CANADIAN INDUSTRY: FAR AHEAD, MOVING FORWARD

By Cynthia Kincaid

Canada ranked first in the G-7 as the best place in which to conduct business over the next five-years, according to the Economist Intelligence Unit, and it's easy to see why. With 54 percent of its population employed, Canada's labor force-to-population ratio ranks ahead of all other G-7 nations. And with a diverse range of industry — including pharmaceuticals, medical devices, biotechnology, automotive, aerospace, and renewable resources — Canada is poised for impressive growth over the coming year.

Automotive

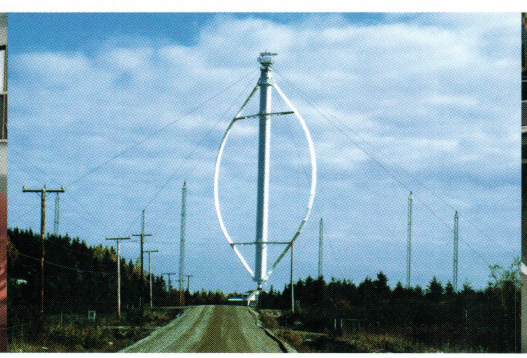
The automotive industry is Canada's largest manufacturing sector, accounting for 12 percent of manufacturing GDP and 24 percent of manufacturing trade. It employs 158,300 people in vehicle assembly and parts production, and another 336,200 in distribution and aftermarket sales and service. Canada is the world's ninth-largest producer of cars and trucks, and the third-largest exporter of automotive goods.

Canada produces 2.6 million vehicles annually for sale in Canada, the United States, and other markets, and is home to 12 high-volume light-assembly plants belonging to Chrysler, Ford, General Motors, Honda, Suzuki, and Toyota. In addition, the nation has more than 650 parts manufacturing facilities and several heavy-duty vehicle plants that build commercial trucks, buses, and chassis.

Canada has core competencies in key automotive technologies such as metal forming, lightweight materials, and advance design and manufacturing, and has dozens of private–public R&D partnerships, such as the National Research Council (NRC) and the AUTO21 network of centers of excellence. Companies continue to invest in automotive manufacturing and R&D in Canada — capital investment has averaged $3.5 billion annually over the past decade.

Aerospace

Canada's aerospace, defense, space, and security (A&D) industries contribute



Enviable Quality of Life

Canada is a land of immense natural beauty. Canadians are also friendly folks who appreciate multicultural diversity and welcome immigrants from around the world — nearly all of the world's ethnic groups are represented here. Canada also has some of the world's most famous cosmopolitan cities, such as Vancouver and Toronto.

In a recent quality-of-life survey of 215 world cities conducted by Mercer Human Resources Consulting Group, five Canadian cities placed among the top 25. Quality of life is all about educational and work opportunities, good salaries and benefits, safe neighborhoods, affordable housing, high-quality healthcare, access to entertainment and culture, and fair laws. Canada has all these and more, which is why the United Nations Human Development Report ranked Canada first among the G7 countries and sixth among 177 countries surveyed.

Excellence in Action

Canada is committed to becoming an even stronger leader in knowledge-based industries. With programs such as Technology Partnerships Canada and the Canadian Network for the Advancement of Research, Industry, and Education, Canada's "National System of Innovation" is developing creative partnerships and utilizing best practices from around the world to make Canada a location of choice for research and development.

The financial commitment is sizeable — every year the Canadian government spends more than $2 billion on its own research programs. During 2006–2007 it planned to invest another $3 billion to support research conducted at postsecondary institutions. In addition, the Canada Foundation for Innovation has invested $3.5 billion over the last decade on thousands of research projects in Canadian universities, colleges, research hospitals, and research institutions. With its unwavering dedication to innovation, its pro-business climate, and the facilitation of strategic partnerships that really work, Canada will continue to make important advances on the global scale and remain at the forefront of the New Economy.

New Wind Farm Contributes to New Brunswick's Goal of Self-Sufficiency

In late January, New Brunswick's Premier Shawn Graham and Energy Minister Jack Keir announced that **Acciona** Energy has been selected to construct a wind farm in Lamèque, N.B., representing a total investment of about $100 million. The 25-year power purchase agreement for up to 49.5 megawatts of wind power is being finalized between NB Power and **Acciona** Wind Energy Canada, Inc. **Acciona** will construct, own, and operate the Lamèque facility. It is expected that several hundred jobs will be created through the development, construction, and lifespan of the project.

Premier Graham is pleased with what this development means for the province's overall goal of self-sufficiency saying, "It will foster economic growth and demonstrate that New Brunswick is an energy hub." Minister Keir notes that wind energy brings greater stability for rates in the future, because it lessens the province's dependence on the uncontrollable prices of foreign oil and coal.

The Lamèque wind farm will be in service by November 2009. The facility will have 33 **Acciona** Windpower wind turbines, which will provide 154 gigawatt hours of power per year. This will be roughly enough power to meet the electricity needs of about 8,900 homes.

significantly to the country's economy. The Canadian aerospace industry alone reported sales totaling $22.1 billion in 2006. The industry has more than 400 aerospace firms employing nearly 79,000 skilled professionals across the country.

According to KPMG's *2006 Guide to International Business Costs*, Canada ranks number one in the G-7 as the most cost-competitive in investment location in the aerospace sector — which might be a factor in the sector's tripling its share of world production in the past 25 years.

Numerous programs and institutions, such as the Strategic Aerospace and Defence Initiative (SADI) and the NRC, assist and support innovation in the Canadian aerospace sector. Annual R&D investments are approaching $1.4 billion.

Pharmaceuticals

Canada's robust pharmaceutical industry is comprised of brand name and generic drug manufacturers, biopharmaceutical firms, non-prescription drug manufacturers, and medical research companies. The country's universities and hospitals round out support of the industry.

Pharmaceutical sales were 2 percent of the world market in 2005, making Canada the eighth-largest in world market sales and the fourth-fastest growing market behind China, Mexico, and Spain. The Canadian drug sales market, encompassing mostly foreign-owned multinationals, comprised 84 percent of total pharmaceutical sales in 2005, with generic pharmaceutical companies making up the other 16 percent. Pfizer Canada has 13.4 percent of the Canadian drug sales market, capturing the largest share of any company.

The pharmaceutical manufacturing industry is also responsible for strong employment growth. Approximately 40,000 people were employed in the industry in 2005, two-thirds of them at brand name companies; an additional 35,000 jobs came indirectly from the industry. The biopharmaceutical market is equally strong, with many new product innovations in various stages of development, including genetically engineered vaccines, recombinant proteins, and various gene therapies.

Medical Devices

Scientific, engineering, and medical disciplines have all converged in developing the innovative medical device breakthroughs that will positively impact Canada's healthcare system for years to come. These innovative and strategic products include surgical and dental equipment, furniture, prosthetics, and diagnostic kits and

As part of Canada's goal of becoming a world leader in genomics and proteomics research, the nonprofit organization Genome Canada works to develop and implement national strategies in these research areas that will benefit Canadians in the areas of health, agriculture, environment, forestry, and fisheries. The organization has invested more than $700 million throughout the country toward 115 projects. For more information about Genome Canada, visit their website at www.genomecanada.ca.

equipment. The industry also capitalizes on world-class research conducted at Canadian universities, hospitals, and research institutions across the country. According to Statistics Canada, nearly 10 percent of Canadian medical device firms are spinoffs of universities and laboratories.

In 2004–2005, 1,101 facilities made up the medical device manufacturing and development industry. Distributed across the country, these facilities comprised approximately 998 firms, 90 percent of which are Canadian-owned. Statistics Canada reports that 26,000 people were employed in the field in 2004–2005.

Approximately $4 billion was generated from medical

device sales in Canada and abroad in 2003. Exports grew from $1.6 billion in 2000 to $2.4 billion in 2005, with the United States as a primary market and destination for 76 percent of all medical device technology. The United Kingdom, Germany, and China received other major export markets. Other rapidly expanding export markets include Singapore, South Africa, and South Korea. The U.S. also accounts for 54 percent of all imports.

Biotechnology

In the past decade, Canada's biotechnology sector has expanded rapidly, with the launch of new companies, new innovations, and a continued diversification of products. Canada places in the top five in the world in biotechnology, a reflection of its leading research, cutting-edge innovation, and proven entrepreneurial thinking. Canadian companies increased their R&D spending by 39 percent each year from 1997 to 2005. In 2005, the biotechnology industry invested $1.7 billion in R&D.

The industry boasts an international reputation in genomics, bio-informatics, stem cell research, and immune therapies. Currently, 16 Canadian universities are partnered with a network of more than 100 teaching hospitals and research institutes. According to *Biopharmaceutical Pipeline Report , Industry Canada*, 176 therapeutic products were in development in 2006.

As of 2005, 532 biotechnology companies called Canada home.

Renewable Energy

Surrounded by vast natural resources and abundant supplies of water, wind, solar and biomass reserves, Canada is a prime location for the development of renewable sources of energy. Significant expansion of the renewable energy industry is expected over the coming years.

Wind power: As the fastest-growing renewable energy source in Canada, wind power is in abundant supply. Canada has pledged more than $53 million in funding over the next 10 years to further develop largest wind energy project in Canada,

Ocean Innovation in Newfoundland & Labrador

Marport, a leading subsea acoustics technology company based in St. John's, Newfoundland, has been awarded $2.2 million in R&D funding from the Government of Canada's Atlantic Innovation Fund (AIF). **Marport** will utilize the funding to further develop its revolutionary Software Defined Sonar (SDS) technology. The project will allow the company to expand its product base to include next generation sensing, sonar, and underwater wireless communication systems targeted to the commercial fishing, offshore energy, ocean science, and military markets.

During the project **Marport** will also collaborate with the National Research Council's Institute for Ocean Technology (NRC-IOT) to develop a compact autonomous underwater vehicle (AUV). The AUV will be designed for seabed mapping, surveillance, reconnaissance, climate change research, and under ice operations. The vehicle will be equipped with **Marport's** Software Defined Sonar technology platform — which will include advanced sensors, sounders, and imaging sonar.

the Prince Wind Energy Farm. This wind energy project was started on 20,000 acres of land northwest of Sault Ste. Marie, Ontario. The wind farm's current 126 turbines are capable of generating up to 189 megawatts of clean, renewable energy, enough to power nearly 40,000 homes.

"We need energy to power our economy, and we need clean energy to protect our environment — that's a priority for our government and the foundation of our practical balanced approach to climate change," says Tony Clement, Minister of Health and Minister for the Federal Economic Development Institute for Northern Ontario. "By investing in projects like this one, we are making sure that clean renewable power from the wind, the sun, and the tides will form an increasingly important part of our energy mix for the future."

More than 150 companies have created 1,000 wind-related jobs throughout Canada. This is expected to increase to more than 13,000 by 2012. Investment in the industry could reach $1.8 billion per year, and by 2012, Canada expects 5,600 megawatts of wind energy, representing investments totaling $8.4 billion.

The Ocean Renewable Energy Group is a competitive partnership of industry, universities, and governments — more than 85 Canadian and international members — that focuses on providing clean energy solutions to the world market. The group's research and advocacy initiatives focus on providing a sustainable ocean energy sector that serves both domestic and international power needs. More information is available at their website, www.oreg.ca.

Bioenergy: Per capita, Canada has access to more biomass resources than any other country in the world. For example, in 1993, existing forest biomass resources totaled 26 billion dry tons, which equaled 82 million barrels of oil, enough to meet Canada's oil needs for the next 151 years at 1993 consumption rates.

Direct combustion, anaerobic fermentation, mixed combustion, rapid pyrolysis, gasification, and biofuels are all processes utilized by Canadian bioenergy production. Biofuels are sold in more than 1,000 points-of-sale in Canada, with sales in excess of 240 million liters each year. A renewable fuels bill has been introduced into Parliament that would allow the Government of Canada to implement regulations that will require 5 percent renewable content in gasoline by 2010.

Hydropower/ocean technology: The energy from water continues to make a significant contribution to Canada's economic growth. Two-thirds of Canada's electricity needs are met with hydropower. Canada has an installed capacity of more than 70,858 megawatts. The average annual production of 350 terawatt hours (TWh) accounts for nearly 13 percent of the global output of hydropower. After France, Canada is the second-largest exporter of electricity.

Solar energy: Approximately 50 companies comprise Canada's photovoltaic technology (PV) industry, generating revenues in excess of $100 million. The industry employed 625 people in 2004, and the avera

annual market growth for PV technologies has been 24 percent over the past 11 years.

ICT

Canada's information and communication technology (ICT) industry strategically benefits from the country's cost-competitiveness in software design, web, and multimedia sectors. Canada's ICT sector revenues were estimated at $140.5 billion in 2006, up 4.6 percent from 2005. On average, annual GDP growth in this sector has been 5 percent since 2002, almost twice as fast as the overall economy (2.8 percent).

The ICT sector is comprised of nearly 32,000 companies, made up of software and computer services (80 percent), followed by ICT wholesaling (11 percent) and manufacturing (7.2 percent). In 2006, Canada's ICT exports reached $31.5 billion, while imports were valued at $49.7 billion. Eighty percent of ICT products manufactured in Canada are exported. This includes computer and peripheral equipment, audio and video equipment, wired and wireless communications equipment, electronic components, instruments manufacturing, communication wire and cable manufacturing, and commercial industry machinery manufacturing.

Since 2003, employment in the ICT sector has grown continuously, and in 2006 it employed an estimated 572,000 workers, or 3.5 percent of the total Canadian work force. On average, workers in this sector earned $56,465 in 2006, 45 percent more than the economy-wide average of $38,848.

Multimedia: Films such as *King Kong*, the *Lord of the Rings* trilogy, the *Harry Potter* series, and *The Chronicles of Narnia: The Lion, the Witch, and the Wardrobe* all used Canadian multimedia technology. Video and computer games have also contributed significantly to the country's revenues, adding $25.6 billion in 2005. Canada also produces some of the most popular game titles for Sony PlayStation, Microsoft Xbox, and Nintendo systems. Companies such as a Softimage, Side Effects Software, and Autodesk, along with more than 2,300 other Canadian multimedia firms, employ 18,000 skilled workers, generating annual revenues of more than $3.5 billion.

Wireless/software: Whether its WiFi, WiMAX, RFID, UWB, or SDR, Canadian companies are among the world's leaders in rapidly evolving wireless technologies. The Government of Canada encourages wireless innovation through policies that provide R&D support for new technologies. And Canadian companies such as Nortel Networks, Research In Motion, and Redline Communications, are leading the way.

In broadband penetration, Canada leads the G-7 group of industrialized countries. In 2004, 629 of every 1,000 persons in Canada used the Internet. The country ranked third in a 60-country study of broadband subscribers, with a rate of 147 per 1000 persons.

Software and computer services represent the largest proportion of trade in ICT services, accounting for 73 percent of total ICT services exports and 63 percent of total ICT services imports in 2006.

Video Gamer Accesses Talent in Prince Edward Island

In November 2007, **Longtail Studios Inc.** of New York opened a new video game production facility in Charlottetown, Prince Edward Island. **Longtail Studios Inc.** will join several game development firms in Prince Edward Island offering attractive career opportunities in the exciting video game development industry. Company President Gerard Guillemot and Head of Production Jason Altman find the island to be "a video-game-friendly business environment that has all the ingredients for success." The company plans to hire at least 40 people over the next two years, and Guillemot adds, "Through local recruitment and the attraction of top level talent, we will be able to establish a world class studio."

Established in 2003, **Longtail Studios** is an award-winning developer of games and entertainment whose products are distributed worldwide. The company operates offices in New York City, Québec City, and Charlottetown.

Photonics

Canada's first fully integrated photonics prototyping and fabrication facility opened in Ottawa, Ontario, in May 2005. The $43 million NRC Canadian Photonics Fabrication Centre (NRC-CPFC) will support the growth of the photonics sector, which utilizes technology to generate and harness light. According to the Optoelectronics Industry Development Association, photonics components enable more than $100 billion worth of products used in optical, computing, and consumer goods. Photonics also has a wide range of applications in the information technology, transportation, health, energy, security, defense, and consumer electronics industries.

The sector is a blend of approximately 250 photonic-related companies and 70 government and academic institutions. Companies in the sector range from optical communication giants Nortel Networks and JDS Uniphase to a host of small and medium-sized enterprises.

Continued growth in key industry sectors and nationwide commitment to research and development in these sectors should keep Canada at or near the top of the G-7 in the years to come.