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Chair

Mr. Leon Benoit

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● (1535)

[*English*]

The Chair (Mr. Leon Benoit (Vegreville—Wainwright, CPC)): Good afternoon, everyone.

We're here to continue our study on innovation in the energy sector. We have with us today several witnesses. First of all, from Bombardier Inc., we have Pierre Pyun, vice-president of government affairs, and Marc Laforge, director of communications with Bombardier transportation and public affairs. Welcome to you both.

From General Motors of Canada Ltd., we have Philip Petsinis, manager of government relations. Welcome.

We have from the AFL-CIO, the Building and Construction Trades Department, Christopher Smillie, senior advisor, government relations and public affairs. Welcome to you, sir.

By video conference from Fredericton, New Brunswick, we have from Atlantic Hydrogen Inc., David Wagner, president and chief executive officer. Welcome to you.

By video conference from Burnaby, British Columbia, we have from the Automotive Fuel Cell Cooperation, Andreas Truckenbrodt, chief executive officer. Welcome to you, sir.

Just before we start the presentations, two members of the committee would like to bring up some motions. I'm told that we can deal with them very quickly, so we will do that.

Ms. Liu, you may go ahead with your motion.

[*Translation*]

Ms. Laurin Liu (Rivière-des-Mille-Îles, NDP): Thank you, Mr. Chair.

I will read my motion. The committee received notice on February 15, 2013.

> That, pursuant to Standing Order 108(2), the Committee hear officials from the Canadian Nuclear Safety Commission and Atomic Energy of Canada Ltd, no later than on Thursday, March 28, 2013, in relation to the shipment of highly enriched uranium from Chalk River to South Carolina.

I hope that my colleagues will support my motion.

[*English*]

We know that this high-priority mission is of special concern because it is the first time that authorities have attempted to truck highly enriched uranium in liquid form. We know there are many risks attached to the transport of this material. We know there is a risk that a chain reaction of fissioning atoms could cause the rupture of the tank transporting it, releasing the solution into the environment and endangering the health of those nearby. So it's of great concern to us to ensure that this transport is done in a safe and secure way. We would ask that both the Canadian Nuclear Safety Commission and Atomic Energy of Canada Ltd. appear before committee so that we can ensure that the proper security measures have been taken.

[*Translation*]

We also know that civil society has asked for assurance that it's done safely.

Thank you.

[*English*]

The Chair: Thank you, Ms. Liu.

We have Mr. Anderson on the list. Does anybody else want to be on the list to speak on this? Okay, no.

Mr. Anderson, go ahead, please, and then we'll deal with this motion.

Mr. David Anderson (Cypress Hills—Grasslands, CPC): Mr. Chair, we have a schedule for the committee. We'd like to stick to that and we're prepared to go to the question now.

The Chair: Let's go to the vote then on Ms. Liu's motion. Those in favour of the motion? Those opposed to the motion?

(Motion negatived)

The Chair: Mr. Hsu, you have a motion as well.

Mr. Ted Hsu (Kingston and the Islands, Lib.): Yes, this motion was put on notice two weeks ago. I'll quickly read it out and explain it:

> That, pursuant to Standing Order 108(2), given the concerns raised in the 2012 Fall Report of the Commissioner of the Environment and Sustainable Development, the Committee further study the issues raised in Chapter 1; that the respective Chairs and officials of the two Atlantic offshore petroleum boards (Canada-Nova Scotia Offshore Petroleum Board and Canada-Newfoundland and Labrador Offshore Petroleum Board) be invited to appear before the Committee; and that the Committee report its findings to the House by June 2013.

I think that would be good for the health of the entire oil and gas industry, because something bad that happens in one part of the industry is bad for the whole industry. I think anybody who's worked in business knows that. You shouldn't rejoice too much if your competitor has a problem. I think it would be important for the social licence of the entire industry, if we were careful and found out from these boards how they were responding to the report of the Commissioner of the Environment.

The Chair: Thank you, Mr. Hsu.

We have Mr. Anderson on this as well. Is there anyone else who'd like to speak to Mr. Hsu's motion? Okay.

Mr. Anderson, go ahead.

Mr. David Anderson: Mr. Chair, we're prepared to go to the question.

The Chair: Okay, let's go to the question on the motion.

Those in favour of the motion from Mr. Hsu? Those opposed?

(Motion negatived)

The Chair: I appreciate going through these quickly because we have witnesses here. I know we're all anxious to hear from them, so let's hear from them in the order they appear on today's agenda.

We'll start with Bombardier. Mr. Pyun, go ahead, please, with your presentation.

Mr. Pierre Seïn Pyun (Vice-President, Government Affairs, Bombardier Inc.): Good afternoon, Mr. Chairman and members of the committee. Thank you for the opportunity to appear before you and to share our thoughts on the development of energy-efficient technologies.

I'm Pierre Pyun, vice-president for government affairs at Bombardier Corporate Office. I'm joined by one of my colleagues on the transportation side of our company, Bombardier Transportation North America, to be more precise, Mr. Marc Laforge, who is director of communications.

[*Translation*]

Bombardier is an international company headquartered in Montreal. We have some 70,000 employees around the world, with 23,000 in Canada. We are one of the world's leading manufacturers in the rail and aerospace sectors.

We have a number of facilities in Canada dedicated to production, engineering, services, training, and research and development in the rail and aviation sectors. In Quebec, we have facilities in Dorval, Saint-Laurent, Mirabel, Saint-Bruno and La Pocatière. In Ontario, we have locations in Kingston, Thunder Bay, North Bay, Downsview, Toronto and Mississauga. We have pilot training facilities in Cold Lake, Alberta, and in Moose Jaw, Saskatchewan.

● (1540)

[*English*]

Bombardier is currently heavily invested in research and development. We have a number of new aircraft programs on the go, such as the CSeries aircraft, a new Learjet aircraft that we call the Learjet 85, as well as the new Global 7000 and 8000 aircraft. These are business jets.

We are also working on cutting-edge rail technologies such as very high-speed trains. In fact, this year will be a very critical year for us. We have a number of milestones to meet on the product-development side of our operations with the CSeries and the Learjet 85 making their first flights this year, as well as the entry into service in China and Italy of our very high-speed train technology, which we call the ZEFIRO. It will run at up to 360 kilometres per hour.

At Bombardier, our stated goal is to develop market-astute aircraft and trains that bring about economic and social value while consistently setting the benchmark for environmental performance. We call it the evolution of mobility. That's our brand promise.

The drivers underpinning technology development at Bombardier include the need to minimize the environmental footprint of our products and technologies, to make our products more cost-effective for our customers and operators, and also to make our products more attractive to passengers and riders, in other words, to enhance passenger experience and comfort.

All these drivers or objectives are, as a matter of fact, quite intertwined. At Bombardier we also take a holistic approach to addressing the environmental challenge by focusing not only on the products but also on production processes. We're taking a full life-cycle approach to reducing our environmental footprint. In our aerospace division we have consistently designed the most fuel-efficient aircraft with the lowest noise and emissions in their category. For example, our new CSeries aircraft will be the world's most environmentally responsible commercial aircraft in its class. By making the aircraft lighter, through the use of composite materials and advanced engine technology from Pratt and Whitney, we have given it a 20% fuel-burn advantage compared to competing or existing products.

With an eye on our production process as well, the CSeries plants in Mirabel and Belfast are designed and built to reduce the environmental impacts of their activities, with the Mirabel CSeries test facility earning a LEED certification. For the first time in the industry, Bombardier has assessed the environmental impact of the entire CSeries aircraft by carrying out a full life-cycle analysis. We will issue an environmental product declaration when the aircraft enters into service. This practice will continue for all our future new products.

We are involved in research projects on sustainable biofuel alternatives. Porter Airlines Q400 turboprop aircraft took flight last year in April using fuel from a non-edible oilseed crop called camelina as part of a new biofuel test program. This test program was led by Bombardier Aerospace with partners such as Porter Airlines, Pratt and Whitney Canada, and Targeted Growth, a Saskatchewan-based company. This initiative was also made possible by funding provided in part by the Green Aviation Research and Development Network—the acronym is GARDN—a not-for-profit R and D organization funded through the Government of Canada's business-led Networks of Centres of Excellence.

We not only focus on developing sustainable products but also work with international organizations such as ICAO, the International Civil Aviation Organization and its Committee on Aviation Environmental Protection, to contribute to future standard-setting for aviation.

We're also responding to the overall improvement in the industry by contributing advice towards a comprehensive air navigation system, a system-wide solution through ICAO's air navigation branch. We are doing this because we understand that the production process only accounts for around 10% of the aviation sector's environmental footprint. The rest lies with the operation of aircraft, really.

In our rail division we have also spearheaded green technologies in the industry. Rail operators around the world face volatile energy costs, as you know well. Bombardier is currently the only rail manufacturer offering a comprehensive and flexible portfolio of green rail technologies to address these challenges. We introduced a portfolio of what we call ECO4 solutions, services, products, and technologies in 2008. You have in front of you some information in that regard.

ECO4 stands for economy, energy, efficiency, and ecology. It includes a series of energy-saving solutions developed by our rail division. We have many examples of those technologies, but I'll highlight two of them that are either being developed in Canada or being tested in Canada.

One example is a wayside energy storage system that we call EnerGstor. This technology was developed at our Kingston site, in Ontario, where we have an engineering centre. Essentially, it captures and stores wasted braking energy from trains and recycles it back into the system. Currently we're working on a pilot project with TransLink in Vancouver to test this system.

The other example I wanted to flag to you is our PRIMOVE technology, which is really a groundbreaking technology. It's a contact-less, catenary-free, and emission-free energy induction transfer technology that has bus, truck, train, and car applications. Again, you have some information on that technology in the package we have distributed to you. Essentially, the electrical supply components are hidden under the vehicle and beneath the truck, thus eliminating the need for overhead wires and poles. Currently we're in the process of concluding an agreement with Montreal Société de transport and Hydro-Québec for a pilot project to test the PRIMOVE technology in Montreal.

In closing, we need to continue working closely with our stakeholders to ensure that Canada has an ecosystem, an environment, and policies conducive to innovation in energy efficient technologies for transportation.

We'd be very happy to take questions from you later.

Thank you.

● (1545)

The Chair: Thank you very much, Mr. Pyun, from Bombardier.

We'll have everybody make their presentations and then we'll go to questions and comments.

Next we have from General Motors of Canada Ltd., Philip Petsinis, manager of government relations. Go ahead, please, with your presentation for up to seven minutes.

Mr. Philip Petsinis (Manager, Government Relations, General Motors of Canada Limited): Good afternoon, I appreciate the opportunity to address the committee today.

I'll start by providing some background on important energy and technology issues facing the automotive industry, then provide you with GM's energy and technology strategy and close with some recommended policy initiatives.

Today petroleum accounts for just over a third of the world's energy needs, yet transportation is 96% dependent on petroleum. GM believes that continuing to rely exclusively on petroleum to power personal transportation is not a sustainable strategy. Next, greenhouse gas emissions have become a regulatory focus of many developed nations. The U.S. and Canada have recently implemented landmark regulations focused on dramatically reducing vehicle greenhouse gas emissions, regulations that will require the most significant introduction of new vehicle technology in more than a generation.

For the first time, these new regulations will establish specific greenhouse gas emission standards for each size of new vehicle, and the greenhouse gas emissions allowed will be reduced every year by 3.5% to 5% up to the year 2025. Cumulatively these reductions will result in vehicle fuel consumption improvements of up to 60% by 2025.

Given these factors, GM's energy strategy, simply put, is to displace petroleum use through accelerating the rate of efficiency improvements for gasoline vehicles, as well as introducing vehicle technologies powered by a diverse range of more sustainable and renewable energy sources.

We strongly feel that there is no single silver bullet that will address the transportation energy challenge and, therefore, it is imperative to have a portfolio of alternative propulsion technologies that use a variety of energy sources that are more sustainable and, where possible, renewable.

As mentioned, the fuel efficiency of gasoline vehicles will continue to improve through a variety of technologies like lightweighting, cylinder deactivation, and direct injection systems. But again, only focusing on improving gasoline and diesel engines will not be enough.

Renewable biofuels like ethanol and biodiesel offer the best near-term solution to reduce transportation's dependency on petroleum and vehicle greenhouse gas emissions. This option has minimal incremental vehicle and refueling costs. GM is a leader in providing these types of vehicles that thanol and biodiesel.

Compressed natural gas and liquid petroleum gas also have benefits, and GM offers vehicles that use these fuels. Compressed natural gas can cut CO2 emissions by more than 15% and there is an abundant supply. Liquefied petroleum gas is currently the third most commonly transportation fuel and it's cheaper than gasoline.

Vehicle electrification has been a large focus recently and GM believes that this path offers the best long-term solution for sustainable personal transportation. We have an expanding number of hybrid electric vehicle models that effectively improve the efficiency of gasoline vehicles, but we've also introduced plug-in electrical vehicles like the award-winning Chevrolet Volt and have announced additional new plug-in electric vehicles like the Cadillac ELR and the Chevrolet Spark. We continue our development of fuel cell electric vehicles as well.

Electricity holds many benefits as a transportation fuel. It's produced domestically, is inexpensive relative to gasoline, and there's significant off-peak capacity to fuel vehicles. Electric powertrains are much more energy efficient than gasoline or diesel powertrains and have dramatically lower fueling costs for consumers, of approximately one fifth the fueling cost compared to a gasoline vehicle.

Canada is a global leader in producing clean low greenhouse gas electricity. When used in plug-in electric vehicles, vehicle greenhouse gas emissions can be virtually eliminated in many provinces like B.C., Manitoba, Ontario, and Quebec.

GM also continues to advance the development of hydrogen fuel cell electric vehicles, which offer the promise of potentially eliminating vehicles' dependence on fossil fuels and provide customers driving ranges and fueling times that are very comparable to those of gasoline vehicles.

As you can see, a diversity of future vehicle technologies and associated energy in fuels will be critically important going forward. As a global vehicle manufacturer, GM is prepared to meet this drive towards a diversified and sustainable personal transportation.

So what does this mean for Canada?

The current reality, unfortunately, is that Canada lags behind most developed countries in policies that support the development of alternative refueling infrastructure. That has resulted in the extremely limited availability, or even non-existence, of these new green fuels. Policies to support establishing alternative fuel pumps and stations have been implemented in other countries and need to be considered by Canada.

A good example is the United States' alternative fuel vehicle refueling property credit program. It provides a 30% tax credit or up to $30,000 to offset costs of establishing a fueling pump for E85 ethanol, B20 biodiesel, CNG, LPG, electric recharging and/or hydrogen.

● (1550)

The U.S. Department of Energy has also been providing funding to support private and public sector initiatives to expand alternative fueling infrastructure.

Retail fuel price support measures are also an important factor. Many other jurisdictions also provide these types of fuel tax reliefs or eliminate fuel taxes for lower carbon alternative fuels to increase consumer demand as well as increase the commercial viability of bringing these new more environmental fuels to market. Canadian fuel excise tax and many provincial fuel road taxes continue to be applied to some green alternative fuels in Canada. This effectively undermines the initial commercial viability of some of these advanced green alternative fuels.

In order to increase the adoption of these new vehicle technologies and fuels, Canada should increase consumer demand for these green fuels by exempting them from federal excise fuel tax as well as provincial road taxes in the early stages of these fuel developments.

With that I'll close my comments.

Once again, thank you for the opportunity to address the committee today.

The Chair: Thank you very much, Mr. Petsinis, for your presentation.

We'll now go to the Building and Construction Trades Department of the AFL-CIO's Canadian office, and Christopher Smillie, senior advisor in government relations and public affairs.

Please go ahead, sir. It's good to have you at our committee again.

Mr. Christopher Smillie (Senior Advisor, Government Relations and Public Affairs, Building and Construction Trades Department, AFL-CIO): Thanks very much.

I just had to sign a liability waiver from the clerk there, so I'm not sure....

Voices: Oh, oh!

Mr. Christopher Smillie: I'm just joking.

Thanks for inviting us back. We are the Canadian building trades. We represent, at last count, I think close to 550,000 skilled trades workers across Canada, in every province and territory.

Today I will talk about innovation in the energy sector—I call it “employment innovation”—and I'll take you through some of the things that are actually helping industry and helping skilled trades workers across Canada.

The energy sector in Canada is actually putting people to work. There isn't too much construction going on in the manufacturing sector. The infrastructure work is largely done, although there are enormous issues arising out of infrastructure renewal in large cities and towns. Except for some big municipalities—Toronto, Vancouver, Ottawa—there isn't too much in the hopper, so to speak, for the people we represent other than in the energy sector. No other sector puts as many of our members to work. On any given day, about half of our national membership is working on a job site that's related to energy.

To the building trades, innovation is about going to work. It's about the place to train the cohort of highly skilled workers who will replace the members of the baby boom generation who are starting to leave today. The energy sector saved Canada, quite frankly, during the recession, especially with our workers, and we hope to continue.

If you look at my testimony from the finance committee of November 19, you will see some additional statistics around the members we represent and actual work volumes, etc., in the energy sector. I wanted to get to some other things today, but that is there.

Construction projects associated with oil sands and pipelines and other energy products certainly are game changers for construction workers. These are national megaprojects that require a national workforce.

I'll mention some things we are working on. First is an emerging drug and alcohol policy. We're doing one test with multiple employers in Alberta. It means getting to work faster and for less money for the worker and the company. This is innovation at work in the building trades: getting to work faster. It's the same as aligning the welding tests from province to province. On energy projects, we are able to test policy that affects training, and we're able to streamline some of the testing requirements to get onto job sites.

We are working on safety training across the country. Large energy projects, especially in Alberta, are an opportunity to test those policies.

There are other unique training opportunities. I talk about northern Alberta, or about a nuclear project; they generally act like a large classroom for training construction apprentices. Let's say there are 2,000 journeypersons on a job site. It means there can be three times as many apprentices learning a construction trade on that project.

We are also working on things like Helmets to Hardhats. In that program, we're helping veterans transition from the military into the skilled trades. I think we have over 1,000 files right now that we're working on. In the military there are trades parallel to those in the civilian workforce. When those folks are done—the average age of military members when they leave is decreasing—we're able to put them to work in high-paying jobs.

In terms of other innovation, in Windsor, Ontario, there isn't too much economic activity, so we're doing practical things to make sure that the people who are in Windsor have the training to go to other places to work. In Windsor we're training to Alberta, Newfoundland, and Saskatchewan standards so that members can get on the plane and go and work on large energy projects.

As you can see, the impact of the energy sector is national, and the impact is large on our organization.

For areas that have the ability to train, like northern Alberta for pipeline jobs, people who are unemployed need to have access and opportunities. These projects give those people opportunities to go to work.

People travel to support their communities at home. If you ask someone in Fort McMurray where they're from, more than half of them will say they're from somewhere else. So these projects really are opportunities for the entire country.

I have a few other things. I don't want to diminish their importance by their placement in my remarks.

There's the mobility of apprentices, and how young people from anywhere in Canada can go and get hours on their apprenticeship on any project. Let's say a pipeline project is approved. There is an opportunity for the apprentice from New Brunswick or from Nova Scotia, where there isn't a lot of work, to be able to go out there and work for a few summers on that pipeline.

● (1555)

What else is innovative? We're talking about things such as the diversity of workplaces. We're working with our contractors on aboriginal engagement in our workplaces. Traditionally these groups haven't been able to access work. Large energy projects provide the opportunity to put under-represented people directly to work.

Can I talk about U.S. politics? I don't want U.S. politics to drive Canada's success. There is a lot of noise about pipelines going to the west coast. I think those pipelines are important to diversify our markets. We already have 11 governments in Canada regulating where people go to work, etc. We don't need another one. The diversity of markets is important for Canada.

The east-west pipeline going from Alberta to Montreal or further points east is also important. That's sort of a nation-building exercise that we should seriously consider. It's probably the CP rail system of the next century.

That's pretty much it. I'd like to stop there, and if you have any other questions, I'd be happy to address them.

Thanks for the opportunity to come to speak.

● (1600)

The Chair: Thank you very much, Mr. Smillie, for appearing before our committee once again.

We will go now by video conference to Fredericton, New Brunswick, to Atlantic Hydrogen Inc. We have David Wagner, president and chief executive officer.

Go ahead, please, Mr. Wagner.

Mr. David Wagner (President and Chief Executive Officer, Atlantic Hydrogen Inc.): Thank you.

Good afternoon, everyone, and thank you for inviting me to speak to the committee today. My name is David Wagner and I am the president and CEO of Atlantic Hydrogen, which is based in Fredericton, New Brunswick, and is a clean energy technology company that for the last 10 years has been conducting research and development on a technology that we have branded the “Carbon-Saver”.

I think the topic of today's meeting, innovation in the energy sector, is what the focus has been for Atlantic Hydrogen since the day the company was created back in 2002. Today, we are a privately held, investor-owned energy company, with 25 full-time staff made up of scientists, engineers, technicians, and a professional management team.

What I'd like to do in the next few minutes is tell you what it's like to develop and build a technology company based on innovating technology for the energy sector. I'm going to start by giving you a bit of background on how the company was created.

It started at McGill in 2002, with a very good idea from a chemist, and an entrepreneur who had money. The whole idea was to apply plasma science to disassociating carbon and hydrogen molecules in natural gas. In other words, they were trying to make hydrogen by removing carbon from natural gas. The project started at McGill and eventually moved to the University of New Brunswick in 2004. Since that time, we have grown to the full complement of 25 people, as I've already mentioned.

Our technology, the CarbonSaver, is a proprietary plasma-based system. The whole idea here is to reduce the carbon footprint by removing carbon, pre-combustion, from natural gas and thereby creating hydrogen, so what we really are is carbon capture for natural gas pre-combustion. The carbon is sequestered in rubber products like tires or in molten metals used and found in the foundry industry.

Our CarbonSaver is addressing worldwide markets and those potential customers who need hydrogen for applications such as fuel cells or industrial applications like refineries or electricity generation. It truly is a very large worldwide market. Our value proposition of the CarbonSaver is to be the lowest-cost producer of hydrogen without producing any CO2 in the process. This is quite unique in the industry.

I mentioned that we have been developing this technology. We are now in the commercialization stage. To date, we have raised in excess of $35 million, about 60% of that via selling shares in Atlantic Hydrogen. We have received about 20% in loans and about 20% in grants.

What I'd like to do is take a few minutes to give you an idea of what that story has been, what the road we've travelled has been like, and, quite frankly, where we are today. The fact is that we would not be here today had it not been for the support from some programs the federal government offers. I do want to make note that for a small company and for a start-up company like Atlantic Hydrogen, these are critical in our growth.

As I mentioned earlier, it starts with a good idea. In our case, it started at McGill and eventually was moved to the University of New Brunswick. The primary reason that the technology of the project was moved to the university is a program called the Atlantic innovation program that was offered back in 2004 by the Atlantic Canada Opportunities Agency. With the support of angels and the AIF program from ACOA, we effectively proved the concepts of disassociating carbon and creating hydrogen in natural gas.

● (1605)

That early success really allowed us to begin trials and leverage that success to raise more money—more angel rounds, and more friends and families. Really, the success in building on the early trials allowed us to create a scale system, which we called our beta system.

Success really does validate the plans, and it also allows us to gain access to federal programs like the ones that are offered by Sustainable Development Technology Canada, or SDTC; IRAP, and ecotrust. I have already mentioned ACOA's AIF program. All of these programs have been critical because we are very high risk at this early stage.

What that also allows is corporate investment, which is also prepared to invest in innovation and new ideas. Atlantic Hydrogen was very successful in attracting some of the largest Canadian energy companies—Encana, Cenovus, and Emera—to invest in our company and to allow us to demonstrate the technology we built.

Where are we today? I'm happy to report that Atlantic Hydrogen, in the fall of 2012, closed a round of capital that is going to be used to construct our first industrial-scale plant. What this will do is demonstrate and validate the use of our technology to produce clean hydrogen and fit-for-use carbon.

AHI has also been able to attract investment from some of the largest energy companies in Canada. Those companies include Emera, Encana, and Cenovus, and we have just recently attracted investment from the largest oil and gas producer in the world, which sees value in our carbon-saver technology.

In summary, I want to tell the committee that Atlantic Hydrogen would not be here today without the financial support of the federal government and programs like the SR and ED program, IRAP, SDTC, and the Atlantic Canada Opportunities Agency's Atlantic innovation fund. We would just not be able to exist without the support of those programs.

Do these programs make us more competitive with other countries? I think the answer is yes. Without them we would not be able to raise enough early stage high-risk capital to do this kind of innovation.

I think the real challenge now is stepping up and making our innovation initiatives, from a country perspective, even stronger than they are today.

I'll end it here and I would like to thank the committee.

The Chair: Thank you very much, Mr. Wagner, from Atlantic Hydrogen Incorporated.

We go now by video conference to Burnaby, British Columbia.

Mr. Peter Julian (Burnaby—New Westminster, NDP): Hear, hear!

The Chair: We have with us, from the Automotive Fuel Cell Corporation, Andreas Truckenbrodt, chief executive officer.

Go ahead, please, sir, with your presentation, for up to seven minutes.

Dr. Andreas Truckenbrodt (Chief Executive Officer, Automotive Fuel Cell Cooperation): Mr. Chairman and members of the committee, thank you very much for the invitation to meet with you today to talk about how we can accelerate zero-emission automotive hydrogen fuel-cell technology to mass-market commercialization.

My name is Andreas Truckenbrodt, and I'm the CEO for the Automotive Fuel Cell Cooperation. AFCC is a private company located in Burnaby, British Columbia, and is owned and funded by Daimler AG and Ford Motor Company. The company was organized and grown from Ballard Power Systems' automotive fuel-cell operations.

We develop hydrogen fuel-cell technology for commercialization in affordable, high-volume, and mass-market Daimler and Ford fuel-cell vehicles. Complementing our R and D efforts, Daimler opened its fuel-cell manufacturing research laboratory and manufacturing plant in Burnaby in 2011. Just recently as another major step, Nissan has joined Daimler and Ford in a joint fuel-cell program centred here in Burnaby. We have approximately 300 employees in Vancouver and are intending to introduce full-capability affordable zero-emission fuel-cell vehicles to the market beginning in 2017.

Today I'd like to give you four messages:

Number one, the automotive industry is committed to zero-emission vehicles, and hydrogen fuel-cell vehicles are a key element of our propulsion-technology portfolio.

Number two, critical to getting to commercialization of fuel cells are innovations in three technical areas—fundamental understanding, manufacturing, and hydrogen production and distribution—as well as a capable supplier network, consistent regulations, and the development of a hydrogen-fuelling infrastructure.

Number three, Canada has had a leading position in zero-emission, hydrogen fuel-cell technology and should not give this up.

Number four, critical success factors for Canada in this dynamic, high-tech and fiercely competitive global environment are a clear commitment to zero-emission technologies and long-term collaboration between government, academia, and industry.

I'd like to go a little further into those four points.

First, all major automotive vehicle manufacturers, in coordination with their home governments, are investing heavily in hydrogen fuel-cell technology and hydrogen-infrastructure development. This is not only a result of regulatory pressure for reduced automotive emissions; it's also an industry-wide recognition that pure-battery electric vehicles, while needed for urban mobility, have limited consumer appeal due to vehicle range restrictions and long recharging times. In order to have a high volume of vehicles deployed in the market, those vehicles need to be able to compete with today's internal-combustion-engine-powered vehicles in terms of performance, range, and cost. The hydrogen fuel cell is the zero-emission technology that can achieve this.

To the second point, I would characterize the current state of research, innovation, and technology development in fuel cells as technically demanding, quickly expanding, and extremely globally competitive. Fuel-cell vehicles are now moving beyond small demonstration fleets to true high-volume global commercialization. No longer is the challenge that all of us companies in this sector face to prove that fuel cells work in automotive applications. That's been done, for instance, through the few hundred fuel-cell cars in customers' hands that we have out today.

The goal now is to reduce the cost of fuel cells to levels that make them competitive with today's internal combustion engines. While we know how to get there, there are still innovations required in tools, in processes, and in human capital in three critical technology areas: the first is fundamental understanding and characterization of fuel-cell materials; the second is high-volume fuel-cell manufacturing technology; and the third is hydrogen-fuelling infrastructure on both the production and the distribution sides. I can expand on these areas, of course, later if you want.

In addition to those technology challenges, the automotive fuel-cell sector is lacking a mature automotive supply base and consistent regulations in the form of policies, codes, and standards. Government policy that encourages supplier investment in Canada could be beneficial in developing Canada's global competitive technology advantage.

● (1610)

The promotion of high-paying technology innovation jobs in Canada, and protecting against a possible Canadian brain drain, is tied directly to research funding and government laboratory-industry collaboration.

My third point concerns the role of Canada. Canada and the greater Vancouver area, including its universities and research institutes, have a long, successful history in proton exchange membrane fuel cell technology since the first days of Ballard's fuel cell development initiated in 1983. Today, Vancouver is arguably the global centre of excellence in fuel cell technology.

The Canadian government has historically had a significant role in partnering with industry and academia to advance fuel cell technology. One specific example for us is SDTC, which has been contributing to AFCC's development with $11.5 million from 2010 to 2013, which is 22% of our project expenses. The financial and non-financial support provided to innovative technologies through SDTC makes Canada a globally attractive destination for industrial investment, which, at the end of the day, has been demonstrated by Nissan joining this effort here in Vancouver.

Fourth, the Canadian federal government has historically been a strong and capable partner to industry and academia in the initiation of Vancouver's automotive global fuel cell centre of excellence. However, very frankly speaking, recently that support has waned to dangerously low levels. Unfortunately, to us it feels like the current federal government has given up on the technology. Evidence of this is clear, either with the lack of a clear strategy, cancellation of programs, cuts to overall funding for supportive clean technology funds, or even the last minute removal of funds to R and D projects already committed to.

Today's high-efficiency, low emissions internal combustion engines have been developed for more than 125 years. By comparison, the technology development progress in PEM fuel cells during the past 30 years is really impressive, but it's still not complete.

Long-term commitment in the forms of a clear strategy, government collaboration with industry and academia, scientific research funding, and tax and incentive policies will be a significant factor in determining if Canada and the Canadian industry can remain competitive in this sector's dynamic, technologically advanced, and fiercely competitive global environment.

Thank you very much for your attention.

● (1615)

The Chair: Thank you, Mr. Truckenbrodt, from Automotive Fuel Cell Cooperation.

Thank you, all, for your presentations.

We'll go now directly to questions, starting with Mr. Trost for up to seven minutes. Go ahead, please, sir.

Mr. Brad Trost (Saskatoon—Humboldt, CPC): Thank you, Mr. Chair.

My first question is for Mr. Truckenbrodt, in Burnaby, and also for General Motors here.

One of the things I found interesting in the last few years is what's been changing in regard to transportation fuels. Electrical fuel cell technology has been out there and talked about for years. But a couple of years ago the natural gas guys came to us and said they needed help with a pilot project to change trucks over to natural gas. We thought about it but nothing happened on the government side, and then they came to us later and said, don't worry, it's moving so fast that we're converting from diesel to natural gas all over the United States and Canada.

We've talked about things like electrical and talked about fuel cells —great, wonderful technologies—but the technology that seems to be capturing the market, taking away from gasoline and diesel, is something that no one really talked about. It has really started to move in because of changes in the supply of natural gas. Prices have plummetted and it's been able to move in. Supply creates its own demand, and that's what has fundamentally changed it. In some respects it has passed fuel cells and electrical in the race for the next generation of automotive fuel.

With that in mind, here is my question for both gentlemen. I like what both of you are doing as far as electrical and fuel cells are concerned, but why should the government or anyone pick and choose one particular technology over another? Why has natural gas started to become the direction in which we're seeing innovation and a new transportation fuel that is going away from gasoline and diesel, and why hasn't it been electrical and fuel cells, which, candidly, seem to have had more government involvement?

I will go first to General Motors, and then to Burnaby

Mr. Philip Petsinis: Thank you for that question. It's a good question.

Governments shouldn't pick technologies. They've never shown a track record of actually making the right decisions in that regard. The reality is that you will need all these technologies, because when you really look at how they are used, both in different jurisdictions of the world, which have energy biases....

For example, some jurisdictions have significant amounts of natural gas. The U.S. has actually been able to unlock significant amounts. Other areas that don't have that availability may have biases to other fuels, such as biofuels, potentially. As a global manufacturer, I need the complete portfolio to satisfy the broad range, both within jurisdictions and across the world.

What you'll also need to understand, too, is that these technologies, the different ones that I spoke of—advanced gasoline, biofuels, CNG, LPG, electric vehicles, hydrogen vehicles—all have pros and cons, and are more or less applicable to certain types of vehicles and how they use them. Let me give you an example.

For an urban vehicle, where 80% of consumers travel less than 65 kilometres on their daily route, a Chevrolet Volt allows them to complete that trek on pure electricity at one fifth the fuel cost of a gasoline vehicle. We are now the leaders of plug-in vehicle sales in Canada. The “con” of an electric vehicle is range. That's why we put an extended-range engine in the Volt, so that it can actually generate its own electricity if you need a longer drive. They're very well suited to smaller vehicles, because as I increase the vehicle mass, I need more and more battery to propel it. So it has very good application in an urban setting.

Natural gas is an example. It's a very cheap fuel now, which is increasing the interest in that area, but I need significant volume to store the natural gas on that vehicle to travel at a distance comparable to the gasoline vehicle. So there's the tankage that I have to do it at.

As an example, we sell trucks and vans that are capable of running on natural gas in Canada. You have to store the natural gas at 7,000 pounds per square inch and have twice the volumetric size of a tank to carry the same amount of energy to travel as a gasoline or diesel vehicle. That's very expensive. These tanks are carbon-fibre tanks, and cost tens of thousands of dollars.

As well, I need the room. If I have a compact vehicle, trying to squeeze these natural gas tanks into the vehicle is a compromising situation. They're more suited to larger vehicles, such as heavy-duty trucks, etc. They have ample volume in the vehicle to actually store that energy.

Secondly, the vehicle technology to run that gas is not as easy as some people think. In the past, there have been garage-type conversions, let's say, converting a gasoline vehicle to natural gas. That is no longer the case today. These vehicles are actually quite expensive. So you need to have a duty cycle that drives a lot of mileage to regain....

You have a price difference, that is, it's cheaper fuel, but the vehicle-cost technology is so much more that you need to be dropping $40,000 instead of $20,000.

● (1620)

Mr. Brad Trost: My time is running down, and Mr. Truckenbrodt also needs to have some time.

Mr. Philip Petsinis: Yes.

Mr. Brad Trost: Thank you.

Mr. Philip Petsinis: So they're all applicable. I think the biggest opportunity for the Canadian government is to provide support, because the one limiting factor in all these technologies is availability of the infrastructure. CNG is cheap today, but the infrastructure for consumers to access CNG or biofuels or hydrogen is extremely limited.

Mr. Brad Trost: Mr. Truckenbrodt.

Dr. Andreas Truckenbrodt: I agree pretty much with what my colleague from General Motors said. I'd just like to add one or two elements.

I think you're right that natural gas can be an attractive fuel. Actually, we've had natural gas vehicles in the market for a few years. The limiting factor, and this also was just mentioned, is really infrastructure. We do not see the natural gas infrastructure just being there and not necessarily developing.

It's different for heavy-duty vehicles. We see natural gas certainly more in trucks, for instance. There is one technological difference, of course. Both battery-electric and hydrogen fuel cell-electric are the only technologies that give you really zero emission from tank to wheel, and give you the ultimate efficiency benefit from well to wheel. That's something that the combustion engines—and natural gas is still a combustion engine—cannot give you.

Of course, for us what is important is that the customer will decide, at the end of the day, which technology will be successful. That's why we have seen with natural gas not really the breakthrough that you might have wanted.

The Chair: Thank you, and thank you, Mr. Trost.

We go now to Mr. Julian for up to seven minutes.

Go ahead, please, sir.

Mr. Peter Julian: Thanks to all our witnesses for very interesting presentations.

Mr. Truckenbrodt, I'd like to start with you. I'd like to thank you for the warm reception we've had every time we've visited the cooperative. It's been very interesting. We're very proud that Burnaby, as you say, is arguably a global centre of excellence in fuel cell technology.

I was struck in your presentation by the following comments. On federal government support, you said:

> ...it has waned to dangerously low levels...it feels like the current federal government has "given up" on the technology. Evidence of this is clear either with the lack of a clear strategy, cancellation of programs, cuts to overall funding for supportive clean technology funds or even the last minute removal of funds to R&D projects already committed to.

Yours is not the only sector that's feeling this. Canada is last in the industrialized world in terms of public investment in R and D. The last six years have been absolutely disastrous for the development of new technologies.

You mentioned that you have powerful partners such as Daimler and Ford, and now Nissan, and yet the federal government doesn't seem to be there as a partner. I guess my first question would be, what do you think that neglect will do to the development of fuel cell technology if the federal government continues its current practice of "dangerously low" levels of support and with the evidence of it having given up on the technology? Do you think Canada will continue to play a leading role in the development of this technology?

● (1625)

Dr. Andreas Truckenbrodt: That's exactly the point I was raising. I think Canada is at risk of losing that leading role. Why are Daimler, Ford, and Nissan coming to Vancouver? It is not because the weather is so nice; right now it's raining again. It is because there is the level of expertise and there are universities and similar companies here that really allow us to develop that technology in the best way.

If the support goes away—and by "support" I mean not only financial support but all the support in making it clear that this technology is important to us in Canada—it's just natural that the efforts and the activities sooner or later will move somewhere else where there is more support. With regard to my comment that globally it's fiercely competitive, some other nations, such as Korea, Germany, and Japan, are more supportive. They have a clearer strategy in this arena, so the risk is definitely there.

Mr. Peter Julian: Thank you for that. I do want to note I'm taking a flight out to Burnaby this evening and in my garden the tulips are already coming up, so it may be raining, but the conditions are much better than in Ottawa.

You referenced three critical technology areas. There is the understanding of fuel cell materials. There is the fuel cell stack manufacturing technology, and we've certainly seen what's in place in Burnaby, but it's to the extent of machine tooling so that it can be done in a mass distribution process and lower the costs. Most important is the whole question of hydrogen fuelling infrastructure, that being a key role, which was also raised by Mr. Petsinis. Could you elaborate a bit on each of those three areas and particularly on the issue of the fuelling infrastructure, which is a key obstacle right now to the development of this technology being used by consumers in any mass way in Canada?

Dr. Andreas Truckenbrodt: Yes, if I may, I can start with this. The infrastructure has a few technical issues on production and distribution that we have to tackle. There are many ways to generate hydrogen, which are in general known, but you really have to perfect these so they work for regular customers. With our cars being out there in California or Germany, for instance, we have the issue that customers cannot fill the car because a station is down. There is a station, but the station is down because of technical issues. That's one part where we need more research and more work going into it.

The other one, of course—

Mr. Peter Julian: Could you address the federal government's role in providing incentives to put in place that infrastructure?

Dr. Andreas Truckenbrodt: That is the second element. Do we have infrastructure? Do we get infrastructure?

The point is made that hydrogen infrastructure is so expensive that this might be a showstopper. There are many studies out there for Germany, California, and other markets that say yes, it costs money, of course, but ultimately this is not more money than needs to be invested in electrical infrastructure distribution, and it is a necessary prerequisite for vehicles showing up because there will be no vehicles without someplace to fill them. That is where incentives and support by the federal government would help to make this attractive.

● (1630)

Mr. Peter Julian: Thank you.

And then there's the issue of the manufacturing technology and fuel cell materials.

Dr. Andreas Truckenbrodt: The automotive industry has been extremely well positioned for over 125 years in all kinds of metal machining. We are perfect in grinding, cutting, and stamping.

We have no experience and nothing has been done in dealing with thin membranes, putting black ink on top of all that, and that's an area where it's not only about having a machine and adapting the machine to higher volumes, but also about working on the processes of how you apply that black ink.

For us this is really an ideal area where academics working in those kinds of areas together with industry, if they have support, can help get a breakthrough in these technologies, because that's something that hasn't been done before.

Mr. Peter Julian: Thank you for that.

Mr. Petsinis, on the same question of the fueling infrastructure, you did very clearly raise the role of government. You talked about the U.S. Department of Energy providing those supports for alternative fueling stations. We don't have a fueling infrastructure in Canada.

What role can the federal government play to start playing catch-up, given the disastrous last six years on research and development, so we can start bringing these new technologies to Canadians who are interested in having alternative fuels and buying green cars?

The Chair: Could I have a brief answer, please, sir?

Mr. Philip Petsinis: I referenced the U.S. IRS for a property credit. I'd say that's the key thing that's been cited as the reason for the success in the U.S. over the last 10 years. They have over 20,000 alternative fuel stations as a result of it. The really critical benefits of the way that program is structured is that it's a credit provided to any retailer or fuel or producer of infrastructure and it does not select the technology. It is applicable to ethanol, biodiesel, electricity, hydrogen, CNG, LPG and provides a level of support to allow the marketplace to decide if it's commercially viable.

An infrastructure program of that nature could be very useful. As an example they have over 2,500 E85 stations dispensing ethanol. In Canada we probably have two retail stations. General Motors alone has produced and sold over half a million E85 ethanol flex fuel vehicles in Canada. The reality is that it's no longer a chicken and egg situation. We've put the vehicles out there; there's no fuelling infrastructure.

So it's a combination of broad infrastructure support and letting the marketplace find the economies to do it. Fuel price support is also important, because you can't expect some of these new fuels at very low volumes to compete against a fuel that's been in the marketplace for a hundred years and has been mass commercialized to the nth degree. In that transition period we feel that some support on both the fuel costs to get consumers attracted to the fuel as an alternative, as well as to offset some of the infrastructure costs. That has been well demonstrated in the U.S. to be successful.

The Chair: Thank you.

Thank you, Mr. Julian.

Mr. Hsu, for up to seven minutes, please. Go ahead, sir.

Mr. Ted Hsu: Thank you, Mr. Chair, and I thank the witnesses for coming here today.

I'd like to start with Mr. Petsinis on that same issue, the fuel price support measures at the retail level. For example, you proposed eliminating the federal fuel excise tax on alternative renewable fuels.

Renewable fuels currently are a small percentage of the total motor fuels we consume. It seems to me that if we eliminated that tax —perhaps in order to keep Jim Flaherty off our back—we could make it revenue neutral, and it wouldn't take too much. We could increase the excise tax on regular fuels a bit, because if you look at the percentage of renewable fuels versus conventional fuels....

Would you support this revenue neutral way of eliminating the excise tax on renewable fuels to keep the finance minister off our backs?

Mr. Philip Petsinis: I'd like to highlight the reality that all of these other alternative fuels would represent a very small percentage of the total fuel that would be used in Canada. So forgoing that 10¢ per litre on those types of fuels would probably be almost a rounding error.

● (1635)

In the near term the offset may not be necessary.

Mr. Ted Hsu: You'd agree that the offset would be very, very small for regular—

Mr. Philip Petsinis: The lost revenue for not collecting excise tax on alternative fuels such ethanol would be very small, and it's really only required in the early stages to help in the commercialization.

I'd also like to add that the whole issue of excise tax on fuel needs to be revisited. The fact is that it is assessed on the basis of per litre. It was fine when 99% of the fuel sold for transportation was gasoline because it was all consistent. The reality is that all these other alternative fuels have generally lower energy density and are in various gaseous forms, so this per litre is inappropriate.

As an example today, the excise tax on ethanol, E85, actually charges 33% more per unit of fuel energy by doing it on a per litre basis in Canada than—

Mr. Ted Hsu: Yes, I understand. You really want the excise tax to be per unit of energy.

Mr. Philip Petsinis: The reality is you're overcharging excise tax currently on a greener fuel that has 40% lower greenhouse gases, etc. In the near term, I think it would be a very low-cost measure. It would help reduce the cost of these fuels in the early stages so consumers—

Mr. Ted Hsu: You wouldn't have to raise the excise tax on the normal fuels to make it revenue neutral.

Mr. Philip Petsinis: We don't believe it would be necessary. Other jurisdictions have definitely not.

Mr. Ted Hsu: Would you oppose it? You wouldn't oppose it, would you?

Mr. Philip Petsinis: We're not suggesting raising taxes on anything, but we're saying have an offset measure.

Mr. Ted Hsu: I don't want to raise taxes. I just want to decrease the tax on....

Ms. Joan Crockatt (Calgary Centre, CPC): You just want to tax the gasoline.

Mr. Ted Hsu: Let's move on.

Some hon. members: Oh, oh!

Mr. Ted Hsu: I know that it's important for you not to say certain things.

I'd like to ask Mr. Truckenbrodt about the fuel cell research that used to go on at NRC. NRC is undergoing a big reorganization. I was wondering if you could tell me what is happening to fuel cell research and how that affects you.

Dr. Andreas Truckenbrodt: As far as I'm aware here, NRC has, in the reorganization and restructuring, put fuel cells very much on the back burner. The NRC's IFCI, Institute for Fuel Cell Innovation, which used to be here in Vancouver, has redefined its priorities and its scope, so there is not a lot of fuel cell research going on any more here in Vancouver. That is a pity because what happens is that our ability to partner and jointly to really advance the fuel cell technology in that area where I said innovation is important—fundamental understanding, analysis, and simulation—has gone down. The second element is that we are losing competent people because they don't find a home any more here. I cannot hire all of them, of course, when they become available, so they are going somewhere. They might either go away from fuel cells, or they might leave this area here, or they might even leave Canada. It has an impact.

Mr. Ted Hsu: In my riding, the Queen's–Royal Military College Fuel Cell Research Centre is important. They've done a lot of research in fuel cells. Can you tell me the importance of the research there to your business?

Dr. Andreas Truckenbrodt: What are you referring to?

Mr. Ted Hsu: The Queen's–Royal Military College Fuel Cell Research Centre and its relevance to what you do.

Dr. Andreas Truckenbrodt: Frankly, I have to pass there. I'm not aware of them. Where are they based?

Mr. Ted Hsu: In Queen's, the Queen's–RMC Fuel Cell Research Centre.

Dr. Andreas Truckenbrodt: In Queen's. Oh, sorry.

Mr. Ted Hsu: The audio quality may not be very good.

Dr. Andreas Truckenbrodt: No, it's not of the Queen, the person, sorry.

Voices: Oh, oh!

Dr. Andreas Truckenbrodt: We still have a lot of joint projects going on within the Canadian fuel cell community, if you like, between university and research organizations on analysis and simulation. They are a partner in that. I can't tell you right off the top of my head which projects we are doing with them, but there is still a good network existing with some of the research institutions in Canada.

● (1640)

Mr. Ted Hsu: Thank you very much.

For Mr. Wagner, does the elimination of the eligibility of capital expenditure for the SR and ED affect your company?

Mr. David Wagner: Yes, it does. I believe it's one whose impact may not be felt right away, but, yes, it will affect the development we do in the future, for sure.

The Chair: Thank you, Mr. Hsu.

We go now to the five-minute round, starting with Mr. Allen, then Mr. Calkins, and then Mr. Nicholls.

Go ahead, Mr. Allen, for up to five minutes.

Mr. Mike Allen (Tobique—Mactaquac, CPC): Thank you very much, Mr. Chair.

I thank the witnesses for being here. A special welcome to Mr. Wagner from the Atlantic Hydrogen Inc., a facility I visited a couple of times and where I once to make an announcement.

Mr. Wagner, I'd like to start with you. It's good to see you're getting to an industrial-scale plant. Specifically, I would like to ask a few questions about that.

First, what is the size of that industrial-scale plant? How much natural gas is going to be required to do the appropriate tests that are going to be needed? How much product output from carbon byproducts will you have and where do you think those byproducts will go?

Mr. David Wagner: Those are all good questions and I'll try to answer them in understandable metrics.

As for the size of our plant, it scaled to do about eight times what our prototype here in the Fredericton facility is capable of doing. To give a metric, when that plant is fully operational, it will produce approximately 1,500 kilograms of hydrogen a day and 1,800 tonnes of particle carbon. Now, that's not the same as 1,800 tonnes of CO2. This is carbon that has been removed from the natural gas.

In terms of the consumption of natural gas, our facility happens to be in Saint John, New Brunswick, on the site of a power-generation facility. Access to natural gas in that part of New Brunswick is not a concern. We would use in the order of 2,000 cubic metres of natural gas an hour to produce the hydrogen and carbon I just referred to.

Mr. Mike Allen: And what are your plans for marketing your hydrogen and byproduct?

Mr. David Wagner: For the hydrogen, we are adjacent to Canada's largest oil refinery, the Irving Oil Limited Refinery in Saint John, and we are in discussion now with Irving to off-take our hydrogen. They use that hydrogen in their refining process.

The beauty of our hydrogen is that it is completely CO2 free. We do not generate any carbon dioxide in the production of our hydrogen.

As far as the carbon is concerned, we have signed off-take agreements with foundries, primarily in Ontario, where they use that product as an additive to the foundry process.

Mr. Mike Allen: Thank you very much for that.

Mr. Smillie, I would like to ask you a question about the opportunity for apprentices and your comment that there's a 3:1 ratio of apprentices to journeymen available to work on the pipelines.

I've talked to a number of apprentices in New Brunswick. There's an issue with respect to their community college system preparing and getting these kids out and going through their apprenticeship program, but there don't seem to be places for them to go. I also understand that there is a limitation on where they can go in the country and still be able to write their block release exams. For someone leaving New Brunswick to go to Alberta, coming back to write their block release exams is an issue.

What are you doing to allow these folks to go out there but still come back to do their education and block releases in their home provinces?

● (1645)

Mr. Christopher Smillie: That's a great question. Just for the members of the committee who don't have all the information about an apprentice program, usually it's 80% in the field working, and then 20% in the classroom.

The community colleges are completely limited by the amount of budget money they receive from their provincial governments. So what we're doing when possible is trying to allow those folks to go back to New Brunswick to run their classroom time. The other thing we're looking at doing is having the community colleges talk to each other, so that you will have NAIT in Alberta and the community colleges in New Brunswick talking. There might be an opportunity to link up the classroom portion with NAIT. Now, we are talking about two different provincial governments and a federal government involved in this. But five years ago an apprentice couldn't take his or her hours in Ontario and then go to work in Alberta and get credit. So it's coming.

A block release means that all the apprentice welders, let's say, would be released from the work site to go back to their community college or their training centre and write their exams. What we'd like to do is to be able to administer the test in the field. So we're trying to partner with the people at the Red Seal Secretariat, who, as part of HRSDC, would facilitate this kind of thing. We're not there yet, but we're working on it. That's one of the things that some of the large locals in northern Alberta—Edmonton, for example—can try to facilitate between community colleges. It doesn't make sense to have people leave the job site when the work is available, because work for these young people is scarce as it is.

The Chair: Thank you.

Mr. Mike Allen: I appreciate your clarifying block release as opposed to a release to the Bloc.

The Chair: Thank you, Mr. Allen. We won't get into that.

Mr. Calkins, you have up to five minutes.

Mr. Blaine Calkins (Wetaskiwin, CPC): That's a line of questioning I'd love to talk about today, Mr. Chair.

The Chair: No, it's out of order.

Mr. Blaine Calkins: I just want to thank the witnesses for coming in today. This was very interesting testimony.

Mr. Smillie, I do want to talk to you a bit about some of the comments you made. I'd like you to elaborate a little bit more on some of the innovations you've made on alcohol and drug testing. I don't know if that's directly related to the committee, but it is of interest to me because I think a safe workplace is a functional workplace, and I'd like to know more about that.

As you know, most of the footprints in the sands of time have been made with workboots and there are a lot of people on the ground working hard in Alberta—from all across this country—doing great things, whether it's in the oil sands or in the various other aspects of our diverse energy sector.

It's very important that you talk to me about the aboriginal engagement as well. I represent the four bands at Hobbema, some 12,000 to 16,000 people living on reserve there, and they need to have a more active role in Canada's economy.

Perhaps I could also get you to elaborate a little bit more on the following. From my perspective, I think that having a pipeline go south would be great, but east would be better, and west would be the best. I'm saying that as an Albertan when it comes to diversifying our market access. I'm wondering if you would agree with my assessment of that. And perhaps you could elaborate on some of the opportunities for the workforce that you represent here, if that were the case.

Mr. Christopher Smillie: Thanks for the questions.

We are working on the drug and alcohol policy. Currently, before you go to a work site, you have to go to a third party and test for drugs and alcohol, and then you're let on the site. That process usually takes about three to four days, so that's three to four days of lost work. We're having people agree to random testing, which then allows them to work at any of the number of employers who've signed up to this program. So at any time any one of our members could be asked to do a drug or alcohol test. This is a breakthrough in Canada in this kind of thing. It really speeds up the process and it means that our employers get the people faster. Nobody wants to be caught, so we've noticed that there has been a reduction. You can talk to Suncor or Total about the rates.

● (1650)

Mr. Blaine Calkins: So there's a lot better chance that they're going to adhere to it rather than if they knew what day they were going to start working, and then planning.... Is that basically what I'm hearing?

Mr. Christopher Smillie: I couldn't say that, but you did.

Mr. Blaine Calkins: Okay, very good.

Mr. Christopher Smillie: So with regard to aboriginal engagement, there's a national association called the National Association of Friendship Centres. It is an urban aboriginal outreach group. It does pre-screening for us. Basically when it has people walk through the door who it thinks are good candidates to join and to go to work at one of our contractors, it lets us know. That's sort of the idea. We're starting to work with it in a closer way.

There are also aboriginal contractors who hire exclusively aboriginal workers from local communities. This is a growing market for us. Think about the aboriginal population. Sixty-five or seventy per cent are under the age of—

Mr. Blaine Calkins: —twenty.

Mr. Christopher Smillie: I don't know what it is, and I wouldn't want to speculate, but there's such a young and growing population, and traditionally they haven't been actively engaged in the trades.

The partnership with the friendship centres is an example of innovation. I really have high hopes for that partnership with that group.

Mr. Blaine Calkins: My last question is—

Mr. Christopher Smillie: West is best.

Mr. Blaine Calkins: Yes. Southeast and west.

Mr. Christopher Smillie: West gives us another customer. That's what I was getting at. So rather than our being beholden to presidential politics or congressional politics or senatorial politics in the United States or in Canada, this will give us another market.

Yes, for the first little while, a lot of the stuff going through that pipeline will go to California, but at the end of the day that's a diversification activity, and I think you can't have a business and only have one customer, so it's important to diversity. So west is best in terms of our national interests in the long term. In the short term....

The Chair: Thank you.

Thank you, Mr. Calkins.

We go now to Mr. Nicholls for up to five minutes.

Go ahead, please, sir.

Mr. Jamie Nicholls (Vaudreuil-Soulanges, NDP): On the idea of going west, I don't think our leader would be opposed to that, but not Gateway. Any other project in another location, we'd be willing to look at—just not Gateway.

Mr. Smillie, I'd like to revisit two articles that appeared in *The Globe and Mail* on December 5, 2012 and February 15, 2012, written by you and Eugene Lang. I'll read you a series of quotes. I just want to see if they're still applicable, yes or no, and if we could put them into the record as statements by you.

You say that "It is naive to think that Canada can become an energy superpower given the labour market constraints we face and"—I emphasize—"lack of public policy action to address this".

Mr. Christopher Smillie: I said it. Public policy action is important. You can't have investment on the natural resources side in the trillions without having a labour force that's ready.

Mr. Jamie Nicholls: Thank you. You also say that "Ottawa should play a greater role in co-ordinating the efforts of provincial governments, industry and educational institutions".

Mr. Christopher Smillie: This is a national issue. Our economy is a national economy, and we have a national workforce in this country, and so there's a role for the federal government.

Mr. Jamie Nicholls: Thank you.

You recommend apprenticeship tax incentives. Have these been costed by any organizations you're involved with?

Mr. Christopher Smillie: Yes, and if you'd like us to table them, we can.

Mr. Jamie Nicholls: I would love you to table them.

Mr. Christopher Smillie: They've also been costed by Finance and HRSDC.

Mr. Jamie Nicholls: Great.

You said, that governments should be held "accountable for the billions of dollars transferred in Labour Market Development Agreements".

Do you agree?

Mr. Christopher Smillie: I agree. A labour market development agreement is a deal with a Canadian province whereby the federal government writes a cheque and then the province delivers curriculum with no policy constraints or milestones.

Mr. Jamie Nicholls: I see. You say you believe there should be a travel grant given to allow for labour mobility. Has this been costed as well and can you table it?

Mr. Christopher Smillie: Yes, sir.

Mr. Jamie Nicholls: Thank you.

You say there's no public policy framework to increase the skilled-labour pool in Canada.

Mr. Christopher Smillie: Can you read the entire sentence?

Mr. Jamie Nicholls: There is no public policy framework to increase the skilled-labour pool.

Mr. Christopher Smillie: At this time there is not a lot of coordination—

Mr. Jamie Nicholls: Okay, thank you.

You said there's a need for a pan-Canadian strategy for economic opportunity in the energy sector.

● (1655)

Mr. Christopher Smillie: I don't think I would be wrong in saying that a lot of our energy partners have said that as well.

Mr. Jamie Nicholls: Okay. That's for skilled trades, I take it?

Mr. Christopher Smillie: For skilled trades, yes.

Mr. Jamie Nicholls: For the renewable energy sectors?

Mr. Christopher Smillie: I don't think I'd comment on that.

Mr. Jamie Nicholls: For smart grid electricity distribution, you comment quite heavily on the need to maintain, update, and upgrade the electricity infrastructure going forward in the next 50 years.

Mr. Christopher Smillie: Absolutely.

Mr. Jamie Nicholls: Yes, okay. Well—

Mr. Christopher Smillie: It's a Canadian issue. Our electricity infrastructure was built 75 years ago.

Mr. Jamie Nicholls: That's right.

Mr. Christopher Smillie: We need significant investment.

Mr. Jamie Nicholls: So you would support the idea of a smart grid and all the employment associated with that.

Mr. Christopher Smillie: Absolutely.

Mr. Jamie Nicholls: Okay.

That dovetails with what Roger Martin, the dean of the University of Toronto Rotman School of Management, has said. He said that more effective collaboration between businesses and universities could bring more commercially viable new products and services to market.

I don't think I would disagree with what you say in terms of the skilled trades being part and parcel of innovation, and I think the quotes that I've read here and that we've put on the record show that there needs to be a greater level of coordination among governments, industry, and universities to push forward that innovation agenda. Would you agree?

Mr. Christopher Smillie: I'd agree. In fact, there was an event that we put on today wherein we had Minister Finley and Minister Raitt talk about the same issues.

Mr. Jamie Nicholls: How much time do I have, Mr. Chair?

The Chair: You have a minute.

Mr. Jamie Nicholls: Oh, wow. I'm being efficient today.

The Chair: Yes, you are.

Mr. Jamie Nicholls: Mr. Petsinis, I noticed your comment that the government shouldn't pick and choose certain technologies to put forward. However, your company received quite a lot in funding to get through a rather difficult period. Do you not see that as the government perhaps picking one company over another company?

Mr. Philip Petsinis: First of all, we were very grateful for the government's action in that stage. It averted some very significant economic devastation that would have happened in a number of communities. In fact, the other OEMs that did not require support also advocated for support because we have a shared supplier network.

Had that step not been taken, not only would it have affected our company and Chrysler, but it would have most noticeably affected every vehicle manufacturer in the country. From that perspective, we continue to think it was a wise investment. We've made significant commitments to the Government of Canada and the Government of Ontario with regard to production mandates and employment—

Mr. Jamie Nicholls: I don't want you to get me wrong. I like what you've testified to today and the direction you're taking. I just sometimes like to have it recognized that sometimes government does have to step in to help companies move in a more innovative direction. Particularly when they haven't been on that track in the past and they want to get on that track, sometimes they need the aid of the federal government.

Mr. Philip Petsinis: The only comment I have is right back to the U.S. policy, where they don't.... It's better to have broad-based initiatives in the area of certain automotive technologies or refuelling, because the dynamics change so often that you need to provide a level of support and let the market dynamics ebb and flow to make the right economic decisions so you have investments that have longer viability.

Some government-selected initiatives or funding at times can result in decisions that don't have longer-term economic viability. On the refuelling side, it is very unclear how that will play out over the near and mid-term future. It will be dynamic.

The Chair: Thank you.

Thank you, Mr. Nicholls.

Continuing the five-minute round, we'll go to Mr. Leef, then Ms. Liu, and then Ms. Crockatt.

Mr. Leef, you have up to five minutes. Go ahead, please, sir.

Mr. Ryan Leef (Yukon, CPC): Thank you, Mr. Chair.

My first questions will be for Mr. Pyun from Bombardier. We haven't heard a lot from you after your opening testimony today. I've looked through a lot of the information that you've provided. A lot of it is rail and air stuff, of course, but I know that Bombardier is highly invested in technologies for smaller-scale stuff.

I was wondering if you could expand briefly on some of the technologies that are deployed on some of your smaller items. I noticed that at the beginning of one of your packages you have a picture of one of your older snowmobiles, but maybe you could talk about this a little for us. If there are any recommendations that you didn't list as to where the government, from your perspective, could improve the advancement of innovation, I'd appreciate hearing them.

Mr. Pierre Seïn Pyun: Sure.

Thank you very much for your question. I was starting to feel a bit neglected with all the questions going to other companies.

But joking aside, the recreational product division of Bombardier was spun off from the company a few years ago. Now it's a separate company. I'm not really in a position to comment on that, but it is part and parcel of the history of Bombardier. The company was built upon this great invention in the thirties and forties, but the company has evolved through acquisitions into other sectors, such as rail and aerospace, and a few years ago that division was spun off.

But on your other question about policies and maybe the ecosystem to support greater innovation in Canada, and more broadly speaking from our experience in other countries, what we would recommend here in Canada is that, I think maybe simply put, we can put measures in two different baskets. On the one side, it would be more the technology-push kind of policies to support the commercialization of technologies. I think there are some great programs afoot here in Canada that have been in existence for some time in the aerospace sector, in the rail sector or, more broadly speaking, in the clean technology sector. We have been able to benefit from some of these programs. We have partnered with others to tap into those programs and move forward some projects in the area of clean technology. Some other programs we haven't really yet benefited from. Examples would include the GARDN program that I referred to. This was an NSERC program. Unfortunately, there was a decision made last year not to pursue this program anymore. It was a question of priorities, we understand, but the biofuel project that I mentioned was partially funded by this program.

Another program I would flag is sustainable development Technology Partnerships Canada. We're in discussions with them over possible potential projects we may work with them on. We have MOUs in place with this organization as an early adopter of some of the technologies that they're developing or funding with the participation of other companies. So that would be on the technology-push side.

For the PRIMOVE technology that we referred to, there's a pilot project that we're currently discussing with the Société de transport de Montréal. Policies to support the deployment of technologies for demonstration projects would also be a policy that we see elsewhere such as Germany. PRIMOVE is being deployed in Germany as well on a pilot-project basis, and it could be a policy that the government may wish to consider further to push forward the innovation agenda.

The other basket of policies would be more on the demand-pull side. I'm talking about strategic procurement, so leveraging procurement or public investment in either infrastructure projects or procurement of products and services to drive innovation and domestic manufacturing capabilities here in Canada. I think one great example is Public Works' Canadian innovation commercialization program that targets specific sectors, including clean technologies.

I think there's scope for the government to maybe expand that kind of program going forward and really use investment in public infrastructure projects as a tool, as a policy lever, to drive innovation. Of course, you have to do it in a way that provides value for money for taxpayers, but maybe in the way projects are spec'd you could leave more scope and latitude to the potential suppliers to provide innovation solutions for more sustainable and smart infrastructure here in Canada.

● (1700)

The Chair: Thank you.

Thank you, Mr. Leef.

We go now to Ms. Liu for up to five minutes.

Go ahead, please.

[*Translation*]

Ms. Laurin Liu: Thank you, Mr. Chair.

Thank you, Mr. Pyun and Mr. Laforge. I prepared some questions for you. I hope you'll feel less neglected.

I am glad that you're here this afternoon. I represent a riding with hundreds of employees in your sector, Rivière-des-Mille-Îles. It's north of Montreal, right beside Mirabel. I would think you're quite familiar with the area.

As you pointed out in your presentation, effective support for the sector requires political will. Your industry has been calling for that for months, if not years.

As you may know, we also have an aerospace caucus, and I'm delighted to be on it. In the House of Commons, I've repeatedly asked the government to introduce a development plan for the industry. In November, the report of the review led by Mr. Emerson was released. You are, no doubt, very familiar with the report. It criticized the federal government for its lack of support for the space and aerospace industries.

What do you have to say about the report? We hope the government will adopt measures in its next budget. Do you have any comments on the report's findings?

● (1705)

Mr. Pierre Seïn Pyun: I can answer your question.

Bombardier actively contributed to Mr. Emerson's aerospace review. We had the opportunity to give the company's perspective, obviously, along with other players in the industry. We are quite pleased with the review's findings and the 17 recommendations it proposes for the aerospace sector.

The recommendations span different parts of the ecosystem to support, maintain or increase the industry's ability to compete on a global level. It covers technologies and employment. In terms of global competition, bilateral and multilateral agreements with other countries need to be put in place or strengthened to create a fair playing field. We also think the report does an excellent job of describing the challenges facing the sector.

In our view, aerospace is a sector that does not enjoy natural forces here, in Canada. For several decades, however, it has had the benefit of investments, which have allowed the sector to develop expertise that is highly prized by other countries. The report does an excellent job of that. It describes the state of global competition, which includes not just traditional aerospace countries. The sector is indeed seeing other countries emerge. A number of countries, such as China and Russia, are looking to build a strong aerospace sector.

So we support the recommendations. We are satisfied thus far with the government's response to the potential implementation of the report's recommendations.

Ms. Laurin Liu: Thank you.

We also know that during the prebudget consultations, the Aerospace Industries Association of Canada made two recommendations.

The first was to make labour and capital expenditures under the SR&ED tax credit refundable and tax-exempt at a rate of 15%.

The second called for better funding for the technological demonstration of new products to allow the industry to remain competitive.

Do you support that recommendation? Is your sector also affected by the tightening up of the SR&ED tax credit?

[*English*]

Mr. Pierre Seïn Pyun: With respect to the SR and ED program, our view is that it's been a good program to support innovation. But in times of economic downturn, especially for a company like Bombardier, which is extremely export-oriented, with 93% of its revenue deriving from export markets, and which, for all intents and purposes, is not really generating profits here in Canada, we're not able to benefit from the program in years when we're not making profits, as you know.... In the past, we have made it known that our view is that if you want to make this program really beneficial, you have to man the program in a way that companies can monetize and use the money to really support innovation, by making it partially refundable, for instance, like it is in certain jurisdictions such as the province of Quebec.

But we also understand the fiscal constraints, and there have been signals given in the past of the savings you can achieve from the changes announced recently to the SR and ED program. There might be a willingness to do more direct forms of support. The Emerson report contains a recommendation for a new technology demonstrator program. One of the challenges of the review process was to come up with recommendations that are fiscally neutral, and we think this recommendation is very affordable and would not in principle entail new funds from the government but the reallocation of existing funds, for instance from the SADI program, to this new program and also from the SR and ED savings.

We look forward to working closely with the government as the government considers implementing this recommendation.

● (1710)

The Chair: Thank you.

Thank you, Ms.Liu.

Ms. Crockatt, go ahead for up to five minutes.

Ms. Joan Crockatt: I'll say at the outset that I was really glad to hear that the NDP is now supporting the pipelines to the west coast, the Kinder Morgan one. I look forward to that continuing. Thank you.

And I'll say to Chris that we haven't properly thanked you. Could you thank your organizations on our behalf for Helmets to Hardhats. It's a fabulous program and it's allowing the veterans, the best of the best, to go to work for you. We're just really happy that you're participating in that, so thank you.

Mr. Petsinis, do you agree with Mr. Truckenbrodt when he says that innovative technologies don't only need money, but also moral support from governments? If you do agree, could you tell us what that might look like?

Mr. Philip Petsinis: I guess in general that's an accurate statement. In the end—in our industry anyway, being a global industry—in many cases the innovative work will be done, but the financial decisions will in many cases drive where it will be done as well. So it's a balance of those two factors.

From an innovation standpoint, GM does have extensive R and D activities in Canada in universities from coast to coast, where we're doing significant research and development on many aspects of our business. So having a very high-quality education system and university-based researchers is a very significant aspect of where you do research as well.

So there are many factors that go into how, when, and where you do that type of innovative activity. We have a very strong research and development centre in Oshawa, as well as at Kapuskasing. In Kapuskasing, we do all the cold-weather testing corporately for GM globally. In Oshawa Ontario we have a regional engineering centre that has almost 300 engineers, with Ph.D.s and masters' degrees, who are working on a variety of advanced technology developments. Canada is a very good place to do that innovative work and we look forward to doing more of it, as we've committed to the government.

Ms. Joan Crockatt: So is the government letting the public know that, so that we can basically give you an edge up with the public understanding what kind of innovation is going on inside your companies? Is that what you were thinking of there?

Mr. Philip Petsinis: No, it's more along the lines of its being a multifaceted issue as to the decision process, and it's not one thing, but many things. So it goes from education, fiscal policies, infrastructure policies, etc., that facilitate making some of these decisions in selecting Canada as a site to do that innovative work. It's about many things, and not usually one thing.

Ms. Joan Crockatt: Mr. Truckenbrodt, I will go to you.

I wonder if you agree with Mr. Petsinis when he says that government shouldn't be picking winners and losers.

Dr. Andreas Truckenbrodt: Absolutely, it's not the government's job.

What he also said in the very beginning was that the car companies are working on all the different technologies because they have their specific applications. Customers will choose them according to their special needs.

The only thing government should make sure of is that there is a level playing field for the various technologies by not picking one above another.

● (1715)

Ms. Joan Crockatt: Yes, it's been a very interesting panel today with all of the variety we have here. You can see the competition you have out here and what we as government are dealing with when we try to put you all into our thinking as to where things are going in the future.

I'll stay with you for a moment, please, Mr. Truckenbrodt. With regard to hydrogen infrastructure, we've talked about it being really expensive. I think you said it was a showstopper. We've also heard that natural gas infrastructure is very expensive. Can you put one of those ahead of the other as far as which one you think is going to be most easily commercially adaptable? I hope that's a fair question for you.

Dr. Andreas Truckenbrodt: Just to be clear, I said that the expenses or the investment required in hydrogen infrastructure is not a showstopper.

Ms. Joan Crockatt: So it's not a show stopper.

Dr. Andreas Truckenbrodt: It is not. It is very difficult to really say which one is more difficult. Both in natural gas and hydrogen, we are talking about gaseous fuels, so the challenges are quite similar.

To your question of whether society will be able to invest in both natural gas infrastructure and hydrogen infrastructure, for us, hydrogen has the huge benefit that at the end of the day it's really a clean zero-emission technology. But there are parts of the natural gas infrastructure that exist. But we believe that hydrogen infrastructure is a necessary investment.

The Chair: Thank you, Ms. Crockatt. Your time is up.

Mr. Jamie Nicholls: On a point of order, Mr. Chair, I didn't want to interrupt Ms. Crockatt during her questioning and I know it wasn't her intention to mislead the committee, but I think the record will reflect that nowhere in my statement did I endorse the Kinder Morgan pipeline project. I simply said that our party does not support the Northern Gateway project.

We're willing to look at other places along the west coast, but I at no time endorsed the Kinder Morgan project.

The Chair: Okay, Mr. Nicholls, that is debate.

We will go now to Mr. Gravelle, and if there is time left, to Mr. Mai.

Mr. Claude Gravelle (Nickel Belt, NDP): Thank you.

I just have a couple of quick questions for Mr. Petsinis and Mr. Truckenbrodt.

It's concerning the money you invest in research and development. Can you tell us how much money your company invests and how much the government invests in the development of electric cars or fuel cells?

Mr. Philip Petsinis: We have made a specific commitment to the Government of Canada on investing almost a billion dollars in research and development activities on a variety of technologies over a given time period. That is probably not the extent of what we will do.

Again, I'll go back to my theme. There is no silver bullet technology in the vehicle transportation sector. To attain the greenhouse gas reduction objectives as well as to meet customer demands and requirements to facilitate their needs, it really is more of a shotgun approach. You will need to provide these varying technologies to do that.

Mr. Claude Gravelle: You said a billion dollars. So how much does the government invest in R and D development?

Mr. Philip Petsinis: There are various programs we've utilized. I don't have those figures readily available but we utilize the NSERC programs—

Mr. Claude Gravelle: Can you supply those figures to the committee?

Mr. Philip Petsinis: I'll have to investigate that from a company perspective to see how we could break that down.

Mr. Claude Gravelle: Thank you.

Mr. Truckenbrodt, I have the same question.

Dr. Andreas Truckenbrodt: Overall, Daimler has invested approximately €1.5 billion in the development of hydrogen fuel cell technology over the last 17 years. That is substantial.

Just in our operations here in the Vancouver area, we are spending approximately $40 million to $50 million every year on this technology, plus the investment that happens in Germany for Daimler and in Japan for Nissan. I do not have those numbers apparently. It's a lot.

Mr. Claude Gravelle: How much does the Canadian government invest?

Dr. Andreas Truckenbrodt: As we said before, the Canadian government has some programs running. We currently have an SDTC contribution of 22% to that one project that was $11.5 million from 2010 to 2013.

● (1720)

Mr. Claude Gravelle: Have you got some facts and figures that you could table for this committee on the amount of money that the government has given your company for R and D?

Dr. Andreas Truckenbrodt: I'll have to collect the numbers and get back to you.

Mr. Claude Gravelle: Thank you.

I have one more quick question before I pass off to Mr. Mai.

If we had a Canadian national transportation strategy that included electric cars and fuel cell cars would that be helpful to your companies—or if we had a strategy, period?

Mr. Philip Petsinis: The U.S. and Canadian governments have established a strategy indirectly via the regulatory process and the greenhouse gas emissions required by vehicles over the 2012-2025 period. In that regulation certain incentives are provided to manufacturers to develop certain types of technologies.

Mr. Claude Gravelle: But that's not a transportation strategy.

Mr. Philip Petsinis: Infrastructure is the missing link in that strategy, but there is no question that none of these objectives can be achieved without allowing the industry to develop all of these types of advanced technologies. They're leaving it to the industry to pick and choose which ones they want to work on.

Mr. Claude Gravelle: Thank you.

I'll pass the rest of my time to Mr. Mai.

[*Translation*]

Mr. Hoang Mai (Brossard—La Prairie, NDP): Thank you, Mr. Gravelle.

I am from Brossard—La Prairie. We are dealing with the Champlain Bridge situation and, especially, as you no doubt know, the matter of the light rail transit system. We are very supportive of that project, one reason being that we understand the importance of investing in public transit.

It is sometimes said that it would be impossible to build such a system in Quebec because of the snow and other reasons of that nature. Of course, the provincial government is the decision maker in that case, but we support the project and we want to see funding flowing that way.

Could you talk about what the project would mean for Bombardier or other companies?

Mr. Marc Laforge (Director , Communications, Bombardier Transportation and Public Affairs, Bombardier Inc.): Thank you.

We have everything we need to address the Champlain Bridge shortcomings. In fact, if you're interested, I encourage you to come see us in Kingston on June 20. We will be giving a demonstration of a product that could address all the issues associated with the Champlain Bridge. The product, Innovia 300, was even designed here in Canada.

There is considerable talk of light rail transit or LRT, to use shop talk. In this case, it's a system of surface rail vehicles that can be fully automated and electrified—producing no emissions—with the capability to more than solve the current traffic problems. It could replace the so-called temporary fix that has lasted for 22 years now, in other words, diesel buses and the orange-coloured cones.

I will make a point to invite you to come on June 20.

The Chair: Thank you, Mr. Mai.

[*English*]

We go now to Mr. Anderson for five minutes.

Mr. David Anderson: Thank you, Mr. Chair.

Mr. Truckenbrodt, Mr. Gravelle asked you for some figures. Could we ask you for a few more? He wanted the figures for R and D assistance. Could you also provide figures for the amount of government subsidization your company and your predecessor company have received? If you want to go back to 1983, that would be good. I think you said that you could provide the R and D figures. Perhaps you could provide that full figure for us.

Mr. Petsinis, I'd like to talk to you a bit about electrical storage. We've had a few discussions here about innovation and technology and battery storage. One of the previous witnesses said that's the next frontier.

Do you have anything you'd like to contribute on the next generation of innovation in terms of electrical storage? That seems to be the limiting factor in so many areas, whether it's integrated energy systems, remote communities, or electrical vehicles.

Mr. Philip Petsinis: From an electric vehicle standpoint, there's no question that the evolution of the battery systems has now enabled us to sell commercially viable vehicles like the Chevrolet Volt. The energy density of batteries has been a limiting factor—how much energy you can put into a certain mass of battery or size. That has been improving and we expect that to continue.

The other relevant factor to the broader commercialization of that technology is the need for the cost to come down as well. The interesting aspect about battery electric vehicles and having the battery onboard is that there's a commercial value to the battery after it's no longer feasible to use in a vehicle. Once a battery gets about 70% charge-holding capacity, it's no longer viable for a vehicle but has much commercial value in things like remote storage, backup power, peak shaving, etc.

We're doing a number of projects with ABB Automation, to look at how to use these batteries in a secondary life—to support levelling charge loads in the infrastructure in the grid and other applications—to help fully utilize that battery and reduce the cost that applies to the vehicle. In fact, we're researching that in our engineering centre in Oshawa.

● (1725)

Mr. David Anderson: I have a question on emissions. I think the majority of provinces still get most of their power from coal-fired power plants. Do you advertise that your electrical vehicles have zero emissions, or do you acknowledge that equation?

Mr. Philip Petsinis: There's no question. Someone earlier mentioned that you have to look at it from "well to wheel", that is, what was the carbon created when you generated that electricity, as well as when you used it? From a Canadian context, when I look abroad to other jurisdictions, 70% of the electric energy in Canada has very low greenhouse gas emissions. The reality is that when we look at the highly populated regions of Canada—B.C., Ontario, Quebec, and Manitoba as a secondary market—those regions have an extremely high, if not almost exclusive, production of electricity by hydroelectric and other means, which have virtually zero emissions. In those provinces, a Chevrolet Volt running on electricity emits 1/15th the greenhouse gas emissions on average in Ontario today, even with the coal-fired plants that are still being wound down, than the most efficient gasoline vehicle on the market. The potential for greenhouse gas reduction from electric vehicles in the Canadian context, given our very green electricity electrons, is quite staggering.

Mr. David Anderson: Actually, that's the point: it's the green system already in place that gives you that benefit, not specifically electric.

Mr. Philip Petsinis: With the electric vehicle, the other thing that's not very well understood is that gasoline engines, even the very best advanced technology engines, convert only about 40% of the potential energy in gasoline to motion. Electric vehicles can do it at about an almost 90% conversion factor, so you're getting twice the efficiency. That's where this other unknown factor is. When consumers understand it, we think that they'll gravitate towards electric vehicles, particularly in city areas. If I have a comparatively sized, very efficient gasoline vehicle and compare it to a Chevrolet Volt powered on electricity at today's prices, it's one-fifth the cost to travel in the Volt versus the gasoline vehicle, per kilometre.

Mr. David Anderson: Some of us need you to do a lot more work on the storage before they will be practical for us, I can tell you that.

Mr. Smillie, you talked to Mr. Calkins about the partnerships you've been working on in encouraging aboriginal involvement in the employment force. Can you talk about some of the other partnerships, the innovative partnerships you have put in place outside of the labour circles? What are you doing to encourage the labour innovations that we need?

Mr. Christopher Smillie: I would say that our top innovation—and I took a ton of heat for it internally—is that we partnered with CAP to talk about workforce delivery issues and about where we need to be to make sure that we have the workforce ready to build their projects in the future. So there's that one.

We're also working with an organization called Journeyman Inc., which promotes women's participation in the trades. We are going across the country getting more females involved in construction. Right now, they are less than 1% of our membership, and it's a real opportunity.

So we have CAP, we have Journeyman Inc., and we've also been talking with the Federation of Canadian Municipalities on infrastructure renewal and what needs to be done. Those are probably the top three.

Mr. David Anderson: Thanks.

Mr. Pyun, I'd like you to talk a little bit about your camelina project and where that's at. I know that a couple of different types of plants are being developed for jet fuel. I'm just wondering if you can tell us a little bit more about that project and where you're at with it.

Mr. Pierre Seïn Pyun: That project was essentially completed last year. There was a demonstration flight with biofuel based on that feedstock. There was then a second flight, a commercial revenue flight that Porter operated, again using the same biofuel.

The objective of the project was to be able to demonstrate that this mix of fuel, which was 50% biofuel and 50% regular diesel fuel—

● (1730)

Mr. David Anderson: Where's that going in the future?

Mr. Pierre Seïn Pyun: I think there are still some issues in terms of cost—the cost of the feedstock, the cost of the process—which needs to be brought down for there to be any hope that we will see it used widely in the industry in the future. I think it's at least four times more costly than just regular aviation fuel, at this point in time.

Of course, we need to continue to innovate, and the company stands ready to support that kind of project going forward.

The Chair: Thank you very much, Mr. Anderson.

I would really like to thank all of the witnesses for great presentations and very good answers to the questions.

I'd also like to thank all the members of the committee for good questions. That was another good meeting. Have a good weekend in your constituencies.

Thank you, all.

The meeting is adjourned.