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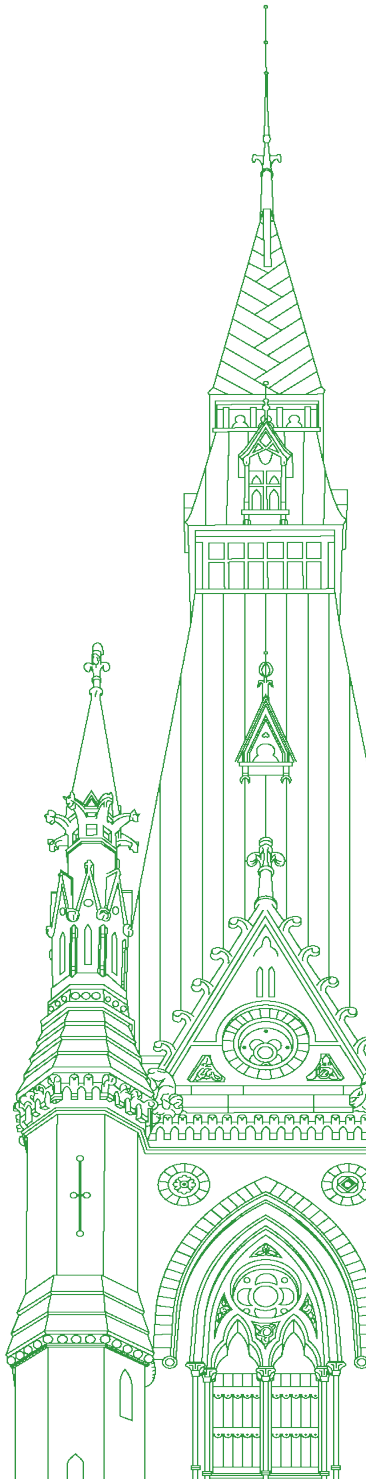

Chair: Mr. James Maloney

Standing Committee on Natural Resources

Friday, May 14, 2021

● (1300)

[*English*]

The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)): I will call this meeting to order.

Thank you, Madam Clerk. I also thank all of our members and our witnesses today.

I have a few housekeeping items before we jump in.

This is meeting number 27 of the Standing Committee on Natural Resources. Many if not all of you have been here before, but I'm not sure you've appeared before this committee in a virtual setting, so things are a little different. We all have headsets, which serve the dual purpose of helping those of us with really long hair and helping us to communicate with each other.

Because it's a virtual setting, I would ask everybody to be patient. Make sure the person who you are communicating with at the time finishes speaking before you start speaking. Doing that helps the interpreters. On that point, I would encourage everybody to speak in either or both official languages. There is an interpretation button at the bottom of your screen.

We'll start with opening remarks for up to five minutes for each group, with the emphasis on “up to”. I will have to interrupt people from time to time if we are going over time. Then we will get into questions after all the panel groups have finished making their opening remarks.

We have the Canadian Biogas Association, the Canadian Gas Association, the Canadian Hydrogen and Fuel Cell Association, H2 V Énergies Inc., Hydrogen In Motion Inc., and Unilia Canada Fuel Cells Inc.

Thank you for joining us.

We will proceed in that order, starting with Jennifer Green, executive director of Canadian Biogas Association.

You have five minutes. The floor is yours.

Ms. Jennifer Green (Executive Director, Canadian Biogas Association): Thank you very much for the opportunity to appear before the committee as you undertake this very important study.

The Canadian Biogas Association speaks for Canada's biogas and renewable natural gas opportunity. We represent more than 150 farmers, municipalities, technology developers, consultants, utilities and other sector organizations with an interest in reducing more greenhouse gas emissions and tapping more clean energy from Canada's biogas and RNG resources.

Biogas is Canada's quiet achiever. There are currently 279 biogas projects operating across Canada. These projects capture methane from organic waste collected from farms, landfills, waste water treatment plants and municipal green bin programs and turn it into reliable and clean energy. How much energy exactly? In 2020, our sector produced biogas that was converted into six million gigajoules of energy through renewable natural gas, 260 million cubic metres of biogas for heat and on-site use and 196 megawatts of clean electricity capacity. This is the equivalent of roughly 400 million square metres of solar panels or more than 13 large hydro dams, and there are more projects in development.

Our recent 2020 market report shows that Canada is only tapping 13% of its easily available biogas resources. The question is, how can we create the right policy signals to drive the private investment needed to tap the remaining 87%?

First, let me be clear about the benefits of tapping this remaining 87%. Biogas generates economic opportunities in every part of Canada, including in both urban and rural areas, particularly in agriculture and municipal sectors, two sectors hit especially hard by the pandemic. Our 2013 modelling suggests that growing the number of biogas projects just five times would generate almost 20,000 long- and short-term jobs and produce $21 billion in economic benefits.

Biogas also supports Canada's pathway to net zero. The recent models completed by the Canadian Institute for Climate Choices show that biogas is part of every single scenario for reaching our 2050 net-zero targets. Meanwhile, blending just 5% renewable natural gas into Canada's existing natural gas distribution system could reduce emissions by 14 megatonnes by 2030. For comparison, British Columbia is targeting a 15% blend of renewable gases by 2030 and Quebec is targeting a 10% blend. Right now, Canada is capturing only a small sliver of these benefits.

What are the opportunities to advance the biogas and RNG industry in Canada? Two things in particular have driven the growth of Canadian biogas over the last decade: first, provincial mandates and programs that incentivize clean electricity and clean natural gas, and second, federal funding programs that help projects overcome capital costs. We anticipate that the rising federal price on pollution will drive new biogas opportunities, though not until closer to 2030 and beyond, when the cost of biogas becomes more competitive with conventional natural gas.

Going forward, we see one major opportunity for the federal government to drive the biogas industry, and that is to drive domestic demand through a federally mandated minimum renewable blend for Canada's natural gas distribution networks. As mentioned, two provinces have established provincial regulations in this regard. It was also recently supported as a policy proposal by Canada's environmental NGO community, as well as offered in the Leader of the Opposition's climate plan. Such a regulation would be similar to the renewable fuels regulation introduced by the Government of Canada in 2010, which requires a minimum countrywide renewable blend for gasoline and diesel. That regulation has been instrumental in growing Canada's liquid biofuels industry and is responsible for significant greenhouse gas reductions.

Thank you so much for the opportunity. I'm ready for any questions.

● (1305)

The Chair: Thank you very much.

Next up, with the Canadian Gas Association, is a familiar face, Timothy Egan, and Christopher Smillie.

Tim, I suspect you're going to start us off.

Mr. Timothy Egan (President and Chief Executive Officer, Canadian Gas Association): I am, Mr. Chair. Thank you very much for the opportunity to participate today.

The Canadian Gas Association is, as many of you know, the voice of Canada’s natural gas delivery industry. Our membership includes utilities and transmission companies, equipment manufacturers and suppliers to the industry. Our members are active in eight provinces and one territory. Combined, we meet roughly 35% of Canada’s energy needs through a network of underground infrastructure. We provide over 20 million Canadians with what is the most affordable, reliable energy service offering available.

Our infrastructure delivers gaseous energy, and increasingly that includes renewable natural gas and hydrogen. Our member utilities are Canadian companies based in communities in your constituencies across the country. We want Canadians to benefit from the energy services we deliver today and in the future. By leveraging our energy infrastructure, we offer some of the most cost-effective options available to help the Government of Canada meet its greenhouse gas emission reduction targets.

Four of our members appeared before the committee on April 30: Énergir, Enbridge, Gazifère and Fortis Inc. They outlined the ambition and level of activity under way in their respective provinces.

For us, as the national association, we're working to support members’ goals in all the provinces in which we're active. We're focused on three key priorities. One, we are designing strategic renewable gas programming and policy support for RNG and hydrogen through public-private funding partnerships. This includes a request for federal leadership to commit to purchasing RNG, and in the future hydrogen, for federal buildings across Canada. Two, we are supporting new RNG and hydrogen technology solutions through initiatives like CGA’s natural gas innovation fund. Three, we are working with member companies to modernize provincial regulatory and legislative frameworks that govern investments that CGA members can make.

In 2020, we turned to our members to solicit project concepts to support our economy and contribute to getting people back to work. All told, we created a list of nearly 70 projects in four areas: green building retrofits, alternative transportation, LNG, and infrastructure and renewable gases. Specific to renewable gases, we mentioned over 21 projects across five provinces. That number is ever increasing and points to the opportunity that Canada has to partner with industry to deploy large-scale renewable gas deployment opportunities.

When our companies appeared before your committee on April 30, you heard about programs under way that deliver RNG to customers. Many of our other members are working in the field as well. ATCO in Alberta is piloting hydrogen and recently announced a partnership with Suncor. Heritage Gas in Nova Scotia is also targeting hydrogen as a key component of its future gas supply in the province.

Globally, governments and industry are realizing the need for gaseous energy infrastructure to meet the growing energy needs of the world. Here in Canada, as we note, recent programming and policy documents support renewable gas development, including the national hydrogen strategy, proposed funding in budget 2021 for carbon capture and storage and the $1.5-billion clean fuels fund.

What do we need to deliver on what is being asked?

First, it's essential that legislative and regulatory frameworks in the provinces allow for investment in low-emission projects like RNG and hydrogen. Specifically, we're looking at a process to adjust legislative frameworks that govern utility investments so that regulators can consider emissions reductions goals in their decision-making framework. At present, they're focused strictly on the lowest cost for customers. If governments want energy delivery companies—and this applies to electric utilities and gas utilities—to deliver on emission reduction targets, the regulatory regime governing utilities will have to be adjusted.

Second, Canada requires more public-private co-operation on clean-tech development. We created an excellent opportunity for such co-operation when we launched the NGIF four years ago as a granting vehicle for new technology start-ups using industry dollars. Governments quickly advised they wanted to partner with us, recognizing the industry leadership.

Recently, we built on that original grant fund and created two new entities: a clean-tech ventures fund and the NGIF Emissions Testing Centre. The investments made through the venture fund will improve environmental performance while building the value of natural gas to meet the ongoing needs of Canada's energy system. The venture fund has an initial investment of $35 million from seven leading companies across the value chain. There is significant opportunity for deeper co-operation so that such market-driven innovation can deliver on the best results for environmental performance.

Third, we need policy leadership from all levels of government that is technology neutral. Government shouldn't pick which energy pathway or technology it thinks best to deliver on its emissions reduction goals. Currently, the Canada Infrastructure Bank prohibits RNG buses and focuses exclusively on hydrogen and battery buses. It's an example of the kind of intervention that needs to change.

● (1310)

To make the point on transportation, RNG is a promising solution in municipal and other fleet applications. We note Canada's first carbon-neutral bus fuelled by RNG in Hamilton, Ontario, and TransLink's recent announcement of 25 CNG buses in B.C.

These announcements mean significant greenhouse gas abatement and reduction in operating costs from the traditional diesel buses you see every day.

The Chair: I'll ask you to wrap up.

You're in summary. I spoke too soon. Go ahead.

Mr. Timothy Egan: There is significant opportunity in the industry to deliver on emission reductions. We're home to leading technology companies and an industry that has a proud record of continuous improvement. Ultimately, we're about ensuring that Canadians, in their homes and businesses, have the affordable, clean, reliable energy they need.

Looking forward, we must be transparent about the cost of emerging fuels and technologies and work with all interested parties to find the most cost-effective and efficient ways to deliver on the goals that have been set.

Thank you.

The Chair: Thank you.

Next, we have Mark Kirby, president and CEO of the Canadian Hydrogen and Fuel Cell Association.

Mr. Mark Kirby (President and Chief Executive Officer, Canadian Hydrogen and Fuel Cell Association): Mr. Chair, honourable members and guests, thank you for the opportunity to speak before you. I join you from North Vancouver, the traditional and unceded territory of the Coast Salish people, the Squamish, Musqueam and Tsleil-Waututh.

I lead the CHFCA, the voice of Canada's fast-growing hydrogen and fuel cell sector. In 2017 the sector employed 2,500 skilled workers, invested $100 million per year in research, and sold $200 million of products and services, 90% of which were exports. Today, I'm not sure. In the past year, membership has more than doubled. Major energy and industrial companies have joined. Research spending has increased. Significant projects are under way in Canada and internationally, with over $300 billion of investment in hydrogen projects through 2030 announced worldwide and growing.

Canadian companies are claiming a good share of that, selling fuel cells, electrolyzers, technology and services. As a result, hundreds of millions in investments have flowed into sector companies; order sheets are full and companies are hiring. We've established branches in Quebec and B.C. due to demand. So I'm pretty bullish about prospects for my members, and I'm also excited about the broader economic potential for Canada. B.C. is seeing vehicle deployments. Quebec and Alberta are attracting investment based on their ability to produce low-cost clean hydrogen for biochemical and biofuel production, iron ore reduction, and rail, bus and truck projects, and we're just starting to scratch the surface of the potential for exports of hydrogen and clean chemicals.

We will also see environmental benefits. Canadians know they need to stop burning fossil fuels and start burning clean fuels, such as clean power, biofuels and clean hydrogen, or that if they do continue to burn fossil fuels, they need to ensure that all carbon emissions are managed through carbon capture, use or storage, i.e., CCUS. Those are the choices: electricity, biofuels, CCUS and hydrogen. Canadians should be free to decide which choice provides them with the best economics and operational efficiency. All options are needed. Hydrogen will play a big role, and we'll need to scale up hydrogen production by at least an order of magnitude. The key thing is that government should ensure that Canadians have access to the cleanest and lowest-cost hydrogen in the world.

There is a good reason for that. Hydrogen is essential to decarbonize tough sectors like heating and heavy transportation. It is needed for the build-out of clean power and biofuels. It represents an economic opportunity, and the availability of clean hydrogen will attract investment.

There are three points I would like to clarify.

First, the CHFCA supports clean hydrogen, i.e., that produced with low or no GHG emissions. That is what all new capacity will be, so a choice to go with hydrogen will be a choice to go net zero. CHFCA has leading companies engaged in the production of clean hydrogen from virtually every energy source: clean power, nuclear, biomass, waste and fossil fuels with carbon management to prevent CO2 emissions. While a discussion of pathways is healthy and standards are needed, my members all agree that all pathways, including fossil fuel-derived clean hydrogen, are essential. Anything else will needlessly drive up cost, create scarcity and slow our transition to net zero.

Second, fuel cell vehicles and battery vehicles are both zero-emission electric vehicles. Batteries and fuel cells are complementary, working together to provide a complete alternative to gasoline or diesel internal combustion engines for all transportation applications: light duty, heavy duty, ground, air or marine. We need both and fuelling infrastructure for both.

Similarly, electric heat and heat from net-zero gaseous fuels also complement each other to provide a complete and cost-effective net-zero alternative to fossil fuel and natural gas for homes, buildings and industrial heat. Both are needed.

As you have heard, hydrogen is enjoying unprecedented support federally and provincially and across party lines. The federal government released the hydrogen strategy for Canada, underpinned by the revised climate plan, with policy measures and significant funding. The Conservative Party's climate plan, while it differs, is consistent in supporting hydrogen.

My association applauds the positive actions and is encouraging Canada's industrial sector to bring forward meaningful projects, but there is more we can and should do to ensure the rapid adoption of hydrogen and other clean fuels. I am sure it will surprise no one that the CHFCA has a list of recommendations such as increasing research funding, broadening Infrastructure Canada's 5,000 zero-emission bus program to include trucks, creating earmarks for hydrogen, making federal buildings net zero, etc., but I'd like to highlight three.

First, focus on net zero. While the price on carbon and the clean fuel standard are important measures, they are geared to emissions reductions. We need policy geared to net-zero technologies such as zero-emission vehicles and net-zero heating, including a deadline perhaps to make gaseous heating fuels net zero by using hydrogen and renewable natural gas.

Second, hydrogen distribution costs are a challenge. We need to sidestep that by developing hydrogen hubs. I'm happy to talk further about what that means.

● (1315)

Three, we need the private sector engaged to provide the billions required to build hydrogen infrastructure, and they will, because the business case is there. The biggest barrier, however, is demand risk, and that is a perfect place for a government to assist with policies proven in other jurisdictions. Again, I'm happy to discuss that further.

Thank you for your attention. I look forward to questions.

The Chair: Thank you, Mr. Kirby.

Next we have, from H2 V Énergies Inc., Mr. Normand Goyette, president and CEO.

[*Translation*]

Mr. Normand Goyette (President and Chief Executive Officer, H2 V Energies Inc.): Mr. Chair, and ladies and gentlemen of the Standing Committee on Natural Resources, good afternoon. Thank you for having me here today.

H2 V Energies is in business to become a world leader in the mass production of carbon-neutral green biohydrogen from renewable biomass as of the second quarter of 2024. The plant will produce close to 50,000 tons of green biohydrogen annually, as well as 953,000 tons of food-grade biogenic CO2 for beverages and other things as a co-product. The production of CO2 is economically valuable because it represents only 3% of the North American market; it is a niche market.

H2 V Energies will eliminate 730,000 tons of waste annually, that is, municipal solid waste, mixed paper, non-recyclable plastics as soon as the legislation permits it, fresh and buried bark, and renewable biomass in general.

Capital investment for the plant is in the order of about $1 billion. The technology is Canadian, from OMNI Conversion Technologies, an Ottawa firm. It is a proven, patented, certified and risk-free technology, and it requires no scaling up.

According to our experts, a life cycle analysis, not including plant construction, will give no GHG emissions, or even negative values based on our initial calculations. Moreover, we will create 1,150 construction jobs and 100 mostly high-level jobs in operating the plant.

Our main advantage is undoubtedly the fact that the process requires 5.25 times less electricity than water electrolysis processes to produce an equivalent ton of green hydrogen. When the plant is operation, the annual economic benefits will be approximately $200 million, that is, $131 million for the two levels of government and $70 million reinvested in the regional circular economy.

H2 V Energies is a shovel-ready project, an innovative, practical application of Canadian technology. The process is omnivorous because it can process any type of organic material, such as renewable biomass and municipal solid waste, apart from metals and glass. The process is exportable because it requires little electricity and not all countries are as privileged as Canada in terms of producing hydroelectricity. The target markets are listed in our brief, which I invite you to consult.

To become a world leader in green hydrogen production, Canada must decide now to invest in infrastructure to support the establishment of green hydrogen mass production plants such as the H2 V project. Infrastructure needs exist both for systems based on the capture and safe release of hydrogen by an organic compound and for the tank cars necessary for the safe transport of hydrogen in the organic solution or for the transport of liquefied biogenic CO2, for rail and maritime supply pipelines, or for storage tanks at plant sites.

Such infrastructure is needed for us, for Canada, to be the first to export zero-emission hydrogen to ports in Europe. By meeting the markets demands of Europe or California, Canada can establish its leadership: we can be the first to meet these market demands for zero- or low-carbon intensity hydrogen.

The Canada-Germany agreement of March 2021 states that Germany is in favour of massive imports of green hydrogen from Canada. One should remember that Canada's trade deficit with Germany is over $ 10.8 billion. By 2050, Rotterdam will represent an import market of 18 million tons per year for green hydrogen.

May I draw your attention to the section of the brief on the dehydrogenation hubs currently being built to release such quantities of green hydrogen in receiving countries. Canada must make its efforts in this area a priority. We need to be turning the Canadian corner and leading the way today, now. Let's be the first to export green hydrogen, made in Canada and produced by H2 V Energies, to the European and Californian markets. Let's make sure we put the needed infrastructure in place, because 2024 is just around the corner. With strong and coordinated leadership, we will make Canada a true leader in the production and export of this energy.

In conclusion, in our view, at the current stage of our project, two messages are key.

First, the benefits of green hydrogen will not be apparent without an industrial phase of mass production. That is what we hope to achieve with the support of governments.

● (1320)

Substantial local use and massive international exports will only happen if initiatives such as ours are supported by strong political will today. The race is on, and we can win it.

Thank you for your attention.

[*English*]

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

Next we have, from Hydrogen in Motion, president and CEO Grace Quan.

Ms. Grace Quan (President and Chief Executive Officer, Hydrogen In Motion Inc.): Good afternoon, committee members. Thank you for inviting me to this very interesting discussion.

Hydrogen in Motion is an SME that has developed a revolutionary nanomaterial that stores hydrogen under low pressure, and we're currently upscaling our technology for commercial launch. I hope with my testimony to give the committee an insider view of the challenges for SMEs in the Canadian hydrogen economy, as well as ideas on how to address some of these challenges and implement a consolidated hydrogen platform across Canada.

As you know, the recent budget announced a target of 40% reduction of CO2, which is equivalent to 293 megatonnes, by 2030. In the hydrogen strategy, it's identified that hydrogen can abate 190 million megatonnes of GHG, so hydrogen is obviously a key to meeting Canada's GHG target. That's why we're all invited to this discussion.

Canada has real expertise in hydrogen technology, with Ballard leading the way as a pioneer and with many companies generating hydrogen using different technologies, as Mark mentioned, including electrolysis and biomass and waste gas reformation. However, the committee might not know that Canadian SMEs are actually pushing the envelope with even more innovative technologies, such as injecting oxygen into old oil wells to release hydrogen and alkalizing sea-water. Moreover, there are other innovations in the supply chain, such as my own unique solid state hydrogen storage technology and improvements in fuel cell technology.

All this to say there are many companies in the hydrogen supply chain. However, how do we put all these diverse technologies together and maximize them?

One concept is a system of hydrogen hubs in a pan-Canadian multimodal low-pressure hydrogen-refuelling rail transport network. The concept is a hydrogen electric retrofit of 40 locomotives, which is 1% of the total. These 40 locomotives would use four million kilograms of hydrogen per annum at a fuel cost of $50 million a year. This would replace 4.5 million gallons of diesel and 46,000 tonnes of CO2 a year.

The challenge is that hydrogen fuel costs are double what the railways are paying right now, so we need to bring the cost of the fuel down. We can do this by exploring different ways of generating, storing, transporting and distributing hydrogen because that's where the majority of the cost is.

These hubs would be multimodal refuelling centres and innovation hubs, getting hydrogen generated from local sources using SMEs with specific expertise in the hydrogen supply chain. The total estimated cost for the project is $500 million, but this project would connect the country with a multimodal station and provide hydrogen for rail, heavy-duty trucks, fleets and remote communities. It could grow the North American network.

We need your help to champion how we can implement this in your constituencies. I have spoken to many members of CHFCA and Canadian railways and they have indicated their enthusiastic support for the concept.

How do we make this happen?

First and foremost, of course, there's funding. The Canadian grants and contributions program, with its 50% matching requirement, is very dilutive from the perspective of a Canadian SME. Within two or three rounds a company is no longer Canadian, and that's why you see many SMEs. Canada has one of the highest educated populations in the world but very few MNEs, very few large corporations.

I would suggest there is a better way to innovate and grow the Canadian hydrogen supply chain. One way is to provide a buyer for the product and take the risk out of the equation. The industry is growing, but it is doing so slowly because supply and demand are not matched. A Crown corporation similar to Petro-Canada could channel funding, share key data between industry and government and level out the demand and supply chain. This could provide sustained growth for the hubs and support innovation, job creation and economic expansion.

Other mechanisms that could be deployed in the short term are fiscal tools that are already available. As a former senior adviser to the Treasury Board, I am familiar with the process, and I think some of these tools can be implemented fairly easily. One is targeted grants and contributions for hydrogen. Another is exemptions to the stacking limits. Loans from regional development agencies have a stacking limit. Companies have to pay them back, so why are they even included in the stacking limits at all? Another is indirect funding such as tradable carbon credits, but regulations such as zero emission are the number one driver for conversion to hydrogen technologies.

● (1325)

In summation, from my perspective as a CEO working in the industry for the last nine years, I think these recommendations would greatly assist in developing the innovative companies in the hydrogen supply chain and provide Canada with a platform for hydrogen that we can use across the country and leverage. Similar to Silicon Valley, we could create a hydrogen hub and get the commensurate benefit of jobs and innovation growth for Canada.

This is the end of my testimony. I welcome your input and questions. Thank you.

The Chair: Thank you very much.

Last but not least, from Unilia Canada Fuel Cells Inc., we have Robert Artibise.

Sir, you have the floor for five minutes.

Mr. Robert Artibise (Vice-President, Technology, Corporate, and General Manager, Canada, Unilia Canada Fuel Cells Inc.): Thank you. Good morning and good afternoon, members of Parliament and members in our audience. It is a pleasure to be here today.

I thank you for giving me this opportunity to share my thoughts on the challenges and opportunities for the low-carbon and renewable fuels industry in Canada. My name is Robert Artibise, and I'm the vice-president of technology for an international hydrogen fuel cell stack engineering and manufacturing company named Unilia Fuel Cells.

Fuel cell technology can and is being used in many applications. At Unilia, our focus is on medium-duty and heavy-duty vehicle electrification. I'm an engineer by training and have been working directly in the automotive fuel cell industry for over 20 years.

The focus of my comments today will be on the impact of scale-up. Over the past 25 years, fuel cells have gone from research and development to deployment. As a new company to the industry, Unilia is led by a team of experts who are industry veterans. The average fuel cell experience for an employee at our Burnaby, British Columbia, location is between 15 years and 20 years.

This knowledge, coupled with the passion to deliver products, has enabled Unilia to grow from establishing a company in September 2017 to commissioning a state-of-the-art product and technology development centre in Burnaby, British Columbia, in March 2020, as well as having a fuel cell stack production facility in Shanghai, China, and Guangdong, China, capable of an annual production of 5,000 stacks per year. After launching our first product line last summer, in 2020, Unilia will be delivering our thousandth stack later next week.

In September 2020, Unilia was proud to announce that Refire purchased an equity stake, making Unilia part of the Refire group of companies.

Since founding Refire in 2015, the company has supplied over 3,000 fuel cell systems to over 40 partners and customers. More than 2,700 operating vehicles are powered by Refire and are on the road today in 17 cities globally. The total combined vehicle mileage has surpassed 60 million kilometres. The vehicles in service are in a wide variety of applications, from a 4.5 ton truck doing short-haul deliveries, to 40 ton trucks doing heavy-duty applications, to 10.5 metre buses and 12 metre buses. Currently, Refire has 915 buses in operation today.

Unilia would love to deploy our fuel cells and technology in Canada and across North America. The ideal hydrogen strategy would be one where we could build a production facility in Canada to serve the North American market.

There are many government policies in Canada that support decarbonization and hydrogen as an energy storage system. These include Canada's net-zero commitment, putting a price on carbon, the clean fuel standard and light-duty, zero-emission vehicle standards in British Columbia and Quebec, which have driven up the retail hydrogen refuelling stations in those two provinces.

Government funding that supports decarbonization and hydrogen as an energy storage includes the $2.75 billion that Infrastructure Canada has put towards the zero-emission bus fund, the $1.5 billion that Canada Infrastructure Bank is putting towards infrastructure rollout, the $0.2 billion in the fuelling infrastructure fund and the $3 billion that the strategic innovation fund has put towards a net-zero accelerator.

I still think there are some gaps that are hindering deployment and adoption of hydrogen and fuel cell applications in Canada. These are the supply of clean, low-cost hydrogen in main hub areas. This exists in Edmonton, but it's needed in other locations, like Toronto, Montreal and Vancouver. Another is project funding approvals. We're seeing lots and lots of projects being proposed, but we need projects granted.

Today my recommendations to the standing committee include a guaranteed demand for fuel providers by issuing credits based on installed capacity. This strategy was previously included in the B.C. low-carbon fuel standard and has been adopted in California to entice greater private sector investment for larger-capacity refuelling stations. Other recommendations are for net-zero emission requirements for vehicles in Canada, net-zero emission requirements for heating fuels in Canada, and guaranteed project funding approvals, using a target system by funding dollars per megatonne of carbon. This can be adjusted on an annual basis as the usage of this funding system goes up or down.

I thank you for the opportunity to speak with you today. I'm happy to answer questions and discuss any comments you might have.

Thank you.

● (1330)

The Chair: Great. Thank you very much.

We're right on time.

We'll move into our first round of questions, for six minutes each, starting with Mr. Zimmer.

Mr. Bob Zimmer (Prince George—Peace River—Northern Rockies, CPC): Thank you to all our witnesses. I appreciate all of your testimony already.

I'm going to pick on Mr. Egan and Mr. Smillie with my questions today.

I will recognize Ms. Green. I appreciate your comments about our leader's environmental plan and support for renewables. Indeed, I have it in front of me. It talks about including 15% renewable natural gas in the supply chain in a way that we can make already clean natural gas even cleaner.

I'll go to my first question.

We talk about the marriage between renewable resources and our natural gas. How do we do that with our existing infrastructure without unduly affecting Canadians who need our natural gas?

The story is—you've heard it many times, Mr. Egan—that in places like my neck of the woods up here in northern B.C., gas isn't really an option we can do without. To increase costs to Canadians up here because of making it renewable is simply very difficult.

How do we do that and make it affordable for Canadians?

Mr. Timothy Egan: I think the focus on affordability is an appropriate one. It's a concern for constituents in your riding, Mr. Zimmer, and in constituencies right across the country. It's something that we focus on all the time.

As I noted, we offer the most affordable energy option to Canadians. Right now, we're meeting about 35% of energy needs, and that percentage is growing. We expect it to grow to 40% in the next 20 years. The reason it's growing is that customers, residential or commercial, are looking for an affordable energy option, and we offer that.

That said, Canadians and Canadian governments are committed to emission reduction targets. The question then is what the most cost-effective emission reduction option is that you can pursue. RNG, we think, is one of the most cost-effective emission reduction options. There's a lot of it across the country because of a very robust agricultural industry and a robust forestry sector. We're working on a variety of projects to try to bring that supply to market in the most cost-effective way possible.

In our view, it's probably the single most affordable renewable fuel option, significantly more affordable in many applications than conventional electricity, much less renewable electricity. However, it is still more expensive than natural gas.

The way to support it and the way to drive those costs down is to partner with industry where possible on new technology developments. I mentioned our natural gas innovation fund. We're investing in roughly a half-dozen RNG companies across Canada that are working on new technologies to make RNG in markets across the country, and looking to build on those kinds of investments and to expand them across the country.

● (1335)

Mr. Bob Zimmer: Thank you, Mr. Egan, for that.

What's key to it all, and you brought it up earlier in your testimony, is that instead of adding a whole bunch of new infrastructure.... We talked about electrification and how good that can be in certain sectors, but, as you said, it's very costly, and we're not there yet.

I think what you brought up that was so critical to this conversation—and customers might disagree—is that natural gas is already a delivery mechanism that's affordable—we had this discussion with Fortis last week—but amongst all the energy forms, it's fairly low in terms of delivery.

You brought up existing infrastructure. I think that's the key to making this affordable. We already have pipes in the ground that go to people's homes to feed their furnaces and whatever else is used by natural gas, and I think that's the key to it all. This doesn't need to be remade overnight. We can use our existing infrastructure for many years. Our goal is to add 50% renewables by 2030. Certainly this enables us to metre up and dial it up as we go, rather than just bringing on a whole entire new system.

I don't know who to ask, Mr. Egan, whether it's you or Mr. Smillie, but with regard to the time to spool up for renewable natural gas for, let's say, the natural gas sector as opposed to spooling up the renewables in other sectors, timeline-wise what are we looking at, if you want to do a comparison?

Mr. Timothy Egan: There are a whole bunch of renewable fuels out there. I don't pretend to have a comprehensive comparison of the timelines for each, but one of the things about renewable natural gas is that, in many applications, it's available now. We've actually been using it for a number of years in different provinces, including yours, Mr. Zimmer. As you may know.... Well, you had Fortis two weeks ago, and they talked to you about this. There is a renewable natural gas option available.

The question, therefore, is not whether there is a technological hurdle per se. The question is this: Is there market demand, and will that trigger more supply and more technological innovation that will deliver more supply?

How does that compare to other renewables? I think a key point is to look at the full value cost when you're doing that. For any other renewable option, ask yourself this: Is there an existing delivery system in place? Is that delivery system already capable of taking on the fuels? Are significant expansions required? Are backup fuels required, etc.? You need to look at that kind of comprehensive analysis in order to make the assessment you're talking about.

We haven't done that comprehensive comparison, but I will tell you that we did make an aspirational commitment as an industry to 5% RNG in our systems by 2025 and 10% by 2030. We did that a number of years ago, and that's triggered all sorts of activity by our industry across the country. Our utilities are working—as the ones who spoke to you two weeks ago indicated—within their own regulatory frameworks to make sure that as much of that product can come to market as quickly as possible.

● (1340)

The Chair: Thanks, Mr. Egan.

Thank you, Mr. Zimmer.

Mr. Bob Zimmer: Thanks.

The Chair: We will move to Mr. Weiler for six minutes.

Mr. Patrick Weiler (West Vancouver—Sunshine Coast—Sea to Sky Country, Lib.): Thank you, Mr. Chair.

I'd also like to thank all the witnesses for joining our committee today and for the fascinating discussion and introductions already.

The first question I have is for Mr. Kirby.

You mentioned that your members are supportive of looking into pathways of both green and blue hydrogen, but there is some confusion, I think, within our committee about what the hydrogen strategy actually focuses on.

In your opinion, does the hydrogen strategy focus on grey hydrogen, the higher-emitting hydrogen sources?

Mr. Mark Kirby: Grey hydrogen, just so everybody is aware of it, is hydrogen typically made from natural gas where there is nothing done to manage the CO2 that is emitted in that process. That's the way most hydrogen is produced today.

That is not what we are about in the CHFCA. We recognize that's a key tool, but what we are promoting and what we are focused on is CO2 produced without GHG emissions.

There are many ways to do that. One way is to simply capture those CO2 emissions, as is being done in Alberta, and then safely and permanently sequester them. There also is technology to avoid the production of CO2 and produce things, such as elemental carbon, that don't lead to GHG emissions. There are also, of course, ways to produce hydrogen, as was mentioned earlier, from waste materials, from waste wood products. There are also technologies to produce it from any type of clean power, and as long as the power is clean, the resulting hydrogen is produced without GHG emissions.

All of those are necessary. They all need to be scaled up significantly. In different parts of the country, it's going to make sense to use one or the other. In Quebec, with its surplus and low-cost clean power, it makes sense to use that to make hydrogen. In Alberta and in B.C., with a large amount natural gas and an ability to sequester, perhaps it makes more sense to use fossil fuels with carbon management. However, all of them achieve the same end result. They make hydrogen available and without producing GHG emissions as a result.

We feel that they all need to be encouraged. We need a lot more hydrogen to enable Canadians to decarbonize transportation, heating and industrial processing. The focus should be on how we spur investment in all these areas.

I point to the recent announcement by ATCO and Suncor that was mentioned earlier. That's a hugely significant project: 300,000 tonnes a year of hydrogen. I had some quick discussions with Fortis, and I understand that's about a third of the total natural gas demand in B.C. today. I could be corrected if I'm wrong on that, but that's the scale of that project. That amount of hydrogen being produced with private sector investment is able to deliver that range of emissions reduction, potentially being used to reduce one-third of the total GHG in B.C.

There are technical challenges, but there are no fundamental technical barriers to doing that.

Similarly, we can be looking to scale up other forms of hydrogen production in other parts of the country.

Mr. Patrick Weiler: Great. Thank you for that.

As a fellow resident of the north shore, I know we're lucky to have a hydrogen fuelling station, the one recently built in North Vancouver, of course.

You're interested in discussing further how we can encourage the private sector to build out some of the hydrogen infrastructure we need. I was hoping you could expand a bit more on that and what we can do at the federal government level to encourage that.

Mr. Mark Kirby: As I think Grace and Rob mentioned as well, there is the idea of credits. If you look at what happened to get the funding together for the stations in B.C., part of it was grants from the federal and provincial governments. However, a big part of that funding was from the sale of low-carbon fuel credits in B.C. British Columbia has a process whereby when you build a [*Inaudible—Editor*] station, you are granted credits for that in recognition of its ability to lower carbon intensity. Those credits can then be sold by the private sector builder to obligated parties, like oil companies and others, to generate the critical funding needed to build those stations.

The challenge is that you need the money up front to build them, and the load comes later. The mechanism that has been shown to work in California is capacity-based credits. You have a system whereby you are issued credits based on the capacity of the plant. Then as the load builds on it, it's replaced with the credits being generated by hydrogen sales. This enables you to get the critical economic business case together to allow private sector money to flow into that. That's a mechanism that can be used to leverage government funding and to get private sector funding in place to allow them to go forward.

● (1345)

Mr. Patrick Weiler: You also mentioned the necessity of switching home heating to net-zero fuels. How easy do you think this would be? What are the pathways to doing that, given the type of infrastructure we already have built out to residential—

Mr. Mark Kirby: I'm not an expert on—

The Chair: That will almost have to be a yes or no answer, by the way. We're running out of time.

Mr. Mark Kirby: I'm sorry?

The Chair: It will almost have to be a yes or no answer. I'll give you a moment to answer.

Mr. Mark Kirby: There are technical challenges, but they are all addressable. I think the utilities are determined to work through those.

Mr. Patrick Weiler: Thank you.

The Chair: Great, thanks.

Thanks, Mr. Weiler.

Next is Mr. Simard for six minutes.

[*Translation*]

Mr. Mario Simard (Jonquière, BQ): Thank you very much, Mr. Chair.

I have a question for Mr. Goyette and Mr. Kirby.

Mr. Goyette, you presented your project and talked about green hydrogen. Two weeks ago, people from Enerkem told me that we need to put a price on the molecule. Here is my question, and it's very simple. Perhaps Mr. Kirby and Mr. Goyette can answer it for me.

Is it more costly to produce a molecule of green hydrogen than a molecule of grey hydrogen?

Mr. Normand Goyette: Studies by Quebec's International Reference Centre for the Life Cycle of Products, Processes and Services, CIRAIG, as well as European studies released consecutively in spring 2020, show beyond any doubt that, all trends considered, globally, the cost of producing hydrogen is expected to reach $4 U.S. per kilogram by 2030. In terms of deployment, what I call transportation and distribution, we're talking about $2 U.S. per kilogram.

So the first challenge with the green hydrogen molecule as opposed to the grey one is to produce it at the lowest possible cost to allow companies to reduce their emissions. However, if companies receive grey hydrogen, it will have no impact on reducing greenhouse gas emissions. It's called “carbon capping” for major polluters. It means that, beyond a certain threshold, those companies don't need to offset their greenhouse gas emissions. So, if they continue to use grey hydrogen, they are not required to offset. On the other hand, if they use green hydrogen such as we are going to produce at H2 V Energies, they avoid the whole “carbon capping” component.

So, that affects two things. It has a direct impact on the price, if our price is below the 2030 target of $4 U.S. That is the case at H2 V Energies. The second big factor in decision-making for companies making the energy transition is that it has an impact on reducing their greenhouse gas emissions as well.

Therefore, if we can produce green hydrogen, perhaps not at the price of grey hydrogen, but at a competitive price, it means we are going to have to mass-produce it and work on distribution and transportation. However, if a company manages to produce it more cheaply, that will drive down the cost of transportation, and at that point, decision-makers will see many advantages to adopting green hydrogen.

The agreement with Germany speaks for itself. The Germans want green hydrogen because they are aware of the benefits, particularly with respect to the greenhouse gas emission thresholds, expressed in CO2 equivalent, to which industry is also subject in Europe.

I hope that explains a little about the dynamics and the difference between grey and green hydrogen.

● (1350)

Mr. Mario Simard: I don't know if Mr. Kirby wants to add anything.

[*English*]

Mr. Mark Kirby: Yes, thank you.

Definitely, without a question, the cost to produce clean hydrogen today—and I'll use the term “clean hydrogen”—is higher than the cost to produce grey hydrogen. However, that is in the control of government. That's what policies such as the price on carbon and the low-carbon fuel standard are closing, because they're starting to put a price on carbon emissions. That means clean alternatives can become economically viable. It's a necessary thing. You have to have some mechanism for putting a price on CO2 emissions to make the clean alternatives cost-competitive.

The cost of those clean alternatives is dropping rapidly, with scale in particular, and scale is really what it takes. It leads to conversations about hubs or conversations about getting projects under way to get that scale.

[*Translation*]

Mr. Mario Simard: Thank you, Mr. Kirby.

I'm concerned about what Canada's hydrogen policy will be.

Would you agree with me that green hydrogen should be given precedence if we are to develop the market?

Currently, we know that producing a molecule of green hydrogen is more expensive. If our goal is to reduce our carbon footprint, shouldn't the Canadian strategy give precedence to green hydrogen in funding projects to be developed, as opposed to grey hydrogen, for which there's already an incentive, in the price?

Mr. Kirby or Mr. Goyette can respond.

[*English*]

Mr. Mark Kirby: Again, I do not promote grey hydrogen. We're talking about clean hydrogen. Clean hydrogen includes what is sometimes referred to as blue hydrogen. We think all those are very viable. There should be competition. We're going to need all of them.

In fact, using the resources, as was mentioned by the gas industry, to build out infrastructure such as pipelines.... To use an example, a pipeline running from Alberta to the coast to supply and to export clean hydrogen produced in Alberta will also enable, all the way along, first nations communities and other communities to take advantage of their clean power resources to produce additional green hydrogen along the way and use that infrastructure to get it to market. They can't do that—they can't have the scale to get it to market—otherwise.

Taking advantage of that low-carbon, clean, fossil fuel-derived hydrogen, which can be produced very cost-effectively today, will start enabling the build-out of infrastructure and demand. Without that, you will block the ability to produce green hydrogen because there will not be markets developing for it, and there will not be infrastructure to move it to market.

In fact, I have members who make their living selling equipment for green hydrogen production, and—

The Chair: I'm going to ask you to wrap up, Mr. Kirby.

Mr. Mark Kirby: Sorry.

The Chair: If you want to finish that thought, that's fine.

[*Translation*]

Mr. Mario Simard: Thank you, Mr. Chair.

[*English*]

Mr. Mark Kirby: They also agree that we need hydrogen from all sources.

[*Translation*]

Mr. Normand Goyette: As additional information—

[*English*]

The Chair: Thank you, Mr. Simard.

Next is Mr. Cannings for six minutes.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you, Mr. Chair.

I'd like to thank all the witnesses here today. With all the riches of the questions I have to ask everyone, it's hard to know where to begin.

I will begin with Ms. Quan.

You talked about how we have the technology in Canada. Canada is clearly a world leader in hydrogen technologies of all sorts, especially fuel cells, but we have difficulty in expanding the companies that we have—we've heard from several of them today—because of the demand situation in Canada, because we are a large country with geographical challenges.

You talked about the cost of distributing hydrogen to create the hubs we need to drive up demand. I was interested to hear your comment about possibly a Crown corporation that would serve to coordinate all this activity that we need, which small companies can't take on on their own, to coordinate the formation of these hubs. Various people have talked about that.

Could you expand on what a Crown corporation like that could do? We really need rapid action here to get things done by 2030 or 2050.

● (1355)

Ms. Grace Quan: Thank you, Richard.

My idea was similar to Silicon Valley. What made it so successful? It's a very concentrated pool of talented people who have a deep understanding of the technology. It was concentrated capital and it had government support.

Right now, we have similar elements in the hydrogen supply chain, in that we have very unique technologies. Similar to my own, Monsieur Goyette has a very unique technology. The hydrogen economy, or the SMEs in it, are very, very innovative.

However, as you say, to scale, we need the concept of having someone buy and put together these projects. These hubs are a half-billion dollar project. To raise the 50% for that is incredibly difficult for one company, or a consortium of companies, to have that kind of scope and reach, attention and management skill and time. It's overwhelming.

If you want a hydrogen connection between all provinces, it's going to be expensive. People need support from the government to do this kind of deep infrastructure and grow these companies. That's why I suggested this idea of a Crown corporation, even temporarily—Petro-Canada was a temporary entity—to grow the industry, share team metrics, and grow key technologies that have to traverse that valley of death.

On their own, it's hit and miss. It's very slow, very difficult. Look at Ballard. It just celebrated a 40th anniversary and they are only now gaining traction. That's how tough it is.

Mr. Richard Cannings: Thank you.

I'd like to move to Mr. Artibise now.

From what I understand, most of your company's production is in China, and it's in China because that's where the demand is. You talked about having hubs in various urban centres. We have something going on in Edmonton right now, but we need that to go on in Vancouver, Toronto, Montreal and even smaller centres if we want to provide access for trucking, etc.

I'm just wondering if you could expand on that and, again, just how we can stimulate the growth of those hubs across Canada because they seem essential to get hydrogen where it needs to be.

Mr. Robert Artibise: Thank you so much for this opportunity.

Yes, our first two manufacturing plants we built up in China, and that's because that's where the demand pull was for our product. Our research and development and our product technology centre is in Burnaby, British Columbia, and that's because that's where the talent is. We were able to start a company and then grow from one employee to 40 in six or seven months, all with years and years of experience because, as Grace said, this is where the talent and education is.

You talked about Canada being a large country, but Canada, in my mind, is three or four cities when it comes to the urban population. You can really make a difference by not looking at Canada as this large country. You can look at it as three or four major cities and really make a difference in that local area. I'd really target 30% of the population in those four cities.

With our products that are running in Shanghai today.... Shanghai has a demand where there are no internal combustion engines in downtown Shanghai, yet it's a 24-hour city. How are those stores going to get Starbucks cups? How are they going to get coffee beans and these kinds of things? They could run this on battery vehicles, and that definitely fills a gap, but for us, our trucks are running 24-7 on the road, making deliveries to all sorts of businesses.

I hope that answers your question.

● (1400)

Mr. Richard Cannings: Yes, thank you very much.

The Chair: Thank you, Mr. Cannings.

We're moving into the five-minute round now, starting with Mr. Lloyd.

Mr. Dane Lloyd (Sturgeon River—Parkland, CPC): Thank you, Mr. Chair.

My first question is for Mr. Egan.

This might seem like an obvious question, but when I listened to a lot of witnesses over the past few weeks, it didn't seem so obvious. Do you believe that the strategy of the Canadian government should be to pursue the means of reducing the most emissions at the lowest economic cost?

Mr. Timothy Egan: The fact is that there are countless technologies. There are a variety of energy delivery pathways, and there's a risk, as I said in my remarks, of picking favourites. I think that there has to be a screen, if you will, on any government's approach to make sure that the effect is not to pick favourites because we don't know what technology is going to come to the fore.

I think that, in an effort to reduce emissions, you should put signals in place that ensure some fundamentals: one, that there's good market competition between technology options; two, that you're making sure that you're keeping things as affordable as possible for the customer; and three, that you're not doing anything that threatens the integrity and reliability of the energy system.

In that context, Mr. Lloyd, that's the screen that I would use in assessing that.

Mr. Dane Lloyd: I would take that as mostly a yes.

Do you believe that in some quarters there is an aversion to working with the fossil fuel industry to reduce emissions?

Mr. Timothy Egan: Look, it's a difficult time for the fossil fuel industry; there's no doubt about it. There's a lot of public criticism of it. I joke about the fact that I'm an oil and gas lobbyist. How do my children react to that?

The reality is, though, that we're part of an industry that is investing more in innovation than I think just about any other sector in the country is. I mentioned our own natural gas innovation fund where we're investing in a whole host of new technologies, including those where many of my fellow witnesses are active. We're working, in fact, quite closely with people like Ms. Green and Mr. Kirby on a host of these technologies.

One of the key things to remember about the oil and gas industry is that it is managing resources and infrastructure that are meeting an enormous percentage of our energy needs across the country. The best way to make that service lower emission is to work with the players who are active in it right now.

Mr. Dane Lloyd: My riding and the riding next to mine have the Alberta industrial heartland. We have companies like Suncor and ATCO. We have the Redwater Sturgeon refinery, which is in my riding. They're utilizing technology like carbon capture and they're developing hydrogen.

Would you agree that it's probably the oil and gas industry that is providing the bulk of investment in these new technologies for lowering emissions?

Mr. Timothy Egan: Well, I don't have an assessment of that. I'd certainly say we're trying to.

Mr. Dane Lloyd: Is there any other sector, other than government, that is investing as much in that?

Mr. Timothy Egan: No, not to my knowledge.

Mr. Dane Lloyd: I appreciate what you said about being technology neutral. Previously, we had some folks from the ministry here. I took them to task because in the latest federal Liberal government climate plan that was put out in the budget, there was a tax credit for carbon capture, utilization and storage. I was really disappointed. One of the largest carbon capture projects in Canada that's currently operational just achieved one megatonne of carbon dioxide sequestered. It's the Redwater Sturgeon refinery. However, because that carbon dioxide, which is collected from a fertilizer plant and a diesel refinery, is used for enhanced oil recovery, it's been excluded.

Would you say this is an example of a government that's not taking a technology-neutral approach?

Mr. Timothy Egan: Refiners aren't part of my membership and I'm not familiar with the particulars of that project. As I said, our goal is to work with a host of technologies and drive forward on efforts to reduce emissions by using those technologies.

Mr. Dane Lloyd: Do you believe that enhanced oil recovery that uses carbon and sequesters carbon currently, thus lowering emissions, should be included under this tax credit?

● (1405)

Mr. Timothy Egan: Again, we're not involved in the oil industry, Mr. Lloyd, so I shouldn't comment on that.

Mr. Dane Lloyd: Okay. What about the natural gas industry, for example? We know that when natural gas is coming out of the ground, it's being burned for hydrogen, for example. The carbon dioxide that's being sequestered can be used for enhanced oil recovery. It makes it much more profitable because you're getting oil out of it.

Do you see your members as being supportive of a tax credit for enhanced oil recovery?

Mr. Timothy Egan: Well, I see our members as being supportive of tax credits that drive efforts to reduce emissions from the use of natural gas. If the two were connected, I suspect we would support such a tax credit, but I'd need to see it.

The Chair: Thanks, Mr. Lloyd.

We're moving to Mr. May for five minutes.

Mr. Bryan May (Cambridge, Lib.): Thank you very much, Mr. Chair.

As the member of Parliament for Cambridge, it seems to me that the concept of hydrogen is on everybody's mind in my region. As I have said before, I attended a virtual town hall with Sustainable Waterloo Region not that long ago, and the hydrogen hub concept was ranked as one of the highest priorities for that organization. I have Toyota in my backyard, which is clearly taking a hydrogen approach moving forward.

I want to thank Mr. Cannings for the question he asked Ms. Quan about the idea of a hub. I want to give Mr. Kirby an opportunity to expand a bit on the idea of a hydrogen hub.

Specifically in terms of the Government of Canada's national jobs strategy, I'd love to hear your thoughts on this, Mr. Kirby. My thought is that this could create jobs not just in the Waterloo region but literally all across Canada.

Mr. Mark Kirby: We've been out talking, and we would agree that hubs will attract economic investment. That's based on what we're seeing internationally.

Hydrogen valleys are called clusters, but generally what we're talking about is two or more companies getting together and sharing a common production facility. It could be as simple as that, or right up to very large clusters, where you have multiple applications connected by a pipeline and so on.

The key thing about them is that they are going to enable low-cost hydrogen, which will attract investment for people deploying trucks, buses and so on. It will provide locations where you can do demonstrations and research, which will allow you to generate the highly skilled individuals Rob referred to. We're going to need a lot more of them. It will also allow technology companies, such as Grace's, to have locations where they can show their technology, to have customers they can rely on and to perhaps not be in mission critical mode so they can work the bugs out of these things and allow themselves to move forward.

It has been shown that starting a cluster will tend to stimulate this type of activity, and all of that leads to jobs and investments coming to the country.

Mr. Bryan May: I would ask you to elaborate a little bit more, and then I'll give Grace an opportunity to answer as well. How will the hub reduce the cost or could reduce the cost of hydrogen, as will, potentially, scaling up, which is something we think is going to have to happen for this to work across the country?

Mr. Mark Kirby: You're going to see hydrogen projects moving forward, for example, the NRCan project in Bécancour. That includes an 88 megawatt hydrogen generation system. That's great, and it's going to be that scale that is going to produce cost-effective hydrogen, but in and of itself, it's not supporting other applications and other types of growth of the hydrogen.

If you turn that into a hub, you can find ways to enable and stimulate others, such as heavy-duty filling stations, to locate in proximity to that to take advantage of that low-cost hydrogen. We have a hubs working group being kicked off, through which we're looking to get input from industry with regard to what can be done to enable companies to come together and share so they can get that scale and they can get the costs down on that hydrogen. It's going to take some additional work and discussion. We're going to have to think about what is needed, how we can encourage two companies to work together, and how we can enable that.

● (1410)

Mr. Bryan May: Thank you.

Ms. Quan, do you want to expand on that or give your thoughts on how the hub system could bring the cost down and increase scale?

Ms. Grace Quan: Bryan, you've brought up a very good point in that cost is the number one driver. We all vote with what's in our pocketbook, right? We really have to reduce the cost of hydrogen, and generation is one part. The difference between steam methane reforming and green hydrogen is probably $2. It's $12 at the pump. What is invisible and what we're not talking about is the cost of transportation, distribution and refuelling, which is between $6 and $8. We have low-pressure solid state storage technology that can cut that price in half. That's where we're going to make that difference in the price. These train companies, the large carriers, are going to be driven only by regulation or price, because if they have to pay double their fuel cost, it's going to be difficult.

The Chair: Thank you very much, Ms. Quan.

Mr. Bryan May: Thank you very much, everybody, for all that you're bringing to the table today.

The Chair: Mr. Simard, we'll go over to you now for two and a half minutes.

[*Translation*]

Mr. Mario Simard: Thank you very much, Mr. Chair.

Mr. Goyette, I believe you wanted to add something earlier, but unfortunately we ran out of time. So I'm going to give you the opportunity to do that now. But before I do, I just want to make a quick point, which Mr. Kirby can comment on after you speak.

My impression is that the Canadian hydrogen strategy is trying to decarbonize the oil and gas sector, when we have resources like hydroelectricity and biomass that are far less carbon intensive.

Do you believe we should be promoting hydrogen production from hydroelectricity and biomass, which leaves a much smaller carbon footprint?

I will now let you finish what you were going to say earlier.

Mr. Normand Goyette: As I said in my statement, we consider that the hydrogen that H2 V Energies produces from biomass uses 5.25 times less electricity than any equivalent electrolysis process.

From the outset, this allows us to make hydrogen much less expensive. We were wondering earlier, and I didn't really go into it, whether a green hydrogen molecule costs more than a grey hydrogen molecule. Strangely enough, they are getting closer in price.

If we want to produce renewable natural gas, we need to focus on exporting hydrogen and transporting it in natural gas pipelines, because currently there's a huge demand for it.

Our advantage at H2 V Energies is that we produce hydrogen from biomass, which itself produces electricity. Why do we use 5.25 times less electricity? Because biomass already produces electricity. Yes, our hydrogen costs less than the projected price of $4 U.S. by 2030, and yes, we are closer to the emerging markets.

If Canada wants to be a leader, we need to think about reducing greenhouse gases. But let me remind you that two factors play a role in reducing those gases.

First, biohydrogen production brings carbon credits. Now H2 V Energies can conduct its own carbon marketing. Second, when we reduce biomass, that also creates carbon credits.

That's how H2 V Energies manages to mass-produce hydrogen cheaper than any other process on the market. We cost less in electricity, biomass produces electricity for us, and we get more carbon credits than any other industry that produces carbon equivalents.

With this in mind, we need to promote mass production of hydrogen. The more we produce in a—

[*English*]

The Chair: Thank you, Mr. Goyette.

[*Translation*]

Mr. Normand Goyette: I mentioned Rotterdam earlier—

[*English*]

The Chair: Thanks. I'm going to have to stop you there.

Thanks, Mr. Simard.

[*Translation*]

Mr. Mario Simard: Thank you.

[*English*]

The Chair: Mr. Cannings, it's over to you for two and a half minutes.

Mr. Richard Cannings: Thank you.

Monsieur Goyette brought up the subject of exports. I was at a G20 energy meeting a couple of years ago. The German minister there mentioned that one of their main strategies around this grand transition to a low-carbon future was to invest in renewable energy projects around the world and then transport that energy in the form of hydrogen. They mentioned projects in Chile, etc. The Japanese minister also mentioned this possibility.

I'd like to ask you, Mr. Kirby, for an overall answer about the place that export might have in a Canadian hydrogen industry. How can we take advantage of some of the obvious renewable energy sources we have, such as the hydro sources in B.C., Quebec, Manitoba, etc., and maybe play into that? I think Monsieur Goyette mentioned Germany specifically.

● (1415)

Mr. Mark Kirby: To Germany I would add Japan and Korea, which are also very significant markets. We're well positioned to service them from B.C., as we're well positioned to serve the European market out of Quebec and the Atlantic provinces. It's an enormous opportunity.

We are already exporting. We're exporting hydrogen, as we are clean chemicals. We're using our clean hydrogen to produce such things as methanol and exporting that, and ammonia. We also have two major clean liquid hydrogen plants in Quebec that are exporting hydrogen down to the U.S. as we speak. It is certainly a very large opportunity. We need to be tackling it as a nation, developing the brand for Canada, and showing that we are in the market seriously.

We can look at what Australia has done. Australia has no further advantage than Canada in terms of production capability of clean hydrogen. They've positioned themselves globally as being the preferred destination. They have come out and said, “We're your supplier. We're willing to do what it takes to get you the clean hydrogen that you're going to need.” I think Canada needs to take a page from that book. They need to be responsive to their customers. If customers want hydrogen derived from renewable power, we need to make that and to make that available. We're well positioned to do that. If they are looking for the lowest-cost clean hydrogen, we can do that with our fossil fuel hydrogen.

I think we are well positioned to do it, but we really need to start working together, not targeting one type of hydrogen or another but targeting clean hydrogen and reacting to what our customers want. I think we can do that. Now, I would—

The Chair: Thank you, Mr. Kirby. I'm going to have to stop you there.

Thanks, Mr. Cannings.

We will now go to Mr. Patzer for five minutes.

Mr. Jeremy Patzer (Cypress Hills—Grasslands, CPC): Thank you very much, Mr. Chair.

I'm going to begin with Ms. Green.

You mentioned in your opening remarks that you work with a lot of different farmers, municipalities and organizations. I serve a large rural riding in Saskatchewan, and I'm curious to know, with an organization like yours, what benefits you bring to the farmers of a riding like mine.

Ms. Jennifer Green: Between the agriculture and municipal sectors, as I mentioned, I think there are a lot of untapped resources that can be used to be able to create biogas and renewable natural gas. Our association helps to lend some education, to inform and to connect people with those valuable questions with a very talented group of experts within our membership, so it's being able to provide resources to those farmers.

Recently, the Canadian Biogas Association launched our farming biogas initiative on farmingbiogas.ca. Within that, there are resources, like checklists, frequently asked questions, different assessment tools, that farmers can use to understand how these kinds of systems can work with their existing farm operations to be able to diversify and to provide value-added resources to the sector.

Mr. Jeremy Patzer: Specifically, do you work more with cattle operations or grain operations, or both? If you're working with grain operations, is there a specific crop that is more beneficial than others?

Ms. Jennifer Green: There is no specific demarcation on commodity. Farmers writ large, whether they are within dairy, pork, poultry, beef or the cash crop area, all of those agriculture resources as well as crop residues can be utilized as feedstocks for biogas and RNG derivations.

● (1420)

Mr. Jeremy Patzer: One of the emerging problems in rural Canada, in particular in my riding, is that a lot of these towns were built at the same time. The infrastructure for either waste water or for their landfills is becoming outdated and they need to be replaced, but the cost is extremely prohibitive.

Is there any potential for an organization like yours, for what you guys are doing, to partner with these towns, with the municipalities, to help get these new facilities put in place? Would it be incorporated hand in hand with an organization like yours to capture and make biofuel?

Ms. Jennifer Green: I definitely think that you're bang on in terms of recognizing dated infrastructure. Many municipalities, for example, are investigating what their options look like in terms of how they need to upgrade and improve, recognizing all of the pressure points on environmental energy policies and trends.

We can definitely provide support in terms of, as I said, creating those networks, which are essential, and being able to expand on that information and education. We're definitely open to seeing how we can continue to advance the conversations.

Mr. Jeremy Patzer: One thing we've been hearing so far in this study, too, is that there's a push towards more canola utilization for biofuels going forward.

There was an article written recently in the Western Producer saying that 4.6 million tonnes of canola is going to be needed to meet the crushing demand of these three plants that are going to be put in place in Saskatchewan. However, the issue is we're hearing that acres are maxed out, and when you look at the trends, the bushels per acre are actually going down.

I'm wondering where you see the issue there. Are there any potential problems with trying to boost canola production at the risk of either losing other cash crops that are being grown or having to convert other types of land to be used for canola for this sake?

Ms. Jennifer Green: That's a great question.

I would say there's one distinction there, in that many of the biogas and RNG resources that are created are actually founded from waste materials as opposed to purpose-grown derived materials. When we're looking at the biogas and RNG resource, it's generally coming from agricultural livestock or residues, as well as municipal green bin materials and that type of thing.

In the liquid biofuels, that's a very different stream and a different process, but when we're looking at the gaseous side, looking at the opportunity to derive that from waste materials is where we've currently set our focus.

The Chair: Thanks, Mr. Patzer.

Mr. Jeremy Patzer: Thank you.

The Chair: We'll move to Mr. Serré for five minutes.

Mr. Marc Serré (Nickel Belt, Lib.): Thank you, Mr. Chair.

Thank you to all the witnesses. We need more time. There's a lot of good expertise here.

Mr. Cannings talked about the hubs and growing that. Mr. Cannings will remember in the last Parliament that we talked about hubs and clusters in the mining industry. We have four regional hubs in Canada: B.C., Saskatchewan, northern Ontario and Quebec.

Mr. May asked Ms. Quan and Mr. Kirby a question.

The issue of hubs is really finding ways to reduce that cost of hydrogen and having companies working together on a scale here.

I'm going to ask Robert Artibise and Norm Goyette questions.

Norm, you mentioned the clusters, the gap, the regional circular economy. What can the government do to expand and support this?

Monsieur Artibise, you talked about building one hydrogen facility to support North America. How does that fit into a hub and cluster strategy?

We'll have Mr. Goyette and then Mr. Artibise.

[*Translation*]

Mr. Normand Goyette: In terms of the regional circular economy, we know that all Canadian provinces have tons of biomass with which to produce hydrogen.

We will inject $70 million into Quebec's circular economy and eliminate 960,000 tons of greenhouse gases each year. If we increased the number of plants producing hydrogen from biomass by a factor of 10, we would reduce greenhouse gas emissions for all of Canada.

● (1425)

[*English*]

Mr. Marc Serré: Mr. Artibise.

Mr. Robert Artibise: I think I'll start with my personal example.

We set up our company in Burnaby, British Columbia, because that's where the talent is. We generate our own hydrogen on site from electricity from B.C. Hydro. It is an enormous cost to make our own boutique hydrogen. Real estate is not cheap in my city. It has to be indoors. We're not allowed to make our hydrogen outdoors for regulation purposes, things like this. I think there's something like 30 fuel cell companies in Burnaby. They would love a security of supply of cheap, renewable green or clean hydrogen. It would bring their costs down, which would then drive more and more sector usage with filling stations. Where are they getting their hydrogen from? How do they guarantee that they can have hydrogen at the pump when a customer shows up?

These hubs spawn these kinds of other investments from the private sector, and then the dollars from those private sectors are going to services that are actually going to customers, instead of like my own case, where we're investing in our generation. It's such a small scale.

Mr. Marc Serré: Thank you.

[*Translation*]

Mr. Goyette, my colleague Mr. Simard often talks about grey hydrogen.

If I understand correctly, the Canadian hydrogen strategy that we introduced in December 2020 doesn't talk about grey hydrogen. It focuses on hydrogen.

I'd like to hear your thoughts on our strategy. What do you like about the strategy? What could the government do to enrich this strategy that we launched in December 2020?

Mr. Normand Goyette: I believe that green hydrogen and blue hydrogen are complementary. Importing countries have needs, and Europe and California have announced theirs.

Let's talk about transporting hydrogen to those importing countries. It takes 46 days to get from Saudi Arabia to the port of Rotterdam by ship. That's 46 days there and back, plus the time to unload.

We were talking earlier about Canadian leadership.

If you go from Eastern Canada or British Columbia to Asia, the trip takes about 21 days, with nine days there, nine days back and three days to unload.

The cost of transporting hydrogen is said to be higher. Obviously, if we reduce the transportation time required for exports, this will allow Canada to make gains. To do that, we need to put infrastructure in place.

There are systems, such as the LOHC solution, which is also available in Asia with the Chiyoda Corporation. These systems use toluene-based solutions. We know we can't transport large quantities of hydrogen if we don't have an alternative.

[*English*]

The Chair: Thank you.

[*Translation*]

Mr. Normand Goyette: Mass transportation of hydrogen will reduce costs and put us in a strategic export position.

[*English*]

The Chair: Thank you, Mr. Goyette.

Thank you, Mr. Serré.

[*Translation*]

Mr. Marc Serré: Thank you.

[*English*]

The Chair: We're going to move into our last round, and we'll have time for one person from each party.

We'll start with Mr. McLean for five minutes.

Mr. Greg McLean (Calgary Centre, CPC): Thank you, Mr. Chair.

Thank you, everybody, for being here today.

My first question goes to Mr. Egan of the Canadian Gas Association.

Mr. Egan, we had some of your members here. They talked about the incremental electricity that would be required in two provinces, Ontario and Quebec, if we switched from carbon-based natural gas towards electricity. They were very explicit in saying that it was 15,000 megawatts in Quebec and 90,000 megawatts in Ontario, so one Grande Baleine hydroelectricity project in Quebec and six in Ontario. Do you have the numbers for us for the rest of the country if we switch from natural gas to electricity?

● (1430)

Mr. Timothy Egan: I don't have them at my fingertips, but we can pull those numbers for you, yes.

Mr. Greg McLean: What percentage of natural gas is consumed in Ontario and Quebec versus the rest of the country?

Mr. Timothy Egan: What percentage of the national consumption? Again, I'm afraid I don't have those numbers at my fingertips. As I've mentioned, globally across the country, about 35% of the energy consumed is natural gas.

Mr. Greg McLean: Okay, let's move on then.

As far as power to heat a home is concerned, can you give us a relative power input from natural gas power versus electricity power?

Mr. Timothy Egan: Well, in the home heating market, we have roughly two-thirds of the market in the country with natural gas heating.

Mr. Greg McLean: As far as megawatts to heat a home via natural gas versus electricity is concerned, are you familiar with that number?

Mr. Timothy Egan: I can certainly get that for you.

Mr. Greg McLean: Okay, thank you.

I'm going to push you a little more, Mr. Egan, because you are part of a carbon-intensive industry, being natural gas, although it's less carbon intensive than oil. Does the issue with enhanced oil recovery benefit the gas industry in relation to the United States, which has an enhanced oil recovery regime that we seem to be ignoring going forward in Canada?

Mr. Timothy Egan: Does it benefit us? As I said in my previous response to Mr. Lloyd, we have to assess on a case-by-case basis. If there's natural gas involved in the exercise, then it could very much be beneficial. At the end of the day, if the goal is to reduce emissions and if using CO2 produced from natural gas in enhanced oil recovery can help reduce emissions, then federal support for that is something we would welcome.

Mr. Greg McLean: Okay, thank you.

I'll turn now to Ms. Green.

Ms. Green, thank you very much for all you've given us here today. I'm really interested in your numbers, the 196 megawatts of untapped clean electricity that you'd be able to provide. That's carbon right now that you would say if we captured it.... It's currently going into the atmosphere from decaying material. If we captured it with your projects, we'd be able to get it clean into the grid. Is that correct?

Ms. Jennifer Green: Yes, and I'll just clarify that's 196 megawatts of capacity that's already deployed and actually installed today. Therefore, that's making up part of those 279 projects that are already installed in Canada, and those projects are actively working, yes.

Mr. Greg McLean: Okay.

We asked one of the witnesses at another meeting, Cynthia Hansen at Enbridge, about the cost of acquiring renewable gas, if you will, collecting it and everything else. She said in an active landfill, obviously, it's a cost.

Can you tell us what your costs are to turn that renewable natural gas into a form that can be collected and moved into productive use at the end of the day? What is that cost per gigajoule?

Ms. Jennifer Green: Certainly, and I'm going to answer it in a roundabout way and say that the types of projects that can actually produce RNG are very vast in type and size, so as you can imagine, that price would vary as well. For example, if you're looking at a large landfill, your price can significantly vary and be much less than if you're looking at an agricultural facility that's much smaller in size.

As Mr. Egan noted, there's a variance between the conventional price versus the renewable price of natural gas. Again, we can see anything varying from $10 to $40 per gigajoule. A lot of those numbers are very much indicative of programs that are currently active today in B.C. and Quebec in terms of their purchasing of RNG, so there's a correlation there.

I hope that answers your question.

Mr. Greg McLean: Thank you. That's $10 to $40 per gigajoule, whereas natural gas is $2 or $3.

The Chair: We're out of time. Thank you.

We'll go to Mr. Lefebvre for five minutes.

Mr. Paul Lefebvre (Sudbury, Lib.): Thank you, Mr. Chair.

It's a very fascinating discussion. The difference between the witnesses we have is really interesting. We have the hydrogen side and then we have the renewable natural gas side.

I want to play a bit of the devil's advocate here. I'll ask Mr. Kirby and Mr. Egan and then I'll smile for my comment.

I'll ask the real tough question. Where do we go from here? We're hearing from hydrogen that they want to get to net zero by 2050 and that's the only way. We hear from the renewable fuels and certainly biofuels that they are a solution, that we need to continue down this road and it's an advantage for Canada that we have it.

Canada is an energy superpower. We are. I've heard from many around the world. They're looking at us as we develop this technology. We heard from Ms. Quan as to what's going on on the SME side.

Again, the panel we have here is really interesting when we're looking at the future and, as a government, asking what the benefits are. We need to reduce greenhouse gas emissions, as we heard from our colleagues, but what are the costs of doing this? How is this going to affect everyday Canadians at the same time?

Mr. Kirby, I'd like to hear from you. I'll ask you the tough question. What is the role of renewable natural gas? What is the role of hydrogen as we move to 2030 targets and as we move to 2050 targets?

Mr. Egan, I will ask you the same question.

● (1435)

Mr. Mark Kirby: I will phrase it by saying that 75% of our energy today is derived from fossil fuels without any carbon management. It is a huge challenge to start moving that to clean alternatives. We need them all. We need renewable natural gas. We need hydrogen. We need clean power. If you look at the studies that say how much it is going to take of each of those, there are going to be debates about whether it's going to be this much for that one or that much for that one. We're going to need them all. You don't get to pick. Sorry. We need to get them all in place and we need to find support mechanisms that allow us to build out all of these clean fuel alternatives if we have a hope of getting ourselves to our targets for 2030 and for 2050.

I'm not going to say that you need renewable natural gas or hydrogen. You need them both. You need clean power. You need batteries. You need fuel cells. I would say the challenge for us is that we do need to be able to find ways to move them all forward. Yes, they should be technology neutral. Yes, they should support each other. On the other hand, we need to make sure they are all advanced, so there needs to be some targeted research on renewable natural gas. There needs to be some targeted research on hydrogen if we're going to have a hope of getting to where we all want to get to.

Mr. Paul Lefebvre: Awesome. Thank you.

That's kind of the comment we keep hearing at this committee on this study. It's to not pick a winner, but let the markets play a role as we advance with the technology and support all technologies. Again, Canada is a world leader in this.

Mr. Egan, I'd like to hear your comments on my question. I saw you chuckle, when I asked my question.

Mr. Timothy Egan: I thought it was going to be easier for me to answer the question than for Mr. Kirby because he's in the hydrogen industry, but he made the point that I would make. In some instances you're going to use RNG and in some instances you're going to use hydrogen.

I'd also note, further to some of the earlier questions I had, in some instances you're going to push carbon capture technologies.

The fact is that we have three energy delivery systems. We have a liquid energy delivery system, a gaseous energy delivery system and an electron energy delivery system. There are three big ones. We want to find technologies on each that will deliver on the targets you've set. Put in place the conditions that allow markets to compete and different technologies to come to the fore. Let's all be surprised by what we find out.

If you pick a winner, I don't think it's going to be a winner at the end of the day.

Mr. Paul Lefebvre: Exactly.

[*Translation*]

Mr. Goyette, I would really like to hear your comments on the question I asked the previous witness.

Mr. Normand Goyette: As was previously stated, we are in an energy transition. Just because we produce more or less doesn't mean that the transition is going to happen by waving a magic wand. We are in a global energy transition. Canada is in an excellent position to make that transition.

I think investments have to be made across the board. We are not going to get there if we don't put in all the effort that's needed. Infrastructure is one of the key elements and there are others, like the workforce and everything that was said earlier.

Of course, I feel that even if you mass-produce in one part of Canada right now, you're not offsetting fossil fuels. That's going to happen over a long period of time. So we are complementary.

Mr. Paul Lefebvre: Excellent.

[*English*]

Mr. Chair—

The Chair: Thank you, Mr. Lefebvre.

Mr. Paul Lefebvre: That's what I thought.

● (1440)

The Chair: You're right on time. I appreciate it.

Next is Mr. Simard for two and a half minutes, and then we'll finish with Mr. Cannings.

[*Translation*]

Mr. Mario Simard: Thank you very much, Mr. Chair.

Earlier, Ms. Green told us that Canada was only tapping into 13% of available resources to produce biogas, which is a very low percentage.

Ms. Green, you also said that if we increased our volume fivefold from today forward, we could create 20,000 more jobs.

About two weeks ago, we had a discussion with Frédéric Verlez, senior vice-president at Evolugen. He told us that renewable natural gas was missing from the clean fuel standard. Would adding natural gas to the clean fuel standard be a good solution to bring up that low percentage of 13%?

My question is for Ms. Green.

[*English*]

Ms. Jennifer Green: You're quite right that the clean fuel standard regulation took a shift away from a dedicated target specifically for decarbonizing gaseous fuels. That being said, there are still mechanisms within the clean fuel standard that allow biogas and renewable natural gas to play a role, by producing low-carbon fuels and by providing fuels for the switching of other fuels, such as diesel or CNG to RNG.

There are mechanisms remaining within the clean fuel regulation, although they're dampened considering what the signal would have been had there been a designated target and obligation for the gaseous stream itself. That's why in my remarks I mentioned where there has been significant uptake. Where we're seeing the greatest advancement for RNG is in the provinces that have specifically provided targets, such as B.C. and Quebec.

[*Translation*]

Mr. Mario Simard: You and Mr. Egan talked about the legislative and regulatory framework being critical. From a regulatory perspective, what do you feel could be done in the near term to encourage the use of renewable natural gas?

Mr. Egan can add something if he wishes.

[*English*]

The Chair: You have time for one very brief answer.

Ms. Jennifer Green: Measures with the clean fuel fund are going to be significant. From a regulatory perspective, I think we'll be looking at the provincial domain and, in a federal context, looking at how we can target mandate opportunities for RNG across the country.

The Chair: Thank you, Ms. Green and Mr. Simard.

Mr. Cannings, we'll go over to you to finish the questions for today.

Mr. Richard Cannings: Thank you.

I'm going to go back to Ms. Quan.

Ms. Quan, you mentioned that the 50% matching requirement for some funding is “very dilutive” and noted the impact that has on small growing companies that are forced to come up with it. This is not just about the difficulty in finding those investments, but about what it does to these small companies in a Canadian context.

I'm wondering if you could expand on that, because there was a pretty quick drive-by there.

Ms. Grace Quan: Thank you, Mr. Cannings, for giving me the last word.

From my perspective as a female CEO, a visible minority and one of the few CEOs in hydrogen and clean tech, I would say that raising money is our number one challenge. When investors know you're getting matching grant contributions, it encourages predatory behaviour. I've seen that myself. I had to refuse funding. I also see that with my colleague companies that have been bought out.

Greenlight Innovation does test equipment for hydrogen and is a leader in the world, but it's no longer Canadian. You see that with many of the hydrogen companies that are leaders. They're slowly being eased out. Also, where is the headquarters going to be? It will be wherever the investor is.

Yes, we can support our Canadian hydrogen people, but if we want to keep them in Canada, we have to rethink our grants and contributions programming. Otherwise, it will continue to slide into erosion and brain drain, which is what you're seeing.

● (1445)

Mr. Richard Cannings: Thanks.

I'll leave it there, Mr. Chair.

The Chair: Perfect. Thank you, Mr. Cannings.

Thank you to all the committee members.

Thank you especially to all of our witnesses. We're very grateful that you took the time to join us today and to share so much valuable information. I think everybody pointed out that we don't have enough time but we do very much appreciate it, and let me just reiterate that. Thank you. We appreciate your being here.

You can now go and start the weekend a bit early—earlier, depending on where you are. For those of you in B.C., you can start it really early. Enjoy.

To the members, thanks. That was really efficient. We started the meeting early and we stayed on time—I think it might be the first time ever that I can say this—with all the witnesses and almost all the questions. I appreciate it.

We have some quick committee business before we wrap up. I hope it will be quick. I shouldn't have said that; I probably jinxed myself.

I'll turn the floor over to Mr. Serré.

[*Translation*]

Mr. Marc Serré: Thank you, Mr. Chair.

[*English*]

Members, I think you have all received the motion of May 12 to look at the supplementary estimates and the main estimates and to have the minister here.

I think our next meeting, Mr. Chair, is Friday, May 28, because of the constituency week and the long weekend. Our next meeting will be with the minister.

I wasn't part of the last time we invited the minister to the estimates, but I know there were some issues. I'm trying to see whether we could come up with a compromise here and save some time. Obviously, the minister has agreed. He has made himself available to the committee numerous times. I think he's made himself available to the three critics on numerous occasions.

The compromise I'm suggesting right now would be to save a bit of time. Normally, the minister comes for one hour. As a compromise, if we could combine the supplementary estimates (A) and main estimates together on May 28, would it be the will of the honourable members of the committee to have him in for an hour and a half?

In the spirit of co-operation, I'm just throwing that out to my colleagues to see if it's a possibility. We could focus with the minister for an hour and a half and have the officials for the last 30 minutes on May 28. I'm just throwing it on the floor to get some feedback from everyone to see if that's an acceptable compromise.

Thank you.

The Chair: Thanks, Mr. Serré.

Please raise your hand if you wish to speak. I see that Mr. McLean has his hand up.

I might first add a qualifier. To my understanding, the supplementary estimates have not yet been tabled in the House. This proposal becomes moot if they don't get tabled the week after next when we return. As Mr. Serré pointed out, next week is a constituency week, and the Monday that we'd be coming back is a holiday. Our first meeting is actually two weeks from today, and that's when the minister is scheduled to come. So unless they get tabled on Tuesday, Wednesday or Thursday of that week, this discussion is sort of moot.

Mr. McLean, you're first.

Mr. Greg McLean: Yes, it's an excellent compromise. I thank the parliamentary secretary for making such a compromise. We don't get enough time with the minister. With his busy schedule, I think having two hours with him at one meeting would be very productive for all of us. I thank the parliamentary secretary for making the minister available for us at that point.

Mr. Chair, can you make sure that it is a full two hours and that we're not stymied by any motions in the committee? If we can just carve out the entire two hours for the minister, that would be really appreciated.

The Chair: I understood Mr. Serré to suggest that the minister would come for an hour and a half and that the officials would be here for the full two hours.

Mr. Greg McLean: I'm sorry. I thought we were looking at two hours as opposed to an hour and a half.

Mr. Serré, why is it an hour and a half?

Mr. Marc Serré: Thanks, Mr. McLean. Essentially, this was to try to see if we could compromise. Normally, it makes it harder for his schedule to have two hours. I think he's made himself available to the committee, and normally he comes for the one hour. Because of the end of the study here in June and everything else, the compromise being suggested is to have an hour and a half with the minister and to have the officials here for the two hours.

That's kind of the compromise, Mr. McLean.

● (1450)

The Chair: Okay. Thanks, Mr. Serré.

We have Mr. Cannings, and then Mr. Simard.

Mr. Richard Cannings: I think it's a good idea to have the minister here for that one day. We have a lot of other things that we're doing. Normally, the minister would come for one hour, but if we have two large...with the supps and the main estimates.... We'll move the whole thing ahead, and I would be willing to have that compromise of an hour and a half. Like Mr. McLean, I would much prefer him before us for the full two hours, but I'm not going to die on that hill, as they say.

The Chair: Thanks, Mr. Cannings.

Mr. Simard.

[*Translation*]

Mr. Mario Simard: I fully agree with Mr. Serré's compromise.

I would propose a compromise within the compromise. As Mr. Cannings and Mr. McLean said, I feel that having a two-hour meeting would address everyone's concerns and it would save the Minister from having to testify twice. That may be the best thing to do and I am pointing it out in passing.

[*English*]

The Chair: All right. Thanks, Mr. Simard.

I think where we are is that right now the minister is scheduled to appear two weeks from today, on the 28th. What always happens is that the minister comes for the first hour and the officials stay for the full two hours. The proposal here is that in anticipation of the supps coming out, rather than starting a new process over and losing another meeting—keep in mind we're going to be running out of weeks when we get back—that we combine the two, and that the minister come for an hour and a half in one meeting rather than two separate meetings for one hour. It sounds like Mr. Cannings is agreeable to that compromise. It sounds like Mr. Simard is as well.

Greg, I appreciate you'd rather have him here for the full two hours, but it becomes a big scheduling challenge for him at that point. The question is whether or not you can see your way to agreeing to the hour and a half, and we can move on.

Dane, go ahead.

Mr. Dane Lloyd: Mr. Chair, what do we do with the remaining half an hour? Are we going to be able to talk to officials?

The Chair: Yes.

Mr. McLean.

Mr. Greg McLean: Yes, I will accept the compromise. My colleagues and I will accept the compromise of an hour and a half. Thank you.

The Chair: Okay. I think we're done. We're all in agreement here. The minister will be coming two weeks from today, on Friday, the 28th.

All right. There are a couple of other housekeeping matters.

On Tuesday, May 25, the clerk is going to distribute the draft report on the study on critical minerals. Everybody could look at it. If you have any revisions, it would be great if you could suggest them by Monday, May 31, which gives everybody almost a week to do it. That would allow for translation services to deal with the submissions and then they could be distributed. Then when we go to review the report it would make things much smoother. Other than that, I think that takes care of all of our business.

I just want to say thank you. We've had several long but very productive weeks, and I know I, and I feel everybody else, is looking forward to a constituency week next week. I hope everybody enjoys it. Get some work done and some downtime. I look forward to getting back at it in 10 days' time. Thank you, everybody. We'll see you then.

The meeting is adjourned.