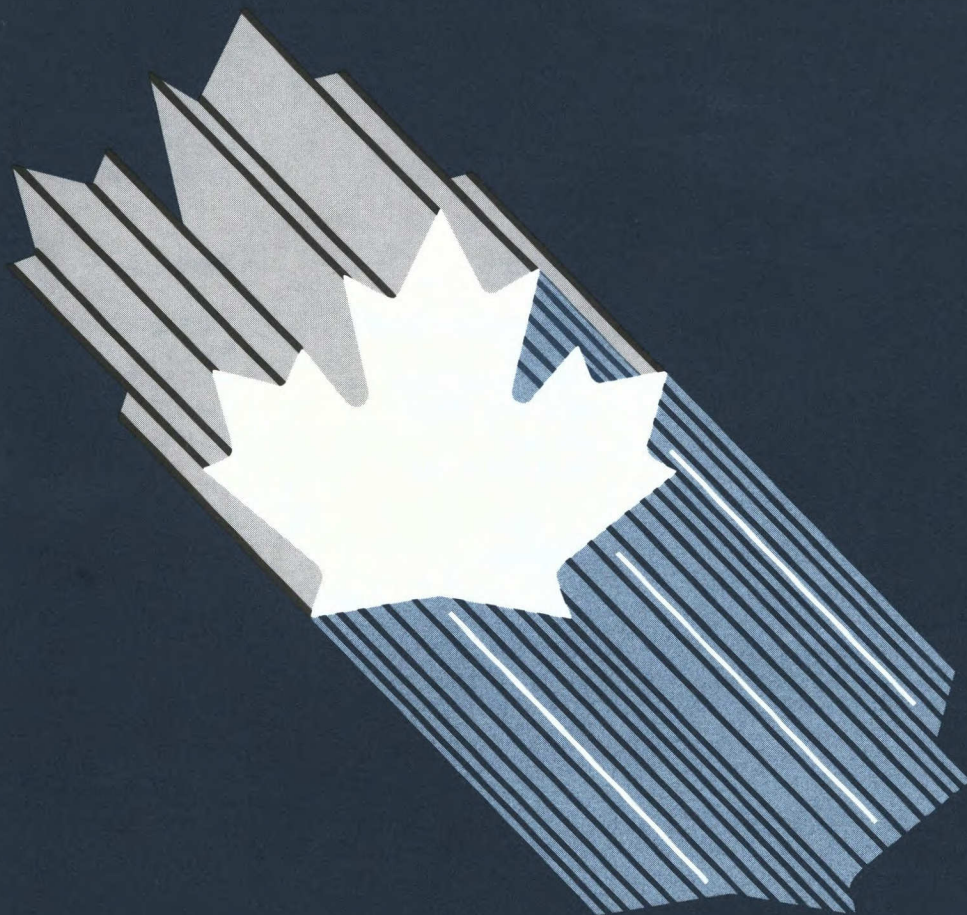


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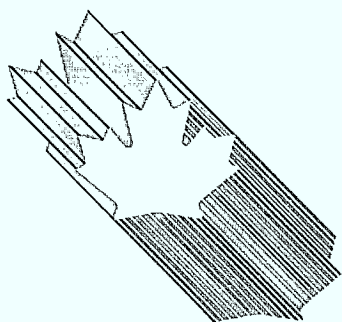


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Technology Canada

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Pulp and Paper Equipment

Canada



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P R O F I L E

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FOREWORD

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

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

Minister

Canada

1. Structure and Performance

Structure

The sector manufactures machinery for the pulp processing, paper making and paper converting industries. Since Canada has essentially no production capacity for paper converting machinery, this segment of the industry is excluded from this profile.

The sector consists of approximately 50 companies which employ some 4000 people. Most are located in the large urban centres of Ontario (30 percent), Quebec (65 percent) and British Columbia, where supplier inputs and skilled labour are concentrated. In 1987, domestic shipments totalled \$215 million, with exports of \$107 million and imports of \$196 million. The industry is largely foreign owned, with its Canadian subsidiaries accounting for approximately 80 percent of the Canadian industry's shipments. Most were established in the 1950s and 1960s during a period of major capital investment in the Canadian pulp and paper industry.

One-half of the equipment suppliers dedicate all their production to the pulp and paper industry and account for approximately 80 percent of total sector shipments. The remainder manufacture specialized products such as boilers, liquid-solid separators, pumps and controls which have applications in a variety of industries.

The firms in this sector have annual shipments ranging from less than \$1 million up to \$40 million. One or two larger concerns have, on occasions, shipped more than \$100 million. Companies tend to concentrate their activities on specialized pieces of equipment for either pulp preparation or paper making. Any given project is usually broken down into smaller entities, each of which normally draws only three or four competitive bids.

Performance

Given the domination of the Canadian pulp and paper equipment industry by multinationals, the performance of the Canadian sector is best understood in the context of global trends, particularly as they affect the North American market.

The 1980s has been a period of considerable adjustment for the world pulp and paper equipment industry, caused primarily by technological changes and rationalization through takeovers and amalgamations.

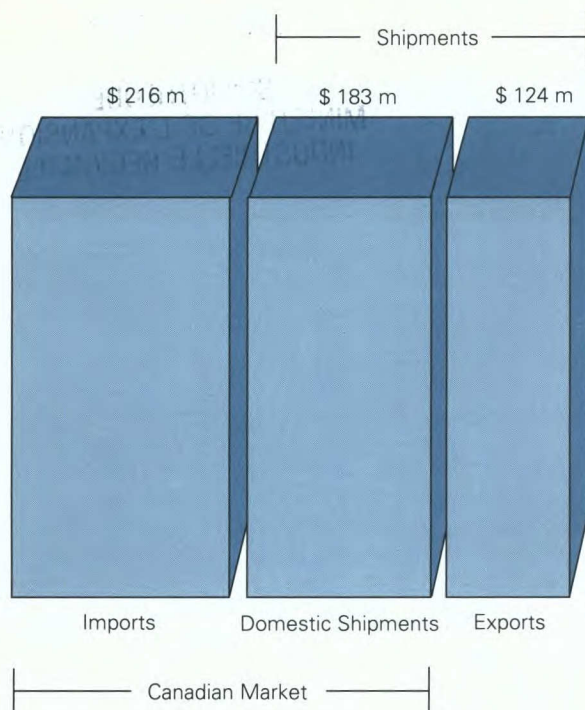
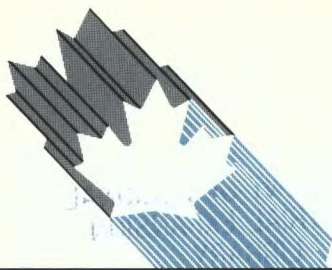
The advent of new pulping processes, such as Chemi Thermo Mechanical Pulp (CTMP), has improved the yields while maintaining pulp qualities; the adoption of higher-speed paper machines (over 1000 m/min) has increased efficiency and reduced the ratio of capital to finished product cost; and the conversion to specialty grades of paper has added to profit margins.

Recent amalgamations have resulted in three major refiner manufacturers dominating the world in the mechanical pulping equipment section of this industry. The one Canadian, albeit smaller, is very competitive and manufactures completely in Canada. The other two foreign suppliers, although one has Canadian assembly facilities, usually have limited Canadian content in their product lines.



Industry, Science and
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**Imports, Exports and Domestic Shipments
1986**

Canada has its strongest capability in chemical pulping equipment. In this area, there are several manufacturers who supply a wide range of products from Canadian manufacture such as digesters, pulp washing, bleaching, thickening and screening equipment as well as chemical recovery boilers.

In the paper machine area, it is believed that there are now only three principal suppliers in the world of wide, high-speed paper machines. Two have branch operations in Canada to serve the Canadian market. Major components such as press rolls, shells, dryer cans, calender stack rolls, still have to be imported. Wide, high-speed paper machines are exported from Canada only when the project is financed by the Export Development Corporation (EDC). The third company, which supplies the North American market from Brazil, has no manufacturing facility in Canada.

Other paper machine manufacturers in Canada have found markets in certain areas of paper making such as pulp drying machines, the conversion of single-wire (fourdrinier) machines to twin-wire formation and the rebuild of older machines. One foreign-owned company has a world mandate for design/engineering and the capability to manufacture complete paper machines in Canada. It has developed a full family of top-wire formers to convert fourdriniers to twin-wire machines making various grades of paper at speeds ranging from 150 to 1000 m/min. Another company, established in 1975 and fully Canadian-owned, has concentrated on the rebuild of fourdriniers, press sections and tissue machines.

The trends to use higher-yield pulping processes, higher-speed paper machines and the production of specialty grades of paper have had several major effects on the machinery sector. Multinational suppliers, in order to remain competitive, are now bidding on larger process areas of the paper mill. To do this effectively they have amalgamated and/or bought smaller companies that had complementary technologies and manufacturing capabilities. As a result, several smaller Canadian companies who had developed an expertise in selected markets have been bought out by international firms.

In the mid-1970s, because of increased world competition and relatively low profits, the Canadian pulp and paper industry began a move away from its traditional products and started to produce more specialty grades. These developments involved major capital investments. The domestic market for pulp and paper equipment grew from average annual sales of \$118 million during the 1976-80 period to \$508 million in 1981. While fluctuating with economic conditions, the annual market for pulp and paper equipment has increased to \$400 million in 1986 and 1987. These higher levels of investments in pulp and paper equipment in Canada are the result of an increased demand in the United States, particularly for specialty papers. Accordingly, many smaller, lower-speed, Canadian paper machines have been converted to specialty papers.

However, because these new investments involved technologies which already existed in Europe, particularly in Sweden and Finland, and since the foreign exchange rates at the time favoured offshore suppliers, imports of pulp and paper equipment increased significantly. From an average of \$59 million in the five years to 1980, imports jumped to \$176 million in 1981, and have remained at a relatively high level ever since, peaking at about \$200 million in 1986 and 1987.

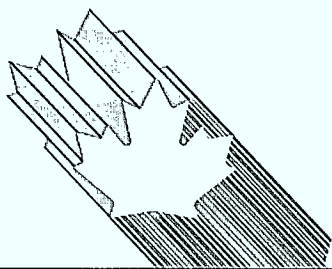
The United States is the largest export market for Canadian pulp and paper machinery, accounting for 63 percent of the \$124 million exported in 1986. However, an EDC financed contract for an overseas turnkey plant can substantially alter this pattern of exports, as was the case in 1985, when one plant in Asia represented over \$100 million in Canadian machinery exports.

It is expected that technological change and the trend towards specialization and rationalization on an international basis will continue into the 1990s.

2. Strengths and Weaknesses

Structural Factors

The key factors influencing competitiveness in the pulp and paper sector are, in order of importance: quality, technology and price.



The Canadian pulp and paper equipment sector has world-recognized capabilities in manufacturing competitive equipment for the chemical pulp and paper making industry. It also has excellent capabilities in equipment for the mechanical pulping industry. The industry has limited capability in tissue making machinery and does not have any capability in paper finishing equipment (i.e., coating, supercalendering).

In Canada, there are no commercial relationships between equipment manufacturers and end-users, as there are in Sweden and Finland for example. This situation affects the sector in two significant ways: not only is it virtually impossible, due to ownership links, to sell equipment to the Scandinavian and Finnish pulp and paper producers, but it is also difficult to work with them on R&D projects for the development of prototype machinery.

As each new pulp and paper project requires extensive process engineering as well as standard product application, it is essential for suppliers to this industry to have a significant local, technical presence to support their marketing efforts. Several foreign suppliers have, therefore, established local marketing and engineering offices in Canada that are able to provide technical expertise and back-up services equivalent to those of domestic firms.

Each purchase from offshore involves substantial capital investment in the order of \$20 million to \$30 million. Thus, financing becomes a critical component of the commercial package. Foreign suppliers of pulp and paper equipment benefit from export-financing assistance from their governments. While Export Development Corporation (EDC) financing is available to Canadian suppliers on export projects, in some instances it is not as attractive as that offered by some other countries. Moreover, financing of this kind is not available to Canadian suppliers to the domestic market, and this places them at a disadvantage vis-à-vis foreign competitors.

The Canadian heavy-equipment manufacturing industry was initially established to manufacture equipment for a variety of sectors (e.g., mining, pulp and paper, environment, etc.). As a result, its facilities, while more flexible, are generally less efficient than those of single-sector suppliers (i.e., more set-ups are required per finished item). Recent observations of the Swedish, and particularly of the Finnish pulp and paper equipment industries indicate that their manufacturing facilities are much better equipped and organized to meet the quality-standard requirements of the industry than those of the Canadian industry. Their productivity also appears to be greater than in Canada, possibly because of the high degree of specialization in each plant.

In addition, the major commitment to R&D of all Swedish and Finnish manufacturers, particularly during the last five years, appears to be a major factor accounting for the rise in their export sales, especially to North America. Total R&D expenditures in pulp and paper equipment in Canada are estimated at less than one percent of total annual sales. This amount does not compare favourably to Sweden and Finland, where R&D expenditures are approximately three to four percent of annual sales.

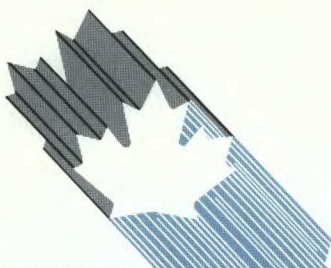
Trade-related Factors

Tariffs are not a major factor inhibiting world trade in this sector. The exception is Brazil, where import tariffs on pulp and paper equipment are in the order of 40 percent. Major import tariffs are as follows: United States, 0.8 percent to 4.2 percent; European Community (E.C.), 3.8 percent to 4.1 percent; and Finland, 5.1 percent.

While Canada's Most Favoured Nation (MFN) rate is 9.2 percent, imports from Brazil are granted the General Preferential Tariff (GPT) rate of 2.0 percent. Also, some pulp and paper equipment is presently imported without duty, as machinery not manufactured in Canada can be imported duty-free under the federal Machinery Program.

Non-tariff barriers (NTBs) are not a significant factor in the world pulp and paper equipment trade. However, in the Nordic countries, government control of the natural resources and government ownership of companies in both the pulp and paper and equipment sectors, as well as the private ownership links between equipment manufacturers and end-users, have inhibited foreign penetration in these markets. In Brazil, import licences, which at times can be difficult to obtain, are an impediment to trade.

Under the Canada-U.S. Free Trade Agreement (FTA), tariffs between Canada and the United States will be phased out over a five-year period beginning January 1, 1989. The FTA also provides for cross-border mobility of service personnel which has, at times, been a problem for Canadian exporters attempting to service their machines in the United States.



Technological Factors

Technology is a key factor in selling equipment to the pulp and paper sector. The Canadian pulp and paper equipment manufacturing industry consists primarily of subsidiaries of foreign-owned companies which are highly dependent on their parents for technology, and which do very little (if any) R&D in Canada. Most large multinationals have their research centres and pilot plants located near their corporate headquarters. Through the transfer of technology, the subsidiaries benefit from the results emanating from these centres, but this type of operation tends to reinforce the branch-plant aspect of the Canadian entities. Failure to offer unique Canadian technology inhibits exports and the attainment of world product mandates and encourages potential customers to view Canadian firms as component manufacturers only. A few Canadian-owned firms do their own R&D and develop their own products and, as a result, are the major contributors to exports in this sector.

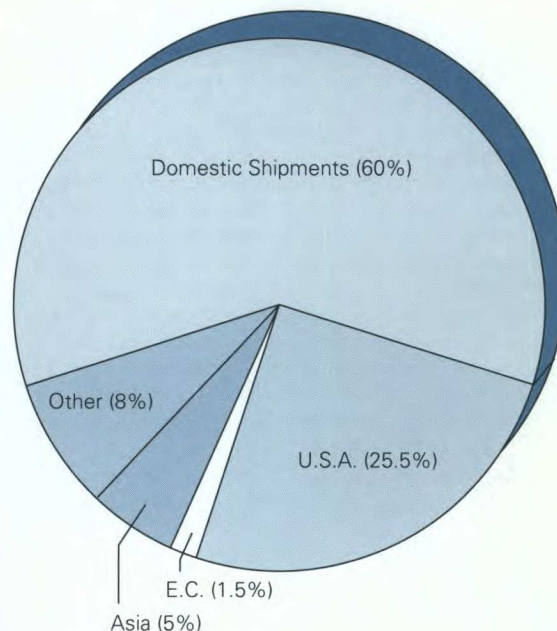
The recent trend in the industry to produce supercalendered and coated papers, an area of technology developed offshore, has meant that all of this type of machinery is imported. The lack of indigenous Canadian R&D in paper finishing makes it unlikely that these products and machines will be manufactured in Canada.

3. Evolving Environment

Since 1985, the world pulp and paper industry has experienced tremendous market demand and high profits. Consequently, capital investments in both modernization and greenfield projects are at a record high, particularly in North America, South America and Australia. It is estimated that in 1988 the world market for pulp and paper equipment was in excess of US\$10 billion and that by the year 2000 it is likely to approach \$US20 billion.

In Canada, at least six major new paper machine projects are already under way and another six have been announced. In addition, the majority of existing mills are investing heavily in modernization and product upgrading. Most Canadian equipment suppliers today are enjoying record orders and are expecting high capacity utilization until 1990.

A rationalization by certain multinationals has shrunk Canadian capability to manufacture some equipment components (e.g., complete paper machines, winders and rewinders). In addition, price competition, which is expected to be intense through the use of favourable offshore financing terms, means that the imports from Scandinavia will continue at a high level. Also, Brazil, where a multinational has established a large, modern subsidiary, has recently emerged as another major source of imports to Canada.



Domestic Shipments	\$183 m, 60%
Exports	\$124 m, 40%

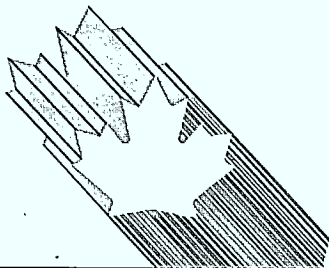
Total Shipments By Destination, 1986
(\$307 million)

NOTE: 1987 data for this chart are not available.

The ability of the Canadian pulp and paper industry to continue to grow at its present rate is constrained by an emerging shortage of traditional wood fibres. Various R&D projects presently under way such as Alcell, 100 percent poplar CTMP and 50 percent jack pine newsprint, are aimed at overcoming this constraint. If successful, these new technologies could result in another wave of major investments.

Canadian consulting engineers specializing in pulp and paper technology are responsible for most of Canada's export of pulp and paper equipment outside North America. They usually spearhead Canada's participation in overseas projects where EDC financing is involved. The Canadian content requirement of such projects (60 to 80 percent) compels foreign companies to allow their Canadian subsidiaries to bid on projects outside their assigned market. Canadian-owned companies export from their Canadian plants. Canadian-owned companies, or those with a product mandate in Canada, export a more significant part of their sales, particularly to the United States.

The FTA is not expected to have a significant impact on this sector. The import tariffs of 9.2 percent do not significantly affect purchasing decisions, and their removal is not seen as a major factor. Canadian operations are generally competitive with their U.S. counterparts. Under the FTA, some branch plants could be adversely affected by corporate rationalization, but this possibility is not seen as posing a significant threat to the industry as a whole.



4. Competitiveness Assessment

Canadian pulp and paper manufacturers have developed the technical expertise to compete in both the domestic and overseas markets. While the smaller Canadian-owned companies are active in the export market, the larger Canadian subsidiaries of foreign-owned companies only compete for international projects when Canadian export financing assistance is being sought and domestic sourcing requirements must be met.

Traditionally, market demand has been for chemical pulp and newsprint. However, new pulping technology and paper mill modernizations and expansions are shifting this emphasis towards higher-yield pulp processes and specialty papers.

The Canadian equipment manufacturers are keeping pace with these international technology developments. A major constraint, however, is that the small scale of indigenous R&D makes it difficult for the industry to be at the leading edge of developments in all fields. For example, in an area of growing importance, such as paper finishing equipment, there is no Canadian production of coating and supercalendering machinery.

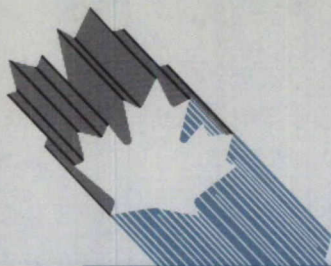
The future performance of the Canadian pulp and paper equipment industry will depend on its ability to develop better linkages with the pulp and paper companies, as is the case in the Nordic countries, and to improve its process and product technology through increased research and development. The success of Canadian consulting engineers in winning contracts for large, overseas, turnkey projects will continue to be an important source of demand for Canadian pulp and paper equipment.

The FTA is expected to have a minimal impact on the Canadian pulp and paper equipment sector.

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

Surface Transportation and Machinery Branch
Industry, Science and Technology Canada
Attention: Pulp and Paper Equipment
235 Queen Street
Ottawa, Ontario
K1A 0H5

(613) 954-3221



PRINCIPAL STATISTICS

SIC(s) COVERED: 3199 (1980)*

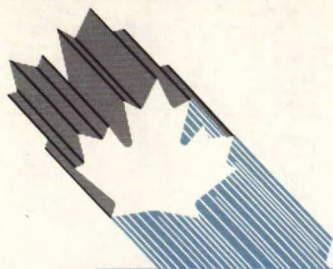
	1973	1982	1983	1984	1985 ^e	1986 ^e	1987
Establishments	N/A	N/A	N/A	N/A	N/A	N/A	50
Employment	N/A	N/A	N/A	N/A	N/A	N/A	4 000
Shipments (\$ millions)	58	303	244	189	287	307	322

* Excludes Paper Converting Machinery

TRADE STATISTICS

	1973	1982	1983	1984	1985	1986	1987
Exports (\$ millions)	18	92	68	75	207	124	107
Domestic shipments (\$ millions)	40	211	176	114	80	183	215
Imports (\$ millions)	40	128	83	108	195	216	196
Canadian market (\$ millions)	80	339	259	222	275	399	411
Exports as % of shipments	31	30	28	40	72	40	33
Imports as % of domestic market	50	38	32	49	71	54	48
Source of imports (% of total value)				U.S.	E.C.	Asia	Others
		1982		53	21	3	23
		1983		60	24	3	13
		1984		67	20	5	8
		1985		50	36	5	9
		1986		44	22	5	29
		1987		50	28	5	17
Destination of exports (% of total value)				U.S.	E.C.	Asia	Others
		1982		57	2	1	40
		1983		68	2	2	27
		1984		76	5	4	15
		1985		42	2	50	6
		1986		63	4	13	20

(continued)



REGIONAL DISTRIBUTION — Average over the last 3 years

	Quebec	Ontario	B.C.
Establishments — % of total	65	30	5
Employment — % of total	70	25	5
Shipments — % of total	70	25	5

MAJOR FIRMS

Name	Ownership	Location of Head Offices
Beloit Canada Inc.	American	Montréal, Quebec
Ingersoll Rand (Canada) Inc.	American	Sherbrooke, Quebec
Black Clawson Kennedy Ltd.	American	Owen Sound, Ontario
Dorr Oliver (Canada) Ltd.	Canadian	Orillia, Ontario
Valmet Dominion Inc.	Finnish/Canadian	Lachine, Quebec
Hymac Ltd.	Canadian	Laval, Quebec
S.W. Hooper	Canadian	Sherbrooke, Quebec
Devron-Hercules	American	North Vancouver, B.C.
Laperrière & Verreault Inc.	Canadian	Three Rivers, Quebec
Flakt Ross Pulp and Paper Inc.	Swedish	La Salle, Quebec

e Estimate

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

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