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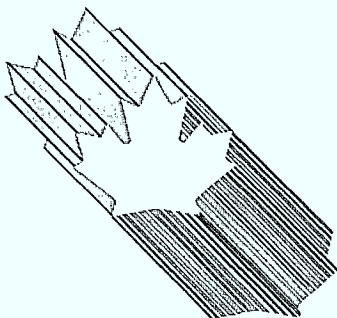


Industry, Science and  
Technology Canada

Industrie, Sciences et  
Technologie Canada

## Electrical Wire and Cable

Canada



# INDUSTRY PROFILE

## ELECTRICAL WIRE AND CABLE

JAN 5 1989

1988

BIBLIOTHEQUE

MINISTÈRE DE L'EXPANSION  
INDUSTRIELLE REGIONALE

### FOREWORD

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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 Canadian electrical wire and cable industry includes manufacturers of bare and insulated conductors for the transmission and distribution of electrical energy, and manufacturers of telephone cables, coaxial cables and fibre-optics cables for telecommunication applications. The sector consists of some 20 firms and employs about 7500 persons. In 1986, shipments totalled approximately \$1.4 billion, while exports were \$179 million and imports \$167 million.

The major materials used in the industry are copper and aluminum, together with the rubber or plastic insulating compounds that are purchased from petrochemical producers. Specialized materials such as glass fibre-optics are becoming more widely used as new communications cable products are developed.

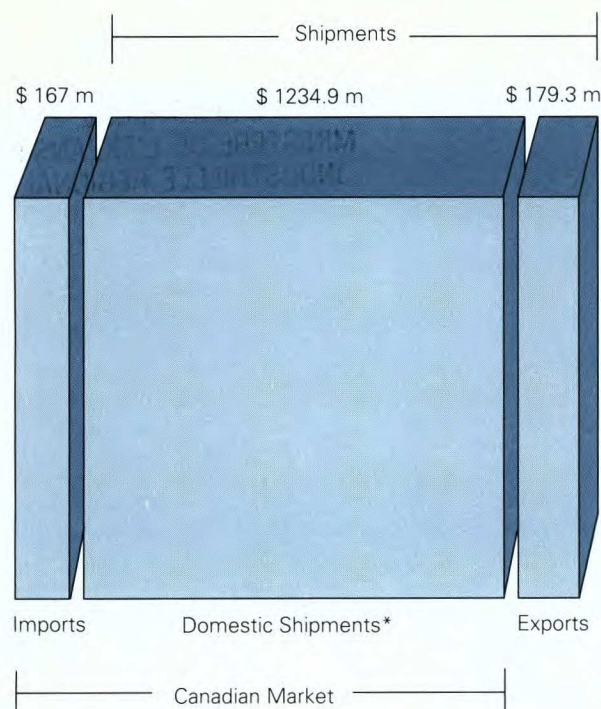
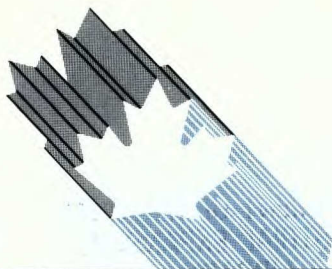
There are three main market segments in the electrical wire and cable sector: the electrical utilities, the construction industry and the telecommunications utilities. Each has specific product requirements. Electrical utility purchases of conductors for overhead transmission and distribution lines, and of high-voltage power cables make up about 38 percent of the domestic market. The construction industry purchases mainly electrical building wire and construction cables and represents some 32 percent of the domestic market. The telecommunications firms account for about 25 percent of the domestic market and are the sole purchasers of telephone cables and coaxial cables. Specialty markets account for the remaining five percent.

The approximately 20 companies in the sector operate more than 40 plants across the country. More than 50 percent of these plants are located in Ontario, with another 20 percent in Quebec and most of the remainder in the western provinces. Much of this geographic dispersion is due to the use of the provincially controlled electrical and telecommunications utilities as regional development tools.

Based on 1985 figures, the distribution of establishments, employment, value added and shipments were:

Size of Establishments (No. of Employees)	% of Establishments	% of Employees	% of Value Added	% of Shipments
Less than 50	34	4	3	4
50 to 199	49	37	39	46
200 and over	17	59	58	50





**Imports, Exports and Domestic Shipments  
1986**

\* Estimated.

Three companies provide most of the wire and cable products used in the Canadian market, while the remaining firms tend to specialize in particular product areas. The largest firm, Canada Wire and Cable Ltd., produces a wide range of products and has a dominant position in the market. It is wholly owned by Noranda Inc. and provides a market channel for much of the copper produced by its parent company. The second-largest firm, Phillips Cables Ltd., also produces a full range of products. Another Canadian-owned firm, Northern Telecom Ltd. (controlled by Bell Canada Enterprises) dominates the communications cable segment of the market.

Some of the remaining companies are subsidiaries of foreign firms, originally established in Canada to service the domestic market and to benefit from the then-existing Commonwealth tariff preferences and relatively high Canadian tariffs. Many of the more recently established subsidiary firms have located in Canada primarily to provide specialty products to the domestic market and also to any export markets where supply from a Canadian plant is advantageous.

Worldwide, the industry is generally oriented toward domestic markets. The relatively low-value weight ratio of many wire and cable products tends to keep production facilities close to markets. Despite increases, Canadian exports of recent years still represent only about 13 percent of total industry shipments. Some 84 percent of these exports are to the United States, with an additional 15 percent to developing countries.

Imports of wire and cable are largely of types not made in Canada, such as new products with insufficient volume to justify the production equipment needed or the development of new process technology. Imports accounted for 12 percent of the domestic market in 1986, with some 91 percent coming from the United States.

### Performance

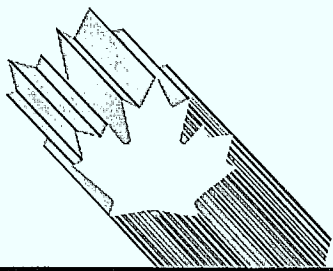
In general, the wire and cable market tends to be cyclical, reflecting the volatile nature of the construction industry and major utility projects. In real terms, as measured by gross domestic product for the sector, there has been a decline in output from \$375.8 million (1981 constant dollars) in 1973 to an estimated \$354.4 million in 1986. The employment drop from 9830 persons in 1973 to an estimated 7500 in 1986 reflects a trend to increased efficiency through automation. However, the number of establishments in the sector has grown from 35 in 1973 to about 53 in 1985. The re-investment rate averages about five percent of the value of shipments. In 1982, the comparable figure for the U.S. electrical wire and cable sector was 3.3 percent. The profitability of the sector has been trending downward from more than five percent of shipments in 1973 to 0.7 percent in 1985. International trade has remained essentially in balance over the past several years, though imports and exports have both grown substantially. Imports peaked at \$202 million in 1983 and have since declined to \$167 million in 1986, while exports have shown a steady increase to \$179 million in 1986.

## 2. Strengths and Weaknesses

### Structural Factors

The key factors affecting competitiveness in the sector are the level of production automation, the scale of production and transportation costs. Material costs vary considerably over time but all producers are similarly affected. In export markets, differing technical standards and purchasing preferences affect the competitiveness of Canadian wire and cable products.

Wire-drawing, insulating and stranding operations, which constitute the greatest volume of work in wire and cable manufacture, tend to be of a continuous-flow nature. Wire and cable manufacture is thus more easily automated than many batch-type processes.



The major high-volume products, such as building wire and construction cables, are very mature and generally material-intensive. Consequently, they are affected by transportation costs and tend to be produced close to their markets. This sensitivity gives domestic manufacturers a degree of protection. Higher-technology products, such as telecommunications cables and high-voltage power cables, are able to support greater transportation costs, and hence, are more widely exported.

The greatest structural weakness of this sector in Canada is its geographic fragmentation. To a very large extent, the multi-plant structure of the industry has been induced by the procurement practices of provincial governments which have sought to provide local production capability to satisfy the needs of their electrical and telecommunications utilities. While this approach has provided the wire and cable suppliers with an assured domestic market and a product mix sufficiently flexible to withstand cyclical fluctuations in demand, it has led towards sub-optimal operating levels for the manufacture of many products. The companies most affected are the large, dominant ones that produce most of the larger-volume, narrow-margin products.

The level of production technology used by the Canadian-owned industry is generally comparable with that of its major competitors. Domestic market requirements compare favourably with those in foreign markets. Imports are still relatively low. The industry in Canada puts emphasis on product design and adoption of new manufacturing processes. Both Canadian-owned and foreign-controlled firms undertake development programs which allow the use of improved insulation materials and reduction of production costs.

The development of fibre-optics technology for application in telecommunications markets represents both a major potential opportunity and a significant challenge to wire and cable manufacturers. This new technology is replacing many conventional telephone cables made with copper conductors in new, high-density installations. The major telephone cable producers in Canada, recognizing this fact, have moved quickly to establish a capability in this new product area. These producers appear to be equal to, or slightly ahead of, their U.S. competitors because Canadian communications utilities are rapidly embracing this new technology and are providing the needed market base to support development.

The most recent "per-establishment" productivity information from aggregate sources for the United States is for 1982. The average annual output for each establishment in Canada in that year was \$21 million; the comparable figure for U.S. producers was \$23 million (exchange rate: C\$1.2340 per US\$1). However, the average number of employees for each establishment was 163 in Canada and 153.5 in the United States.

Two years later, in 1984, the shipments per-employee were \$145 000 in Canada but \$176 580 in the United States. The value-added for each production-worker hour was \$37.68 in Canada and \$43.72 in the United States. The average cost of labour was essentially the same in both countries at about \$12.36 for each production-worker hour. (The exchange rate used for 1984 is C\$1.2948 per US\$1.)

Although the average annual output for each electrical wire and cable establishment in Canada is only slightly lower than its U.S. counterparts, the product range is much broader. This situation is contributing to the lower Canadian productivity. American plants have a narrower product range and longer runs that can justify more specialized and efficient machinery; consequently, they experience less time loss because of production-line changeovers.

The cost of raw materials for the sector varies considerably with availability of supply; however, price changes tend to affect Canadian and foreign manufacturers equally as the raw materials are internationally traded commodities.

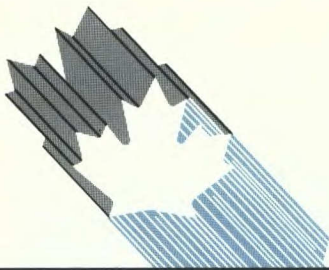
### Trade-related Factors

Tariffs on wire and cable products entering the U.S. market are about five percent. Tariffs on bare and insulated electrical wire and cable products entering the European Community (E.C.) countries are 6.5 percent, and the tariff on bare aluminum wire and cable products is seven percent. The Japanese have a "bound" Most Favoured Nation (MFN) duty rate of 8.2 percent on imports of bare and insulated electrical copper wire and cable. However, they are currently imposing a temporary unbound rate of 5.8 percent. Their "bound" GATT duty rate for bare aluminum wire and cable products is 9.2 percent; the temporary rate is 6.3 percent.

The Canadian tariff levels for bare and insulated copper wire and cable are 4.5 and 10.2 percent, respectively. In addition, there exist a few duty-free, "end-use" classifications for types not produced in Canada.

Electrical wire and cable products entering Canada must meet the Canadian Standards Association (CSA) electrical safety requirements. Other countries have similar national standards for their wire and cable products. These tend to be impediments for Canadian exporters, particularly in Europe and Japan where they are used to close the markets effectively to foreign suppliers. CSA is working with standards bodies in other countries, particularly in the United States, to overcome these differences. Efforts are being made to harmonize standards between countries and to set up a system of mutually acceptable testing procedures and facilities so as to reduce product certification problems when dealing with other jurisdictions.





In the United States, much of the utility industry is privately owned and tends to support local manufacturers. The main formalized non-tariff barriers into the U.S. market are the federal "Buy America" provisions and similar purchasing preferences legislated in some of the states.

In many developing-country markets, lower-technology wire and cable products are among the first items of an electrical nature to be identified for local manufacture. They are generally supported by tariffs that are, for example, 70 percent ad valorem on aluminum cable that is steel reinforced (ASCR) in Brazil, or 30 percent ad valorem on insulated wire and cable products in Indonesia. In addition, rather effective non-tariff barriers such as import licensing and foreign-exchange controls are used to restrict imports. The most effective access to these markets is through joint-venture manufacturing relationships.

The Canada-U.S. Free Trade Agreement (FTA) will eliminate tariffs on bilateral trade in this sector over a 10-year period.

### Technological Factors

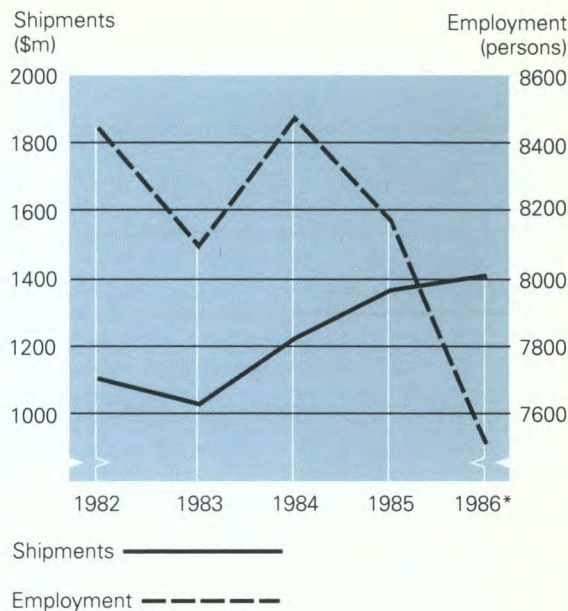
The technology in the electrical wire and cable sector, in general, is mature and most advances result from the application of improvements to existing materials and production techniques. An exception has been the recent introduction of a new material, glass fibre-optics, for telecommunications applications. This technology is expected to eventually dominate this market segment.

Foreign-owned subsidiaries, in addition to undertaking product development in Canada, often obtain technology, under licence, from their parent companies. The majority of specialty firms actively seek technology licences to remain competitive. It should be noted, however, that the relatively small domestic market in Canada implies a greater difficulty for Canadian firms to undertake development programs on their own, since the eventual products must be sold on a smaller market.

The sector routinely uses wire drawing and annealing facilities, stranding machines, and continuous plastic or rubber extrusion machines. In the higher-technology products of the sector, paper-tape winding machines and sophisticated test equipment are also used. Much of the machinery is robust and designed to produce high volumes of products. Because of the specialized nature of the machinery employed, and the limited domestic market, rapid movement into new products is somewhat inhibited.

### Other Factors

On average, about 35 percent of the value of shipments of wire and cable products is in-plant, value-added. The remainder of the production costs is the value of materials used. For the most part, these are internationally priced commodities. Wire and cable exports, particularly the more mature narrow-margin products, are also sensitive to changes in the relationship of the Canadian dollar with respect to other currencies.



### Total Shipments and Employment

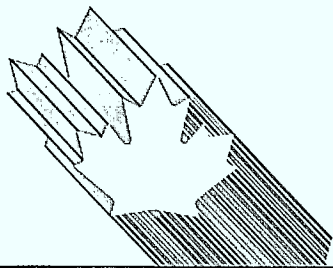
\* Data for 1986 are estimates.

Because of the high, fixed-cost nature of wire and cable production, it is somewhat sensitive to capacity-use levels. To achieve adequate profitability, plants must maintain a high level.

## 3. Evolving Environment

The developed-country markets in Europe and Japan are likely to remain essentially closed to Canadian wire and cable products because of different technical standards, transportation costs and non-tariff barriers. However, shipments to the United States, which accounted for more than 80 percent of total wire and cable exports during the past two years, will continue unless there is a significant shift in the Canada-U.S. dollar exchange-rate. The largest growth of exports in the longer term is likely to be into the developing countries, both through direct sales of higher-technology products from Canada and joint-venture manufacturing of lower-technology products in these countries.

In the domestic market, the electrical utility industry is expected to grow slowly for most of the next decade. Construction is currently operating at close to capacity because of the continuing construction boom. Its future performance will depend on the level of industrial and residential construction activity.



In the telecommunications industry, the use of copper conductor-based cable is projected to grow at two percent annually, while the use of fibre-optics-based cables is expected to grow at 15 percent per year over the next several years. The impact of the replacement of basic copper conductors in the manufacture of many types of communications cables will not be significant for the copper producers because these cables only constitute 26 percent of shipments, and their copper content is lower than that in other types of cable.

Electrical-energy wire and cable, which constitutes 74 percent of the sector, will remain unaffected by the new technology as glass fibres cannot transmit electrical energy. However, the energy wire and cable portion could be seriously affected in the longer term if the current research efforts to produce practical superconducting materials are successful. Research in the United States and Japan is still at the basic development stage. Canadian efforts are largely of a technology-monitoring nature. Present indications are that the widespread, practical use of superconducting materials will not occur before the end of the next decade.

The removal of tariffs over a 10-year period under the FTA will provide a much larger market for Canadian wire and cable manufacturers. The increased competition in the domestic market, also resulting from the FTA, will tend to force domestic producers to concentrate on their most profitable products, and thus significantly reduce the range of products they will manufacture. There could be a rationalization of manufacturing operations despite the fragmenting influence of provincial utility-buying practices. It is very likely that some parts of the domestic market, such as the Atlantic and western provinces, will be lost to closer U.S. plants for lower-margin products that are sensitive to transportation costs. These regional-market losses should be offset by increased penetration of the U.S. market and growth of the rest of the domestic market. Although the Canadian and U.S. tariffs will gradually disappear under the FTA, the "Buy America" provisions and the preferences of private sector and provincial utility buyers for locally manufactured goods will remain. These will tend to limit market penetration.

In the longer term, there will likely be some reduction in the number of Canadian producers as the U.S. subsidiary firms that serve only the Canadian market are gradually withdrawn and their market shares supplied by their parents. However, sudden changes in the level of trade in the sector between the two countries are not expected, although some predatory pricing practices could develop in copper communications cables between the two countries as the new optical-fibre technology renders much of the copper-based cable manufacturing capacity surplus.

## **4. Competitiveness Assessment**

The lower-technology products of the sector, such as building wire, are not fully competitive internationally but continue to be produced in Canada because of the protection they are given by transportation costs and Canadian tariffs. Higher-technology products, such as power and telecommunications cables, are competitive internationally as demonstrated by the continuing successes of Canadian wire and cable manufacturers in the U.S. and Middle East markets. The new capital investment being made by Canadian wire and cable producers on a continuing basis should maintain and improve the current productive efficiency of the sector in relation to its foreign competitors.

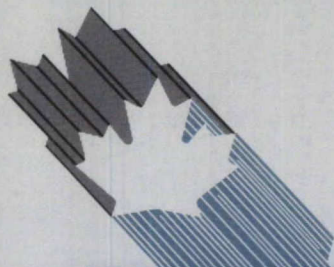
The gradual reduction of tariffs between Canada and the United States under the FTA will provide a challenge and an opportunity for the sector. Those firms that adapt to the changed environment by developing new products and increasing their presence in the U.S. market will benefit. Firms that cannot participate in the U.S. market, or that opt for the status quo, will 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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K1A 0H5

(613) 954-3260





**PRINCIPAL STATISTICS**

**SIC(s) COVERED: 3381 (1980)**

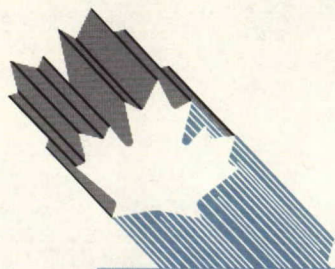
	1973	1982	1983	1984	1985	1986 <sup>e</sup>
Establishments	35	52	55	58	53	N/A
Employment	9 830	8 466	8 101	8 480	8 171	7 520
Shipments (\$ millions)	527	1 117.0	1 031.0	1 229.6	1 374.7	1 414.2
Gross domestic product (constant 1981 \$ millions)	375.8	259.6	252.9	306.8	349.4	354.4
Investment (\$ millions)	26.2	87.6	72.1	68.5	70.6	N/A
Profits after tax (\$ millions)	28.0	6.4	-7.6	-0.4	9.8	N/A
(% of Shipments)	5.3	0.6	-0.7	—	0.7	N/A

**TRADE STATISTICS**

	1973	1982	1983	1984	1985	1986 <sup>e</sup>
Exports (\$ millions)	28	105.0	119.0	162.0	168.7	179.3
Domestic shipments (\$ millions)	499	1 012.0	912.0	1 068.0	1 206.0	1 234.9
Imports (\$ millions)	31	170.0	202.0	191.0	157.0	167.0
Canadian market (\$ millions)	530	1 182.0	1 114.0	1 259.5	1 363.0	1 401.9
Exports as % of shipments	5	9	12	13	12	12.7
Imports as % of domestic market	6	14	18	15	11	11.9
Source of imports (% of total value)			U.S.	E.C.	Asia	Others
		1982	55	27	1	17
		1983	50	14	1	35
		1984	68	19	1	12
		1985	94	2	3	1
		1986	91	4	3	2
Destination of exports (% of total value)			U.S.	E.C.	Asia	Others
		1982	53	1	4	42
		1983	72	1	1	26
		1984	73	1	2	24
		1985	80	1	4	15
		1986	84	1	4	11

**(continued)**



**REGIONAL DISTRIBUTION — Average over the last 3 years**

	Atlantic	Quebec	Ontario	Prairies	B.C.
Establishments — % of total	3	20	53	17	6
Employment — % of total	N/A	26	57	N/A	5
Shipments — % of total	N/A	25	59	N/A	6

**MAJOR FIRMS**

Name	Ownership	Location of Major Plants
Canada Wire and Cable Ltd.	Canadian	Ontario, Manitoba
Phillips Cables Ltd.	British	Ontario, Saskatchewan, British Columbia
Northern Telecom Ltd.	Canadian	Quebec, Saskatchewan, Ontario
Pirelli Cables Inc.	Swiss (Italian)	Quebec, Ontario, British Columbia

e Estimate

**Note:** Statistics Canada data have been used in the preparation of this profile.



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