

2011



Invest in Canada

BIOPHARMACEUTICALS

Canada's competitive advantages



Canada 

MAJOR GLOBAL INVESTORS IN CANADA

- Amgen
- AstraZeneca
- Bayer
- Bristol-Myers Squibb
- GlaxoSmithKline
- Johnson & Johnson
- Jubilant Life Sciences
- Merck
- Novartis
- Pfizer
- Roche
- Sandoz
- Sanofi-aventis
- Teva Canada

LEADING CANADIAN COMPANIES

- Apotex
- Bioniche Life Sciences
- Cangene
- Cardiome Pharma Corp.
- ImmunoVaccine Technologies
- MDS Nordion
- Medicago
- Oncolytics Biotech Inc.
- QLT
- Theratechnologies
- Valeant

RECENT INVESTMENTS IN CANADA

PFIZER

In 2010, Pfizer announced that it was expanding its Canadian headquarters in Montréal, adding 100 new employees. The facilities represent an investment of \$22 million*.

TAKEDA PHARMACEUTICAL

That same year, Takeda Pharmaceutical signed a \$1 million research deal with the B.C. Cancer Agency to develop treatments for prostate and breast cancer.

EISAI INC.

Also in 2010, Eisai Inc. a Japanese pharmaceutical, opened a Canadian subsidiary company in Mississauga, Ontario.

OTSUKA PHARMACEUTICAL

Otsuka Pharmaceutical, another Japanese firm, opened an office in Montréal in 2010 to coordinate and promote the sale of its pharmaceutical products.

MERCK

In 2009, Merck invested over \$30 million to expand its Schering-Plough manufacturing facility in Montréal to supply the growing U.S. pharmaceutical market.

CHARLES RIVER LABORATORIES INTERNATIONAL

In 2009, Charles River Laboratories International of Massachusetts opened a preclinical services facility in Québec, employing 1,000 people.

SANOFI-AVENTIS

In 2008, French firm Sanofi-aventis invested \$100 million in a new vaccine R & D facility in Ontario.

*Unless otherwise noted, all values in this publication are in Canadian dollars.



BIOPHARMACEUTICALS

Canada plays a key role in the global biopharmaceutical industry, with unique strengths in research and development, clinical trials, and manufacturing. Each of the world's 10 largest pharmaceutical companies have operations in Canada, with several of them engaged in both R & D and manufacturing.

In 2009, global biopharmaceutical sales were estimated at over US\$800 billion. In the same year, the Canadian biopharmaceuticals sector recorded sales of \$21.5 billion and exports of nearly \$6.2 billion. Approximately 80 percent of these exports were to the U.S. market.

More than 800 pharmaceutical and biotechnology establishments, employing nearly 29,000 people, are located across the country. Canada offers a dynamic and innovative environment for global biopharmaceutical companies, with its first-rate academic institutions, world-class innovative science, wide-reaching research networks, highly skilled workforce, supportive innovation climate, and numerous partnership opportunities.

CANADA'S KEY CAPABILITIES

RESEARCH & DEVELOPMENT: From discovery to full Phase 3 pivotal trials, the Canadian R & D sector is known for its high-quality, cost-effective research and clinical development. In 2009, innovative drug companies in Canada spent over \$1.2 billion on R & D. Canada also boasts a research community of some 30,000 investigators across 17 medical schools and more than 100 teaching hospitals. This community is supported by a large public research infrastructure, led by the Canadian Institutes of Health Research (CIHR) and the National Research Council. In 2009, CIHR provided grants and awards of close to \$1 billion for health research. Canada is second in the world, after the U.S. for its innovation capacity in life sciences.

MANUFACTURING: Many major pharmaceutical companies have manufacturing facilities in Canada. With easy access to U.S. markets through the North-America Free Trade Accord (NAFTA), Canada is a high-quality, cost-competitive location for manufacturing pharmaceuticals for the North-American market. Canadian firms have a world-class expertise in small-molecule and biologics manufacturing, from pilot projects to full-scale production. Canada is home to several major producers of influenza vaccines, peptide therapeutics, solid dose medications, and one of the world's largest manufacturers of generic drugs, Apotex.

PHARMACEUTICAL SERVICES: Many world-class contract service companies are located in Canada, specialized in drug discovery, custom synthesis, analytical technology, clinical trials, manufacturing and countless other services required to support the life-sciences industry.

CANADA'S COMPETITIVE ADVANTAGES

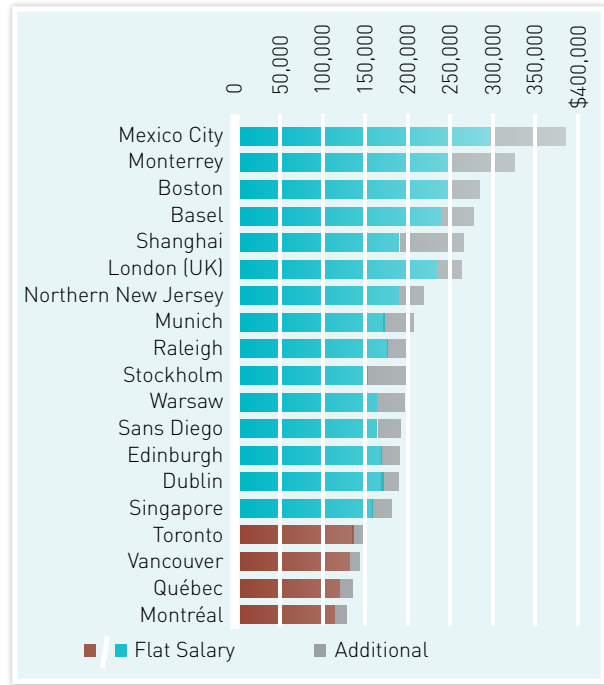
Advantage:

Competitive remuneration costs

When it comes to salary costs for R & D executives, Canadian cities prove more competitive than comparable cities in the United States and Europe.

- This chart examines remuneration levels for heads of research and development working in multinational companies. R & D heads, who exercise overall control of their company's R & D function, may direct research units in a limited number of countries or in a large research and development centre for a single product line; the products they oversee are highly technical and require years of development. In the chart, remuneration includes flat salary as well as additional compensation, such as incentive payments and performance bonuses.

Head of research and development



Sources: fDi Benchmark; Towers Watson, 2010/2011 Global 50 Remuneration Planning Report

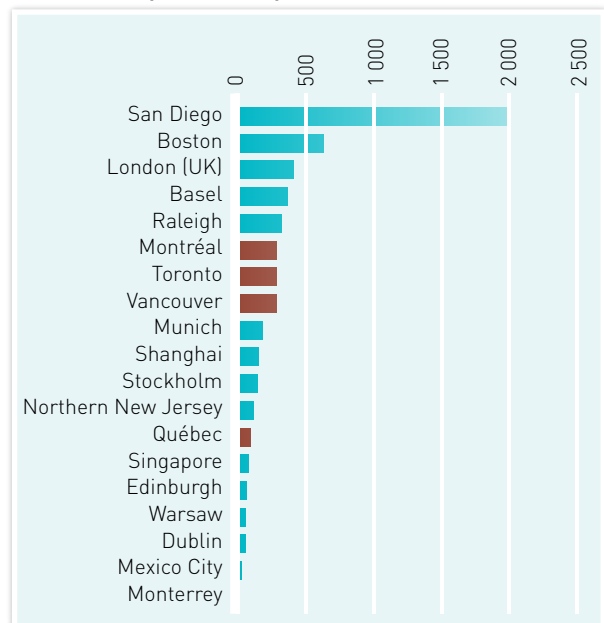
Advantage:

A high number of valuable biopharmaceutical patents

Canadian companies in Montréal, Toronto and Vancouver hold a comparatively high number of biopharmaceutical patents, as this chart illustrates.

- This chart gives the estimated number of biopharmaceutical industry patents issued by the United States Patent and Trademark Office since 2003.

Number of patents in pharmaceuticals



Sources: fDi Benchmark; fDi intelligence estimates based on data from the United States Patent and Trademark Office

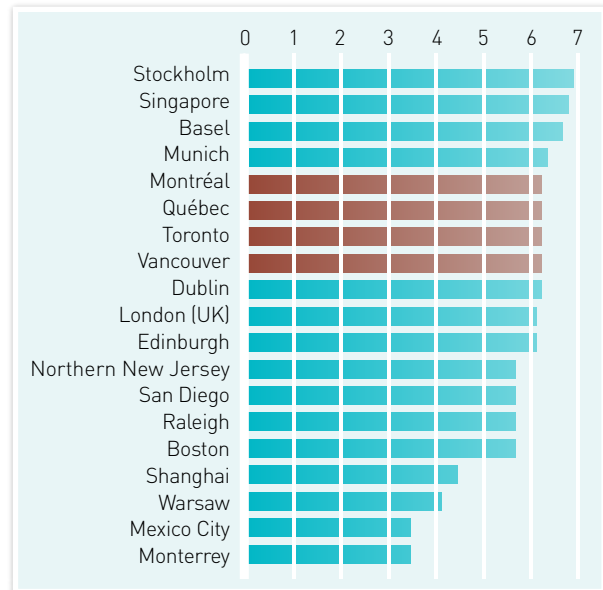
Advantage:

A respect for intellectual property rights

The protection of intellectual property (which includes the protection of patents and trademarks) is essential for biopharmaceutical companies that dedicate years of research to create new products. As this chart indicates, Canada offers a high level of intellectual property protection.

- This chart rates selected cities on a scale of 0 to 7, where 0 signifies that intellectual property protection is “very weak” while 7 signifies that it is “very strong.”

Intellectual property protection



Sources: fDi Benchmark; World Economic Forum, *Global Competitiveness Report (2010/11)*

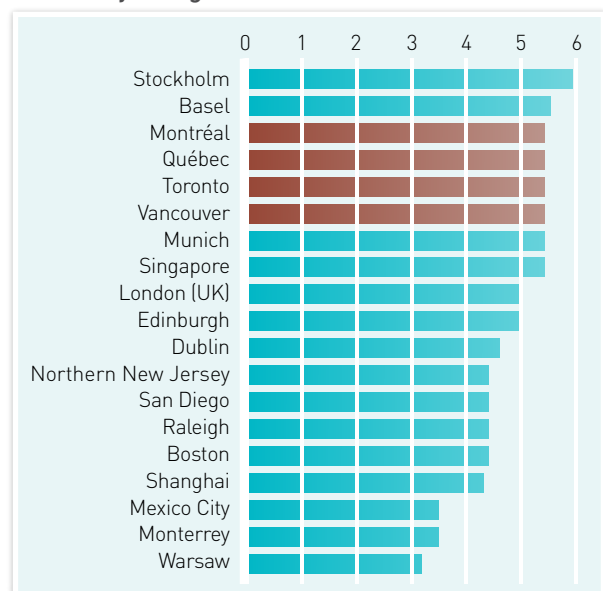
Advantage:

A no-nonsense legal framework

Canada's legal framework has a reputation for settling legal disputes reasonably and to the satisfaction of involved parties. The federal government deals with legal issues of national scope, including those related to patented and generic pharmaceuticals, international trade, and intellectual property, while provincial governments handle legal matters related to health and commercial rights, among other issues. Canada's legal system is rooted in British common law, while the province of Québec operates under a system of civil law for private legal matters.

- This chart assesses the efficiency of legal frameworks in settling private business disputes, with 0 signifying that a framework is “extremely inefficient” and 6 “highly efficient.”

Efficiency of legal framework



Sources: fDi Benchmark; World Economic Forum, *Global Competitiveness Report (2010/11)*

THE BIOPHARMACEUTICALS SECTOR ACROSS CANADA: AN OVERVIEW

BRITISH COLUMBIA ○

British Columbia's biopharmaceuticals sector encompasses more than 90 companies and some 2,200 employees. The sector is anchored by top companies such as Cardiome, based in **Vancouver**, and Xenon, located in **Burnaby**. In fact, Vancouver is the third largest pharmaceutical cluster in Canada. The B.C. Cancer Agency, the B.C. Centre for Disease Control, the University of British Columbia, and the University of Victoria house some of the province's world-leading research facilities.

ALBERTA ○

Edmonton hosts world-renowned researchers and publicly supported, state-of-the-art facilities that provide a wealth of biomedical research capacity. The University of Alberta, the University of Calgary, and the University of Lethbridge comprise a strong network for primary research across the province. Successes include the Edmonton Protocol for the treatment of type 1 diabetes, advanced cancer imaging and treatment, neurological imaging, and cutting-edge research into treatments for cardiac and infectious diseases.

Innovative, private-sector companies add depth to the research environment in Alberta. They include Oncolytics Biotech Inc., R & D firms NAEJA Pharmaceutical and ChemRoutes Corporation, and Gilead Sciences, which operates a manufacturing facility in Edmonton.

SASKATCHEWAN ○

A number of outstanding research facilities are located in Saskatchewan, including many companies and organizations involved in cutting-edge work aimed at developing vaccines and finding cures for coronary disease, cancer, diabetes and viral infections. The province is home to many industry-leading firms, including Novozymes Biologicals and the POS Pilot Plant.

The National Research Council Plant Biotechnology Institute in **Saskatoon** focuses on developing plant-based products to improve the health and wellness of Canadians, and the non-profit Vaccine and Infectious Disease Organization (VIDO) at the University of Saskatchewan is credited with five world firsts in animal vaccine research. VIDO has expanded into human health applications in an effort to ease the suffering caused by influenza and hepatitis C and to address the lack of effective vaccines for newborns as well as adults in developing countries.

MANITOBA ○

With more than 40 companies, 30 R & D establishments, 23 service firms, and 4,200 employees, **Winnipeg's** life sciences cluster offers significant capabilities in biopharmaceutical R & D and production. The cluster's areas of focus include infectious diseases, cardiovascular and respiratory diseases, oncology, neuroscience, nutraceuticals and functional foods, and diagnostics.

Two of Canada's top 10 life sciences companies, DiaMedica and Kane Biotech, are located in the city, and the Winnipeg region is Canada's third-largest exporter of pharmaceuticals, with manufacturing activity centred on firms such as Cangene, Apotex Fermentation, Valeant and Vita Health. Winnipeg is also the headquarters of the Public Health Agency of Canada and the site of one of the world's few Level 4 containment laboratories, both of which have helped make the province a global centre of excellence in the identification and management of infectious disease.





ONTARIO

Toronto is home to one of the largest biopharmaceutical and medical communities in Canada, which includes the MaRS Centre, the Donnelly Centre for Cellular and Biomolecular Research at the University of Toronto, several research hospitals and specialized medical institutions, and numerous innovative firms. These entities have helped to make the Greater Toronto Area a leading centre for research and development in genomics, proteomics, bioinformatics and targeted therapeutics. Furthermore, the Greater Toronto Area is home to the Canadian operations of many world-leading biopharmaceutical firms such as Bayer, Eli Lilly, GlaxoSmithKline and Sanofi-aventis.

Ottawa was one of the first cities in Canada to capitalize on the vast business potential of biotechnology. The National Research Council and 20 life sciences-related research institutes located in Ottawa have made the city a thriving centre for drug and diagnostic R & D and clinical research. Annual investments in R & D by these organizations are estimated at \$350 million.

QUÉBEC

Montréal boasts one of the largest and most important biopharmaceutical clusters in North America, employing approximately 15,000 people. The city is a top location for basic and contract research, as well as for the development and commercialization of innovative products. Montréal's cluster benefits from a wealth of expertise in clinical research, dynamic entrepreneurs in bioinformatics and medical technologies, and manufacturers of patented and generic products.

With top-level expertise in vaccine research and therapeutic protein bio-manufacturing, the city also has a leading reputation in R & D. Several renowned international research centres are located in Montréal, among them the McGill University and Génome Québec Innovation Centre and the National Research Council Biotechnology Research Institute. World-class firms such as AstraZeneca, GlaxoSmithKline, Merck, Novartis, Pfizer, and Sanofi-aventis operate in Montréal.

Québec City's biopharma sector has a large concentration of jobs in vaccine production, contract research, diagnostics, and the manufacturing of medical equipment and medical technologies. Many industry-leading firms are located in and around the city, including Æterna Zentaris, Anapharm, and GlaxoSmithKline, as are seven research centres that focus on cutting-edge research in cardiology, genomics, infectious diseases, immunology, obesity, oncology, neuroscience, functional foods and nutraceuticals.

Since 2006, pharmaceutical companies have invested close to \$1 billion in their production units located in the province of Québec, due in large part to the abundant pool of available academic, technical, and specialized labour.

NOVA SCOTIA

Halifax is home to a number of leading companies involved in the development of therapeutic products and the development and manufacturing of natural health products. These include Merck, Kytogenics Pharmaceuticals, Ocean Nutrition, and Ascenta Health, a company that holds the largest share of Canada's market for omega-3 supplements. Another source of pride for Halifax is the Brain Repair Centre, a multidisciplinary facility that links more than 100 world-class researchers and physicians specializing in ground-breaking treatments and technologies for studying the brain.

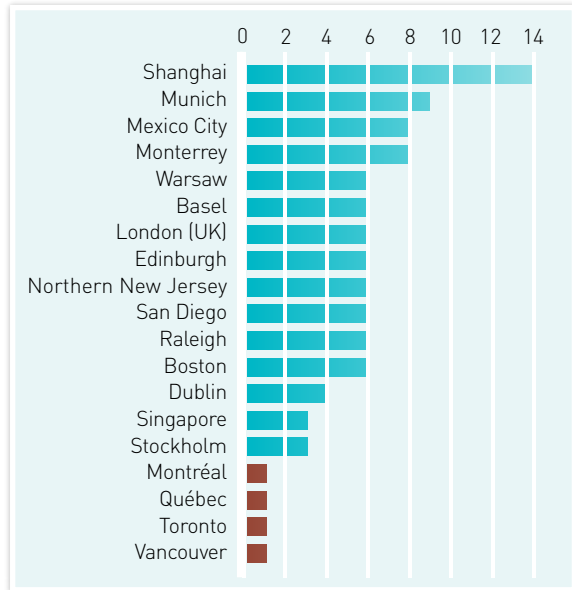
CANADA'S COMPETITIVE ADVANTAGES

Advantage:

Simplified, one-step business registration

In Canada, only one procedure is required to register a business: simply select the appropriate federal or provincial authority and register the business name by filling out the appropriate forms and paying the required fees. Once a company has obtained its legal status, it can register with the various regulatory agencies that govern its area of activity and that are responsible for applying relevant taxation statutes and labour codes.

Number of procedures required to start a business



Sources: fDi Benchmark; World Bank, *Doing Business 2010*

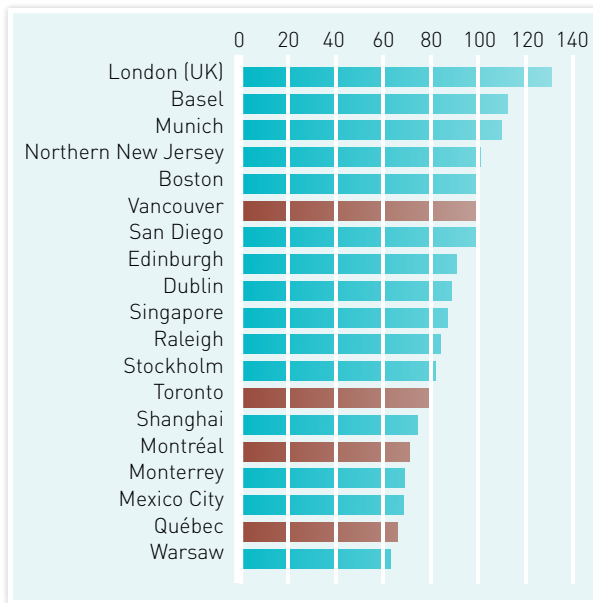
Advantage:

Great quality of life at affordable cost

Canadian cities offer a high quality of life at an affordable cost. Compared to most cities in Europe and in the U.S. where biopharmaceutical clusters are located, Canadian cities such as Toronto, Montréal and Québec City boast a lower cost of living combined with a higher quality of life. In 2011, the Economist Intelligence Unit ranked Vancouver as the most liveable city in the world, while Toronto and Calgary also placed in the top 10.

- This chart assesses a variety of living costs, including housing.

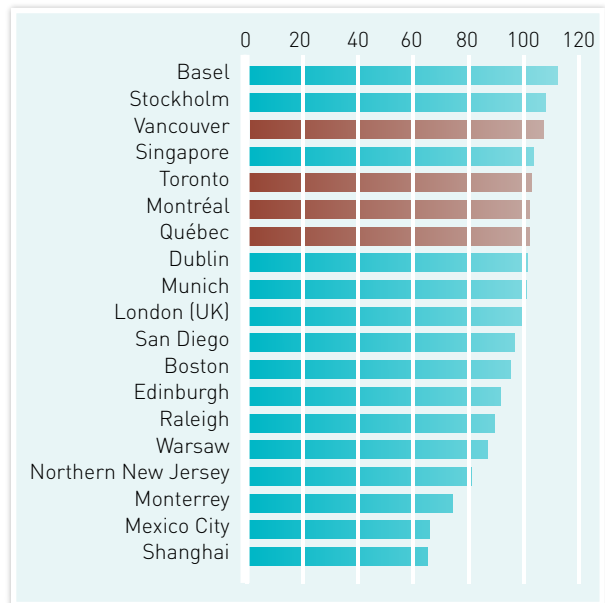
Cost of living Index



Sources: fDi Benchmark; fDi intelligence based on data from the Financial Times Ltd.

- This chart assesses quality of living factors.

Quality of living index



Sources: fDi Benchmark; fDi intelligence based on data from the Financial Times Ltd.



CANADA'S COMPETITIVE ADVANTAGES

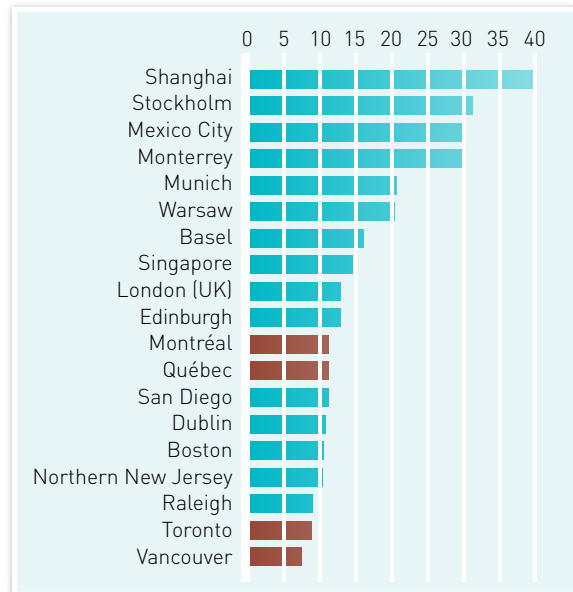
Advantage:

Low social security contributions

Canadian workers have very good social security coverage, but this does not translate into excessive costs to employers. In Canada, social security contributions paid by employers are generally lower than in some Asian and European countries.

- This chart looks at employers' contributions to employee social benefits, expressed as a percentage of employee salaries.

Social security paid by businesses



Sources: fDi Benchmark; Deloitte International, *International Tax and Business Guide* (Oct. 2009); Towers Watson, *2009/2010 Global 50 Remuneration Planning report*; PricewaterhouseCoopers, global tax summaries (Oct. 2009); fDi intelligence based on Towers Watson data (Aug. 2010); fDi intelligence based on data from the International Social Security Association (ISSA; Aug. 2010



INVESTMENT LOCATION BENCHMARKING

The tables and graphs in the preceding pages were generated by fDi Benchmark, a service of the Financial Times Ltd. (www.fdibenchmark.com). This search tool relies on industry-recognized databases and location assessments to appraise the attractiveness of countries, states/provinces and cities around the world for specific sectors and investment projects.

- ▶ The following cities and region, selected for benchmarking, contain clusters of biopharmaceutical manufacturers: Basel, Boston, Dublin, Edinburgh, London (U.K.), Mexico City, Monterrey (Mexico), Montréal, Munich, the Northern New Jersey region, Québec, Raleigh, San Diego, Shanghai, Singapore, Stockholm, Toronto, Vancouver and Warsaw.
- ▶ The model enterprise profile is a biopharmaceutical manufacturing plant with 350 employees, most of whom work in an industrial facility, with others located in a downtown office.

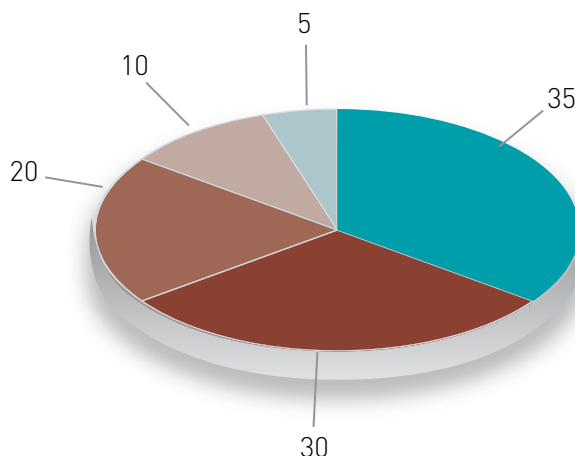
Biopharmaceutical manufacturing plant






COST FACTOR	USAGE AMOUNT
Property	Square metres
Total occupancy (in-town office rent)	2,300 m ²
Total occupancy (industrial rent)	23,000 m ²
Utilities	
Industrial gas	40,000 m ³
Electricity	621,000 100 kWh
Water	1,300 000 m ³

EMPLOYEE TYPE	PROFILE HEAD COUNT
Manufacturing	
Head of manufacturing	1
Production manager	1
Production operative (highly skilled)	40
Production operative (skilled)	103
Production operative (unskilled)	25
Quality control manager	1
Quality control specialist	8
R&D / Engineering	
Head of research and development	10
Laboratory specialist	70
Laboratory technician	15
R & D team leader	12
Scientist	55

EMPLOYEE TYPE (continued)	PROFILE HEAD COUNT
Administration	
Facilities/office services specialist	2
Secretary	7
Total	350

Quality model properties / Weights applied



WEIGHTING MODEL OVERVIEW	WEIGHTING
Presence of an industrial cluster	35% 
Labour availability and quality	30% 
General business environment	20% 
Infrastructure and accessibility	10% 
Living environment	5% 

CANADA'S COMPETITIVE ADVANTAGES

Canada boasts many advantages and unparalleled potential: it is a place where businesses can achieve excellence on a global scale.

A HIGHLY EDUCATED WORKFORCE

Canada ranks second in higher-education achievement among members of the Organisation for Economic Co-operation and Development (OECD). (Source: IMD, *World Competitiveness Yearbook 2010*)

A WELCOMING BUSINESS ENVIRONMENT

The Economist Intelligence Unit rated Canada the number one place to do business in the G-7 for the next five years. (Source: Economist Intelligence Unit, *Business Environment Ranking*, March 2011)

A SOUND ECONOMY

Since the third quarter of 2009, Canada's economy has grown for six consecutive quarters and has now fully recovered job and output losses that occurred during the global economic crisis. (Source: Department of Finance Canada, Budget 2011)

FINANCIAL STABILITY

Over the past three years, Canada's banking system has repeatedly been declared the soundest in the world by the World Economic Forum.

LOW TAX RATES

Canada's overall tax rate on new business investment is substantially lower than that of any other G-7 country, while corporate tax rates are among the lowest in the G-7. (Source: Department of Finance Canada, 2010)

SCIENTIFIC RESEARCH AND EXPERIMENTAL DEVELOPMENT

Canada has a very generous Scientific Research and Experimental Development Program (SR & ED) and the lowest costs in R & D-driven sectors in the G-7. (Sources: KPMG, *Competitive Alternatives 2010*; OECD)

NAFTA

Canada's NAFTA advantage (North American Free Trade Agreement) gives investors access to more than 448 million North American consumers and a combined continental GDP of more than US\$16.3 trillion. (Source: World Bank, *World Development Indicators Database*, 2010)

A GREAT PLACE TO LIVE AND WORK

World-class universities; a universally acclaimed health-care system; clean, friendly cities; and spectacular scenery make Canada a great place to invest, work, live and raise a family. (Sources: United Nations Development Programme, *Human Development Report 2010*; Economist Intelligence Unit, *Global Liveability Report 2010*)



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