

The trend to larger unit sizes which has been evident in the past few years continued in 1971. Of the 1,554,000 kw of thermal capacity installed, 1,480,000 kw or 95% was contributed by units of 150,000 kw or greater. In hydro-electric additions, where size is largely affected by hydraulic conditions, there were 1,812,000 kw or nearly 80% in units of the 150,000-kw, or greater, size range.

Although the 4,500,000 kw of new capacity predicted to be placed into service during 1971 were not attained, the 3,862,000 kw which were installed established an all-time high for capacity additions in a single year. The previous record of 3,840,000 kw was set in 1969. In 1970 less than 3,100,000 kw of new generating capacity were added.

Electrical energy generated in Canada in 1971 increased by 5.7% to 216,472 gigawatt hours (gwh) (million kilowatt hours). Exports of energy to the United States rose appreciably (30% over 1970) to 7,321 gwh or slightly more than 3% of total generation. With 3,378 gwh of energy being imported from the US, net exports at year-end stood at 3,943 gwh (58% above the 1970 net export). The actual growth of primary and secondary energy supplied within Canada, therefore, was up only 5.0% to 211,271 gwh. The 5.0% increase is substantially below the 6.7% average growth rate for the 1961-71 period.

In 1971, energy generation from thermal units continued to show the more substantial increase — 15.2%, compared with a modest 2.6% rise in hydro generation. A significant rise was experienced in steam generation, both nuclear (312%) and conventional (10%), while there was a considerable decrease in internal combustion (-5%) and gas turbine (-29%) generation. The share of total energy supplied by hydro-electric facilities fell from 76.7% (156,276 gwh) in 1970 to 74.6% (160,412 gwh) in 1971.

The portion of energy generated by electric utilities during the year was approximately 85%, up from about 84% in 1970; such a growth pattern will likely continue. The only provinces where industrial power generation still plays a significant role are British Columbia and Quebec, with 41% and 21%, respectively, of the total electricity in those provinces being generated by industry. In Manitoba and Prince Edward Island all major power generation comes from electric utilities.

### 13.3.8 Generating capability and load requirements

Power generating *capability* is the measurement of the available generating resources of all hydro and thermal facilities at the time of the one-hour firm peak load for each reporting company, and is not equal to the *capacity* of such generating facilities. For example, a hydro plant may have a capacity of 100,000 kw but if, at the time of peak load, the water available for generation is only 80% of the plant capacity requirements, then its capability is 80,000 kw.

Total generating capability has grown at a rapid rate especially in the past few decades. The annual rate of increase was 7.0% in the period 1961-71 and 9.3% in the period 1967-71. In comparison, the forecast rate of growth for the years 1972-76 is 7.3%; thermal generating capability is expected to grow at an average rate of 10.7% a year in the forecast period compared with 13.3% in the period 1961-71, and hydro-electric capability is expected to increase at 5.3% a year compared with 4.4% in the 1961-71 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. More specific information can be found in Table 13.13.

Among the provinces, Ontario has the largest generating capability, followed by Quebec, British Columbia and Alberta. Quebec has the largest hydro-electric generating capability, followed by Ontario and British Columbia, but Ontario has the largest thermal capability, followed by Alberta and British Columbia. The first full-scale nuclear power station went into commercial operation in Ontario in early 1967.

The largest absolute growth in generating capability for the forecast years is indicated for Ontario at 6,889,000 kw, followed by Newfoundland at 3,666,000 kw, British Columbia at 2,835,000 kw and Quebec at 1,327,000 kw. Ontario will meet most of its increased generating capability by adding 2,835,000 kw in thermal capability and 60,000 kw in hydro capability, the former including 60,000 kw nuclear. Newfoundland will add 3,663,000 kw hydro and 3,000 kw thermal, and British Columbia 2,493,000 kw hydro and 342,000 kw thermal.

*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 6.9% a year from 1961 to 1971 and 6.5% a year from 1967 to 1971; peak-load demand is forecast to increase at the