

Canadian Hydrogen and Fuel Cell Sector Profile 2014



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Canadian Hydrogen and Fuel Cell Sector Profile 2014

For more than a decade, the Government of Canada and the Canadian Hydrogen and Fuel Cell Association (CHFCA) have collaborated to develop an industry profile of the Canadian hydrogen and fuel cell sector. The profile is published annually in order to:

- Capture trends, growth and achievements for the Canadian sector.
- Offer insights into the current state of the sector.
- Provide valuable information for policy makers, investors and other stakeholders.

The 2014 profile was commissioned by Industry Canada and the CHFCA and conducted by MNP LLP. The information presented in the profile was collected through a survey of Canadian companies, educational institutes and government agencies that were directly involved in hydrogen and fuel cell-related activities in 2013. This edition is similar to previous publications, but includes selected case studies to help highlight some of the sector's recent activities.

Hydrogen production represents a large segment of the sector, but is not represented in the profile. There is minimal participation in the survey from the segment likely due to concerns about inferring financial information from the survey data.

Our thanks to all the organisations that contributed to the development of the Canadian Hydrogen and Fuel Cell Sector Profile 2014.



HTECH's Hydrogen Waste Capture Demonstration Facility

Introduction

The Canadian Hydrogen and Fuel Cell Sector is recognised as a leader in the global industry for pioneering new technologies and industry expertise. Increasing demand for clean energy products and solutions is generating opportunities and investments in a broad range of applications, including passenger vehicles, buses, stationary and back-up power and materials handling. Fuel cell technologies are also being used to enhance the performance of clean energy systems by helping to balance fluctuations in energy loads. These technologies also play an important role in helping to grow the renewable energy sector in Canada and around the world. The sector is also an important contributor to the Canadian economy and the development of clean, efficient and reliable energy alternatives.

The Industry at a Glance in 2013:

- Revenue was \$133 million.
- Product sales generated \$88 million of revenue.
- Research, development and demonstration expenditures were \$130 million.
- Employment was 1,554.
- 134 demonstration projects were reported.
- 43 strategic alliances were reported.
- 427 research partnerships were reported.

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Aussi offert en français sous le titre Profil de l'industrie canadienne de l'hydrogène et des piles à combustible 2014.

Organisation Profile

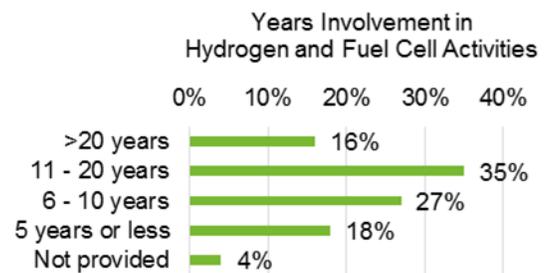
Organisation Type

Corporate organisations, including public, private companies and subsidiaries, represented 65% of total survey responses. Government organisations accounted for 10%, educational institutes and non-profit organisations, including associations, represented the remaining 25% of respondents.



Years of Involvement in Hydrogen and Fuel Cell Activities

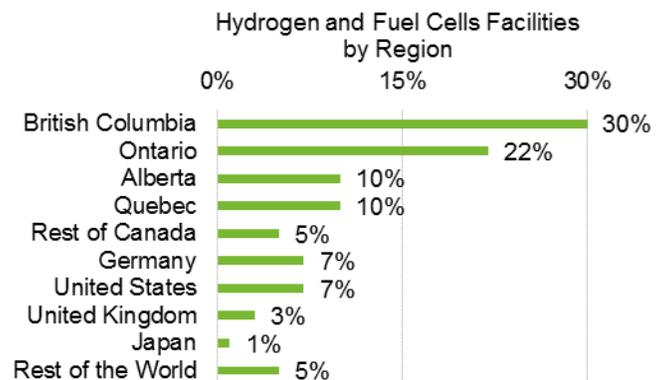
Fifty-one percent of survey respondents reported involvement in hydrogen and fuel cell activities for more than ten years.



Hydrogen and Fuel Cell Facilities by Region

Survey respondents reported 82 locations for hydrogen and fuel cell facilities and activities in 2013. In total, 77% of facilities were located in Canada, 7% were in Germany, 7% were in the United States, 3% were in the United Kingdom, and 1% were in Japan. The remaining 5% were overseas in China, Korea, South Africa, Belgium, France, Spain, South America and Mexico.

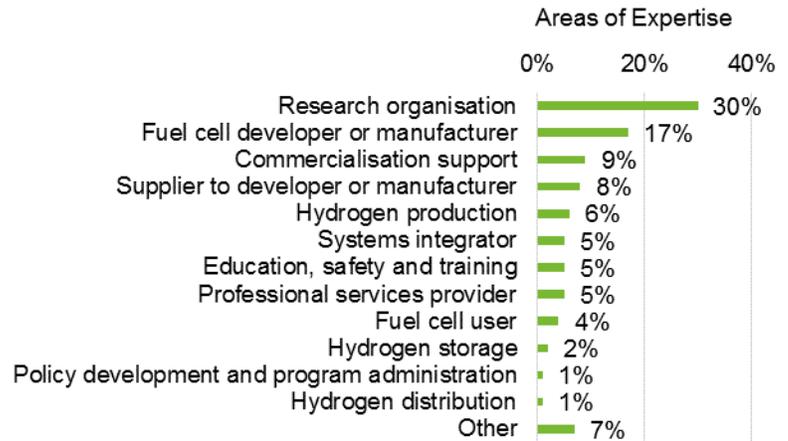
In 2013, hydrogen and fuel cell activities took place in most provinces within Canada. The majority of facilities and activities were in British Columbia and Ontario, followed by Alberta and Quebec. The rest of Canada included facilities located in Manitoba, Newfoundland and New Brunswick.



Areas of Expertise

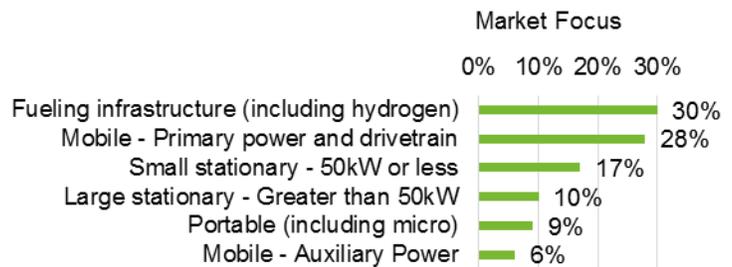
The sector's main area of expertise in 2013 was research (30%). Fuel cell development or manufacturing represented 17%, followed by commercialisation support (9%), supplier to developer or manufacturer at 8% and hydrogen production at 6%.

The other areas of systems integrator, education, safety and training, professional services provider, fuel cell users, hydrogen storage, policy development and administration and hydrogen distribution each represented 5% or less of the sector's expertise.



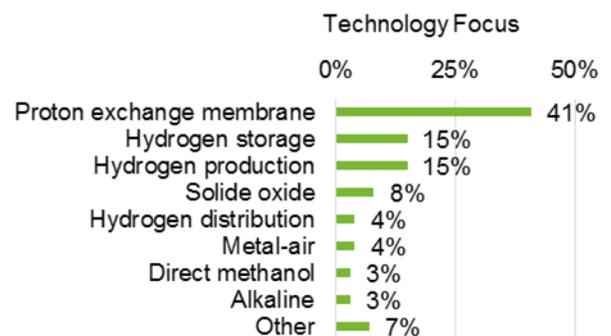
Market Focus

In 2013, fueling infrastructure, which includes hydrogen production, distribution and storage, represented the largest single area of market focus at 30%. The combined mobile applications of primary power and drivetrain (28%), portable (9%) and auxiliary power (6%) represented 43% of the market focus. Stationary applications, including both small (17%) and large (10%), represented 27% of the sector's market focus.



Technology Focus

Proton Exchange Membrane (PEM) fuel cells dominated the focus of technology activities in 2013 at 41%. Hydrogen storage and production each accounted for 15% of the technology focus. Solid oxide fuel cells represented 8%, hydrogen distribution and metal-air each represented 4%, and the remaining categories represented 13% of the sector's technology focus.



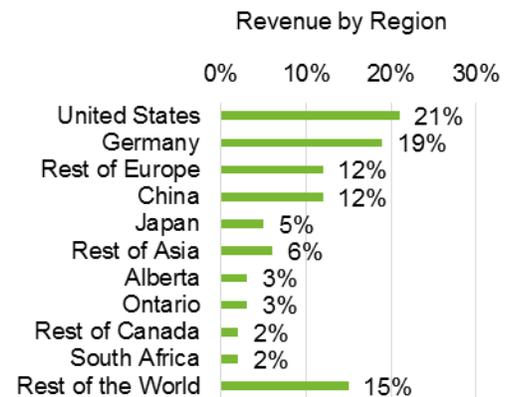
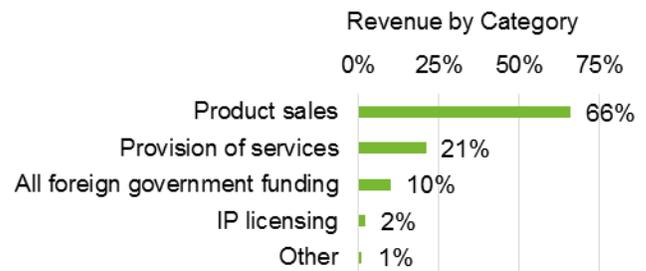
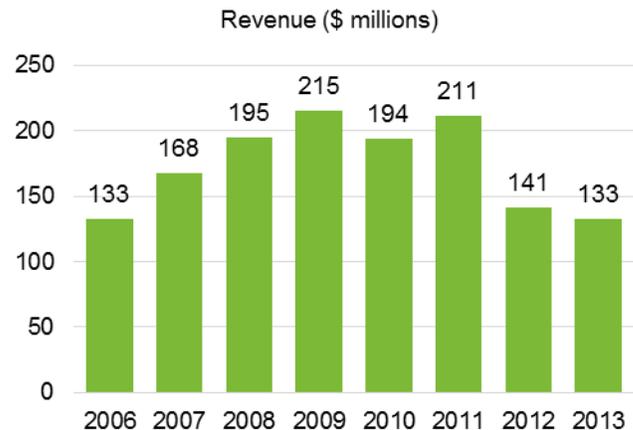
Revenue

In 2013, 40% of survey respondents generated revenue from hydrogen and fuel cell activities. Revenue was approximately \$133 million in 2013. Year-over-year revenue is directly comparable due to variations in organisations and participation rates.

Of the organisations that generated revenue in 2013, 30% reported more than \$5 million in revenue, 23% reported between \$1 and \$5 million, and 43% reported less than \$1 million in revenue.

In 2013, the two categories that generated the most revenue were product sales and provision of services generating 66% or \$88 million and 21% or \$28 million in revenue respectively. Foreign government funding represented 10% of reported revenue.

The regions with the most hydrogen and fuel cell-related sales were in Europe (31%), Asia (23%) and the United States (21%). Sales in Canada represented 8% of total fuel cell-related sales, with three-quarters of the Canadian revenue generated in Alberta and Ontario.



Headquarters

The majority of survey respondents (94%) reported headquarters of hydrogen and fuel cell activities located in Canada. Others organisations had headquarters in the United States, Germany and the United Kingdom.

Centres of Excellence

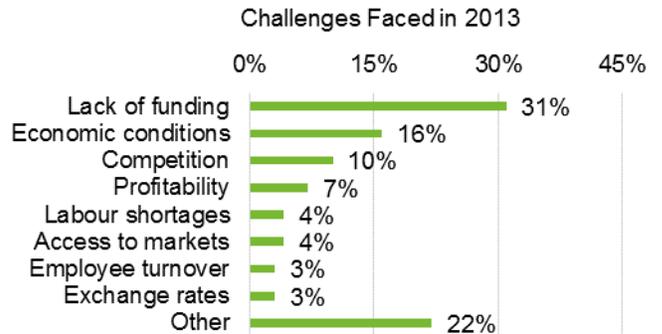
Daimler established its global center of excellence for fuel cell stack manufacturing in British Columbia due to the established fuel cell cluster in the region. Mercedes Benz Fuel Cells, a division of Daimler, has built an automated production facility. The fuel cell manufacturing plant in Burnaby is a state-of-the-art facility, involving custom robotics and world-class technologies to build Membrane Electrode Assemblies (MEA), seals and full stacks. The facility is working to ramp up production to produce fuel cells for next generation of Mercedes' fuel cell vehicles.



Mercedes-Benz Fuel Cell Production and Research Facility

Competitive Performance and Challenges

Survey respondents were asked to identify challenges faced by their organisations in 2013. The main challenges faced by survey respondents were the lack of funding (31%), economic conditions (16%) and competition (10%). Profitability was identified as a challenge by 7% of respondents, labour shortages and access to markets each represented 4%, and employee turnover and exchange rates each represented 3%. Other challenges identified by organisations were cost of capital and process tools, as well as challenges associated with scaling production orders with capital needs.



Stable, Reliable, Distributed Power Generation

Green energy systems and technologies are closely associated with current global challenges and future energy security and solutions. The research at Lambton College has focused on two areas:

- electrocatalysis for fuel cells, electrolyzers and batteries.
- integration of hybrid energy systems into the existing energy mix.

One of the projects at Lambton College is highlighted here: BioGenerator Solutions Inc., a Canadian company based in London, Ontario, with Western University and Lambton College have been working on evaluation and demonstration of a 10kW BioGenerator for use in a Distributed Generation System. The BioGenerator, invented at the Western University, is the world's first microbial fuel cell for large scale power generation and is the first biotechnological converter of hydrogen to electricity. The BioGenerator is fundamentally based on the use of the respiration system of specially-selected microorganisms to catalyze the oxygen reduction reaction at a fuel cell cathode, eliminating the need for expensive precious metal cathodic electrocatalysts.

This novel technology has several applications in a Smart Grid including smoothing of power from renewable sources (e.g., wind and solar) and large-scale power storage. Currently, a team from BioGenerator Energy Solutions, Western University and Lambton College is building a 10kW BioGenerator pilot system. It will be used to store electrical energy for the smoothing of the power generated from a system consisting of 11kW solar array, a 3kW wind turbine and a 5kW hydrogen generation unit at the Sustainable Smart House research facilities at Lambton College. As part of the project, Western and Lambton College researchers have successfully developed highly efficient and durable anodes for the BioGenerator based on a novel dispersion technique developed at the college. The application is aimed at leveraging the BioGenerator's ability to deliver a dependable base supply of power, while also instantaneously increasing its output as required to offset sudden drops in the outputs of solar array and wind turbine. The result is a stable, reliable power generation distribution, successfully integrated onto the grid and available during peak daytime demand.



Grand opening of CNL's new hydrogen labs

Research, Development and Demonstration (RD&D)

In 2013, 69% of survey respondents participated in RD&D activities and reported total RD&D expenditures of approximately \$130 million. Total research and development (R&D) expenditure was \$120 million or 92% of total RD&D spending, and demonstration expenditure for 2013 was \$10 million.

R&D expenditure was almost double the \$65 million of expenditure reported in 2012, while demonstration expenditure was compared to 2012.

2013 Total RD&D Expenditures	R&D \$ millions	Demonstration \$ millions	Total \$ millions
Corporate	112.2	7.1	119.3
Government, Academic and Non-Profit	7.8	3.0	10.8
Total	120.0	10.1	130.1

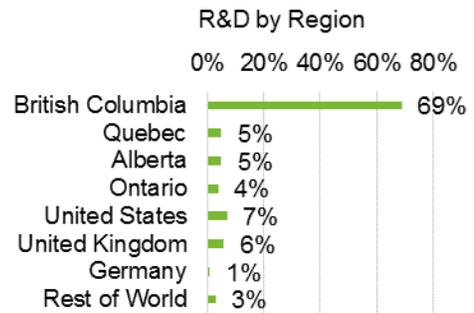
Sources of Funding for RD&D Expenditure

The table below provides a breakdown of funding for R&D and demonstration expenditures by source. Corporate operations together with parent, affiliated or subsidiary organisations funded 62% of total reported R&D expenditure. Foreign governments provided 15% of R&D funding and the Canadian government provided 7%. For demonstration expenditure, corporate operations funded 59% of demonstration projects, while the Canadian and foreign governments funded 29% and 10% respectively.

2013 Total RD&D Expenditures	R&D		Demonstration		Total	
	\$ millions		\$ millions		\$ millions	
Parent, affiliated or subsidiary organisation	47.5	40%			47.5	37%
Corporate operations	26.8	22%	6.0	59%	32.8	25%
Foreign government	18.3	15%	1.0	10%	19.3	15%
Canadian government (all levels)	8.2	7%	2.9	29%	11.1	9%
University or academic institute	1.8	2%			1.8	1%
Other	1.2	1%	0.1	1%	1.3	1%
Not specified	16.2	13%	0.1	1%	16.3	12%
Total	120.0	100%	10.1	100%	130.1	100%

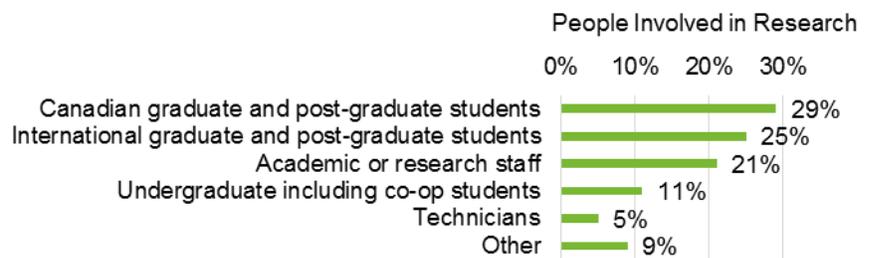
R&D by Region

British Columbia led all regions with 69% of participant R&D expenditure followed by the United States (7%) and the United Kingdom (6%). Quebec and Alberta each represented 5% of spending while Ontario represented 4%,



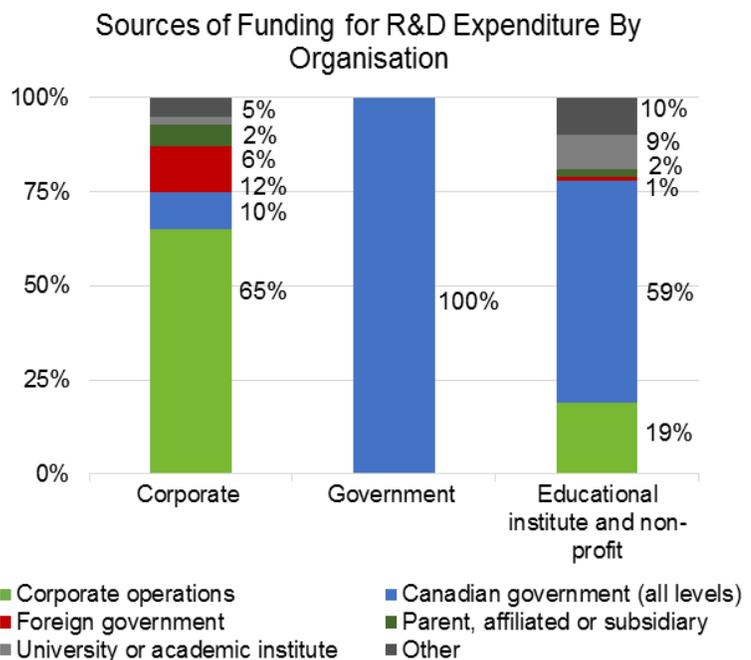
People Involved in Research

Survey respondents reported that a total of 239 people were involved in hydrogen and fuel cell-related research activity in 2013. Of the total people involved in research, 29% were Canadian graduate and post graduate students, 25% were international graduate and postgraduate students, 21% were academic or research staff, 11% were undergraduate students, including co-op and 5% were technicians. The other category included research involvement from corporate organisations.



Sources of Funding for R&D Expenditure

Corporate organisations received the majority of their funding for R&D expenditure from corporate operations (65%). Government organisations received funding for R&D expenditure exclusively from Canadian government sources. Educational institutes and non-profit organisations also received most of their funding from Canadian government sources (59%) and corporate operations (19%).



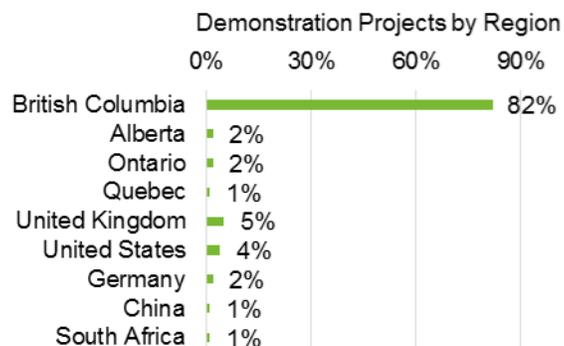
Demonstration Projects and Patents

Demonstration Projects

In 2013, survey respondents reported their participation in 134 demonstration projects around the world.

Demonstration by Region

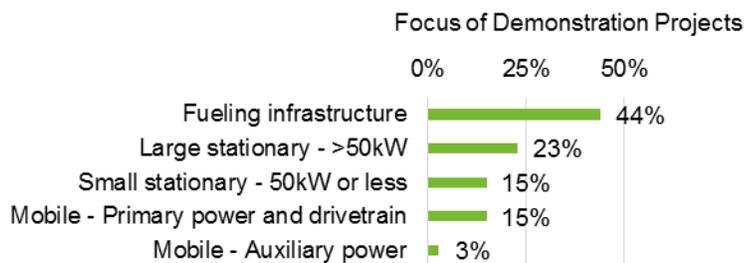
Canadian provinces hosted 87% of total demonstration projects in 2013. The majority of demonstrations took place in British Columbia (82%). Other Canadian provinces accounted for 5% of demonstrations which were hosted in Alberta (2%), Ontario (2%) and Quebec (1%). The rest of the demonstration projects took place in other regions, including the United Kingdom (5%), United States (4%), Germany (2%), China (1%) and South Africa (1%).



Sources of Funding for Demonstration

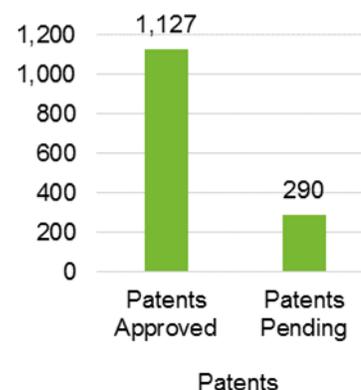
In 2013, Canadian governments funded 29% of the reported \$10 million demonstration expenditure and corporate operations funded 60%.

Fueling infrastructure was the main area of focus at 44% of overall demonstration projects. Stationary applications represented 38% of the demonstration project focus while mobile applications were the focus of the remaining 18%.



Patents

In 2013, respondents reported 1,127 newly approved patents and 290 patents awaiting approval.



New Flyer Industries

New Flyer Industries Inc., New Flyer Industries Inc., the leading manufacturer of heavy-duty transit buses in the United States and Canada, recently announced that it is developing the first ever North American designed and built zero-emission 60-foot battery-electric fuel cell bus.

This propulsion system is being integrated into New Flyer's heavy-duty transit Xcelsior bus platform that includes a combination of batteries, a fuel cell, and hydrogen storage. The electric drive bus will allow the fuel cell to operate at a relative steady-state, while the batteries will be able to both capture braking energy and provide power for propulsion.

New Flyer has partnered with Ballard Power Systems Inc., and Siemens on a battery-electric fuel cell bus that will be operated by AC Transit for 22 months of in-revenue-service operations. Ballard will supply a next-generation fuel cell power plant that is smaller, lighter and lower in cost than previous models. A key step in the commercialization will be to complete a full Altoona durability and performance test as part of the US Federal Transit Administration (FTA) Bus Testing Program. Upon the success of this program, New Flyer will offer this battery-electric fuel cell bus to customers throughout the United States and Canada.

Concurrently through a separate program sponsored by the California Energy Commission, New Flyer is working with Hydrogenics Corporation on the integration of their advanced fuel cell technology in a 40 foot New Flyer Xcelsior® bus. SunLine Transit will operate the Bus in its regular revenue route in Coachella Valley, California to validate the technical and market viability of this pre-commercial advanced fuel cell technology.



New Flyer Zero Emissions Electric Bus taken at the airport in Winnipeg

Employment

The organisations that responded to the survey (44%) reported a total of 1,554 employees involved in hydrogen and fuel cell activities in 2013. Corporate organisations employed the most employees (74%).

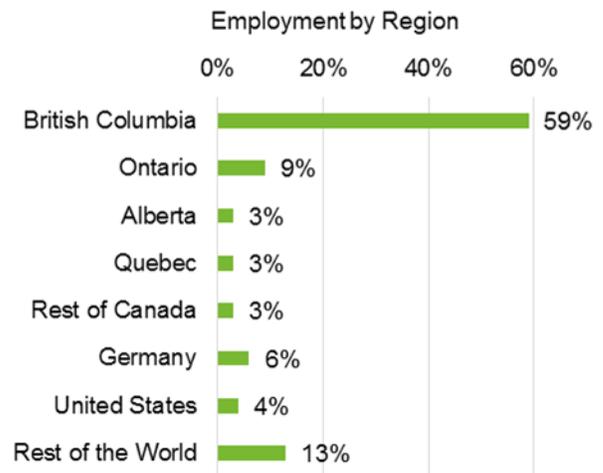
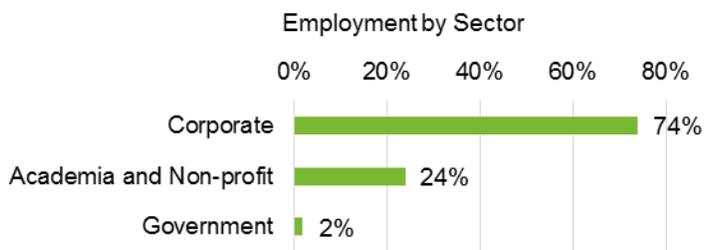
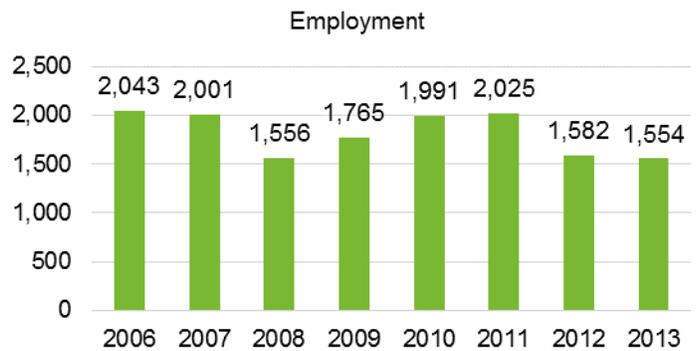
In 2013, the largest proportion of the sector’s employees (approximately 77%) were located in Canada. Within Canada, most employees were located in British Columbia, followed by Ontario, Alberta and Quebec. Other employees were in Germany, (6%) the United States (4%), and the remaining 13% were overseas.

Most of the organisations surveyed (63%) employed fewer than 10 employees. 13% of the organisations had between 10 and 25 employees, 9% had between 25 and 50, employees and 15% of organisations had more than 50 employees.

Based on the data provided for the number of employees and total salaries, the average annual salary paid to employees was \$64,592 in 2013. Extrapolating the average salary to the 1,197 employees in Canada, the sector contributed approximately \$77 million in salaries to the national economy.



Mercedes-Benz Fuel Cell Production and Research Facility, Interior



New Technologies

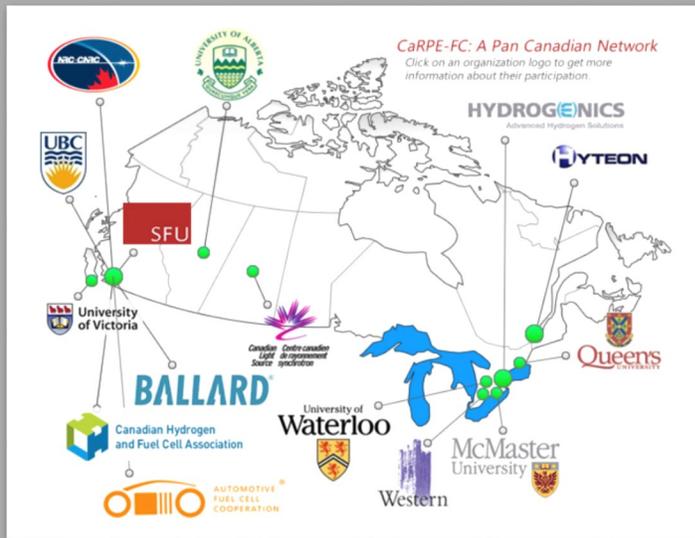
Terrella Energy Systems provided design and prototype services for equipment used for the production of graphite bipolar plates. The company specializes in roll embossing process which can rapidly form highly conductive graphite materials into a fuel cell plates offering a superior bipolar plates at a fraction of the cost of conventional methods. Terrella embossing process includes the precision micro features, and part to part repeatability, and plate performance this is easy to integrate into current fuel cell stack products.



Terrella Roll Embossing Line

Partners in Research

Catalysis Research for Polymer Electrolyte Fuel Cells (CaRPE-FC) is a pan-Canadian research network led by Simon Fraser University and supported by Automotive Partnership Canada (APC), the Natural Sciences and Engineering Research Council of Canada (NSERC) and a consortium of industry partners. The network has active participation from eight universities, four SMEs, an industry association and three government departments. Currently 91 research scientists, engineers and students are contributing to the research areas.



Proton electrolyte fuel cells are being developed for a variety of stationary, portable power and materials handling applications, and there is the potential in the automotive sector, to reduce greenhouse gas emissions and air pollution. The objective of the Network is to bring together researchers and partners with the common goal of reducing fuel cell costs primarily by reducing the platinum (Pt) requirement in fuel cells, but it is sufficiently diverse to impact all PEFC commercial sectors in Canada. The network focuses on developing an understanding of topics in:

- Electrocatalysts and catalyst support materials, in which ultra low Pt content catalysts and non-platinum group metal (PGM) catalysts are investigated; and
- Catalyst Layers (CLs) and Transport Phenomena, which investigates specifically-adapted designs of CLs and membrane electrode assemblies that alleviate the demanding requirements of thermal, water, proton and gas transport.



Strategic Alliances and Research Partnerships

Research Partnerships

Research partnerships promote closer collaboration between the university research community and other sectors, including government and industry. Survey respondents indicated that there were 427 research partnerships in 2013. Since survey respondents may report partnerships that they have with each other, there is a possibility that the number of research partnerships is overstated. However, research partnerships as a percentage of the total should be representative of actual partnerships.

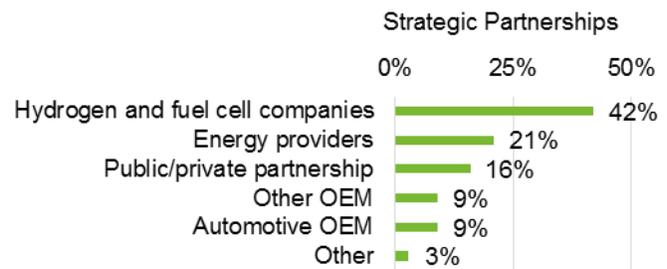
Partnerships with Canadian academia/non-profit/associations represented 53% of all research partnerships, foreign governments represented 25% of partnerships, industry in Canada represented 5% or partnerships, industry outside of Canada represented 7% of partnerships and Canadian government represented 9% of all research partnerships.

The number of research partnerships signifies the necessity of pre-commercial collaboration in order to address common technical challenges. The table below illustrates the various types of partnerships and collaborations in the hydrogen and fuel cell sector within Canada and abroad.

Number of Research Partnerships	
In partnership with Canadian academia/non-profit/associations	227
In partnership with foreign governments	106
In partnership with Canadian government	40
In partnership with industry outside of Canada	30
In partnership with industry in Canada	23
Other	1
Total	427

Strategic Alliances

In 2013, survey respondents reported 43 strategic partnerships and alliances. Hydrogen and fuel cell companies represented 42% of these partnerships and alliances, while energy providers represented 21%. Public-private partnerships represented 16% of partnerships, followed by automotive and other OEM each with 9% of partnerships.



Funding Requirements

Continued education of governments and public capital markets on the benefits of investing in the hydrogen and fuel cell sector is an important part of the industry's efforts to secure funding. Given the industry's long development period and demanding RD&D requirements, adequate financing is necessary to bring commercial products to market.

In 2013, most funding (62%) was allocated to R&D (both intramural and in-house). About 23% of funding was allocated to education, safety and training. For educational institutes and non-profit organisations, 71% of funding was allocated to R&D and 27% was allocated to education, safety and training.

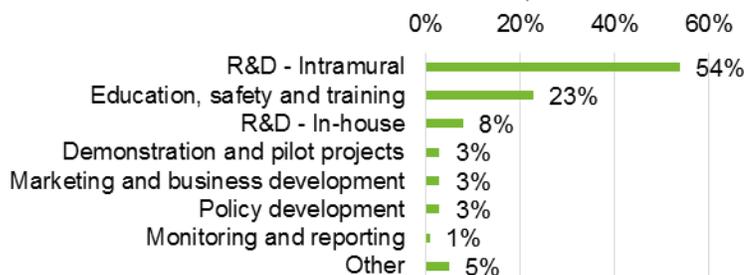
Corporate

Corporate respondents reported the top three sources of funding for 2013 were from operations (43%), government (20%) and private equity (19%).

The financial requirements for the next five years were estimated to be \$573 million.

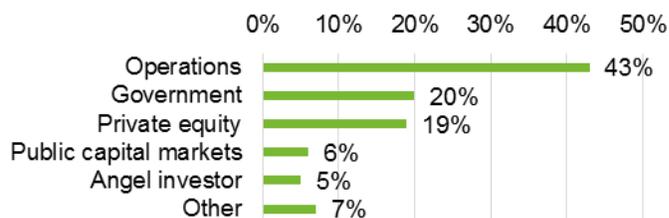
Twenty five percent of survey respondents reported new investment in the sector, the majority of which originated in British Columbia (28%), followed by Alberta (22%), Quebec (10%) and Ontario (3%). The remaining new investment in the sector was from the United States (15%) and international sources (22%).

Funding Allocation By Area - Government, Academia and Non-profit



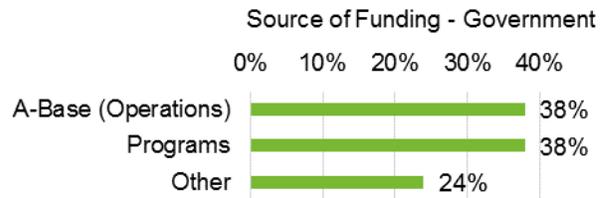
Fuel Cell Forklift.

Source of Funding - Corporate



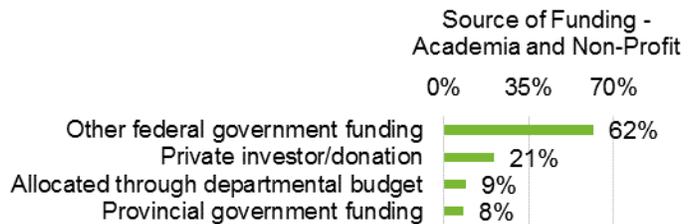
Government

The total budget for hydrogen and fuel cell-related activities reported for 2013 for which government was directly responsible; (including employee salaries and benefits) was \$2.5 million. Programs and A-base operations each contributed 38% of the funding.



Academia and Non-Profit

The total budget for hydrogen and fuel cell-related activities reported for 2013, for which academic and non-profit was directly responsible, (including employee salaries and benefits) was \$6.1 million. The sources of funding for 2013 were from federal government funding (62%), private investors/donations (21%), departmental budgets (9%) and provincial government funding (8%).

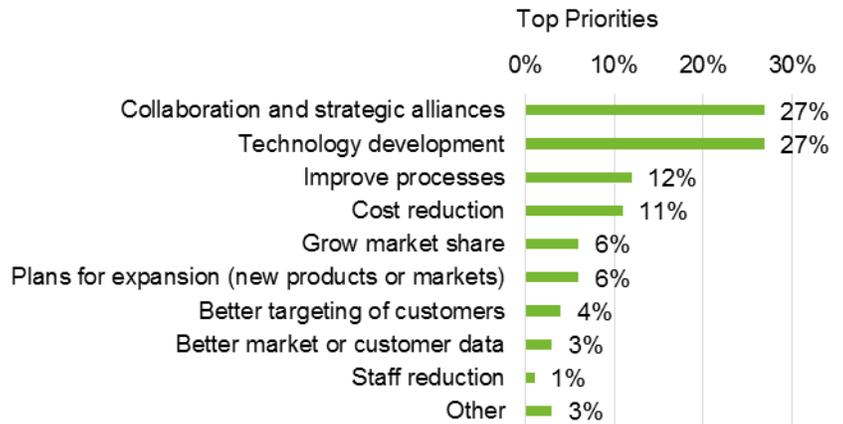


First fuel cell stack produced at the new Mercedes-Benz facility in Burnaby.

Outlook

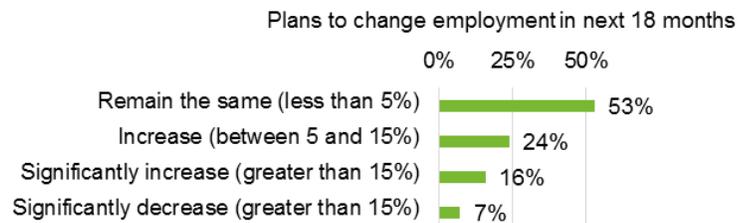
Looking ahead to 2015, survey participants were asked to identify the top three priorities to enhance competitive performance. Collaboration and strategic alliances and technology development, were identified as top priorities for respondents (27% each). Improving processes was identified by 12% of respondents, and cost reduction by 11%.

Growing market share, plans for expansion, better targeting of customers, better market or customer data and staff reduction were also identified as priorities for some respondents. Other concerns identified by respondents included regulatory changes and finding ways to help the industry connect and succeed in foreign markets.



Employment Outlook

Of the organisations surveyed, 53% anticipate that employment will remain the same over the next 18 months. 40% plan to increase employment within the next 18 months, while 7% of companies plan to reduce employment.



Conclusion

The Canadian hydrogen and fuel cell sector is recognized for its role in the development of clean technology applications. In 2013, approximately 51% of respondents reported involvement in hydrogen and fuel cell activities for more than 10 years suggesting an industry with a stable base. The industry also continues to innovate with the total number of approved and pending patents increasing from 699 in 2012 to 1,417 in 2013.

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- Research, development and demonstration expenditures were \$130 million.
- Employment was 1,554.
- 134 demonstration projects were reported.
- 43 strategic alliances were reported.
- 427 research partnerships were reported

Canadian Hydrogen and Fuel Cell Association (CHFCA)

The Canadian Hydrogen and Fuel Cell Association (CHFCA) is the national association accelerating Canada's world recognized hydrogen and fuel cell sector. As the sector's collective voice, the CHFCA works to raise awareness of the economic, environmental and social benefits of hydrogen and fuel cells. We are a national, non-profit association providing services and support to Canadian corporations, governments and educational institutions promoting development, demonstrating and deploying hydrogen and fuel cell products and services in Canada. Our members cover most types of hydrogen and fuel cell technologies, components, systems supply and integration, fuelling systems, fuel storage, and engineering and financial services.

The CHFCA was formed in January of 2009 as a result of a merger between the Canadian Hydrogen Association (CHA) and Hydrogen & Fuels Cells Canada (H2FCC). The merger unites the members of the former associations to create a vibrant, influential association that represents the majority of the stakeholders in Canada's hydrogen and fuel cell sector.

Industry Canada

Industry Canada's goal is to enhance the competitiveness of Canadian industry. The organisation is responsible for maintaining channels of communication with key sectors to facilitate informed advocacy of industry interests in government decision-making and to convey the government perspective back to industry; analyzing the challenges and opportunities that face key sectors in the economy; developing policy options for possible government response to extraordinary challenges and opportunities; and delivering the subsequent programs and services.

MNP LLP

For more than 65 years, MNP has served and responded to the needs of clients in the public, private and non-profit sectors. We customize every engagement to meet the specific needs of our clients. By having local, regional and national expertise in all of our markets, we are able to provide clients with partner-led projects to ensure a more efficient approach to engagements.

Today, MNP is the fastest growing major chartered accountancy and business consulting firm in Canada, with more than 70 locations and 3,000 team members across the country. In British Columbia, MNP is well-recognised across the province, with more than 700 team members located in over 20 communities.



Methodology

The 2014 Sector Profile is the eleventh annual publication of information on the Canadian Hydrogen and Fuel Cell Industry. As in previous years, existing and potential members of Canadian Hydrogen and Fuel Cell Association, educational institutes, government stakeholders and partners in current hydrogen and fuel cell demonstration activities were asked to voluntarily complete a survey questionnaire.

While the survey questionnaire has remained substantially consistent from the survey's inception, each year the organizers have refined the questions to gather more detailed information to better reflect the sector and its trends. Since the 2004 survey, specific questions have been asked from three types of stakeholders:

- Corporate (public and private organisations);
- Government (government and government agencies); and
- Educational institutes and non-profit (educational, nonprofit, and non-governmental organisations (NGOs).

All monetary results are presented in Canadian dollars.

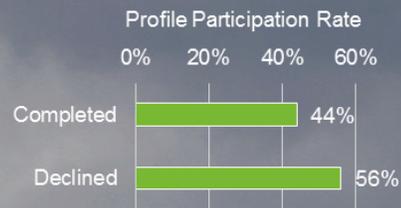
New to the 2014 profile is the addition of case studies which highlight some of the sector's recent activities.

Response Rate

A total of 116 organisations associated with hydrogen and fuel cells in Canada were invited to participate in the development of this Sector Profile.

In total 51 completed responses were received, representing an overall response rate of 44%. Not all respondents provided information for every category requested. Some investigation was conducted as to the completeness of the data provided by respondents or reasons for non-provision, but in some cases clarification was received.

Note that industrial hydrogen production represents a large segment of the sector, but participation in the survey is likely low due to concerns about inferring financial information from the survey data.



A list of survey respondents is included at the end of the report. There were five additional respondents that did not consent to have their organisation's name published in the sector profile.

Presentation of Data

Figures presented for 2013 were collected by an online questionnaire in 2014. Figures presented for 2012 are as reported in the 2013 Sector Profile and, therefore, may not be fully comparable due to differing respondents and/or basis of individual responses.





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Sector Profile please contact:**

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2014 Participants



Associated Plastics & Supply Corp

Atlantic Hydrogen Inc.

AUTO21 Network of Centres of Excellence

Automotive Fuel Cell Cooperation

Ballard Power Systems, Inc.

BioGenerator Energy Solutions Inc.

Canadian Hydrogen and Fuel Cell Association

Catalysis Research for Polymer Electrolyte Fuel Cells Network

Change Energy Services Inc.

Department of Foreign Affairs, Trade and Development

dPoint Technologies Inc.

Enbridge Inc.

Evergreen Energy Technologies Inc.

FCTECK Holdings Ltd.

FireWater Fuel Corporation

FuelCell Energy, Inc.

Greenlight Innovation Corporation

HTEC: Hydrogen Technology & Energy Corporation

Hydrogenics Corporation

Hyteon Inc.

Industry Canada

ITM-Power Plc

Lambton College

McMaster University

Mercedes-Benz Canada Inc.

National Research Council Canada

New Flyer Industries Inc.

NORAM Engineering and Constructors Ltd.

Palcan Energy Corporation

PowerDisc Development Corporation

Quadrogen Power Systems, Inc.

Red River College

Simulent Inc.

Sustainable Development Technology Canada

TISEC Inc.

Terréllá Energy Systems Ltd.

Group of Research in Energy & Environment (Université de Sherbrooke)

Hydrogen Research Institute (Université du Québec à Trois-Rivières)



Clean Energy Research Centre (University of British Columbia)

University of Ontario Institute of Technology

University of Ottawa

Institute for Integrated Energy Systems (University of Victoria)

Waterloo Technical Instruments Inc.

Western Hydrogen Ltd.

Xebec Adsorption Inc.

Zolair Energy Ltd.

Hyundai and Mercedes Benz Fuel Cell vehicles at fueling station

www.chfca.ca

www.ic.gc.ca

www.mnp.ca

