Invest Vancouver
Industry Overview:

Hydrogen and Fuel Cell Technology

The Metro Vancouver region is home to a growing green economy, with businesses helping to create a cleaner future. At the heart of this industry lies an internationally renowned hydrogen and fuel cell technology cluster. Innovation lives in within the region's cluster, with engineers, manufacturers, and specialized consulting services for alternative fuels. The sector is supported by a rich ecosystem, including esteemed research institutions and universities, alongside sector-specific accelerators and conducive regulation.

50%+ of Canada's hydrogen and fuel cell companies are located in the province of British Columbia (BC)

60% of the total research investment in hydrogen and fuel cell development comes from BC

1st province in Canada to implement a hydrogen strategy

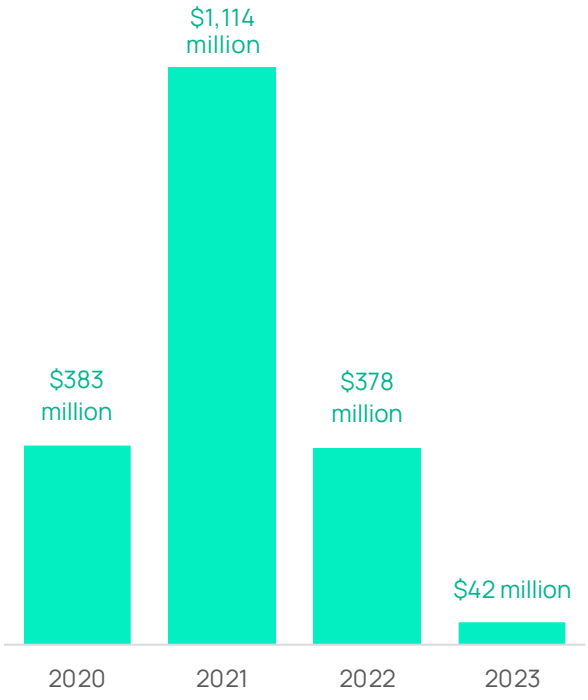
20% of Canada's pure-play clean tech companies are located in British Columbia

SOURCE: BC GOVERNMENT; BC CLEANTECH PROFILE

"The 'Silicon Valley' of fuel cell technology"

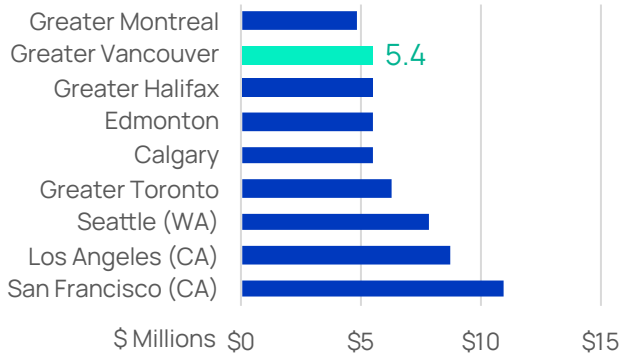
according to **cellcentric**, a 50:50 joint venture of Daimler Truck AG and the Volvo Group AB

Investment in Hydrogen Firms Headquartered in the region

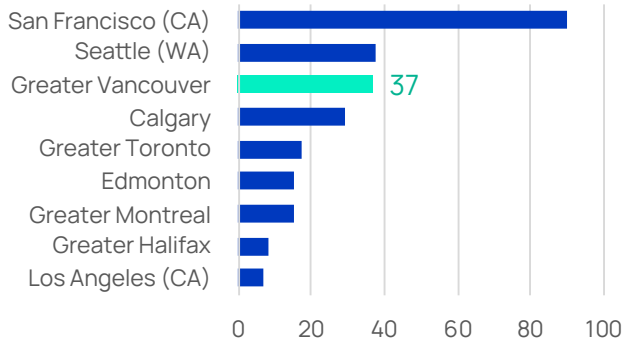


SOURCE: PITCHBOOK, 2024

Annual operating costs for Hydrogen firms



Number of hydrogen patents per 100,000 population



SOURCE: SOURCE: FDI BENCHMARK FROM THE FINANCIAL TIMES, 2024

Leading the way in the Metro Vancouver region

AVL Fuel Cell Canada Inc. is a subsidiary of AVL List GmbH, a global company known for developing, simulating, and testing powertrain systems for various vehicles. AVL Fuel Cell Canada performs cutting edge PEM fuel cell stack development for all applications, including automotive, heavy-duty, and marine.

Ballard Power Systems is a global hydrogen company, with 900+ employees at their Burnaby headquarters. One of the oldest companies in the sector, Ballard began the development on PEM fuel cells in the 80's. Today, they design, manufacture and sell fuel cell products that power zero-emission transit buses, trucks, trains, marine vessels, and forklifts.

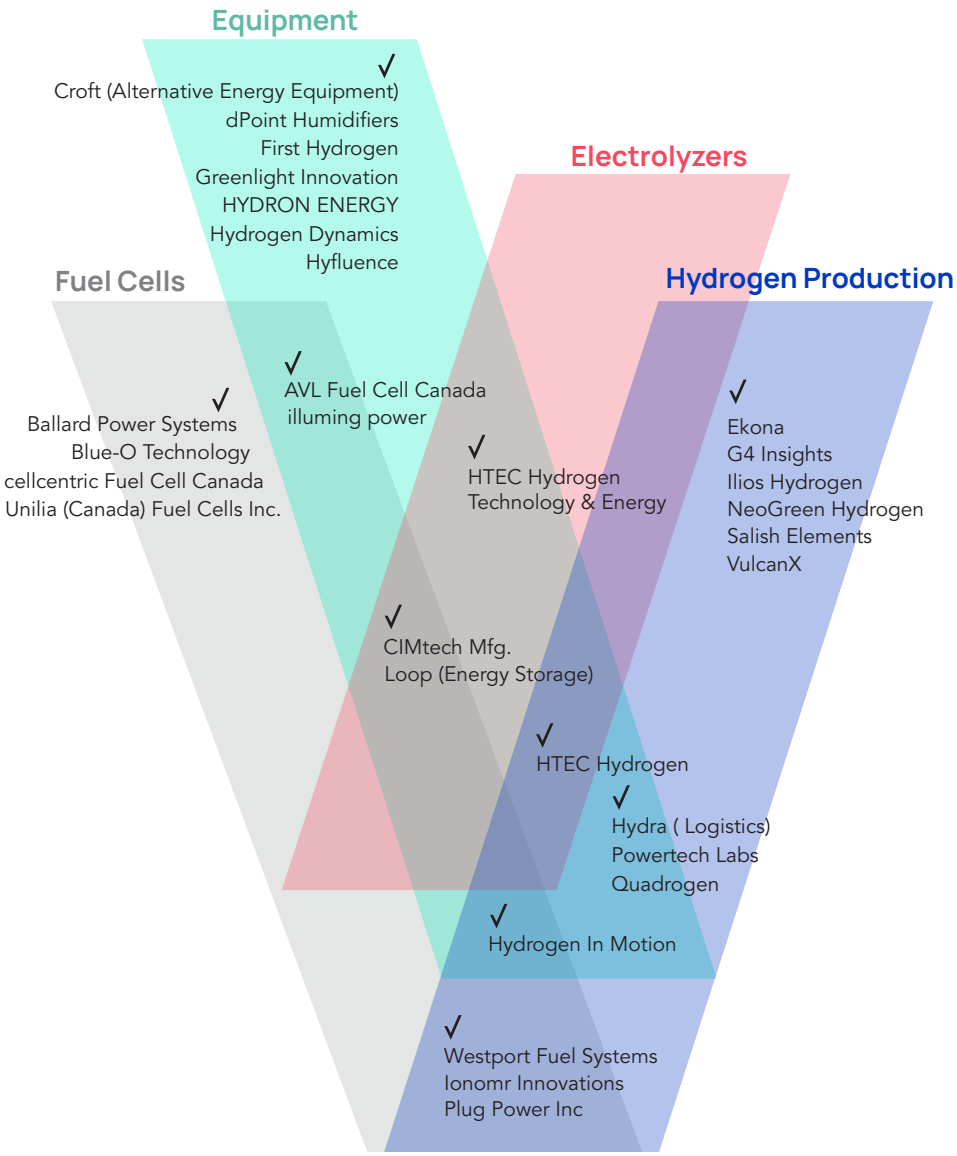
cellcentric, a German company aiming to become a global leader in fuel cell manufacturing, is developing fuel cell stacks for long-haul trucks in Burnaby. The region's unique pool of specialized talent was the key factor in the firm's decision to pursue the future of sustainable transportation here.

Ionomr Innovations is a developer of ion-exchange membrane and polymer technology designed to be used for hydrogen production, fuel cells and energy storage.

Greenlight Innovation is driving the advancement of sustainable transportation and energy usage by creating top-tier testing and development equipment. Based in Burnaby, the company is globally renowned for researching and manufacturing fuel cells, electric vehicles, and energy storage systems.

Westport Fuel Systems specializes in engineering, manufacturing, and supplying alternative fuel systems and components for various transportation applications. They cater to both original equipment manufacturers (OEMs) and the independent aftermarket.

Hydrogen Firms and Industry Composition



The Region's Support Ecosystem

The region's hydrogen sector thrives with federal and provincial support, innovative research centers, and specialized talent. This ecosystem boosts renewable and low-carbon hydrogen production, drives research, and commercializes hydrogen technologies, positioning the region as a global leader in the hydrogen economy.

Government Financial and Regulatory Support

PROVINCIAL

- B.C. Low Carbon Fuel Standard (LCFS) provides financial incentives for low-carbon fuel use based on measurable greenhouse gas reductions.
- B.C. Hydrogen Strategy is a set of 63 actions that set the course for BC to be a world leader in the hydrogen economy by 2050 by accelerating the production and use of renewable and low-carbon hydrogen.
- Clean Energy and Major Projects Office serves as the Province's one-stop shop for hydrogen, streamlining the regulatory process and providing guidance for clean energy initiatives.
- Innovative Clean Energy (ICE) Fund supports projects that advance B.C.'s clean energy sector and has committed over $114 million since 2008.

PROVINCIAL & FEDERAL

- Scientific Research and Experimental Development (SR&ED) provides tax incentives to businesses to conduct R&D in BC and Canada that advances technological or scientific knowledge.

FEDERAL

- Clean Hydrogen Investment Tax Credit is a refundable tax credit of up to 40% of investments in projects that produce hydrogen. The tax credit will be available for investments from March 28, 2023 to 2034. Legislation will be introduced in 2024.
- Canada Growth Fund (CGF) is a $15 billion public fund dedicated to advancing Canada's shift to a low-carbon economy and accelerate the deployment of clean technologies.
- Canadian Clean Fuel Regulations (CFR) is a national clean fuel program that provides credits for using low-carbon fuels, advancing innovation, and fostering investment in clean energy.

Research and Innovation Centers

- **B.C. Centre for Innovation and Clean Energy (CICE)** is an independent, not-for-profit incubator for the research and commercialization of clean energy solutions
- **Canadian Hydrogen Association (CHA)** is a non-profit organization that fosters collaboration between industry, government, and academia, providing advocacy, research, and networking opportunities.
- **Clean Energy Research Centre (UBC)** is a multidisciplinary research hub that focuses on research, training, development, and demonstrations to address climate change and sustainability.
- **MITACS** is non-profit national research organization that connects firms with researchers and talent, offers financial support and expert guidance to help organizations in their innovation projects
- **SFU Clean Hydrogen Hub** is a research and innovation center focused on development and commercialization of hydrogen solutions.
- **BC Research Inc.** Is an innovation center specializing in the incubation and commercialization of novel technologies
- **Smart Hydrogen Energy District (SHED)** is a UBC research facility integrating solar, hydro and hydrogen energy into a unified micro-grid.

Metro Vancouver region boasts a strong hydrogen talent pool, driven by competitive costs for skilled labor and an appealing lifestyle that attracts top professionals.

- Major companies like Ballard Power Systems and Westport Fuel Systems pioneer the growth of the hydrogen talent pool.
- Simon Fraser University (SFU) and the University of British Columbia (UBC) host cutting-edge hydrogen research centers.
- hy-fcell Canada conference plays a role in the talent pool by bringing together international hydrogen experts and fostering the exchange of knowledge.

Sector Activity

The region is at the forefront of the global hydrogen economy. With advancements in fuel cell technology and the expansion of hydrogen production and refueling infrastructure, new projects and technological breakthroughs are being announced regularly. Just in the first half of 2024, investments and innovations from HTEC, Ionomr, Ballard and many others have further accelerated the progress of the hydrogen sector in the region.

In the first half of 2024…

HTEC accelerates Western Canada's hydrogen network

Canada Infrastructure Bank (CIB) invested $337 million in HTEC to expand hydrogen production and build up to 20 inter-provincial refueling stations in BC and Alberta. This loan supports HTEC's H2 Gateway, a $900 million program, focusing on developing a hydrogen ecosystem for the transportation sector.

Canadian airports pioneer hydrogen for aviation

Vancouver International Airport (YVR), Toronto Pearson International Airport (YYZ), Montreal-Trudeau International Airport (YUL), Airbus, and ZeroAvia, signed a Memorandum of Understanding (MoU) to study the feasibility of hydrogen infrastructure at Canadian airports.

Ionomr's Iridium-Free Catalyst Coated Anion Exchange Membranes for low-cost green hydrogen

Ionomr released Catalyst Coated Membranes (CCMs) based on its Aemion® Anion Exchange Membranes (AEMs). These CCMs are free of iridium and toxic perfluorinated (PFSA) substances, marking a new era in green hydrogen production.

Ballard's ninth Generation Fuel Cell Engine for Heavy-duty vehicles

Ballard introduced the FCmove®, a high-performance fuel cell engine featuring the highest engine volumetric density of 0.36 kW/L and gravimetric power density of 0.48 kW/kg for heavy-duty mobility.

cellcentric's NextGen Fuel Cell System for long-haul trucks

cellcentric launched a new, highly-integrated, compact, and low-weight fuel cell system with a peak power of above 350 kW, tailored for hydrogen-powered long-haul trucks in North America and Europe.

First Hydrogen's fourth hydrogen-fuel-cell powered vehicle

First Hydrogen's hydrogen-fuel-cell-powered vehicle (FCEV) began trials with a large multinational logistics company that uses commercial vans for parcel deliveries, following three successful trials.

UBC launches a research facility that will accelerate innovation in BC's hydrogen energy sector

UBC launched a $23-million Smart Hydrogen Energy District (SHED) that is equipped with a hydrogen fueling station and combines hydro, solar, and hydrogen energy in a unified micro-grid. SHED is the province's first hydrogen station to serve light- and heavy-duty vehicles.