

The Electrical Manufacturing Industry

By Fred Kee

Many Canadian manufacturers have played key roles in the development of electric power from the early days and have made significant contributions to the country's expanding economy. They are of two basic types: those who manufacture electrical equipment and supplies for the electrical utilities and those who are heavy users of electrical power and, as a result, account for growth of the utilities over the years. Some of these have contributed background material for portions of this book.

The individual stories of these manufacturing companies constitute important historical highlights within the overall story of power. We have selected three early pioneering examples: Canadian General Electric Co. Ltd., Westinghouse Canada Inc. and the Aluminum Company of Canada Limited, known throughout the world as "Alcan".

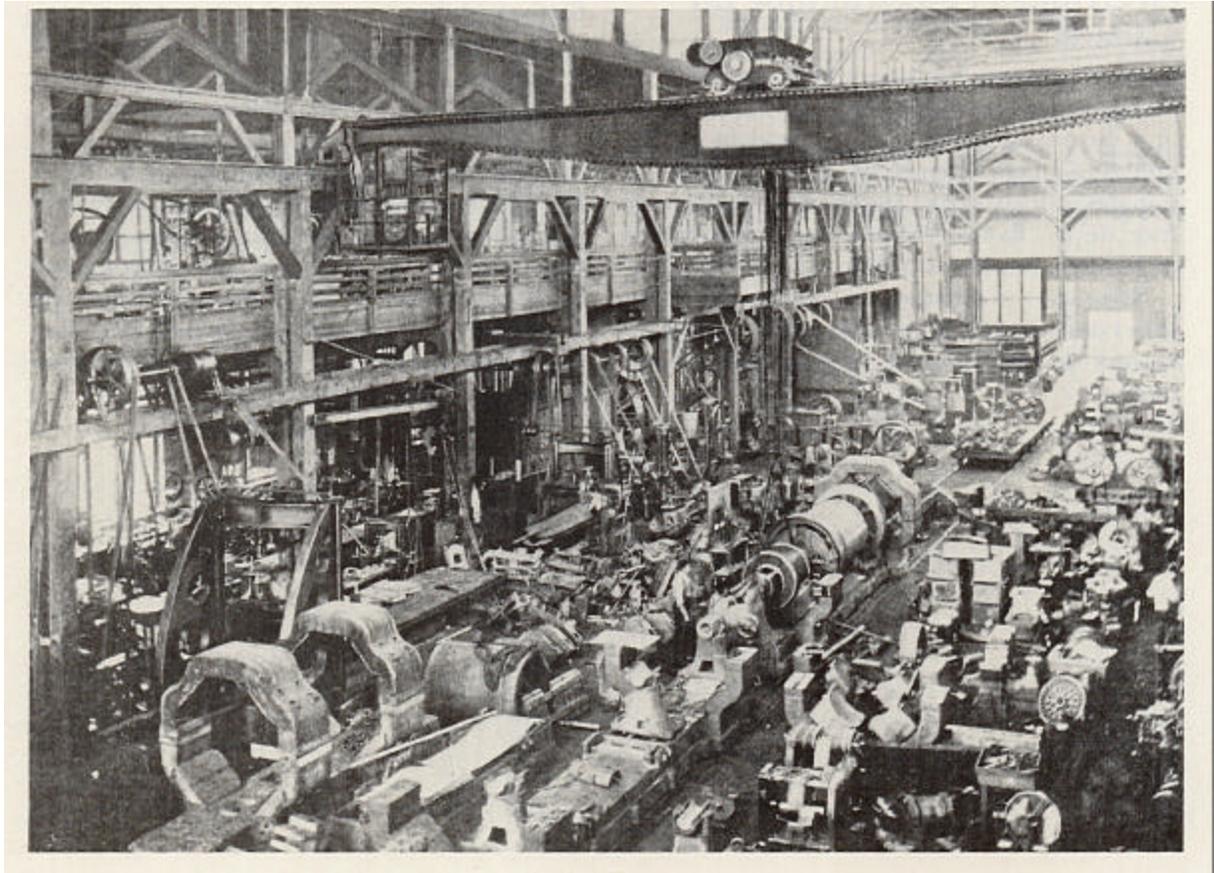
Canadian General Electric, in a historical booklet, traces its origins to two previous companies both incorporated in 1882: Edison Electric Light Company of Canada and Thomson-Houston Electric Light Company of Canada. The former was originally established in Hamilton, Ontario, with shareholders: Thomas Alva Edison and Grosvenor Porter Lawrey of New York City, E. Hearle of Montreal, James Sutherland of Woodstock (Ontario) and Alexander MacInnes of Hamilton. The latter was originally established in Montreal. In keeping with the rapid developments of the times, subsidiaries were formed and a branch plant was established in Sherbrooke, Quebec. The Edison company was selling and installing isolated plant systems of lighting and power for industry as well as central stations for illuminating companies to supply



Early construction of electrical machinery manufacturing plant in Peterborough, Ontario, 1891. Photo courtesy of Canadian General Electric Company Limited.

electricity for lighting cities and towns.

In 1889 the Edison General Electric Company of New York was formed to consolidate the many manufacturing operations of the Edison interests including those in Canada. By 1890 the Sherbrooke plant, employing 175 men, had insufficient capacity to meet the rapidly expanding volume of business. A larger plant was constructed at Peterborough, Ontario consisting of three buildings 272 feet long with total manufacturing area of 74,000 sq. ft. which closely resembled the Edison shops in Schenectady, N.Y. The entire Sherbrooke staff was transferred to Peterborough and then expanded to 400 persons to manufacture dynamos, motors for stationary power and electrical railway purposes, mining locomotives, underground conductors, electrical instruments, appliances, electric cables and insulated wire.



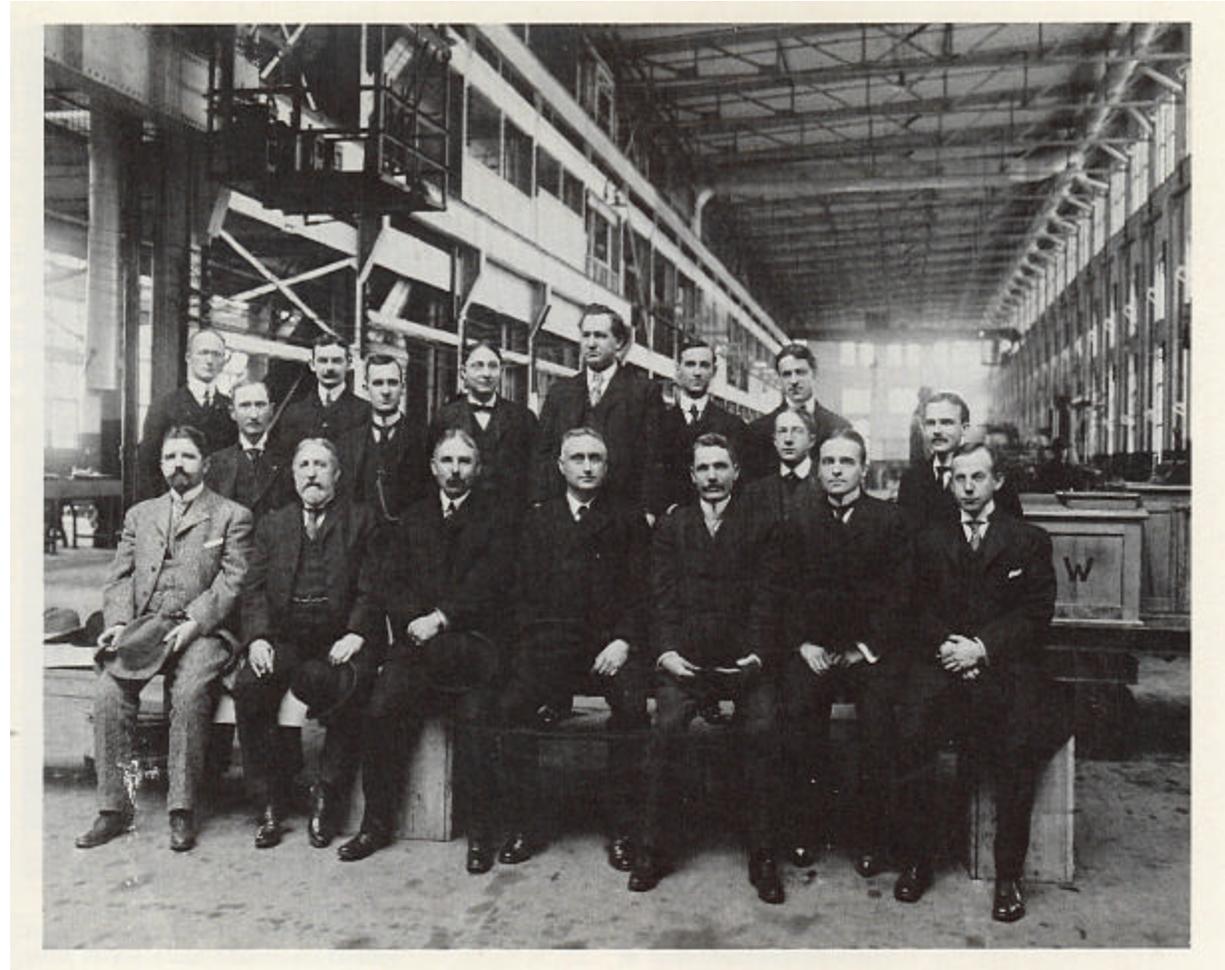
Floor of main Machine Shop, Canadian General Electric's plant in Peterborough, Ontario, 1894. Photo courtesy of Canadian Electric Company Limited.

In 1892 the operations and assets of the Edison, Thomson-Houston and Brush Electric were consolidated into the General Electric Company of New York. Within a few months Canadian General Electric was formed to merge the assets, in Canada, of Edison General Electric and Thomson-Houston.

From this beginning, Canadian General Electric, with manufacturing centered at Peterborough, expanded into a major Canadian manufacturer with multi-plants in various locations and highly trained sales staff in all areas of Canada. The output of these plants has served the needs of Canadians and considerable export business in all segments of the electrical market: industrial, residential, transportation, municipal, commercial and institutional. Over the years many new product lines were added and many old ones dropped. The company still operates in a wide field

of Utility products, lighting, home appliances and rotating equipment for light and heavy industry for both domestic and export markets.

Our second example of pioneering in the field of electrical manufacturing is known today as Westinghouse Canada Inc. From a historical pamphlet issued by the company in 1978 we extract some interesting highlights:



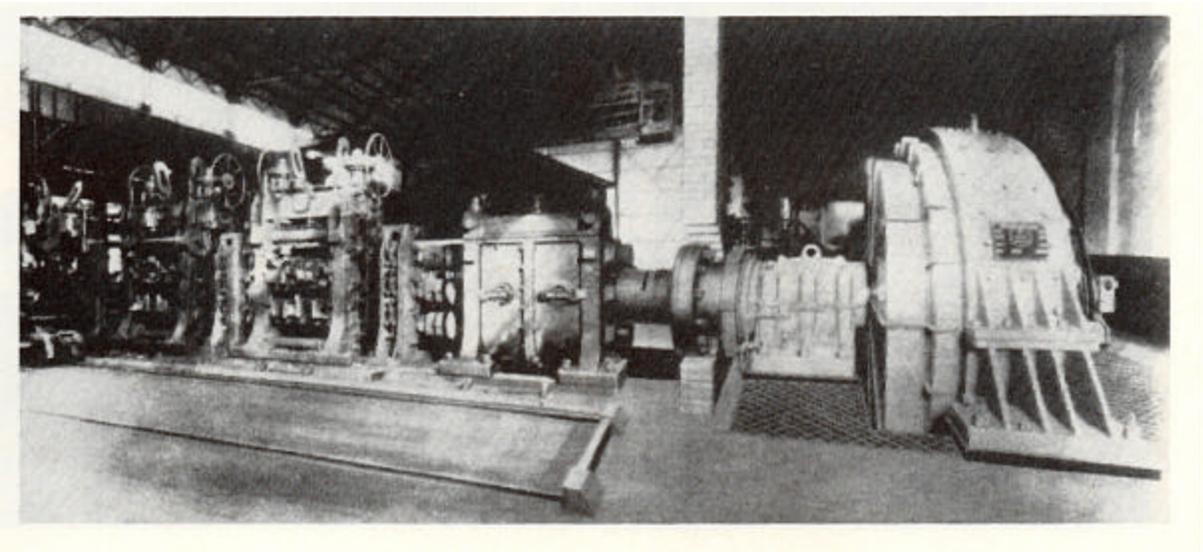
Directors and Sales Manager, Canadian Westinghouse Company Limited, 1904. Photo courtesy of Westinghouse Canada Inc.

“Westinghouse Manufacturing Company Limited was established in Hamilton, Ontario, in 1896 to manufacture air brakes for Canadian railroads. By 1903 this business was employing about 200 people”. Up to that time the electrical products of Westinghouse in the U.S. were already being distributed in Canada by Messrs. Ahern and Soper Limited of Ottawa. Then, in 1903, the Canadian Westinghouse Company Limited was formed, at the recommendation of George Westinghouse, to consolidate Westinghouse interests in Canada, with shareholder investment divided between: Westinghouse Electric and Manufacturing Company, Westinghouse Air Brake Company and representative Canadian persons or corporations”.

Thus, the airbrake manufacturing plant in Hamilton was expanded to manufacture electrical products for home and industry. The key to transmission of electric power over long distances had been found in recognition of the merits of alternating current and development of the transformer. Westinghouse had pioneered in both.

The company went on to develop “the basic products used in generating, distribution and application of electricity-generators, transformers, motors, switchgear, circuit breakers, meters,

lamps and lighting.” The 1909 annual report disclosed that: “The distinction rests with your company of having manufactured during the past year, the only transforming and switching apparatus yet produced in Canada for operation in connection with lines transmitting electrical energy at a pressure of 110,000 volts, the highest transmission voltage yet attempted in any part of the world”.



Installed 1931, 5000 hp DC reserving motor driving a 3-stand 3-high mill at the Sault Ste. Marie plant of Algoma Steel Corporation, was the largest DC motor in Canada at that time. Photo courtesy of The Thomas Fisher Rare Book Library of the University of Toronto.



Roughing Mill Main Drive Motors rated 8000 hp each at 35 rpm. Photo courtesy of DOFASCO Inc. and CGE.



Roughing Mill control during automatic slab rolling. Photo courtesy of DOFASCO Inc. and CGE.

Later the company expanded to serve both residential and industrial markets. In more recent times (1971) the name was changed to “Westinghouse Canada Inc., which has become a diversified company serving the utility, industrial, construction and defence markets. Product scope now includes: turbines, generators, transformers, nuclear products, motors, electronics, control and power distribution products.

Westinghouse Canada Inc. employs over 5800 people in its various manufacturing plants, service and repair centres, and sales locations across Canada and abroad.

Our third example of electrical pioneering is Aluminum Company of Canada Limited (Alcan). Here we have a company deeply engaged as a manufacturer of wire and cable and as a very large producer and consumer of electricity. From company bulletins, dated 1964 and later, we quote:

(indentation here)The water resources of the Province of Quebec first attracted the pioneers of the aluminum industry at the turn of the century, then led the province to become one of the great light-metals-producing centres of the world. In 1900, because of the development on the St. Maurice River, Alcan’s first powerhouse and aluminum smelter was established at Shawinigan. As the market for aluminum developed, it became apparent that the available capacity of the St. Maurice system was insufficient to satisfy the growing needs for the metal and other industries which had followed Alcan in establishing plants in Shawinigan.

Power resources were available in the Saguenay-Lake St. John system and it was here in 1925 that Alcan expanded. In the process this created work for thousands of people.

In 1948, Alcan surveyed the Kitimat-Kemano area in British Columbia to assess its potential as an aluminum smelter site. Needed were an abundant supply of hydroelectric power, a deep

water port with access to the Pacific Ocean, and an area large enough for a smelter capable of 550,000 tons of aluminum annually as well as a town that could grow to house 50,000 citizens.

Many of the developments which followed in what was a wilderness, 400 miles northwest of Vancouver on the British Columbia coast line at the head of a long fiord, 80 miles from the open sea, are now history. This \$440 million project is the largest financial and engineering project ever undertaken in Canada by private enterprise.

Today the Kitimat Smelter and its related Hydroelectric generating station at Kemano, together with Alcan smelters and Hydroelectric developments in Quebec, produce about 20% of the world's aluminum. Fifteen percent of our aluminum ingot production is processed into sheet, foil and other forms at fabricating works located across Canada including those owned by the company in Vancouver, B.C., Arvida and Shawinigan, Que., and Etobicoke, Kingston and Toronto in Ont. The balance of our production must be sold in world markets.(end of indentation)

We view the Alcan story as a prime example of the development of Canadian water power resources for heavy industry manufacturing, employment, Canadian made electrical products, products which support other manufacturing plants, as a source of foreign currency on a large scale from around the world, and as an electrical energy producer for the communities which develop in the areas surrounding the industrial sites. Other examples include the steel and pulp and paper industries.

We have cited only three examples of major electrical industries to illustrate the pioneering role which has been played by Canada's electrical manufacturing organizations. There are literally



Interior view of Kitimat Potroom, 1979. Photo courtesy of Alcan Aluminum Limited.

hundreds of others which could be included except for space limitations. Most of these are represented by the Electrical and Electronic Manufacturers Association of Canada.

World Wide Web Resources as of March 2000:

Alcan – www.alcan.com

IEEE Canada Millennium Web Site – Kitmat-Kemano

The Electrical and Electronic Manufacturers Association Canada (EEMAC)

This association was formed in 1976 from two previous organizations: Canadian Electrical Manufacturers Association (dating from 1944) and the Electronics Industries Association of Canada which developed out of the Radio Manufacturers Association of Canada (dating from 1929).



*Aluminum Ingot for processing into sheet.
Photo courtesy of Alcan Aluminum Limited.*

A brief account of the purposes and activities of this organization as a promotional force within the electrical industry is extracted from two information bulletins:

EEMAC has one purpose:

- to serve and develop the Canadian electronics and electrical industries.

EEMAC's priorities are:

- Research and Development: promote a favourable climate for R&D undertaken by private industry.
- Education: promote responsiveness by educational institutes to industry needs.
- Energy: promote the use of electricity in industrial and residential markets for economic benefit of all the provinces.
- International Trade: give association leadership in the electrotechnical industry for international trade.
- Consumer Markets: promote public awareness of the quality and standards of electrical products made by Canadian industries

EEMAC's Success:

- The Association represents over 200 member companies in the industrial heartland of Canada.
- EEMAC members employ 135,000 Canadians who collectively earn \$2 billion annually.
- EEMAC members serve a domestic market in excess of \$15 billion and an export market in excess of \$4 billion annually.
- EEMAC provides counsel and data to its membership on: national and international marketing; research and development; codes and standards; employee relations; government relations; public affairs; statistics and economic information ... and, in fact, on practically all aspects of successful electrical and electronics industry operations.