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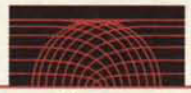

I N D U S T R Y P R O F I L E

1990–1991

ELECTRICAL WIRE AND CABLE

FOREWORD

In a rapidly changing global trade environment, the international competitiveness of Canadian industry is the key to growth and prosperity. Promoting improved performance by Canadian firms in the global marketplace is a central element of the mandates of Industry, Science and Technology Canada and International Trade Canada. This Industry Profile is one of a series of papers in which Industry, Science and Technology Canada assesses, in a summary form, the current competitiveness of Canada's industrial sectors, taking into account technological, human resource and other critical factors. Industry, Science and Technology Canada and International Trade Canada assess the most recent changes in access to markets, including the implications of the Canada-U.S. Free Trade Agreement. Industry participants were consulted in the preparation of the profiles.

Ensuring that Canada remains prosperous over the next decade and into the next century is a challenge that affects us all. These profiles are intended to be informative and to serve as a basis for discussion of industrial prospects, strategic directions and the need for new approaches. This 1990–1991 series represents an updating and revision of the series published in 1988–1989. The Government will continue to update the series on a regular basis.

Michael H. Wilson
Minister of Industry, Science and Technology
and Minister for International Trade

Introduction

The overall Canadian electrical manufacturing sector includes companies that produce industrial electrical equipment, electrical power generation products, electrical wire and cable products, batteries, major appliances, small appliances, lighting products and miscellaneous electrical products. Each industry differs markedly from the others in technologies, production techniques and markets.

In 1991, shipments of electrical manufactured goods constituted 2.98 percent of total Canadian manufactured goods shipped and 2.02 percent of all manufactured goods exported. Shipments of electrical manufactured goods totalled $8 281.2 million, and the total Canadian market for these products was $10 867.8 million. Exports were valued at $2 139.8 million, and imports of $4 726.4 million satisfied 43.5 percent of the Canadian electrical goods market. The manufacture of electrical goods in Canada provided employment for about 70 000 people.

This profile deals only with electrical wire and cable. In addition, other profiles have been published on the following industries:

- *Industrial Electrical Equipment*
- *Major Appliances*
- *Power Generation Equipment*
- *Small Portable Electrical Appliances*

Structure and Performance

Structure

The electrical wire and cable industry comprises manufacturers of bare and insulated conductors for the transmission

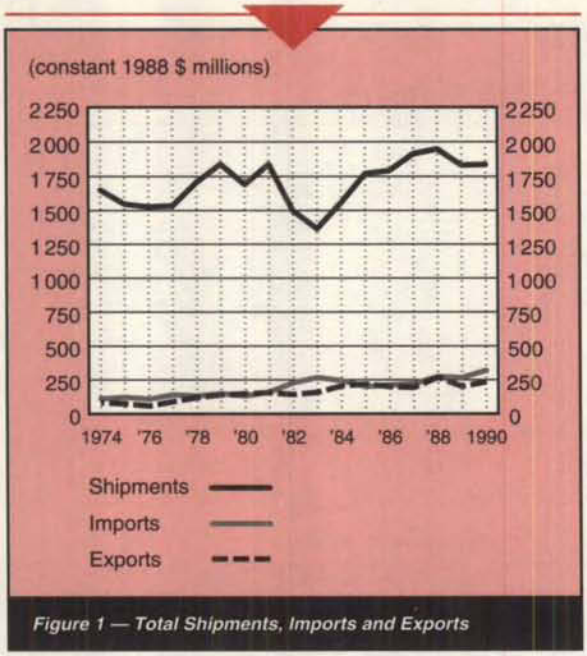

Figure 1 — Total Shipments, Imports and Exports

and distribution of electrical energy as well as manufacturers of telephone cables, coaxial cables and optical fibre cables for telecommunications applications. The major materials used in the industry are copper and aluminum, together with rubber or plastic insulating compounds purchased from petrochemical producers. Specialized materials such as glass optical fibres are becoming more widely used as new communications cable products are developed.

In 1989, the electrical wire and cable industry in Canada consisted of 64 establishments and employed 8 936 people. Shipments in current dollars totalled $2 170 million, while exports were $237 million and imports were $315 million. Figure 1 illustrates shipments, imports and exports in constant 1988 dollars.

Exports represented only about 12.8 percent of total industry shipments in 1990. Annual real growth rates for Canadian exports over the period 1983 to 1988 were 6.9 percent, reaching $268 million in 1988. Over the next two years exports declined, reaching $234 million (constant 1988 dollars) in 1990. In 1990, some 74 percent of these exports went to the United States and 8 percent went to the European Community (EC). Most of the remaining 18 percent went to newly industrialized countries (NICs).

Imports of wire and cable are largely of types not made in Canada, such as new products required in volumes too small to justify either purchasing the production equipment needed or developing new process technology in Canada. Imports accounted for 16.6 percent of the Canadian market in 1990, with some 87 percent of them coming from the United States.

Worldwide, the industry is generally oriented toward domestic markets. The relatively low ratio of value to weight of many wire and cable products makes transportation expensive and tends to keep production facilities close to major markets.

The three main market segments of the electrical wire and cable industry are the construction industry, the electrical utilities and the telecommunications utilities. Each segment has specific product requirements. In 1989, the construction industry purchased mainly electrical building wire and construction cables, representing some 42 percent of the Canadian market. This figure was about 10 percent higher than its historical share because of the peak in residential and industrial construction. Electrical utilities purchase conductors for overhead transmission and distribution lines as well as for high-voltage power cables. In Canada, they made up about 36 percent of the Canadian market in 1989. The telecommunications portion accounted for about 22 percent of the Canadian market and is the key purchaser of telephone cables, coaxial cables and optical fibre cables.

The table below shows Canadian electrical wire and cable establishments, employment, value-added, shipments, and shipments per employee by firm size as of 1986, the latest year for which all such data are available from Statistics Canada. The data indicate that medium-sized plants were the most productive in 1986. This condition is an initial result of a trend in the industry toward increasing automation. By 1989, larger shares of establishments and employment were concentrated in the middle range as well as the 200 to 499 employment group.

The five largest firms in the industry operated 31 manufacturing plants across the country in 1989, and the remaining 33 plants were individually owned by different firms. About 58 percent of the plants are located in Ontario, with another

Establishment Size, 1986

	Number of employees per establishment		
	Fewer than 50	50 to 199	200 and over
Establishments (% of total)	35	50	15
Employment (% of total)	5	40	55
Value-added (% of total)	5	51	44
Shipments (% of total)	4	51	45
Shipments per employee ($ thousands)	131.5	205.5	135.3

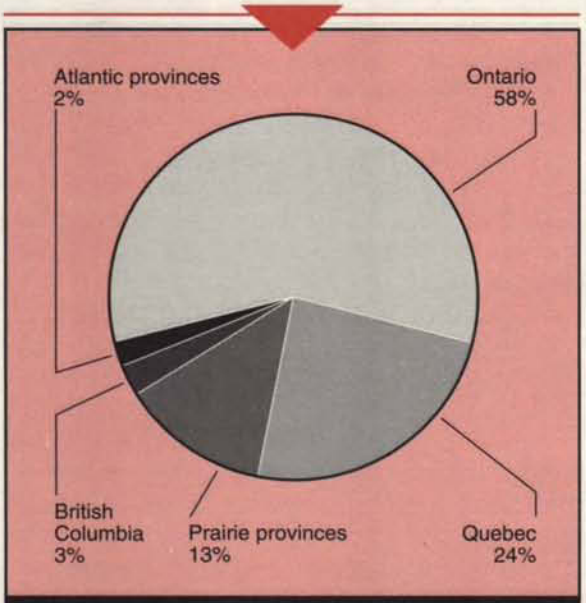

Figure 2 — Regional Distribution of Establishments (average for 1986 to 1988)

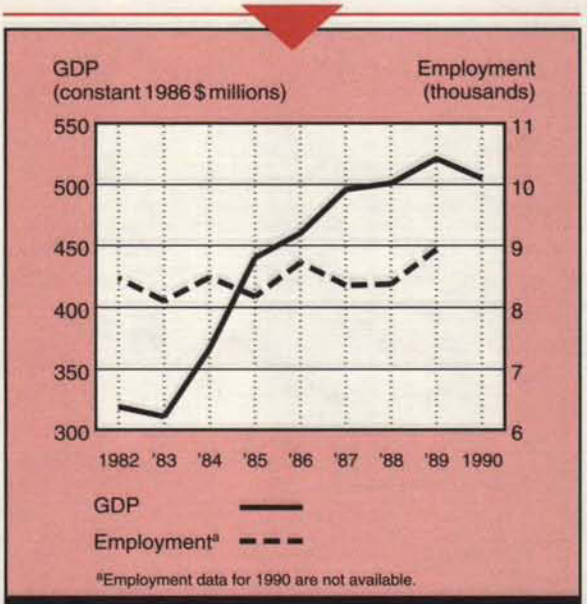

Figure 3 — Gross Domestic Product and Employment

24 percent found in Quebec and most of the remainder in the western provinces (Figure 2). Much of this geographic dispersion is the result of local preference procurement policies of the provincially controlled electrical and telecommunications utilities, which seek to satisfy their needs by encouraging producers to set up plants nearby.

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, Alcatel Canada Wire (formerly Canada Wire and Cable), produces a full range of products that constitute about one-third of the industry's output. It was wholly owned by Noranda and provided a market channel for much of the copper produced by Noranda. In 1991, it was sold to the French arm of Alcatel Cables S.A. The second largest firm, Phillips Cables, also produces a wide range of products. Northern Telecom (a Canadian-owned firm controlled by Bell Canada Enterprises), dominates the communications cable segment of the market.

Some of the remaining companies are subsidiaries of foreign firms. They were originally established in Canada to serve the domestic market and to benefit from the then-existing Commonwealth tariff preferences, which provided relief from relatively high tariffs in Commonwealth countries. 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 that give preference to supplies originating from a Canadian plant, for example, through tied-aid financing or the involvement of a Canadian project consultant who would tend to draft specifications on the basis of Canadian standards.

Performance

The electrical wire and cable market tends to be cyclical, reflecting the volatile performance of the construction industry and major utility projects. In real terms, as measured by gross domestic product (GDP) for the industry, which essentially measures Canadian value-added, average growth in output was 10 percent from 1983 to 1988, during the rise in the business cycle. Industry GDP peaked at $521 million in 1989 before decreasing to $505 million in 1990 (Figure 3). Coincident with the growth in GDP, real value shipped grew at the rate of 7 percent from 1983 to 1988. This growth was driven by rising demand in both foreign and domestic markets, with exports growing at average annual rates of 6.9 percent and the domestic market at 5.9 percent. Over the same period, imports fluctuated, but were slightly higher in 1988 than in 1983.

The year 1988 marked the peak of Canadian shipments and the Canadian market. By 1990, prices began to decline so that real shipments, real exports, real imports and the Canadian market rose while actual dollar values fell relative to 1989 levels.

Employment from 1983 to 1988 grew from 8 100 people to almost 8 400 (Figure 3), but GDP grew at a faster rate. Slower growth in employment than in GDP reflects productivity gains between 1983 and 1988. Some expansion in employment occurred during 1989 as a result of the construction boom.

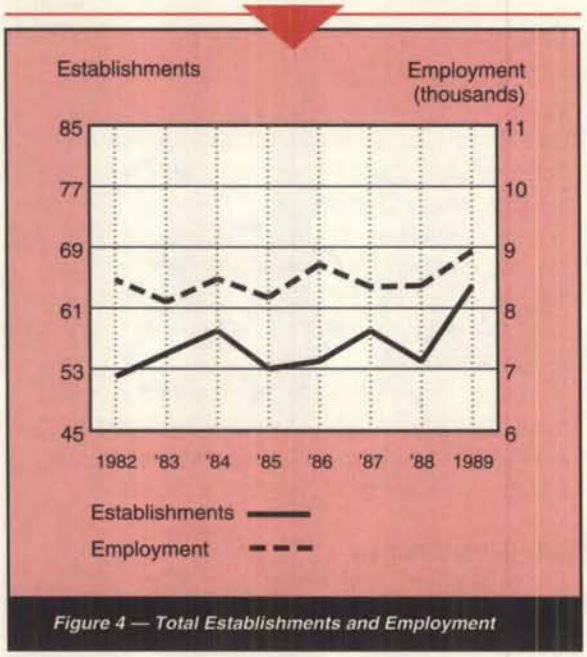

Figure 4 — Total Establishments and Employment

The number of establishments in the industry has grown from 55 in 1983 to 64 in 1989 both because of provincial procurement pressures and because of the establishment of specialized product plants (Figure 4). The Canadian reinvestment rate for the industry averages between 4 and 5 percent of the value of shipments. In 1987, the comparable figure for the U.S. electrical wire and cable industry was 2.25 percent. Industry profitability has been cyclical, ranging from 5.3 percent of shipments in 1973 to a loss of 0.7 percent in 1983, recovering to 4.3 percent in 1989. International trade has remained essentially in balance over the past several years, although imports and exports have both grown.

Strengths and Weaknesses

Structural Factors

The key factors affecting competitiveness in the industry are transportation costs, market fragmentation and the degree of product specialization, the level of production automation, efficiency and material costs. Material costs vary considerably over time but all producers are similarly affected, as they all purchase their materials on the open market. 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 manufacturing, tend to be continuous operations. Wire and cable manufacturing is therefore more easily automated than operations that process goods in batches.

Products manufactured in high volume, such as building wire and construction cables, represent mature technology that is generally material-intensive. Consequently, they tend to be produced close to their markets in order to keep transportation costs as low as possible. This sensitivity to transportation costs gives domestic manufacturers a degree of protection from foreign competition. Products that embody higher-technology processes, such as telecommunications cables and high-voltage power cables, are able to support greater transportation costs and hence are exported to more distant markets in developing countries. However, the transportation cost for imports continues to afford protection to Canadian producers.

The greatest current structural weakness of this industry in Canada is its geographic fragmentation. To a very large extent, the multiplant structure of the industry has been induced by the procurement practices of provincial governments for their electrical and telecommunications utilities. While this approach has provided several of the wire and cable suppliers with an assured local market and a product mix sufficiently flexible to withstand cyclical fluctuations in demand, it has resulted in suboptimal 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 Intergovernmental Agreement on Government Procurement should help alleviate some of this difficulty.

The level of production technology used by the Canadian-owned industry is generally comparable with that of its major competitors abroad. The range of products required by the Canadian market is much the same as that required in foreign markets, but specifications vary somewhat. Local specifications, in addition to the high shipping costs from abroad, restrict imports to relatively low levels. The industry in Canada puts an emphasis on product design and the adoption of new manufacturing processes. Both Canadian-owned and foreign-controlled firms undertake development programs that allow the use of improved insulation materials and the reduction of production costs. Larger firms are automating their production processes where volume supports such activity.

The development of fibre optics technology for application in telecommunications markets represents both a major potential opportunity and a significant challenge to traditional wire and cable manufacturers. Optical fibre cables have a much higher information-carrying capacity and allow greater ease of installation. 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. counterparts, because Canadian communications utilities are rapidly embracing this new technology and are providing the needed market base to support development.

A comparison of the Canadian electrical wire and cable industry with those of selected other countries shows the Canadian firms to be in the middle range of efficiency according to a number of criteria (for statistical analysis, see the Appendix on page 12). The average annual output per production establishment in Canada was $26.4 million in 1986, compared with $26.3 million in the United States. This value is somewhat lower than that in Sweden and considerably lower than that in other countries such as France, the Republic of Korea and Chile. However, it compares favourably with the Japanese value of $26.9 million in 1987.

Electrical wire and cable manufacturing plants in Canada averaged 161 employees in 1986. The comparable U.S. figure was 123, but Japan averaged only 108 employees per plant in 1987. Plants in other countries generally had well over 200 employees.

The average output per employee in Canada in 1986 was $162 500. The comparable U.S. figure was $213 300, and the corresponding figure for Japan in 1987 was $248 500. The Canadian figures compare favourably with corresponding figures from most other countries listed in the Appendix. The output per employee in Canada and the United States in 1984 was $145 000 and $176 800, respectively.

The labour cost per production worker-hour in Canada in 1986 was marginally less than that in the United States and considerably less than that in Sweden. The average labour cost per production worker-hour increased to $13.89 in the United States and to $13.25 in Canada in 1986 from $12.36 in both countries in 1984. The value-added per production worker-hour in Canada in 1986 was $37.51, essentially the same as the $37.68 achieved two years earlier. During the same period, the U.S. figure increased from $43.72 to $51.15. Although there have been some productivity increases in the Canadian industry, it has greatly lagged behind increases during the same period in the United States. However, based on output per production worker, Canadian producers were more efficient than those in NICs such as Chile, the Republic of Korea and Mexico during the late 1980s.

Although the average annual output for each electrical wire and cable establishment in Canada is close to that of its U.S. and Japanese counterparts, the product range is much broader. This situation contributes to the lower Canadian productivity. Moreover, the high fixed costs of Canadian wire and cable production make profitability sensitive to capacity/use levels of plants, particularly those manufacturing more mature, narrow-margin products. To achieve adequate profitability, plants must maintain longer production runs. American and Japanese plants have a narrower product range and longer production runs that can justify more specialized and efficient machinery. Consequently, they experience less time lost to production line change-overs.

These comparisons show that Canadian electrical wire and cable producers are not the most efficient in the international scene, but are far from being the least efficient. They also show that the so-called low-wage NICs are not really the threat they are often perceived to be.

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

Trade-Related Factors

The Canadian tariff for insulated copper wire and cable from countries having Most Favoured Nation (MFN) status with Canada is 10.2 percent. Under terms of the Canada-U.S. Free Trade Agreement (FTA), which was implemented on 1 January 1989, the tariff rates for electrical wire and cable and optical fibre cable products traded between Canada and the United States are being gradually eliminated in 10 annual, equal steps. In 1992, the Canadian tariff on U.S. insulated copper wire and cable was 6.1 percent. The Canadian General Preferential Tariff applicable to wire and cable from NICs is 6.5 percent, while that on bare aluminum cables is the same as that for insulated copper cables (10.2 percent). In addition, there exist a few duty-free, end-use classifications for insulated wire and cable products.

Tariffs on electrical wire and cable products entering the U.S. market were 3.2 percent in 1992 for Canadian products under the FTA, whereas the MFN rate is 5.3 percent. Under the U.S. Generalized System of Preferences for developing nations, however, these products generally enter tariff-free. Optical fibre cable entering the United States attracted a rate of 5.0 percent in 1992 if it originated from Canada and 8.4 percent if coming from MFN countries.

Tariffs on bare and insulated electrical wire and cable products entering the EC countries are 6.5 percent. The EC tariff on optical fibre cables is 8 percent and that on bare aluminum wire and cable products is 7 percent.

The Japanese duty on imports of bare and insulated electrical copper wire and cable is formally agreed upon under the General Agreement on Tariffs and Trade (GATT) not to exceed an MFN rate fixed or "bound" at 7.2 percent. However, Japan is currently imposing a temporary unbound rate of 5.8 percent, applicable to the landed value of the goods, including cost, insurance and freight (c.i.f.) charges. Japan's bound duty rate

for bare aluminum wire and cable is 7.9 percent, while the temporary rate being applied is 6.3 percent on the c.i.f. value. The optical fibre cable tariff is bound at 3.9 percent but is admitted duty-free.

Electrical wire and cable products entering Canada must meet the electrical safety requirements established by the Canadian Standards Association (CSA). Similarly, other countries have national standards for their wire and cable products. For example, the International Organization for Standardization's ISO 9000 standards are currently being adopted by the EC and considered by other non-EC members. These standards tend to be impediments for Canadian exporters, particularly in Europe and Japan, where they are used effectively to close the markets to foreign suppliers. The CSA is working with standards bodies in other countries, particularly the United States, to overcome these differences. Efforts are being made to harmonize technical and safety 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 (NTBs) into the U.S. market are the federal "Buy America" provisions and similar purchasing preferences legislated in some of the states. In some areas where labour unions are militant, they pose an informal barrier in that their members frequently refuse to handle foreign or non-union-produced goods.

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. For example, Brazil charges 10 percent ad valorem on aluminum cable that is steel reinforced (ACSR), and Indonesia assesses 30 percent ad valorem plus value-added tax (VAT) surcharges on insulated wire and cable products. In addition, rather effective NTBs such as import licensing and foreign-exchange controls are often used to restrict imports. The most effective access to these markets is through joint-venture manufacturing relationships.

Currently, the greatest overall impediment to sales of Canadian wire and cable products, particularly to developing countries, is the lack of sufficient *crédit mixte* (combining internationally agreed financing rates with government subsidized rates) financing that is competitive with the support available to wire and cable manufacturers in several other developed countries. This has forced Canadian exporters to focus their international marketing efforts on countries where potential customers are able to earn hard currency directly, such as oil-exporting companies, or on NICs, where there are no shortages of hard currency and no NTBs due to differing standards or preferences given to local manufacturers. Following these criteria, Canadian wire and cable producers have enjoyed some moderate success in Middle Eastern markets.

Another factor is the hesitancy of the Export Development Corporation (EDC) to consider wire and cable products as capital goods for financing purposes unless they are part of a larger equipment package. The EDC considers telephone cables as intermediate products, which are generally supported with financing for only two or three years.

Whereas the FTA provides for tariff elimination for most products in 10 annual, equal steps, it also allows an FTA review panel to hear requests for accelerated tariff reduction. Consideration of these requests must involve taking account of all input materials, which make up about 70 percent of the cost of production, to ensure that they receive the same or more rapid tariff reductions. Otherwise, Canadian producers would be placed at a disadvantage with respect to foreign suppliers in the Canadian market. If this condition can be met, some acceleration of the 10-step elimination might be accepted. However, an immediate move to a zero tariff could not be considered, because major adjustments such as more specialized tooling and equipment are needed and putting them in place would take at least a few years.

Technological Factors

The technology in the electrical wire and cable industry generally is mature, so 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 optical fibres, which conduct pulses of light to transmit telecommunications signals. This technology is expected eventually to 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. However, given the relatively small domestic market in Canada, firms concentrating on the Canadian market have difficulty in undertaking development programs on their own; because the resulting products are likely to be sold to a smaller market base, each unit produced must carry a larger portion of the development cost.

The industry routinely uses wire-drawing and annealing facilities, stranding machines and continuous plastic or rubber extrusion machines. For the higher-technology products of the industry, paper tape winding machines and sophisticated test equipment are also used. Much of the machinery is robust and is designed to produce high volumes of product. Because of

the specialized nature of the machinery employed and because of the limited domestic market, companies are cautious about moving into new product areas.

Other Factors

On average, about 30 percent of the value of shipments of wire and cable products is added through production processes in the plant. The remainder of the production cost is the value of materials used. For the most part, these materials are internationally priced commodities, although the higher volume of purchases made by some larger international competitors can command lower material prices. Canadian prices to domestic users are often at the international price plus Canadian tariff for materials produced in Canada that are sold internationally.

There is a growing shortage of engineering graduates with knowledge applicable to the electrical wire and cable industry. The work force shortfall is expected to worsen over the next several years as many of the technical experts now in the industry reach retirement age.

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 NTBs. However, shipments to the United States, which accounted for about 80 percent or more of total wire and cable exports during the mid- to late 1980s, are likely to resume this level of importance under the current trading environment. The most promising avenue for growth over the longer term is likely to be exports to NICs, both through direct sales of higher-technology products from Canada and through joint-venture manufacturing of lower-technology products in these countries.

Electrical utilities are expected to grow slowly for most of the next decade as conservation programs and other energy-saving strategies continue to be implemented. Construction, particularly residential housing, is currently in a slump and its future performance will depend on the rate of recovery of industrial and residential construction activity, which in turn is closely tied to the performance of Canadian interest rates and consumer confidence. In the telecommunications industry, the use of copper-based cable is projected to grow at 2 percent annually, while the use of optical fibre-based cables is expected to grow at 15 percent or more per year over the next several years. This projection is not encouraging for producers of copper-based communications cables. Because these cables constitute only 22 percent of shipments and because their copper content is lower than that in most other types of cable, the loss of this portion of their market would not be of major importance for producers of raw copper.

Electrical-energy wire and cable, which constitutes 78 percent of the market, will remain unaffected by the new optical fibre technology, as glass fibres cannot transmit electrical energy. However, the energy wire and cable portion could be seriously affected in the longer term if current research efforts to produce practical high-temperature superconducting materials are successful. Research in the United States and Japan is still at the basic developmental stage. One Canadian group is known to be working in this field, although Canadian efforts are largely of a technology-monitoring nature. Present indications are that the widespread, practical use of superconductive materials will not occur before the end of the century.

Mounting concerns for environmental protection by consumers in both Canada and the United States may force changes in product and process technologies. A specific example is the growing pressure in the United States to limit the lead content of wire and cable insulants, which poses a threat to the environment when copper is recovered from used wire and cable by burning the insulation. In general, the "cleaner" industrial processes are the more electrically intensive. Thus, environmentalist pressures could serve indirectly to enlarge the electrical wire and cable market in the longer term. Similarly, the introduction and the widespread use of the electric automobile would have a favourable impact on the wire and cable market.

The removal of tariffs in 10 annual, equal steps 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 will thereby significantly reduce the range of products they manufacture. It will also force price reductions and drive unused capacity out of the Canadian wire and cable industry. There could be a rationalization of manufacturing operations, despite the fragmenting influence of the buying practices of provincial utilities. 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 losses of regional markets are likely to 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 utility buyers in both countries for locally manufactured goods will remain. These NTBs will tend to limit market penetration.

In the longer term, there will probably 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 are supplied by their parents. However, sudden changes in the level of trade in industry products between the two countries are not expected, although some predatory pricing practices could develop in copper communications cables as the new optical fibre technology renders much of the copper-based cable manufacturing capacity surplus.

On 12 August 1992, Canada, Mexico and the United States completed the negotiation of a North American Free Trade Agreement (NAFTA). The Agreement, when ratified by each country, will come into force on 1 January 1994. The NAFTA will phase out tariffs on virtually all Canadian exports to Mexico over 10 years, with a small number being eliminated over 15 years. The NAFTA will also eliminate most Mexican import licensing requirements and open up major government procurement opportunities in Mexico. It will also streamline customs procedures, and make them more certain and less subject to unilateral interpretation. Further, it will liberalize Mexico's investment policies, thus providing opportunities for Canadian investors.

Additional clauses in the NAFTA will liberalize trade in a number of areas including land transportation and other service sectors. The NAFTA is the first trade agreement to contain provisions for the protection of intellectual property rights. The NAFTA also clarifies North American content rules and obliges U.S. and Canadian energy regulators to avoid disruption of contractual arrangements. It improves the dispute settlement mechanisms contained in the FTA and reduces the scope for using standards as barriers to trade. The NAFTA extends Canada's duty drawback provisions for two years, beyond the elimination provided for in the FTA, to 1996 and then replaces duty drawback with a permanent duty refund system.

Competitiveness Assessment

The lower-technology products of the industry, such as building wire, are not fully competitive internationally but continue to be produced in Canada because of the protection afforded by high transportation costs, Canadian tariffs and differing standards. 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 United States and Middle Eastern markets. The larger Canadian manufacturers of electrical wire and cable have been investing heavily in process automation and now consider themselves to be comparable with their most efficient U.S. competitors in products manufactured in these upgraded plants. 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 industry relative to its foreign competitors.

The gradual reduction of tariffs between Canada and the United States under the FTA is providing a challenge and an opportunity for the industry.

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

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PRINCIPAL STATISTICS[a]

	1973[b]	1982	1983	1984	1985	1986	1987	1988	1989	1990
Establishments	35	52	55	58	53	54	58	54	64	N/A
Employment	9 830	8 466	8 101	8 480	8 171	8 718	8 350	8 371	8 936	N/A
Shipments										
($ millions)	527	1 117	1 031	1 230	1 375	1 426	1 607	1 949	2 170	1 795
(constant 1988 $ millions)	1 618	1 499	1 364	1 559	1 770	1 792	1 914	1 949	1 833	1 837
GDP[c] (constant 1986 $ millions)	462	319	311	367	440	460	496	501	521	505
Investment[d] ($ millions)	26.2	87.6	72.1	68.5	36.6	64.8	51.4	54.5	84.4	80.4
Profits after tax[e]										
($ millions)	28.0	6.4	-7.6	-0.4	9.8	2.6	41.8	71.4	94.6	N/A
(% of shipments)	5.3	0.6	-0.7	–	0.7	0.2	2.6	3.7	4.3	N/A

[a]For establishments, employment and shipments, see *Electrical and Electronic Products Industries*, Statistics Canada Catalogue No. 43-250, annual (SIC 3381, communications and energy wire and cable industry).

[b]Data for this year are not strictly comparable with data for other years shown, due to changes in the definition of the industries that were introduced in the revised edition of *Standard Industrial Classification, 1980*, Statistics Canada Catalogue No. 12-501.

[c]See *Gross Domestic Product by Industry*, Statistics Canada Catalogue No. 15-001, monthly.

[d]See *Capital and Repair Expenditures, Manufacturing Subindustries, Intentions*, Statistics Canada Catalogue No. 61-214, annual.

[e]ISTC estimates.

N/A: not available

TRADE STATISTICS

	1973[a]	1982	1983	1984	1985	1986	1987	1988[d]	1989[d]	1990[d]
Exports[b]										
($ millions)	28	105	119	162	169	159	162	268	237	229
(constant 1988 $ millions)	86	141	158	205	217	200	192	268	200	234
Domestic shipments										
($ millions)	499	1 012	912	1 068	1 206	1 267	1 445	1 681	1 933	1 566
(constant 1988 $ millions)	1 532	1 358	1 206	1 354	1 553	1 592	1 722	1 681	1 633	1 603
Imports[c]										
($ millions)	31	170	202	191	156	168	184	273	315	312
(constant 1988 $ millions)	95	228	267	243	200	211	220	273	266	319
Canadian market										
($ millions)	530	1 182	1 114	1 259	1 362	1 435	1 629	1 954	2 248	1 878
(constant 1988 $ millions)	1 627	1 586	1 473	1 597	1 753	1 803	1 942	1 954	1 899	1 922

[a]Data for this year are not strictly comparable with data for other years shown, due to changes in the definition of the industries that were introduced in the revised edition of *Standard Industrial Classification, 1980*, Statistics Canada Catalogue No. 12-501.

[b]See *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

[c]See *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

[d]It is important to note that data for 1988 and after are based on the Harmonized Commodity Description and Coding System (HS). Prior to 1988, the shipments, exports and imports data were classified using the Industrial Commodity Classification (ICC), the Export Commodity Classification (XCC) and the Canadian International Trade Classification (CITC), respectively. Although the data are shown as a continuous historical series, users are reminded that HS and previous classifications are not fully compatible. Therefore, changes in the levels for 1988 and after reflect not only changes in shipment, export and import trends, but also changes in the classification systems. It is impossible to assess with any degree of precision the respective contribution of each of these two factors to the total reported changes in these levels.

SOURCES OF IMPORTS[a] (% of total value)

	1982	1983	1984	1985	1986	1987	1988[b]	1989[b]	1990[b]
United States	55	50	68	94	91	90	88	85	87
European Community	27	14	19	2	4	5	6	6	5
Asia	1	1	1	3	3	3	3	5	5
Other	17	35	12	1	2	2	3	4	3

[a]See *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

[b]Although the data are shown as a continuous historical series, users are reminded that HS and previous classifications are not fully compatible. Therefore, changes in the levels for 1988 and after reflect not only changes in import trends, but also changes in the classification systems.

DESTINATIONS OF EXPORTS[a] (% of total value)

	1982	1983	1984	1985	1986	1987	1988[b]	1989[b]	1990[b]
United States	53	72	73	80	84	82	86	79	74
European Community	1	1	1	1	1	1	3	6	8
Asia	4	1	2	4	4	2	2	4	8
Other	42	26	24	15	11	15	9	11	10

[a]See *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

[b]Although the data are shown as a continuous historical series, users are reminded that HS and previous classifications are not fully compatible. Therefore, changes in the levels for 1988 and after reflect not only changes in export trends, but also changes in the classification systems.

REGIONAL DISTRIBUTION[a] (average over the period 1986 to 1988)

	Atlantic	Quebec	Ontario	Prairies	British Columbia
Establishments (% of total)	2	24	58	13	3
Employment (% of total)	X	30	56	X	X
Shipments (% of total)	X	26	60	X	X

[a]See *Electrical and Electronic Products Industries*, Statistics Canada Catalogue No. 43-250, annual.

X: confidential

MAJOR FIRMS

Name	Country of ownership	Location of major plants
Alcatel Canada Wire Inc.	France	Fergus, Ontario Toronto, Ontario Winnipeg, Manitoba
Northern Telecom Canada Limited	Canada	Lachine, Quebec Saskatoon, Saskatchewan Kingston, Ontario
Phillips Cables Limited	United Kingdom	Dartmouth, Nova Scotia Saint-Jérôme, Quebec Brockville, Ontario Moose Jaw, Saskatchewan Vancouver, British Columbia
Pirelli Cables Inc.	Switzerland/Italy	Saint-Jean-sur-Richelieu, Quebec Guelph, Ontario Surrey, British Columbia

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APPENDIX — ELECTRICAL WIRE AND CABLE MANUFACTURE, SELECTED COUNTRIES[a]

	Canada		United States		Sweden	France	Japan	Korea	Chile	Mexico
	1986	1987	1986	1987	1986	1989	1987	1986	1989	1989
Output per plant ($ millions)	26.4	29.3	26.3	29.5	31.0	45.0	26.9	38.1	37.5	17.2
Total workers per plant	161	144	123	133	270	232	108	270	233	295
Production workers per plant	111	N/A	92	99	146	134	59	220	187	148
Output per employee ($ thousands)	162.5	203.7	213.3	221.2	114.8	193.9	248.5	141.2	160.7	58.1
Cost per production worker-hour ($)	13.25	N/A	13.89	13.50	20.37	N/A	14.25	5.06[b]	2.52[b]	6.04[b]
Value-added per production worker-hour ($)	37.51	N/A	51.15	56.54	51.40	N/A	N/A	N/A	N/A	N/A
Output per production worker ($ thousands)	237.8	N/A	285.9	296.6	212.3	335.5	454.5	173.3	200.9	116.1
Value-added per dollar of production labour ($)	2.83	N/A	3.68	4.19	2.52	N/A	N/A	N/A	N/A	N/A
New investment per dollar of output ($)	0.045	0.0302	0.024	0.0225	N/A	0.065	N/A	N/A	N/A	N/A

[a]All monetary values are expressed in Canadian dollars or equivalent. Conversions from foreign currency values were made using Bank of Canada annual average rates. Many of these statistics come from the trade sections of Canadian embassies abroad.

[b]ISTC estimates.

N/A: not available

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