

economy obtained by using this moderator with neutron-transparent core materials (zirconium alloys) means that Canada's abundant resources of natural uranium may be used as fuel. The CANDU system is however, sufficiently flexible that enriched uranium, plutonium recovered from spent fuel, or thorium may be incorporated into its fuel system.

The production of heavy water has been a critical item in the Canadian nuclear power program. The first 800-ton-a-year (726 t) heavy water production plant at Ontario Hydro's Bruce nuclear power development on Lake Huron went into operation in 1973 and is producing at over 80% of its design capacity. Ontario Hydro is now building the first of two additional plants at the Bruce site and completion is scheduled for 1978. In Nova Scotia rehabilitation of the Glace Bay plant continued with start-up scheduled for 1976, and operation of the Port Hawkesbury plant was considerably improved after modifications. Ownership of this plant was transferred from Canadian General Electric to AECL in May 1975. There will be a two-year delay in the construction of the new 800-ton-a-year (726 t) La Prade plant owned by AECL at the Gently site in Quebec. The first 400-ton unit (363 t) is expected to be operating by 1981.

At Douglas Point, on the shore of Lake Huron, the country's first full-scale nuclear power station went into operation in 1966. The station, built with the cooperation of Ontario Hydro, houses a 220-MW CANDU reactor. Experience gained in the design and operation of the NPD and Douglas Point reactors encouraged and contributed to the development of larger units. Construction of the 2 160-MW Pickering nuclear station near Toronto is now complete; two of the station's four units came on line in 1971 and units 3 and 4 produced their first electricity ahead of schedule in 1972 and 1973. Work on the Bruce nuclear station for Ontario Hydro is proceeding with four 800-MW units planned for installation from 1976 to 1979. In addition, a duplicate of the Pickering station, at the Bruce site, has been committed and Hydro-Québec and New Brunswick Electric Power Commission have started construction of 600-MW CANDU stations at Gently and at Point LePreau.

A further step in the development of the CANDU reactor is the use of boiling light water instead of pressurized heavy water as the coolant. The initial Gently nuclear power station (Gently 1) utilizes boiling light water in its CANDU reactor; this station came into service in 1971 with 266 MW of nuclear-electric capacity.

### 13.6.5 Load demand and electrical energy use

Firm power peak load is the measure of the maximum average net kilowatt demand of one-hour duration from all loads, including commercial, residential, farm and industrial consumers as well as the line losses. Such load demand increased at the rate of 7.5% a year from 1963 to 1973 and 7.4% a year from 1969 to 1973; peak-load demand is forecast to increase at the average rate of 7.4% a year in the period 1976-80. As a result of the rapid increase in generating capability and the somewhat slower but steady increase in the peak loads, together with the slight reduction in deliveries of firm power to the US, the indicated reserve on net capability in the 1961-75 period increased each year except 1961, 1963, 1964, 1966 and 1972. The reserve ratio as a percentage of firm power peak load reached a high of 28.2% in 1960 and fell to 13.7% in 1968 but is expected to increase to 20.0% in 1980. Absolute figures are given in Table 13.11.

As indicated in Table 13.12, total electrical energy consumed in Canada during 1974, showed industrial loads at 42% down sharply from 67% in 1950; domestic and farm consumption at 22%, up from 13% in 1950; and commercial consumption at 27% in 1974, the latest year for which detailed statistics were available, up from 11% in 1950.

While availability of electric energy at reasonable cost is an important element in Canada's industrial growth, in only a few industries is the cost of electric power a key element in economic competitiveness. Energy distribution for