489 | 39,081 | 41,227 |

1. Employment size is based on total employment in Canada.

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-----------------------|---------------|---------------|---------------|---------------|---------------|-------------------|-------------------|-------------------|-------------------|
| person-years | full time equivalents | | | | | | | | | |
| 0 – 9 | 2,831 | 2,401 | 2,126 | 2,096 | 2,153 | 2,158 | 2,561 | 3,310 | 3,643 | 3,800 |
| 10 – 19 | 2,368 | 2,277 | 1,852 | 1,813 | 1,709 | 2,099 | 2,322 | 3,109 | 3,170 | 3,541 |
| 20 – 49 | 3,232 | 3,526 | 3,079 | 3,158 | 3,552 | 3,857 | 4,847 | 6,110 | 6,101 | 6,386 |
| 50 – 99 | 2,805 | 2,770 | 2,405 | 3,103 | 3,741 | 3,748 | 4,771 | 5,797 | 5,239 | 4,933 |
| 100 – 199 | 3,411 | 3,550 | 3,664 | 3,931 | 3,725 | 4,079 | 5,155 | 6,543 | 5,620 | 4,551 |
| 200 – 499 | 2,863 | 3,540 | 3,772 | 4,013 | 4,513 | 4,959 | 5,314 | 6,061 | 5,543 | 5,945 |
| 500 – 999 | 2,387 | 3,017 | 3,160 | 3,238 | 2,691 | 2,437 | 3,532 | 3,376 | 4,020 | 4,224 |
| 1,000 – 1,999 | 3,388 | 3,399 | 3,614 | 3,572 | 4,275 | 4,430 | 5,126 | 5,611 | 6,057 | 6,267 |
| 2,000 – 4,999 | 2,381 | 2,535 | 2,123 | 2,724 | 3,242 | 4,890 | 3,525 | 3,713 | 5,538 | 10,541 |
| > 4,999 | 13,160 | 13,238 | 12,626 | 14,256 | 13,321 | 12,131 | 14,214 | 13,521 | 10,580 | 6,325 |
| Total | 38,826 | 40,253 | 38,421 | 41,904 | 42,922 | 44,788 | 51,367 | 57,151 | 55,511 | 56,513 |

1. Employment size is based on total employment in Canada.

Table 59. Total R&D personnel, by employment size – Manitoba and Saskatchewan

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| person-years | full time equivalents | | | | | | | | | |
| 0 – 9 | 467 | 423 | 368 | 326 | 356 | 371 | 423 | 445 | 477 | 475 |
| 10 – 19 | 184 | 195 | 98 | 107 | 116 | 126 | 202 | 209 | 225 | 172 |
| 20 – 49 | 343 | 414 | 298 | 254 | 172 | 250 | 239 | 280 | 291 | 261 |
| 50 – 99 | 255 | 250 | 297 | 265 | 246 | 154 | 209 | 198 | 223 | 239 |
| 100 – 199 | 193 | 220 | 289 | 334 | 321 | 291 | 278 | 171 | 203 | 232 |
| 200 – 499 | 371 | 249 | 152 | 193 | 176 | 273 | 200 | 514 | 260 | 251 |
| 500 – 999 | 179 | 178 | 131 | 122 | 138 | 314 | 332 | 357 | 305 | 297 |
| 1,000 – 1,999 | 163 | 233 | 203 | 217 | 160 | 57 | 272 | 196 | 124 | 137 |
| 2,000 – 4,999 | 105 | 160 | 115 | 92 | 243 | 194 | 158 | 100 | 152 | 7 |
| > 4,999 | 23 | 10 | 13 | 5 | 11 | 213 | 36 | 10 | 10 | 84 |
| Total | 2,283 | 2,332 | 1,964 | 1,915 | 1,939 | 2,243 | 2,349 | 2,480 | 2,270 | 2,155 |

1. Employment size is based on total employment in Canada.

Table 60. Total R&D personnel, by employment size – Alberta

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| person-years | full time equivalents | | | | | | | | | |
| 0 – 9 | 952 | 907 | 822 | 698 | 636 | 718 | 775 | 904 | 774 | 727 |
| 10 – 19 | 420 | 418 | 309 | 316 | 428 | 420 | 479 | 512 | 492 | 527 |
| 20 – 49 | 677 | 631 | 492 | 520 | 511 | 539 | 675 | 656 | 681 | 532 |
| 50 – 99 | 401 | 456 | 445 | 471 | 271 | 243 | 361 | 549 | 306 | 430 |
| 100 – 199 | 343 | 462 | 453 | 549 | 605 | 582 | 554 | 729 | 886 | 490 |
| 200 – 499 | 242 | 186 | 243 | 339 | 404 | 332 | 367 | 499 | 593 | 633 |
| 500 – 999 | 184 | 120 | 262 | 130 | 182 | 251 | 231 | 317 | 156 | 85 |
| 1,000 – 1,999 | 372 | 373 | 339 | 151 | 160 | 124 | 66 | 171 | 265 | 281 |
| 2,000 – 4,999 | 401 | 440 | 480 | 374 | 549 | 488 | 518 | 518 | 531 | 913 |
| > 4,999 | 823 | 791 | 711 | 819 | 958 | 610 | 497 | 459 | 468 | 128 |
| Total | 4,815 | 4,784 | 4,556 | 4,367 | 4,704 | 4,307 | 4,523 | 5,314 | 5,152 | 4,746 |

1. Employment size is based on total employment in Canada.

Table 61. Total R&D personnel, by employment size – British Columbia

| Employment size ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|------------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| person-years | full time equivalents | | | | | | | | | |
| 0 – 9 | 1,614 | 1,452 | 1,037 | 970 | 926 | 935 | 1,020 | 1,170 | 1,281 | 1,449 |
| 10 – 19 | 787 | 671 | 418 | 485 | 417 | 534 | 702 | 784 | 922 | 980 |
| 20 – 49 | 1,320 | 1,134 | 870 | 875 | 918 | 1,076 | 1,304 | 1,610 | 1,501 | 1,572 |
| 50 – 99 | 920 | 1,070 | 1,011 | 927 | 931 | 1,121 | 1,399 | 1,458 | 1,467 | 1,541 |
| 100 – 199 | 467 | 554 | 464 | 756 | 601 | 777 | 1,025 | 1,207 | 1,059 | 893 |
| 200 – 499 | 316 | 949 | 981 | 1,068 | 1,219 | 1,467 | 870 | 1,012 | 1,229 | 880 |
| 500 – 999 | 1,212 | 652 | 671 | 503 | 785 | 89 | 953 | 1,374 | 882 | 1,180 |
| 1,000 – 1,999 | 274 | 410 | 379 | 65 | 330 | 913 | 1,460 | 1,000 | 762 | 1,052 |
| 2,000 – 4,999 | 262 | 263 | 189 | 345 | 213 | 191 | 98 | 308 | 132 | 39 |
| > 4,999 | 354 | 303 | 277 | 300 | 220 | 162 | 193 | 173 | 133 | 156 |
| Total | 7,526 | 7,458 | 6,297 | 6,294 | 6,560 | 7,265 | 9,024 | 10,096 | 9,368 | 9,742 |

1. Employment size is based on total employment in Canada.

Table 62. Total R&D personnel by size of R&D expenditures – Canada¹

| Size of R&D ² | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 | 2002 ^f | 2003 ^p |
|--------------------------|-----------------------|---------------|---------------|-------------------|-------------------|-------------------|-------------------|----------------|-------------------|-------------------|
| in thousands of \$ | full time equivalents | | | | | | | | | |
| 0 – 24 | 2,785 | 2,577 | 2,443 | 2,386 | 2,131 | 2,031 | 1,980 | 2,046 | 2,093 | 2,062 |
| 25 – 49 | 1,888 | 1,855 | 1,758 | 1,643 | 1,742 | 1,697 | 1,741 | 1,918 | 2,012 | 2,069 |
| 50 – 99 | 3,073 | 3,137 | 2,817 | 2,694 | 2,752 | 2,738 | 3,111 | 3,534 | 3,702 | 4,105 |
| 100 – 199 | 4,808 | 4,776 | 4,138 | 4,143 | 4,384 | 4,688 | 5,424 | 6,131 | 6,338 | 6,696 |
| 200 – 399 | 5,784 | 5,993 | 5,342 | 5,283 | 5,554 | 6,228 | 6,888 | 8,146 | 7,801 | 9,053 |
| 400 – 999 | 7,753 | 8,087 | 6,274 | 6,598 | 7,362 | 8,146 | 10,552 | 12,078 | 11,660 | 12,413 |
| 1,000 – 1,999 | 5,778 | 6,429 | 6,601 | 6,509 | 6,534 | 7,496 | 8,421 | 10,111 | 9,609 | 9,509 |
| 2,000 – 9,999 | 12,784 | 13,681 | 13,317 | 14,356 | 16,277 | 16,288 | 18,924 | 21,865 | 21,292 | 20,390 |
| > 9,999 | 34,230 | 35,477 | 36,654 | 39,036 | 39,201 | 41,527 | 47,275 | 49,809 | 48,901 | 49,996 |
| Total | 78,883 | 82,012 | 79,344 | 82,648 | 85,937 | 90,839 | 104,316 | 115,638 | 113,408 | 116,293 |

1. Canada totals include the Yukon, Northwest and Nunavut Territories.

2. Size of R&D is based on total R&D expenditures in Canada.

Table 63. Total R&D personnel by size of R&D expenditures – Atlantic Canada

| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 ^f | 1998 ^f | 1999 ^f | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|--------------------------|-----------------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| in thousands of \$ | full time equivalents | | | | | | | | | |
| 0 – 24 | 122 | 137 | 165 | 146 | 137 | 117 | 96 | 89 | 88 | 82 |
| 25 – 49 | 65 | 96 | 99 | 82 | 97 | 91 | 75 | 61 | 72 | 68 |
| 50 – 99 | 126 | 154 | 131 | 142 | 120 | 123 | 139 | 138 | 129 | 141 |
| 100 – 199 | 167 | 147 | 184 | 145 | 200 | 196 | 218 | 192 | 171 | 176 |
| 200 – 399 | 194 | 265 | 212 | 238 | 236 | 282 | 221 | 287 | 207 | 229 |
| 400 – 999 | 224 | 252 | 183 | 268 | 336 | 249 | 390 | 328 | 324 | 304 |
| 1,000 – 1,999 | 224 | 310 | 314 | 279 | 347 | 304 | 283 | 216 | 162 | 141 |
| 2,000 – 9,999 | 374 | 364 | 225 | 265 | 293 | 357 | 444 | 719 | 768 | 545 |
| > 9,999 | 134 | 118 | 193 | 9 | 38 | 15 | 115 | 72 | 104 | 222 |
| Total | 1,630 | 1,843 | 1,706 | 1,574 | 1,804 | 1,734 | 1,981 | 2,102 | 2,025 | 1,908 |

1. Size of R&D is based on total R&D expenditures in Canada.

Table 64. Total R&D personnel by size of R&D expenditures – Quebec

| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|--------------------------|-----------------------|---------------|---------------|---------------|---------------|---------------|-------------------|-------------------|-------------------|-------------------|
| in thousands of \$ | full time equivalents | | | | | | | | | |
| 0 – 24 | 949 | 933 | 897 | 1,028 | 1,011 | 946 | 919 | 975 | 1,040 | 1,100 |
| 25 – 49 | 707 | 694 | 763 | 724 | 768 | 772 | 831 | 943 | 1,031 | 1,129 |
| 50 – 99 | 1,133 | 1,229 | 1,215 | 1,184 | 1,177 | 1,228 | 1,426 | 1,604 | 1,763 | 2,033 |
| 100 – 199 | 1,740 | 1,827 | 1,683 | 1,656 | 1,714 | 1,834 | 2,220 | 2,429 | 2,579 | 2,971 |
| 200 – 399 | 1,875 | 2,146 | 2,187 | 1,918 | 1,956 | 2,360 | 2,476 | 2,979 | 2,845 | 3,450 |
| 400 – 999 | 2,471 | 2,637 | 2,647 | 2,359 | 2,633 | 2,918 | 3,583 | 3,829 | 3,734 | 4,056 |
| 1,000 – 1,999 | 1,623 | 1,743 | 2,158 | 1,969 | 2,080 | 2,548 | 2,573 | 3,153 | 3,177 | 3,629 |
| 2,000 – 9,999 | 2,843 | 3,148 | 3,014 | 3,431 | 4,153 | 4,625 | 5,269 | 6,400 | 6,960 | 6,347 |
| > 9,999 | 10,390 | 10,956 | 11,828 | 12,315 | 12,500 | 13,263 | 15,770 | 16,177 | 15,952 | 16,512 |
| Total | 23,731 | 25,313 | 26,392 | 26,584 | 27,992 | 30,494 | 35,067 | 38,489 | 39,081 | 41,227 |

1. Size of R&D is based on total R&D expenditures in Canada.

Table 65. Total R&D personnel by size of R&D expenditures – Ontario

| Size of R&D ¹ | 1994 | 1995 | 1996 ^f | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
|--------------------------|-----------------------|---------------|-------------------|---------------|---------------|---------------|-------------------|-------------------|-------------------|-------------------|
| in thousands of \$ | full time equivalents | | | | | | | | | |
| 0 – 24 | 844 | 751 | 694 | 652 | 503 | 518 | 502 | 549 | 524 | 493 |
| 25 – 49 | 589 | 584 | 525 | 486 | 515 | 474 | 509 | 539 | 551 | 513 |
| 50 – 99 | 1,049 | 1,020 | 915 | 883 | 921 | 867 | 943 | 1,118 | 1,237 | 1,320 |
| 100 – 199 | 1,791 | 1,637 | 1,417 | 1,546 | 1,589 | 1,811 | 1,976 | 2,377 | 2,349 | 2,362 |
| 200 – 399 | 2,232 | 2,151 | 1,903 | 2,093 | 2,305 | 2,373 | 2,797 | 3,543 | 3,351 | 3,852 |
| 400 – 999 | 3,229 | 3,539 | 2,510 | 2,877 | 3,321 | 3,612 | 4,943 | 5,614 | 5,534 | 5,840 |
| 1,000 – 1,999 | 2,568 | 2,653 | 2,504 | 2,759 | 2,772 | 3,323 | 3,992 | 5,269 | 4,509 | 4,391 |
| 2,000 – 9,999 | 6,840 | 7,474 | 7,345 | 7,770 | 8,696 | 8,023 | 9,199 | 10,568 | 10,166 | 10,052 |
| > 9,999 | 19,684 | 20,444 | 20,608 | 22,838 | 22,300 | 23,787 | 26,506 | 27,574 | 27,290 | 27,690 |
| Total | 38,826 | 40,253 | 38,421 | 41,904 | 42,922 | 44,788 | 51,367 | 57,151 | 55,511 | 56,513 |

1. Size of R&D is based on total R&D expenditures in Canada.

Table 66. Total R&D personnel by size of R&D expenditures – Manitoba and Saskatchewan

| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 ^f | 2002 ^f | 2003 ^p |
|--------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|
| in thousands of \$ | full time equivalents | | | | | | | | | |
| 0 – 24 | 152 | 132 | 136 | 102 | 94 | 90 | 90 | 80 | 79 | 63 |
| 25 – 49 | 83 | 88 | 50 | 67 | 64 | 65 | 53 | 66 | 63 | 65 |
| 50 – 99 | 131 | 107 | 68 | 69 | 99 | 89 | 121 | 108 | 107 | 94 |
| 100 – 199 | 162 | 160 | 131 | 183 | 147 | 133 | 168 | 199 | 235 | 165 |
| 200 – 399 | 239 | 227 | 164 | 109 | 152 | 169 | 217 | 232 | 177 | 188 |
| 400 – 999 | 360 | 258 | 178 | 189 | 122 | 193 | 217 | 292 | 293 | 265 |
| 1,000 – 1,999 | 229 | 438 | 328 | 320 | 262 | 164 | 206 | 219 | 342 | 321 |
| 2,000 – 9,999 | 677 | 755 | 774 | 696 | 874 | 824 | 873 | 779 | 605 | 632 |
| > 9,999 | 250 | 167 | 135 | 180 | 125 | 516 | 404 | 505 | 369 | 362 |
| Total | 2,283 | 2,332 | 1,964 | 1,915 | 1,939 | 2,243 | 2,349 | 2,480 | 2,270 | 2,155 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 67. Total R&D personnel by size of R&D expenditures – Alberta | | | | | | | | | | |
|--|-----------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
| in thousands of \$ | full time equivalents | | | | | | | | | |
| 0 – 24 | 285 | 251 | 239 | 190 | 179 | 168 | 160 | 153 | 152 | 113 |
| 25 – 49 | 166 | 160 | 131 | 133 | 122 | 133 | 126 | 147 | 90 | 90 |
| 50 – 99 | 236 | 218 | 183 | 176 | 178 | 183 | 209 | 221 | 192 | 157 |
| 100 – 199 | 328 | 381 | 343 | 246 | 323 | 287 | 370 | 403 | 344 | 361 |
| 200 – 399 | 467 | 453 | 356 | 381 | 461 | 514 | 541 | 446 | 438 | 476 |
| 400 – 999 | 571 | 517 | 297 | 360 | 404 | 422 | 602 | 704 | 567 | 527 |
| 1,000 – 1,999 | 368 | 586 | 559 | 450 | 402 | 326 | 277 | 491 | 607 | 392 |
| 2,000 – 9,999 | 798 | 612 | 788 | 856 | 839 | 828 | 918 | 977 | 964 | 937 |
| > 9,999 | 1,596 | 1,606 | 1,660 | 1,575 | 1,796 | 1,446 | 1,320 | 1,772 | 1,798 | 1,693 |
| Total | 4,815 | 4,784 | 4,556 | 4,367 | 4,704 | 4,307 | 4,523 | 5,314 | 5,152 | 4,746 |

1. Size of R&D is based on total R&D expenditures in Canada.

| Table 68. Total R&D personnel by size of R&D expenditures – British Columbia | | | | | | | | | | |
|---|-----------------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|
| Size of R&D ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 ^f | 2001 ^f | 2002 ^f | 2003 ^p |
| in thousands of \$ | full time equivalents | | | | | | | | | |
| 0 – 24 | 412 | 358 | 309 | 267 | 207 | 192 | 213 | 200 | 209 | 211 |
| 25 – 49 | 268 | 230 | 189 | 150 | 175 | 162 | 146 | 161 | 205 | 203 |
| 50 – 99 | 392 | 400 | 301 | 240 | 252 | 246 | 272 | 345 | 274 | 360 |
| 100 – 199 | 615 | 622 | 380 | 363 | 404 | 427 | 472 | 530 | 660 | 660 |
| 200 – 399 | 756 | 751 | 520 | 540 | 441 | 527 | 633 | 655 | 783 | 858 |
| 400 – 999 | 889 | 884 | 459 | 545 | 546 | 749 | 817 | 1,311 | 1,208 | 1,421 |
| 1,000 – 1,999 | 766 | 699 | 738 | 732 | 671 | 831 | 1,090 | 763 | 812 | 635 |
| 2,000 – 9,999 | 1,252 | 1,328 | 1,171 | 1,338 | 1,422 | 1,631 | 2,221 | 2,422 | 1,829 | 1,877 |
| > 9,999 | 2,176 | 2,186 | 2,230 | 2,119 | 2,442 | 2,500 | 3,160 | 3,709 | 3,388 | 3,517 |
| Total | 7,526 | 7,458 | 6,297 | 6,294 | 6,560 | 7,265 | 9,024 | 10,096 | 9,368 | 9,742 |

1. Size of R&D is based on total R&D expenditures in Canada.

Technical notes

Definitions

R&D personnel: calculated in full-time equivalent (FTE's). R&D may be carried out by persons who work solely on R&D projects or by persons who devote only part of their time to R&D, and the balance to other activities such as testing, quality control and production engineering. To arrive at the total effort devoted to R&D in terms of person-years, it is necessary to estimate the full-time equivalent (FTE's) of these persons working only part-time in R&D.

(FTE's) = number of persons who work solely on R&D projects + estimate of time of persons working only part of their time on R&D.

Example Calculation:

If out of five scientists engaged in R&D work, one works solely on R&D projects and the remaining four devote only one quarter of their working time to R&D, then: $(FTE's) = 1 + 1/4 + 1/4 + 1/4 + 1/4 = 2$ scientists.

Research and Development

Research and development (R&D) is systematic investigation carried out in the natural and engineering sciences by means of experiment or analysis to achieve a scientific or commercial advance.

Research is original investigation undertaken on a systematic basis to gain new knowledge.

Development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products or processes. If successful, development will usually result in devices or processes which represent an improvement in the "state of the art" and are likely to be patentable.

Example:

The investigation of electrical conduction in crystals was research. The application of this knowledge to the creation of a new amplifying device - the transistor - was development. The application of the device to the construction of new electrical circuits for television receivers was development. The formulation of new plastic cases for a television receiver is design, not development.

Research and development may be carried out either by a permanent R&D unit (e.g., R&D division) or by a unit generally engaged in any non-R&D activity such as engineering or production. In the first case, the R&D unit may spend part of its time on routine testing or trouble shooting or on some other activities which should not be included in R&D. In the second, only the R&D portion of such units' total activity should be considered.

Research and development should be considered to be "Scientific Research and Experimental Development" as defined in Section 37, Regulation 2900 of the Income Tax Act; this section specifically **excludes** the following:

- (i) market research, sales promotion,
- (ii) quality control or routine analysis and testing of materials, devices or products,
- (iii) research in the social sciences or the humanities,
- (iv) prospecting, exploring or drilling for or producing minerals, petroleum or natural gas,
- (v) the commercial production of a new or improved material, device or product or the commercial use of a new or improved process,
- (vi) style changes, or routine data collection.

Note:

Although the definition of “Scientific Research and Experimental Development” is considered to be the same as R&D, certain expenditures for scientific research cannot be claimed for income tax purposes (e.g., land, building). All expenditures attributable to R&D are included in this report.

Industrial classification

The natural classification to use within the business enterprise sector is the North American Industry Classification System (NAICS). There are, however, problems with its use. A major problem is caused by companies with establishments in more than one industry (e.g., companies which both refine petroleum and extract oil). Another is caused by the concentration of the R&D activity among a few companies. In order to prevent disclosure of individual respondents many industries must be grouped together to provide sufficient observations for publication. A third problem is that the classification, chosen to represent general industrial activity, may not be entirely suitable for identifying companies chosen only for their involvement in R&D.

There are some restrictions on the application of the NAICS, for example, industrial non-profit organizations will be assigned to the industry they support.

The R&D activities of other sectors such as the federal government, provincial governments, higher education, and private non-profit organizations are covered in other reports.

Interpretation of R&D

Generally speaking, industrial R&D is intended to result in an invention which may subsequently become a technological innovation. An essential requirement is that the outcome of the work is uncertain, i.e., that the possibility of obtaining a given technical objective cannot be known in advance on the basis of current knowledge or experience. Hence much of the work done by scientists and engineers is not R&D, since they are primarily engaged in “routine” production, engineering, quality control or testing. Although they apply scientific or engineering principles their work is not directed towards the discovery of new knowledge or the development of new products and processes. However, work elements which are not considered R&D by themselves but which directly support R&D projects, should be included with R&D in these cases. Examples of such work elements are design and engineering, shop work, computer programming, and secretarial work.

If the primary objective is to make further technical improvements to the product or process, then the work comes within the definition of R&D. If however, the product, process or approach is substantially set and the primary objective is to develop markets, to do pre-production planning or to get a production or control system working smoothly, then the activity can no longer be considered as part of R&D even though it could be regarded as an important part of the total innovation process. Thus, the design, construction and testing of prototypes, models and pilot plants are part of R&D. But, when necessary modifications have been made and testing has been satisfactorily completed, the boundary of R&D has been reached. Hence, the costs of tooling (design and try-out), construction drawings and manufacturing blueprints, and production start-up are not included in development costs.

Pilot plants may be included in development only if the main purpose is to acquire experience and compile data. As soon as they begin operating as normal production units, their costs can no longer be attributed to R&D. Similarly, once the original prototype has been found satisfactory, the cost of other “prototypes” built to meet a special need or fill a very small order are not to be considered as part of R&D.

| Specific cases and their treatment | | |
|--|------------------|---|
| Activity | Treatment | Remarks |
| Economic research, market research, management studies. | Exclude | All activities in the social sciences. |
| Quality control, routine testing, style changes, minor adaptation of a product to meet a customer's specific requirements. | Exclude | Even if carried out by staff normally engaged in R&D. |
| Prospecting, exploratory drilling, development of mines, oil or gas wells. | Exclude | Except for R&D projects concerned with new equipment or techniques in these activities, such as in-situ and tertiary recovery research. |
| Engineering | Exclude | Engineering unless it is in direct support of R&D. |
| Design and drawing | Exclude | Design and drawing unless it is in direct support of R&D. |
| Prototypes, pilot plants | Include | As long as the primary objective is to make further improvements. |
| Contracts for R&D | Include | All contracts for R&D. For contracts which include other work, report only the R&D costs. |
| Tooling up, trial production, trouble shooting | Exclude | Although R&D may be required as a result of these steps. |
| Patent and license work | Exclude | All administrative and legal work connected with patents and licenses. |

Reliability of the data

All the possible sources of error are examined below. Definitions have been taken from **A Compendium of Methods of Error Evaluation in Censuses and Surveys**, Statistics Canada, Catalogue No. 13-564.

Coverage

“Coverage errors are introduced whenever the sampling frame...does not adequately represent the target population at the time of the survey.”

Coverage is a minor source of error. Surveys are of all known and suspected, large R&D establishments and funders (R&D \geq \$1,000,000).

Administrative data are used for the small R&D establishments or funders. Companies have up to 18 months after their fiscal year end to claim a tax credit for their R&D expenditures; however, we estimate under reporting to be less than 6%.

Response

“A response error occurs whenever a characteristic is misreported in a census or a survey.”

As a result of a reconciliation of federal and industrial accounts of government grants and contracts, we think that industrial R&D performance estimates may be slightly low. This is caused by the non-reporting of industrial R&D funded by contract. Such work is sometimes not distinguishable from non-R&D contract work.

The accuracy of the company's estimates of future expenditures has also been a problem in the past, particularly in the wells and petroleum products industries.

Non-Response

“Non-response occurs when information required for a survey unit is missing. This could happen because the unit cannot be contacted, because the unit is unable to provide the information requested, or because the unit refuses to cooperate in the survey.”

Non-response is a potential problem in four areas. One is the estimate of R&D expenditures two years past the base year. If no estimate is made, editors make one - based usually on the expenditure of the preceding year or a slight increase in expenditures.

The second involves the administrative data used for the smaller R&D establishments. These represent less than 9% of all R&D performed by businesses. Certain information is not asked of them. However, the missing data are imputed from the replies of the larger establishments in the same industry.

The third concerns companies inadvertently not included in the survey. A number of sources are used to create the mailing lists and it is unlikely that major establishments would be overlooked.

Failure of surveyed companies to reply is the fourth type of non-response. We believe non-response error to be minor and may result in a minor under-estimation of R&D expenditures.

Coding

“A coding operation in a survey or census is defined as the operation where data on questionnaires or source documents are transformed into a format which is suitable for input to the data capture operation. This often involves the assignment of codes for ‘write-in’ entries but may also be a fairly straightforward transcription operation.”

Uncorrected coding errors are unlikely because of the examination of numerous tables and listings prepared for data analysis before publication tables are created.

Data Capture

“The data capture operation in a census or survey consists of converting the data received on questionnaires (e.g., respondent answers) to a machine readable format.”

All data capture for science statistics is through manual intervention: key-edit or typed entry at a computer terminal.

Significant uncorrected data capture errors are unlikely because of the examination of numerous tables and listings prepared for data analysis before publication tables are created.

Edit and Imputation

“The edit procedure usually consists of: (i) checking each field of every record to ascertain whether it contains a valid code or entry; (ii) checking codes or entries in certain predetermined combinations of fields to ascertain whether codes or entries are consistent with one another... The imputation procedure consists of changing values in some of the fields in records which failed the edit rules with a view to ensuring that the resultant data records satisfy all edit rules”.

Although there are a number of edits, all cases of failed edit checks are corrected after consideration by editors. Automatic imputations are made only for the smaller R&D establishments and funders.

Sampling

“Sampling error occurs whenever survey results are based on a sample of units from a survey frame... Obviously there is no sampling error in complete enumeration surveys.”

Although a complete enumeration is carried out of known and suspected R&D establishments and funders, records received from the administrative data do not provide as much information as do those completing the long form. Certain data are imputed for records from the administrative file based on the patterns of long form respondents in the same industry. Thus, as a result of the 2003 survey, the 2003 business enterprise sector R&D expenditures would be based on full enumeration but about 10% of the expenditures for 2004 and 2005 would have been imputed.

Catalogued publications

Statistical Publications

- 88-001-XIE** Science Statistics (monthly)
- 88-202-XIE** Industrial Research and Development Intentions (with 2003 preliminary estimates and 2002 actual expenditures) (annual)
- 88-204-XIE** Federal Scientific Activities (annual)

Volume 29

- No. 1 Distribution of federal expenditures on science and technology by province and territories, 2002-2003 (January 2005)
- No. 2 Research and development (R&D) personnel in Canada, 1993 to 2002 (May 2005)
- No. 3 Biotechnology scientific activities in federal government departments and agencies, 2003-2004, (May 2005)
- No. 4 Industrial Research and Development, 2001 to 2005 (June 2005)
- No. 5 Estimates of total spending on research and development in the health field in Canada, 1988 to 2004 (July 2005)

Volume 28

- No. 1 Estimation of research and development expenditures in the higher education sector, 2001-2002 HERD (January 2004)
- No. 2 Total spending on research and development in Canada, 1990 to 2003 and provinces, 1990 to 2001 GERD (January 2004)
- No. 3 Distribution of federal expenditures on science and technology, by province and territories, 2001-2002 (February 2004)
- No. 4 Research and development (R&D) expenditures of private non-profit (PNP) organizations, 2002 (April 2004)
- No. 5 The provincial research organizations, 2001 (May 2004)
- No. 6 Scientific and technological (S&T) activities of provincial governments, 1994-95 to 2002-03 (June 2004)
- No. 7 Biotechnology scientific activities in selected federal government departments and agencies, 2002-2003 (July 2004)
- No. 8 Estimates of total spending on research and development in the health field in Canada, 1988 to 2003 (July 2004)
- No. 9 Industrial research and development, 2000 to 2004 (August 2004)
- No. 10 Estimation of research and development expenditures in the higher education sector, 2002-2003 (November 2004)
- No. 11 Federal government expenditures on scientific activities, 2004-2005^p (November 2004)
- No. 12 Total spending on research and development in Canada, 1990 to 2004^p, and provinces, 1990 to 2002 (December 2004)

Working papers – 2005

- ST-05-01E Federal government expenditures and personnel in the natural and social sciences 1995-96 to 2004-05, (January 2005)
- ST-05-02E Provincial distribution of federal expenditures and personnel on science and technology, 1996-97 to 2002-2003 (January 2005)
- ST-05-03E Industrial R&D statistics by region, 1994 to 2002 (January 2005)
- ST-05-04E Knowledge sharing succeeds: how selected service industries rated the importance of using knowledge management practices to their success (February 2005)
- ST-05-05E Characteristics of firms that grow from small to medium size: Industrial and geographic distribution of small high-growth firms (February 2005)
- ST-05-06E Summary: Joint Statistics Canada – University of Windsor Workshop on Intellectual Property Commercialization Indicators, Windsor (March 2005)
- ST-05-07E Summary: Meeting on Commercialization Measurement, Indicators, Gaps and Frameworks, Ottawa (March 2005)
- ST-05-08E Estimates of research and development, personnel in Canada, 1979 to 2002 (May 2005)
- ST-05-09E Overview of the Biotechnology Use and Development Survey – 2003, (April 2005)
- ST-05-10E Access to Financing Capital by Canadian Innovative Biotechnology Firms, (April 2005)
- ST-05-11E Scientific and technological (S&T) activities of provincial governments and provincial research organizations, 1995-96 to 2003-04 (September 2005)
- ST-05-12E Innovation in the Information and Communications Technology (ICT) services sector industries: Results from the Survey of Innovation 2003 (October 2005)
- ST-05-13E Innovation in Selected Professional, Scientific and Technical Services: Results from the Survey of Innovation 2003 (October 2005)
- ST-05-14E Innovation in Selected Transportation Industries: Results from the Survey of Innovation 2003 (November 2005)
- ST-05-15E Innovation in Selected Industries Serving the Mining and Forestry Sectors: Results from the Survey of Innovation 2003 (November 2005)
- ST-05-16E Functional Foods and Nutraceuticals: The Development of Value-added Food by Canadian Firms (November 2005)

Working papers – 2004

- ST-04-01E Starting the new century: technological change in the Canadian private sector, 2000-2002, (January 2004)
- ST-04-02E Estimation of research and development expenditures in the higher education sector, 2001-2002 (January 2004)
- ST-04-03E Estimates of Canadian research and development expenditures (GERD), Canada, 1992 to 2003^P, and by province, 1992 to 2001 (January 2004)
- ST-04-04E The Many Guises of Innovation: What we have learnt and where we are heading (January 2004)
- ST-04-05E Provincial distribution of federal expenditures and personnel on science and technology, 1995-1996 to 2001-2002 (February 2004)
- ST-04-06E Biotechnology Use and development Survey: methodology, issues and responses (February 2004)

- ST-04-07E An historical comparison of technological change, 1998-2000 and 2000-2002, in the private and public sectors (March 2004)
- ST-04-08E Technological change in the public sector, 2000-2002 (March 2004)
- ST-04-09E Regional disparities of research and development in the business services sector (April 2004)
- ST-04-10-E Innovative firms: A look at small firms (May 2004)
- ST-04-11-E Scientific and technological activities of provincial governments, 1994-95 to 2002-03 (June 2004)
- ST-04-12-E Federal government payments to industry, 1997-1998 to 2001-2002 (July 2004)
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- ST-04-14-E Estimates of total expenditures on research and development in the health field in Canada, 1988 to 2003 (July 2004)
- ST-04-15-E Community innovation: innovation performance of manufacturing firms in Canadian communities (September 2004)
- ST-04-16-E List of papers published by Kluwer Academic Publishers, in the Economics of Science, Technology and Innovation Series (October 2004)
- ST-04-17-E Trends in Canadian biotechnology activity: 1997 to 2001 (October 2004)
- ST-04-18-E Public sector technology transfer in Canada, 2003 (November 2004)
- ST-04-19-E Estimation of research and development expenditures in the higher education sector, 2002-2003 (November 2004)
- ST-04-20-E Estimates of Canadian research and development expenditures (GERD), Canada, 1993 to 2004^p, and by province 1993 to 2002 (December 2004)
- ST-04-21-E Characteristics of firms that grow from small to medium size: growth factors--interviews and measurability, 1999 (December 2004)
- ST-04-22-E Characteristics of firms that grow from small to medium size: innovation and growth in small manufacturing firms, 1997 to 1999 (December 2004)

Research papers

- No. 1 The state of science and technology indicators in the OECD countries, by Benoit Godin (August 1996)
- No. 2 Knowledge as a capacity for action, by Nico Stehr (June 1996)
- No. 3 Linking outcomes for workers to changes in workplace practices: an experimental Canadian workplace and employee survey, by Garnett Picot and Ted Wannell (June 1996)
- No. 4 Are the costs and benefits of health research measurable? by M.B. Wilk (February 1997)
- No. 5 Technology and economic growth: a survey, by Peter Hanel and Jorge Niosi (April 1998)
- No. 6 Diffusion of biotechnologies in Canada, by Anthony Arundel (February 1999)
- No. 7 Barriers to innovation in services industries in Canada, by Pierre Mohnen and Julio Rosa (November 1999)
- No. 8 Explaining rapid growth in Canadian biotechnology firms, by Jorge Niosi (August 2000)
- No. 9 Internationally comparable indicators on biotechnology: a stocktaking, a proposal for work and supporting material, by W. Pattinson, B. Van Beuzekom and A. Wyckoff (January 2001)
- No. 10 Analysis of the survey on innovation, advanced technologies and practices in the construction and related industries, 1999, by George Seaden, Michael Guolla, Jérôme Doutriaux and John Nash (January 2001)

- No. 11 Capacity to innovate, innovation and impact: the Canadian engineering services industry, by Daood Hamdani (March 2001)
- No. 12 Patterns of advanced manufacturing technology (AMT) use in Canadian manufacturing: 1998 AMT survey results, by Anthony Arundel and Viki Sonntag (November 2001)