



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update November 2015: Canada

The IPHE Secretariat requests each IPHE member submit a one-page narrative update on hydrogen and fuel cell (HFC) activities. Please only report actions and developments since the last Country Update and leave Sections blank if there have been no new developments.

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Covered Period	June 2015 – November 2015

1. New Policy Initiatives on Clean Technologies and Clean Energy

Federal government: Currently there are no federal government HFC specific policies and measures. However, there are framework policies that can apply to HFC technologies, and, clean technologies are a top priority for Canada. Specific commitments include:

- Investing an additional \$100M/year in clean technology development;
- \$200M more per year to support innovation and the use of clean technologies in our natural resources sector (forestry, mining, fisheries, agriculture and energy);
- The creation of a *Canadian Infrastructure Bank* which will issue Green Bonds to fund projects such as electric vehicle charging & fuelling networks, transmission lines for renewable energy, building retrofits and clean power storage;
- Tax incentives designed to stimulate research, development and manufacturing of clean technology investments;
- Working with other levels of government to set stronger air quality standards, monitor emissions, and provide incentives for investments that lead to cleaner air and healthier communities;
- Increase the use of clean technologies by government;
- Improve energy efficiency standards for consumer and commercial products, and use new financing instruments to encourage investments in energy-saving retrofits to Canada's industrial, commercial, and residential buildings;
- Provide additional export promotion and investment attraction support to clean technology firms;
- Identify opportunities for government to be an early adopter of emerging green technologies, including rapidly expanding the federal fleet of electric vehicle;
- The establishment of Canada Research Chairs in sustainable technology; and,
- To work with provincial and territorial governments on the development of a Canadian Energy Strategy to protect Canada's energy security; encourage energy conservation; and bring cleaner, renewable energy onto the electrical grid.

Provincial governments

Quebec has launched a new electric vehicle strategy that will invest \$420M over 5 years to promote electric vehicle use, innovation, commercialization, and exports. 50% of the electric vehicles deployed in Canada are in the province of Quebec and an additional 100,000 new electric and hybrid electric vehicles are projected to be on the road by 2020 (2% of total vehicle stock).

Alberta has developed a *Climate Leadership Plan* designed to: accelerate the transition from coal to renewable electricity sources; puts a price on carbon pollution; sets an overall oil



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sands emission limit of 100 mega tonnes; and, implement a methane reduction strategy to reduce emissions by 45% by 2025.

British Columbia continues to reinvest revenue generated through a regional carbon tax into: the Innovative Clean Energy Fund (ICE); product purchase incentives for clean energy vehicles (CEVs); clean infrastructure development support; and, the development of a CEV Advanced Research and Commercialization (ARC) program to be launched in 2016/17 (details below).

2. Hydrogen and Fuel Cell R&D Update

Energy Systems

Canadian Nuclear Laboratories (CNL) hosted a *Hydrogen Energy Storage* workshop in September, 2015. The event was well attended, it provided an opportunity for participants to learn about each other's capabilities and interests and, to promote collaborative efforts to advance hydrogen and fuel cell technologies. See www.cnl.ca.

The *Canadian Hydrogen Infrastructure Initiative (CHII)* has been established. The objective of this national collaborative effort involving industry, academia and various levels of government is to develop publicly available hydrogen refueling infrastructure, in select Canadian markets, over the next 5 years. Hydrogen corridors are being envisioned up and down the eastern and western coasts of North America.

Natural Resources Canada (NRCan) has agreed to provide the financial support required to validate the Power-to-Gas (PtG) techno-economic analysis tool developed by the National Research Council of Canada (NRC), Canadian Nuclear Laboratories (CNL), the US Department of Energy (US DOE) and National Renewable Energy Labs (NREL) under the Canada/US Clean Energy Dialogue initiative (<http://energy.gov/ia/initiatives/us-canada-clean-energy-dialogue-ced>). This will be done by conducting analysis of real &/or potential PtG deployments in North America.

Transportation Systems

Mercedes Benz Fuel Cells (MBFC)'s R&D efforts, along with those of their suppliers, have led to the retooling of their automated production line. MBFC's mandate is to determine how to manufacture automotive fuel cells stacks, on an industrial scale, at an affordable price.

3. Demonstration and Deployments Update

Tugliq Energy's hybrid renewable energy system at Glencore's remote Raglan mine in Nunavut continues to make progress and is close to being fully commissioned. The Raglan mine is the largest employer in the territory, it's an off-grid location which was 100% dependent of fossil fuels. The system involves a 3MW wind turbine, several methods of storing energy (hydrogen, batteries & flywheels) a fuel cell and a power management system. The production of electricity and the reliability of the system have exceeded corporate expectations to date. As a result, management is considering adding additional capacity to the system and potentially introducing additional HFC solutions below the surface.

The number of fuel cell vehicles (FCVs) in the Vancouver region have increased from 2 to 10, with additional load expected to follow.



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Ballard Power Systems and Hydrogenics Corporation have both recently made significant commercial announcements regarding transportation applications, particularly in China (buses, trams and cars).

4. Events and Solicitations

Globe 2016 Conference & Innovation Expo: March 2 - 4 2016, Vancouver, Canada. Globe is North America's largest and longest-running sustainable development conference and exposition. With approximately 2000 delegates expected from over 50 countries, Globe 2016 will offer opportunities to interact with business and government representatives from around the world. A HFC track is expected. See: www.globeseries.com.

The British Columbia government (BCG) has issued a request for proposals for the development of a provincial **Clean Energy Vehicle (CEV) Economic Opportunities Assessment** to be completed in Q2, 2016. The objective is to inform policy makers and use it as the basis for a CEV Advanced Research and Commercialization (ARC) program to be launched in 2016/17 with the priorities to include: skills development, Research, Development & Demonstration, and, commercialization of CEV technologies.

The IEA Implementing Agreement on Renewable Energy Technology Deployment (IEA-RETD) is issuing a call for tenders for the "preparation of a **technology assessment of current and future Power-to-Gas options for use in light duty vehicles and busses/coaches**, addressing technological and political obstacles and possible solutions". The project was proposed by Germany and is expected to be completed in May, 2016. See: www.iea-retd.org. Canada's is represented at the IEA-RETD by the Natural Resources Canada (NRCan)

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

The BC government and the Canadian Hydrogen & Fuel Cell Association (CHFCA) have released a call for proposals for a public hydrogen refuelling station in the Vancouver region to support the deployment of additional FCVs and potentially FC buses in the region. The BCG is contributing \$500K towards this initial public station. Additional stations and vehicles are expected to follow.