

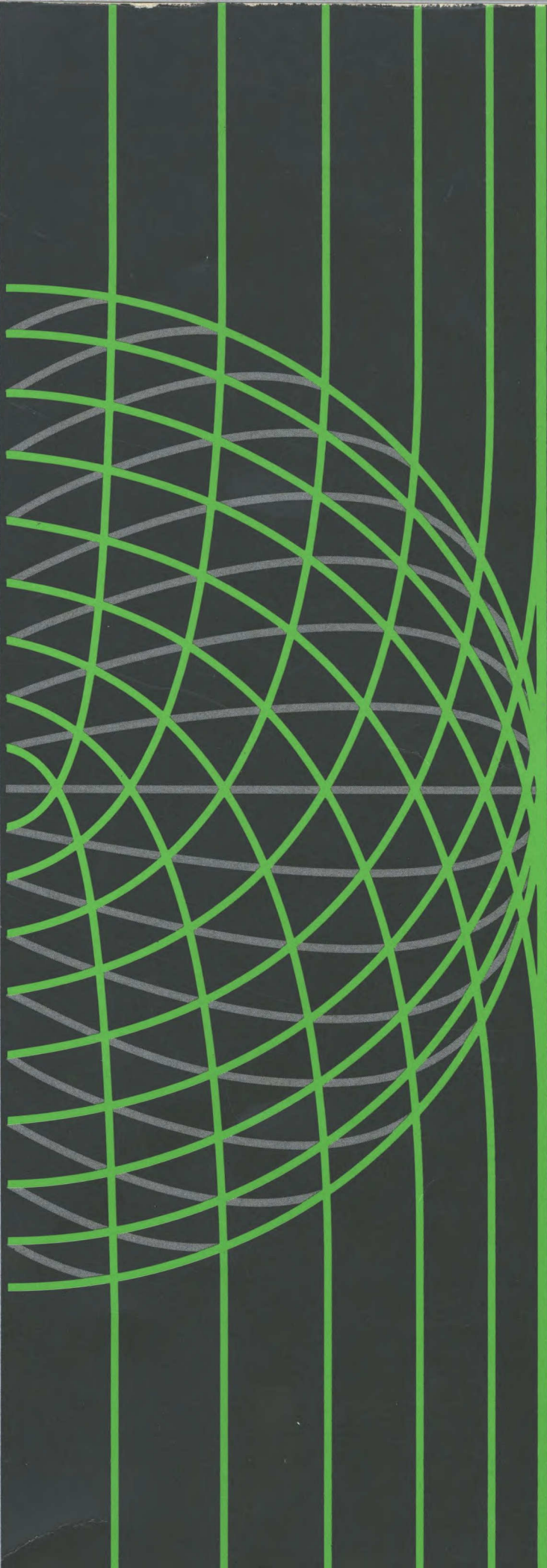
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Wood-Based Panel Products

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WOOD-BASED PANEL PRODUCTS

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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 forest products sector is a major component of the Canadian economy. In 1991, the Canadian forest products sector had shipments totalling \$32.5 billion in current dollars, excluding \$2.3 billion shipped from lumber companies to pulp and paper manufacturers and market pulp shipped to the Canadian paper manufacturers. Exports were \$20 billion, of which 65 percent went to the United States. While the total annual shipments are exceeded by the transportation (automobile) industry and the food industry, the forest products sector is the greatest net contributor to Canada's trade balance at \$17 billion.

The forest products sector is of crucial economic importance to all regions of the country and is most prominent in British Columbia where it accounts for 45 percent of manufacturing shipments. Single-industry communities across the country depend on it for their economic well-being. It provides

direct employment for almost 250 000 people, including over 40 000 people in logging activities.

The forest products sector is composed of two major industry groups: paper and allied products industries, and (solid) wood industries. The paper and allied products industries account for approximately 62.2 percent of the value of total shipments and employ approximately 130 000 people inclusive of those in related logging operations. This group is made up of two distinct segments: firms producing pulp and paper (market pulp, newsprint, fine papers, paperboard and tissue) and those making converted or value-added paper products (packaging, business forms, stationery and other consumer paper products).

Wood industries account for 37.8 percent of the value of total shipments and employ approximately 120 000 people inclusive of those in related operations. This group consists of two segments: firms making commodity products (lumber,



plywood, shakes and shingles, veneer, particleboard, medium-density fibreboard and oriented strandboard (OSB)/waferboard), and those manufacturing value-added wood products (manufactured housing, doors, windows, kitchen cabinets, hardwood flooring, pallets and millwork).

Related profiles dealing with *Pulp and Paper Equipment* and *Forestry Equipment* as well as the following lumber and allied lumber products industries are available:

- *Lumber*
- *Value-Added Wood Products*
- *Wood-Based Panel Products*
- *Wood Shakes and Shingles*

Structure and Performance

Structure

Wood-based panels are made from a variety of wood products and by-products bonded together with a resin or glue. They generally come in standard dimensions and are used in building construction as well as furniture and cabinet making.

There are two major types. Structural wood-based panels are manufactured with waterproof adhesives, which make them suitable for exterior end uses in construction, where strength is an important characteristic. These products include softwood plywood and OSB/ waferboard. Softwood veneers are intermediate products used in the manufacture of softwood plywood.

Most non-structural wood-based panels are bonded with a non-waterproof type of bonding agent and consequently are suited for use only in interior or protected applications. Such products include hardwood plywood and hardwood veneer, particleboard, medium-density fibreboard (MDF), hardboard and insulation board. Hardboard siding, however, is manufactured with an adhesive suitable for exterior use. Most hardwood veneers are used in the manufacture of hardware plywood, but many are used for decorative purposes. The relative importance of the various wood-based panel products is provided in Table 1.

In 1991, the wood-based panel products industry comprised an estimated 114 plants and employed about 13 500 people directly. There are many additional jobs in related forest harvesting operations and service industries.

In 1991, shipments of wood-based panel products were valued at \$1 460 million (Figure 1). About 65 percent of shipments of wood-based panel products were consumed domestically. Exports of wood-based panels in 1991 were valued at \$512 million or 35 percent of the value of Canadian

Table 1 — Contribution of Major Products, 1991

(\$ millions)

	Shipments ^a	Exports ^b	Imports ^c	Employment ^d
Softwood plywood/veneer	500	89	44	5 000
Hardwood plywood/veneer	341	167	86	3 600
OSB/waferboard	245	139	7	1 800
Particleboard	259	60	29	2 100
Fibreboard ^e	115	57	58	1 000
Total	1 460	512	224	13 500

^aSee *CANSIM, Canadian Socio-economic Information Management System, mini base series directory*, Statistics Canada Catalogue No. 12-569.

^bSee *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

^cSee *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

^dISTC estimates.

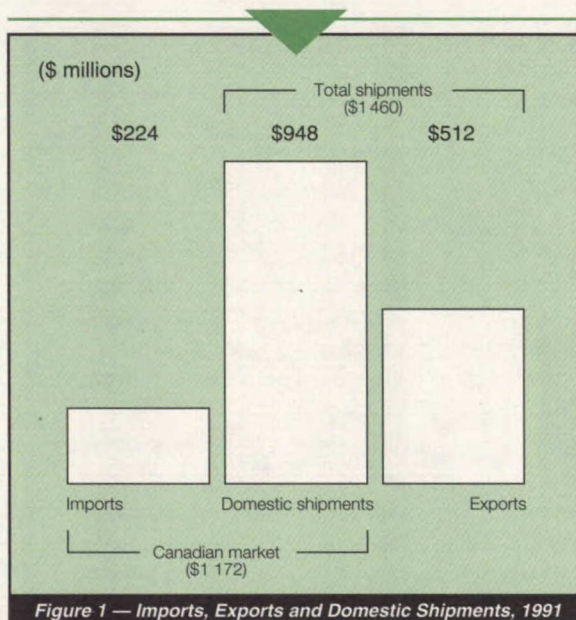
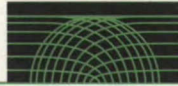
^eData include hardboard, medium-density fibreboard and insulation board.

wood-based panel product shipments. Major markets were the United States, the European Community (EC) and Asia.

Imports in 1991 totalled \$224 million. Imports have traditionally represented less than 20 percent of the Canadian market and have principally involved non-structural panel products. Imported panel products are manufactured mainly from wood species neither widely available in nor indigenous to Canada. In 1991, the major imported product was hardwood plywood/veneer, which represented almost 38 percent of the volume of all imports of wood-based panels. Except during times of production curtailments in Canada, softwood plywood has not been imported to any significant degree.

About 65 percent of the structural wood-based panel products subsector is Canadian-owned, with most of the remaining 35 percent being controlled by U.S., New Zealand and Japanese firms. In the non-structural subsector, foreign ownership is widespread among particleboard and MDF mills, with 45 percent of capacity being controlled by German and U.S. interests. In the other product areas, including hardwood plywood/veneer and insulation board, Canadian ownership predominates.

The distribution of wood-based panel products in the domestic market is carried out by large, integrated distribution organizations (some owned by producers), independent wholesalers, national chains and independent local building



supply centres. Softwood plywood is marketed in offshore countries by relatively few exporters based mainly in British Columbia. In the United States, Canadian OSB/waferboard is distributed by a network similar to the one in Canada, comprising integrated distributors and national and local wholesalers, some of which are owned by U.S. producers. In addition, at least one integrated Canadian producer has established a U.S. distribution system to market its full range of wood-based products.

The capacity of the Canadian structural panel industry in 1992 is estimated at 5.3 billion square feet on a 3/8-inch basis (4.7 million cubic metres). By comparison, the non-structural subsector capacity is estimated at 3 billion square feet on a 3/8-inch basis (2.7 million cubic metres). According to the Food and Agriculture Organization of the United Nations, Canadian production of wood-based panel products represented about 5 percent of world production in 1988.

Table 2 shows the distribution of the 114 plants in the industry across Canada in 1991 according to the principal product made. Some 50 percent of total industry capacity is owned by large, integrated, forest product companies. The balance, including many small establishments, are owned privately or by worker co-operatives. As well, provincial governments participate in the ownership of several plants.

Structural Wood-Based Panels

The softwood plywood segment of the industry is based on two major, relatively slow-growing species groups: Douglas fir, found mainly in the southwestern part of British

Table 2 — Distribution of Plants, 1991^a

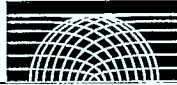
	Atlantic	Quebec	Ontario	Prairies	British Columbia
Softwood plywood/veneer	1	—	—	4	25
OSB/waferboard	1	5	3	4	1
Hardwood plywood/veneer	2	24	18	—	—
Particleboard	1	4	6	1	3
MDF	1	1	—	1	—
Hardboard	1	—	—	—	1
Insulation board	—	4	1	1	—
Total	7	38	28	11	30

^aISTC estimates.

Columbia, and spruce, pine and fir, which grow throughout the rest of Canada. Because of competition for these trees from the softwood lumber industry and the long time they need to reach a suitable harvesting size, the traditional resource in terms of log size has been declining. Nevertheless, an adequate supply of quality logs should continue to be available to most producers over the medium to long term. OSB/waferboard is based almost entirely on rapidly growing and self-propagating aspen, which is found in a wide belt across the country and which is currently underutilized. However, the aspen resource is becoming a major source of raw material for pulpmill capacity expansion in Western Canada.

Softwood plywood mills manufacture plywood from veneer they produce or purchase from specialized veneer manufacturers. Veneer sheets, produced on rotary lathes from high-quality logs, are trimmed to remove waste, dried, treated with a waterproof glue and compressed together in several layers under high pressure in multi-opening hot presses. Plywood is usually manufactured in 4 x 8-foot panels (1.22 x 2.44 metres), although some mills produce other sizes for special uses. Standard thicknesses, from 6 to 32 millimetres, are produced, although other sizes are also available by special order.

OSB/waferboard is produced in specialized mills that process roundwood logs into rectangular strands or flakes. After flaking and drying, the strands are blended with a thermosetting resin and wax and then are deposited on continuously moving belts. Most mills orient strands in different directions throughout the mat to generate desired physical properties



in the final product. The mat is pressed under heat into large panels, which are usually cut to 4 x 8-foot (1.22 x 2.44 metres) sheets, although other sizes are also available. A variety of thicknesses are available from 6 to 32 millimetres.

Softwood plywood and OSB/waferboard compete for many but not all end uses and are generally sold in standard-sized panels used primarily for construction, packaging and industrial applications. Softwood plywood, including upgraded specialty products such as overlaid concrete-form plywood, is used extensively in engineered structures as well as in industrial and packaging applications in domestic and offshore markets. Although OSB/waferboard is used predominantly in the residential and commercial construction sectors in both Canada and the United States, increasing volumes are being utilized for industrial uses. At present, limited volumes of OSB/waferboard are exported offshore and very little of the Canadian product is upgraded other than by some mills that provide a cut-to-size service.

Non-Structural Wood-Based Panels

The non-structural wood-based panel products sub-sector depends primarily on a renewable raw material supply obtained from two major sources: roundwood logs and residues. Residues are principally sawmill by-products, such as planer mill shavings, wood chips and sawdust, but small quantities of newsprint, paper and wood fibre from municipal recycling programs are used in some products.

For the hardwood plywood/veneer segment of the industry, the major raw material is veneer produced from large-diameter hardwood logs, although some high-grade hardwood lumber is also used. Because of a decline in suitable domestic supply of preferred hardwood species, much of the better-grade veneers used by the industry are imported from the United States or are manufactured from U.S. logs.

Wood raw material for particleboard is almost entirely sawmill residues — sawdust and wood shavings — although some roundwood is used. Mills in this segment are generally located in or near regions with high concentrations of sawmills and other wood transformation industries. Softwood and hardwood chips from sawmills and some low-grade roundwood are used in the manufacture of MDF, hardboard and insulation board. Some recycled newsprint is used in the manufacture of insulation board.

Hardwood plywood is generally manufactured from hardwood veneers, which are glued together, usually with the wood grain running at right angles. For many applications, particleboard, MDF or other wood-based products are used as core material in place of solid wood. Hardwood veneer is produced from high-quality logs on rotary lathes or slicing equipment, or from better grades of hardwood lumber utilizing

a specialized slicing process. The rough pieces of veneer are trimmed to size, dried and assembled into sheets. The process of manufacturing decorative sheets of hardwood veneer involves considerable manual labour using both aesthetic and technical skills.

Particleboard is manufactured from wood particles that are dried, mixed with an adhesive, laid out in either a batch or continuous process as a mat, and pressed at high temperature and pressure to form a panel. MDF is manufactured from mechanically refined wood fibres bonded together with a synthetic resin adhesive in a process similar to that used for making particleboard. Density ranges from 660 to 860 kilograms per cubic metre (kg/m³).

Hardboard in Canada is manufactured from wood fibres by a wet process. The fibre is produced by a mechanical refining process carried out at elevated temperatures. A fibre mat is formed and pressed at high pressure and temperature to obtain a density between 800 and 1 000 kg/m³. Insulation board is also manufactured from wood fibres by a wet process, but the density is lower — in the range of 240 to 330 kg/m³.

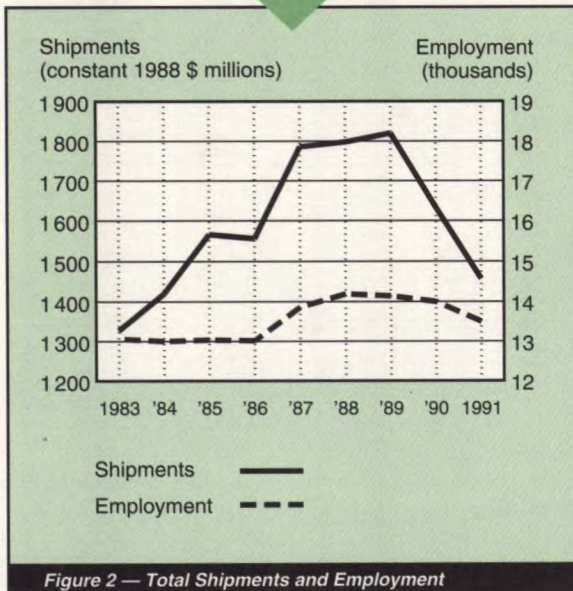
Most non-structural products are sold as standard-sized sheet materials used mainly for office and residential furniture, kitchen cabinets, flush door coverings and bathroom vanities. Construction is another important outlet, including the new, repair, renovation and do-it-yourself markets. Approximately 30 to 40 percent of insulation board production is consumed as sheathing material in residential construction and therefore has a structural application.

Performance

The performance of the wood-based panel products industry during the late 1970s and 1980s was characterized by rapid growth in certain segments of the industry and retrenchment and rationalization in others. Overall trends in shipments and employment are shown in Figure 2.

The wood-based panel industry as a whole has experienced product substitution from both outside and within the industry. For example, non-wood sidings such as those made from vinyl or aluminum are competing with hardboard siding. Particleboard, upgraded with overlays such as paper foils, melamines and prefinished hardboard, has in part replaced hardwood plywood in furniture and cabinet manufacturing. Moulded hardboard has replaced a large part of hardwood plywood door coverings in interior residential doors. MDF continues to replace both solid wood and particleboard in some furniture and cabinet applications. OSB/waferboard and sheathing grades of softwood plywood continue to compete for market share in Canada and the United States.

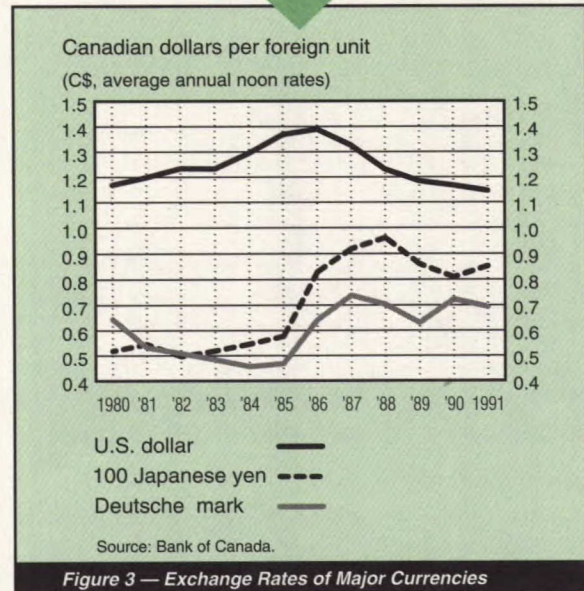
Following the downturn of the early 1980s, the industry improved its capacity utilization, and most plants operated



near capacity during the second half of the 1980s. Overall capacity utilization during 1989 averaged more than 90 per cent. Operating rates would have been even higher were it not for the fact that plant modernization, expansion and establishment took place during this period. Several particleboard manufacturers also invested in overlaying equipment to enable the mills to produce value-added products. However, capacity utilization rates declined to below the 80 percent level during the recession and most industry segments have not yet recovered to prerecession levels.

The relative weakening of the Canadian dollar during the mid-1980s relative to U.S., European and Japanese currencies (Figure 3) enhanced the competitive position of wood-based panel products in most foreign markets. In the late 1980s, however, the situation reversed, as the Canadian dollar strengthened relative to these currencies. Nevertheless, during the 1989 building boom, the value of exports of panel products to the United States increased 12 percent over the 1988 value. The largest single export commodity was OSB/waferboard, which represented about 60 percent of the total value of exports to the United States.

There was limited investment by the forest products sector in the wood-based panel products industry during the early 1980s. However, industry information indicates that major investment in new establishments and in modernization and expansion projects during the remainder of the 1980s was carried out in the OSB/waferboard, particleboard, MDF and softwood plywood segments of the industry. Although detailed financial information is not available on each segment,

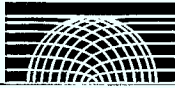


most companies experienced several years of prosperity in the period following the 1981–1982 recession, but were severely affected by reduced market demand leading to intense competition in 1991 when the value of shipments fell to 78 percent of 1989 levels.

Structural Wood-Based Panels

Between 1975 and 1991, the capacity of the structural wood-based subsector expanded at an average annual rate of 5.0 percent. Nearly all of the growth resulted from new OSB/waferboard capacity. Some expansion also occurred in the softwood plywood industry, with the establishment of at least one new plywood mill, two new softwood veneer plants, and significant expansion of capacity through modernization and productivity improvement programs. Softwood plywood output remained essentially unchanged between 1983 and 1989 but output declined in 1990 at the start of the recession. During the past five years, the softwood plywood industry has experienced several mill closures, particularly on the British Columbia coast. Similarly, a number of older waferboard mills that had become uncompetitive during the mid-1980s were closed and output per employee declined in 1991 by nearly 25 percent from the level of output in 1989.

Softwood plywood export volumes, which in 1991 represented about 85 percent of the structural subsector's offshore exports, declined by about 30 percent relative to 1990 output. Although Canadian softwood plywood is facing intense competition in Europe from the United States, the industry continues to expand its exports to Japan.



Non-Structural Wood-Based Panels

Some of the product lines in the non-structural subsector also experienced rapid development in the postrecession period of the early 1980s. Several new particleboard and MDF mills were established and major capacity expansions were undertaken at other particleboard mills. However, competition from alternative domestic and imported materials has resulted in plant closures and the development of new products to achieve niche markets. Notable closures include hardwood plywood and veneer plants, a hardboard plant and several insulation board plants.

Strengths and Weaknesses

Structural Factors

Canadian mills have been built to take advantage of economies of scale. Consequently, plant capacities of wood-based panel mills in Canada are generally similar to those of their U.S. counterparts. Except for the hardwood plywood segment, which is characterized by small to medium-sized companies, many producers are part of large, integrated, diversified forest products companies and thereby benefit from a broad industrial and financial base.

With the exception of softwood plywood, most Canadian panel products are manufactured to meet both Canadian and U.S. standards, which in many instances are similar. A significant difference between the Canadian and U.S. panel industries is found in the softwood plywood segment. In the United States, standards permit lower-grade veneer than is the case in Canada. This is used in a lower-grade sheathing product not manufactured in Canada, which provides strong competition for Canadian sheathing plywood in some price-sensitive offshore markets and, more recently, the domestic market.

Average wood costs for Canadian-produced softwood plywood and OSB/waferboard represent about 35 and 30 percent, respectively, of manufacturing costs. Raw material costs in Canada are estimated to be generally comparable with those in the United States, although some regional variations do exist. Raw material costs for the non-structural subsector are estimated to be generally the same as those in the United States.

Resin, energy, transportation and labour are the other major components of manufacturing costs in the panel industry. Average costs of these elements for the domestic industry are estimated to be somewhat higher than those for their U.S. counterparts. At the same time, while labour costs are higher in Canada than in the United States for most panel products, they are partially offset by certain regional advantages in lower energy and raw material costs. On average, production costs in Canada for softwood plywood are significantly higher than

those in the United States, and OSB/waferboard costs are marginally higher. Detailed manufacturing cost estimates for the non-structural panel subsector indicate that Canadian firms are generally competitive with their U.S. counterparts in terms of resource costs, labour and productivity per employee.

Transportation costs for the industry are significant. Most Canadian non-structural mills are located close to major domestic markets as well as those in the northeastern and north-central areas of the United States. However, due to the high weight-to-value ratio, relatively high transportation costs hinder penetration of more distant markets in the United States and overseas. In the structural panel subsector, which is located near the resource base, transportation is a significant factor, as many of the plants are distant from major domestic markets in Ontario and Quebec. In this context, OSB/waferboard has an advantage over softwood plywood, since about 50 percent of its capacity is situated near major domestic markets in Eastern Canada. Specialized large-volume ships having long-term chartering arrangements with exporters in British Columbia have enabled softwood plywood mills in that province to obtain competitive shipping rates to major offshore markets.

Trade-Related Factors

Table 3 shows the range of tariffs assessed by certain countries on selected wood-based panel products from trading partners with whom they have exchanged Most Favoured Nation (MFN) status. Some additional charges apply in certain countries for specific products.

In the structural panel subsector, the softwood plywood trade between Canada and the United States has historically been limited by the 20 percent tariff applied to plywood exports entering the United States and by the 15 percent Canadian tariff on imports from the United States.

U.S.-produced C-D plywood is considered by Canadian manufacturers to be somewhat inferior to Canadian softwood plywood, since larger defects are allowed in the U.S. product. This issue was not resolved prior to the implementation of the Canada-U.S. Free Trade Agreement (FTA) on 1 January 1989, and the United States suspended the introduction of FTA tariff elimination on softwood plywood, particleboard and OSB/waferboard until the issue was resolved. Canada also suspended tariff removal on the same products. In 1988, the two governments agreed to establish a binational committee of experts to resolve standards issues related to the softwood plywood dispute through the development of compatible performance standards. As a result of the agreement on compatible performance standards, plywood tariffs were reduced in the United States from 20 percent to 10 percent, and in Canada from 15 percent to 7.5 percent, effective 1 January 1993.



Table 3 — Selected MFN Tariffs, 1991^a

(percent)

	Canada	United States	European Community	Japan
Softwood plywood	15	20	10	10
Softwood veneer	free	free	6	5
OSB/waferboard	4	4	10	8 – 10
Hardwood plywood	3.2 – 9.2	0 – 3.2	10	10
Hardwood veneer	free	free	6	5
Particleboard	4	4	10	8 – 10
MDF	4.5 – 6.5	2.1 – 4.2	10	3.5
Hardboard	3.6 – 9.2	2.1 – 4.2	10	5.2
Insulation board	4.5 – 6.5	free	10	3.5

^aISTC estimates.

The remaining tariffs in both countries will be reduced in equal, annual increments, as intended by the FTA, until they are completely eliminated on 1 January 1998.

Canadian and U.S. tariffs on OSB/waferboard and particleboard were eliminated effective 1 January 1993. The FTA tariff phase-out on insulation board from the United States is in 10 annual, equal steps, making it duty-free by 1 January 1998. U.S. tariffs on panel products other than softwood plywood from Canada have been removed effective 1 January 1993.

Several factors have contributed to Canada's strong export performance in the United States. These include acceptance of OSB/waferboard under U.S. residential building codes, a 4 percent U.S. tariff, expanding U.S. markets and a decline in U.S. softwood output resulting in log shortages due to environmental pressures. Exports of OSB/waferboard to offshore markets, particularly the EC, have been limited by a 10 percent tariff, the lack of acceptance within European building codes and limited product knowledge, but continue to show positive growth. OSB/waferboard exports to Japan are increasing. The Canadian Import duty on OSB/waferboard is currently 4 percent.

Certain grades of softwood plywood enter the EC under an annual duty-free global quota, bound under the General Agreement on Tariffs and Trade (GATT), of 600 000 cubic metres (680 million square feet, 3/8-inch basis). Volumes in excess of the quota are subject to a 10 percent tariff. The EC

also imports certain types and thicknesses not included in the quota, which are subject to the same tariff.

In Japan, which is a growing market for Canadian softwood plywood, the import tariff is currently 10 percent. Following an evaluation by the Japanese government, Canadian mills interested in pursuing the Japanese market are being certified by the Council of Forest Industries of British Columbia (COFI) to grade softwood plywood to the Japanese Agriculture Standard (JAS) for use in residential construction in Japan. All wood-based panel products used in residential construction in Japan must conform to JAS. COFI provides similar certification programs for European countries. Certification processes in both geographic areas are lengthy.

Technological Factors

The level of technological development in Canadian mills is generally similar to that in other major producing countries. Over the past several years, Canadian and foreign suppliers have developed a manufacturing capability in Canada for major components such as presses, conventional lathes, rotary veneer clippers, waferizers and dryers and have reduced the industry's dependence on equipment imported from Europe and the United States. The design and engineering efforts of specific plant requirements usually involve an integrated approach between Canadian design engineers and equipment suppliers.

New technology and manufacturing processes continue to be developed. The application of emerging technology can be expected to enhance raw material use and productivity, to improve energy conservation, to meet environmental requirements and to improve competitiveness through reduced manufacturing costs. Examples of recent activities in the area of research and development (R&D) include the development of new edge profiles for softwood plywood used in roofing and flooring, new moisture-tolerant adhesives, moisture-stabilized OSB/waferboard, enhanced computer-integrated plant controllers and veneer incisors, as well as advances in veneer dryers, moisture sensors and steam-injection presses. Equipment manufacturers and suppliers in Canada, Germany, Japan, the United States and Scandinavia produce much of the machinery and technology and make the same developments available to panel producers everywhere.

Technology to improve both products and manufacturing processes is being developed by R&D facilities in Canada and elsewhere. Canadian research facilities such as the Alberta Research Council, Forintek Canada Corp., universities and private organizations such as the COFI Plywood Technical Centre play a vital part in both process and product development.

Individual industry segments have demonstrated differences in both the development and implementation



of technological innovation. Insulation board and hardboard manufacture is based largely on technology developed more than 30 years ago. Particleboard, OSB/waferboard and MDF are at the forefront in technological developments as older plants are modernized and additional capacity based on the latest equipment is added. Most softwood plywood plants have also been modernized. The most notable changes have been automated plywood lay-up lines, improved dryers, computerized lathe chargers and controllers, new press loading and unloading equipment and modern resin systems.

Other Factors

The cyclical nature of the construction sector has a significant impact on the panel products industry. However, the traditional seasonal reduction in domestic demand for softwood plywood in residential construction during the late fall and early winter is offset to some degree by export opportunities in the first half of each year caused by the rush to obtain a share of the EC duty-free quota.

A high degree of co-operation exists between the industry and the federal government. The Forest Sector Advisory Council (FSAC), which includes representation from the industry, labour groups and universities offering courses in forestry, provides the government with input to policy development on a range of issues.

Evolving Environment

The wood-based panel products industry is highly dependent on the level of North American residential construction activity. The reduced Canadian demand is being compounded by similar reductions in economic activity in most major offshore markets. New Canadian house construction activity declined in annual housing starts from the 215 000 achieved in 1989 to 156 000 in 1991. The Canada Mortgage and Housing Corporation expects housing starts to be 167 000 units in 1992 and then recover to 187 000 in 1993. U.S. housing starts are also anticipated to decline over the next several years from the rate experienced during the late 1980s, but at a slower rate than in Canada.

The reduction in residential construction and the general economic slowdown in 1990–1991 have resulted in less demand for all wood-based panel products. Accordingly, capacity utilization rates in most industry segments have declined, and many companies have initiated temporary production cutbacks or permanent closures. The structural subsector is particularly affected, with several mills temporarily or permanently closed or working on reduced schedules. Slowdowns are reported in the other industry segments, including closures of some hardwood

veneer operations and an insulation board mill. MDF production is not affected to any large degree at this time.

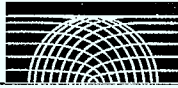
Substitution by alternative products is continuing. OSB/waferboard is eroding the domestic market share of softwood plywood and insulation board used as sheathing in construction applications. Melamine-laminated particleboard is replacing traditional hardwood plywood in furniture and kitchen cabinet applications. MDF is replacing hardwood plywood and particleboard in some furniture products. Other non-wood products, such as aluminum siding and gypsum wallboard, compete with hardboard siding and panelling products.

Canadian and U.S. softwood plywood and OSB/waferboard producers are increasing their offshore marketing efforts. Canadian softwood plywood continues to achieve additional code acceptance in many foreign markets. However, except for sales to Japan, Canadian softwood plywood exports have declined over the past decade because of competition from lower-cost U.S. plywood as well as growth in domestic OSB production. Exports of OSB/waferboard to both Europe and the Pacific Rim countries are gradually increasing. Canadian MDF producers continue to explore export opportunities, particularly in Asia.

Under the FTA, procedures have been established to facilitate requests from the industry for accelerated tariff elimination. During the first round carried out in 1989, a Canadian hardwood plywood doorskin manufacturer was successful in obtaining accelerated tariff removal for this specific product. Certain value-added softwood plywood products are under consideration in the third round of accelerated tariff elimination consultations. Other producers in both countries are considering requesting faster tariff removal for other panel products.

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.

Most wood-based panel mills have been operating below the break-even point since the start of the recent recession. Consequently, little if any new capacity will be required during the next several years. However, some additional capacity in MDF and particleboard plants has been built in Quebec and New Brunswick, and several companies are investigating future investment opportunities in OSB, MDF and particleboard mills. Further modernization of existing mills can be expected to occur once the current economic difficulties are overcome.

Employment levels are not likely to change significantly over the medium term. Some shifts are likely, however, as employment in the plywood segment declines while some additional jobs are created in other industry segments.

Environmental issues surrounding land use, harvesting and forest management practices are receiving increased public attention. Although most of the attention is focused on the pulp and paper and solid wood industries, there is constant pressure to reduce the land base available to the forest industry and to convert this to recreational, wildlife habitat preservation and other uses. The preservation of old-growth timber has emerged as a very contentious issue in the debate over the forest resource.

Private sector forecasts suggest that offshore exports will continue to show more weakness as a result of a slowing of demand in key export markets and a stronger Canadian dollar. However, new opportunities may develop as a result of the political and structural changes that are taking place in Eastern Europe. In addition, the rebuilding of Middle East economies and developments in China, the Republic of Korea and India offer longer-term prospects for improved export performance.

Competitiveness Assessment

The effects of the FTA have not yet been fully experienced by the wood-based panel products industry, since tariff reductions on key industry segments have been delayed until recently by the softwood plywood standards dispute. The FTA will subject the Canadian softwood plywood segment to increased competition, but it will benefit from improved access into the

United States for certain value-added products in niche markets. OSB and particleboard producers will experience immediate benefits as tariffs are reduced.

Structural Wood-Based Panels

The competitive position of softwood plywood is being eroded by increases in operating costs, substitution in domestic markets by OSB/waferboard and the importation of U.S. plywood. However, softwood plywood continues to be competitive in domestic and several offshore markets, particularly in applications involving engineering design specifications and certain specialized industrial uses such as packaging and concrete forming. Imports of U.S. plywood are likely to increase following the harmonization of performance standards between Canada and the United States and the resulting reduction in tariffs.

Canadian OSB/waferboard is competing effectively in the domestic market but is experiencing strong competition in key U.S. markets. Further rationalization of older plants in Canada, as well as some structural changes, is occurring in the short term. However, OSB/waferboard will probably maintain its penetration of residential sheathing markets and gain increasing acceptance in the growing renovation, industrial and do-it-yourself markets. Although offshore market opportunities have expanded during the past several years, growth has been limited by tariff barriers and by the lack of acceptance of the product outside North America. Although the resolution of the FTA softwood plywood standards issue involves the reduction of a relatively low tariff on OSB/waferboard, it will have a positive impact on the Canadian industry.

Non-Structural Wood-Based Panels

The hardwood plywood and veneer segment is continuing to decline with plant closures. The remaining producers are competitive with U.S. producers, but their position depends to a large degree on the continuing availability of adequate supplies of high-quality U.S. logs and veneers. Continued substitution by particleboard, MDF and hardboard is also challenging their traditional markets.

Canadian MDF continues to be competitive in the domestic and many offshore markets. Additional capacity is being established to take advantage of export opportunities in both the U.S. and Asian markets. New thin MDF capacity will enable Canadian producers to replace some volume of traditional imports of Asian plywoods in both the domestic and export markets. The addition of upgraded products will allow companies to benefit from market niches.

Although rapid expansion of the particleboard industry in recent years has resulted in oversupply and depressed market conditions, the industry remains competitive in Canada.



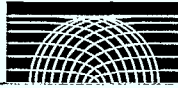
Investment in plant modernization programs, a readily available resource base and the addition of value-added products, such as overlaid, painted and cut-to-size panels to complement standard commodity products, should improve the industry's ability to compete both domestically and in bordering American states.

Canadian hardboard producers are competitive but are experiencing increasing competition from lower-priced imports from South America and elsewhere. New thin MDF capacity, which came on stream in 1991, will undoubtedly affect the hardboard industry adversely, as it will compete for a share of the traditional hardboard market. Hardboard siding, which represents about 25 percent of hardboard output in Canada, is under pressure from non-wood siding products.

The insulation board segment remains competitive with its U.S. counterpart. Canadian mills continue to operate at a relatively high level of output.

For further information concerning the subject matter contained in this profile or in the ISTC initiative (see page 14), contact

Forest Industries Branch
Industry, Science and Technology Canada
Attention: Wood-Based Panel Products
235 Queen Street
OTTAWA, Ontario
K1A 0H5
Tel.: (613) 954-3039
Fax: (613) 941-8048



PRINCIPAL STATISTICS^a

	1983	1984	1985	1986	1987	1988	1989	1990	1991
Establishments/Plants ^b	119	119	121	120	120	120	118	117	114
Employment	13 059	13 000	13 033	13 016	13 864	14 194	14 141	14 000 ^c	13 500 ^c
Shipments									
(\$ millions)	1 216	1 278	1 432	1 560	1 801	1 798	1 863	1 628	1 460
(constant 1988 \$ millions)	1 327	1 420	1 566	1 556	1 786	1 798	1 820	1 633	1 457

^aSee *Wood Industries*, Statistics Canada Catalogue No. 35-250, annual (industry group 252, veneer and plywood industries; SIC 2592, particle board industry; and SIC 2593, wafer board industry); and *Paper and Allied Products Industries*, Statistics Canada Catalogue No. 36-250, annual (SIC 2714, building board industry).

^bPre-1988 data are based on Statistics Canada surveys and refer to "establishments." Data for 1988 and subsequent years refer to the number of plants as determined by ISTC.

^cISTC estimates.

TRADE STATISTICS

	1983	1984	1985	1986	1987	1988 ^c	1989 ^c	1990 ^c	1991 ^c
Exports ^a									
(\$ millions)	359	440	485	456	481	546	587	546	512
(constant 1988 \$ millions)	392	489	530	455	477	546	573	548	511
Domestic shipments									
(\$ millions)	857	838	947	1 104	1 320	1 252	1 276	1 082	948
(constant 1988 \$ millions)	935	931	1 036	1 101	1 309	1 252	1 247	1 085	946
Imports ^b									
(\$ millions)	122	117	133	187	230	243	246	223	224
(constant 1988 \$ millions)	133	130	145	186	228	243	240	224	224
Canadian market									
(\$ millions)	979	955	1 080	1 291	1 550	1 495	1 522	1 305	1 172
(constant 1988 \$ millions)	1 068	1 061	1 181	1 287	1 537	1 495	1 487	1 309	1 170
Exports (% of shipments)	29.5	34.4	33.9	29.2	26.7	30.4	31.5	33.5	35.1
Imports (% of Canadian market)	12.5	12.3	12.3	14.5	14.8	16.3	16.2	17.1	19.1
Canadian share of international trade (%)	7	9	9	9	8	7	9	N/A	N/A

^aSee *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

^bSee *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

^cIt 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.

N/A: not available



	1983	1984	1985	1986	1987	1988 ^b	1989 ^b	1990 ^b	1991 ^b
United States	57	66	67	69	67	67	73	75	80
European Community	1	2	2	2	2	3	3	4	3
Asia	36	26	24	22	25	24	19	17	13
Other	6	6	7	7	6	6	5	4	4

^aSee *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

^bAlthough 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.

	1983	1984	1985	1986	1987	1988 ^b	1989 ^b	1990 ^b	1991 ^b
United States	63	68	73	76	71	71	74	71	79
European Community	33	28	23	20	22	20	17	20	12
Asia	2	2	2	2	4	7	7	7	7
Other	2	2	2	2	3	2	2	2	2

^aSee *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

^bAlthough 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)	5	34	29	8	24

^aSee *Wood Industries*, Statistics Canada Catalogue No. 35-250, annual; and *Paper and Allied Products Industries*, Statistics Canada Catalogue No. 36-250, annual.



MAJOR FIRMS

Name	Country of ownership	Location of major plants
Fletcher Challenge Canada Limited	New Zealand	Kelowna, British Columbia Armstrong, British Columbia
MacMillan Bloedel Limited	Canada	New Westminster, British Columbia Hudson Bay, Saskatchewan Nipigon, Ontario
Malette Inc.	Canada	Timmins, Ontario Saint-Georges-de-Champlain, Quebec
Norbord Industries Inc.	Canada	Val d'Or, Quebec Lac-des-Isles, Quebec La Sarre, Quebec Cochrane, Ontario
Uniboard Canada Inc.	Germany	Sayabec, Quebec Val d'Or, Quebec Mont-Laurier, Quebec
Weldwood of Canada Limited	United States	Williams Lake, British Columbia Quesnel, British Columbia Longlac, Ontario

INDUSTRY ASSOCIATIONS

Canadian Hardwood Plywood Association (CHPA)
27 Goulburn Avenue
OTTAWA, Ontario
K1N 8C7
Tel.: (613) 233-6205
Fax: (613) 233-1929

Canadian Particleboard Association (CPA)
27 Goulburn Avenue
OTTAWA, Ontario
K1N 8C7
Tel.: (613) 233-6205
Fax: (613) 233-1929

Canadian Wood Council (CWC)
Suite 350, 1730 St. Laurent Boulevard
OTTAWA, Ontario
K1G 5L1
Tel.: (613) 731-7800
Fax: (613) 731-7899

Council of Forest Industries of British Columbia (COFI)
Suite 1200, 555 Burrard Street
VANCOUVER, British Columbia
V7X 1S7
Tel.: (604) 684-0211
Fax: (604) 687-4930

Structural Board Association (SBA)
Suite 412, 45 Sheppard Avenue East
WILLOWDALE, Ontario
M2N 5W9
Tel.: (416) 730-9090
Fax: (416) 730-9013



SELECTED SITUATIONS AND INITIATIVES

The following initiative is supported by Industry, Science and Technology Canada (for additional information, see address on page 10).

Forest Industries R&D and Innovation Program

The overall objective of the three-year Forest Industries R&D and Innovation Program is to increase the international competitive position of the forest industry by encouraging, through government assistance, increased R&D activity by the industry. The strategic approach is to encourage R&D activity undertaken in alliances with other stakeholders and, thereby, to expand the transfer of technology and accelerate its implementation in advanced forest products and processes in the industry.

An important program delivery mechanism is through strategic memoranda of understanding (MOUs) with companies. The objective is to work with recognized industry leaders to stimulate R&D activity undertaken in co-operative alliances with other partners, including smaller companies and suppliers. A key MOU is with the Pulp and Paper Research Institute of Canada (PAPRICAN), which is to encourage research directed toward addressing the environmental challenges confronting the pulp and paper industry.



Business Service Centres / International Trade Centres

Industry, Science and Technology Canada (ISTC) and External Affairs and International Trade Canada (EAITC) have established information centres in regional offices across the country to provide clients with a gateway into the complete range of ISTC and EAITC services, information products, programs and expertise in industry and trade matters. For additional information, contact one of the offices listed below:

Newfoundland

Atlantic Place
Suite 504, 215 Water Street
P.O. Box 8950
ST. JOHN'S, Newfoundland
A1B 3R9
Tel.: (709) 772-ISTC
Fax: (709) 772-5093

Prince Edward Island

Confederation Court Mall
National Bank Tower
Suite 400, 134 Kent Street
P.O. Box 1115
CHARLOTTETOWN
Prince Edward Island
C1A 7M8
Tel.: (902) 566-7400
Fax: (902) 566-7450

Nova Scotia

Central Guaranty Trust Tower
5th Floor, 1801 Hollis Street
P.O. Box 940, Station M
HALIFAX, Nova Scotia
B3J 2V9
Tel.: (902) 426-ISTC
Fax: (902) 426-2624

New Brunswick

Assumption Place
12th Floor, 770 Main Street
P.O. Box 1210
MONCTON, New Brunswick
E1C 8P9
Tel.: (506) 857-ISTC
Fax: (506) 851-2384

Quebec

Suite 3800
800 Tour de la Place Victoria
P.O. Box 247
MONTREAL, Quebec
H4Z 1E8
Tel.: (514) 283-8185
1-800-361-5367
Fax: (514) 283-3302

Ontario

Dominion Public Building
4th Floor, 1 Front Street West
TORONTO, Ontario
M5J 1A4
Tel.: (416) 973-ISTC
Fax: (416) 973-8714

Manitoba

Newport Centre
8th Floor, 330 Portage Avenue
P.O. Box 981
WINNIPEG, Manitoba
R3C 2V2
Tel.: (204) 983-ISTC
Fax: (204) 983-2187

Saskatchewan

S.J. Cohen Building
Suite 401, 119 - 4th Avenue South
SASKATOON, Saskatchewan
S7K 5X2
Tel.: (306) 975-4400
Fax: (306) 975-5334

Alberta

Canada Place
Suite 540, 9700 Jasper Avenue
EDMONTON, Alberta
T5J 4C3
Tel.: (403) 495-ISTC
Fax: (403) 495-4507

Suite 1100, 510 - 5th Street S.W.
CALGARY, Alberta
T2P 3S2
Tel.: (403) 292-4575
Fax: (403) 292-4578

British Columbia

Scotia Tower
Suite 900, 650 West Georgia Street
P.O. Box 11610
VANCOUVER, British Columbia
V6B 5H8
Tel.: (604) 666-0266
Fax: (604) 666-0277

Yukon

Suite 210, 300 Main Street
WHITEHORSE, Yukon
Y1A 2B5
Tel.: (403) 667-3921
Fax: (403) 668-5003

Northwest Territories

Precambrian Building
10th Floor
P.O. Bag 6100
YELLOWKNIFE
Northwest Territories
X1A 2R3
Tel.: (403) 920-8568
Fax: (403) 873-6228

ISTC Headquarters

C.D. Howe Building
1st Floor, East Tower
235 Queen Street
OTTAWA, Ontario
K1A 0H5
Tel.: (613) 952-ISTC
Fax: (613) 957-7942

EAITC Headquarters

InfoExport
Lester B. Pearson Building
125 Sussex Drive
OTTAWA, Ontario
K1A 0G2
Tel.: (613) 993-6435
1-800-267-8376
Fax: (613) 996-9709

Publication Inquiries

For individual copies of ISTC or EAITC publications, contact your nearest Business Service Centre or International Trade Centre. For more than one copy, please contact:

For Industry Profiles:
Communications Branch
Industry, Science and Technology
Canada
Room 704D, 235 Queen Street
OTTAWA, Ontario
K1A 0H5
Tel.: (613) 954-4500
Fax: (613) 954-4499

For other ISTC publications:
Communications Branch
Industry, Science and Technology
Canada
Room 216E, 235 Queen Street
OTTAWA, Ontario
K1A 0H5
Tel.: (613) 954-5716
Fax: (613) 952-9620

For EAITC publications:
InfoExport
Lester B. Pearson Building
125 Sussex Drive
OTTAWA, Ontario
K1A 0G2
Tel.: (613) 993-6435
1-800-267-8376
Fax: (613) 996-9709

Canada