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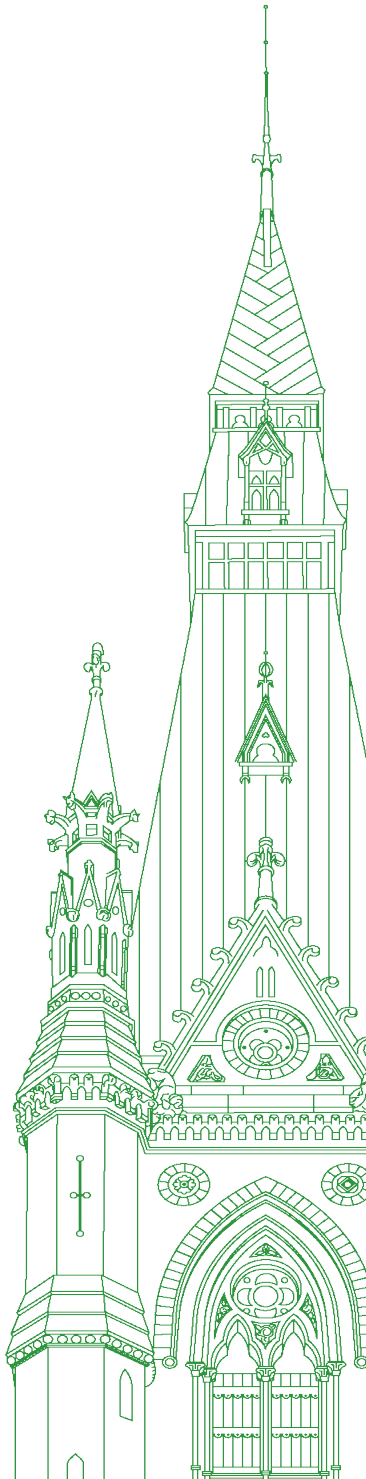

Chair: Mr. Francis Scarpaleggia

Standing Committee on Environment and Sustainable Development

Tuesday, October 4, 2022

● (1545)

[*English*]

The Chair (Mr. Francis Scarpaleggia (Lac-Saint-Louis, Lib.)): I call the meeting to order.

Good afternoon, members of the committee and witnesses.

Welcome to meeting number 29 of the House of Commons Standing Committee on Environment and Sustainable Development. Today's meeting is taking place in a hybrid format.

You may speak in either official language. When you're not speaking, please put your mike on mute. This is for those who are at home or somewhere that's not here. If you need to raise your hand, you can use the yellow hand icon.

I'm told that, unfortunately, Mr. Létourneau, who was supposed to appear on the first panel, did not receive his regulation headset in time. Therefore, he will be invited to appear at our next meeting. This means we will have five witnesses at that meeting.

[*Translation*]

The first panel comprises three witnesses, each of whom will have three minutes to make their presentation.

Let's start with Dr. Madeleine McPherson, assistant professor at the University of Victoria, who's appearing as an individual.

Dr. McPherson, you have the floor for three minutes.

[*English*]

Dr. Madeleine McPherson (Assistant Professor, University of Victoria, As an Individual): Thank you so much for having me.

Good afternoon, everyone.

My name is Madeleine McPherson and I'm an energy systems modeller at the University of Victoria, where I lead a team of researchers who develop models that focus on how to decarbonize our energy systems.

What we're seeing is that the electrification of transport and heating systems is at the heart of decarbonization, but it will only work if our power systems are decarbonized first. Some of our provinces' power systems are already decarbonized—B.C., Manitoba and Quebec are largely powered by hydro—but the fossil-dependent provinces will see enormous wind and solar build-outs to meet carbon targets at a rate we've never seen before.

To get to a net-zero power system by 2035, our modelling is showing that we'll need over 100 gigawatts of wind across Canada by 2050. Alberta alone will see about 40 gigawatts of wind by 2035 and over 80 gigawatts of wind by 2050. This will constitute most of their energy needs. It is an incredible amount of infrastructure to build in not very much time.

This is a huge opportunity, but only if we have the programs in place to train people, the supply chains to get equipment and the policies that streamline processes. That only solves one part of our problem, because once we build this system, operating a renewable base grid requires flexibility to mitigate variability—those times in the year when the wind doesn't blow or the sun doesn't shine.

Batteries and other kinds of storage will no doubt have a key role to play, but each of these future high-wind provinces conveniently neighbours a hydro-rich province. This characteristic, which defines the energy fabric of our country, is an opportunity that we can't ignore. If provinces had more transmission linkages, hydro in one province could balance the wind in its neighbouring province. Interprovincial transmission connection is coming out of our modelling work as a no-brainer.

The federal government has a critical role in making this happen, though. First, there's the question of funding for that infrastructure, either directly or by de-risking private sector investments. Perhaps more importantly, the federal family can help facilitate a conversation between the ministers and premiers in the provinces. One thing that's coming up in a lot of our conversations is ensuring that rates remain affordable and equitable, and that's coming out as a huge concern.

You can also start the engagement process with indigenous rights holders to ensure that free, prior and informed consent happens, ensure that benefits flow to indigenous communities, and ensure that this massive effort is a force for decolonization and a pillar of reconciliation.

I think there's a clear role for the federal government to play when it comes to providing leadership and direction on this issue. What's hopeful is that if the federal government and provinces work together to achieve this, I think we can get to net zero, but we have to start now.

● (1550)

The Chair: Thank you very much, Professor McPherson, for that very clear presentation.

We'll go now to Mr. Brian Kingston, president and CEO of the Canadian Vehicle Manufacturers' Association.

Go ahead, Mr. Kingston.

Mr. Brian Kingston (President and Chief Executive Officer, Canadian Vehicle Manufacturers' Association): Thank you, Mr. Chair and honourable members. Thank you for the invitation to be here today as part of your study on clean technologies in Canada.

The Canadian Vehicle Manufacturers' Association, CVMA, is the industry association that represents Canada's leading manufacturers of light and heavy-duty motor vehicles. Our members include Ford, General Motors and Stellantis, which is also known as FCA Canada.

Canada's auto industry is responsible for $13 billion in annual economic activity, 117,000 direct jobs and approximately 370,000 jobs in the aftermarket services and dealership network. The industry is our second-largest export sector, with $36 billion in exports last year.

The auto industry is one of Canada's leading green technology sectors. Electric vehicles and their related infrastructure now account for fully 40% of energy transition investment in Canada.

It's CVMA members that are really at the forefront of this transition. Over the past two years, we've had some excellent news in Canada. Ford, General Motors and Stellantis have announced investments of $13.5 billion, which will create over 6,000 direct jobs and tens of thousands throughout the auto supply chain. The majority of this investment is dedicated to EV assembly and the battery supply chain.

We recommend the following actions to realize the full economic benefits of clean technologies in the auto industry and to ensure that Canada achieves its climate objectives.

Priority number one is that we have to keep up and keep aligned with the United States. The Inflation Reduction Act is arguably the most significant development for Canada's auto sector since the passage of CUSMA. The U.S. is committing more than $370 billion U.S. to fight climate change. This includes massive new investments in EV manufacturing, sales and related infrastructure. The federal government should move swiftly to identify and react to competitive gaps in our manufacturing sector that will be exacerbated by this act. Particular attention should be given to battery manufacturing, where the U.S. now has a significant advantage.

Number two is that we need to boost EV adoption in Canada. We need a comprehensive plan to help more Canadians make the switch to electric and achieve our climate goals.

According to RBC's recent assessment of the investments required to achieve net zero by 2050, spending on EVs will need to grow from $4 billion annually right now to approximately $22 billion annually.

Priority, of course, should be on building a comprehensive public charging network; investments in clean, affordable and reliable electricity generation and grid infrastructure; and improvements to the consumer purchase incentive program, also known as iZEV, to make EVs affordable for all Canadians.

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

The Chair: Thank you, Mr. Kingston.

Last, but not least, we have Ms. Natalie Giglio, senior associate of business development at Carbon Upcycling Technologies.

Go ahead, please.

Ms. Natalie Giglio (Senior Associate, Business Development, Carbon Upcycling Technologies Inc.): Good afternoon.

My name is Natalie Giglio, and I'm here representing Carbon Upcycling Technologies. I'd like to thank you for inviting me to speak on behalf of my company today.

Carbon Upcycling's technology is simple. We capture and utilize CO2 directly in a single-step, low-energy system that uses only two main inputs. The first input is an industrial by-product or natural mineral that is typically sent to landfills. The second is CO2 directly from a point source of emissions. We combine the waste materials and CO2 in our system to produce cement replacements that actually make concrete stronger. Our technology will enable Canada to build climate-resilient concrete infrastructure.

Carbon Upcycling is a Canadian-founded company based in Calgary, Alberta. We operate a commercial facility in Calgary. Earlier this year, the Honourable Chrystia Freeland visited us to see the progress we are making in deploying CCUS in Canada. Over the last eight years, we have successfully scaled up our technology 10 million times. That scale-up was largely supported by $12 million in government funding, and now we've begun raising capital investment.

As I discussed, our first input is an industrial by-product or natural mineral. Across Canada, there are abundant supplies of these materials that are simply underutilized. Carbon Upcycling turns those materials into valuable cement replacements, so we can continue to use concrete without increased emissions. Our second input is CO2. Canada has 15 operational cement plants, each emitting CO2. Carbon Upcycling's technology directly captures and utilizes that CO2 from the cement plants before that CO2 even has a chance to enter the atmosphere.

Our technology is being scaled up in Canada today. We're working with some of the most influential partners on that journey. We partnered with the City of Calgary to deploy low-carbon concrete sidewalks, and we are actively working with some of Canada's largest cement and concrete companies.

In order to keep scaling this technology in Canada, we see three areas where we can be better supported. First, funding needs to enable technology to scale quickly. Companies and projects need to be granted funding now, so we can build our first commercial units before 2030. Second, regulatory barriers need to be reduced or removed in order to foster innovation. This can be done by adjusting federal procurement language. Third, CCUS needs to be incentivized, so it can be rapidly deployed and scaled. The investment tax credits for CCUS have set a solid framework for supporting companies like ours. We have submitted our recommendations on ITCs, so they can better support a more holistic CCUS ecosystem within Canada.

With that, I hope you continue to support and follow our journey, as we're on track to becoming one of the most impactful carbon utilization companies of this decade. If you are ever in Calgary, I would be more than happy to host a tour at our facility.

Thank you.

● (1555)

The Chair: Thank you very much.

We will now go to our two rounds of questioning, starting with Mr. Seeback for six minutes.

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

Brian, it was interesting to hear you mention the IRA. We've heard about that at this committee several times during this study. What would you say needs to be done to compete with the IRA, specifically in the zero-emissions vehicle space?

Mr. Brian Kingston: Thank you.

The most significant component of the IRA, as it relates to auto manufacturing—particularly zero-emissions vehicle manufacturing—is what's called the "advanced manufacturing production credit" in section 45X of the IRA. What it does is provide a refundable credit of $35 per kilowatt hour to companies that build battery cells or modules in the United States.

This is a game-changer. It's the most significant incentive we've seen in a very long time, and Canada now has to compete with not just municipal and state-level governments, but the federal government. That tax credit alone is estimated at a cost of $30 billion U.S. If we want to win battery investments, we have to match that.

Mr. Kyle Seeback: Is there any comparable, or relatively comparable, program currently being offered by the Canadian federal government?

Mr. Brian Kingston: No. Budget 2021 introduced a zero-emissions manufacturing tax credit, but it's very narrow. The timelines are narrow, it's not refundable, and the calculation of eligible income is very precise, so it's not comparable. It had potential and got a lot of attention when it was announced, but the definitions are too narrow. It won't even come close to what the U.S. is offering.

Mr. Kyle Seeback: Would you hazard a guess about what will happen if the federal government in Canada doesn't come up with similar incentives with respect to the battery sector?

Mr. Brian Kingston: If we don't match what the U.S. has done, I think it's safe to conclude that it's highly unlikely we will see significant battery investments made in Canada going forward.

Mr. Kyle Seeback: I want to turn quickly to this. You have a dashboard that your organization has put up with respect to the incentive and charging gap, and the Road to 2035 zero-emission vehicle mandate.

We had a gentleman here at committee last week, Monsieur Rochette. I brought up the charging gap. If I look at the dashboard, it says that right now 1,660,338 is the gap in Canada. The gap is not closing quickly. He said basically that's crazy. What would you say about that?

Mr. Brian Kingston: There are differing estimates for what is required in terms of public charging infrastructure. Our assessment is based on what leading jurisdictions in the world are doing and what ratio they're using. Typically, the ratio that's determined is, how many EVs on the road per public charger do you need?

What we see when we look at California, Germany and the European Union is that the ratio they use is 10:1. In Canada, the federal government's most recent assessment put out by NRCan is suggesting that we need 43 EVs on the road per public port. I don't understand why we've chosen such an unambitious target. I think that's extremely concerning if we're going to help every Canadian make the switch. While you can debate which ratio is the best, I know that we are not currently on track. Of the 34,000 chargers that the government has provided funding for, only 2,500 are operational.

The government's own study admits that we need to get to over 700,000 by 2050 to support an electrified fleet. I don't see a path from 2,500 to 700,000, and I would argue that 700,000 is far too few.

● (1600)

Mr. Kyle Seeback: What you're saying is that Europe is using the standard of 10 vehicles per charger, but somehow, the Government of Canada is saying that the correct number is 43, more than four times higher.

Mr. Brian Kingston: That's correct. The European figure is one public port for every 10 EVs on the road. In Canada, the recent study says that we need 43 EVs per port.

Mr. Kyle Seeback: How much time do I have, Mr. Chair?

The Chair: You have less than two minutes.

Mr. Kyle Seeback: I now want to turn to the incentive gap part of your chart. We know that there is a zero-emission vehicle mandate coming. By 2035, you can no longer purchase an internal combustion engine. The adoption right now is somewhere around 5% or 6% of new vehicles that are EVs. What would you say is the main impediment and the reason why we're nowhere close to 100%?

Mr. Brian Kingston: Affordability is the number one impediment. Survey after survey, from both industry and government, confirms that's the biggest barrier. Recent data that we've just had a look at, from J.D. Power, which looks at transaction price, shows that there is a gap of $20,000 in the most popular segment, the compact SUV segment, between EV and ICE.

Canada's incentive is $5,000, and in our most populous province, Ontario, there is no incentive. Asking a middle-class family to increase their vehicle budget by $20,000 is highly unlikely in the current economic environment. We need a bigger incentive, first and foremost.

Mr. Kyle Seeback: Would you say the lack of charging infrastructure is also a problem right now?

Mr. Brian Kingston: Number one is affordability and price. Number two is charging. Those are the two big barriers that consistently come up.

Mr. Kyle Seeback: Those are my questions.

Thank you.

The Chair: Thank you, Mr. Seeback.

Next is Ms. Thompson.

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

If could, I'll begin with Ms. Giglio.

Your company is doing some truly innovative work in utilizing circular economy principles to both reduce greenhouse gas emissions and produce better products. Would you please discuss how putting a price on greenhouse gas emissions is essential for clean technologies to be able to compete on a clear playing field?

Ms. Natalie Giglio: For our company specifically, we're looking at making our technology economically available without the need for a price on greenhouse gas emissions. Carbon credits and pricing schemes are an additional benefit to our technology specifically, but that's unique to our business model.

For the rest of our industry and for the rest of the technology that we need to bring to market, it's extremely important. That factor itself is going to be what drives our partners—the big cement companies, the big heavy emitters—to invest in companies like ours faster, if they have this price chasing them down to invest and to bring infrastructure online to decarbonize their systems.

Ms. Joanne Thompson: Thank you.

Mr. Kingston, I'll now move to you, if I could.

In what ways could Canada's current regulatory and policy framework facilitate or hinder the realization of the country's potential in the battery supply chain?

Mr. Brian Kingston: Sure. Thank you.

The most important thing for the Canadian economy and the auto supply chain is our integration with the United States. That's really what's underpinned so many of the investments that have been made here. Over 90% of the vehicles that we build end up in the United States, so ensuring that we continue to align our regulations with the U.S., from a manufacturing perspective and from a safety perspective, is key.

One big element of this is the fact that we have aligned tailpipe regulations—aligned with the EPA. That's been pivotal to increasing the efficiency of vehicles and encouraging this integrated market.

I would say that that should be our biggest priority: to keep an eye on the U.S. and keep aligned.

Ms. Joanne Thompson: Thank you.

On the same thread, what changes would you make to federal policies and support programs to ensure that Canada realizes its EV battery supply chain potential?

● (1605)

Mr. Brian Kingston: First and foremost is a response to the Inflation Reduction Act.

We need to move quickly and understand those competitive gaps. We don't have the fiscal firepower to match the U.S. $30-billion tax credit, but we do have some unique advantages in the supply chain—critical minerals being a great example. Where we do have those competitive advantages, we have to match what the U.S. is providing companies to make sure that investment still flows to Canada.

Ms. Joanne Thompson: Thank you.

Continuing on, are there lessons from Canada's successes to date in the EV battery sector that can be applied to other tech sectors? If so, could you discuss that?

Mr. Brian Kingston: Yes. I think the big lesson, particularly over the last two years in the success that Canada has had in attracting some investment into EV manufacturing, is that a lot of it is because of programs like the strategic innovation fund and the net-zero accelerator that was attached to that. Companies took note when the government announced major incentive programs that were dedicated to zero-emission or net-zero technologies.

I think more of that—and applied to other sectors—is really important. Companies are looking to invest right now, and if governments are out explaining the programs they have on offer, it does get attention.

Ms. Joanne Thompson: I want to go back to a point that came forward last week with another witness. It aligned with the realities of how quickly the technology is expanding and shifting with the investment in infrastructure.

Could you speak to that in terms of projecting five or 10 years down the road, when we know the technologies around EVs are shifting so rapidly?

Mr. Brian Kingston: I'm sorry. Do you mean in terms of charging infrastructure?

Ms. Joanne Thompson: Yes.

Mr. Brian Kingston: There's no doubt that the technology is shifting rapidly.

In total, right now, global automakers are investing about $550 billion U.S. into this technology through 2030. This is why one of the big asks that we've had of government recently is to engage more with automakers on charging infrastructure because we're bringing new vehicles into the market with new technologies at a very rapid pace, and some have much larger batteries that require different paces and speeds of charging.

There's a lot happening, and it does make it difficult to forecast out what the technology will look like and how much of it we need. What we do know is that more and more EVs are coming to market, and Canadians are going to need more infrastructure to make that accessible for them.

Ms. Joanne Thompson: Thank you.

I'll move to Dr. McPherson.

In one of our meetings last week, other witnesses commented on the funding programs needed to support clean technologies and recommended that they be better harmonized to allow for faster deployment of clean tech. Do you agree with that? I would really appreciate your comments on that.

Dr. Madeleine McPherson: Yes, definitely.

The deployment, especially of renewables right now, but also of transmission infrastructure and EV charging and basically the technologies that we have on deck now.... Getting those in the ground is hugely important and a huge challenge. We have only 13 years between now and 2035. There's obviously a lot of research and development that can go into improving technologies, but at this moment in time, I think deployment—and policies and funding for accelerated deployment—needs to be a top priority.

The Chair: Sorry, we'll have to move on.

Ms. Joanne Thompson: Thank you.

The Chair: We'll go to Madame Pauzé for six minutes.

[*Translation*]

Ms. Monique Pauzé (Repentigny, BQ): Thank you, Mr. Chair.

I'd like to digress for a moment on the issue of the problems we're experiencing, with headsets in particular. I know we'll be discussing the possibility of Parliament sitting in hybrid format in perpetuity. I'd like people to really think about it. Because of these problems, the witness we'd suggested, Mr. Létourneau, will be appearing at the following meeting. As a result, I'll have half as much time to ask him questions. That's all I wanted to say. Now, back to the issue of renewable resources.

Ms. Giglio, at the end of your presentation, you spoke of the need for a solid framework around the CCUS expense tax credit for companies such as yours. You added that you'd submitted your recommendations to better support a more holistic CCUS ecosystem.

I can recall hearing about carbon capture and storage in another context, one in which CO2 is used in a very different way. In this particular context, the idea is to scrape the bottom of deposits that cause global warming.

You seem to proceed differently. In terms of your company's track record of greenhouse gas emissions, are they lower than those that took a different approach, one that doesn't involve capture or storage of carbon?

● (1610)

[*English*]

Ms. Natalie Giglio: Carbon Upcycling is focused on turning CO2 into value-added products. We don't store CO2 underground or in the oceans. We put it into materials that can be used in transportation networks, in our sidewalks or in the infrastructure in our buildings, wherever concrete is used. That's where our company is focused.

There is room for storage underground, but I think the real change in Canada's ability to be a leader is in helping support technologies that are taking CO2 and turning it into valuable products. That's what we do.

[*Translation*]

Ms. Monique Pauzé: So you're mainly involved with cement products.

Have you implemented any energy efficiency technologies in your own facilities?

[*English*]

Ms. Natalie Giglio: Yes. Our technology doesn't use any added heat, water or fossil fuels to produce and capture the CO2. We take it directly from a cement kiln and capture it into that industrial by-product or natural mineral, and then that material permanently holds on to the CO2 and puts it into concrete. We ourselves don't generate any emissions. We capture it into the material.

[*Translation*]

Ms. Monique Pauzé: Have you heard of ECOncrete, which manufactures green concrete without any capture? Do you know if they're using the same technology?

[*English*]

Ms. Natalie Giglio: I have not heard of ECOncrete, but there are multiple angles in the concrete sector. There are people who make the concrete blocks or Jersey barriers, the precast formed concrete, and then there are folks who make what goes into sidewalks—the wet concrete that comes out of the trucks.

There are technologies to utilize carbon on both sides.

[*Translation*]

Ms. Monique Pauzé: Okay, thank you very much.

You talked a lot about procurement in your presentation. What strategic measures could we recommend the federal government take in its procurement policies?

[*English*]

Ms. Natalie Giglio: What I would suggest is changing the specification language to be about performance, and not a prescriptive mix where you say you need to have this many kilograms of cement and this many kilograms of aggregate and sand. We want it to be performance-based, to say, "Use whatever ingredients you need to make this strength of concrete."

That's going to be what allows innovations like ours to be included in procurement and infrastructure that the government funds.

[*Translation*]

Ms. Monique Pauzé: A researcher and academic who testified, among other things, about the efficiency of energy-efficient buildings reminded us of the absolutely colossal amount of funding that Canada has doled out to oil and gas since the 1970s. She believes this trend needs to be reversed as soon as possible. Excluding the 400-some technologies identified in the ETP Clean Energy Technology Guide, this lady stated that 38 of these technologies were ready to be brought to market. With proper support, they could be scaled up immediately.

If you had to select some clean technologies to prioritize in the development of policies and programs, which would they be?

[*English*]

Ms. Natalie Giglio: That's a big question. I would say that carbon utilization as an entire industry, where you take that CO2 and turn it into value-added products.... It can go into concrete, fertilizers, chemicals, beyond just infrastructure. There are many companies out there that have great ideas and need the platform to bring CO2 into those valuable products.

[*Translation*]

Ms. Monique Pauzé: How much time do I have left, Mr. Chair?

The Chair: You have 40 seconds left.

Ms. Monique Pauzé: I'll make another brief comment, then.

If we redirected funds to renewable energies and energy efficiency, spending in the area is liable to increase 100-fold overnight. Obviously, I'm basing this comparison on what's been invested in fossil fuels.

The Chair: Thank you very much.

Ms. Collins, the floor is yours.

● (1615)

[*English*]

Ms. Laurel Collins (Victoria, NDP): Thank you, Mr. Chair.

My first question is for Dr. McPherson.

The importance of our electricity grids is something we've heard about from a number of witnesses. We need to move toward electrification to reduce our emissions. You identified interprovincial grid connections as a key piece of this. You spoke a bit about the role the federal government can play. The American Inflation Reduction Act has been mentioned a number of times today. The U.S. is investing billions in renewables, grid infrastructure, and storage.

In some ways, it feels like Canada is positioned really well, with abundant non-emitting sources, albeit in different regions, but it feels like we're falling behind. It feels like grid connections aren't moving forward as quickly as we'd like to see.

Can you talk a bit more about what you think federal leadership would look like, in terms of both the scale of funding and working with the provinces and indigenous governments?

Dr. Madeleine McPherson: That's exactly right. We're positioned really well in many ways. Many of our provinces are already largely decarbonized. In some ways, we're ahead of other jurisdictions that are still working on decarbonizing their power systems. At the same time, we obviously have provinces that still depend a lot on fossil energy, or fossil sources, for electricity. What we really need at this point is to be strategic about using the assets that we already have to help decarbonize the power systems in the provinces that really need to get there.

Coming back to Brian's point on EVs, and some of the other conversations that we've been having around electrification, it really only works when our power system is decarbonized. There aren't a lot of carbon benefits, or decarbonization benefits, from driving an EV charged on a power system that is really fossil-intensive. At the same time, many of those provinces that have fossil-intensive grids have really excellent wind resources. Again, we're kind of lucky in that way.

It's a question of getting those grids off fossil fuels first, which means a lot of wind deployment—other technologies, too, but a lot of wind deployment. The variability of operating that grid really can be helped by transmission linkages with the other provinces.

Federal leadership in that space really looks like helping the provinces talk to one another to really figure out how to have that different rate structure between different provinces. Some are vertically integrated, and others are open markets. A lot of discussions need to happen to help get the provinces to do that interprovincial transmission connection. The federal government could play a role in helping to have those conversations and bringing the provinces together to do that.

Ms. Laurel Collins: Currently, the rate of growth for renewables in Canada is among the lowest in the G20. It seems like you're saying that regardless of the energy mix, as we move forward, our electrical grids are going to be a key part of reaching our targets.

Do you have a sense of the scale of investment that you would like to see from the federal government in order to support both our move toward renewables, wind power, and others, and this critical piece of building out our transmission lines and interprovincial grid connections?

Dr. Madeleine McPherson: Yes. The highest rate of renewable deployment that we've seen in Canada is about 10 gigawatts. That happened between about 2011 and 2015. That was sort of our record for wind and solar deployments. Moving forward, what we'll need to see, on average, is about 50 gigawatts, or about a fivefold increase, in addition to previous deployment levels.

The good news is that wind—and to a lesser extent solar, but wind in particular—is already competitive in market forces. Private investors are already doing a lot of the investment in that, so I think signalling, as far as the deployment of wind goes.... The price on carbon really helps to make wind more competitive, but I think derisking those investments and making the permitting processes for those investments, particularly in wind...would be really helpful.

I think what we're going to see is that as soon as those provinces get to 30% or 40% penetration of wind on their systems—if we look at other jurisdictions—they're going to start running into operational issues around variability. That's really where that transmission interconnection piece comes into play. The reason I'm pushing more on the transmission piece right now is that we're seeing that this will be an issue on the horizon.

The process of building interprovincial transmission is just so time-consuming, especially if we want to do it properly and if we want to do it in collaboration with indigenous communities. It's a lengthy process. That's why we really have to start on that now.

● (1620)

Ms. Laurel Collins: Thank you so much.

How much time do I have, Chair?

The Chair: Your time is essentially up. You have about 10 seconds.

Ms. Laurel Collins: Okay.

It just seems that those interprovincial connections are critical to reducing Canada's emissions and keeping the global temperature rise below 1.5°C.

Thanks so much.

The Chair: Thank you.

Mr. Carrie, you have five minutes, please.

Mr. Colin Carrie (Oshawa, CPC): Thank you very much, Mr. Chair.

I'd like to start with Mr. Kingston.

Coming from Oshawa, I know the auto industry is hugely important for my community. There was a disappointment with some witnesses last week; we had some great Canadian innovation, but they basically went south of the border because there were no programs to support their particular companies here in Canada.

I want to get back to this whole idea of charging stations. You mentioned that, using the best estimates that are out there with the world leaders, we would need about four million charging stations. That doesn't take into account that it's actually pretty cold here. I've driven electric vehicles before, and sometimes at this time of year it starts to go down. So it may be even more, but even with those numbers, I estimate—and I'm not the greatest at math—that we need only 3,997,500 more charging stations to meet our goals, and we've been doing this for five or six years.

Have you seen any government plans that will allow us to meet those goals in the time frame that the government has actually set for industry?

Mr. Brian Kingston: As it stands right now, no, I haven't. The government's current plan is to build 84,500 chargers by 2027. Only 2,500 are operational. At the current rate of build and deployment, it seems highly unlikely to me that we'll get to that 84,000 target by 2027.

If you consider a fully electrified fleet, if we hit those targets 100% by 2035, that's nearly 39 million vehicles on the road by 2050. That's when you're going to require, if you use the 10:1 ratio, four million public chargers. That doesn't even include the estimate for multi-unit residential chargers, which are critically important to this. People who live in apartments and condo towers will need to be able to charge at home. The government's own assessment is estimating 5.6 million MURB ports, and I am not aware of any plans to build that out. That's going to be hugely expensive. It's possible, but it's a big lift.

Mr. Colin Carrie: Well, that's disappointing to hear. As I said, we had some bad news last week.

Listen, you guys are numbers guys. How much would four million charging stations cost at today's estimates?

Mr. Brian Kingston: I wish I could give you a good figure for that, but I don't have one. What I can give you is the estimate that NRCan has put forward to build the public charging network that it thinks we need, which I would argue is a little bit too small. They're estimating that it will cost $20 billion over the next three decades to build that number of public chargers. My estimate is four times that. Using very back-of-the-envelope math here, we're talking about $80 billion.

Mr. Colin Carrie: I'm thinking we might need a few more. I'd go five times, so I'm thinking maybe $100 billion for that. I just wonder who's going to pay for that with no plan.

We talked a bit about the grid. We've heard witnesses talk to us a little about the grid. I live in Oshawa, Ontario. There are some challenges with the grid. We've heard that in some communities you can plug in 10 of these electric cars and it will cause a brownout.

Do you have any idea what it would cost to upgrade our grid? Let's just look at Ontario. Do you guys have any numbers for us? We need to plan these things as a responsible government.

Mr. Brian Kingston: Unfortunately, we don't, and this has been something that we have been asking for. All of the local distribution companies are developing plans to accommodate more electrification, but as far as we're aware, nobody has pulled together a macro estimate for Ontario or for the broader Canadian economy of what we will require in every single jurisdiction to accommodate more vehicles.

It's safe to say that it's going to be in the billions, but there's no transparency or clarity on what that looks like or who's planning for that build-out to accommodate a higher uptake of EVs, and that's critical. We can build all the public charging ports we want, but if we don't have the transmission lines and the generation capacity, we'll be in a difficult position.

● (1625)

Mr. Colin Carrie: Yes, I can see that.

We had some ideas from witnesses that I thought were good ideas. One of them was that the government adopt a procurement process that would support different industries.

Do you know of a federal government plan right now that would assist the industry? In other words, does the federal government buy a lot of electric cars right now? If it does not, does it have something to do with there not being enough charging stations to plug these into to get the work done?

The Chair: You have 10 seconds, Mr. Kingston.

Mr. Brian Kingston: We've been asking the government to be a leader in this and to procure more electric vehicles if it wants the Canadian public to follow suit, so we'd like to see more.

Mr. Colin Carrie: Yes, that makes sense.

Thank you.

The Chair: Mr. Duguid, you have the floor.

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

I'm going to give a significant amount of my time to Mr. Longfield, as he has a very timely question to ask.

My one question is for Ms. Giglio.

I'll come to see Carbon Upcycling very soon, if you'll have me.

Ms. Natalie Giglio: I would like that. Of course.

Mr. Terry Duguid: I'll be in Calgary in the not-too-distant future, and I'll talk to you about that.

Back to the issue of procurement, the Government of Canada is the largest owner of buildings in the country. It is the largest procurer of cement, the last time I checked. I wonder if you can amplify on some of the comments you made earlier. Have you done any modelling on what difference it would make to industries like yours if the government had a procurement policy that significantly supported your sector and related sectors?

Ms. Natalie Giglio: When I look forward to when technologies like Carbon Upcycling's are at scale—specific to the cement industry in this case, because we're talking about concrete procurement—if Carbon Upcycling's technology was implemented at full scale across the cement plants, we could essentially cut the emissions from the cement and concrete industry in half, so there's a significant benefit to supporting technologies like ours.

Then, on the flip side, once it's at that scale or while it's scaling, on the procurement angle.... When we talk about low-carbon infrastructure, it's a very broad statement. A low-carbon building could be LED lights or better windows. There's a large breadth of what you can deploy.

When I think about concrete on the procurement side of things, you need to make sure that it talks about that performance basis, that you're not limiting yourself to specific specifications or quantities of material. I think that's going to be a big part of it, but it's part of a broader strategy.

The Chair: Go ahead, Mr. Longfield.

Mr. Lloyd Longfield (Guelph, Lib.): Thanks, Mr. Chair, and thanks for sharing some time, Mr. Duguid.

Mr. Kingston, you know I love the auto industry and the developments that are happening. Thank you for the work that you've done with us on our auto caucus.

I want to bring up a couple of questions or comments about some of your members, which are very positive. I'm very excited to see what's going on in the EV market in Canada. One investment is in Windsor, with Stellantis and LG doing an EV plant, which is a $5-billion investment, up and running for 2025. That's 2,500 jobs for Windsor, which is incredible news for Windsor.

There was testimony earlier today that we wouldn't be doing EV in Canada. Can you square that circle for me, please?

Mr. Brian Kingston: Thank you for all your support of the auto caucus and the industry.

Over the past few years, there has been $13.5 billion in new investment in Canada, including a $5-billion investment for a battery plant, as well as converting Windsor Assembly Plant to manufacture an electric vehicle. It's the same thing in Brampton. These are massive investments.

The government...full credit for everything that was done with respect to the Build Back Better Act. You'll recall a very concerning issue with respect to North American assembly. Now Canadian-built vehicles will be eligible for the U.S. EV incentive, which is critical.

Mr. Lloyd Longfield: Yes, we saved it.

Mr. Brian Kingston: The big question now, on a go-forward basis, is whether, given the scale of the IRA, companies will invest in Canada when they have an incentive so large in the United States.

● (1630)

Mr. Lloyd Longfield: Given the integrated supply chain.... When I look at General Motors, another one of your members, in Bécancour, Quebec, I see it is doing the battery chemical plant that will then supply other General Motors plants creating the batteries. Then they'll come back to the GM lines in Oshawa and Ingersoll. Both Oshawa and Ingersoll are committed to EV production. There are pickup trucks in Oshawa, and I can't wait to see those come off the line. In fact, I have my Colorado just sitting in the driveway—anyway, that's a whole other story.

The integrated nature of Canada supplying minerals and doing chemical processing, and then having the batteries come back for value-add in Canada with General Motors, is a great opportunity.

Mr. Brian Kingston: It's a huge opportunity.

The positive element of the Inflation Reduction Act is that the United States has put very specific guardrails and restrictions around which vehicles will qualify for incentives. A lot of that now hinges on sourcing critical minerals from North America or a free trade partner.

Canada is a trade partner, obviously, but we also have endowments of critical minerals that the U.S. doesn't have. I think we have a very unique opportunity in some niche areas to be part of that supply chain.

Mr. Lloyd Longfield: That's great.

Ford is also doing EVs in Oakville, so—

[*Translation*]

The Chair: Thank you, Mr. Longfield.

Ms. Pauzé now has the floor for two and a half minutes.

Ms. Monique Pauzé: Thank you, Mr. Chair.

My question is for Dr. McPherson.

You spoke quite a bit about the various levels of government. Indeed, the energy issue, and environmental issues in general, involves all levels of government, be they municipal, provincial or federal. Public policy harmonization and collaboration are critical. Beyond that, what has your research revealed about what concrete steps could be taken to facilitate collaboration between the various levels of government?

[*English*]

Dr. Madeleine McPherson: Thank you for that question.

As I was saying, one big thing that the federal government can do is help convene a conversation. One of the tangible things, actually, that NRCan has already done is provide $5 million to start an energy modelling hub. The idea of the hub is basically to bring together modellers and decision-makers. That is a tangible example of a way in which we can get different types of stakeholders, which could include different levels of government, at the same table having a conversation. They could use the insights from modelling to evaluate different pathways and explore the barriers and opportunities in those pathways to try to have a more consistent and evidence-based conversation.

That's one example that is, to some extent, already happening, in the sense that we've launched this energy modelling hub initiative. At this point, we are looking for people like you to come and use the capacity that we're building.

[*Translation*]

Ms. Monique Pauzé: I actually meant to ask you how much time it would take for it to launch. We're told that we're in a climate emergency. You're saying that it's already in the works, so that's good news.

Dr. McPherson, how optimistic are you about the federal government's current approach with regard to its structures and programs designed to cut down on greenhouse gas emissions by supporting clean technologies?

The Chair: You have time for a brief response, Dr. McPherson.

[*English*]

Dr. Madeleine McPherson: I think the price on carbon is a great first step, but to get to our climate goals we really do need a lot more. We especially need a lot more when it comes to strategic thinking about how to decarbonize our grids and then how to electrify as much and as quickly as possible.

The Chair: Thank you.

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

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

I was really excited to see the $5 million from NRCan for the energy modelling hub. It's really great to see the Institute for Integrated Energy Systems at the University of Victoria as a partner.

Mr. Carrie and Mr. Kingston were talking a little bit about the gap in knowledge around what that build-out of grid infrastructure is going to look like. Can you talk about the role of the energy modelling hub and the work it's doing on decarbonizing energy systems in Canada? How would you want the government to interact with and use what you're producing going forward?

● (1635)

Dr. Madeleine McPherson: I see two major gaps.

First is improving our modelling capability in general, so that we can explore deep decarbonization. One thing that I think is happening, especially with electrification, is that our energy systems are becoming a lot more intertwined with one another. Even this conversation about EVs is really a linking of the transport system and the power system, which have historically been distinct. That introduces a lot of complexity in terms of navigating pathways and understanding the implications of power system prices on EV charging and vice versa. There's a lot of complexity there, so we need more modelling capability to be able to explore that.

That really ties to the second thing, which is that it's becoming more interdependent, so we need more voices in the room. We need more stakeholders. We can't really be sitting in our silos anymore where, for example, a power systems engineer is just looking at the power system, or a transportation engineer...or someone is just thinking about indigenous rights. We actually need all of those voices in the same room at the same time. Then we need to be able to take those insights and give them to the decision-makers who can make use of them and who are actually designing the policies and turning those things into action.

I think our biggest gap in Canada is that we don't have that linkage in the way that the States and Europe have institutions that really link modelers to decision-makers. It can be quite an effective thing. I think that's been one of our big gaps.

The Chair: You have 10 seconds.

Ms. Laurel Collins: Thank you so much to all of the witnesses.

The Chair: Thank you.

I have Mr. Carrie's name, and in parenthesis that he may yield to Mr. Seeback.

Mr. Kyle Seeback: I'm going to share my time with Mr. Carrie. How much time do I have?

The Chair: Go ahead. You have five minutes.

Mr. Kyle Seeback: Dr. McPherson, I read a report by RBC on the path to net zero. It's a $2-trillion path. One thing they outline is the key need to double electricity output. That is just going to be generation, but then, of course, there's going to be transmission, which will often involve going across provincial boundaries, as you have talked about today.

It is a massive undertaking to double the electricity capacity of the country. I think it requires federal leadership to do that. Have you seen any evidence of federal leadership in doubling the electricity capacity and also in dealing with the transmission of that capacity across the country?

Dr. Madeleine McPherson: I completely agree. I think it's a huge undertaking. That twofold number is coming out of a lot of different studies, including our own work. It could actually be more than that. I think there's a huge opportunity for federal leadership, especially when it comes to those interprovincial lines.

As for federal leadership so far, I guess there was the funding of the energy modelling hub, but I think we can see a lot more leadership, especially when it comes to those interprovincial ties. Some of our work looking at that has said it's sort of a threefold to fivefold increase in interprovincial transmission lines. A lot of negotiation has to happen to make that work. I think there's a role for the federal government in doing that.

Mr. Kyle Seeback: I'll cede my time now to Mr. Carrie.

Mr. Colin Carrie: Thank you very much, Mr. Seeback.

I want to go a little more with the auto industry.

When you're looking at the mining and the supply chains, as my colleague said, here in Canada we have the rare earth minerals. We have the capability in this country to take it out of the ground, turn it into a battery or press it and turn it into a piece of steel. All those value-added jobs can be kept here if we have the right policies. Last week, we were hearing about companies leaving. We want to keep them here.

There are 31 critical minerals that have been recognized as important for building these batteries. With the automotive industry building electric cars now, do you know of any Canadian mines where they're sourcing critical minerals today to supply those batteries in North American plants? Are they sourcing it from Canada yet?

● (1640)

Mr. Brian Kingston: I'm aware that nickel is being sourced from Canada. In terms of the rest of the minerals on that list, I think most of those are still to come.

Mr. Colin Carrie: I think cobalt is, too.

Mr. Brian Kingston: That's right. There's cobalt.

Mr. Colin Carrie: Out of the 31 essential critical minerals, we're sourcing about two of them. I think there are some new ideas for mines, but they need to go through the environmental assessment, and they need to get up and running. Do you have any idea how many years it takes to get a mine up and running, especially a mine for a critical mineral like lithium, in which toxic chemicals can be released? Do you have any idea how long that's going to take in Canada?

Mr. Brian Kingston: My understanding is that it's about eight to 10 years for the regulatory approval process.

Mr. Colin Carrie: We have two minerals that are getting sourced, and maybe one in another 10 or 12 years.

I'm also interested in R and D. In Oshawa, we used to have the engineering centre. We did a lot of R and D. We as a government invested in the automotive centre of excellence.

With respect to incentives for electrification, how does Canada compare to our largest trading partner and to Mexico in terms of the competitive piece of it? For a company to do the R and D here, are there equal incentives here in Canada or are we still lagging behind?

Mr. Brian Kingston: In the auto industry, we tend to see that when you have a major investment in an actual assembly facility or an engine facility, then research and development comes along with that. A good example is that of the recent Stellantis and LG Energy investment in a battery plant. With that, you're going to see a research facility attached, with a number of jobs, usually very highly skilled jobs, associated with it. We've been making the case that you need to attract that anchor investment for the EV assembly and the battery plant, and then the R and D will come with it.

Right now, given some of the provisions in the IRA, I think it has become more challenging, but I think if we focus on those anchor facilities, we'll see the R and D come along with those.

Mr. Colin Carrie: I agree with you that we have to have the bricks and mortar here, but we don't have any R and D announcements yet.

With the IRA, I could see that as a subsidy of sorts. Could that be challenged with the WTO? Should the government be looking into that as a competitive advantage for the United States because of a government policy? Should we be challenging that under the WTO?

The Chair: Could we have a yes-or-no answer? We're out of time.

Mr. Brian Kingston: The answer is no, given the integration of our industry.

The Chair: We'll go to Ms. Taylor Roy.

Go ahead, please.

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

Thank you to our witnesses for being here today.

It's been a very interesting conversation. I think one thing that has become clear is the complexity of modelling what our energy needs are going to be, in particular for charging stations.

I have a constituent who is currently working in a company, Purus Power, that is involved in kinetic energy. Vehicles will be recharging themselves as they drive. As you commented, Mr. Kingston, the technology is changing so rapidly that I'm almost glad we haven't built out all these stations, which may not be able to serve us in the future.

Ms. McPherson, given that this is such a multi-variable analysis and that our attempts to forecast into the future and our assumptions are constantly changing with the quick pace of development in clean tech, do you think we can really accurately forecast right now what we're going to need in the future for charging stations?

Dr. Madeleine McPherson: That's a great question.

I think there are two parts to that question. On the one hand, I think we have to be doing everything we can as quickly as we can because these timelines are really tight. When we're doing our modelling, what's really interesting is that there are some pathways that are quite robust, meaning that as we change our assumptions or different ways in which the future could pan out, our results are quite robust against those.

Then there are other pathways that are less robust, meaning that if we tweak an input assumption one way or another, we get an entirely different pathway or entirely different analysis.

I think that version of sensitivity analysis is really important. Again, this comes back to the modelling work—getting more into the technical weeds here—of developing machine learning models that really help us explore which of those pathways and which of those decisions are robust and which of those decisions are less robust.

Ms. Leah Taylor Roy: It's very complex.

The other thing I was wondering about was the comparison between the numbers that Canada is using and those that Europe is using—for example, the 10 versus 43 number for charging stations. How would at-home charging stations—and the fact that many Canadians have their own house and many people, like me, have two charging stations in their garage right now—and even the technology that's going to allow us to put energy back into the grid from cars off-peak all factor into those numbers? Do you believe that, given the additional percentage of private homes, Canada needs to have the same number as Europe?

● (1645)

Dr. Madeleine McPherson: There are a couple of things. The first thing is that it really depends. Talking about robustness, one thing that changes the answer to a lot of these questions is when and where the charging is happening. If everybody comes home at six o'clock and plugs their electric vehicle into a neighbourhood with a distribution system that has not been upgraded, it doesn't work. However, if we have smart charging and different people are charging at different times of the day—taking advantage of high-wind periods of the day, for example—it's a totally different story. To what extent are we going to have rates and policies that incentivize people to charge during optimal times of the day? That's part of it.

To the earlier part of the conversation, these distribution systems vary across the country in how much additional capacity they have on them. Unfortunately, that's data—and Brian was alluding to this as well—that's really hard for us to get our hands on, at least from a research perspective. It's a bit trickier to know what's going on in those distribution systems. It also depends on the policies for when and where people are charging.

Ms. Leah Taylor Roy: Thank you.

Do I have any time left?

The Chair: You have 45 seconds.

Ms. Leah Taylor Roy: The other thing I was going to ask about was regulation and government incentives, because we were talking about de-risking investments in clean tech and looking at that. I know there's a lot of talk saying that governments shouldn't have regulations and all we need is to put money into the industry and everything will be fine.

However, when it comes to de-risking investments and regulations that require long-term contracts—for example, for some of our alternative power producers—how helpful do you think that would be in requiring that utilities purchase power from some of these alternative sources and have those long-term contracts?

Dr. Madeleine McPherson: I think de-risking those investments is really important, especially for wind. It's fairly competitive, but uncertainty in what regulations are going to look like can put a damper on things.

The Chair: Thank you so much. What a fascinating discussion.

We really appreciate the panel's participation.

We'll take a small break and connect with the second panel.

● (1645)

_____(Pause)_____

● (1650)

The Chair: Unfortunately, we have only about 50 minutes, so I'll have to adjust the time that each questioner has. I'll do the math while we hear from our witnesses, for three minutes each.

● (1655)

We have Dr. Donald Smith, who is a distinguished James McGill professor. I think we met last spring. It's nice to see you.

Please start, Dr. Smith, for three minutes.

Dr. Donald L. Smith (Distinguished James McGill Professor, McGill University, As an Individual): First, I'd like to thank the committee for inviting me here. It does seem like a very interesting process.

In terms of general background from where I am, agriculture can help manage some large environmental challenges, such as greenhouse gas levels and associated climate change, because it covers quite a slice of the earth's total terrestrial surface area.

Atmospheric CO2 can be incorporated into food crop residual biomass—stems, leaves, roots and things like that—or biomass crops, where it all goes into the soil. The point is that these things can be added into the soils. They improve soil quality and subsequent crop productivity. There's a bit of a feed-forward there in terms of removing CO2 from the atmosphere.

The biomass can also be used for biofuel production—I'm guessing that a lot of you know this. The nice thing about this, from my perspective, is that when you burn biofuel material, it releases CO2 into the atmosphere that came out of the atmosphere only a year or two before, whereas when you burn fossil fuels, the CO2 that's released came out of the atmosphere millions of years to hundreds of millions of years before, and the system is equilibrated to its absence.

In terms of broader efforts, in research, Dr. Xiaomin Zhou and I, both from McGill University's faculty of agricultural and environmental sciences, administer the biomass cluster, the BMC as we call it, which is funded through AAFC. BMC conducts work on recycling crops and other waste biomass as heat sources to make crop production more sustainable, including at high latitudes.

There's also a production of things like high-value bioproducts. There's a novel bioadhesive, which has now been patented and is being scaled up for production. There's research on biochar. The really nice thing about biochar is that when you add standard biomass to soils, the material is in there, on average, from years to decades, but when you add biochar, the carbon you've added to the soil is there from centuries to millennia, so the carbon is out of the atmosphere for a long time.

Finally, there's work on making plant biomass supply chains maximally efficient.

In terms of my own research, my lab works on microbial technologies that enhance crop yield and resilience to stressful conditions such as those associated with climate change. This is through the effects of, at least in some cases, signal compounds that are produced. We actually discovered a number of these. They regulate plant metabolism and even gene expression at very low concentrations, so they're kind of like hormones.

Several of these have been commercialized. One of them has been with Novozymes and Bayer for a few years and has been earning over half of the royalties from all the technologies at McGill University, indicating, I would argue, that it's being widely distributed and is having an impact.

That's it from me. Thank you very much.

● (1700)

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

We'll now go to Ian Thomson from Advanced Biofuels Canada, for three minutes, please.

Mr. Ian Thomson (President, Advanced Biofuels Canada): Thank you very much.

[*Translation*]

Good afternoon, ladies and gentlemen.

[*English*]

Thank you for the opportunity to speak to the committee today.

My name is Ian Thomson. I'm the president of Advanced Biofuels Canada.

I would like to begin by acknowledging that I'm speaking with you today from the traditional and unceded territory of the Squamish Nation.

Our trade association members include global biofuel producers and technology developers, with over 23 billion litres of global advanced biofuel capacity.

Time is brief, so I'll speak directly to the status of clean energy investments in Canada.

You've heard this from previous witnesses this morning, but on August 16, the U.S. administration signed into law the Inflation Reduction Act, or IRA. With its $369 billion U.S. in clean energy provisions, the U.S. has clearly thrown down the gauntlet in the race to capture economic advantage in the global manufacture of clean fuels. The IRA's tax credits and funding programs create material challenges to the competitiveness of clean fuel capital investments and the production and use of clean fuels in Canada.

The IRA has cross-cutting implications for future clean energy production. It will drive clean energy investments in low-carbon electricity, hydrogen, and clean fuels to the U.S. Without immediate and focused efforts to create balanced investment conditions in Canada, our clean energy projects are imperiled.

Our recommendations, which we'll submit in a more detailed document to the committee, focus on new measures necessary to mirror U.S. actions.

One is to establish a refundable low-carbon fuel production tax credit in the Income Tax Act to mirror the IRA clean fuel production credit, which comes into force on January 1, 2025.

Two is to amend the Greenhouse Gas Pollution Pricing Act to fully exempt low-carbon-intensity fuels from the fuel charge. The exemption should require registration and compliance under the clean fuel regulations.

Three is to revise the proposed federal carbon capture, utilization, and storage tax credit by converting the credit design to a production tax credit that mirrors the new IRA 45Q scope and credit rates.

Four is to amend the newly established zero-emission technology manufacturing federal income tax rate cut to apply to all low-carbon-intensity fuel manufacturing registered under the CFR.

In closing, I would simply say that the U.S. has taken action, putting Canada at a real crossroads with respect to its clean energy future. Generational clean energy capital investments are being drawn to the U.S. market under the IRA framework. Without immediate action to restore balance in north-south clean energy trade, Canada will forgo most of the economic benefits of the low-carbon economy, and our reliance on imported clean energy products, such as clean liquid fuels and low-carbon hydrogen, will be increased.

Thank you for the opportunity to appear before you today. I look forward to your questions.

The Chair: Thank you, Mr. Thomson.

We'll go to Mr. Robert Saik, founder and chief executive officer of AGvisorPRO Inc., for three minutes, please.

Mr. Robert Saik (Founder and Chief Executive Officer, AGvisorPRO Inc.): Ladies and gentlemen, distinguished guests, I'm a professional agrologist and a certified agriculture consultant. In 2006, I was recognized by Alberta as a distinguished agrologist, in 2014 as Canadian agri-marketer of the year, and in 2021 as one of Canada's top 50 most influential agriculture leaders.

Currently, I'm CEO of AGvisorPRO, a connectivity platform for agriculture. In 2007, I founded arguably one of the first carbon credit trading companies in Canada. To date, we've traded over $50 million of offsets in agriculture.

In 2019, on January 23, I presented this to all of the federal and deputy ministers of agriculture in Canada. These numbers come from the NIR and the IPCC, and according to these numbers, all the greenhouse gases emitted from agriculture are about 60 million tonnes, the smallest being fertilizer. From that, it is acknowledged that 11 million tonnes of carbon dioxide is sequestered or pulled out of the atmosphere into the soil. What is not accounted for is the full balance assessment of the 79 million tonnes of carbon dioxide being stored in the grain from the 95 million tonnes of produce that farmers grow.

Farmers capture 132% of their total CO2e emitted, and when you take soil into account, that's 150%. This grain is being shipped internationally, meaning that Canada's crop farmers are 30 million tonnes of CO2e to the positive. We take into account cow burps in the national inventory. It's recognized that carbon is stored in soils, and we recognize the carbon stored in forestry, so we should be thinking about the carbon that's stored in grain. When we do that, we come up positive.

However, today the focus is on fertilizer.

It's recognized that Canada produces about 1.6% of the global emissions. Agriculture is about 10% of Canada's emissions, and fertilizer is 17% of agriculture's emissions or 1.75% of Canada's greenhouse gas emissions. So, if we reduced our emissions by 30% in Canada from all fertilizer sources, it would amount to 0.0028%.

That's really what we're talking about here, and I'm here to talk to you about agriculture technology, precision ag, slow-release fertilizers, etc.

Thanks for inviting me.

● (1705)

The Chair: Thank you.

[*Translation*]

We now go to Ms. Emmanuelle Rancourt, from Vision Biomasse Québec. You have three minutes.

Ms. Emmanuelle Rancourt (Coordinator and Co-spokesperson, Vision Biomasse Québec): Thank you, Mr. Chair.

I thank the members of the committee for inviting our organization and giving us an opportunity to speak on the important issue of clean technologies in Canada.

Vision Biomasse Québec is a group of around 20 organizations from the co-operative, municipal, business, environmental and rural development sectors. These organizations have chosen to unite with a common objective, that of promoting an exemplary and efficient sector of forest biomass heating in Quebec. We participate in the acquisition and dissemination of knowledge in regards to the use of forest biomass for heat production through communication and awareness-raising activities. We also contribute to structuring the sector by taking part in political representation activities.

Some time ago, these organizations drew up for the renewable energy sector a vision full of promises that showcase its strong potential. They've identified a potential for heating conversion of buildings in Quebec, outside large urban centres, which could make it possible to replace 400 million litres of fossil fuels annually; recover one million metric tons of residual forest biomass annually; avoid the emission of one million metric tonnes of CO2 equivalent per year; produce 4,000 gigawatt hours of renewable energy annually; improve Quebec's trade balance to the tune of $225 million; and create 12,500 jobs in the construction phase and 3,600 permanent jobs subsequently.

These numbers could certainly be increased if we applied this vision to all of Canada and even more if we added industrial sectors that might consider conversions, for example cement and steel plants.

Vision Biomasse Québec fervently believes that forest biomass as an energy source is a winning clean technology for Canada. The use of post-cutting, post-processing and post-consumption forest residues for direct heating uses is the most efficient mode of energy conversion compared to cogeneration and the production of biofuel or hydrogen. The yield being higher, the carbon debt is reduced and the GHG balance is further improved. Its use in the bioenergy sector would only serve, in this case, to cannibalize a more efficient use of the basic resource.

Being abundant in Canada, forest biomass is a local resource and its increased use as a replacement for fossil fuels will improve the trade balance of several provinces by reducing the value of imports, while allowing energy security and independence.

The direct heating from forest biomass sector remains little known in Canada, however. Most of the market is outside the country. It is essential to develop the domestic market, because millions of tonnes of forest biomass could be sold locally to create renewable energy and thus contribute to the country's energy transition.

A promising avenue for the domestic development of the sector can be found in remote communities. Some of the communities in the northern regions of many provinces and territories have already converted to using local forest biomass for heating.

However, government funding programs are essential for these projects to ensure they are successful and can act as a showcase and thus support the healthy development of the sector. The federal programs currently in place to support these conversions should therefore be maintained and could be expanded and enhanced to accelerate conversions and the country's energy transition.

A number of potential projects fall through because the Treasury Board doesn't consider that biomass reduces GHG emissions, and so funding possibilities are limited. It would be useful if the various departments consulted each other in order to standardize the status of the renewable energy that is biomass.

The Chair: Unfortunately, we'll have to stop there to move on to questions.

In order to finish the meeting on time, I've had to cut a third of the committee members' speaking time. Consequently, members will have four minutes in this first round.

Let's start with Mr. Dreeshen.

● (1710)

[*English*]

Mr. Earl Dreeshen (Red Deer—Mountain View, CPC): Thank you very much, Mr. Chair, and thanks to all the witnesses. This is amazing testimony here this afternoon.

Of course, Canadian farmers and ranchers are the most environmentally conscious in the world, and all they ask is that progress be recognized when they are measured against global competitors. I believe, Mr. Saik, you've pretty well hit the nail on the head on what we actually do, yet nobody wishes to talk about that particular fact. I know that Alberta has always been a leader in carbon management, whether it be in agriculture or in other industries.

I'm wondering, Mr. Saik, if you could discuss your experience in the carbon offset space, since your company is one of the leaders in this. Could you talk about why we're not getting credit for that 132% of carbon sequestration that we have with the grains that we sell around the world? We don't get credit for the water that we put into it and sell, and the transfer of water around the world.

Could you talk to us about that, please?

Mr. Robert Saik: Yes, I'll quickly do some cowboy math. For every 1% increase in organic matter in soils, farmers pull out of the air approximately 20 tonnes of carbon dioxide. I'll repeat that: For every 1% increase in soil organic matter, 20 tonnes of carbon dioxide go into the soil. In western Canada alone, 70 million acres, a 1% increase would be 1.4 billion tonnes of carbon dioxide out of the atmosphere, if that were recognized by the government.

Farmers are doing a lot. Yesterday I went out to a farm and spent some time on the on-farm climate action fund, OFCAF. Did you know that the farmer I was dealing with would not qualify for any support? Do you know why? He is already doing soil testing, already doing split nitrogen application, already using nitrogen inhibitors and doing crop rotation. The work that the federal government wants us to do is already being done by farmers, but it's not being recognized.

It's far better for us to be given incentives, carrots rather than sticks, than to be told to reduce our nitrous oxide by 30% when we're already among the most highly efficient nitrogen farmers in the world.

Mr. Earl Dreeshen: Can you expand on that as far as the cattle feed industry is concerned, because they have also done amazing things and, again, it's another sector that is not getting its due?

Mr. Robert Saik: When you think about the forest—and my esteemed colleague talked about biochar and the utilization of biomass—you burn wood, and somehow that is a cycle that everybody recognizes. The half-life of methane is 10 years. The half-life of carbon dioxide is 1,000 years. Carbon dioxide goes into plants. Cows eat those plants and they burp out methane. In 10 years, that methane starts converting back into carbon dioxide.

How did cows make more greenhouse gases? They don't. The only way cattle can make more greenhouse gas is if there are more cows, but the peak of the cattle herd was in 1971. If you take cattle away, or demonize the cattle industry, you've taken away one of the key ingredients that we use in agriculture to harvest cellulose and hemicellulose, and you put at risk one of the most fragile ecosystems in the world, which is the grasslands and the foothills of the province of Alberta, where you need a keystone species to keep the rosebushes and the poplars at bay.

A lot of people don't think about cattle, but it's a biogenetic cycle, the same as biochar, the same as biomass.

The Chair: Thank you.

We'll have to go to Mr. Longfield now, for four minutes.

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

I was listening with great interest to Mr. Saik and thinking of a conversation I had at the University of Guelph, where they're looking at measuring carbon using satellite technology to be able to give credit to the farmers for the carbon levels they are maintaining in the soil.

Is that anything you're familiar with?

Mr. Robert Saik: Yes. There are a number of measurement devices that are being experimented with right now. If I was asked categorically if there was one that you would depend upon, I would say no. They're still trying to do regression analysis to find out if these measurement devices.... Satellite imagery to ascertain carbon in soils is still a long way off.

In western Canada, a lot of the carbon is sequestered in the top zero to six inches of the soil, but in eastern Canada you have more tillage and more rainfall, so consequently the carbon sequestration is deeper in the plow layer. I think it's pretty hard to ascertain all of that coming from satellite remote-sensing imagery.

● (1715)

Mr. Lloyd Longfield: Six inches, or whatever the baseline ends up being.... Thank you for your testimony. That is very good for our study.

I'd like to switch over to Dr. Smith.

I understand that you got your Ph.D. in Guelph, which is always a good connection.

Dr. Donald L. Smith: That's true.

Mr. Lloyd Longfield: It's great that you're continuing to work on research. I've seen your research grant is up to $65 million, which also includes some spinoff businesses, one of them being Bios Agriculture Inc., commercializing technology on the farm.

Could you maybe expand on the clean technology opportunities for business spinoffs from the work you're doing?

Dr. Donald L. Smith: Sure. We are conducting work right now on developing technologies, and I guess ultimately products, out of plant-microbe interactions. I mentioned this in my introduction. These seem to be producing signal compounds. The microbes plus the plant are now considered the holobiont, and I've started calling these “hormones” of the holobiont, because they work at hormonal levels.

They have some profound effects on the plants. They increase their growth rates, and they also make them substantially more resistant to the kinds of stresses that are associated with climate change. There's a lot of interest and there are a lot of interesting things that can be done with that.

The original company, Bios Agriculture, had an interesting history. It actually went through the corporate food chain. It was taken up by a larger Canadian company and wound up with Bayer.

Right now, I'm working with two companies in my lab that are both start-ups based on technologies from my lab. There's a lot of interest in these technologies. We're producing more as time goes by. I'm hoping to get some funding focused just on that.

Mr. Lloyd Longfield: Thank you.

To add to the NSERC funding, maybe we can get some other innovation funding. We can talk about it offline, if I can help in any way.

Mr. Chair, I know I'm coming up to the four-minute mark. I have about half a minute left.

Ms. Rancourt, I'm very interested in the forest biomass that you talked about. One of the studies I read a few years ago had to do with wood chips and making some sawmills more viable by selling wood chips to the market. Is this the sort of thing that you'd be involved with?

[*Translation*]

Ms. Emmanuelle Rancourt: Could your clarify the question?

[*English*]

Mr. Lloyd Longfield: I'm sorry. I'm thinking of the biomass products coming from wood chips from sawmills, to make use of the biomass that would normally be a waste product in sawmills.

[*Translation*]

Ms. Emmanuelle Rancourt: We're talking about wood waste from processing. It's one of the most frequent sources of residual forest biomass. Many lumber mills will be able to use their own wood waste to heat their facilities and even their drying kilns. It's a kind of circular economy.

The Chair: Thank you.

Ms. Pauzé, you have four minutes.

Ms. Monique Pauzé: Thank you very much, Mr. Chair.

I thank the witnesses for appearing.

Ms. Rancourt, my questions are for you. I only have four minutes, but I've many questions to ask. Let's start with biomass.

I was in Stockholm last spring. There used to be a coal-fired plant right in the middle of town; now, the whole city is heated by a biomass plant. That goes to show the sector's potential.

If Quebec's public institutions were to make a similar change, how much of a greenhouse gas reduction could we achieve? Do you have any idea?

Ms. Emmanuelle Rancourt: We haven't made any Canada-wide assessments. We really only work on the Quebec side and we don't really have any equivalent in the rest of Canada. I'm sure there are organizations in British Columbia that are a bit like ours and who might have a better idea.

In any case, that's an avenue we're looking at more closely. In Quebec, we're working with the Société québécoise des infrastructures, which handles all of the government of Quebec's building inventory. The organization is increasingly considering these kinds of options, especially for detention centres. As you've mentioned, there's considerable potential there. Not only are boilers being considered, but also having networks around those boilers. It's all very promising.

Ms. Monique Pauzé: It is difficult to evaluate the potential reduction in GHG emissions, but I guess that will come eventually.

Ms. Emmanuelle Rancourt: It is very hard to evaluate, yes, but it would definitely be relevant.

Ms. Monique Pauzé: We know that the forestry sector uses more and more waste products from tree cutting and from trees that have been damaged by insects or forest fires.

What are the benefits and the environmental risks associated with the gathering of these forestry waste products?

● (1720)

Ms. Emmanuelle Rancourt: One of the risks that is often mentioned is soil vulnerability. Normally, waste products that are left on the ground contribute to the regeneration of the ecosystem. The carbon and other elements that go back into the soil play an important role.

Finding ways to limit the quantity of waste products that is gathered according to soil vulnerability levels would be important. First, a survey of soil vulnerability levels across the territory would have to be done. Factors like angle of slope or soil porosity influence the amount of waste products that should be left on the ground. That is the sort of data that would be needed. When we make recommendations, we often tell people to take these factors into consideration. Including them in a formal framework or in official recommendations could be very relevant.

Ms. Monique Pauzé: We know that forest biomass products, as wood pellets, are used for heating in the Northwest Territories. That is an example of the potential that this type of energy has.

Given the abundance of forest resources and the technological advancements in recent years, do you think this energy could potentially be deployed throughout northern Quebec and, of course, northern Canada?

Ms. Emmanuelle Rancourt: Absolutely. It is one of the sectors that has the best potential. The communities we are talking about are very remote, cannot be connected to Hydro-Québec's network and rely heavily on fossil fuels like propane and equipment that is difficult to use. For these reasons, it is a very interesting option.

The only issue is that residual forest biomass has to be fairly strictly standardized to be relevant as an energy source. Northern conditions complicate things somewhat. Torrefied wood pellets help to alleviate this problem. They undergo an extra treatment to make them very stable and extremely resistant to humidity, among other things. It really helps to solve the issue.

The other difficulty is getting the forest biomass up north. It sometimes has to be shipped by boat. That is an important thing to consider. We have to make sure that the entire supply chain is set up before launching a big project in the north, otherwise it could get complicated.

The Chair: Thank you.

Ms. Collins, you have the floor for four minutes.

[*English*]

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

My question is for Ian Thomson with Advanced Biofuels.

You spoke a little bit about the Inflation Reduction Act. It's so great to see the United States finally taking serious climate action. Also, we have this risk of lost opportunities here in Canada if our own action doesn't match the pace and scale, proportionately, of what the U.S. is doing.

You mentioned a kind of growing sense of alarm about the impacts of the IRA on competitiveness in Canada's clean fuel sector. Can you tell us a bit more about what you're hearing from your members and talk a bit more about the broader implications on the transition to low-carbon transportation in Canada?

Mr. Ian Thomson: We are hearing across the sectors—and this might come across as all of us crying wolf—all the way from my colleagues in the refining sector.... A number of our members are refiners that make renewable fuels, but also hydrogen and renewable natural gas and biogas. I have spoken with my colleagues in those sectors over the last week, and there is, across the board, concern that the fiscal and financial provisions in IRA are so generous and there is such a magnitude that there are really very few scenarios in which you can see a Canadian producer competing, because American producers are allowed to keep the credits that are in those programs when they export fuel, but the programs, to date so far, exclude Canadian product. We're shut out of the American market by virtue of economics, and the Americans are allowed to load up our market with exported product.

We've discussed the potential for things like trade action. We can't wait until 2026 to resolve this. There is deep concern across the board about the provisions.

Ms. Laurel Collins: Thank you.

Can you expand on the importance of clean technologies in transportation when it comes to reducing our greenhouse gas emissions and meeting Canada's climate targets?

Mr. Ian Thomson: I'd be happy to. Transportation is Canada's largest end-use sector, so it's the place where we get most of our GHGs. It's a tough sector to decarbonize, so these technologies are really critical.

On electrification, Brian Kingston spoke earlier to some of the wins that Canada made with the Build Back Better plan, and that was tremendous to see, but we're going to still be reliant on internal combustion engines well past the middle of the century, and I don't say that because I'm skeptical of the alternatives. I drive an electric vehicle, and it's great technology. I'm just aware that we have to have every single solution at the table.

Right now in Canada, we have a number of companies that are looking to put substantial volumes of really low-carbon liquid clean fuels into the market. A number of them are right on their final investment decisions, and when they look at the provisions in IRA, it will cause them to hit the pause button.

● (1725)

Ms. Laurel Collins: It's immense stress.

The clean fuels fund is providing $1.5 billion over five years. Applications for building clean fuels production capacity closed a year ago. How is the build-out going for that fund?

Mr. Ian Thomson: We don't have a lot of insight into it, although I am getting feedback from some of my members that they've been waiting a long time to see contribution agreements, etc. It is generally regarded as a tough fund to access. I get that you need to have appropriate measures, but again, if you're waiting for an agreement after a year, your project can't just sit on the shelf and wait.

There's some anxiety about that.

The Chair: Thank you.

We'll go to Mr. Mazier for three and a half minutes.

Mr. Dan Mazier (Dauphin—Swan River—Neepawa, CPC): Mr. Saik, thank you for being here today.

Unfortunately, I can't think of any Canadian government that has vilified our farmers and agricultural industry more than the current government. The attack on agriculture in the name of climate change has become so senseless that we are now seeing countries like New Zealand planning to tax burps from cows.

Farmers are some of the most environmentally responsible people in our country. They use clean technology every day. No one in this government gives them credit for that.

Mr. Saik, if farmers increase their crop yields, they can sequester more carbon and, therefore, offset more greenhouse gas emissions. Would you agree?

Mr. Robert Saik: Absolutely. I've been working with farmers since my hair was a dark colour—it's not now—and in all of the places I've travelled to in the world, whether it was Kazakhstan or South America, I've never met a farmer who wants to spend any more money on crop inputs than they need to.

The only way to feed a planet that's passing eight billion people right away is through something called sustainable intensification. Sustainable intensification of agriculture is the way we have to go in order to reduce our environmental footprint and protect and feed the planet at the same time.

Mr. Dan Mazier: Would you agree that growing more food on the same amount of land is a sustainable practice that we should strive to achieve? Answer yes or no, please.

Mr. Robert Saik: Absolutely. Yes.

Mr. Dan Mazier: Would you agree that nitrogen fertilizer allows farmers to grow more crops on the same amount of land? Answer yes or no, please.

Mr. Robert Saik: Absolutely. Yes.

Mr. Dan Mazier: Would you consider synthetic fertilizer a clean technology?

Mr. Robert Saik: Yes. What are the alternatives?

Mr. Dan Mazier: Exactly.

When this government announced that they were planning to reduce fertilizer emissions by 30%, farmers began to worry. They worried because fertilizer grows food.

Does this government's fertilizer emissions reduction plan make sense for Canada?

Mr. Robert Saik: My concern with this whole thing as an agronomist is, “30% from where?” My understanding is that the coefficient they're using to calculate the reduction of 30% has a minus-30 and a plus-40 error in the standard deviation of the coefficient. This means that with just the coefficient, we could be at minus-30 already.

Nobody wants to release more nitrous oxide than needed into the atmosphere. That includes Canadian farmers. As I said earlier, between soil testing, variable rate technology, nitrogen inhibitors and the split application of nitrogen, we're doing all of these things. What else are we supposed to do?

If you're going to try to achieve this target, the only way to do it is through an absolute reduction in fertilizer, which is absolutely ridiculous. The world needs more Canada right now, not less Canada.

Mr. Dan Mazier: Are there technologies that you're currently working on in farming and agriculture in particular that would be useful for this study?

● (1730)

Mr. Robert Saik: There are all kinds of remote-sensing technologies, as well as bioengineering down the line, such as what's happening in Argentina with a company called Bioceres, which is producing wheat that's resilient to drought and saline soils. That's an example of genetic engineering moving us in the direction of more sustainability.

The Chair: Thank you.

We'll go to Mr. Weiler for three and a half minutes.

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

Thank you, witnesses, for joining us today.

My first question is for Mr. Thomson. What role do you see the output-based pricing system and the clean fuel regulations playing in reducing emissions from the transportation sector and leading to fuel switching?

Mr. Ian Thomson: The clean fuel regulation is a huge benefit. It will take time to come into effect. These regulations don't have an immediate effect. We anticipate that mid-decade is when we'll probably start to see incremental actions that go beyond current provincial actions in the CFR. It's very important.

The output-based pricing system is more intended to address fixed facilities. It's more of a facility-based one. The federal carbon charge is the other side of the OBPS and it's the one that applies to fuel, hence our recommendation that the Greenhouse Gas Pollution Pricing Act should align with international practice, which is to fully waive biofuels from a carbon charge.

Right now, anything that's above 10% of renewable content in gasoline or 5% in diesel is exempted. That's a lot of fuel under 10% for gasoline and 5% for diesel that's currently being taxed by the government. There's no reason to tax it. It's not best practice internationally. In fact, it's not even a common practice.

Mr. Patrick Weiler: Thank you for that.

You mentioned, in some detail, some of the concerns you have about competitiveness with the IRA coming into effect. Obviously, this is something that Canada needs to look at very closely. What level of urgency do you see with some of the measures you proposed to this committee, and otherwise, that needs to be taken into account in how we're going to respond with measures in Canada?

Mr. Ian Thomson: We are also making those recommendations in our pre-budget consultations submission.

There is urgency to it. I mentioned that these really troubling provisions come into effect in 2026. The kinds of facilities that produce these fuels take half a decade to build, and they're half-a-billion-dollar projects. If there is a looming threat to your market in two or three years and you don't know whether you'll have it resolved under a trade action, you simply won't go ahead with the project. It's going to have a chilling effect right now, hence our urgency to understand how our government can match the IRA provisions and provide parity for project developers here.

It appears to be, just from my conversations, a concern across the board. I anticipate that you'll hear from both the conventional and non-fossil sectors.

Mr. Patrick Weiler: If we don't see those investments take place in Canada, what impact do you see that having on Canada's ability to reach its emission reduction targets by 2030, and get to net zero by 2050?

Mr. Ian Thomson: It's conceivable we could still meet them. We would be heavily reliant on imported product. With global supply chain issues and the general concerns about energy security, I don't think any of us would perceive that it's in our best interest to be import-reliant for our clean fuels. It will actually retard it.

You can't sustain support for clean fuel technologies—and clean technologies, period—unless Canadians can see themselves benefiting from jobs or investments. They want to see it in their community. They don't want to be importing it and paying for it.

[*Translation*]

The Chair: Thank you.

Ms. Pauzé, you have the floor for two minutes.

Ms. Monique Pauzé: Thank you, Mr. Chair.

I have one question for Ms. Rancourt and one for Mr. Smith.

Ms. Rancourt, we always talk about residual biomass. How can biofuels help to reduce rural and remote—particularly indigenous—communities' dependence on diesel?

Ms. Emmanuelle Rancourt: We are mostly interested in direct heating because, as mentioned earlier, it is the most efficient mode of energy conversion. More transformation means more emissions, more energy used and more money required. As a result, we try to promote direct heating.

That would work really well with northern communities, because heating is a major need of theirs. Also, when it is very cold and Hydro-Québec cannot meet the demand during peak periods, it would help to alleviate the problem.

As for liquid biofuels, I am really not an expert in that area. I know that some people in the room are far more knowledgeable than I am on that subject. We specialize in solid biomass that is burned for direct heating.

● (1735)

Ms. Monique Pauzé: Thank you, Ms. Rancourt.

Mr. Smith, what measures could the federal government implement to encourage the development of new forest biomass products?

[*English*]

The Chair: You have 30 seconds.

Dr. Donald L. Smith: There's quite a bit that could be done. There's the potential for the addition of a number of new technologies. In the area where I work, we are currently just beginning to open the doors on this, and there are many potential technologies in there. What we need is some funding to get that tail-end research done, to get it to the point where the materials can be moved to applied research, and ultimately to the market. These sorts of things would help.

In terms of some sort of support, I suppose, for initial start-up companies, we should recognize the importance of this area and get them moving quickly in order to get them stable as quickly as possible.

The Chair: Thank you.

Ms. Collins, you have two minutes.

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

Mr. Thomson, you're recommending establishing a low-carbon fuel production tax credit. Can you expand more on how you'd like to see a tax credit applied?

I have a related question. You're also recommending converting the government's proposed CCUS investment tax credit into a production tax credit. Can you explain a bit more how that would benefit biofuel production?

Mr. Ian Thomson: I can. A clean fuel production credit would match what is in place in the U.S. It would give provisions for fuels like renewable diesel, sustainable aviation fuel and synthetic fuels made from direct air capture, etc. It would look to align with the provisions in the U.S. The Americans have attached some carbon intensity provisions to their proposed incentives, which is appropriate. If you want to incent lower-carbon fuels, then the rates are higher and that's appropriate.

It would be in the Income Tax Act, so it would not be subject to being a political football, quite frankly. We hear from all of the fuel sectors—conventional and alternative—that stability of policy and signal is arguably the most important thing of all, in addition to the level.

The Americans would propose it for three years. We're proposing one that would go for the better part of a decade to give that long-term benefit.

The costs of these programs, by the way, do tend to go back into the fuel, so Canadians would be getting less expensive fuels as a result of this. We're not doubling up on the cost of fuels.

The Chair: Thank you.

We'll go now to Mr. Dreeshen for three and a half minutes.

Mr. Earl Dreeshen: Thanks once again.

Of course, natural gas is an important feedstock in fertilizer production. It's this government's fixation on hydrocarbon reduction that has initiated this narrative of fertilizer use reduction, but there are a lot of other things that can be done in agriculture.

Mr. Saik, some initiatives are taking place, and I believe you've probably seen them. For example, there's exhaust management and putting the CO2 into the ground. I wonder if you could speak to some of these and the significance of these other strategies that you see in the agricultural field.

Mr. Robert Saik: I think it's important to understand that every breath we take is 78% inert nitrogen—every breath you take, every move you make, it should be a song. The Haber-Bosch process turns that inert nitrogen into fertilizer that ultimately supports 50% of the protein in every man, woman and child on planet earth. It's also a question of how you sustain life on Mars, where it's only 2.6% inert nitrogen.

From a standpoint of what we could do in agriculture, I already talked about some of the things. The ability for us to utilize nitrogen inhibitors to reduce the conversion of fertilizer into urea or into nitrous oxide is important. The ability for us to include methane reduction agents into feeding, when you're feeding cattle.... There are methane reduction agents being researched right now that can reduce the methane or the burps from cattle by 50% to 75%. Seaweed extracts are one of these. Again, if you incent farmers to do these things, they'll find ways to do these things.

I think the most important thing we can do is grow more crop. It takes 3.3 pounds of nitrogen to grow a bushel of canola, and 1.5 pounds of nitrogen to grow a bushel of corn. The more corn you grow, paradoxically, the more root mass you have and the more carbon sequestration you have.

The idea of reducing nitrous oxide emissions from agriculture is laudable, but all the discussion.... If we do this and achieve a 0.0028% reduction in Canada, this is not what we should be going after. We should be going after other things that make our farmers more productive, not looking at policies that are punitive to agriculture production in Canada.

● (1740)

Mr. Earl Dreeshen: Some of those new technologies are, of course, in precision farming. I'm just wondering if you could, in the short time we have left, quickly describe where that is going.

Mr. Robert Saik: We're utilizing satellite technology or remote-sensing technology to do bio-vegetation index maps. We take soil samples based on the zones that are in those bio-vegetation index maps. Satellites give us the maps. We go into the field and soil-test, and then agronomists like me will make recommendations based on the amount of fertilizer that we want to hit, based on the yield target. We put these into air seeders, and as the air seeders go across the field with GPS guidance, they regulate the amount of fertilizer to hit the target yield.

The Chair: Thank you very much.

Ms. Thompson, you have three and a half minutes.

Ms. Joanne Thompson: Thank you, Mr. Chair.

Mr. Thomson, one of the best ways we can rapidly reduce net emissions from fields is to increase the use of biofuels. Would you be able to discuss the importance of biofuels in the transition to a net-zero economy?

Mr. Ian Thomson: Thank you. It's a great question.

In short, they're indispensable. There's modelling from the Canadian Climate Institute, from the IEA, from the California EPA and from the California Air Resources Board. All of them tell us that we'll have a lot of internal combustion engines around, as I already mentioned. Fully 75% of the greenhouse gases that are emitted when you turn on a vehicle come from the crude oil in it. The only way to address those 75% of emissions is to switch to something that's non-fossil. That would be renewable natural gas, or a biofuel, or a synthetic fuel that's made from direct air capture.

With 75% of transportation emissions and significant internal combustion engine fleets, we can't have them running on fossil fuels. Even if those fossil fuels have slightly lower carbon emissions because of technology, you really have to be fuel switching, which is why electrification is so important in light-duty. In heavy-duty, it's more difficult. Shipping, aviation, rail and long-haul trucking are regarded as places where biofuels or synthetic fuels are going to be critical for decades.

Ms. Joanne Thompson: Thank you.

Dr. Smith, perhaps I could go back to a point you made in the last question around biomass and technologies. What role can government play to ensure that technology that is being developed is actually able to scale and have that real-world impact?

Dr. Donald L. Smith: As always, I guess, there's financial support. There's a need to...if you want them to be pushed all the way out. It's not always easy. I've gotten a number of research findings all the way to technologies and actual products, but a number of the ones that I thought would succeed failed. It was just because there was something missing at some step along the way.

If it comes to the point where you have something ready to go out the door but the right company is not there, or there's a company there that could be the right company but they just don't have the support.... They're not growing and things like that. There's nothing making them move. Again, it's a recognition of the importance of some of those specific areas and the need to do something to make it work.

It would be nice if there was someone we could speak to—because each situation can be quite unique—where we could say, "Look, we have this situation right now. We have this technology and this company, but there's a piece missing in that bridge. Could you guys fill that missing piece?"

It's not always the same. A uniform policy doesn't always work.

● (1745)

Ms. Joanne Thompson: Thank you.

Mr. Saik, could you go back to your last point and explain to the committee how different types of precision farming techniques that thousands of farmers are already using can help significantly reduce emissions?

Mr. Robert Saik: Again, I think this goes back to some fundamentals in sustainability. Number one is soil health. Number two is water use efficiency. Number three is greenhouse gas balance. Number four is farm viability. For these programs that we're putting forward, farmers need to be viable.

The fifth area, actually, is love. Farmers love their livestock. They love their land. It's intergenerational. We need to recognize that farming and agriculture are about learning, unlearning and relearning. The technologies that we're bringing together are at light-speed. I think one of the Achilles heels, believe it or not, in making agriculture more sustainable, is broadband. We need broadband across the country.

The Chair: Thank you.

We'll have to stop there.

Thank you for a very interesting panel on what can be done in the agricultural sector to reduce emissions. Thanks again to all the panellists and members for the excellent questions.

We don't have a meeting on Friday, because we have a meeting of the steering committee, so we'll see members after the Thanksgiving break.

Have a good Thanksgiving.

The meeting is adjourned.