

Each household contributes to greenhouse gas (GHG) emissions in two main ways. Direct emissions from motor-fuel use and residential-fuel use account for one-third of household emissions in Canada. Indirect emissions from industrial production of the goods and services that households consume make up the other two-thirds.

Together, direct and indirect household emissions accounted for 46% of Canada's total GHG emissions in 2004. The remaining 54% of total emissions came from industrial production of goods and services for other consumers (for example, exports to foreign countries) and from government activities.

Direct emissions

GHG emissions related to households increased 13% from 285,884 kilotonnes in 1990 to 321,727 kilotonnes in 2004. Canada ranked third among G8 countries,

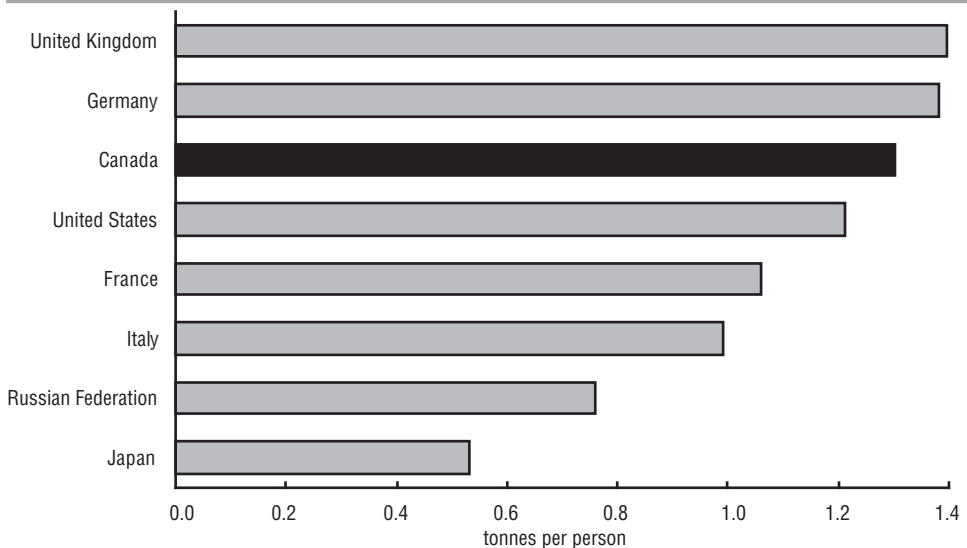
just behind the United Kingdom and Germany, in direct household GHG emissions per capita in 2005.

There was an insignificant change in GHG emissions per capita from 1990 to 2004, despite efficiency gains in industry and efficiency improvements in homes. Motor fuels are the largest source of households' direct GHG emissions.

Household emissions from motor-fuel use increased 29% from 55,770 kilotonnes in 1990 to 71,873 kilotonnes in 2004; this increase outpaced Canada's population growth of 16% over the same period, reflecting the popularity of larger vehicles that consume more fuel per kilometre. Sales of light-duty trucks, minivans and sport-utility vehicles climbed 74% from 1990 to 2004.

In 2004, 58% of the energy Canadians used in their dwellings came from natural gas and heating oil. Burning these two

Chart 12.1
Residential greenhouse gas emissions in G8 countries, 2005



Notes: Only includes direct GHG from fuel use in the home.

GHG data from United Nations Framework Convention on Climate Change.

Source: United Nations, World Population Prospects Population Database: The 2006 Revision.

fuels accounts for 99% of the emissions from fuel use within the home. (Electricity represents 42% of total energy used in the home, but its consumption does not directly result in the release of GHGs.) Emissions from fuel use in the home remained stable from 1990 to 2004.

Households that switched from heating oil to natural gas helped stabilize those emissions. When burned, heating oil releases 47% more carbon dioxide per unit of energy than natural gas.

Indirect emissions

Two-thirds of indirect household GHG emissions, or 137,074 kilotonnes, were linked to goods production in 2004, while the remainder (72,174 kilotonnes) came from producing services. The goods and services that result in the highest indirect GHG emissions are electricity, food and beverages, restaurant meals and accommodations, and motor fuels and

Table 12.a
Greenhouse gas emissions attributable to households, 2004^P

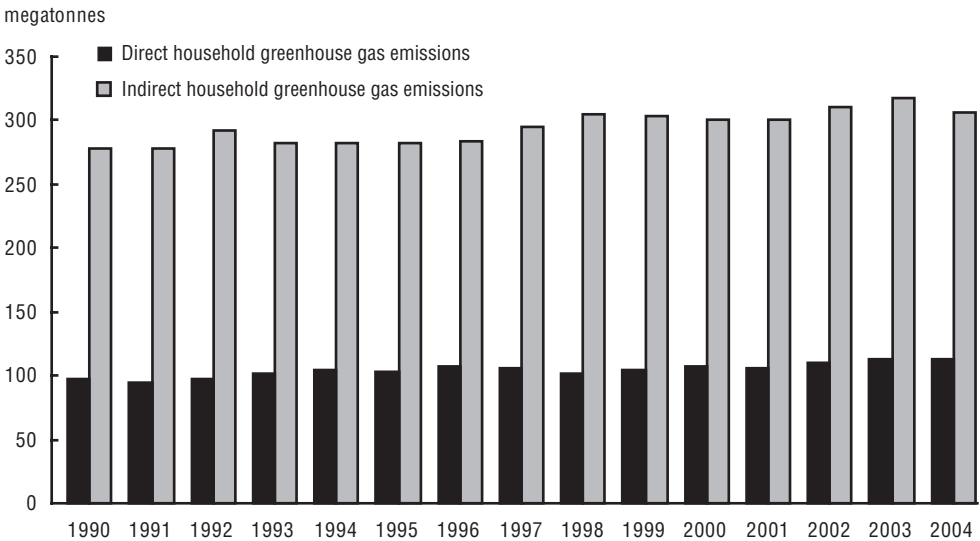
| | kilotonnes | % |
|--------------------|----------------|--------------|
| Total | 321,727 | 100.0 |
| Indirect emissions | 209,249 | 65.0 |
| Goods | 137,074 | 42.6 |
| Services | 72,174 | 22.4 |
| Direct emissions | 112,478 | 35.0 |
| In-home fuel use | 40,605 | 12.6 |
| Motor fuel use | 71,873 | 22.3 |

Source: Statistics Canada, Catalogue no. 16-002-X.

lubricants. These categories represented 54% of indirect GHG emissions from households in 2004 and 21% of household spending.

In 2004, the use of electricity resulted in the greatest indirect GHG emissions from households, though it represented a small portion (2%) of total household spending. This is because of the high emissions associated with the production of electricity.

Chart 12.2
Direct and indirect household greenhouse gas emissions



Notes: Direct household greenhouse gas emissions include all greenhouse gas emissions due to energy use in the home and for private motor vehicles. Indirect household greenhouse gas emissions are those business-sector emissions due to the production of the goods and services purchased by households.

Source: Statistics Canada, CANSIM table 153-0046.

Environmentally active lifestyles

In 2006, 45% of Canadian households had very environmentally active lifestyles. 'Very active' means the household participates in at least four of six environmental behaviours: recycling, composting, lowering temperatures, using reduced-volume toilets, using low-flow shower heads, and using compact fluorescent light (CFL) bulbs. Practising two to three of these behaviours means a 'moderately active' environmental lifestyle; adopting zero or one suggests a 'less active' one.

In 2006, another 45% of households were moderately active, while 10% were less active. Of households with incomes above \$100,000, 60% were very active in 2006, compared with 35% of households with incomes of \$28,000 or less. At 54%, homeowners are more likely than renters (at 22%) to be very environmentally active.

Which households drink bottled water?

In 2006, higher-income households and households with children were the most likely to use bottled water for their main source of drinking water in the home.

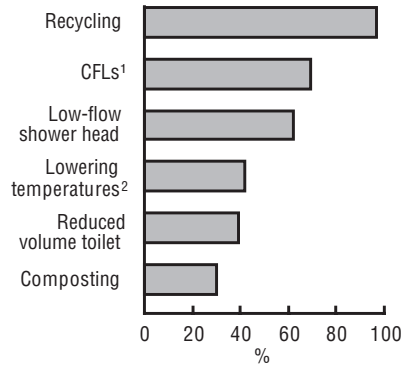
Almost one in four households with an income of \$40,000 or less drank bottled water in the home; this rose to one in three households with an income over \$91,000.

One in three households made up of working-age adults and children under 18 used bottled water as their main source of drinking water in the home.

Meanwhile, households living in apartments, households with seniors and no children, and households with at least one member with a university education were the least likely to drink bottled water.

In 2007, almost 6 in 10 Canadian households with municipally supplied

Chart 12.3
Frequency of behaviours in environmentally active households, 2006



Note: As a percentage of all households that have a thermostat and have access to at least one recycling program.

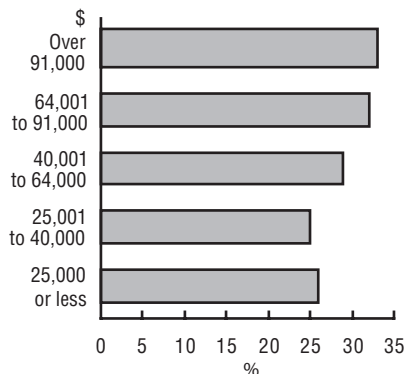
1. Compact fluorescent lights.

2. Winter temperature lowered when asleep.

Source: Statistics Canada, Catalogue no. 16-002-X.

Recycling is the most common of the six environmental behaviours: 97% of households with access to it participate. The least common is composting, at 30%.

Chart 12.4
Households drinking bottled water, by household income, 2006



Source: Statistics Canada, Catalogue no. 16-002-X.

water drank mainly tap water. Of those people, 54% treated the water before drinking it, up from 48% in 2006.

Table 12.1 Greenhouse gas emissions, by source, 1990 and 2006

| | Carbon dioxide | | Methane | | Nitrous oxide | |
|------------------------------------|----------------|----------------|--------------|--------------|---------------|------------|
| | 1990 | 2006 | 1990 | 2006 | 1990 | 2006 |
| | kilotonnes | | | | | |
| Total¹ | 456,000 | 560,000 | 3,500 | 4,900 | 160 | 150 |
| Energy | 425,000 | 519,000 | 1,700 | 2,600 | 30 | 30 |
| Stationary combustion sources | 276,000 | 317,000 | 200 | 200 | 7 | 8 |
| Electricity and heat generation | 94,800 | 116,000 | 1.8 | 4.6 | 2 | 2 |
| Fossil fuel industries | 49,700 | 65,200 | 80 | 100 | 1 | 1 |
| Petroleum refining and upgrading | 16,000 | 16,000 | ... | ... | 0.3 | 0.4 |
| Fossil fuel production | 34,100 | 49,100 | 80 | 100 | 0.7 | 1 |
| Mining and oil and gas extraction | 6,150 | 16,400 | 0.1 | 0.3 | 0.1 | 0.4 |
| Manufacturing industries | 54,300 | 45,800 | 3 | 3 | 2 | 2 |
| Iron and steel | 6,430 | 6,310 | 0.2 | 0.2 | 0.2 | 0.2 |
| Non-ferrous metals | 3,170 | 3,030 | 0.07 | 0.07 | 0.05 | 0.04 |
| Chemical | 7,060 | 6,450 | 0.15 | 0.14 | 0.1 | 0.1 |
| Pulp and paper | 13,500 | 5,650 | 2 | 2 | 0.8 | 0.8 |
| Cement | 3,680 | 4,840 | 0.07 | 0.1 | 0.04 | 0.04 |
| Other manufacturing | 20,500 | 19,500 | 0.4 | 0.4 | 0.4 | 0.4 |
| Construction | 1,850 | 1,290 | 0.03 | 0.02 | 0.05 | 0.03 |
| Commercial and institutional | 25,500 | 33,200 | 0.5 | 0.6 | 0.5 | 0.7 |
| Residential | 40,900 | 37,300 | 100 | 100 | 2 | 2 |
| Agriculture and forestry | 2,370 | 1,900 | 0.04 | 0.03 | 0.05 | 0.06 |
| Transportation ² | 138,000 | 184,000 | 30 | 30 | 20 | 20 |
| Civil aviation (domestic aviation) | 6,180 | 8,190 | 0.5 | 0.4 | 0.6 | 0.7 |
| Road transportation | 94,900 | 130,000 | 15 | 9.3 | 10 | 11 |
| Light-duty gasoline vehicles | 43,800 | 37,700 | 7.8 | 2.9 | 6.2 | 3.6 |
| Light-duty gasoline trucks | 19,600 | 43,100 | 3.1 | 3.2 | 3.2 | 5.3 |
| Heavy-duty gasoline vehicles | 7,720 | 6,130 | 1.3 | 0.35 | 0.22 | 0.44 |
| Motorcycles | 143 | 254 | 0.14 | 0.17 | 0.00 | 0.01 |
| Light-duty diesel vehicles | 347 | 423 | 0.01 | 0.01 | 0.03 | 0.03 |
| Light-duty diesel trucks | 691 | 2,270 | 0.02 | 0.06 | 0.05 | 0.2 |
| Heavy-duty diesel vehicles | 20,500 | 39,000 | 1 | 2 | 0.6 | 1 |
| Propane and natural gas vehicles | 2,170 | 784 | 1 | 0.7 | 0.04 | 0.02 |
| Railways | 6,160 | 5,660 | 0.3 | 0.3 | 3 | 2 |
| Navigation (domestic marine) | 4,690 | 5,380 | 0.3 | 0.4 | 1 | 1 |
| Other transportation | 26,000 | 35,000 | 20 | 20 | 6 | 8 |
| Off-road gasoline | 6,000 | 6,000 | 8 | 8 | 0.1 | 0.1 |
| Off-road diesel | 13,000 | 19,000 | 0.7 | 1 | 6 | 8 |
| Pipelines | 6,700 | 9,390 | 6.7 | 9.4 | 0.2 | 0.3 |
| Fugitive sources | 11,000 | 17,000 | 1,500 | 2,400 | 0.1 | 0.1 |
| Coal mining | ... | ... | 90 | 30 | ... | ... |
| Oil and natural gas | 10,600 | 17,400 | 1,440 | 2,320 | 0.1 | 0.1 |
| Oil | 95 | 190 | 193 | 262 | 0.1 | 0.1 |
| Natural gas | 226 | 656 | 613 | 1,010 | ... | ... |
| Venting | 6,090 | 11,200 | 627 | 1,040 | ... | 0.01 |
| Flaring | 4,400 | 5,900 | 2.6 | 4.1 | 0.00 | 0.01 |

See notes and source at the end of this table.

| | Carbon dioxide | | Methane | | Nitrous oxide | |
|--|----------------|--------|---------|-------|---------------|------|
| | 1990 | 2006 | 1990 | 2006 | 1990 | 2006 |
| | kilotonnes | | | | | |
| Industrial processes | 31,000 | 41,000 | ... | ... | 37.8 | 7.88 |
| Mineral products | 8,300 | 9,600 | ... | ... | ... | ... |
| Cement production | 5,400 | 7,300 | ... | ... | ... | ... |
| Lime production | 1,700 | 1,600 | ... | ... | ... | ... |
| Mineral product use ³ | 1,090 | 600 | ... | ... | ... | ... |
| Chemical industry | 5,000 | 6,600 | ... | ... | 37.8 | 7.88 |
| Ammonia production | 5,000 | 6,600 | ... | ... | ... | ... |
| Nitric acid production | ... | ... | ... | ... | 3.27 | 3.98 |
| Adipic acid production | ... | ... | ... | ... | 35 | 3.9 |
| Metal production | 9,770 | 12,800 | ... | ... | ... | ... |
| Iron and steel production | 7,060 | 7,760 | ... | ... | ... | ... |
| Aluminum production | 2,700 | 5,000 | ... | ... | ... | ... |
| Sulfur hexafluoride used in magnesium smelters and casters | ... | ... | ... | ... | ... | ... |
| Consumption of halocarbons and sulfur hexafluoride | ... | ... | ... | ... | ... | ... |
| Other and undifferentiated production | 8,000 | 12,000 | ... | ... | ... | ... |
| Solvent and other product use | ... | ... | ... | ... | 0.56 | 1.0 |
| Agriculture | ... | ... | 980 | 1,300 | 93 | 110 |
| Enteric fermentation | ... | ... | 860 | 1,200 | ... | ... |
| Manure management | ... | ... | 120 | 160 | 11 | 15 |
| Agricultural soils | ... | ... | ... | ... | 82 | 96 |
| Direct sources | ... | ... | ... | ... | 45 | 49 |
| Pasture, range and paddock manure | ... | ... | ... | ... | 8.2 | 12 |
| Indirect sources | ... | ... | ... | ... | 30 | 30 |
| Waste | 270 | 190 | 820 | 950 | 2 | 2 |
| Solid waste disposal on land | ... | ... | 810 | 940 | ... | ... |
| Wastewater handling | ... | ... | 11 | 12 | 2 | 2 |
| Waste incineration | 270 | 190 | 0.4 | 0.07 | 0.4 | 0.2 |
| Land use, land use change and forestry | -110,000 | 19,000 | 150 | 360 | 6.5 | 15 |
| Forest land | -140,000 | 11,000 | 130 | 340 | 5.6 | 14 |
| Cropland | 13,000 | -1,700 | 10 | 7 | 0.7 | 0.4 |
| Grassland | ... | ... | ... | ... | ... | ... |
| Wetlands | 4,000 | 2,000 | 0.3 | 0 | 0.01 | 0 |
| Settlements | 9,000 | 8,000 | 5 | 5 | 0.2 | 0.2 |

Note: Figures may not add to totals because of rounding.

1. National totals exclude all greenhouse gas emissions from the 'Land use, land use change and forestry' sector.

2. Emissions from ethanol fuel are reported within the gasoline vehicle subcategories under 'Transportation.'

3. 'Mineral product use' includes carbon dioxide emissions from the use of limestone and dolomite, soda ash and magnesite.

Source: Environment Canada, 2008, *National Inventory Report: Greenhouse Gas Source and Sinks in Canada, 1990-2006*.

Table 12.2 Household participation rates for environmental behaviours, by province, 2007

| | Low-flow showerhead | Reduced-volume toilet | Compact fluorescent light bulbs | Composting ¹ | Recycling ^{1,2} | Lowering temperatures ³ |
|---------------------------|---------------------|-----------------------|---------------------------------|-------------------------|--------------------------|------------------------------------|
| | % | | | | | |
| Canada | 62 | 39 | 69 | 27 | 97 | 55 |
| Newfoundland and Labrador | 55 | 28 | 65 | 21 | 94 | 60 |
| Prince Edward Island | 59 | 32 | 73 | 91 | 99 | 63 |
| Nova Scotia | 63 | 37 | 77 | 69 | 99 | 60 |
| New Brunswick | 61 | 31 | 70 | 32 | 96 | 54 |
| Quebec | 63 | 30 | 63 | 13 | 95 | 56 |
| Ontario | 65 | 47 | 76 | 34 | 98 | 53 |
| Manitoba | 52 | 38 | 62 | 23 | 88 | 49 |
| Saskatchewan | 46 | 37 | 64 | 27 | 96 | 59 |
| Alberta | 58 | 47 | 64 | 22 | 96 | 58 |
| British Columbia | 57 | 35 | 71 | 30 | 99 | 58 |

1. 2006 data.

2. Percentage of all households that had access to at least one recycling program.

3. Percentage of households that had a thermostat; temperature lowered when asleep during winter.

Source: Statistics Canada, Catalogue nos. 11-526-X and 16-001-M2008006.

Table 12.3 Capital expenditures on pollution abatement and control, by environmental milieu and by industry, 2006

| | All environmental milieux | Air | Surface water | On-site contained solid and liquid waste | Noise, radiation and vibration |
|--|---------------------------|--------------|---------------|--|--------------------------------|
| | \$ millions | | | | |
| All industries | 908.7 | 545.6 | 249.0 | 94.2 | 19.9 |
| Logging | 0.8 | F | F | F | F |
| Oil and gas extraction | 409.8 | 271.2 | 61.8 | 67.4 | 9.4 |
| Mining and quarrying | 174.5 | 38.4 | 129.9 | x | x |
| Electric power generation, transmission and distribution | 65.8 | 52.5 | x | x | x |
| Natural gas distribution | 3.0 | x | x | x | x |
| Food manufacturing | 12.8 | 8.8 | x | F | x |
| Beverage and tobacco product manufacturing | x | x | x | 0.0 | x |
| Wood product manufacturing | 30.7 | 17.1 | x | x | F |
| Paper manufacturing | 21.3 | 15.7 | 5.2 | x | x |
| Petroleum and coal product manufacturing | 45.7 | 33.0 | 10.8 | 1.3 | 0.6 |
| Chemical manufacturing | 25.8 | 17.6 | 5.0 | 1.8 | 1.6 |
| Non-metallic mineral product manufacturing | 16.1 | 14.8 | 0.9 | x | x |
| Primary metal manufacturing | 68.9 | 49.5 | 13.0 | 5.1 | 1.2 |
| Fabricated metal product manufacturing | 3.0 | 2.2 | 0.1 | F | x |
| Transportation equipment manufacturing | 15.7 | 10.7 | 2.1 | F | x |
| Other manufacturing industries | 12.8 | 10.6 | F | F | 0.5 |
| Pipeline transportation | x | 0.2 | x | x | x |

Source: Statistics Canada, CANSIM table 153-0054.

Table 12.4 Capital expenditures on pollution prevention, by environmental milieu and by industry, 2006

| | All environmental milieu | Air | Surface water | On-site contained solid and liquid waste | Noise, radiation and vibration | Other |
|--|--------------------------|--------------|---------------|--|--------------------------------|--------------|
| \$ millions | | | | | | |
| All industries | 1,561.1 | 885.2 | 189.2 | 203.1 | 11.4 | 272.2 |
| Logging | F | F | F | F | F | F |
| Oil and gas extraction | 377.1 | 122.9 | 63.7 | x | 4.4 | x |
| Mining and quarrying | 49.2 | 3.2 | 28.1 | 15.0 | x | x |
| Electric power generation, transmission and distribution | 105.9 | 36.6 | 22.7 | 45.3 | x | F |
| Natural gas distribution | 54.1 | 52.6 | x | 1.3 | x | 0.0 |
| Food manufacturing | 41.0 | 5.4 | F | 0.9 | x | F |
| Beverage and tobacco product manufacturing | 3.1 | x | 0.4 | 0.7 | x | x |
| Wood product manufacturing | 18.3 | 5.9 | 5.4 | F | F | F |
| Paper manufacturing | 52.0 | 31.8 | 11.7 | 2.3 | 0.8 | 5.4 |
| Petroleum and coal product manufacturing | 533.1 | 508.1 | 18.8 | x | F | x |
| Chemical manufacturing | 44.0 | 27.5 | 4.9 | 7.6 | 0.1 | 4.0 |
| Non-metallic mineral product manufacturing | 22.7 | 12.9 | 3.0 | 3.0 | F | 3.5 |
| Primary metal manufacturing | 31.1 | 19.1 | 3.8 | 6.8 | 0.0 | 1.5 |
| Fabricated metal product manufacturing | F | F | 0.3 | F | x | F |
| Transportation equipment manufacturing | 18.7 | 7.1 | 1.1 | F | F | F |
| Other manufacturing industries | 73.0 | 24.7 | F | F | x | F |
| Pipeline transportation | 39.2 | 4.4 | 13.1 | 16.5 | 1.6 | 3.5 |

Source: Statistics Canada, CANSIM table 153-0054.

Table 12.5 Waste disposal and diversion, by province, 2002, 2004 and 2006

| | 2002 | 2004 | 2006 | 2002 | 2004 | 2006 |
|---------------------------|----------------------|-------------------|-------------------|--------------------------|------------------|------------------|
| | Total waste disposed | | | Total materials diverted | | |
| tonnes | | | | | | |
| Canada | 24,081,371 | 25,226,766 | 27,249,178 | 6,641,546 | 7,112,735 | 7,749,030 |
| Newfoundland and Labrador | 376,594 | 400,048 | 407,728 | 30,386 | 35,308 | 30,385 |
| Nova Scotia | 389,194 | 399,967 | 401,670 | 192,006 | 239,845 | 275,983 |
| New Brunswick | 413,606 | 442,173 | 450,238 | 130,728 | 139,262 | 252,174 |
| Quebec | 5,846,459 | 6,454,000 | 6,808,440 | 1,743,376 | 2,130,100 | 2,456,300 |
| Ontario | 9,645,633 | 9,809,264 | 10,437,780 | 2,265,968 | 2,414,552 | 2,396,856 |
| Manitoba | 896,556 | 928,117 | 1,024,272 | 215,815 | 157,490 | 152,799 |
| Saskatchewan | 795,124 | 794,933 | 833,753 | 116,296 | 114,182 | 106,868 |
| Alberta | 2,890,294 | 3,077,311 | 3,819,872 | 690,517 | 620,080 | 652,637 |
| British Columbia | 2,687,882 | 2,767,657 | 2,917,080 | 1,218,475 | 1,209,216 | 1,366,191 |

Note: Data for Prince Edward Island and the territories have been suppressed to meet the confidentiality requirements of the *Statistics Act*.

Source: Statistics Canada, CANSIM tables 153-0041 and 153-0043.

Table 12.6 Production of selected mineral commodities, 2006 and 2007^p

| | 2006 | 2007 ^p |
|-------------------------------|------------|-------------------|
| | carats | |
| Diamonds | 13,277,703 | 17,007,850 |
| | kilograms | |
| Gold | 104,448 | 101,026 |
| Platinum group | 24,389 | 24,455 |
| | tonnes | |
| Zinc | 637,956 | 619,550 |
| Copper | 603,295 | 590,342 |
| Nickel | 232,948 | 254,413 |
| Lead | 83,096 | 72,774 |
| Uranium | 9,862 | 9,500 |
| Molybdenum | 7,723 | 6,841 |
| Cobalt | 7,115 | 8,261 |
| Silver | 995 | 871 |
| Cadmium | 579 | 452 |
| Bismuth | 214 | 145 |
| Antimony | 269 | 241 |
| Gemstones | 119 | 110 |
| Tantalum | 55 | 60 |
| | kilotonnes | |
| Sand and gravel | 239,895 | 236,906 |
| Stone | 178,424 | 172,699 |
| Iron ore | 34,943 | 32,032 |
| Salt | 14,389 | 11,807 |
| Potash | 8,369 | 11,149 |
| Gypsum | 9,789 | 7,640 |
| Quartz | 2,394 | 2,265 |
| Peat | 1,221 | 1,242 |
| Nepheline syenite | 738 | 740 |
| Soapstone, talc, pyrophyllite | 85 | 67 |
| Barite | 19 | 7 |

Source: Statistics Canada, Catalogue no. 26-202-X.