HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

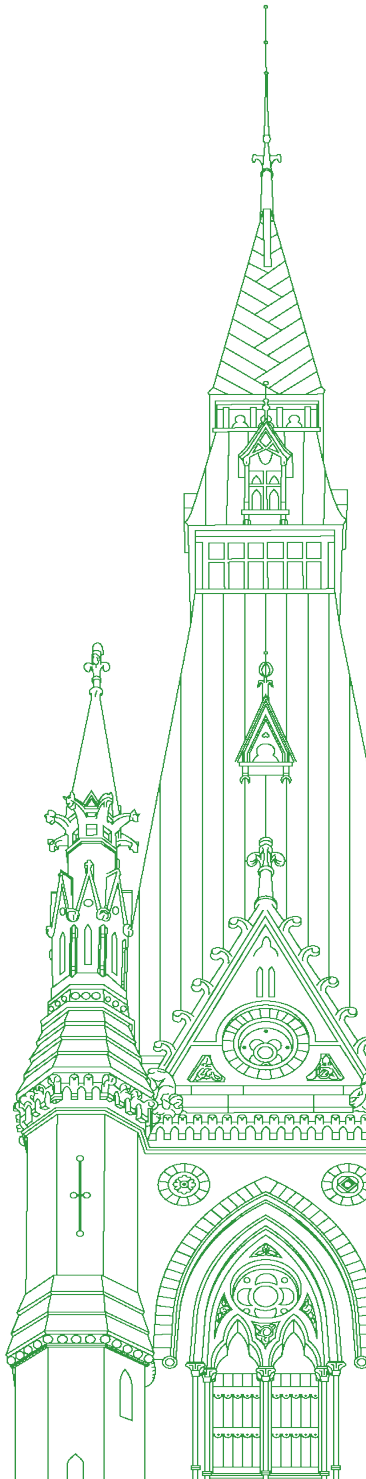
44th PARLIAMENT, 1st SESSION

Standing Committee on Environment and Sustainable Development

EVIDENCE

NUMBER 026

Tuesday, September 20, 2022



Chair: Mr. Francis Scarpaleggia

Standing Committee on Environment and Sustainable Development

Tuesday, September 20, 2022

● (1530)

[*Translation*]

The Chair (Mr. Francis Scarpaleggia (Lac-Saint-Louis, Lib.)): Good afternoon, everyone.

I am pleased to see you all after the long summer break.

Today, Ms. Pauzé will be replaced by Ms. Vignola, who has been with us before. Unless I'm mistaken, Ms. Pauzé is in New York for a North American climate summit, which the minister is also attending.

We are continuing our study of clean technology, which we were able to start after the summer break. This is our second meeting with witnesses on the subject.

Today's meeting is taking place once again in hybrid format. I remind everyone I see on the screen that they must put their microphones on mute when they do not have the floor. Of course, they may speak in either official language.

Aside from that, I believe everyone knows the health measures to follow when attending meetings in person.

[*English*]

In this first hour of our second meeting on the Conservative clean tech study, we have, as an individual, Dr. Michael Ross, who is the industrial research chair in northern energy innovation at Yukon University.

[*Translation*]

We also have with us Mr. Vincent Moreau, executive vice president of Écotech Québec, participating by videoconference, and Ms. Jeanette Jackson, chief executive officer of the Foresight Cleantech Accelerator Centre, participating in person.

Witnesses will each have three minutes for their opening remarks. We will then move on to questions and answers. I will follow the order I have before me.

[*English*]

Dr. Ross, the floor is yours for three minutes.

Dr. Michael Ross (Industrial Research Chair in Northern Energy Innovation, Yukon University, As an Individual): Thank you very much.

My name is Michael Ross. I lead a research program at Yukon University that's directed by the electric power utilities in the territories. What that means is that I look at and investigate renewable technologies and all technologies to meet our industries' needs, but in a lot of ways what I've been focusing on is the integration of renewables into remote communities across the north, focused on indigenous communities and their renewable energy projects.

Ultimately, what I have found with regard to the integration of renewable energy technologies is that it's never siloed. You have to consider many different aspects. I like to use the STEEP framework to identify the considerations of integrating renewables into remote communities. It's the STEEP framework where we look at the social, technical, economic, environmental and policy aspects of integrating renewables.

With regard to the social aspect, that's what government is for: to look at the best interests of people. The integration of renewables can leave a lasting legacy in the sustainability of these remote communities if it is established properly.

On the technical aspect, that's my bread and butter. I'm an electrical engineer. It's utilities' prime mandate to provide safe and reliable power to their customers. When power systems are four nines reliable—99.99% reliable—everybody just always assumes that you can throw anything at them and they will always work, whereas that's not always the case. Especially when power in has to equal power out at all times, when you integrate intermittent resources like solar and wind, where you can't tell the sun to—

The Chair: Excuse me, Dr. Ross. We're having trouble with the interpretation, I think.

Mr. Dan Mazier (Dauphin—Swan River—Neepawa, CPC): It's all going to the room. There's nothing, or very little, going to her mike. It's like the volume has switched.

● (1535)

[*Translation*]

Mrs. Julie Vignola (Beauport—Limoilou, BQ): The interpreter is having difficulty hearing the witness.

The Chair: If I understand correctly, it's because he is speaking a little fast, and not because there are technical difficulties on our side.

[*English*]

Dr. Ross, does your headset have an arm? Could you bring it down a bit and maybe speak a little more slowly? That will allow the interpreters to do their fine work, and we'll see how it goes.

Go ahead, please.

Dr. Michael Ross: If we can't tell the sun to shine or the wind to blow, it's hard for the utility to provide safe and reliable power to the customers when they don't have as much ability to control it. If we reduce our reliance on diesel fuel, which is a proven technology that can be dispatched and that is easy to control, we just have to supplement that with additional resources and capabilities to provide those ancillary services for a safe integration.

There's also the economic aspect of it, which impacts the business case and how much ratepayers pay for their electricity. On the environmental aspect, I'm of the opinion that you can't extract energy from an ecosystem without affecting that ecosystem. It's just a matter of different resources having different impacts on the environment.

Then finally—

The Chair: Excuse me, Dr. Ross. I apologize for these technical difficulties.

[*Translation*]

I'm told that we can't hear you.

Mrs. Julie Vignola: The interpreter said that the sound was too bad for her to be able to work and turned her microphone off.

The Chair: Is the witness using a headset provided by the House?

The Clerk of the Committee (Mr. Alexandre Longpré): No, we didn't have time to send him one.

[*English*]

The Chair: Okay.

Unfortunately, your headset doesn't meet the particular standard here, which means that the interpreter cannot interpret. I don't know if you have another headset available.

Dr. Michael Ross: Can you hear me now?

The Chair: Can we do a little test? Just talk about the weather.

Dr. Michael Ross: The weather up here is getting cold.

The Chair: Is that good? I'm sorry, but it's not working properly.

I think what we'll do, since there doesn't seem to be a way to salvage this at this point, is to go now to Mr. Moreau for three minutes, and hopefully his headset will work properly.

[*Translation*]

Before starting, Mr. Moreau, to check your microphone, could you tell us about the weather where you are?

Mr. Vincent Moreau (Executive Vice-President, Écotech Québec): It's cool, it's getting chilly and it's humid. We hope that it will warm up a little. It looks like fall has already started.

The Chair: You are correct.

Is the sound good for the interpreters, now?

It would seem so.

Thank you for the weather update, Mr. Moreau. You have the floor for three minutes.

Mr. Vincent Moreau: Thank you, Mr. Chair.

Thank you very much to the committee members for having us here today to talk about the Clean Technology Data Strategy. My name is Vincent Moreau and I've been Écotech Québec's executive vice president for three years now. Écotech Québec is an industrial cluster that supports Quebec's clean tech ecosystem. We're talking about investors, innovators and companies that want to adopt clean technologies. We're also talking about accelerators and incubators. In short, we drive and support this ecosystem to facilitate and accelerate the deployment of solutions that will protect the environment and contribute to the fight against climate change.

The second thing we do is influence public policy along these lines. We believe very strongly in the power and the means offered by clean technologies to initiate the green transition, which businesses need to make. Think of large companies or industries that will ask their small suppliers to adapt to criteria or standards, such as sustainable finance, or even environmental targets. The fact that we are starting a green transition, which is necessary to address climate change in Canada, will have an impact on the entire supply chain.

We have three recommendations to that effect.

First, support small and medium-sized innovative companies to bolster their position and enable them to continue their research and deployment activities. This can be done in a number of ways, including enhanced programs or through eco-fiscal measures or tax credits. I can talk more about this during the question and answer period.

Second, we need to enhance programs currently in place. Make it faster and easier for businesses to access them, and accelerate their deployment activities. We want to get as many projects up and running as possible. So, we need to ensure quick access to existing programs, while enhancing and aligning them.

Third, we must encourage industrial companies that have taken steps, that want to pick up the pace and embark on the transition adventure, which must happen. We must also use other measures to encourage companies that benefit from these programs. Require them to have targets and standards, or to show they are adopting clean technologies that will have an impact on fighting climate change and on protecting the environment. This can be done in many ways. I can give you several examples of recommendations. One is accelerated depreciation. We can also allow companies to protect their intellectual property, offer them tax credits, for example for research and development, enhance programs—

● (1540)

The Chair: Thank you.

I'm sorry, but we've just gone over the three minutes. We will, however, have the opportunity to delve deeper during the question period.

[*English*]

Ms. Jackson, it's your turn for three minutes.

Ms. Laurel Collins (Victoria, NDP): Mr. Chair, I have a point of order.

With respect to Dr. Ross's time, are we going to try to get the sound working for him, or will he not be able to answer questions in this session?

The Chair: I'll go to Ms. Jackson right now, but after Ms. Jackson, we'll give it one more shot. Maybe we can ask him some questions with the hope that we can receive a written response. Just because Dr. Ross cannot at the moment interact verbally, that doesn't mean we can't ask him to provide some insights and information in writing.

We'll go to Ms. Jackson, and then we'll see if we can get Dr. Ross back online.

Ms. Jackson, go ahead.

Ms. Jeanette Jackson (Chief Executive Officer, Foresight Cleantech Accelerator Centre): Hello. My name is Jeanette Jackson. I'm the CEO of Foresight Canada. I'm honoured to be here today.

Foresight is Canada's largest clean-tech accelerator, and our audacious goal is that Canada be the first G7 country to reach net zero. We can do this by effectively bringing together innovators, industry, investors, academia, government and indigenous communities in strategic, thoughtful ways to rapidly launch, commercialize and scale clean-tech solutions from Canada.

We have a passionate team of 35 staff and 170 global executives who support three key pillars of activity around acceleration, adoption and ecosystem alignment. I'm happy to discuss some different program details as required.

Tackling climate change takes collaboration. With our partners and networks, our programs have helped more than 850 Canadian companies validate, commercialize and scale and 150 global partners source Canadian clean tech. Our venture network has created more than 7,050 green jobs and $1.2 billion in investments and has driven more than $2 billion in economic impact for Canada. We also do investor matchmaking and curate about 1,000 introductions per year to strategic investors.

We applaud the Government of Canada's efforts to position Canada as a global leader. Other countries are catching up in some areas around investment and policies in adoption.

The biggest challenges and opportunities for Canada are in every sector. Every sector is impacted, and we have a very dynamic landscape of sectors and competencies across the country. This will, if we work together, lead to unprecedented economic and social well-being opportunities through investments, exports and attracting the best minds in the world, as well as preserving our resources.

I want to showcase a few strengths and, in particular, clean tech across different value chains. In forestry, we're talking about engineering wood, biomaterials, bioenergy and packaging; in mining, mineral processing, ore sorting, better electric vehicles, zero-emission vehicles for large industry, and of course lithium production; in energy and carbon management, things like CCUS, hydrogen, methane, renewables, the processing of those technologies and ores, and of course utilities management; and in transportation, in things like batteries and fuel cells, we have these competencies.

We cannot overlook waste management and the built environment, as those are up-and-coming aspects of excellence in Canada. Also, water is often an unlooked-at segment, because you don't calculate it by GHGs; you calculate it by saved water.

In Canada, we are also building competencies around data and digital clean tech, AI and some manufacturing and carbon credit management solutions. If you want to become a global centre for financing clean tech, let's look at the finance sector as well.

We have innovation gaps in these value chains, in particular around manufacturing in scale, and it is important to keep in mind that companies are still moving from Canada, closer to adoption as well as capital.

In the opportunities we have, on the ideation stage, let's make sure that we're giving industry information to academic institutions and innovation hubs so that we can be more problem-, market- and data-driven. I'm happy to get into that.

On the commercialization side, this is why we've launched some of our programs around technology acceleration. You really need to know how to commercialize technology and allow ventures the tools they need to use engineering firms and other sources without feeling insecure about their IP.

● (1545)

The Chair: Thank you.

Ms. Jeanette Jackson: There's great opportunity there. We have engineering strengths across the country.

The Chair: Thank you.

Ms. Jeanette Jackson: Am I done already?

The Chair: Yes. There will be opportunities for a back-and-forth.

Let's try Dr. Ross one more time.

Dr. Ross, could you say a few words?

Dr. Michael Ross: Can you hear me?

The Chair: We can hear you. Can you string a few words together?

Dr. Michael Ross: The fall up here is beautiful.

The Chair: Say a few more. What was it like last year? Do you remember?

Dr. Michael Ross: Last year on this day, we had snow.

The Chair: No, it's not working.

Okay. I would urge you to send any written comments to the clerk. If you would like to do that, it would be helpful for the report. Please participate in that way if you can.

We'll go to the first round, the six-minute round, with Mr. Seeback, please.

Mr. Kyle Seeback (Dufferin—Caledon, CPC): Thank you very much, Mr. Chair.

I guess I'm going to open this up to any of the witnesses who would like to answer this question or want to take a stab at it.

Vaclav Smil writes extensively about energy transitions. When we talk about moving towards net zero in Canada and around the world, what we're talking about is an energy transition. One thing Smil says is that "all energy transitions have one thing in common: They are prolonged affairs that take decades to accomplish, and the greater the scale of prevailing uses and conversions, the longer the substitutions will take".

Right now in Canada, only about 7.4% of electricity is generated by wind and solar or biomass. Given the complexity and difficulty of energy transitions, whether it's from wood to coal or from coal to natural gas, etc., why is the pace of this transition in Canada moving so slowly?

Ms. Jeanette Jackson: I'll start talking a little bit. We'll kick it off and hopefully not offend anyone. Certainly, certain countries outside of Canada have been more bullish on policies, where certain fuels in certain applications are no longer accepted. Those economic environments are quite different from Canada's economic environment, in which we do rely on that sector to fund a lot of non-energy-related programs around social services and other pieces.

At Foresight, we are supporting those regions that would like to go aggressively and go straight to green hydrogen, but we also understand that some sectors need to take a more thoughtful approach.

Something I would like to see, and something that Foresight has been championing, is an energy decision tree so we can map out where it makes sense for hydro, biofuels or hydrogen, based on some economic drivers in different regions or some outputs or waste energy materials—biofuels and things like that—in certain heavy-industry regions across the country. That might accelerate that pathway for industry that is perhaps not able to flip a switch.

In certain situations where there's more low-hanging fruit, I think we could be more bullish. Retrofits and stuff are nice, but, even with cement, there are still a lot of great companies that are doing zero cement that can't get into the sector. Energy is a big piece, but I'm cognizant of the importance of that sector for other intentions.

Mr. Kyle Seeback: You mentioned cement. I've heard of net-zero cement being developed in some countries. I was in Sweden, and they talked about that. What's the impediment to that being adopted here?

Ms. Jeanette Jackson: You have great companies like CarbonCure and several others that sell outside of Canada, but there are policies with respect to building across municipalities. If it's not embedded in the specifications, then it's just too complicated for the engineering firm approving the project, or even the engineers within those communities, if it's a municipal buyer, to get a project approved within a jurisdiction.

● (1550)

Mr. Kyle Seeback: Is it also because of cost?

Ms. Jeanette Jackson: Actually, most of the projects now are becoming cost-comparable. You might pay a small premium, but once you start to factor in carbon tax, you have to do a holistic analysis.

Mr. Kyle Seeback: Right. I'm glad you brought up the carbon tax. The carbon tax is in Canada. It's been running for a number of years. Emissions in Canada have gone up every year since the carbon tax was implemented. Would you say it's been an effective tool to reduce carbon emissions?

Ms. Jeanette Jackson: I am not a carbon tax expert. I do believe the carbon tax creates a framework to collect dollars to invest in programs that will accelerate the net-zero transition. I think it has the effect, in certain ways beyond the money, of getting people to start thinking and acting, so yes.

Now, on numbers from a per capita perspective, we're monitoring those. We'd like to see Canada be the first G7 country. Consumer behaviours and other things could also be invested in.

Mr. Kyle Seeback: Does anybody else want to take a stab at that question before I move on to another question?

[*Translation*]

The Chair: Mr. Moreau, you raised your hand. Did you want to answer the question?

Mr. Vincent Moreau: Yes. We were mostly talking about why the energy transition couldn't happen faster. Essentially, we need public policies in place to accelerate it.

Renewable energy can replace fossil fuels in some situations. Unfortunately, others require more research. Clean technologies accelerate that research. We absolutely need to invest in companies that have solutions for the industrial sector, such as replacing natural gas with hydrogen for certain processes.

I think public policy has a big role to play. We need to provide tax incentives and tie available subsidies to the principle of cross-compliance to get results. We need to encourage investments and things like the carbon tax or the carbon exchange, a tool we have here in Quebec that can be quite effective. However, once again, we need to link the implementation of all our programs with accountability by requiring a contribution to the energy transition.

[*English*]

Mr. Kyle Seeback: When you talk about government programs, do you think the tax credits and other incentives that the government offers for investment in clean tech are sufficient to speed up the energy transition?

The Chair: Please give us a very brief answer. We're out of time, but go ahead.

[*Translation*]

Mr. Vincent Moreau: It is never enough. We need to create synergy between existing programs and add support for those with solutions that could be applied immediately.

The Chair: Thank you.

[*English*]

Dr. Ross, I see your hand is up. Has something changed?

Dr. Michael Ross: Can you hear me?

The Chair: I think it's the same problem. We'll give it one last shot, but I assure you we will reinvite you and send you the proper headset.

I believe we still have the same problem. You can say a few words and we'll see, but I don't think anything has really changed.

Dr. Michael Ross: Okay. I'll try to answer the question as well as I can.

From a technological standpoint—

The Chair: No, wait. We're just testing here.

Dr. Michael Ross: Oh, I see.

The Chair: Could you say a few words? The interpreters will signal to me whether the situation has improved.

Dr. Michael Ross: It's cloudy outside in Whitehorse, but it doesn't look like it's going to rain.

The Chair: It has not improved. We will send you a headset and reinvite you.

In the meantime, if you have comments you would like to make in writing in response to any part of this discussion, please do so.

Mr. Longfield, you have six minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thanks, Mr. Chair.

Thanks to the witnesses.

It's good to be back in Ottawa.

Before I get started with my questions, I have a motion I'd like to put on the table. I hope you can find unanimous consent for it. The motion reads as follows: “That the clerk of the committee be authorized to grant access to the committee's digital binder to the offices of the whips of each recognized party.”

The Chair: Is there unanimous consent to consider and adopt this motion? I see heads nodding.

(Motion agreed to)

Congratulations, Mr. Longfield, on the adoption of your motion.

Mr. Lloyd Longfield: Thank you.

Thank you to my colleagues and the whips behind us who are supporting all of us. Whatever we can do to help the whips help us is great.

I'd like to direct my first question to Ms. Jackson. Thank you for your presentation. Three minutes go quickly.

I want to follow up on your connections with innovation centres across Canada. I know you have a partnership with Innovation Guelph—one that's near and dear to me—and you're working with women's entrepreneurship through Innovation Guelph. There are the connections to Calgary and other innovation centres that we have in Canada, as well as the clean growth hub that we have in Ottawa. Now the clean growth hub is in place to try to help foster innovation and look for the barriers to adoption we've already been talking about in the committee this afternoon.

● (1555)

Ms. Jeanette Jackson: Sure.

Foresight, as an organization, is national. We work with over 20 different organizations in different regions and sectors, including associations, to provide a pillar of support around acceleration—so companies they're interested in learning more about, getting them further along in their commercialization pathway—and, on the adoption side, running innovation challenges for industry.

With Innovate Guelph, Climate Adventures, Platform Calgary, and Innovate Edmonton, we're all connected. We're looking at clean tech and climate and how we can make the acceleration of cleantech development faster.

The clean growth hub has been a great portal. They seem to be thoughtfully convening different groups to try to get them to collaborate, share information and, most importantly, transfer knowledge from all the different ministries on what they're doing and what they're interested in in clean tech, whether it's funding buckets or events or initiatives, and trying to get that translated down to all the regional groups.

That would be our biggest engagement with the clean growth hub.

Mr. Lloyd Longfield: The clean growth hub has put out a report. They were audited and reported back on improving communications to get better contact with the proper applicants, people who would be applying for things they can support through the clean growth hub.

Have you had any experience with what works or doesn't work with the clean growth hub? I know this isn't your thing, but as a customer, maybe.

Ms. Jeanette Jackson: We, as an organization, don't use the clean growth hub for our own funding. That was not an option for us. It's really about venture services.

It's interesting, because each ministry also has a portal for specific programs in the ministry, so it depends. I'll give an example. PacifiCan has the BSP program and a few other things. Most of the companies in that province go directly to that PacifiCan outlet. Obviously, there's a communication function and a portal management function for where you can apply for funds.

Mr. Lloyd Longfield: They don't do direct funding, but they do the connections, as you said. Thank you for that.

I want to go to Mr. Moreau. It's really good to have your testimony from Quebec. I know that the Quebec government, provincially, has been a large supporter of Écotech and you've had good success working with the provincial government.

Could you mention the work with the federal government? Where are the opportunities for the federal government to help with your organization?

Mr. Vincent Moreau: Thank you for your question.

I will say this in French. It will be better for me, and also shorter.

[*Translation*]

Écotech Québec works a great deal with the provincial government to support companies that want to transition, to go green and improve their practices.

We would like to have greater ties with and support from the federal government. One of our recommendations is to improve funding for liaisons like us, who bring all the players together, whether it's accelerators, financiers, venture capitalists, or companies, to better support them and establish more links.

In terms of the support these companies need right now, understand that the transition will happen faster and faster, and needs will become pressing. Therefore, in our opinion, this would be an opportunity for the federal government to support organizations across Canada that, like ours, serve as liaisons between companies with needs and companies with solutions, between the research sector and financiers.

That said, we are also part of...

[*English*]

Mr. Lloyd Longfield: I'd like to interject.

I'm sorry to interrupt, but I noticed that you're also working in New York City with the smart cities connect challenge. I'm thinking that there might be some international opportunities that the federal government might be able to help with as well.

Mr. Vincent Moreau: Yes, that's true.

[*Translation*]

We work a great deal with Canadian agencies outside of Canada to promote the innovators and solutions we have here. This allows us to showcase our savoir-faire and technologies, and makes exporting them easier.

We are therefore working effectively at the international level with many players, with the entire Canadian network and with the network in the United States.

● (1600)

The Chair: Thank you.

We are now moving on to Mrs. Vignola.

Mrs. Julie Vignola: Thank you very much, Mr. Chair.

I will direct my questions to you, Mr. Moreau. Thank you for being with us.

I also thank all the other witnesses.

Écotech Québec has been around since 2009. Your exemplary activity has provided a high-quality framework for organizations walking the path you have laid out. I say bravo; you are an example.

The green economy is a very dynamic sector in Quebec and a real source of pride. The green economy generated annual revenues of $8.6 billion in 2018 and contributed $18.9 billion to Quebec's GDP in 2019, while creating nearly 84,000 jobs. That's tremendous.

Before I ask my questions, I would like to point out that I only have six minutes. Therefore, please be succinct. If there are any details that you feel are important to add, please feel free to send them to us in writing.

I would like to hear from you on the following points.

First, several billion dollars are being spent on reducing the carbon footprint. In your opinion, is Canada making the most of businesses—the real drivers of innovation, particularly in Quebec—and is it investing enough in them?

Secondly, your organization has certainly identified barriers to developing the full potential of Quebec clean tech companies, whether it be timeframes, program implementation, funding, subsidies, and so on. What obstacles did your organization identify? Have you found any likely solutions to overcome them?

Mr. Vincent Moreau: Thank you very much for the question. I won't have enough time to answer it in six minutes, but we'll be happy to send you our thoughts and the list of barriers we've identified.

It is good that many billions of dollars are available to drive the adoption of clean technologies. However, it also needs to be well directed and aligned. Also, we need to make sure there is proper accountability so that these programs and investments are actually contributing to protecting the environment and fighting climate change.

In the innovation sector right now, there are a lot of solutions. Some companies are struggling to meet their financial needs, that is, they're always a little bit short on funding. In the case of both public and private funding, you can currently accumulate up to 75% in public contributions, but it is extremely difficult to get that 25% of private funding. How do we do it? By using blend financing or by giving more latitude. For example, municipal contributions could be considered private funding. These projects are about adopting clean technology and implementing it within their own jurisdiction, as customers or consumers. Several such solutions are possible.

Also, as you said, when it comes to the regulatory aspect, we need to speed up the approval processes that give access to programs. If it takes six or nine months to get the money, that's too long for a small startup. It often takes a year and a half to two years to get the funding and test a technology to get it to market as soon as possible. That means programs need to be accelerated. We also need programs to be flexible and adapt over time, because what's relevant today may not be relevant in two or three years.

I could tell you about it for the entire afternoon. Instead, I'll send you our brief with our recommendations by October 10th.

Mrs. Julie Vignola: Thanks to your work and to the impressive Radar portal, Quebec's green economy has a magnificent showcase. Its clean innovations are spreading throughout the entire world. You mentioned it earlier, Congratulations.

Mr. Vincent Moreau: Thank you very much.

We're very proud of this tool, which is promoting Quebeckers' savoir-faire. I can tell you that economic development officers throughout the world use it, especially those in Canadian offices.

Mrs. Julie Vignola: Well, you anticipated my question. I was just going to ask if we were in a situation where our visionaries are better known abroad than at home. You just answered my question. This tool is used a great deal in Quebec and Canada, as well as abroad.

Mr. Vincent Moreau: It is indeed used abroad. Our clean technology innovators and businesses are currently facing a challenge: it is easier to do business outside the province rather than within it, due to the regulatory aspect. The Canadian government could facilitate the transition on a regulatory level and make it easier to adopt or implement our clean technologies at home. The fiscal and regulatory aspects really need some attention.

● (1605)

Mrs. Julie Vignola: You just said that this tool is used extensively abroad, internationally, and I'd like to come back to that.

What are the advantages for businesses in Quebec and Canada to increase their use of a portal like Radar?

Mr. Vincent Moreau: You're ahead of me, because we have an ongoing project that I wanted to talk about: we want to create a decision support tool.

The problem is that an entrepreneur doesn't know what's out there when they're looking for something. This kind of portal offers support based on their challenges and needs. It then directs them to the right technology tools, the right clean technologies and the right innovations, so they can take action faster.

When we create these types of tools at Écotech Québec, we always think about facilitating and accelerating the adoption of clean technologies. By facilitating these connections, we're helping businesses to take part in the green transition and act immediately.

The Chair: Thank you.

We will now move on to Ms. Collins.

[*English*]

Ms. Laurel Collins: Thank you, Mr. Chair.

I want to thank the witnesses for being here.

A number of my questions were going to be directed towards Dr. Ross.

Maybe I will just read out a few of them so that you can send some answers in writing, Dr. Ross. I was looking forward to hearing from you in particular because it's so important that we support northern rural indigenous communities in the transition to clean energy and reducing diesel consumption.

This summer, I met with some amazing researchers who are doing projects in B.C. in supporting Canada's off-grid communities, the majority of which are indigenous. Those are focused on wind, tidal and wave energy—it's the Pacific Regional Institute for Marine Energy Discovery—and I would love to hear or at least get in writing a description of some of the socio-economic benefits of independent power production in northern and indigenous communities. How important could renewable energy be in the context of local economic development and benefits for rural indigenous communities?

Maybe I will direct a few questions to the other witnesses. There have been a number of really interesting comments.

First, maybe for you, Ms. Jackson, based on your experience, what do you see as the biggest barrier facing renewable energy and efficiency technologies in Canada?

Ms. Jeanette Jackson: Renewable energy.... Do you mean literally solar and wind? There is a broad spectrum of technologies that aren't as mature.

Ms. Laurel Collins: I would say technologies that are going to get us to our goal of net zero.

Ms. Jeanette Jackson: On the wind and solar stuff, it's a capital problem and a commitment problem.

On some of the barriers, I think I'm going to echo what Mr. Moreau said. Thankfully, I was listening. It's really about the ability to have innovation sandboxes where regulatory and even capital structures to finance these types of projects are given a little bit more leniency, and again, even some education. A lot of the major consumers, including municipalities, aren't aware of how they can leapfrog by looking at a blend of different renewable sources so they can start to move the needle in that direction. It's education.

Also, it's policy. Permitting structures take too long: six months, 10 months or 12 months. By that time, someone is onto a new idea. Then, of course, it's education on what's possible, on what an actual energy structure to support that community can look like.

Those would be some of my comments.

I'm not sure if my colleague.... Say hi to Denis for me as well.

Ms. Laurel Collins: Mr. Moreau, I know that you previously answered this in part, but perhaps you have something to add.

[*Translation*]

Mr. Vincent Moreau: Yes, Ms. Jackson, I will say hello to Denis for you.

Another thing to consider with regard to energy transition is not just renewable energy forms, but also the whole aspect of energy efficiency. We consume a lot of energy in Canada. There are technologies that will increase our energy efficiency immediately, while others require investment and support, through accelerators, incubators or liaison organizations such as ours, to make sure they reach the companies that will then implement them.

So we must remember that energy efficiency is also part of the solution. It also depends on the public policies, requirements, regulations, rules and incentives that will be implemented, as well as follow-up measures to evaluate the results.

● (1610)

[*English*]

Ms. Laurel Collins: Ms. Jackson, I really love your goal of Canada being the first G7 country. Can you give some examples internationally of countries that are doing it right? What could Canada be doing better in following some of those examples?

Ms. Jeanette Jackson: Sure. One example right out of the gate would be Denmark. They're usually one of the most prolific examples. They've just mandated renewables. They've mandated some reflection on future investments in projects that aren't on a pathway to net zero in infrastructure and other things like that.

When we do our cluster development strategies, a lot of regions have more consultation in place, so they give capacity that's like what Écotech is doing. We do that in different regions as well. You're bringing together the stakeholders in municipalities: What does your energy structure look like? What does your climate impact look like? How can we map out a pathway? Then you're bringing in those existing solutions or new technologies and bringing in the industry and the investors to actually invest and get those things going.

Some regions are effective in that. Quite frankly, Lytton is an interesting example now. Having to rebuild from ground zero, you're almost a blank canvas. You don't have all those other barriers. I think it will be interesting to watch them.

In South Africa, there is a really interesting government program to attract capital into projects. It's not just equity capital or debt capital but investing in projects that have a business case. They give sort of a kickback and a tax break based on the number of green jobs created and of course the actual calculated GHG reduction.

The Chair: Thank you very much. It's very interesting, but we have to move on to our second round.

Mr. Dreeshen, you have five minutes, please.

Mr. Earl Dreeshen (Red Deer—Mountain View, CPC): Thank you very much, Mr. Chair.

Thank you to all of the witnesses we have here today.

I know that Dr. Ross can't respond to this, but I did want to acknowledge some of the things he spoke about. He talked about power grids that are not always reliable, diesel fuel and the supplementation that is required, and different resources, of course, having different impacts. We've seen issues around the world, especially if we go back to the power grids in California, where there's a big push for electric vehicles but right now they're just trying to keep the lights on. These are issues that we have to be concerned about, and I just wanted to put that on the table. Perhaps, Dr. Ross, if you get a chance, you can address those things.

Second, Ms. Jackson, thank you very much for being here today. One of the things you spoke of was that you have 170 collaborators, I believe, who are working with your group via 35 staff. I'm interested in the types of groups that are working for you.

I say that from this particular context. It doesn't matter what we're trying to build and what clean technology we have; unless we measure it from the first shovel that we use to dig it up to the last shovel that we use to cover it up, we're not having a fair assessment. It doesn't matter whether it is hydro dams, windmills, solar panels, oil and gas, or hydrogen. All of these things have to be taken into consideration. Then we have to take a look at what the impacts of the CO2 issues are going to be, if that still remains one of the issues that we have.

I know that 170 is quite a few, but can you give me some of the highlights of the people who actually understand and realize that those are important metrics?

Ms. Jeanette Jackson: Yes, it's quite a list. We engage with folks in the ecosystem in a few different buckets. One would be policy leaders. We're not a policy expert group, but we work with folks like Clean Energy Canada, Pembina and all those groups to understand what they're putting forward, which will include finance tracking and metric counting, and standardizing that, if you will, across different industries. We work a lot with engineering firms, whose job is to quantify the impact of a project and whether it should be implemented, and to get more of an understanding of whether we can get them ahead with the clean-tech companies, so that they can help the clean-tech companies communicate what impact they can have that's validated and tangible for buyers.

On the municipality side, we do a lot of innovation matchmaking with municipalities, where they need support. It's something that I'm championing for a net-zero integrated marketplace where there are tried-and-true tested policy specifications and technologies that can be rapidly deployed. We can then work on that next funnel of technologies that aren't quite ready yet—

● (1615)

Mr. Earl Dreeshen: If I can, I'll jump in there. One of the things I believe Mr. Seeback has spoken of is the gatekeepers we have in municipalities, because they haven't quite got their heads around how they want to have any kind of industry in their communities.

These are some of the things that concern me.

If you take, for example, building an electric vehicle battery, it's 1,000 pounds, and 500,000 pounds of earth has to be moved to make that happen. You don't do that unless you have hydrocarbons there to make that occur. That's what I'm speaking of when I say we need to measure all aspects of it, because some of these great ideas.... You know, I love science. I love the way it can be done, but it doesn't necessarily mean that it is going to get the results that we want. That's one of the parts.

The other concern that I have.... You mentioned forestry and how important it is, how it's able to change and find its way in the renewable industries. Agriculture is the same. It hasn't been mentioned. We fear that the measurements and the things that have happened in agriculture are not being considered. We know the whole concept of nitrogen fertilizer has nothing to do with anything other than the fact that it comes from natural gas. Therefore, if you want to cut down on the use of natural gas, you have some blanket statement that says we need to get rid of or reduce fertilizer.

Do you have agricultural groups in your collaboration network?

The Chair: Answer in 10 seconds, please.

Ms. Jeanette Jackson: We have the AgriNext program. It's a national program in partnership with different associations across the country and farmers who are on the job, trying to figure out what the climate is going to look like for them. We're pulling information and looking at the ventures.

The Chair: Excellent. Thank you.

Ms. Taylor Roy, you have five minutes.

Ms. Leah Taylor Roy (Aurora—Oak Ridges—Richmond Hill, Lib.): Thank you, Mr. Chair.

Thank you for being here, Ms. Jackson. Thank you to our other guests for being here virtually.

I think it has been a great discussion. We've been in the weeds a lot, which is awesome to understand some of the details. However, I wanted to move back a bit, because it's been suggested by the leader of one of our parties that investing in clean tech alone will solve the climate crisis and that we don't need a price on pollution and we don't need regulation or anything else. All we need, really, is to increase clean tech.

While I agree that clean tech is vital for reaching net zero, I remember my grandmother always saying to me that necessity is the mother of invention. I'm wondering whether our witnesses today could comment on the supply and demand side balance between having the price on pollution and investing in clean tech.

What signal does it send to investors in clean tech when people hear questioning on whether a price on pollution or some of these regulations or mandates are necessary? What kind of impact does that have in this arena?

Ms. Jeanette Jackson: I'll go first.

The two things definitely lean on consumer behaviour. You're absolutely right. People make what people buy. I think we are missing an opportunity to educate consumers on their buying habits and consumption. Obviously, you can't control them, but education could go a long way.

In terms of investments—industry investments and other private capital investments—they're based on confidence in a market. The reality is that in 99.9% of cases, most VCs and large investors looking at that $130 trillion that's going to be deployed over the next 27 years are going to want to see confidence in the markets, confidence in policy, confidence in tax structures and confidence, at least for the time being, that carbon credits will be a factor in the business models that will allow them to invest.

● (1620)

Ms. Leah Taylor Roy: Thank you.

Is there anything else?

The Chair: Go ahead, Mr. Moreau.

[*Translation*]

Mr. Vincent Moreau: If I may, I would like to add to what Ms. Jackson said.

Clean technologies are of course not the only solution to climate change. We also have to protect natural environments and change our consumption habits. It is clear though that we must adopt clean technologies.

The important point here is that all actions or approaches are relevant and complementary, including the carbon price signal, incentives offered through programs to reduce the environmental footprint and fight climate change, and changes in consumption habits.

Clean technologies alone cannot solve the whole climate change problem. It is clear, however, that today's finances are not tomorrow's finances. There is a climate risk. Shareholders or investors seek safety in this regard. For a company to remain profitable and viable in the future, it will have to adapt to this new reality. I am talking about ESG factors, that is, environmental, social and governance. Sustainable funding criteria will increasingly be integrated, sought out and guided by carbon price signals and other variables we have just discussed.

[*English*]

The Chair: Do you have another question?

Ms. Leah Taylor Roy: Yes. Thank you.

Earlier today, in fact, with some other members here, we were listening to the special trade envoy from New Zealand. On agriculture, she was talking about the fact that for farmers in New Zealand there were mandates put in place for reductions in methane, that they were getting absolutely no government assistance for any clean tech or anything else, and that they were very proud of the fact that they were undertaking these changes on their own and felt it was their responsibility to do this.

There are models where there are mandates and requirements or prices on pollution being put in place without the support. How important, though, do you think that support for clean tech is in reaching those targets?

The Chair: Answer very briefly, please, as we have 10 seconds.

Ms. Jeanette Jackson: I believe that supports are required. I do think that there needs to be more flexibility. There are a lot of buckets, and if there were a little bit more flexibility with fewer buckets, you might see better resolve. In Holland, there's a very similar thing. They allow each farm to have its own wind farm and feed that back into the utility. There is flexibility in other aspects for them to make up funds on the climate side to feed into those other transition factors.

[*Translation*]

The Chair: Ms. Vignola, you have the floor for two and a half minutes.

Mrs. Julie Vignola: My first question will probably result in a written answer from Ms. Jackson, Mr. Ross and Mr. Moreau.

We touched on the importance of research in developing clean technologies. We also talked a lot about solar energy technologies, a field with frequent innovation, as well as wind energy technologies.

A few years ago, though, I heard a lot about geothermal energy. In the past, this was mentioned as a potential solution, especially for the Far North. I hardly hear anything about it these days though, and I am wondering why.

Is there enough research into geothermal energy? What is preventing the people of Quebec and Canada from using geothermal energy?

The Chair: Ms. Vignola, is your question for Mr. Moreau?

Mrs. Julie Vignola: Yes, to begin.

Mr. Vincent Moreau: I am not an expert on geothermal energy, but I can tell you that innovations are still being made in vertical or horizontal geothermal energy. We have members who are innovators in this area. I would say that there is no less interest, but it also depends on the available infrastructure. As to the energy efficiency of all our built heritage, it is a tremendous challenge to transition from fossil fuels to renewable energy forms.

Another energy form that I would like to mention and that we have not talked about much is biomass, that is, all organic materials, including forestry waste. It has tremendous energy potential, even for remote areas that are not connected to a network such as Hydro-Québec or another electricity supplier.

● (1625)

Mrs. Julie Vignola: Thank you.

The Chair: Ms. Vignola, would you like someone else to answer?

Mrs. Julie Vignola: I would ask Ms. Jackson to answer.

[*English*]

The Chair: You have 30 seconds, please.

Ms. Jeanette Jackson: I thought you were going to talk about fusion and nuclear, so that's interesting. It's the same thing—infrastructure costs, and there are a few sites that have been defined that could deploy geothermal. On the rest of the research, I think Mr. Ross would probably be the most equipped to respond further.

The Chair: Thank you.

Mr. Ross, maybe you could send in some written comments, but as I said, we'll have you back.

I will go now to Ms. Collins for two and a half minutes.

Ms. Laurel Collins: Thank you, Mr. Chair.

I want to follow up with you, Ms. Jackson. You mentioned Lytton, which made me think about the devastating impacts of the climate crisis and how flooding, climate fires and extreme weather are impacting this transition as well. I'm curious to know whether any of the work you've done has looked at how increasingly extreme weather events interact with this transition to a low-carbon economy. I'm thinking in particular of our electricity grids, but do you have any other thoughts on that?

Ms. Jeanette Jackson: Well, sometimes we're so focused on the here and now that we forget about the importance of adaptation and resiliency. Certainly in B.C. there have been fires and floods. I've spent some time with some different groups across Europe that are making a lot of investments in adaptation, with peat moss and a whole bunch of other opportunities, where we have to really lean in on our adaptation and resiliency with innovation and business models that make it make sense.

So yes, I think it's a “nice to do”. I think the model, both with Écotech and the work that Foresight does from an accelerator and adoption perspective, given some capacity, should be factored into the whole opportunity analysis around clean tech. We have a lot of companies that do it. We funnel them into the clean-tech category just so that we can get them supports, but there's certainly an opportunity to be more diligent. I think insurance companies and other folks might want to weigh in and perhaps even invest in some of those actions as well, but we need a starting point in capacity to do that type of work.

Ms. Laurel Collins: Maybe I'll open it up to you, Mr. Moreau. Do you have anything to add on any of the companies you're working with or on any kind of interaction between that clean-tech development and the impacts of the climate crisis?

[*Translation*]

Mr. Vincent Moreau: A lot of companies in the energy efficiency field help companies that are facing energy challenges and want to eliminate bunker fuel, oil or diesel, for example. A lot of companies approach us seeking innovations, to learn about the clean technology ecosystem and to find innovators and solutions. The support provided by Écotech Québec is essential to the ecosystem. If we had more resources and could provide greater support, that would be beneficial.

The Chair: Thank you very much.

You have the floor, Mr. Mazier.

[*English*]

Mr. Dan Mazier: Thank you, Chair.

Thank you to the witnesses for coming out here today.

We've heard a lot about the so-called valley of death in the clean-tech industry. There's a lot of money being spent on research and development in clean tech, but we hear that a lot of this technology is failing to be commercialized.

Mr. Moreau and Ms. Jackson, what would you recommend the government do to support the commercialization of clean technology in Canada?

Ms. Jeanette Jackson: An interesting perspective from someone like me, who runs an accelerator, is that I think we need to be very honest with ourselves about what type of team value proposition, business model and competitive advantage a venture has. If they do check a certain number of boxes, they will get capital. The next tier where they're missing one of those factors is where accelerators like us come in.

You don't want to disrupt a company that is already on its pathway, but if a company can't quite get it, let's be honest: What do we need to have them show to really recommend that government programs lean in and make those investments that will have a higher probability of success? We do a lot of work with our programming to weed out who really has those boxes checked. Remember, regardless of what company you look at that's successful, they're going to pivot along the way. They're going to learn on the way. There's no perfection. But if we have platforms that are rigorous, that are market-, data- and problem-driven, then I think the supports that follow will align with that.

Certainly on the project funding side, that's a little trickier. I would say that the investment needs to be more on domestic adoption opportunities. Those companies that have a perceived valley of death will win through procurement efforts, as opposed to having to worry as much about the venture side. It's a two-sided marketplace.

● (1630)

Mr. Dan Mazier: Mr. Moreau, do you have anything to add to that?

[*Translation*]

Mr. Vincent Moreau: Yes, I would say that additional funding is required for entrepreneurs who want their technology to reach maturity, be demonstrated, and then be commercialized. It is always hard to get the last chunk of funding for commercialization. To complete all the stages for approval, certification and standards, in particular, additional highly targeted funding would be beneficial since innovation also has to meet a need, as Ms. Jackson pointed out.

As to venture capital, money is available. What is lacking is private funding. The funding phase also has to be completed so that demonstration projects can reach technological maturity and commercialization. That is the crux of the matter. A lot of projects do not make it that far precisely because they are lacking that extra boost, which is not a huge amount of funding, but is still essential.

[*English*]

Mr. Dan Mazier: Thank you.

At the last committee meeting, I asked the department about its clean growth hub. The hub acts as a one-stop shop for federal clean-tech programs. However, when I asked the department how many clean-tech projects that receive government funding reach commercialization, they stated that “the Hub does not collect information on the number of projects that reach commercialization stage after receiving government funding”.

Do you believe that it would be useful for the government to know how many clean technologies reach commercialization?

Ms. Jeanette Jackson: We do annual surveys and quarterly surveys, so we actually have a lot of that data. Data is important. It's important to know who's winning and who's doing what. I do think that making decisions and offering programs based on data is important.

Mr. Dan Mazier: Go ahead, Mr. Moreau.

[*Translation*]

Mr. Vincent Moreau: I think it is important to have that data, namely, the number of innovations awaiting a lead investor in order to get to the trial stage and, as the case may be, the number of funded innovations that are commercialized.

[*English*]

Mr. Dan Mazier: Ms. Jackson, you mentioned the importance of attracting investments into clean tech. How can we create a more investment-friendly environment for clean tech in Canada?

The Chair: You have about 10 seconds. I'm sure you know the answer.

Ms. Jeanette Jackson: I think it's tax incentives to attract more private capital. That would be my 10-second response. That's not easy, but....

The Chair: No, that's a good answer. Thank you.

I'm sorry that we have time constraints. It's unfortunately the way it is around here sometimes.

Ms. Thompson, you have five minutes, please.

Ms. Joanne Thompson (St. John's East, Lib.): Thank you, Mr. Chair.

Thank you to our witnesses.

I'd like to focus on hydrogen. According to Natural Resources Canada, Canada is one of the top 10 hydrogen producers in the world, with three million tonnes of hydrogen produced annually.

My question is for Ms. Jackson, and then I'll certainly circle back to Mr. Moreau once Ms. Jackson is finished.

The first question is, how did Canada become a leader in hydrogen technology?

Ms. Jeanette Jackson: For anyone to become a leader, there's usually a scenario where there's waste hydrogen. In this case, there was waste hydrogen and people were figuring out how to collect it and turn it into something valuable. That is my understanding of where the starting point of hydrogen innovation came to light.

Then, when they're figuring out where we can actually apply the hydrogen, that's where more innovation happens on the demand side. On specific manufacturing and production industrial sites, hydrogen is an output of the process, and that's where a lot of the innovation has come from. Now we're looking at non-industrial sites and at hydrogen production within communities and stuff like that.

Usually, there's just an environment and some waste product. Someone has to turn it into something valuable and, boom, you have a market.

Ms. Joanne Thompson: Continuing on that thread, I wanted to reference the Canada-Germany hydrogen alliance in August 2022. I was so pleased to be there. It was incredibly exciting. Is Canada on the right track to ensure continued leadership in this area?

● (1635)

Ms. Jeanette Jackson: I think we're on the right track. Canada is probably one of the most well-positioned countries to provide clean energy security for many countries around the world. We have the expertise in “how” through our traditional energy sector. Let's use that expertise in “how” to transition to providing, exporting and, of course, using internally—most important is domestic adoption—those clean renewable or green energy sources.

Ms. Joanne Thompson: What lessons from Canada's success with hydrogen production and hydrogen fuel cells production can be applied to other types of clean tech?

Ms. Jeanette Jackson: That's really interesting. There's important learning between sectors. I'll give an example. We did a hot water reclamation project for the resource sector in Alberta. There was an opportunity to take that technology and apply it to some mining applications across the province, into B.C.

Sharing best practices and technology competencies between industries is something very important for us to look at. You don't need to start from scratch in each sector. Let's see what's working in other sectors and apply it horizontally across each sector.

Ms. Joanne Thompson: Thank you.

Mr. Moreau, would you like to comment on any of the questions?

[*Translation*]

Mr. Vincent Moreau: Let me just say something briefly about hydrogen.

The challenge with hydrogen production is transport. It will take a lot of investment in research and innovation to produce hydrogen that is truly green, that is, with a zero carbon footprint. Transport always involves challenges in terms of logistics, costs and profitability. So an investment component should perhaps be provided if we want to remain leaders in hydrogen production and application.

In terms of green hydrogen, it is always better to have a short route, that is, local production and consumption. If other sectors of the economy can be decarbonized and if there is a viable solution for hydrogen transport, this might be an area of interest. It will not happen overnight, but it could be achieved in the long term.

[*English*]

Ms. Joanne Thompson: Thank you.

Following those comments, Ms. Jackson, I'll go back to you and how you began this session, talking about how we need to move across multiple sectors. I look in Newfoundland and Labrador and can see what's happening around water, wind, minerals and technology. It's quite incredible how, for a small province, we've been able to move forward in a number of different sectors toward greening solutions.

Can you go back to some of the ideas? How do we use the opportunity and work across multiple government sectors—I believe municipal and provincial—as well as in a global space? How do we dig in and start moving clean tech forward, understanding that we have 2030 and 2050 deadlines?

The Chair: Unfortunately, we're out of time.

Ms. Jeanette Jackson: I had something really important to say, too.

The Chair: You could always email some comments to our clerk.

I want to thank the witnesses for a very interesting discussion in our second meeting on the topic. Again, please feel free to send written comments if you want to add some commentary.

We'll now have a very short break to welcome the next panel.

My question for the committee members is, would you be okay with going 10 minutes over, past 5:30?

Some hon. members: Agreed.

The Chair: Okay, we'll do that. If we're succinct and we move quickly, we'll be able to get a full round in.

Thank you again to the witnesses. It was very interesting.

Dr. Ross, we'll be back with you for a future appearance.

● (1635)

_____(Pause)_____

● (1640)

The Chair: I call the meeting back to order. We'll start now, so that we can finish not too late.

We have with us at the moment Dr. Christina Hoicka, Canada research chair in urban planning for climate change, and Francis Bradley, president and CEO of Electricity Canada. I think there are some log-in problems for Ms. Andrea Kent from Renewable Industries Canada, so we'll go to opening statements from Dr. Hoicka and Mr. Bradley.

You have three minutes, Dr. Hoicka.

● (1645)

Dr. Christina Hoicka (Canada Research Chair in Urban Planning for Climate Change, Associate Professor in Geography and Civil Engineering, University of Victoria, As an Individual): Hello. Thank you for having me here.

My Canada tri-council-funded research focuses on renewable energy transitions for communities in Canada and on nearly every continent. Canada can reach its 2030 targets to uphold its pledge made to the UNFCCC, which are only eight years away, if we follow the evidence on our fastest, cheapest options that also improve social and economic benefits in a socially and economically just manner.

Critical and technologically viable options for decarbonization include electrification of transportation, deep energy retrofits to buildings, the rapid introduction of heat pumps and the rapid scale-up of waste heat capture for heating and cooling processes in cities and industrial districts. To do this, we need to quickly scale up renewable electricity generation and new distribution and transmission technology to get this renewable electricity to where it's needed.

Peer-reviewed research shows that over at least 50 years, public and private sector funding for research, development and deployment for nuclear and fossil fuels has been orders of magnitude more than funding for renewable energy and energy efficiency in Canada. If we spent on renewables the way we spend on these, we could direct financial, regulatory, knowledge and administrative resources toward our best possible pathway of meeting both the 2030 and the 2050 targets.

A dramatic increase of renewable energy is possible as there have been technological advances. For example, renewable energy has become the cheapest option on the market, including compared to coal. Combining renewables and adding flexibility, like load balancing and demand response, can reduce the cost of storage.

According to the Organisation for Economic Co-operation and Development and the International Energy Agency's energy technology guide, there are at least 38 technologies, including a range of renewable energy technologies, that are market-ready and could be scaled immediately with the right supports. According to my own research, Canada is not supporting these proven technologies to the extent needed to reach our climate goals.

Supports for renewable energy and reducing energy demand should focus on increasing the supply of renewable energy as a critical opportunity for local economic development and socio-economic benefits for rural and indigenous communities that can develop renewable energy to export out of our regions and into cities to support the rapid uptake of electric vehicles and heat pumps; addressing the electricity grid and developing and implementing innovations that reduce the congestion of energy demand in cities; research and development of new materials and innovations to address the supply of critical rare earth magnets and minerals; and removing regulatory barriers and improving the economic, regulatory and administrative supports to improve the utilization of these innovations.

Thank you.

The Chair: Thank you very much, Dr. Hoicka.

Mr. Bradley, you have three minutes.

[*Translation*]

Mr. Francis Bradley (President and Chief Executive Officer, Electricity Canada): Hello, Mr. Chair and committee members.

My name is Francis Bradley and I am the president and chief executive officer of Electricity Canada. Electricity Canada is the national voice for electricity in Canada. Our members produce, transport and distribute electricity to industry, commercial and residential clients from sea to sea.

[*English*]

Electricity is Canada's energy future, and it's a key economic, environmental and social enabler essential to Canadian prosperity.

The sector employs over 100,000 people and contributes over $30 billion to Canada's GDP. It's also among the cleanest in the world, with more than 80% of Canadian electricity already being produced from non-emitting sources.

Electricity itself is not a new technology. The first arc lamp was switched on in front of the Davis hotel in Winnipeg in 1873, the first recorded use of electric light in Canada. Even though electricity may be an old invention, let's not make the mistake of thinking that it's no longer innovative. In fact, electricity has been at the forefront of technological innovation throughout its history and will remain so, particularly as the world seeks to reduce emissions and move towards a greener economy.

Ultimately, emissions reduction is about finding innovative ways to power economic activity with cleaner technologies. Electricity is the nexus between emissions reduction and clean technologies. Our sector is either an adopter or an enabler of the clean technologies that will help us reach our climate goals. Electricity is a clean technology, and, with the appropriate support, it has the potential to fill most of our energy needs and pave the way towards a net-zero future.

Now, what do I mean by “appropriate support”? Getting to net zero will require massive investments in our electricity systems. Transportation, home heating and industrial processes that currently use some sort of fossil fuel will increasingly be electrified. Even where direct electrification isn't practical, such as with some heat-intensive processes or heavy transport, alternative fuels like hydrogen can be produced using electricity.

For us to reach our net-zero targets, electricity will need to become Canada's primary energy source. The federal government has projected that Canada will need to produce two to three times as much clean electricity by 2050. To do so, Canada will need to lean on all available options, including more renewables, traditional hydro and transmission, as well as emerging technologies such as small modular reactors, carbon capture, energy storage and hydrogen. Balancing all of this alongside affordability and reliability will be a monumental effort.

● (1650)

The Chair: Thank you.

Mr. Francis Bradley: The number of days before the end of 2035—when the government has committed us to be net zero—is 4,851. It's not a lot of time. To meet the needs of tomorrow, Canada needs to start building today.

The Chair: That's perfect.

Mr. Seeback, go ahead for six minutes, please.

Mr. Kyle Seeback: Thank you very much.

Mr. Bradley, you started to get into exactly where I want to go, which is to look at some of the costs of this. RBC put out a report called “The $2 Trillion Transition: Canada's Road to Net Zero”. Electricity is a big part of that. Just to decarbonize the electric grid, they suggest that, starting now, somewhere in the neighbourhood of $5.4 billion will need to be spent every year for the next 28 years and that we will need to at least double the electricity capacity in this country by 2050.

Are you aware of any plans that have been put forward by the federal government to make sure we are able to implement these kinds of things as we move forward?

Mr. Francis Bradley: I thank the member for the question.

It is indeed a challenging future that we're facing. There have been a number of studies that have attempted to give a sense of the scope and scale—anywhere between $1.2 trillion and $2 trillion. When we're looking at doubling or tripling the electricity output in this country, that's huge, but doubling it between now and 2050 means having a 3% to 4% increase each year. That is doable, except that we're not doing it yet.

We're not really clear about exactly what that is going to look like and precisely what kind of support is going to be available, but we're actively in discussions on everything from what the investment climate may look like to the evolving clean electricity regulation that is being developed at this stage.

Mr. Kyle Seeback: Do you have any idea what electric grid capacity increase will be necessary to meet the zero-emission vehicle targets that are coming in by 2030? We're seven years and four months away from that. I would think that's going to create a large draw on the existing electricity capacity. Do you know how much that will be? Again, has the government said what their plan is to help industry get to that over the next seven years and four months?

Mr. Francis Bradley: Yes, the challenge to meet the electrification of transportation is certainly one that will be enormous over the long term. Have there been plans that have been articulated at a national level? Not with respect to the grid itself, but certainly there have been with respect to what we understand will be the pace with which electric vehicles will be coming out. The responsibility for ensuring that our transmission and distribution systems will be ready for that is not something that is at the federal level. It's something that resides with the individual companies themselves.

It is also important that while we know when the target date is for all new vehicles to be electrified, that doesn't mean we will have to throw a switch on that day, because an internal combustion engine car is going to last for 10 or 15 years.

● (1655)

Mr. Kyle Seeback: Sure.

Mr. Francis Bradley: So it will be a bit of a slower rollout, but it is a rollout, at least with respect to the electricity system, that needs to be managed at the individual company level and within what effectively are 13 different electricity systems in this country.

Mr. Kyle Seeback: I'm aware that the federal government doesn't have the role of actually producing electricity in the country, but if industry has to double capacity and decarbonize the grid in order to meet these targets, someone is paying for that.

Mr. Francis Bradley: Absolutely—

Mr. Kyle Seeback: Either industry is going to pay for it, or government is going to help industry pay for it. If government doesn't help industry pay for that, do you have any idea what the cost of that would be to the average consumer of electricity?

Mr. Francis Bradley: Thank you for that. It is about the individual consumer. When people say that it's the government paying for it or industry paying for it, what we're saying is that it's either the ratepayer or the taxpayer who is paying for it. It's not clear where all of these costs are ultimately going to fall. It is certainly something that is foremost in the minds of the sector. We're very conscious of the pressures and the price pressures.

It's also something that we are trying to get a better sense of with other stakeholders in this space. The Canadian Climate Institute has been doing modelling in this space. The Trottier Energy Institute has been doing modelling in this space.

It is not precisely clear what that is going to look like in the future, but it is certainly something that is top of mind when I talk to the CEOs of my member companies: the impacts on the individual customer.

Mr. Kyle Seeback: Would you agree with me that the federal government has a role to make sure that all the costs of decarbonizing the electric grid and the expansion of the electric grid don't go down to the ratepayer, to the individual taxpayer?

Mr. Francis Bradley: Well, I guess the question is that the costs need to go somewhere. They will go either to the ratepayer or to the taxpayer or a combination of those two. There isn't a third pocket from which one can draw.

Our principal concern at this stage with respect to the energy transition is the speed with which it's taking place, and there is an important role that the Government of Canada can play. There have been announcements of projects, most recently in Labrador with the hydrogen project, for which we're told there could be a period of about two years to build the project, but, boy, to site a project and to go through all the hoops required to get a project moving forward, we're talking a decade.

A major hydroelectric project, for example, takes decades to go through all of these processes. Our net-zero commitments as a country are less than 5,000 days away, so that's where we see a principal role for the government.

The Chair: Okay. We're out of time.

I'm told that Ms. Andrea Kent has been able to log on. I'll go to Ms. Kent for her opening statement—for three minutes max, please—and then we'll move on down the list of questioners.

Ms. Kent, go ahead, please.

There seems to be a connection problem.

I'm going to go to Mr. Duguid. Then we'll try to come back to Ms. Kent.

Mr. Duguid, you have six minutes, please.

Mr. Terry Duguid (Winnipeg South, Lib.): Thank you, Mr. Chair.

Thanks to our witnesses for appearing today. My first question will go to Mr. Bradley.

As you pointed out, hydro power uses mature existing technology that of course we have been so blessed with in Manitoba. Hydro provides 95%, I believe, of our electricity needs, but it's 20% in Saskatchewan and only 5% in Alberta. In Manitoba, we've long talked about something we call the east-west power grid, sort of the Atlantic loop for western Canada, if you will. We have the Birtle subdivision, which is already providing electricity to Saskatchewan to help them in their decarbonization efforts. You have Site C, which has had its share of problems—I see a knowing look from Ms. Collins—but could potentially be a source of clean power for decarbonizing Alberta.

Do you have any comments on that vision? Is that a project that your association is seized with? I understand that one of the issues is the regulatory systems that have to be meshed, and of course the provincial rivalries. There may need to be some innovation there, to use your word. Is that the kind of thing we need to be looking at to really scale up our efforts and meet the electricity needs that you've spoken about?

● (1700)

Mr. Francis Bradley: I thank the member for the question. As I noted in my comments, if we're going to meet our 2050 targets and if we're going to double or triple the electricity system in this country, we will need an "all of the above" approach.

Transmission, and greater regional transmission, will absolutely be required for the future, but it is not the sole solution. None of these are the sole solution. Small modular reactors will be part of the future, but that is not the sole solution. Hydrogen will be part of the future. It is not the sole solution. The scope and scale of increasing our electricity two to three times will mean that we absolutely are going to have to rely on far greater transmission, interregional transmission, but that will be only one part of a larger solution. It's an "all of the above" approach.

Mr. Terry Duguid: Thank you.

I had the good fortune to speak at the Heating, Refrigeration and Air Conditioning Institute annual conference on Monday morning. I was just astounded to hear that all of the technology that we need to get to net zero in buildings exists. Their major ask of government—or of society, I suppose—is that they need upskilling and reskilling. They need what we're calling the "just transition" approach for their particular sector. The building sector is responsible for 20% of greenhouse gases. We are investing staggering amounts of money, $2.6 billion, in home retrofits. There are not enough people to actually assess homes at this time.

Do you have any comments, Dr. Hoicka, on the issue of workforce development, not only in the building sector but also in the renewables sector, if we're going to achieve the kind of goals you mentioned?

Dr. Christina Hoicka: Yes, absolutely. I think it's a really important part of a just energy transition. This is what we hear everywhere. I think quite a few organizations in Canada are willing and able to start to support workforce transition in this area.

Mr. Terry Duguid: Mr. Bradley, do you have any comments on workforce development?

Mr. Francis Bradley: Absolutely. It's a priority right now.

Today we're having challenges with ensuring that we have a sufficient workforce for the electricity system that we have currently. The skill sets are going to change in the future. It is something that the industry is very much seized with and conscious of. I keep talking about the doubling or tripling of the electricity system, but it's also going to be a different kind of system. There will be different skill sets required for that future. It is something that we are very much engaged in with a number of our partners.

Mr. Terry Duguid: Thank you, Mr. Chair.

The Chair: Before we go to Madame Vignola, I'll try Ms. Kent one more time.

Ms. Kent, are you there?

Ms. Andrea Kent (Board Member and Past President, Renewable Industries Canada): Yes.

The Chair: Go ahead with your three-minute opening statement.

Ms. Andrea Kent: Third time's the charm. Thanks so much for the accommodation.

I've already been able to hear, from colleagues here on the panel, a couple of key aspects, one of which is that certainly there is no perfect solution—

The Chair: Excuse me, Ms. Kent, but the microphone is not activated. You're actually speaking into the computer. There's a switch at the bottom of your screen. You'll see, probably, a little arrow. You choose the headset.

Ms. Andrea Kent: I have done that. I'm very unclear as to why it is not working.

The Chair: Unfortunately, because it's required for the interpreters in order not to harm their hearing, we may have to invite you back on another occasion. Please stay on the line. If you have any comments to make, you can send them in writing to the clerk. They will be useful for our report.

● (1705)

[*Translation*]

Ms. Vignola, you have the floor for six minutes.

Mrs. Julie Vignola: Thank you very much, Mr. Chair.

My first questions are for you, Mr. Bradley.

I doubt that you, as CEO of Electricity Canada, and your members focus on green electricity production, that is, renewable energy that is as carbon-neutral as possible. On a Bloc Québécois initiative, this committee conducted a study and drafted a report about potential federal legislation on carbon neutrality that would require car manufacturers to offer a minimum number of electric vehicles. If we want people to buy them, there has to be some availability, but that is often not the case.

In the last budget, the government undertook to set up charging stations for electric vehicles along major highways, and in short order. One of the deterrents for people interested in buying an electric vehicle is precisely access to charging stations, which can still be problematic.

Firstly, are your organization and partners familiar with the federal government's plan to set up charging stations?

Secondly, were you consulted on the implementation of this plan?

Mr. Francis Bradley: Thank you for your questions.

[*English*]

The membership of the association has been engaged in those conversations about the mandates since the very beginning. We continue to engage. The process has certainly not come to a landing. There are a great many challenges as we move forward to the future.

Many of our members are now getting involved, as well, in electric vehicle charging infrastructure because of that lack of infrastructure. We are seeing that across the country, from coast to coast. We have been in conversation, as the EV mandate and EV discussions have been moving forward, with the Government of Canada on its strategy.

[*Translation*]

Mrs. Julie Vignola: You say you are engaged. Can you tell what that involvement entails, not only in discussions, as you said, but concretely, in setting up stations?

I would also like to hear more about the challenges you mentioned and how they can be addressed, if you have any solutions.

[*English*]

Mr. Francis Bradley: Most of the challenges I'm talking about are not specific to the mandates themselves. The challenges we're attempting to address are more technical challenges that we have with the timing of upgrades to the distribution system, so from a system's standpoint, and increasingly working with customers to ensure that the kind of service the individual customers have is appropriate for what they will require.

For many customers, the current electricity service they receive at their home is insufficient for the kind of charge that will be required if they're going to have home charging. A number of approaches are being looked at. Up until now, most of this has been done by the individual customers themselves, but increasingly the industry is getting involved in these discussions. The timing of the deployment of charging infrastructure has an impact on distribution systems. We want to make sure we have greater visibility in this space.

[*Translation*]

Mrs. Julie Vignola: Given our climate in Canada, would it be possible to have charging stations along our highways, or perhaps even electric highways?

How can your expertise be utilized so customers can have quick and easy access to charging stations on major highways, without having to go completely out of their way?

● (1710)

[*English*]

Mr. Francis Bradley: That is the challenge of everybody in the electric vehicle space right now: ensuring that we have that infrastructure. So far it's been a combination of private players, commercial operators, the utilities themselves, and governments and municipalities that are building out infrastructure.

That's so far, but this is an infrastructure that's being built out for a relatively low level of penetration. At the same time, we're trying to understand what's happening in other jurisdictions where we're seeing significantly higher penetration. We're trying to see what lessons we can learn from their rollouts, but most of those countries do not have the same geographic challenges we have in terms of the long distances that are driven.

The Chair: Thank you.

Ms. Collins, you have six minutes, please.

Ms. Laurel Collins: Thank you, Mr. Chair.

Ms. Hoicka, I understand that according to the OECD, around 38 clean energy technologies are considered market-ready and could be scaled immediately. You gave some examples of those technologies that the government could be better supporting and that would make a real difference. Can you expand on why it's so important to focus on rapidly scaling up these technologies that are currently available in the near term, before 2030?

Dr. Christina Hoicka: Absolutely. Basically, these are technologies that are ready to go and are implementable on fairly short time scales, as long as we have really good policy and program design, which means administrative, regulatory and economic instruments and that type of thing. These are technologies that are proven, so they can be implemented on a short time scale.

Some other technologies that are not proven on a short time scale—for example, nuclear small modular reactors—might be able to get to market after the 2030 time frame, but from all the evidence I've seen, including from the nuclear sector itself, they are not likely to be ready immediately.

The time frames are really important. If we don't meet the 2030 and then the 2050 time frame, the impacts of climate change become far more disastrous to current and future generations. We're already feeling that presently.

Ms. Laurel Collins: You mentioned nuclear, but what about carbon capture, utilization and storage? Does it fall into one of these 38 categories? Does it currently show the ability to bring down emissions that we would need by 2030 to keep warming below 1.5°C?

Dr. Christina Hoicka: Not currently, no.

Ms. Laurel Collins: Thank you.

Based on your research and experience, what is the biggest barrier facing renewable energy and energy efficiency technologies in Canada?

Dr. Christina Hoicka: In terms of their utilization, one of the biggest barriers is lack of policy for their uptake. We've had really successful policies in Canada, such as feed-in tariff laws that allowed for a lot of different types of communities and organizations to develop these. Europe is continuing this with the new energy communities and renewable energy communities laws.

That's one piece. A future issue will be around materials, because the materials that go into them are finite. Again, we can adjust that by putting resources, through Canada's tri-council, into research and development of materials for these types of technologies.

Ms. Laurel Collins: [*Technical difficulty—Editor*] Would you say the federal government has given clear, consistent policy direction that would enable investment in new infrastructure to meet the electricity needs?

Dr. Christina Hoicka: I've looked at—

Ms. Laurel Collins: I'm sorry, Ms. Hoicka. This was directed at Mr. Bradley.

Mr. Francis Bradley: We have clarity in some areas. We have clarity, for example, with respect to the price of carbon. That's one piece of the plank.

What we are lacking, really, is clarity in some other specific areas. One area where we would like to see some clarity is.... We would very much like to see an articulated national strategy for electrification.

● (1715)

Ms. Laurel Collins: I'm thinking about the Atlantic loop and the needed transmission lines between B.C. and Alberta. You wrote in an article this year:

> Unfortunately, though the federal government has been good at crafting and announcing aspirational targets and commitments, the electricity industry has been left wanting for details. In fact, during one week last spring, Canada had three different emission targets for 2030.

Can you describe the impact that this kind of policy incoherence has when we need to start building and we're running out of time?

Mr. Francis Bradley: The requirement to make investments in the order of—as was said earlier—somewhere between $1 trillion and $2 trillion requires a level of certainty that we don't have at this stage. That is what we're looking for. We need certainty in the ability to move projects through to completion. It simply takes too long to bring projects forward and get them adopted.

In that vein, if there are specific projects, one of the things we should be thinking about is some way to fast-track the best projects, as opposed to having them all in the same queue.

Ms. Laurel Collins: Thank you so much.

Ms. Hoicka, can you speak a bit about the challenges facing our electricity grids, in terms of both increasing electricity demand and the threats posed by increasing extreme weather events due to the climate crisis? Are there any solutions that you see to those challenges?

Dr. Christina Hoicka: Yes, absolutely.

I'll start with the climate crisis. What we're seeing around the globe and here in Canada—I've experienced it both in Toronto and in British Columbia—is around extreme events and weather hazards due to climate change. This could be extreme heat events requiring a lot of air conditioning. This could be events in which the grid infrastructure is overheated, which means, basically, that people are not getting the electricity they need when they need it.

In order to address this, what we really need to be thinking about is having more resilient grids, allowing and encouraging people to be prosumers and having behind the meter every type of resilient option possible with microgrids.

The Chair: Perfect. Thanks very much.

We'll now go to the second round with Mr. Mazier, for five minutes.

Mr. Dan Mazier: Thank you, Mr. Chair.

Mr. Bradley, the energy needs of rural and northern Canada are very different from those of urban Canada. Canadians who live in rural and northern regions use and pay for more energy. As someone who represents rural Canadians, I know that they are being unfairly burdened because of the government's energy and environment policies.

In the 2022 net-zero report that was prepared for your association, section 5.2 focused solely on the importance of not having a one-size-fits-all approach to energy policy in Canada. It says, "Approaches to energy system policy, planning and regulatory reform need to be anchored in the principle of respecting difference."

Can you expand on this and provide recommendations on how we can better address the unique needs of rural and remote regions when it comes to energy?

Mr. Francis Bradley: I thank the member for the question.

There are different approaches that need to be taken for different circumstances. I mentioned there are 10 provincial and three territorial electricity systems.

To the member's point, there are significant differences in the requirements for rural, remote and indigenous communities. So far, we are pleased to see that, at least in the evolving clean electricity regulation, there was a recognition that off-grid electricity will seemingly be treated differently from on-grid electricity systems. That is at least one example where we seem to see a recognition that there are differences between the connected systems and the disconnected systems.

To your point, there is a disproportionate amount of non-renewable generation that is required in these areas, and we need to ensure that we're bringing forward policies and programs to help those rural and remote communities.

Mr. Dan Mazier: Are independent power producers considered in that mix? When you were talking about off-grid.... I have always thought that, especially when you get into the rural areas, the distribution grid is under some tremendous challenges as utilities are trying to get power out to those rural areas. Have there been any more discussions among the old utilities across Canada, some kind of plan for how they're going to deal with independent power producers to actually achieve these goals? Is there any policy change happening to address this?

● (1720)

Mr. Francis Bradley: Well, within our association, we have both the incumbent utility companies and the largest independent power producers. They are members of our association, and they are also active participants in the discussions that take place among the CEOs around the boardroom table about the policies for the electricity sector writ large. We're not the association of electric utilities. We're the association of all the companies that are generating, transmitting and distributing electricity. Those views are part and parcel of what we bring forward.

Mr. Dan Mazier: Is there any concern about the decentralization of the electrical grid as it expands so much? That could spell trouble for reliability. Where is that conversation happening?

Mr. Francis Bradley: That's a terrific question. I think what we're seeing, and what we're going to continue to see, is two forces happening at the same time—both expansion and contraction taking place at the same time. To be able to meet those long-term targets that we have with respect to greenhouse gas emissions, we're going to have to significantly increase our grid-connected and grid-level power, but we're also going to have to massively ramp up what happens at the individual consumer level and at the community level. We're going to be seeing customers themselves increasingly becoming producers and part and parcel of this market.

So we're going to see the grid itself expand, but we're also going to see the role of individual consumers and distributed energy resources and community-level resources expand. All of those are going to be happening at the same time.

Mr. Dan Mazier: Okay.

There are many rural and remote communities that are having difficulty just accessing electricity or enough electricity. There's a company in my riding that's just starting a greenhouse to grow tomatoes locally. One of the main challenges they're facing, before they begin construction, is sourcing the electricity to operate, which is raising not only their electricity cost but also their operational cost to even get started.

How important is access to affordable energy for economic growth in Canada?

The Chair: I think we have to go to Mr. Weiler now. We're out of time. But you can answer that question in answering another question.

Mr. Francis Bradley: In one word, it is foundational. Absolutely.

The Chair: Okay.

Mr. Weiler, go ahead, please.

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

My first question will be for Mr. Bradley.

You mentioned the need to fast-track projects, as well as the short timeline for Canada to start shipments of green hydrogen to Germany, along with the agreement that was signed last month. Earlier this spring, Canada announced the regional energy and resource tables to align priorities in the low-carbon economy, funding and financing opportunities, and policy and regulatory approaches with different orders of government, business, labour and indigenous groups. With this policy, one of the areas that were highlighted with respect to Newfoundland was hydrogen.

How important do you see this type of process being to our ability to take advantage of the major opportunities that are going to be there when we're in a globally competitive market?

Mr. Francis Bradley: Thank you for the question. It is going to be critical that we have co-operation and collaboration between different levels of government, between different stakeholders. The energy and resource round tables have the potential, I think, to be important and critical as we move forward. We would like to see them rolling out with greater speed, because at least they will be bringing to the table the players who need to be part of these discussions and these dialogues at a regional level.

Mr. Patrick Weiler: Thank you.

You mentioned that one aspect of the framework that's in place is the price on pollution. The Government of Canada has proposed bringing in what are called carbon contracts for differences to be able to provide long-term certainty that the price on pollution won't be rolled back. How important do you see this type of policy being to driving investment in clean tech as well as renewable energy in Canada?

Mr. Francis Bradley: I think those kinds of approaches are going to be critical. We're talking about—particularly with the larger projects—assets that will last for decades. To be able to make investment decisions on assets that will last for decades, the certainty with respect to the business environment within which you're operating needs to be beyond the medium term.

Yes, there are concerns about the stability of the policy environment within which we're operating, and these types of contracts are certainly one approach that a number of my members are very interested in seeing move forward. The concern is that we would see potential rapid policy change and policy whiplash. We've seen that in some jurisdictions.

They may say that nature abhors a vacuum. Business and business decisions abhor chaos, and what we need is stability.

● (1725)

Mr. Patrick Weiler: Thank you.

My next question is for Dr. Hoicka.

You mentioned that there are gaps in terms of the areas where Canada should move on better supporting clean tech deployment. Canada, to this point, has accelerated the capital cost allowance for business investment in clean energy equipment and a 50% reduction in corporate income tax for manufacturers of net-zero emissions technologies, and in the budget this year we announced an investment tax credit of up to 30% for clean tech. From your point of view, where does the government have to go further than these particular tax measures?

Dr. Christina Hoicka: Thanks for summarizing that, and thank you for the question.

Those tax measures appear to me to be more on incubating and accelerating technology. Is that correct?

Mr. Patrick Weiler: They're investment tax credits.

Dr. Christina Hoicka: Okay.

Where I would say there needs to be more support is.... There are different stages of technology diffusion. One of the areas where technology tends to get really stuck is in the diffusion stage, which means making it into markets and making it into communities. What we need are basically the market pull types of regulatory and economic instruments and administrative supports, and I would say that Canada can uptake those.

Another piece is that you can also do targeted research support. For example, as I mentioned, that's targeting things like technology that will address congestion in cities, which is where most of the energy growth and electricity growth will go. That's a big piece. You can also target materials for different types of clean technologies, which are finite resources, and you can target things like wind turbines in Arctic areas.

The Chair: Thank you.

[*Translation*]

Ms. Vignola, you have two and a half minutes.

Mrs. Julie Vignola: Thank you, Mr. Chair.

Ms. Hoicka, in recent decades, some LEED certified houses and buildings have gone up. This is not a required standard, however, and new buildings keep going up that are concrete blocks with little or no energy added value.

Firstly, what incentives would encourage the construction of buildings that are energy efficient, self-sufficient in energy, or even energy producers?

Secondly, will we have to completely revamp our urban planning models in order to adopt models with significant benefits not only for preserving environments, but also for energy use and production? Which aspects should be considered in establishing such models?

[*English*]

Dr. Christina Hoicka: This is a really good question. Those are absolutely what we should be thinking about and where we should be going.

Addressing climate change and energy use at the urban scale is a really critical lever that we have. For example, having waste heat capture and usage on the neighbourhood scale would be a really great way to reduce waste heat, and also, then, to use waste heat and reduce fossil fuel emissions. Getting people out of cars and into public transit and walking, or on cycle lanes, those types of things will also dramatically reduce the energy used.

In terms of buildings, most of our buildings are already built, so what I have argued for in the past is to have innovative business models: to put the innovation into the business model around clusters of technology that can retrofit buildings, and to focus on convenience and also on cost, making sure that we reach the widest population possible. In terms of new buildings, I would say, again, that it's innovative business models in terms of the targets you wish to reach. All of those are really critical going forward, because this has to do with equity issues, with comfort and with climate change.

● (1730)

The Chair: Thank you.

You have your time, all of you who remain, but if you could come in under time, I'd be eternally grateful.

Ms. Collins, you have two and a half minutes.

Ms. Laurel Collins: Thank you, Mr. Chair.

Ms. Hoicka, how big a role do energy conservation and energy efficiency have to play?

Dr. Christina Hoicka: It's a very big role, as big as we can get it.

Ms. Laurel Collins: Can you speak a bit more about deep building retrofits? What do we need to do when it comes to energy efficiency and on the conservation side?

Dr. Christina Hoicka: A deep building retrofit can bring down energy use in a building by 50% to 80%, whereas a regular retrofit—when we're not thinking in terms of systems—is only 20% to 30%. If we focus on the method by which we'll do it, we can get those really deep reductions. That's how we're going to support populations, households and businesses in this energy transition, and concerns around any rising costs—for example, the inflation we're experiencing right now. That's a very protective aspect. It will also improve comfort and resilience for building occupants.

As I said, the technologies are out there. The innovation needs to be around business models that address labour, address investment and address convenience. A lot of these types of renovations are not convenient for people.

Ms. Laurel Collins: When it comes to support for the deployment of renewable energy, how would you say Canada compares on the international stage? Are there specific examples of countries that you think we should be looking at?

Dr. Christina Hoicka: Canada did pretty well with the feed-in tariffs, but then a lot of those programs and a lot of the contracts were cancelled, which is unfortunate.

A few places that are leading.... Vietnam had one of the most rapid uptakes of renewable energy, starting with solar photovoltaic and then wind. This was because of the alignment of a whole range of regulatory, economic and knowledge support incentives. It had the most rapid uptake of renewable energy ever seen, I think, in a really short period of time.

The European Union is now moving forward with a new understanding of grid distribution by looking at something called renewable energy communities and energy communities. This is looking at things like microgrids, virtual power plants and the clustering of tech in different communities.

The Chair: Thank you.

Go ahead, Mr. Dreeshen.

Mr. Earl Dreeshen: Thank you very much, Mr. Chair.

I've been waiting for a while to respond to Mr. Duguid's question about an energy corridor from Manitoba back over to Alberta. Perhaps we could get one from Alberta all the way to the east coast and to the west coast, so that we can replace some conflict oil and help our economy so that we have the money available to develop new resources and new resource concepts, as we've been talking about.

On a more serious point, Mr. Bradley, the question is on charging stations. A Tesla going from Edmonton to Calgary last winter, when it was -40°C, made it halfway on a full charge. It had to stop. It couldn't charge outside. It had to go inside in order to charge enough to make it the rest of the way. There is a long way to go in order to get to the stage where consumers who don't live in a city are going to say, “Maybe this is something we might try and might consider.” However, when a government puts a full blanket ban that simply says, “That has to be it; we're not going to sell any more”, there are concerns and issues.

When we talk about electricity—and you would be the one who could tie into this, as you're the distributor of electricity—could you supply us with the full life-cycle costs of each of the energy sources that we plan on using in the future and compare them to those energy sources that we presently use?

In 15 to 20 years, we're going to be replacing all the windmills and all the solar panels. We're going to be dealing with those types of technology changes. We have issues as far as oil and gas are concerned, as far as nuclear is concerned and as far as building dams is concerned.

Who looks at the amount of energy that is used to implement and produce each and every one of these energy sources that we either have or plan on having in the future?

● (1735)

Mr. Francis Bradley: Thank you for the question.

Those kinds of determinations are made in each of the jurisdictions. Each jurisdiction has a different approach to it. Some provinces have integrated resource-planning processes. Some provinces have an independent system operator that is charged with undertaking those sorts of studies.

Yes, on the life and the life cycle of some of these generation sources, we don't know yet and, indeed, we're going to have to see. We're used to building technology that lasts for decades and decades. In the case of some of our hydro plants, we have hydro plants that were built in the late 1800s on the Niagara River that are still operational today. Now, they've been upgraded, and they continue to be upgraded on an ongoing basis, but we don't know at this stage if that is going to be the future of wind generation and if what occurs in wind generation will be a changing out of some of the parts.

The same is true of other new generation sources as well. We just don't know yet. We don't have enough experience, but there are responsibilities in every jurisdiction to undertake those studies and make those determinations.

Mr. Earl Dreeshen: On what I mentioned first about the electrical grid and being able to get energy from Canada around the world, we see what is happening in Europe right now, where their industrial heartland is being completely undermined by the fact that they need to make sure they have enough electricity to keep their people going for the winter. That is the biggest concern. Unless we are prepared to look at all possibilities and to use what we have, which in Canada is an energy source that the whole world is still using.... I really think it's important that we try to find the right mix so that eventually we are able to help fund those renewable energy sources.

Do I have much time, Mr. Chair?

The Chair: No, not really.

Mr. Earl Dreeshen: Okay. I'll leave it at that. Thank you.

The Chair: Thanks, Mr. Dreeshen. I appreciate it.

Mr. Longfield is next.

Mr. Lloyd Longfield: Thank you, Mr. Chair.

Mr. Bradley, we've had a lot of testimony today around the complex nature of electrical distribution. Provinces and territories and indigenous communities all have standards that they operate under. The federal government has some role to play—and could play—in terms of harmonizing some of the standards, but that then needs approval by the provinces and territories.

This clean tech study that we're working on has electricity as one of the key areas where Canada could advance clean technologies. There are things like the combined heat and power operating in Japan or the Energiewende program in Germany that's operating successfully.

We have some challenges constitutionally. Could you maybe talk about how your industry is trying to bridge some of the challenges to harmonizing that we face?

Mr. Francis Bradley: Yes. Thank you for the question.

As a representative of a national association essentially representing an industry that is principally provincially based, this is what we do. We spend the bulk of our time trying to bridge those divides. As a country, we've been successful in the past at having federal and provincial co-operation in areas that are principally a provincial responsibility.

As you know, as a country we've been quite successful in some of these endeavours in the past. If you look at the challenge that we're facing as an economy to get to net zero by 2050, this challenge is probably as great as it was when we wanted to introduce universal health care. We should be thinking of it in those kinds of terms: in terms of requiring that kind of effort.

● (1740)

Mr. Lloyd Longfield: We see this through carbon pricing and the disagreements with the provinces and even going all the way to the Supreme Court to try to fight over jurisdiction on that.

If you have any other comment about what we could include in our report in terms of the importance of Canada working together on this, go ahead, and then I'll turn my time back to the chair.

Mr. Francis Bradley: If we have additional comments, we'll provide them in writing.

Thank you.

Mr. Lloyd Longfield: Thank you very much.

The Chair: Thank you, witnesses, for your very clear, definitive, expert and experienced opinion in the area. I'm sure your testimony will be extremely valuable for the report that the analysts will be writing.

With that, I would ask for a motion to adjourn.

Some hon. members: Agreed.

The Chair: We'll see you on Friday. Take care.