

oil exports accounting for most of the increase. Imports also climbed, reaching \$5,649 million, up \$988 million from 1986. Imports of coal, up \$600 million, and crude oil, up \$300 million, accounted for most of the increase.

Despite low oil prices, 1987 marketable production of crude oil, excluding the estimated amount of oil produced and used in oil sands and heavy oil operations, was 95 451 thousand  $m^3$ , up 4038 thousand  $m^3$  compared to the previous year. This increase was led by impressive gains in heavy oil and synthetic crude production. During the same period, refined oil product demand increased by 3.9%. Generally, production levels of other energy sources, such as coal, natural gas and electricity, also increased.

Canadian primary energy production was 10250 PJ (petajoules) in 1987, an increase of 5.3% from 1986. Natural gas, including Natural Gas Liquids (NGLs), accounted for 36.6% of production, crude oil 36.0%, hydro and nuclear, including nuclear steam, 13.8% and coal 13.6%.

In 1987, primary energy available for consumption in Canada was 8105 PJ, an increase of 3.7% over 1986. Of the total primary energy consumption, 38.9% was from crude oil, 31.8% from natural gas and NGLs, 15.5% from hydro and nuclear and 13.8% from coal.

## 11.4 Oil and natural gas

### 11.4.1 Production and consumption

**Crude oil and equivalent.** In 1987 the production of crude oil and equivalent (excluding own use at oil sands plants) in Canada increased by 4.0 million  $m^3$ , an increase of 4.4%. Production of light, medium and heavy crude increased 2.6 million  $m^3$ , synthetic crude by 1.1 million  $m^3$  and pentanes increased by 0.4 million  $m^3$  over levels of 1986. Two full-scale oil sands plants in Alberta are continuing to produce synthetic crude oil — for the period 1985 to 1987, they had an average production rate of near 15.4 million  $m^3$  per year, accounting for 15% of total crude oil production in Canada. The consumption of crude oil and equivalent in Canada during 1987 was 81.9 million  $m^3$ , an increase over 1986 of 3.0 million  $m^3$ .

In 1981, the average wellhead price of crude in Canada rose by \$20/ $m^3$  over the price paid in 1980, from \$97/ $m^3$  to \$117/ $m^3$ . Crude prices continued to rise in Canada and peaked in 1985 at almost \$221/ $m^3$ . It was during the fourth quarter of the year that the collapse in world oil prices occurred also causing Canadian prices to plunge to an average of \$114/ $m^3$  in 1986. Since 1986,

crude oil prices have remained unstable due to global supply-demand imbalances. In 1987, Canadian oil prices rose by about \$24/ $m^3$ .

**Natural gas.** Production of natural gas in 1986 declined 225 PJ from the 1985 level, but rose again by 266 PJ in 1987 to reach 3402 PJ. Exports of natural gas followed a similar pattern and declined 195 PJ in 1986, but rose by 262 PJ in 1987 to reach 1059 PJ. Final domestic usage, after declining 72 PJ in 1986, declined a further 19 PJ in 1987, down to 1904 PJ, 4.6% lower than in 1985. Natural gas deregulation, the drop in international price of crude oil and warm winter weather in most of North America, have combined to cause serious marketing problems for gas producers. Although domestic demand has declined slightly, export volumes have increased and are expected to increase further, even though revenues from these volumes have declined. In the event that gas prices stay low, and large quantities remain shut-in throughout Western Canada, exploration will be reduced.

### 11.4.2 Exploration and development

After having completed a record 12,171 wells in 1985, the drop in oil and gas prices resulted in a drastic decline in drilling with only 5,763 wells drilled in 1986 and 6,905 in 1987. Two-thirds of all wells drilled in Canada have been drilled in Alberta. Many wells have been drilled in Canada's frontier regions, in such areas as the Arctic Islands, Beaufort Sea and off the East Coast. Commercial development in these areas has been slow due to the enormous cost involved. Cost of drilling a single well in these frontier areas has exceeded \$50 million. Current plans have focused on the development of oil reserves at Hibernia, off the coast of Newfoundland.

### 11.4.3 Reserves

Canada's crude oil and pentanes established reserves stood at 1079 million  $m^3$  at the end of 1987, down slightly from the year-end volume of 1986. Natural gas established reserves at the end of 1987 were 2692 billion  $m^3$ , a decline of 53 billion  $m^3$ , or 2.0%, from the 1986 level.

## 11.5 Oil refining

The Canadian refining industry closed a total of 12 refineries during the period of 1974-85 due to rationalization and a declining domestic demand. In 1987, one of the refineries formerly closed in Newfoundland was reopened to supply the export market. Demand declined 4.9% between 1984 and 1986, but in 1987 it increased 3.4% over the 1986 level, reaching 81933 thousand  $m^3$ .