

is a 260-kV HVDC link from the mainland to Vancouver Island. This facility has a capacity of 312 MW and includes 21 miles (34 km) of undersea cable; it is a monopolar system using the ground as a return path for current. It was being expanded to 624 MW for an in-service date of 1976. A 450-kV HVDC system was placed in service in 1973 linking the Kettle generation station on the Nelson River to Winnipeg where two 555-mile (893 km) lines have been completed and converter equipment with an initial capacity of 810 MW is in service. The planned ultimate rating of this system is 3 200 MW. Another application designed to provide a non-synchronous tie between the power systems of New Brunswick and Quebec is a 320-MW back-to-back HVDC system located at Eel River, NB. This facility was placed in service in 1972 employing solid state thyristor valves in place of the mercury arc valves used for the earlier-committed HVDC systems in British Columbia and Manitoba.

Interconnections of 66 kV and 138 kV already exist between British Columbia and Alberta and a 230-kV tie is being planned. Saskatchewan, Manitoba, Ontario and portions of the Quebec system are interconnected and, through the Ontario Hydro system, are linked with northeastern United States systems. Quebec, New Brunswick and Nova Scotia systems are interconnected. The first major international tie connecting regions of the Maritimes in Canada with the United States became a reality during 1970 on completion of a 345-kV link between the New Brunswick and Maine systems. British Columbia has an international tie with the Pacific Northwest (500 kV) and a 230-kV link between Manitoba and the United States was completed in 1970.

The search for economies in transmission systems has led to changes not only in materials used but also in tower erection and cable-stringing methods. Guyed V-shaped and Y-shaped transmission towers are being used increasingly in place of self-supporting towers where the terrain is suitable, and erection costs are being reduced by the use of helicopters to transport tower sections to the site.

### 13.6.7 Electric utilities

Federal government regulation of electric utilities with respect to the export of electric power and the construction of lines over which such power is exported falls within the jurisdiction of the NEB.

Power is generated in Canada by publicly and privately operated utilities and by industrial establishments. Of the total electric power generated in 1974, 70.5% was produced by publicly operated utilities, 15.6% by privately operated utilities and 13.9% by industrial establishments. However, ownership varies greatly in different areas of the country. Although Quebec power installations were at one time privately owned, almost all were transferred to public ownership in 1963. In Ontario almost all electric power has been produced by a publicly owned utility for over 60 years.

Because the determination of market prices and regulation of services is limited to inter-fuel competition with oil, gas and coal, there is some regulation of electric utilities in all provinces. In all but two provinces major generation and main transmission of power is the responsibility of a provincial Crown corporation. Investor-owned electric utilities are prominent in Alberta, Newfoundland and Prince Edward Island and continue to play a significant role in Ontario and British Columbia; they contributed about 15.6% of the total power generated in Canada in 1974. Non-utility generating facilities in industrial establishments represented 10.2% of installed capacity at the end of 1974 and generated 13.9% of the total electric energy produced in Canada in that year; however, on a percentage basis, there is a continuing decline in industrial generation as it becomes increasingly attractive to purchase power from utilities which can take advantage of larger unit sizes and operational flexibility. Even when process steam is required for industry, there are instances when it is advantageous to purchase both steam and power from the electric utility.