

August 6, 2016

The Honourable Navdeep Bains
Minister of Innovation, Science and Economic Development
House of Commons
Ottawa, Ontario K1A 0A6

Dear Minister Bains,

On behalf of the Canadian Hydrogen and Fuel Cell Association (CHFCA), I would like to thank you for your consideration of the hydrogen and fuel cell (HFC) sector in Canada, as well as your continued support for the innovation and use of clean technologies.

Canada is a pioneer in the development of automotive fuel cell technologies, including an expertise in the supply of parts and components for fuel cell vehicles (FCVs). With the transportation sector representing 37 per cent of total provincial greenhouse gas emissions, hydrogen powered cars and buses are essential to reducing emissions and maintaining healthy air quality as the country transitions to a lower carbon economy. Adopting hydrogen fuel cell transportation systems and modes can positively contribute to reducing greenhouse gas (GHG) emissions and meeting the federal government's announced greenhouse gas emission targets, while also supporting the growth and competitiveness of the economy.

Hydrogen fuel cell electric (FCE) vehicles will play a key role in reducing vehicle greenhouse gas emissions and contribute to a low carbon economy in Canada. In contrast to conventional gasoline vehicles, today's FCE vehicles do not emit any greenhouse gases (GHGs) during vehicle operation, and can effectively reduce emissions by over 30 percent. While battery electric vehicles also reduce emissions, only fuel cell cars meet the extended range and consumers' rapid refueling demands.

With sufficient incentives, policy frameworks and regulatory requirements in place that would encourage the production and sales of FCEVs, hydrogen powered vehicles can have an immediate impact on reducing carbon emissions and significantly improving air quality for Canadians. If Canada were to have a fleet of just 5,000 hydrogen powered vehicles on the road by 2020, the country's yearly greenhouse gas emissions would be reduced by 14,750 tonnes; similarly, a fleet of 20,000 FCE vehicles by 2025 or 100,000 FCE vehicles by 2035 would reduce GHG emissions by 58,800 tonnes and 294,000 tonnes respectively.

In addition to personal hydrogen fuel cell vehicles, fuel cell-powered buses that run on hydrogen will serve to greatly reduce greenhouse gas emissions on a well-to-wheels basis and assist Canada in meeting its Climate Change goals. Transit ridership is increasing as citizens recognize that traveling by public transportation uses less energy and produces less pollution than travel in private vehicles. However, in comparison to their diesel alternatives, a hydrogen powered bus are two to three more times efficient and will emit roughly 90 tonnes of GHG emissions less than a gasoline powered bus per year. Furthermore, because fuel cell and electric drive systems have no moving parts, engine wear and

maintenance costs are significantly reduced as well. if Canada were to adopt fleets of 200, 500, 2000, or even 5000 fuel cell buses, this equates to an annual displacement in excess of 18,000, 45,000, 180,000, or 450,000 tonnes of CO emissions respectively.

A significant economic benefit of investing in hydrogen and fuel cell-powered transportation system is the resulting national job creation that benefits Canada's knowledge economy from building tens of thousands of FCE vehicles, buses, and components. With a projected global market for hydrogen and fuel cell products of \$8.5 billion by the end of 2016, Canada has the opportunity to establish a permanent, high-value employment base that is a significant contributor to GDP, tax revenues and national pride. As hydrogen fuel cell powered cars are being introduced by companies such as Honda, Hyundai, and Toyota into the marketplace, employment opportunities will become increasingly available, particularly with Ontario-based automotive part makers and original equipment manufacturers (OEMs) who will be tasked with manufacturing parts for distribution in Canada.

The Canadian hydrogen and fuel cell sector generates \$200 million a year in sector revenue. With a projected global market for hydrogen and fuel cell products of \$8.5 billion by the end of 2016 alone, Canada can reap the significant economic benefits from the investment in fuel cell vehicles, buses, and components. Unlike wind turbines or solar panels which are not manufactured locally, approximately 90 percent of Canadian hydrogen and fuel cell products are manufactured in Canada by firms such as Ballard, Hydrogenics, Powertech Labs, Greenlight Innovation and similar companies before being exported, with a significant portion consisting of fuel cells for buses and trains that are shipped from Canada to China, US, and Europe (e.g. France). Canada benefits from the more than \$100 million export sales the sector achieves annually (PricewaterhouseCoopers Hydrogen and Fuel Cell Sector Profile 2010), as these revenues contribute to more than one-third of Western Canada's GDP that derives from exports.

Canadian zero emission fuel cell technology has the ability to make a significant contribution to GHG reductions and create new jobs in science and technology, and we appreciate your efforts to invest in clean technology producers in order to make a zero-emission future possible for all Canadians.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric Denhoff". The signature is fluid and cursive, with a prominent underline at the end.

Eric Denhoff
President and Chief Executive Officer
Canadian Hydrogen and Fuel Cell Association