increase at 3.8% a year compared with 6.1% in the 1963-74 period. This rate of growth in hydro generating capability in the forecast period is attributable to the large power projects under construction in relatively remote areas that will be completed within the next few years.

Among the provinces Ontario has the largest generating capability in all forms followed by Quebec, British Columbia and Newfoundland. Quebec has the largest hydro generation capability, followed by Ontario, Newfoundland and British Columbia. Ontario has the largest thermal generation capability, followed by Alberta and British Columbia.

The largest absolute growth in generating capability for the forecast years 1974-78 is indicated for Ontario at 7,348 MW, followed by British Columbia at 2,927 MW, Quebec at 1,998 MW and Newfoundland at 1,876 MW. Ontario will meet most of its increased generating capability by adding 5,052 MW in fossil-fuelled capability and 2,192 MW nuclear. British Columbia will add 2,673 MW hydro and 254 MW thermal, and Quebec 1,660 MW hydro and 338 MW thermal.

13.5.3 Hydro-electric power generation

Hydro-electric generation forms a significant though decreasing part in Canada's electrical development. By the end of 1974, the hydro portion of the country's total generating capacity had fallen to 63.9% from over 90%, 20 years earlier.

In view of the vast water resources existing throughout Canada, it would appear that many undeveloped sites could be potential sources of hydro-electric power. It cannot, however, be assumed that all these possibilities represent economically viable sources of electric power. In fact, only a fraction of the sites with a theoretical power potential can actually be developed competitively. Before a site can be termed a source of potential power, a detailed analysis of such factors as cost, geography, geology and ecology must be performed. Until such a study is completed on a national scale, estimates of Canada's undeveloped water-power resources (recently estimated to be in excess of 60,000 MW), may be misleading.

Figures of water-power resources already developed are given in Table 13.10 and are based on the manufacturer's rating in kilowatts as shown on the generator nameplate, or derived from the electrical rating. The maximum economic installation at a power site can be determined only by careful consideration of all the conditions and circumstances pertinent to its individual development. It is normal practice to install units having a combined capacity in excess of the available continuous power at Q50 (flow available 50% of the time), and frequently in excess of the power available at Qm (arithmetical mean flow). There are a number of reasons for this. Excess capacity may be installed for use at peak-load periods, to take advantage of periods of high flow, or to facilitate plant or system maintenance. In some instances, storage dams have been built after initial development to smooth out fluctuations in river flows. In other cases, deficiencies in power output during periods of low flow have been offset by auxiliary power supplied from thermal plants, or by interconnection with other plants operating under different load conditions or located on rivers with different flow characteristics. The extent to which installed capacity exceeds the available continuous power at various rates of flow depends on factors that govern the system or plant operation, and varies widely from one area to another.

The distribution of installed hydro-electric generating capacity given in Table 13.10 reveals that substantial amounts of water power have been developed in all provinces and territories except Prince Edward Island. As natural-resource development proceeds, the fortunate incidence of water power in proximity to mineral, forest and other resources becomes increasingly apparent. The existence of large amounts of potential hydro power on northern rivers may well prove to be a factor of prime importance in the eventual realization of the natural wealth of the Canadian north.

The water-power resources of Nova Scotia and New Brunswick, although small in comparison with those of other provinces, are a valuable source of energy and make a substantial contribution to the economies of the two provinces. Numerous rivers provide moderate-sized power sites either within economic transmission distance of the principal cities and towns or advantageously situated for use in development of the timber and mineral resources. These provinces have, however, turned to thermal generation, initially coal-fired with a subsequent shift to oil. Plans are now well advanced for development of nuclear generation in New Brunswick and there have been recent indications of a possible return to coal as a fuel source for new installations.