INDUSTRY PROFILE

Industry, Science and Technology Canada
Industrie, Sciences et Technologie Canada

Industrial Electrical Equipment

Canada

INDUSTRY PROFILE

INDUSTRIAL ELECTRICAL EQUIPMENT

1988

FOREWORD

In a rapidly changing global trade environment, the international competitiveness of Canadian industry is the key to survival and growth. This Industry Profile is one of a series of papers which assess, in a summary form, the current competitiveness of Canada's industrial sectors, taking into account technological and other key factors, and changes anticipated under the Canada-U.S. Free Trade Agreement. Industry participants were consulted in the preparation of the papers.

The series is being published as steps are being taken to create the new Department of Industry, Science and Technology from the consolidation of the Department of Regional Industrial Expansion and the Ministry of State for Science and Technology. It is my intention that the series will be updated on a regular basis and continue to be a product of the new department. I sincerely hope that these profiles will be informative to those interested in Canadian industrial development and serve as a basis for discussion of industrial trends, prospects and strategic directions.

Minister

1. Structure and Performance

Structure

The industrial electrical equipment industry consists of companies manufacturing a wide range of equipment for the generation, transmission, distribution and conversion of electrical power. This equipment ranges from large, custom-engineered hydro-electric generators and transformers, to switchgear and electric motors and small, mass-produced industrial controls. Major customers are electrical utilities and primary and secondary manufacturing industries.

The industry is a large user of processed raw materials including iron, steel, copper, aluminum and plastics. It is an important market for Canadian industrial producers of component parts and semi-finished goods.

Consisting of 269 companies with more than 22 000 employees, the industry is located mainly in Ontario and Quebec. In 1986, shipments amounted to $2.1 billion. Exports accounted for $394 million, with $288 million (73 percent) going to the United States. Imports in 1986 were valued at $974 million — of which $692 million (71 percent) was supplied by the United States.

The larger companies in this industry represent the bulk of manufacturing capacity, and are subsidiaries of foreign-owned multinational corporations. These Canadian subsidiaries were originally established to supply the domestic market when it was protected from imports by high tariffs. As additional domestic market opportunities for specialized products were identified, Canadian-owned companies were also established. These remained small, however, because of the limited size of the Canadian market.

Compared to their international competitors, all Canadian companies in this industry are small. Of the 269 firms in the industry, only 58 employ more than 100 people. Even one of the largest Canadian companies (with 1986 corporate sales of approximately $1.5 billion) is ranked only 14th in overall sales compared to international competitors such as General Electric of the United States, Siemens of Germany and Hitachi of Japan. In fact, sales of some large foreign electrical equipment manufacturers far exceed the total Canadian market of $2.7 billion.

The industrial electrical equipment industry can be divided into two sub-sectors — low-volume, large, custom-engineered products and high-volume, standard products. Custom-engineered products have a strong domestic technology base and are competitive in both Canadian and international markets. High-volume standard products depend on foreign technology and primarily supply the domestic market. The small size of that market and the resulting production fragmentation have restricted the efforts of standard products manufacturers to improve their competitive position through economies of scale and specialization.

Canada

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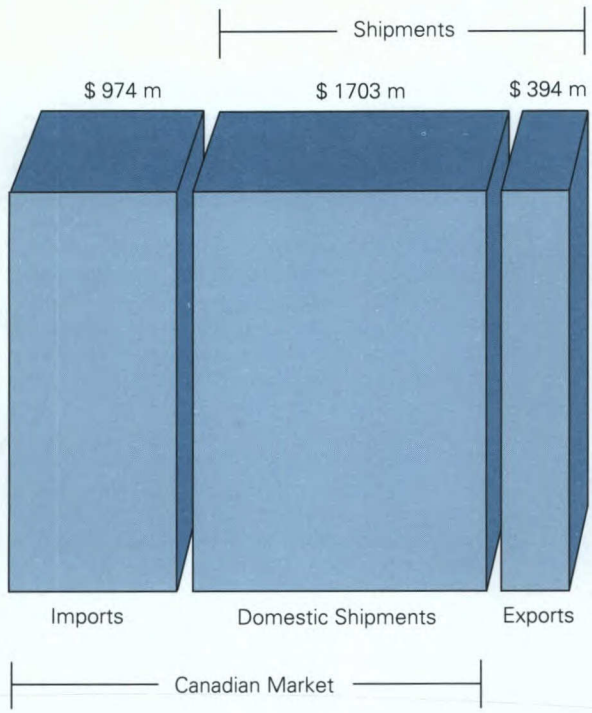


Imports, Exports and Domestic Shipments
1986

The structure of this industry has been affected by the buying practices of Canadian electrical utilities, which usually call separate tenders for engineering, procurement and construction, and, in many cases, oversee the implementation of the project themselves. As a result, Canadian companies, while able to supply the different components of a project, have had little experience in bidding for complete turnkey construction projects. This situation has placed Canada at a disadvantage in the international market, where competitor countries with integrated firms are better able to respond to tender calls for complete turnkey projects.

Performance

In general, the industrial electrical equipment market tends to be cyclical, reflecting the "lumpy" nature of major utility projects. In real terms, as measured by gross domestic products for the industry, output increased steadily from a 1973 total of $324 million (1981 constant dollars) to $732 million in 1982. This increase, however, was followed by a dramatic drop to a 1983 low of $629 million because of the recession of the early 1980s. As a result, electrical utilities found themselves with an overcapacity so they reduced their equipment purchases. Output recovered to a value of $794 million in 1986, as the industrial sector pulled out of the recession and electrical utilities undertook major new projects.

Employment fell from 27 486 in 1982 to a low of 21 000 in 1984, with a slight recovery to 22 273 in 1985. These figures reflect cutbacks that resulted from the loss of production orders caused by the recession. As orders increased in 1985, the industry increased its productivity by installing more automated equipment and other production improvements.

In nominal terms, the industry's export shipments have increased from eight percent ($51 million) of total shipments in 1973 to 19 percent ($394 million) in 1986. Imports of $974 million satisfied 36 percent of the domestic market in 1986 and $253 million (31 percent) in 1973. Exports have come mainly from the large, custom-engineered equipment sub-sector where Canadian equipment is competitive internationally in both technology and price.

Imports have tended to be the high-volume, standard equipment such as DC motors, for which the domestic market is not large enough to support local production on an economic basis.

2. Strengths and Weaknesses

Structural Factors

The major strength of the Canadian industry is its capability to supply large, custom-engineered, state-of-the-art equipment, required by large electrical utilities and resource-based companies, at internationally competitive prices from a strong domestic technology base. Its inherent weaknesses are: lack of experience in complete turnkey projects or systems integration; the small size and high degree of foreign ownership of its companies; and its production of high-volume standard products at prices not internationally competitive.

This industry was established in Canada primarily to meet the needs of electrical utilities and resource-based primary manufacturing companies. A number of subsidiary companies were established by multinational corporations to supply the Canadian market. However, because of Canada's unique requirements, these companies tended to direct their efforts at custom-engineered products. These included advanced hydro-electric generators, extra-high voltage utility equipment such as transformers, air blast breakers and line reactors, and industrial drive systems for industry and marine propulsion.

By directing their efforts to custom-engineered products, the industry became a world leader in the design and manufacture of this type of equipment. Several Canadian subsidiaries have acquired world product mandates for their equipment. In this sub-sector, Canada offers competitively priced, state-of-the-art equipment, which has been very successful in both domestic and export markets, particularly the United States.

The industry, however, has supplied mainly equipment rather than systems to North American electrical utilities. It has assumed this role because electrical utilities have developed their own systems capability in both Canada and the United States, and rely on the manufacturing industry for equipment only. As North American requirements for additional equipment decline, the industry is looking to other export markets to maintain its facilities. This lack of systems capability becomes a major handicap to the industry when it is bidding on projects in developing countries that normally require a complete turnkey package.

The relatively small size and foreign ownership of the industry in Canada are also drawbacks in the export market. To bid on larger projects in developing countries, the industry needs to form consortia to be competitive with the large international companies.

The high-volume, standard products in Canada are manufactured for the domestic market which is too small to justify large-scale mass production. In general, these products tend not to be competitive with products manufactured by larger firms in the United States, Europe and Japan. A further complication is the purchasing policy of some provincial electrical utilities, which gives preference to local manufacturers. This practice has fragmented the industry in Canada and eroded efficiency because of small production runs.

Trade-related Factors

Canadian tariffs on industrial electrical equipment are 17.5 percent on switchgear, 15 percent on hydro-electric generators and transformers, and 9.8 percent on industrial generators. The United States imposes tariffs ranging from 6.6 percent for electric motors and generators to 2.4 percent on transformers. Japanese tariffs are in the 4.9- to 5.8-percent range, while the European levies are between five and 8.5 percent.

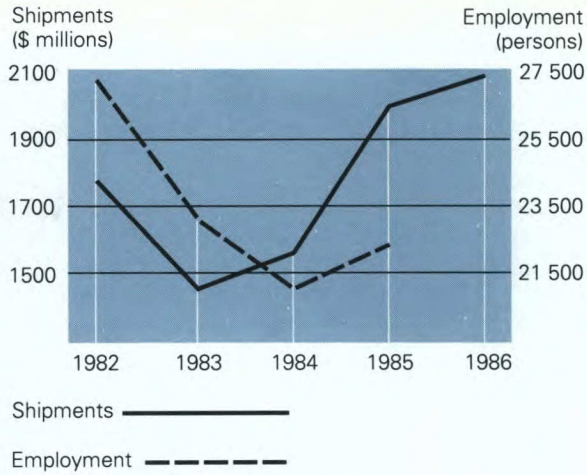
The most important factors affecting Canadian exports are the non-tariff barriers (NTBs) of other developed countries (the United States is an exception) which close their markets to foreign competition completely. Canadian companies are kept out of these markets through commercial pre-qualification requirements and technical specifications written to favour local suppliers.

The markets of most developing countries are open to Canadian suppliers. The exceptions are countries such as Brazil and the Republic of Korea, which have developed their own industries and impose prohibitive tariffs on imported equipment.

The Canada-U.S. Free Trade Agreement (FTA) will phase out tariffs between Canada and the United States over the next 10 years.

Technological Factors

In general, the technology in the industrial electrical equipment industry is mature. Most advances result from improvement to component parts and manufacturing processes.

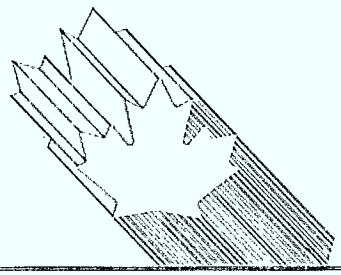


Total Shipments and Employment

In the custom-engineered equipment sub-sector, the industry's strength has been its ability to develop products that meet the demanding requirements of the Canadian market which result from the need to operate under severe climatic conditions and to transport power over long distances. Over time, the industry has had to develop advanced hydraulic generator designs, extra-high voltage utility equipment such as 745 kV transformers, air blast breakers and line reactors. With the expertise gained in developing these new products, a number of multinational subsidiaries have become centres of excellence for these products within their corporations and have been awarded the world product mandate. This expertise has also allowed companies to increase their R&D activity with support from parent companies. Canada is a technological world leader when it comes to industrial electrical equipment.

The technology for high-volume, standard products is acquired from parent corporations for the most part. Canadian manufacturers concentrate on the production process to adapt the product to shorter production runs required for the smaller domestic market.

In both custom-engineered and standard products, the industry is seeking to improve productivity by applying advanced manufacturing technologies. A majority of the companies are now equipped with computer-aided design (CAD), and they are slowly phasing in computer-aided manufacturing (CAM) as they upgrade their production equipment.



Other Factors

Procurement policies of provincial electrical utilities provide the most notable government influence on the industry. Electrical utilities in Ontario, Quebec and British Columbia have explicit purchase preferences for local suppliers. This situation has led to a fragmentation of certain segments of the industry with the resulting loss in operation efficiencies. Some provincial utilities have tended to purchase equipment offshore because of price and, although dumping has been suspected, it has been difficult to prove.

3. Evolving Environment

Developed country markets in Europe and Japan are likely to remain closed to Canadian industrial electrical equipment because of different technical standards, national preferences and other NTBs. Developing countries such as Brazil and the Republic of Korea have established manufacturing capabilities in electrical equipment and have essentially closed their markets to imports. In fact, these countries are now emerging as competitors.

The electrical utilities sector in both the United States and Canada is expected to grow slowly over the next decade. The largest potential markets for industrial electrical equipment are in developing countries. Markets in the People's Republic of China, India, Pakistan and the ASEAN countries are the most promising.

The industry has begun to pursue these markets. It has concluded that to meet the international competition it must put together Canadian consortia capable of supplying a complete equipment package. To compensate for their lack of systems integration capability, manufacturers are joining together with consulting engineers and the international operations of provincial utilities.

4. Competitiveness Assessment

Canadian low-volume, custom-engineered equipment is internationally competitive in both price and technology. This sub-sector is particularly strong in hydro-electric generation equipment and high-voltage transmission and distribution systems.

High-volume, standard products are not internationally competitive, except in some areas of specialization or where products have been rationalized between the Canadian subsidiary and its foreign parent.

The FTA is expected to assist the custom-engineered equipment sub-sector by providing more secure access to the American market where Canadian custom products are already competitive. It will, however, threaten some of the standard product manufacturers which rely on tariff protection to make them competitive in the small Canadian domestic market. The 10-year phase-out of tariffs will allow some of these companies to adjust to increased competition from the United States and to take advantage of the much larger U.S. market.

The agreement and the accompanying gradual reduction of tariffs will provide both a challenge and an opportunity for the industry. Firms that adapt to the changed environment by developing new products and increasing their presence in the U.S. market will benefit from the FTA. Companies that will not or cannot participate in that market, or that opt for the status quo, could encounter increasing competitive pressures to which they may be unable to respond.

For further information concerning the subject matter contained in this profile, contact:

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Ottawa, Ontario
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PRINCIPAL STATISTICS

SIC(s) COVERED: 3371, 3372, 3379 (1980 Basis)

	1973	1982	1983	1984	1985	1986
Establishments	179	255	256	250	269	N/A
Employment	27 579	27 486	23 147	21 000	22 273	N/A
Shipments ($ millions)	604	1 801	1 464	1 563	2 001	2 097
Gross domestic product (constant 1981 $ millions)	324	731.8	629.3	648.8	781.5	794.4
Investment ($ millions)	24.1	23.2	22.8	28.3	33.3	55.6

TRADE STATISTICS

	1973	1982	1983	1984	1985	1986
Exports ($ millions)	51	267	211	307	356	394
Domestic shipments ($ millions)	553	1 534	1 253	1 256	1 645	1 703
Imports ($ millions)	253	685	653	754	878	974
Canadian market ($ millions)	806	2 219	1 906	2 010	2 523	2 677
Exports as % of shipments	8	15	14	20	18	19
Imports as % of domestic market	31	31	34	38	35	36

Source of imports (% of total value)		U.S.	E.C.	Asia	Others
	1981	75	11	6	8
	1982	70	12	10	8
	1983	68	16	8	8
	1984	74	11	8	7
	1985	79	11	8	2
	1986	71	14	8	7

Destination of exports (% of total value)		U.S.	E.C.	Asia	Others
	1981	54	6	13	27
	1982	56	5	5	34
	1983	68	5	3	24
	1984	72	4	6	18
	1985	80	4	6	10
	1986	73	4	6	17

(continued)

REGIONAL DISTRIBUTION — Average over the last 3 years

	Atlantic	Quebec	Ontario	Prairies	B.C.
Establishments – % of total	1	35	60	2	2
Employment – % of total	1	36	60	1	2
Shipments – % of total[e]	1	20	75	2	2

MAJOR FIRMS

Name	Ownership	Location of Major Plants
General Electric Canada Inc.	American	Peterborough, Ontario Lachine, Quebec
MIL Group Inc.	Canadian	Tracy, Quebec
Westinghouse Canada Inc.	American	Hamilton, Ontario

N/A Not available

Note: Statistics Canada data have been used in preparing this profile.

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