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# *Canadian* EXCELLENCE-2000-2001

AGRICULTURE AND AGRI-FOOD

CONSTRUCTION,  
BUILDING AND  
FORESTRY PRODUCTS

CULTURAL INDUSTRIES

EDUCATION

ENERGY

ENVIRONMENT

FINANCIAL SERVICES

INFORMATION AND COMMUNICATION  
TECHNOLOGIES

LIFE SCIENCES

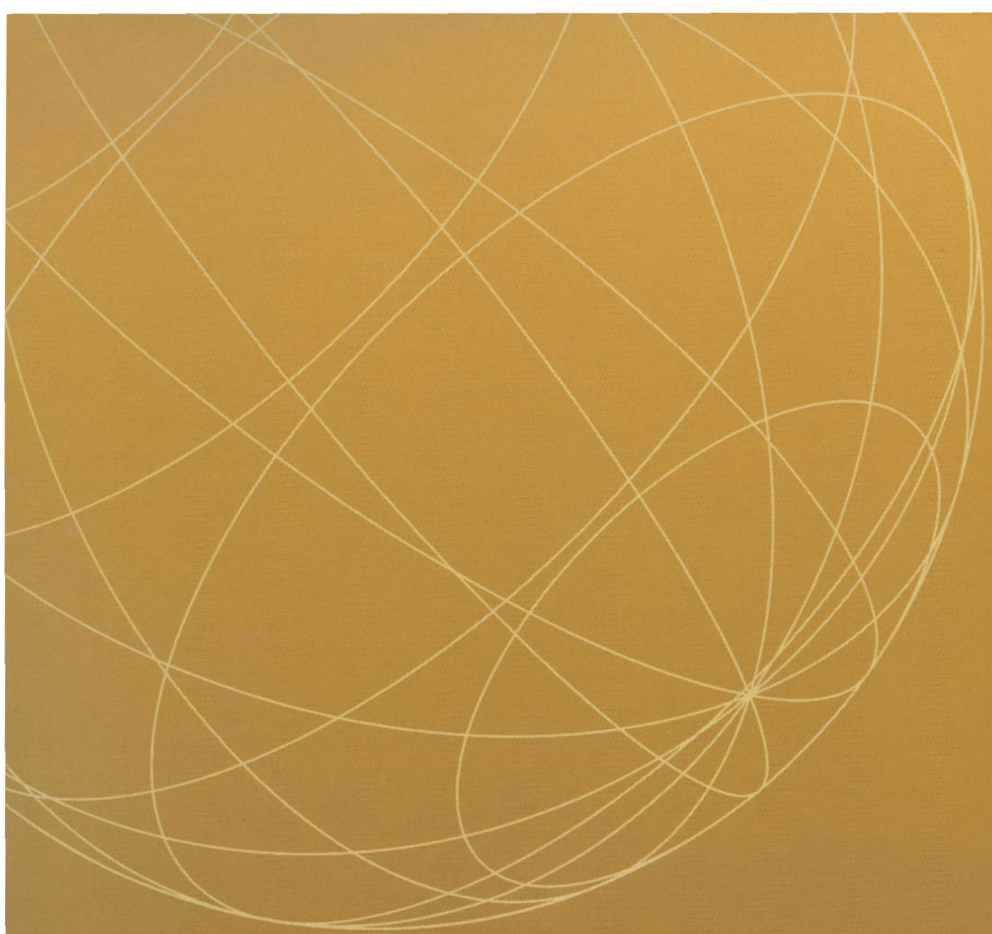
MINING AND MINERALS

TRANSPORTATION



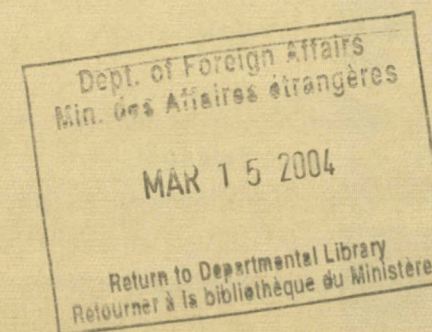
Canada





# Canadian

E X C E L L E N C E



*Canadians understand that building international business ties is vital to our continued prosperity. By forging stronger international trade and investment partnerships, we share the values and ingenuity that make Canada a global business leader. Through Team Canada, Canadian governments and our business community are working to ensure that we continue to develop these partnerships and deliver the products, services and technology that our customers demand.*

THE RIGHT HONOURABLE  
**Jean Chrétien**  
PRIME MINISTER OF CANADA

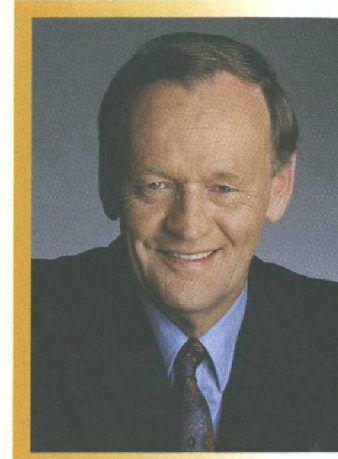
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## MESSAGE FROM THE PRIME MINISTER OF CANADA

Entering the 21st century, Canada continues to build a powerful, modern economy through creativity, innovation and expertise. Canadians understand that success in the global market place depends on their ability to utilize these strengths — and they are meeting the challenge of global competition head-on.

Our products, services and technologies are internationally recognized as being of excellent quality and cost-competitive, due in no small part to a qualified and well-educated workforce. Canadian companies continue to set many industry standards and are staking their claim as world leaders in a variety of fields.

This commitment to excellence spans all of our industry sectors. Canada is the world's largest exporter of minerals, metals and forest products. We are the world's largest producer of hydroelectric power and, because of the challenges that our geography and climate present, we have pioneered many new transmission technologies. Other emerging technologies, like wind power and new generation fuel cells, are well suited to satisfy the world's increasing requirements for energy services.

Canadian companies are now at the cutting edge of information and communication technology developments. With a sophisticated and innovative technology base and a highly skilled workforce, several Canadian companies have helped install and upgrade information and communication systems around the world. These same technological and labour advantages have helped fuel our world-renowned transportation industry.

As well, Canada's immense oil, gas and water reserves have fostered the development of environmentally-friendly methods of producing safe, abundant and efficient energy. Recognizing the environment as one of Canada's greatest natural resources, several companies are leading the way in developing equipment and services for cleaning the air, water and earth. The prevention and clean-up of environmental spills, geomatics, remote sensing, waste management, laboratory testing and research are just a few of the areas in which Canadian companies hold substantial expertise.

Canada's health and educational programs and services are often cited as being among the world's best. Groundbreaking technology and software developments, in addition to a telecommunications network unsurpassed in its capacity to move and process information, have kept Canada at the forefront in both of these areas.







The building and construction technology industry in Canada has a proven reputation for designing comfortable, energy-efficient homes. Through experience gained by building products for extreme Canadian climatic conditions, our companies can easily customize products and services to fit international specifications.

Many countries look to Canada as a source of agricultural expertise — and for good reason. As one of the few countries completely self-sufficient in food production, Canada boasts some of the world's most advanced agricultural and food biotechnology industries.

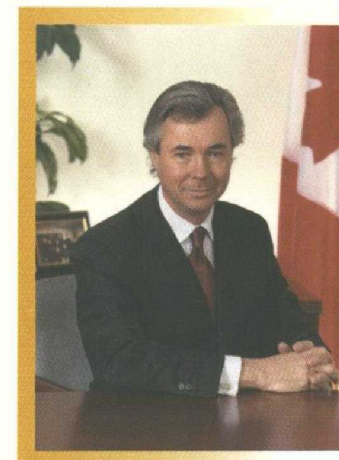
The Canadian cultural sector has also been experiencing rapid growth, particularly in the recording, publishing and film industries, with many Canadian artists winning international acclaim.

Accessing the capital necessary to purchase Canadian products and services can be done through one of our leading-edge financial institutions, which offer some of the most sophisticated trade finance services available.

Our companies are among the very best — but don't take my word for it. I invite you to ask the thousands of satisfied customers throughout the world who have purchased Canadian goods, services, technology and expertise. I have little doubt that you will find yourself believing in Canadian excellence.

The Right Honourable Jean Chrétien

PRIME MINISTER OF CANADA



## MESSAGE FROM CANADA'S MINISTER FOR INTERNATIONAL TRADE

The millennium started off with a bang as Canada's globally minded business community set new benchmarks for achievement in exporting to the world and in attracting investment. Exports of goods and services increased some 11 percent in 1999 to reach a record \$412 billion. Meanwhile, some \$37 billion in direct investment flowed into Canada in 1999, bringing the stock of foreign direct investment (FDI) in Canadian wealth-creating enterprises to \$240 billion.

The momentum continues to build. By the second quarter of 2000, we were exporting more than a billion dollars worth of goods a day. Every day of the week we now do more than \$2.2 billion worth of business — exports and imports of goods and services — with the world.

Canada has become a global success story. Now we are entering into an even faster-paced new chapter as Canadian companies embrace the challenges of the world's "new economy." In 1999, exports of telecommunications equipment, for example, increased 11 percent. Exports from the highly sophisticated automotive products sector increased by 24 percent. And exports of services generating royalty and licence fees grew 31 percent. To Canada's vast wealth of natural resources we have added the most valuable asset of all: the skills needed to successfully compete in the knowledge-intensive industries of the 21st century.

*Canadian Excellence* showcases the products, expertise and ingenuity Canada has to offer the world in such sectors as information and communication technologies, life sciences, finance, energy, environment, transportation, mining and minerals, agriculture and agri-food, construction and building material, culture and education.

These profiles will help explain what customers around the world are learning: that when you buy Canadian, you are buying the best. Canadian firms consistently demonstrate creativity and versatility in their approaches to worldwide challenges. They have the willingness to adapt — to satisfy the needs of their customers, transfer technology and form successful strategic alliances. And Canadians understand that strong partnerships are the key to success in business. Through Team Canada and other trade missions, as well as trade policy designed to help foster co-operation in the international marketplace, Canada reaches out to countries looking to capitalize on the opportunities that international trade brings.

I am confident you can find Canadian companies ready to help you achieve your business goals. All you need do is get in touch with one of our Canadian Trade Commissioners, who work in more than 125 locations around the world. They can help you identify and contact potential Canadian partners offering the products, services and technology you are looking for.

I invite you to become an integral part of the fabric of *Canadian Excellence* we are weaving together.

The Honourable Pierre Pettigrew

MINISTER FOR INTERNATIONAL TRADE







# Introduction

**C**anadian Excellence is a chronicle of the products, services, technologies and industries available in Canada and is a testament to the dedication, knowledge and expertise of the Canadians responsible for our success.

Canada has benefited greatly by engaging in trade with the rest of the world. In 1999, exports of goods and services accounted for 43 percent of gross domestic product (GDP), highest among the Group of Eight (G-8) industrialized economies. Canadian exporters produced a merchandise trade surplus of \$33.8 billion in 1999, up significantly from \$19.1 billion in 1998.

Canada benefits from belonging to a trade system based on predictable, clear rules. Whether we are negotiating new trade agreements with other World Trade Organization members or doing business with our free trade partners, the United States, Mexico, Chile and Israel, Canadians understand that our economic success stems largely from the creation of a level playing field. This understanding is part of the driving force behind ongoing efforts to expand trade in Asia Pacific, with the European Union and throughout the western hemisphere.

With low-cost, high-quality education and health-care systems, one of the most developed economies in the world and a per capita GDP of \$31 332, Canada is recognized worldwide as an example of successful development. Indeed, for the last seven years, the United Nations ranked Canada as the best place in the world to live in terms of quality of life.

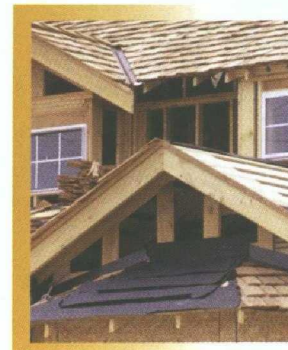
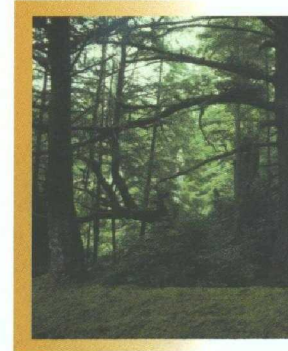
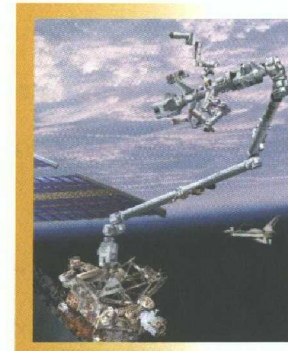
The federal government's fiscal policies have resulted in the elimination of the deficit, a falling debt burden, a budget surplus and, through tax cuts, increasing disposable income for Canadians. Inflation settled to a respectable 1.5 percent for 1999. Unemployment averaged 7.6 percent in 1999, the lowest rate in more than two decades. Job growth hit 3 percent in 1999, with 427 000 net jobs created — the highest total since 1979. The Organisation for Economic Co-operation and Development projects that Canada's economic growth will average 2.9 percent over the period 2000-2001 — second only to France in the G-7.

Canada offers one of the most advantageous business climates in the world. A well-educated and highly skilled labour force and a cutting-edge technology industry, combined with one of the world's most supportive research and development environments, have reinforced international investment. Foreign direct investment in Canada has more than doubled in 10 years, exceeding a total value of \$240 billion in 1999.

Although Canada already possesses one of the best technological infrastructures in the world and is second only to the United States in terms of Internet users, the government has made the building of a readily accessible and competitive "Information Highway" a priority — with the objective being to put all of Canada on-line early in the 21st century.

One of Canada's greatest assets is its enviable reputation in leading-edge technologies. With its small population spread over a vast and varied geography, Canada has long been a pioneer in telecommunications. It has arguably the most modern telephone system in the world and is home to some of the world's most innovative telecommunications companies.

Add to this abundant natural resources and low-cost energy supplies; safe, clean and modern cities; breathtaking natural beauty; a highly regarded legal system that ensures transparency and the rule of law; and a tradition of social tolerance and acceptance, and there can be no doubt that it would be difficult to find a better business and investment partner than Canada.





# Agriculture and Agri-food



Canada is a leading producer and exporter in the increasingly sophisticated international food and beverage marketplace. Not only is it the perfect place to shop for competitively priced products and technologies, but it also offers enticing investment opportunities and strategic alliance partnerships.

Capital investment in Canadian-based food and beverage processing now totals more than \$2 billion a year. Offering an internationally respected agri-food inspection system, Canada is highly committed to food safety and quality. It also welcomes and encourages investment in its food and beverage sector through policies that promote investment and growth. Over three quarters of the world's leading companies have already invested in Canadian processing facilities, confirming Canada's reputation as the most lucrative investment location in North America.

Under the North American Free Trade Agreement, Canadian agri-food companies have gained preferential access to the U.S. and Mexican markets of close to 370 million consumers. In 1999, Canadian agri-food companies recorded \$21.7 billion in sales, mostly to customers in the United States, Japan, the European Union, China and Mexico. The secret to Canada's success in this area has been a combination of high-quality foodstuffs and dramatically improved efficiency.



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Canadian companies are committed to the international marketplace, where demand for value-added foods and beverages is booming, especially in emerging economies. Sectors in which Canadian agri-food interests are internationally competitive include cereal grains, seafood and aquaculture, vegetable oils, meat and animal genetics, and processed food and beverages.

## GRAINS AND OILSEEDS

With international sales of \$8.2 billion in 1999, Canada has an undisputed reputation as a reliable supplier of high-quality grains and oilseeds. Canada produces a wide range of grains, including wheat, barley, corn, oats and rye, and oilseeds including canola, flax and soybean. Canada's leading-edge research has developed many varieties of grains and oilseeds with superior protein composition and processing characteristics as well as desirable agronomic characteristics. The development of canola oil is an excellent example. It has become a popular vegetable oil worldwide, both for direct consumption and for use as an ingredient in processed food.

Canadian grain and oilseed processing industries include wheat, corn and oat milling, malting, canola and soybean crushing for meal and oil, and the production of biscuit, breakfast cereal, pasta, gluten and starch.

## SEAFOOD AND AQUACULTURE

New processing technologies and product innovations are transforming Canada's seafood processing and export industries. Canada is now a world leader in processing seafood such as salmon, roe, prawns, lobster, surf clams, geoduck, scallops, crabs, herring, black cod, and other groundfish and shellfish species. It also leads in the processing of by-products for new food ingredients and industrial commodities such as chitin, chitosan and bi-polymer chemicals used in a wide range of industries, from pharmaceuticals to water treatment.

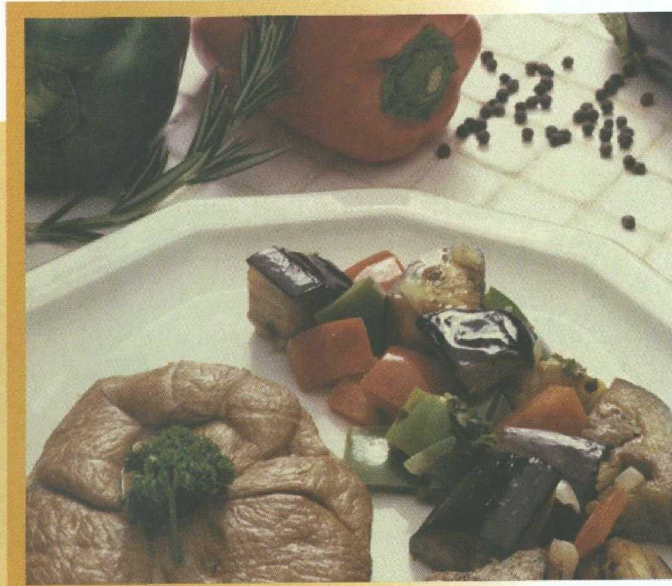
The effects of the decline of some groundfish stocks has been partially offset by innovative processing management and advanced technology. The industry has combined new overseas product sources and a greater emphasis on aquaculture products and services to strengthen its position in the marketplace — sales are now over \$3 billion annually. Often, alliances forged with foreign firms have created new supply sources and market opportunities.

## MEAT AND ANIMAL GENETICS

Canada is a major supplier of high-quality meats to world markets. The experience of Canadian livestock producers and meat processors and their state-of-the-art technology have forged Canada's excellent reputation in this area. Canada continues to develop new processing technologies in the handling, preservation and packaging of finished products.







Canada's two leading red meat sectors are beef and pork — with pork exports totalling \$1.3 billion in 1999 and representing 40 percent of Canadian production, Canada is the world's largest pork exporter outside of the European Union. With \$1.7 billion in exports in 1999, Canada is the fourth-largest beef exporter in the world outside of the European Union. These considerable sales are a result of efficient production methods, access to economical feed supplies, modern technology, strict inspection standards and Canada's superior breeding stock.

The development of superior dairy, beef and swine genetic material has translated into sales of over \$253 million in 1998 to more than 70 countries.

## PROCESSED FOODS AND BEVERAGES

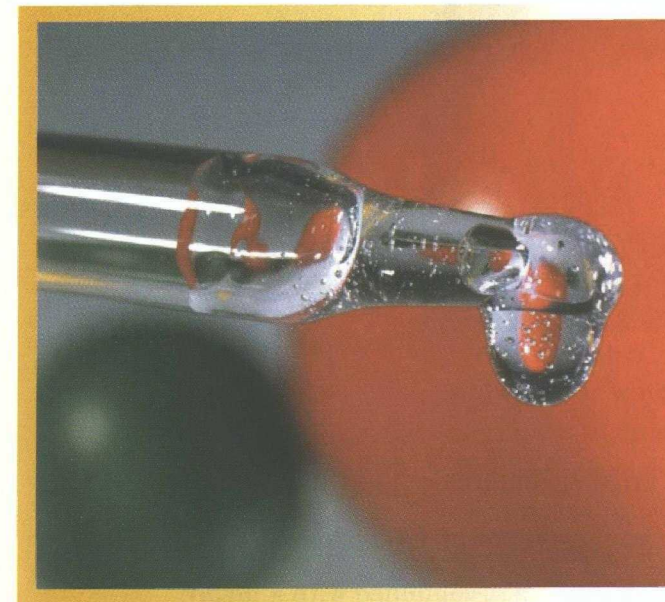
Canadian exports of consumer-oriented agri-food products have grown significantly over the last few years, from \$6.8 billion in 1996 to \$10.2 billion in 1999. Meat and poultry products top the list. Canada's meat processors specialize in red meats, including beef, veal, pork, lamb and horse, as well as a wide variety of other products ranging from fresh and frozen meats, to processed, smoked, canned and cooked meats, to sausage and deli meats. Following meat products in importance are dairy and cereal products, which include flour, baked goods, breakfast cereals, feeds and pasta. Other important exports are wines and spirits, fruits and vegetables, seafood products, soft drinks, confectioneries, vegetable oils and snack foods.

Canadian processed-food and beverage companies make good international partners. While Canada's larger processors ship a wide variety of foods, many smaller firms have become competitive by using flexible processing equipment and production facilities, allowing them to produce an attractive array of products. By adapting their production facilities, smaller firms can process private-label brands for retailers and other manufacturers under co-packing agreements and respond more quickly to specialized product and market opportunities.

## CANADA'S R&D ADVANCES IN FOOD AND BEVERAGE PROCESSING ARE SECOND TO NONE.

## RESEARCH AND DEVELOPMENT

Canada's research and development (R&D) advances in food and beverage processing are second to none, and R&D costs in Canada are highly competitive. Canada's academic and government research institutions house an impressive network of research professionals in food sciences and related disciplines. These institutions, comprising 11 universities and 18 federal agri-food research centres, work together to create multi-disciplinary research teams that collaborate with industry clients.



Canadians are clearly the main beneficiaries of this dedicated approach to technological innovation in the processed-food and beverage industry. The industry, however, welcomes investment in Canada and partnerships abroad, and entrepreneurs and consumers in other countries are taking advantage of Canadian advances in this field.

## BIOTECHNOLOGY

Canada's long-standing history of agricultural research expertise has made it a world leader in agricultural biotechnology. The new Canadian Biotechnology Strategy is designed to ensure that Canada remains a responsible provider and user of biotechnology products and services. In practice,

this means more product choices for farmers and consumers, improved food quality and safety, as well as environmental benefits. It also means careful management of biotechnology products and services, with regulations based on sound scientific procedures and data.

Forty-four percent of all biotechnology product and service revenue in Canada now comes from agricultural biotechnology — from both major multinational firms and small, innovative Canadian companies, which bring the results of their research to markets around the world. The Canadian government has already assessed and approved more than 30 agricultural biotechnology products, and thousands of controlled product field trials are now under way.

The agricultural biotechnology field also benefits from Canada's impressive R&D environment, which includes tax incentives and a large base of highly skilled workers. Canada's many centres of agricultural biotechnology excellence are enjoying the fruits of valuable partnerships between universities, governments and business, enabling Canada to continue to use its expertise to meet the world's food needs.





# Construction, Building and Forestry Products



PHOTO: © NATIONAL  
RESEARCH COUNCIL CANADA

**T**he construction and building products industry is one of Canada's largest and strongest, with an annual output of \$90 billion. Access to a rich and abundant supply of indigenous materials, combined with a highly skilled, efficient labour force and ample manufacturing capacity, has fuelled a 60-percent increase in the industry's exports in the last three years.

The international competitiveness of Canada's construction and building products is further enhanced by the willingness of Canadian companies to work with foreign partners to establish building standards and practices. Canada's building codes are constantly upgraded, and products must meet the exacting standards of the Canadian Standards Association. Canadian technologies in this area also reflect the high priority placed on quality and energy conservation, while making efficient use of sustainable resources.

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**CANADA IS  
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MANUFACTURED OR  
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HOUSING, WITH  
EXPORTS IN THIS  
AREA MORE THAN  
TRIPLING IN THE LAST  
THREE YEARS.**

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With exports expected to continue growing, Canada offers outstanding investment opportunities for countries the world over. Furthermore, the North American Free Trade Agreement gives investors tariff-free access to a construction and building products market valued at more than US\$600 billion.

## HOUSING

According to the Organization for Economic Cooperation and Development (OECD), Canadians are among the best-housed people in the world. Weather conditions, which vary from harsh, dry winters to hot, humid summers, have forced Canadian scientists to take the lead in developing world-class technologies in air control, heat and moisture flow, durability and fire safety. Canadian housing products incorporate first-rate building technologies exemplified by the Canadian-developed R2000 standard, which ensures that products provide maximum energy conservation and optimum internal air quality and comfort.

Canadian expertise in the industry ranges from complete turnkey projects, for which Canada is renowned in such places as China and Germany, to finished manufactured components. Canada is recognized as a world leader in manufactured or prefabricated housing, with exports in this area more than tripling in the last three years. Available as complete systems, Canada's prefabricated, wood-frame housing systems are easily transported and can be constructed quickly, and both systems are earthquake resistant. Possessing many of the same qualities, Canadian panelled housing systems are equally suited to export markets.

Many Canadian companies are incorporating a Healthy Housing approach to design, construction or refurbishing methods, making the best use of environmentally friendly materials that require less energy to manufacture and reduce pollution inside the home. The Healthy Housing approach to energy efficiency combines high levels of insulation, solar heating and efficient appliances to dramatically reduce energy consumption.

Canadians are also at the forefront in high-rise construction technologies such as concrete composite systems, having pioneered the leading flying-form construction techniques for medium- and high-rise apartment blocks.

## BUILDING PRODUCTS AND MATERIALS

Canada's building products sector encompasses more than 400 different manufactured products, valued at \$39.7 billion annually. Among the highly competitive products in which Canada excels are windows, doors





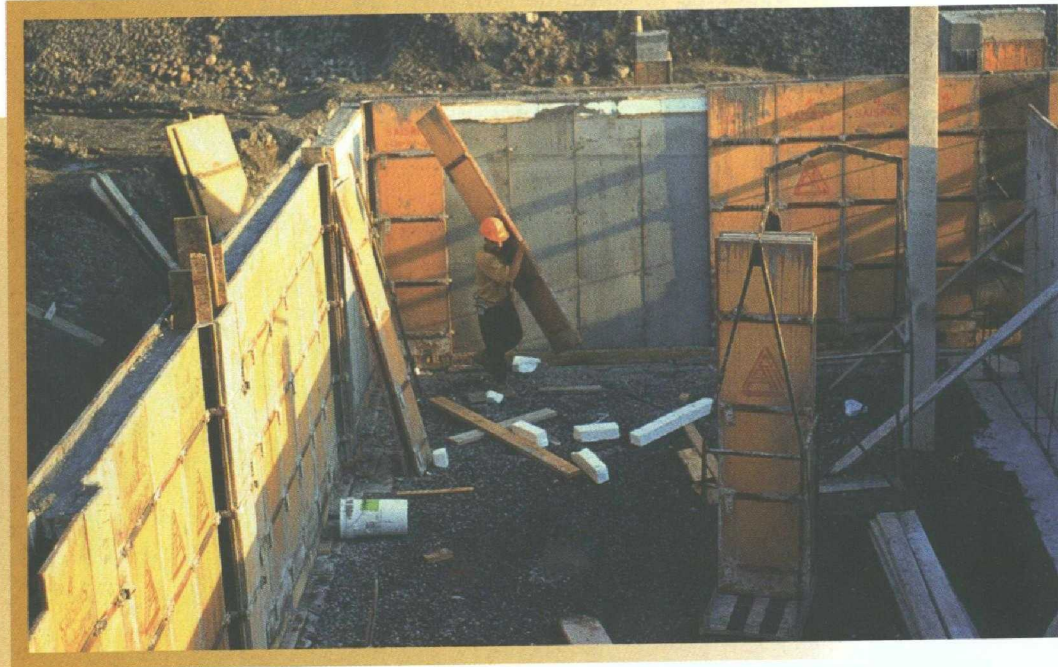


PHOTO: © NATIONAL RESEARCH COUNCIL CANADA

and cabinets. Exports of wood and plastic windows and doors have increased more than 186 percent over the past five years. Canadian-manufactured kitchen cabinets also enjoy a worldwide reputation for quality, design and finish as well as excellent export growth capacity.

Canada is recognized for its heating system technologies, including thermal energy conservation. Its leading-edge heat recovery ventilators and air-exchange technology reflect the high priority the Canadian industry places on air quality. A Canadian breakthrough in air-flow technology and temperature and moisture control is the seamless house-wrap sheeting membrane.

Canada excels in construction and building materials ranging from trusses and insulated thin-brick panel-cladding materials to aluminum and vinyl cladding. Canadian scientists have developed innovative technologies in masonry veneer and asphalt roof shingling as well as high-density calcium silicate bricks.

Canadian companies have developed outstanding production systems for fast-formed concrete foundations. Shotcrete and other construction and restoration techniques such as dry-stacked concrete block-wall systems exemplify Canada's leading position in the use of concrete. Canada also leads the way in tilt-up concrete construction, curtain-wall construction technologies, and colour-coated steel production as well as the reconstitution of structural wood to form the highest-strength and best-quality composite materials.



## FORESTRY

With some 240 million hectares of commercial forests, Canada is home to some of the world's finest softwoods and hardwoods, including the world's second-largest commercial softwood forest. This fine resource base, combined with a highly skilled workforce, advanced technology and proximity to international markets, gives Canadian forest products a significant advantage in the world marketplace.

Canada is the world's largest exporter of forest products. In 1998, industry shipments totalled \$58 billion, three fifths of which were exported to markets around the world. Principal exports include high-quality primary products such as market pulp, newsprint, softwood lumber and wood-based panel products. The production and export of value-added products such as paper packaging, stationery and business papers, wood windows, doors, mouldings and furniture as well as wood building products are high-growth areas.

Two key groups comprise Canada's forestry sector: paper and allied industries, and wood industries, with most of the country's major forest firms producing both paper and wood products. Mills that produce commodity pulp and paper and wood products tend to be world-scale operations with integrated activities ranging from silviculture and harvesting to manufacturing, while producers of value-added products tend to be smaller operations.

Over its 200-year history, the Canadian forestry sector has evolved into a world-class, technologically advanced industry and a leader in sustainable forestation techniques. As well, a new Canadian standard has been developed for the certification of sustainable forest management.

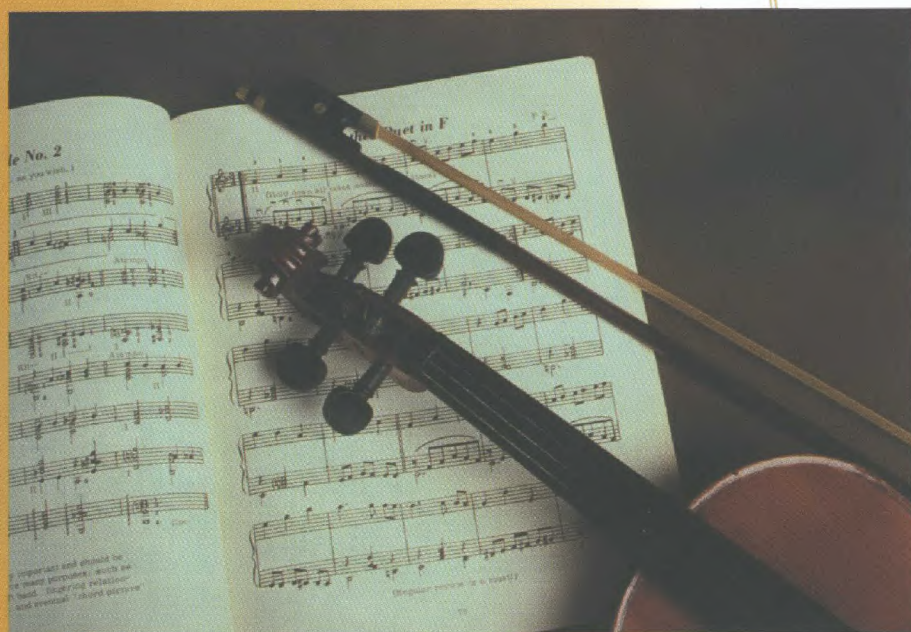
Three internationally competitive forest products research institutes have been established in Canada: the Pulp and Paper Research Institute of Canada, the Forest Engineering and Research Institute of Canada, and Forintek Canada Corporation. These institutes work collaboratively with industry and government to address technology, product innovation and environmental issues. Strong co-operation between industry and government over the last decade has resulted in the development of world-class technologies, especially in paper recycling. For example, the closed-loop technology has revolutionized the paper industry around the globe.

Canada's forest product companies have made significant investments in capacity-increasing manufacturing and environmental technologies, resulting in high-quality, cost-competitive products that respect the sensitive ecological balance of forest resources.

**WITH SOME  
240 MILLION  
HECTARES OF  
COMMERCIAL  
FORESTS, CANADA  
IS HOME TO SOME  
OF THE WORLD'S  
FINEST SOFTWOODS  
AND HARDWOODS,  
INCLUDING THE  
WORLD'S SECOND-  
LARGEST COMMERCIAL  
SOFTWOOD FOREST.**







**T**he Canadian arts and cultural industries have succeeded on the international stage by sharing our rich cultural heritage through film, music, visual arts and literature. Canadian authors, film producers and visual artists have won international acclaim, receiving some of the world's most prestigious prizes.

Rapid growth in exports has taken place in virtually all sectors of Canadian cultural industries. The recording industry witnessed a growth in exports of 324 percent between 1990 and 1995. Export sales of books, in both English and French, almost doubled between 1996 and 1999. Exports of Canadian films tripled over the same period. Supported by first-rate technology in areas such as telecommunications, broadcasting and multimedia, the industry is well poised to continue this growth.



## PUBLISHING

The high quality of Canadian books is recognized internationally. Canada's 490 publishers and agents sold over \$1.9 billion worth of product between 1996 and 1997, ranging from books by Margaret Atwood, winner of France's Order of Arts and Letters, and Michael Ondaatje, winner of the Booker Prize, to Harlequin Romances.

Canada's exports of books have increased in recent years from \$271 million in 1996 to \$407 million in 1999. To enhance our publishers' success around the world, the Association for the Export of Canadian Books co-ordinates the publishing industry's presence at major international book fairs such as Guadalajara, Frankfurt, Bologna and BookExpo America (Chicago), and produces a series of publications aimed at promoting Canadian publishers' works worldwide.

## MUSIC

Canadian music and sound recording exports reached over \$433 million in 1999. Six major multinational firms, as well as 200 independent recording companies, operate in Canada. The Canadian music industry also benefits from producing for both English- and French-speaking markets. Canada is the world's second-largest producer of French-language recordings, after France, and the third-largest producer of English recordings, after the United States and the United Kingdom. In addition, more than 200 titles of Canadian Aboriginal music are available. While home to many recording artists of international acclaim, Canada is also known in the international recording industry for its expertise in recording studio technology.

**CANADIAN AUTHORS,  
FILM PRODUCERS AND  
ARTISTS HAVE WON  
INTERNATIONAL  
ACCLAIM, RECEIVING  
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WORLD'S MOST  
PRESTIGIOUS PRIZES.**

## FILM AND TELEVISION

Canada's film and television industries have been remarkably successful, given a small population that is culturally and linguistically diverse and the strong influence of foreign content. Total production activity increased in 1998-99 to reach \$3.7 billion.

### Film

International partners are attracted to Canada's expertise in the filmmaking industry, and Canadian companies are active in sharing this expertise. Canada has over 46 official audio-visual co-production agreements in effect in 54 countries, which have led to wider distribution and success in international media. In fact, treaty co-productions enjoyed a major increase in 1998-99, nearly doubling to \$823 million. Recent successful co-productions include *The Red Violin* and *Stardom*. Moreover, Canada's highly skilled technical services and excellent infrastructure have made Canada a major centre for film location shooting.





## Television

Broadcasting is one of the largest and fastest-growing components of Canada's cultural industries. Canada has three national English-language television networks and three French networks, several provincial educational television services, 48 specialty programming services, 15 French specialty services, one national French specialty service, five third-language specialty services, five premium services, four pay-per-view services and two direct-to-home satellite licensees. Canada also operates an international radio and broadcasting service, Radio Canada International, and is one of the founding partners of TV-5, the international French-language television service seen around the world. In 1998-99, the value of television production grew to reach \$2.8 billion. Given the increased number of private, specialty and pay-TV services, an all-time high of \$215 million was spent in 1998 on the acquisition of Canadian programming.

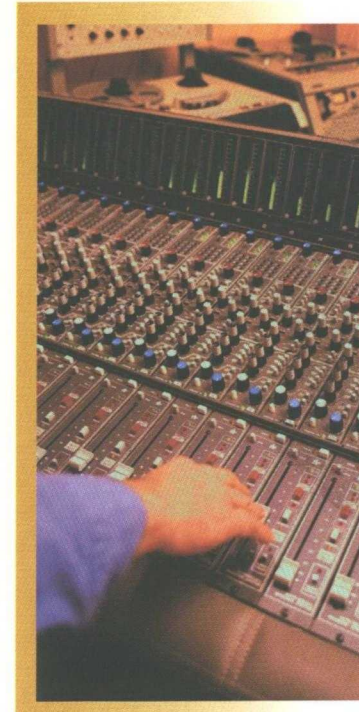
As new cable, pay-TV and satellite broadcast services emerge around the world, Canadians are well equipped to provide their expertise. Already, many Canadian television programming service holdings such as CanWest Global and Chum City International are active in international markets, including Australia, New Zealand and Ireland.

## MULTIMEDIA

There are more than 500 producers of multimedia of varying specializations in Canada. Canada has the right mix of education, content, technology, infrastructure, skills and savvy to nurture multimedia development. Canadian-based companies such as Alias, SoftImage and Corel have been at the forefront of developing graphics, animation and special-effects software, while courses such as the animation program at Sheridan College in Toronto offer students a world-class education in this highly specialized area. It is estimated that 60 percent of the software used in Hollywood was developed in Canada.

## VISUAL ARTS

The visual arts sector has experienced significant growth in Canada over the past three decades. The domestic market has seen a healthy development, both in expansion of market and in creative activity on the production side. The sector is in a good position to develop its export markets. In the past decade, we have already witnessed important penetration on the international scene, mostly by individual artists. They are often invited to participate in major international events such as the Venice Biennale, São Paulo Biennale, Sydney Biennale, and Documenta in Kassel. A number of associations, including the Professional Art Dealers Association of Canada (PADAC), the Saskatchewan Professional Art Galleries Association and the Association des galeries d'art contemporain (Montreal), support their members in the promotion of Canadian art and artists around the world. Art fairs are key to familiarizing international art collectors, dealers and curators with Canadian art.



Canada is also gaining international attention through domestic events that feature an international component, including exhibitions organized by the Ydessa Hendeles Foundation in Toronto and the Musée d'art contemporain in Montreal, and international cultural events such as "Le mois de la photo" in Montreal, the photo festival "Contact" in Toronto, the Biennale de Montréal, and the Toronto International Art Fair.

## CRAFTS

The export of Canadian arts and crafts is a growth sector, thanks in large part to the creativity of Canadian artists and artisans and the quality of their products. There are about 250 to 300 export-ready craft and giftware producers in Canada. The contemporary crafts sector represents a range of products from unique, handmade and individually created collectable goods to some larger production objects. The main export markets for giftware and luxury items are the United States, France, Italy and the United Kingdom.

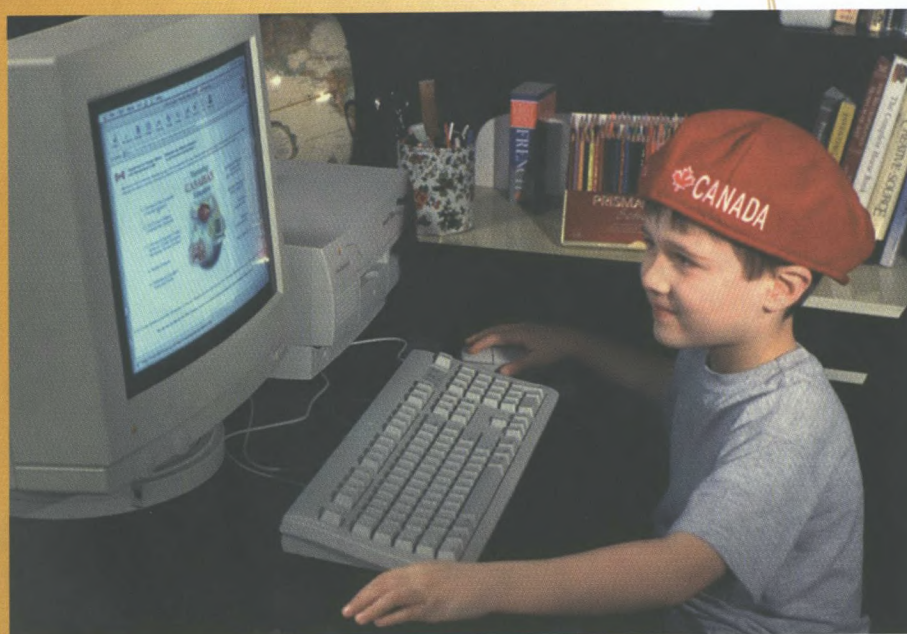
With native wholesalers and producers attending international trade shows in Canada, the United States and Europe, arts and crafts products are making their way into the export market. To date, efforts have been focussed on the U.S. and German markets, but there is increased emphasis on the potential offered by other European markets such as Italy, Belgium and the Netherlands, and Asia. Canadian producers often sell to European and Asian buyers through U.S. trade shows.

## MUSEUM GOODS AND SERVICES

Canadian museums and museum consulting firms have achieved international recognition for their expertise in museum planning and managing, in museum training programs, and in information technology. Some of the larger museums such as the Royal Ontario Museum, the Glenbow Museum and the Royal British Columbia Museum have begun to develop and to export consulting services, making the expertise of senior staff members available to other museums and to the private sector. At the Ontario Science Centre, the International Marketing Department's Museum Development Services have been active internationally for a number of years. Principal activities include feasibility studies, advice on the creation and operation of new science centres, and conceptual exhibit design plans. There are also a number of Canadian consulting firms specializing in museums who work both nationally and internationally. They have been active internationally in recent years with, among others, the development of new "turnkey" museums in Singapore, the Philippines and Saudi Arabia.







**T**he global shift from resource-based to knowledge-based economies has resulted in a growing demand for education and training services all over the world. Mature and emerging economies alike recognize that a highly educated and trained workforce is one of a country's most important resources. Canada has gained international respect and admiration for the excellence of its educational system and training programs.

Canadians have always placed a premium on education. The percentage of adults who have received a college, technical or university education is higher in Canada than in most other member countries of the Organization for Economic Cooperation and Development (OECD), including the United States, the United Kingdom and France. Canada has made significant investments to prepare for a knowledge-based economy by creating an infrastructure supported by multi-dimensional educational content. Canadian education and training providers offer their international clientele high-quality education and state-of-the-art facilities.

Education and training is not only an industry in itself but a significant component of other leading economic sectors including information and communication technologies, finance and banking, transportation, agriculture, energy and natural resources, health care, environment and aerospace.

Canadian universities are widely known and respected around the world as centres for leading-edge technical development and training, all of which offer top-quality programs and instruction in English or French, or in both languages.



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Canada's community colleges, which provide training for specific careers, also offer excellent post-secondary education and training. Often, a course of study will emphasize technical skills coupled with hands-on experience. Many Canadian students now combine university degrees with college degrees to ensure they obtain the highest level of academic qualifications possible and specific training in a targeted employment area.

Learning is a lifetime occupation in Canada. Many Canadians undertake mid-career training through continuing education courses to upgrade their qualifications, acquire new professional skills and keep pace with technological changes and new workplace theories and practices. Canadian educational institutions and corporations offer courses specifically designed to meet the needs of a rapidly changing workforce and even more rapidly changing technology.

In 1999, there were 114 167 international students authorized to study in Canadian education and training institutions. International students who have studied in Canada speak highly of its safe and clean surroundings, high quality of instruction and state-of-the-art facilities.

Tuition fees for international students vary among institutions and programs of study, and in many cases are lower than in the United States and the United Kingdom.







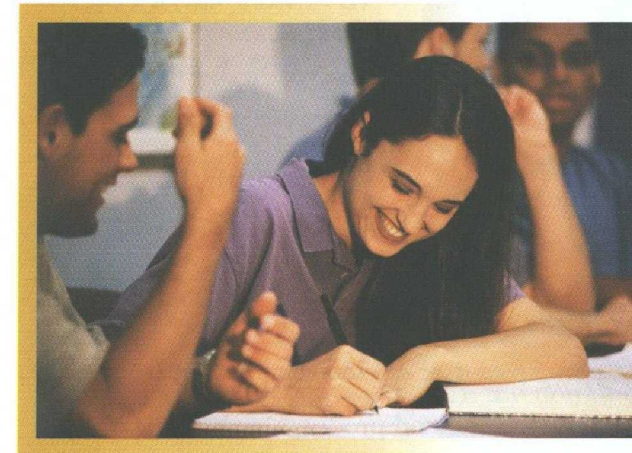
Canada has initiated several marketing channels that provide on-the-ground assistance to Canadian education exporters to promote their programs, services and products in international markets. The Canadian Education Centre Network (CECN), through 10 offices in Asia Pacific (Bangkok, Hong Kong, Jakarta, Kuala Lumpur, New Delhi, Singapore, Seoul, Taipei, Beijing and Canberra) and five in Latin America (Mexico City, Buenos Aires, Bogotá, São Paulo and Santiago), promotes and markets Canada as a destination for international students as well as a source of international corporate and group training.

In Europe and the Middle East, three Education Resource Centres, based in the Canadian embassies in Athens (Greece), Abu Dhabi (United Arab Emirates) and Ankara (Turkey), help Canadian education

exporters access these markets. The Canadian government has also established partnerships with non-governmental organizations in countries like Germany, Finland and Venezuela to promote Canadian education.

Since Canada is a large country, distance education allows Canadians in remote areas to pursue their studies by correspondence. Many Canadian educational institutions are actively involved in distance education, and several offer such studies overseas. In many cases, Canadian information and communication technology suppliers and educational institutions work with foreign ministries of education or economic development to make distance learning possible from cities around the world.

In January 1999, Canada announced the opening of the first of a new generation of marketing centres in Kyiv, Ukraine. The Canadian Learning Centre (CLC) is a high-tech office designed to promote Canadian capacity in educational services and products. Unlike a Canadian Education Centre or an Education Resource Centre, the primary focus of a CLC is not the recruitment of students to Canada. In contrast, CLCs bring Canadian educational capacity, particularly new learning technologies and distance education courses, directly to the target country. Through partnerships with private industry, public education institutions and government, CLCs are models of distance- and technology-mediated learning overseas, permitting students to receive education from Canadian institutions while remaining in their home countries.



Canada, already with an excellent education system, talented human resource pool and world-class technological infrastructure, is quickly developing into a leader in the new field of multimedia. Highly interactive, multimedia combines content (text, pictures, sound, music, graphics, data, animation, full-motion video) to create a new world of communication products. Largely delivered on CD-ROM or through the Internet, multimedia presentations have become an innovative and effective way to inform and educate.

There are more than 500 multimedia producers in Canada — with total revenues of about \$350 million in 1998 — which employ some 3800 people. Experiencing tremendous growth, the sector was expected to add another 3000 jobs in the year 2000 and increase revenues to around \$690 million. Courses such as the Multimedia Professional Studies program at Sheridan College in Toronto will help ensure that Canada has a steady supply of new talent and expertise in this exciting new area.







PHOTO: ATOMIC ENERGY OF CANADA LIMITED

## ELECTRICAL

Canada is the world's third-largest per-capita user of electrical power. It is not surprising, then, that electricity and related products and services are cornerstones of its economy.

Plentiful, inexpensive energy is essential to provide heat in a northern climate, to transport goods in the second-largest country in the world and to run a large industrial economy. A good supply of high-quality electricity is also essential to support Canada's rapidly growing information economy. In spite of all the demands and challenges placed on Canada's electrical power industry, consulting engineering firms, equipment manufacturers and project developers have succeeded in making Canada a world leader.

Canada's great needs for electricity are met by the availability of abundant energy resources — water, coal, natural gas and uranium. Sixty-four percent of Canada's electrical power is generated from hydro sources, 20 percent from thermal and 16 percent from nuclear. Its electrical power industry had assets

**CANADIANS HAVE DEVELOPED A WEALTH OF KNOWLEDGE AND EXPERIENCE IN BUILDING SYSTEMS TO GENERATE, TRANSMIT AND DISTRIBUTE POWER. THEY HAVE DESIGNED, BUILT AND OPERATED SOME OF THE WORLD'S LARGEST AND MOST COMPLEX ELECTRICAL PROJECTS.**

of \$148 billion in 1997 and earns \$35 billion in revenue annually. Canadian utilities directly employ about 78 000 people, with an additional 25 000 working for manufacturing and engineering companies.

Canadians have developed a wealth of knowledge and experience in building systems to generate, transmit and distribute power. They have designed, built and operated some of the world's largest and most complex electrical projects, such as the James Bay and Niagara Falls projects in Canada. In the last 10 years, the industry has focussed on its strengths in niche markets. To provide solutions for today's utility needs, Canadian suppliers are now emphasizing short lead times, flexible product offerings, more standardized products, performance guarantees and strong support services.

## NUCLEAR

Atomic Energy of Canada Limited is the third-largest global supplier of nuclear energy systems, offering a unique technology in its CANDU power system. Units have been running successfully in Canada for more than 25 years, and in the Republic of Korea and Argentina for more than 15 years. In 1996, the first CANDU system in Europe, Cernavoda Unit 1, began operating in Romania, while two other CANDU-6 units are under construction at the Qinshan site in China.

In the non-nuclear power generation area, export products range from small hydro installations, to modular, efficient gas turbines for distributed generation, to power boilers, to the world's largest air-cooled hydro generator in Venezuela. Canadian expertise in hydro power has been applied to many projects in China, including Geheyuan (1280 MW), Ertan (3300 MW) and Three Gorges (18 000 MW).

## NEW-GENERATION TECHNOLOGIES

New-generation technologies, including wind power and photovoltaic and fuel cells, which possess considerable environmental advantages, are currently being developed in Canada. Some of these emerging technologies are also well suited to filling increasing requirements for distributed generation and customized energy services. One example is the Ballard Generation System 250-kilowatt natural gas-powered fuel cell power plant for stationary power applications.



PHOTO: BALLARD POWER

With suitable hydro sites in Canada often located far from the marketplace, Canadian companies have had to be innovative in securing efficient power transmission. New Canadian transmission





technologies include the world's first 735-kilovolt (kV) transmission line, which utilizes state-of-the-art extra high voltage alternating current and high-voltage direct current.

Counting all transmission and distribution lines rated 50 kV and higher, Canada's bulk transmission network measures 158 156 kilometres of high-voltage power lines. The experienced and capable suppliers who helped develop this network in Canada are ready to provide the international marketplace with this same advanced capability. Among the products they offer are transformers, switchgear, wire and cable as well as the latest generations of supervisory control and data acquisition (SCADA) and other network management systems.

In addition to equipment manufacturers, Canada has over 200 consulting engineering firms and engineering contractors, many with established track records in world markets for power station rehabilitation. Larger Canadian companies are able to take on the role of an Engineer, Procure, Construct contractor, assuming full responsibility for a plant's construction and start-up, generally on a fixed-price turnkey basis. Some companies provide total project solutions, including complete financial structuring, and occasionally take their own investment positions.

The advent of competition in Canada's electrical sector has encouraged the growth of small enterprises with control, monitoring and other innovative technologies. Advanced products offered by Canada in this area range from robotic repair and maintenance units, to diagnostic and control systems, to generation scheduling and user management software.

There are also a number of companies that provide plant refurbishment services. Choosing refurbishment and/or repowering over building new generating capacity can lead to substantial improvements in capacity, efficiency and environmental performance. Canadian utilities have turned increasingly to the Repair, Modernize, Upgrade option as a plant reaches the end of its life cycle and have developed state-of-the-art techniques and equipment in this area. Several Canadian utilities have refurbished existing conventional steam electrical power plant units, enabling them to operate in a more efficient and environmentally safer manner.

### OIL AND GAS

The long-running success of oil and tar sands development in Alberta and, more recently, the development of oil and gas reserves off Canada's Atlantic coast have helped establish Canada as a leader in oil and gas exploration and development. Canada is at the forefront of the latest developments in enhanced recovery techniques and oil sands extraction. With nearly 2300 major firms combining for \$10 billion in production in 1998, 30 percent of which was



PHOTO: HIBERNIA



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exported, the oil and gas technologies and services sector in Canada continues to underpin a significant portion of the domestic economy.

In addition to contributing to a competitive domestic market, Canadian firms in the sector are well placed to take advantage of emerging opportunities overseas because of their state-of-the-art technology, expertise and technical personnel.

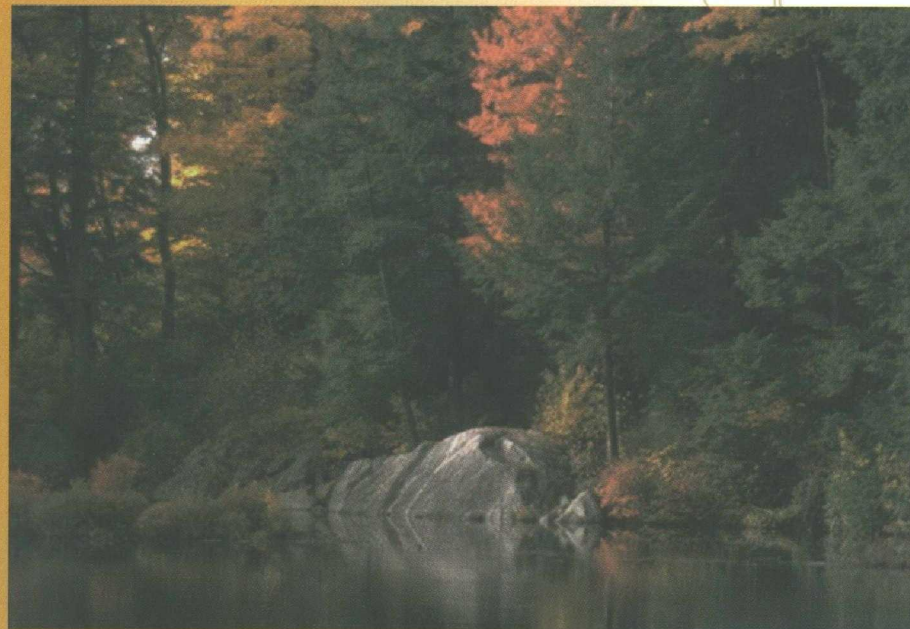
The Canadian oil and gas equipment and services industry is a world leader in several advanced petroleum equipment niches such as sour gas technologies, oil sands extraction and processing, enhanced recovery techniques and advanced drilling technologies. Canadian exports include geophysical prospecting equipment, drilling rigs and ancillary tools, pumping machinery, cementing and well-fracturing units, field-processing components such as dehydrators, separators and treaters, and drill and processing equipment for offshore drilling platforms. The Canadian industry also has an excellent reputation in the areas of product quality and after-sales service.

Internationally competitive and globally oriented, several Canadian firms have established foreign subsidiaries or joint ventures in such major trading areas as the United States, Europe, the republics of the former Soviet Union, India and Southeast Asia. In addition, manufacturers have established a worldwide network of agents, distributors and service companies to ensure that parts and service will be readily available to foreign customers.

The technologies, products, skills and management employed by Canadian firms allow for more efficient development of petroleum resources and reduce the environmental impact of energy use in Canada and abroad. These advantages have given Canadian equipment suppliers a competitive position in the international market, where similar technologies will be required to achieve the environmental improvements stipulated in the Kyoto Accord.

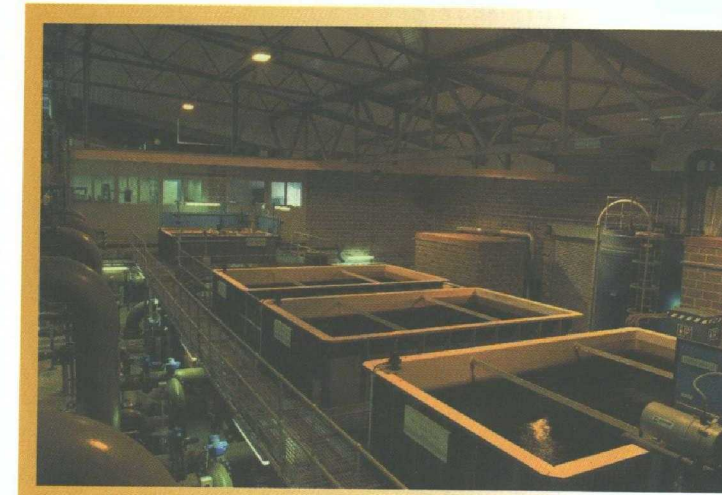






Canadians are committed to protecting their environment — to preserve the quality of air and water, protect nature and conserve wildlife. Canadians understand how environmental technologies provide jobs and economic growth, enhance ecosystems through protection and prevention, and improve our quality of life by reducing pollutants that harm our health and environment. This attitude has helped foster an environmental industry in Canada that is respected worldwide for its innovative approaches to ecological challenges.

There are over 6000 Canadian firms active in the environmental industry. Together, they earned environmental revenues of \$14.4 billion in 1998, most of which came from the sale of manufactured goods such as membranes for water treatment, heat exchangers, ventilation systems, recycling equipment, alternative fuel vehicle components and hydro turbines. Services such as consulting and environmental and energy engineering as well as a wide range of scientific and technical services are also growing steadily, particularly in spill prevention and clean-up, geomatics, remote sensing, waste management, laboratory testing and general research.



Most countries recognize that economic growth and environmental protection go hand in hand. While many are quickly developing their own capabilities, they still need to acquire efficient and workable service and equipment solutions. Clients and joint-venture partners around the world look to Canada for environmental expertise, whether in soil, water or air. Canada is a world leader in environmental services, biotechnology, remediation, monitoring and instrumentation, with more than 600 of Canada's environmental companies actively exporting.

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In 1998, Canada exported close to \$1.25 billion in environmental goods and services, representing almost 9 percent of its total environmental revenues. About 69 percent of these exports went to the United States, followed by Asia, Europe and South America.

## WASTE WATER MANAGEMENT

Canadian industrial waste water management firms, associated research and development centres and universities have developed technical solutions for complex municipal and industrial water and waste water treatment requirements. Canadian firms specialize in a variety of processes, including anaerobic technology, sequencing batch reactor technology, biological nutrient removal, reciprocating ion exchange, membrane systems, automated polymer dosing, ultraviolet oxidation and disinfection, wet air oxidation, waste water treatment plant modelling and wetlands technologies.

## AIR QUALITY MANAGEMENT

Air quality management equipment manufactured by Canadian companies can be grouped into four major categories: filters, extractors, specialized scrubber components and precipitators. Canadian companies have proven expertise in the management of sulphuric emissions and the effects of acid rain as well as in advanced industrial filtering systems.

Canadian air quality management firms have developed innovative, cost-effective solutions in such emerging sectors as continuous emissions monitoring with process controls, biofiltration, clean incineration technologies, hot-gas cleaning using advanced particle filters, and indoor and ambient air technologies.







PHOTO: ENVIRONMENT CANADA

### SOLID WASTE MANAGEMENT

Currently 80 percent of municipal and industrial solid waste in Canada is disposed of by landfilling processes, with the remainder disposed through recycling, resource recovery and incineration. As a result of the introduction of more stringent regulations in many countries, solid waste management has become one of Canada's fastest-growing environmental sectors. While the emphasis to date has been on the North American market, Canadian equipment, technologies and services are now being sold worldwide.

Canadian expertise in solid waste management includes composting and recycling technologies, material recovery facilities, co-generation incineration, waste management planning, sludge management, anaerobic treatment, soil remediation, landfill and liner design, and hazardous waste disposal.

### HAZARDOUS WASTE DISPOSAL AND SITE REMEDIATION

A number of Canadian waste management firms offer specialized services and technologies for oil and gas extraction and delivery, electrical power generation, and pulp and paper manufacturing, to name a few. Several firms in British Columbia, Alberta, Ontario and Nova Scotia have developed considerable expertise in cleaning up oil-contaminated sites and marine oil spills. Other unique Canadian technologies treat specific chlorinated contaminants, heavy metals or oily sludges.

New Canadian hazardous waste technologies also help prevent pollution and reduce and recycle hazardous waste. As well, many Canadian environmental service firms offer site assessments and diagnostics using advanced instrumentation in preparation for site remediation. A few companies market specialized thermal, biological, phyto and chemical technologies for contaminated soil treatment.

### ALTERNATIVE ENERGY TECHNOLOGIES AND ENERGY EFFICIENCY

The Kyoto Climate Change Convention is pointing the way to the future for energy companies relying on fossil fuels — greenhouse gas (GHG) emissions must be reduced. Energy efficiency and renewable energy technologies will be the primary means of doing so.

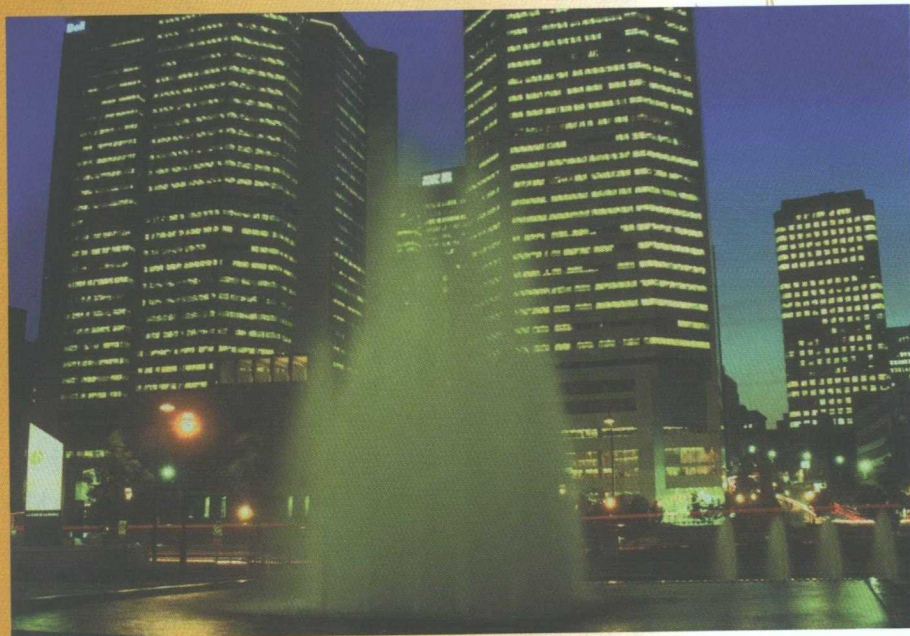
A number of Canadian environmental companies currently offer technological solutions that control emissions, improve energy efficiency and reduce GHG emissions. Fuel cell technology, small-scale hydro, and biomass fuel conversion, for instance, all provide efficient, low-emission sources of power, and are recognized as some of the best technological solutions to mitigate climate change. Canada is a world leader in the early commercialization of these technologies and is strategically positioned to capture a substantial share of the global market for micropower — small, clean, reliable and cheap generating technologies for use in transportation, electricity generation and portable heating products. In fact, Canadian firms are among the few in the world that have clustered to build and successfully demonstrate technically viable hydrogen fuel cell engines for buses.



PHOTO: BALLARD POWER







**C**anadian financial institutions offer a variety of products and services that have made them attractive to customers and investors around the world. They offer investments that are not only lucrative, but low in risk.

From banks, trust companies and co-operatives to insurance companies and stock exchanges, Canada's well-regulated financial institutions are among the safest in the world. Canadian legislators are very attentive to the rules and regulations that govern Canada's financial sector. They are determined to maintain a system that is stable and encourages competition.

Canadian financial institutions are also among Canada's leading export earners. Liberalization of financial regulations in North America, South America, the Caribbean, Europe and Asia is providing foreign clients with greater opportunities to take advantage of Canadian financial services.

Canada's six major banks have all established foreign commercial operations, most of them in a number of countries on several continents. Canadian life insurance companies, major investment brokers and trust companies operate virtually everywhere in the world.

These institutions have responded to the growing interest of foreign investors in Canada as a secure, low-restriction market offering attractive returns and an opportunity for risk diversification. They have also responded to the growing demand for competitive, reliable financial services in other countries.

While there are differences among the services offered by Canadian institutions, there are also some basic similarities:

- Banks focus on private and investment banking services for both Canadian and international customers. They also offer foreign exchange and treasury services, trade credit, guarantees and acceptances.
- Trust companies offer private and merchant banking, investment services and a range of advisory services to both international and Canadian clients.
- Life insurance companies sell individual policies and annuities to local customers, either directly, through brokers, or through corporate employee benefit plans.
- Brokerage houses offer Canadian securities — as well as securities from other countries — to international and Canadian customers.

Technological change is making modern financial institutions more efficient and user-friendly. Canadian financial institutions have developed a sophisticated capacity to manage efficient automated systems spanning large networks of branches across Canada. They possess a wealth of expertise in operating and co-ordinating branches, in the design of payments systems, and in many other areas. Some foreign financial institutions have already learned that they can speed up the modernization of their systems by taking advantage of these advisory resources.

The Canadian Depository for Securities has developed an automated facility for the electronic clearing of security transactions and the custody of securities. This facility helps reduce clearing costs through both its efficiency and its protection against fraud and corruption.







PHOTO: BMO NESBITT  
BURNS

Canadian institutions are always looking for ways to offer healthy returns on equity to international customers seeking opportunities that are diversified, potentially lucrative and safe. In recent years they have upgraded their capacity to offer assistance with investment banking, treasury and foreign exchange operations, and various private banking services. They are also experienced in the realm of venture capital through sponsorships and investments in venture funds that finance high-technology companies.

Canadian insurance companies have been successful at selling life and health insurance policies as well as pension plans and annuities to foreign companies. The Canadian advantage can be stated in one word: security. In Canada, life and health insurers must satisfy regulatory authorities that policy reserves are sufficient to meet the anticipated requirements of policyholders.

There are 132 life and health insurance companies in Canada. Since there are also no significant barriers to entry for foreign or domestic players (other than clear regulations that guarantee the safety of a client's money), the Canadian insurance industry is extremely competitive.

The system offers a variety of traditional life insurance products in health, accident and sickness, and annuities and other pension services. This Canadian system is appreciated in the United States and other foreign countries; more than 44 percent of the industry's revenues come from abroad. More than 10 million non-Canadians in 20 countries own more than \$1.1 trillion in life insurance policies underwritten by Canadian companies.

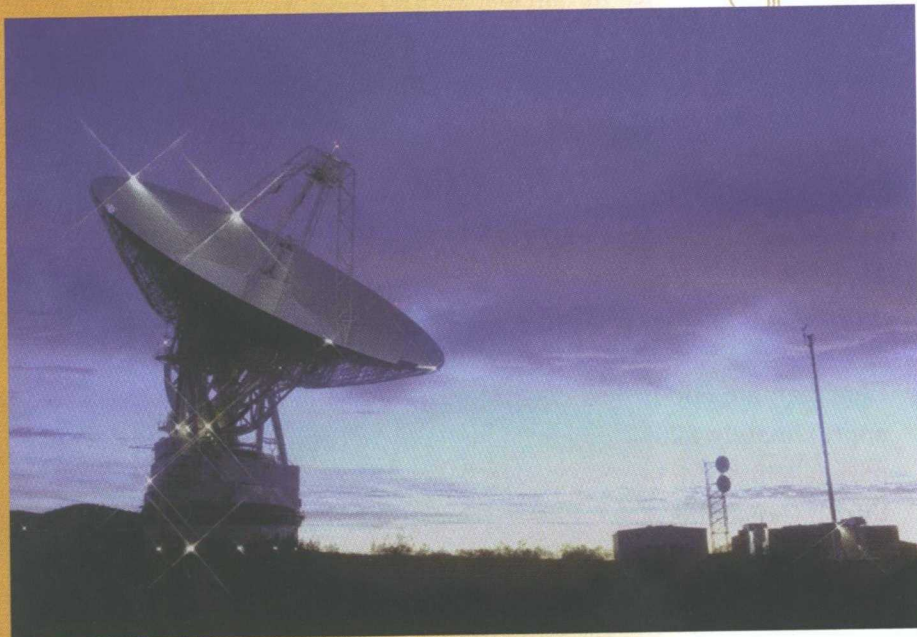
Although there has always been a strong regulatory framework for insurance companies in Canada, several steps were taken by the federal government in 1992 to enhance consumer protection. The Canadian industry itself provides a protection fund for policyholders with Canadian institutions. The government further enhanced the system's international reputation by bringing in a regime of Minimum Continued Capital and Surplus Requirements. This is similar to the requirements of the Bank for International Settlements, which ensure that banks have adequate capital available to settle all claims in even the most difficult circumstances.

Canadian life and health insurers possess worldwide assets of approximately \$200 billion. Canadians are the world's second-largest purchasers of life insurance (the Japanese are first, the Americans third). Canadians are discerning customers shopping in a competitive market; the quality of products offered by Canadian insurance companies is therefore high.





# Information and Communication Technologies



Leading-edge information and communication technologies (ICT) are key elements of a country's infrastructure and of its international competitiveness. Working from a sophisticated domestic base, Canadian companies have helped upgrade information and communication systems around the world.

Canadians have been setting the pace in some of these industries for more than a century. The very first telephone call was placed in Canada by Alexander Graham Bell, the Canadian inventor of the telephone. Canadian ICT companies continue to win contracts throughout the world, particularly in the highly competitive U.S. market.

One need only look at a map to see that Canada's communications systems have always had to overcome challenging geography and climatic extremes. Canada's recent telecommunications breakthroughs have coincided with information technology advances in software, computers, peripherals, instrumentation and services, multimedia, geomatics and electronic components. Canadian ICT suppliers are also responding to the growing



- CANADIAN TELECOMMUNICATIONS  
"FIRSTS" INCLUDE:**
- **THE WORLD'S FIRST ALL-OPTICAL NATIONAL R&D INTERNET (2000)**
  - **THE WORLD'S MOST POWERFUL GEOSTATIONARY MOBILE COMMUNICATIONS SATELLITE (1996)**
  - **THE WORLD'S MOST COMPREHENSIVE FIBRE-OPTIC NETWORK (1994)**
  - **THE WORLD'S LARGEST POINT-TO-POINT ASYNCHRONOUS TRANSFER MODE (ATM) NETWORK (1993)**
  - **THE WORLD'S LARGEST CONTIGUOUS CELLULAR NETWORK (1990)**
  - **THE WORLD'S FIRST NATIONAL GEOSTATIONARY SATELLITE (1972)**
  - **THE WORLD'S FIRST PACKET-SWITCHED NETWORK (1972)**
  - **THE WORLD'S FIRST DOMESTIC DIGITAL MICROWAVE NETWORK (1971)**

market demand for electronic commerce products by advancing their traditional expertise in document management, data-mining, multimedia tools and other areas to the Internet environment. At the same time, Canadian companies are developing a worldwide reputation in new areas like encryption.

## COMMUNICATION TECHNOLOGIES

Canadians are the largest users of telephones in the world — 99 percent of households have telephones and more than 90 percent have been digitized. As well, 92 percent of Canadians have access to multiple television channels through cable networks.

Canada has the lowest Internet access costs in the world. It is tied with the United States in Internet use per capita, is second only to the U.S. in Internet hosts per capita, and leads the world in the use of electronic banking.

Coast-to-coast fibre-optic networks provide a full range of commercial services as well as the necessary bandwidth required to develop and test tomorrow's high-speed multimedia services. The spiralling need for high-capacity data connectivity and the trend toward carrier consolidation have encouraged many

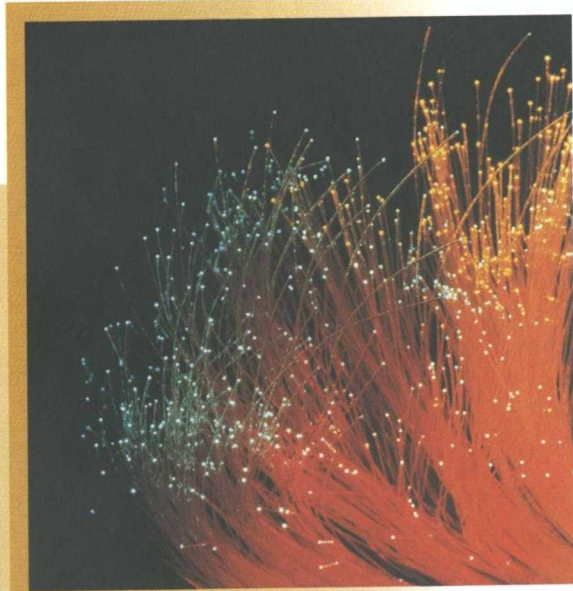
Canadian companies to invest in and develop broadband technology, which will allow them to offer a wider range of voice and data services.

Canadian telecommunications companies are active in such countries as the United States, the United Kingdom, Brazil, China, Thailand and the Philippines, installing the same efficient communications networks that Canadians have come to depend upon at home.

Over the next 10 years, Canada's local and long-distance networks will be upgraded to interactive, two-way broadband capacity, at which time about 85 percent of all businesses and homes in Canada will have access to the multimedia traffic lanes and technologies of the information highway. Canada's goal is to build the highest-quality, lowest-cost information network in the world.







In 1998, Canada sold over \$11.8 billion in telecommunications equipment, mostly to the United States, China and the United Kingdom. Canadian companies specialize in several areas of telecommunications, including switching systems, broadband and multimedia products and services, fibre-optic cabling, rural communications, submarine cable systems, satellite networking, computer telephony integration and mobile and cellular phones. In fact, there are very few ICT areas in which Canadian companies are not at the forefront.

The willingness to form strategic alliances and transfer technology is an essential characteristic of a good partner. Many joint trade and investment opportunities have been realized after representatives of other countries visited Canada through the Telecommunications Executive Management Institute of Canada education program. Countries are moving toward the creation of more open economic systems, welcoming healthy competition from abroad and joint enterprises within their own borders.

Canada itself encourages both competition and outside investment. Its regulatory agency, the Canadian Radio-television and Telecommunications Commission, has effectively opened competition for local telephone and international long-distance service to all suppliers, including cable companies, resellers and wireless providers. As a result, telecommunications companies can now provide new information and multimedia services such as home banking and shopping, distance education and telehealth.

## INFORMATION TECHNOLOGIES

Canadian exports of information technology products, including computers, consumer electronics, peripherals and software products, are on the rise. With Canadian firms recording strong performances and demonstrating growing capacity, offshore investors and companies are eager to form alliances in Canada.

Canada's expertise in information technologies has traditionally been, and continues to be, in software and multimedia products and in geomatic solutions. Revenues of the top 100 Canadian software product companies totalled over \$3.1 billion in 1999 (up 26 percent from 1998), of which 77 percent came from exports. Similarly, revenues of the top 50 professional service firms grew by 39 percent, reaching \$4.8 billion in 1999. Many of these

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MANAGEMENT.**

companies have formed strategic alliances with foreign partners to enhance their distribution capabilities and foster new product development.

Canada has established leading positions in specialized markets such as graphics, Internet tools, document management, geographic information systems, systems development and information technology management. The SchoolNet program, a co-operative venture among federal, provincial and territorial governments, is integrating the Internet into virtually every classroom, library and community across the country to help Canadians develop the skills to meet the demands of today's information- and knowledge-based economy.

In the field of new media or multimedia, Canadian firms are developing high-quality training and educational products and are also excelling in specialized areas such as animation, 3D simulation and photo applications. In fact, about 60 percent of the software used for movies in Hollywood, including *Apollo 13*, *Titanic* and *Godzilla*, was developed in Canada.

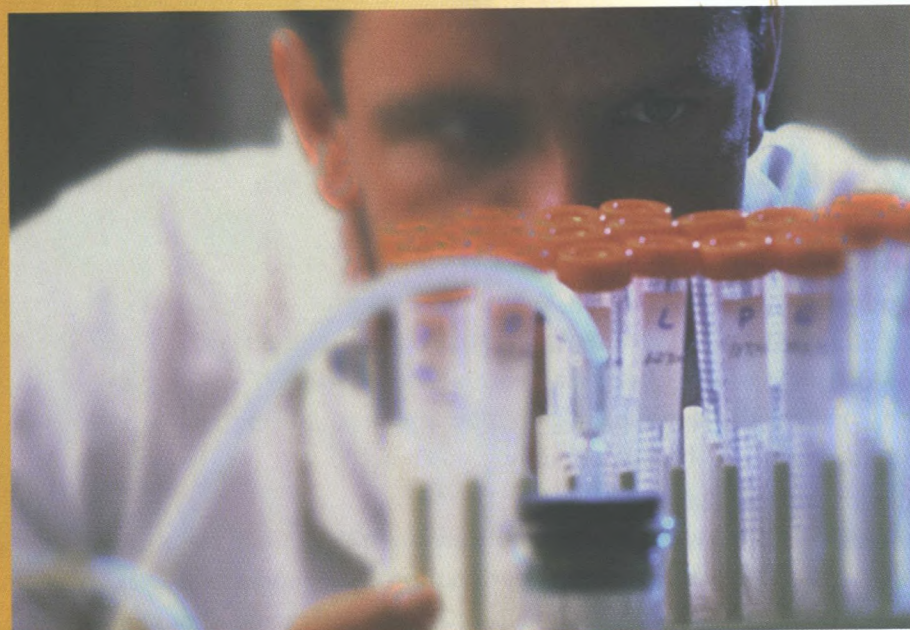
The United States is still the largest foreign market for Canada's software and new media industries, but Canadian companies are quickly building international alliances in countries such as the United Kingdom, Brazil, Peru, Norway and Singapore.

Geomatics, an area in which Canada has become recognized as an international leader, involves the acquisition, storage, analysis, distribution and management of geographically referenced information. This technology can be used to manage information in such diverse areas as natural resources, weather and tax collection. Canadian industry-government alliances have successfully captured a number of international geomatic projects.

Canada is also well positioned to compete in electronic commerce with its enviable policy framework, which includes an encryption policy, privacy and digital signature legislation, a framework for consumer protection currently under development by industry and consumer representatives, tax neutrality, and a comprehensive review of intellectual property rights.







## HEALTH CARE AND BIOTECHNOLOGY

Canada has become a life sciences success story. Over the past several years, all three levels of Canadian government, the research community and industry have combined to create a strong infrastructure and to support developments in the knowledge-intensive health and biotechnology industries.

In Canada, there is a commitment to universal access to publicly funded health care. Dramatic changes are taking place in the health-care environment, including an ageing population, better informed and more demanding consumers, and increasing requirements to provide health care in the community and in the home.

Recent federal government investments in Canada's research base and the supply of knowledge workers are significant. In 1999 the Canadian Institutes of Health Research were created, and in the year 2000 Genome Canada — a not-for-profit corporation to co-ordinate and fund Canadian genomics research — was established. These investments contribute to Canada's base of innovation and support commercialization, which encourages life sciences companies to deliver new diagnostic and therapeutic products to international markets.

**CANADA'S HEALTH INDUSTRIES ARE DYNAMIC, PROGRESSIVE AND KNOWLEDGE-BASED, PRODUCING HIGHLY MARKETABLE AND EXPORTABLE PRODUCTS, SERVICES AND EXPERTISE. THE 2000-2001 BUDGET FOR THE CANADIAN INSTITUTES OF HEALTH RESEARCH IS \$402 MILLION; VIRTUAL INSTITUTES IN 13 KEY HEALTH RESEARCH AREAS ARE BEING CREATED.**

## MEDICAL DEVICES

Within the medical devices sector, Canadian firms provide a wide range of products used for the diagnosis and treatment of ailments, including medical, surgical and dental equipment, furniture, supplies and consumables, orthopaedic appliances, prosthetics, electro-medical equipment, and diagnostic kits and reagents.

Among Canada's recognized strengths are cardiovascular products (heart valves, pacemakers, catheters), in-vitro diagnostics (for cancer and sexually transmitted diseases), radiation therapy and therapy planning software, medical imaging (3D imaging, image archiving systems, ultrasound scanners and related software), dental products (high-speed steam sterilizers, dental implants), assistive devices for home health care (mobility aids, peritoneal dialysis equipment and supplies), and orthopaedic, prosthetic and orthotic devices (artificial limbs, including myoelectric hands).

Canada's strengths in this area are based on several key factors, including:

- 800 manufacturing firms, employing some 18 000 people;
- about 90 percent of firms are Canadian-owned with most being small and medium-sized enterprises (SMEs);
- a strong national industry association (Medical Devices Canada), active regional industry associations, and a number of horizontal associations (e.g. Canadian Advanced Technology Association, Electro-Federation Canada);
- estimated production of \$2.7 billion in 1998; and
- a 70-percent increase in exports between 1995 and 1999, reaching \$1.4 billion.

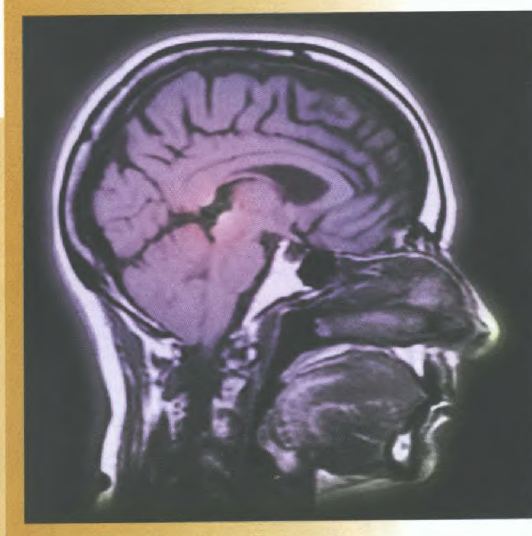
## HEALTH SERVICES

Canada's health services sector is made up primarily of SMEs, which provide services in Canada and abroad in the following general categories: telehealth, health telematics and informatics; contract research; home care; medical and diagnostic laboratory services; health administration and consultation; institutional and facilities management; continuing medical, nursing and health education and training; architectural and design services; and health insurance.

Telehealth, for example, has the potential to improve the access, quality and efficiency of the health-care sector. Canadian telehealth companies are creating solutions to deliver home-based care to patients from a distance, using health-care technology and the world's most advanced optical R&D Internet. More than 230 companies, many with strong linkages to large information and communication technology companies, are active in telehealth.







The federal government's CANARIE Telehealth Program allocates \$1 million per year for innovative R&D projects that will enhance the adoption of telehealth in Canada's health-care delivery system. Some of the most promising telehealth applications are telecardiology, telepathology, teleradiology, home telecare (including diagnostics and monitoring), medical imaging, consumer health information, health informatics and continuing professional education.

### PHARMACEUTICALS

Over 350 new pharmaceutical products are under development in Canada. The pharmaceutical industry encompasses three key segments: subsidiaries of multinational brand-name drug producers, many with research and product mandates; Canadian-owned generic drug companies; and a dynamic and growing small and medium-sized biopharmaceutical industry. Contract research organizations, Canadian universities and academic centres also play a pivotal role in the sector's research activities.

Canada's capabilities in this area are based on a number of contributing elements, including:

- 143 firms producing or distributing a full range of pharmaceutical products;
- in 1997, 15 of Canada's top 50 R&D investors were pharmaceutical companies;
- shipments valued at \$5.3 billion in 1997;
- rapidly growing exports — \$1.446 billion in 1999 from \$800 million in 1996;
- R&D spending by brand-name manufacturers totalled \$900 million in 1998 and is expected to reach \$1 billion in 2000;
- a growing biopharmaceutical sector of over 100 SMEs;
- some 140 contract research organizations offering integrated services to pharmaceutical and biotechnology companies; and
- a solid health science research infrastructure with 16 medical schools, over 100 teaching hospitals and 30 000 medical researchers, government laboratories and Networks of Centres of Excellence.

### BIOTECHNOLOGY

Canada is a world leader in biotechnology. In 1997, Canada had the second-largest industrial biotechnology community in the world, including dedicated biotechnology firms, established corporations with biotechnology divisions, university departments, research institutes, venture capital firms, regional associations, regulatory authorities and suppliers.

According to a 1998 Statistics Canada Biotechnology Firm Survey, the Canadian biotechnology industry consists of 282 dedicated firms, 25 percent of which are publicly traded, and employs close to 10 000 people. Industry Canada has identified 102 new biotechnology start-ups since then, the

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majority of which are in the biohealth sector. The Canadian industry is characterized by a mixture of dedicated biotechnology companies and companies that use biotechnology as a tool to develop other products and services.

Over 70 percent of these firms are still growing — employing fewer than 50 people — the greatest concentration being in the health-care sector, followed by agriculture and environment, respectively. Half of all Canadian firms are using DNA-based technologies, with the rest applying biochemistry or bioprocessing technologies. Sales of Canadian biotechnology products and services exceeded \$1 billion in 1997 — 40 percent from exports — the largest share being from health care, followed closely by the agriculture and food-processing industry.

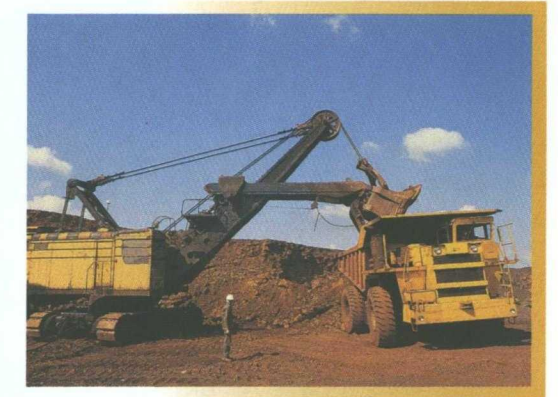
The federal government recognizes the value of genomics research to the biotechnology industry. In the year 2000, \$160 million was committed to establish Genome Canada — a new not-for-profit corporation — and its five research centres across Canada. The establishment of the Canada Foundation for Innovation helps to ensure that Canadian researchers have the facilities and equipment they need to maintain their leading-edge research. The federal government promotes the commercialization of biotechnology through the Networks of Centres of Excellence (NCE) program, which links multi-disciplinary teams of academic researchers with industry researchers. Since 1994, six biotechnology NCEs have helped establish 33 new companies (which already employ over 400 people) to commercialize new technologies.

Canada also has one of the world's best biotechnology regulatory systems. With a strong emphasis on safety, human health and environmental protection, the system has the flexibility to deal with special cases. Many countries in Latin America and eastern Europe are looking at Canada's regulatory regime as a model.

Quality of knowledge is driving the new economy. By 2005, the federal government will have invested \$300 million to implement Canada Research Chairs, a permanent new program of 2000 research chairs at Canadian universities. This program is a key component of the strategy to ensure that Canada continues to produce a stable supply of well-educated knowledge workers in the years to come. Several Canadian cities already boast an enviable network of university and government researchers around which companies have been established. These include Toronto, Montreal and Vancouver (health care), Saskatoon and Guelph (agriculture), and east and west coast cities (aquaculture). The success of Canada's biotechnology industry is due in large part to an established educational system coupled with excellent post-secondary staff and facilities, which give Canada a distinct advantage, allowing it to develop a skilled biotechnology workforce.







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At the end of 1999, companies of all sizes listed on Canadian stock exchanges held interests in exploration and producing properties in more than 100 countries around the world. Large Canadian mining companies now control approximately one third of planned worldwide exploration expenditures.

Canada's geological assets, combined with its well-established mining infrastructure, an efficient transportation system and a highly skilled and productive workforce, have earned it an international reputation for excellence in mining. In 14 of the last 27 years, Canada has ranked first in the world as a destination for international mineral exploration capital.

## MINING TECHNOLOGIES

To achieve and maintain Canada's impressive level of mineral production, Canadian companies have developed unique mining and exploration expertise in all aspects of underground and open-pit mining. In addition, most of Canada's mining workforce uses electronics, robotics and advanced telecommunications technologies.

Canada pioneered the development of many exploration techniques in ground and airborne geophysics, with Canadian companies controlling 70 percent of the world market for airborne geophysical surveying.

Canadian technologies improve mine safety, enhance environmental systems and increase productivity, allowing mining companies to be at their competitive best. Canadian companies are developing the "intelligent mine" — which can automatically detect changing mine conditions and respond appropriately. Canada is also a world leader in microwave applications for refractory and carbonaceous ores, as well as other technologies such as three-dimensional geological computer modelling and mine-planning systems.

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Canada has vast amounts of natural resources and energy reserves and has become a leader in the multi-faceted field of mineral development. Canadians have designed, built and now operate a large network of infrastructure used to explore, refine and distribute these resources.

## MINING

Canada is one of the world's largest producers and exporters of minerals, metals and related products, with approximately 300 mines, 3000 quarries and some 50 non-ferrous smelters, refineries and iron plants. Canada is the world's largest producer of potash and uranium and, in 1998, ranked second in the production of nickel, zinc and cadmium.







Canada's expertise in mining equipment ranges from small-diameter borehole survey instruments to tunnelling machines. Canada is also home to innovative designers and manufacturers of custom and utility vehicles, trucks and load-haul-dump equipment of all sizes, as well as computerized maintenance and dispatch systems for underground mining. Canada's innovative mining equipment includes dual-rotary drills, reverse-circulation drilling machines, and high-tech equipment for bulk handling of materials. And Canadians are at the forefront in the use of global positioning systems in open-pit mines. Other key technologies developed in Canada include three-dimensional drill hole technology, which simplifies the process of delineating a mineral deposit, flash and continuous smelting, and world-leading assaying techniques.

Canadian mining companies have developed leading-edge technologies to improve environmental performance, and Canadian environmental service companies are enjoying significant international growth. Among the environmental technologies in which they excel are exhaust purification, which ensures a clean underground environment, de-watering and fluidizing methods for the treatment of tailings, and a full range of ground-water monitoring instrumentation.

The Canadian mining industry was the first in the world to develop and adopt a national environmental policy. Canada also has a well-established and effective scrap metals recycling industry, which includes many companies with expertise in recycling electronic scrap.

## INVESTMENT OPPORTUNITIES

The Canadian government is committed to a favourable mining investment climate. Foreign investors are offered many opportunities to participate in hundreds of projects at all stages of development, from early exploration to production. The Prospectors and Developers Association of Canada annually holds one of the world's largest mining trade shows.

Canada also provides a positive climate for smaller mining companies. Companies listed on Canadian stock exchanges offer further opportunities for investors to participate in mineral development around the world. Many major initial public offerings and secondary financing have made Canada the world's pre-eminent centre for mine financing.







PHOTO: BOMBARDIER  
TRANSPORTATION

**T**he first bond of Canadian nationhood was the transcontinental railway built across this vast and rugged country late in the 19th century. Since then, efficient, reliable transportation has been a priority. To be competitive, Canadians have had to develop transportation systems and vehicles that move people and goods quickly, inexpensively and safely, over long distances, in all kinds of weather.

Canada now has more kilometres of road and railway track per person than most other countries, including the United States. Intermodal passenger systems, whether subways, buses or commuter rail lines, exist in every major city. The Trans-Canada Highway, completed in 1962, is, at 7775 km, the longest national highway in the world.

## RAIL AND URBAN TRANSIT

In 1999, the rail and urban transit sector of Canada's transportation industry shipped approximately \$3 billion worth of goods, more than 70 percent of which was destined for foreign countries. The United States is Canada's top

customer, but countries in Asia and Latin America have shown an increasing interest in Canadian capabilities. Canadian sales to non-U.S. markets have increased significantly since 1993, particularly through the design, engineering and construction of ready-to-operate transit systems.

Major products offered by the Canadian industry include:

- rail rolling stock: passenger and freight;
- turnkey passenger rail systems;
- buses: large transit buses; low-floor and alternative fuelled buses; intercity coaches and school buses;
- diesel locomotives: D-C and A-C traction;
- signalling and communication systems;
- advanced train-control systems;
- specialized software for transit scheduling, operations and public information; and
- consulting services such as the development and implementation of management information systems.

With showpiece urban transit systems in Canada, Turkey and the United States, and work under way on transit projects in Malaysia, Canadian companies have demonstrated they can provide the necessary products and expertise

## AUTOMOTIVE

Canada possesses the sixth-largest automotive industry in the world. It would be difficult to overstate the importance of the automotive sector to Canada's economic growth.

The light vehicle sector assembles passenger cars and light-duty trucks, produced by DaimlerChrysler, Ford, GM, Honda, Suzuki and Toyota. The automotive parts industry includes "in house" production by vehicle assemblers as well as that of independent producers, over a wide range of products for original equipment (OE) and aftermarket (AM) parts and accessories. There are approximately 550 parts plants in Canada. Heavy-duty truck and bus manufacturing comprises nine major manufacturing plants that supply approximately 20 percent of the total North American demand for heavy trucks and over 70 percent of the demand for intercity and urban buses.







PHOTO: BALLARD POWER

In 1999, the total value of vehicles and parts manufacturing shipments was \$103.6 billion, of which over 80 percent was exported, mostly to the United States. The sector accounted for 178 000 direct manufacturing employment positions and 536 000 in total employment, and generated an overall \$4-billion automotive trade surplus. Canada's light vehicle production, valued at \$70.3 billion, was three million units from 15 plants. Parts production, valued at \$33.3 billion, accounted for 13 percent of Canada's manufacturing gross domestic product (GDP).

Growth in the Canadian automotive industry has been significant. Assembly production increased by 750 000 units over the past 12 years. Nowhere has this growth been more evident than in the auto parts sector. The sector emerged from restructuring in the mid-1990s strong, world class, global in outlook, and competitive. Canadian parts makers survived strong international competition and a growing excess capacity by providing quality products, innovative processes (e.g. blow/injection moulding, tool/die, light-metal technology) and niche technologies.

Canada has also emerged as a world leader in alternative fuel and clean propulsion systems, such as Ballard Power Systems' clean hydrogen fuel cell engines. Advanced materials (metals and plastics), manufacturing processes and alternative fuel systems are also potentially significant fields for Canadian expertise in cutting-edge technologies. GM, Chrysler and Ford are each undertaking alternative fuel projects at Canadian locations.

Canada also has a strong and competitive aftermarket sector and is a source for replacement parts, accessories, and service and repair equipment for many international clients. Canadian aftermarket sales and services were valued at \$15 billion in 1999.

## AEROSPACE

Canada's aerospace sector includes aircraft and aircraft parts manufacture, avionics, defence industries, space industries, and support systems, such as air traffic management, simulation and training. Canada has earned a reputation throughout the world for supplying high-quality, innovative aerospace products and services in selected niche markets.

## AIRCRAFT AND AIRCRAFT PARTS

Bombardier Aerospace, a unit of Bombardier Inc., is the world's leading manufacturer of business, regional and amphibious aircraft with full design and production capabilities in three countries.

Bombardier Aerospace leads the 20- to 70-passenger regional carrier market with its Q Series Dash 8<sup>®</sup> turboprop and CRJ Series airliner families. It now offers added capacity with the 70-seat Q400 and two derivatives of its 50-passenger CRJ regional jet: the 70-seat CRJ700 Series to enter service in early 2001; and the 86-seat CRJ900, in early 2003.

PHOTO: BOMBARDIER AEROSPACE



Bombardier Aerospace offers the industry's widest range of business jets, from the light and midsize Learjet<sup>®</sup> series to the widebody

Challenger<sup>®</sup>, super midsize Continental Business Jet and ultra long-range Bombardier Global Express<sup>®</sup>. Bombardier also provides the industry's most comprehensive range of aviation services including the Flexjet<sup>®</sup> fractional aircraft ownership program, technical services, aircraft maintenance and pilot training for business, regional airline and military customers. Bombardier also produces the multimission Canadair 415 waterbomber.

Bell Helicopter Textron, a division of Textron Canada Ltd., the first totally integrated helicopter manufacturing company in Canada, currently manufactures the 206B-III Jet Ranger, 206L-IV Long Ranger, and 407 light





helicopters. It is located in Mirabel, Quebec. The 427 new twin (advanced composite constructed twin-engine four-blade light helicopter) has recently received certification from both Transport Canada and the Federal Aviation Administration. Additional products are the 430 intermediate, and 212, 412EP and 412CF medium-weight helicopters. Bell Helicopter Textron enjoys a 50-percent share of the world market for civil turbine-powered light-to-medium helicopters.

Three Canadian firms build world-class commercial aircraft landing gear systems — Messier-Dowty Inc. (Ajax, Ontario, and Mirabel, Quebec), Menasco Aerospace, a division of Coltec Aerospace Canada Ltd. (Oakville, Ontario) and Héroux Inc. (Longueuil, Quebec). Over the last 10 years, these three firms have produced more than 50 percent of the landing gear systems for the commercial transport aircraft segment. In 1997, they held a 31-percent share of the \$1.46-billion world market for landing gear systems.

### SIMULATION, TRAINING AND SUPPORT SYSTEMS

CAE Electronics Ltd. is the world leader in designing and producing commercial full-flight simulators. It also designs and manufactures military full-flight simulators, power plant simulators and electronic control systems.

Canadian companies are recognized internationally for the excellence of their aerospace training capacity, specializing in fields such as flight simulation, air traffic control, diagnostics and pilot training. Canada also provides consulting services and training in air navigation; aviation meteorology; aerial firefighting; and airport planning, design, operations, maintenance and management; and is a world leader in airport security products.

### DEFENCE INDUSTRIES

Canadian firms have developed leading subsystems and components for individualized markets, particularly in specialized vehicles, marine systems and platforms, informatics, aircraft upgrade programs, precision optics, robotic systems, explosive and narcotics detectors, shipboard system acoustics, communications systems, helicopter haul-down systems and avionics.

### SPACE

The Canadian space industry has evolved dramatically over the last 10 years, realigning itself as a supplier of high-quality niche products and services to large foreign prime contractors. By focussing on strategic areas of expertise, most notably satellite communications, Earth observation, space robotics and space sciences, the industry has been able to compete more effectively and capture a larger share of world markets.

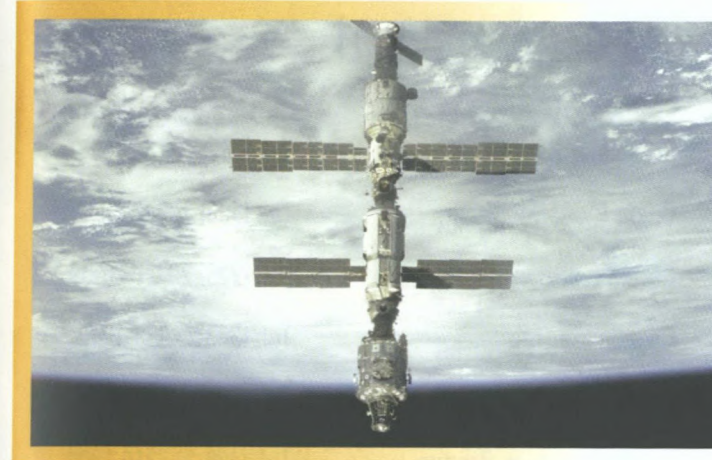


PHOTO: CANADIAN SPACE AGENCY

While Canada's space industry traditionally involved only a handful of corporate players, it currently enjoys the support of 250 firms, which together generate \$1.5 billion in annual revenues, 50 percent of which is derived from exports.

Since the launch of Anik-1 in 1972, Canada is now home to several companies that manufacture space and ground-based telecommunications hardware and provide satellite-based long-distance services and satellite operations.

**BASED ON 1998 DATA, CANADA'S AEROSPACE INDUSTRY RANKS FIFTH IN THE WORLD AMONG EXPORTERS OF AIRCRAFT AND AIRCRAFT COMPONENTS. WITH A GLOBAL REPUTATION FOR EXCELLENCE IN SERVICE AND LEADING-EDGE TECHNOLOGY AND QUALITY STANDARDS, THE AEROSPACE AND DEFENCE SECTORS GREW TO ANNUAL SALES OF \$17 BILLION IN 1999, WITH OVER 80 PERCENT DERIVED FROM EXPORTS.**

Innovative Canadian technologies include flight demonstrations of satellite platforms of analogue and digital on-board processing technologies, multi-beam antennas, high-data-rate inter-satellite links and advanced-user terminal networks as part of the next generation of multimedia satellite communications systems.

RADARSAT-1, launched in 1995, helped strengthen the position of Canada's remote sensing industry in Earth observation. A worldwide network of ground stations now enables near real-time downloading of data to clients seeking solutions to exploration, navigation, agriculture and disaster management operations. A follow-on satellite system, RADARSAT-2, is scheduled to be launched in 2003 and will offer improved data image quality.

Building on the success of the Canadarm, the Mobile Servicing System (which includes the next-generation Canadarm) represents Canada's main contribution to the International Space Station and is Canada's largest-ever science and technology project — opening up new opportunities in space robotics and automation. The launch is scheduled for 2001.

Canada's unique geographical location has long made it an ideal place for domestic and international communities to conduct space science experiments. Moreover, Canada's participation in the International Space Station affords its scientists and industry access to the micro-gravity laboratory for advancements in biotechnology, engineering, Earth observation and telecommunications.





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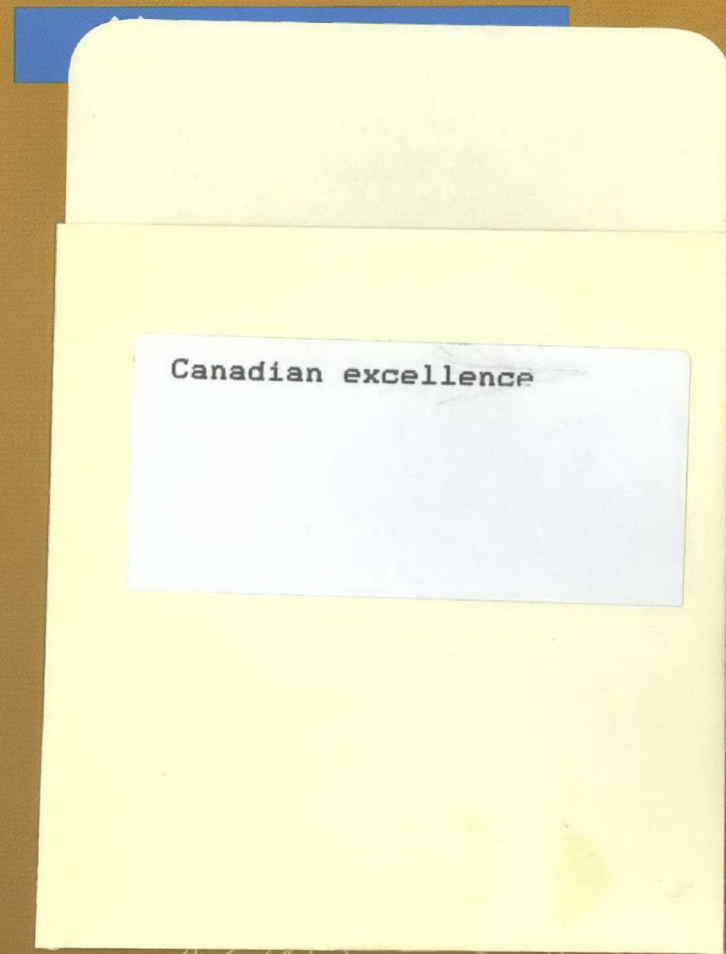


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Minneapolis	Tel: (612) 332-7486		
New York	Tel: (212) 596-1650		
Princeton	Tel: (609) 333-9940		
San Francisco	Tel: (415) 834-3180		
San Jose	Tel: (408) 289-1157		
Seattle	Tel: (206) 443-1777		



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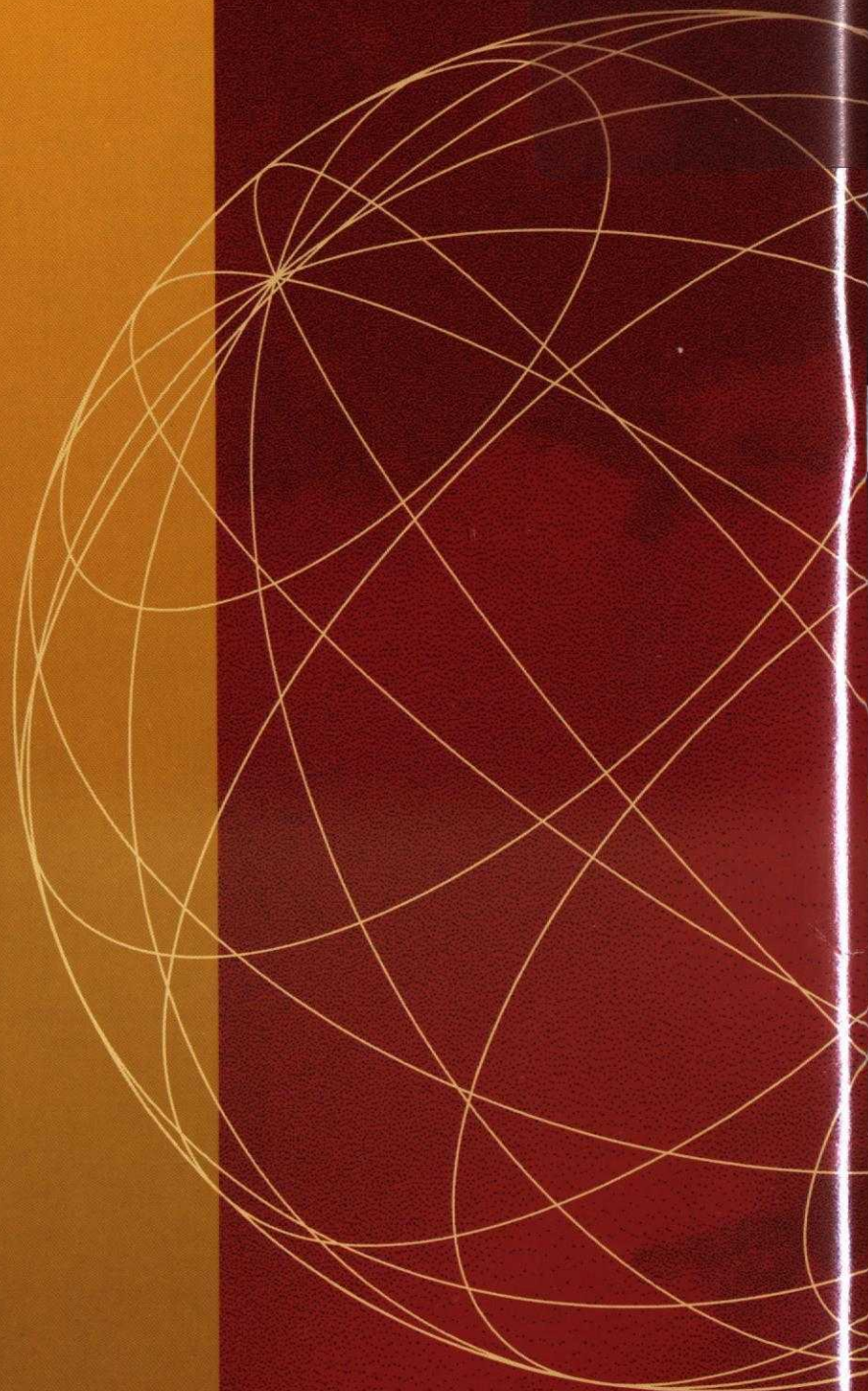


*Canadian*

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Department of Foreign Affairs  
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