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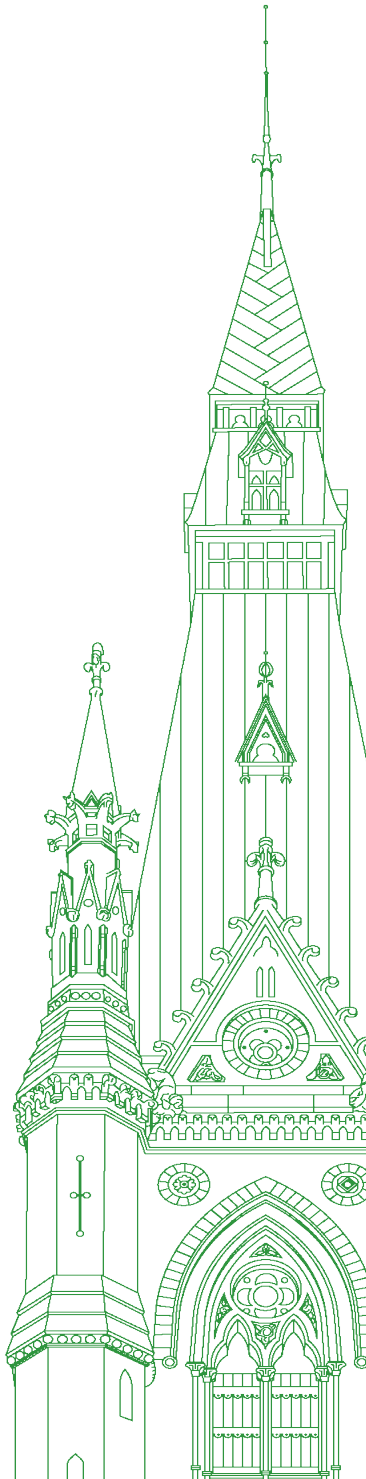

Chair: Terry Duguid

Standing Committee on Natural Resources

Tuesday, May 26, 2026

● (1100)

[*English*]

The Chair (Hon. Terry Duguid (Winnipeg South, Lib.)): Colleagues, let me call this meeting to order and welcome you back from our constituency weeks. I hope they were productive for you and your teams.

I also welcome our wayward travellers to Scandinavia, who I understand had a great trip. I hope we'll get some feedback from Gaétan, Corey and Mario.

As you know, our forestry study is still a work in progress.

With that, colleagues, I would like to acknowledge that we're meeting on the unceded territory of the Algonquin Anishinabe nation.

This is meeting number 38 of the House of Commons Standing Committee on Natural Resources. Today's meeting is taking place in a hybrid format.

I'd like to remind participants of the following points: Before speaking, please wait until I recognize you. Those participating by video conference, click on the microphone icon to activate your mic, and please mute yourself when you are not speaking.

I would like to remind witnesses that committee members may ask questions in either French or English. If you need interpretation, please take a moment now to prepare your earpiece and select the listening channel you need in order to take full advantage of the time allotted for questions and answers.

As well, think of our amazing interpreters. If you would kindly not talk too fast or bang things around your microphone, I know that our interpreters would appreciate that, as would we.

Members participating in person or on Zoom, please raise your hand if you wish to speak. The committee clerk and I will do our best to maintain a consolidated speaking order. I will also remind you that all comments should be addressed through the chair.

Pursuant to Standing Order 108(2) and the motion adopted on Thursday, April 23, 2026, the committee shall commence its study of Canada's electrification, energy self-sufficiency and domestic energy security.

I would like to welcome our witnesses. There's a long list, colleagues, so bear with me.

From the Canadian Energy Regulator, we have Darren Christie, chief economist, and Ganesh Doluweera, technical leader, energy outlooks, joining us by video conference.

From the Department of Crown-Indigenous Relations and Northern Affairs, we have Joanna Ankersmit, acting assistant deputy minister, northern affairs organization.

From the Department of Natural Resources, we have Drew Leyburne, assistant deputy minister, energy systems sector; André Bernier, director general, electricity systems branch, energy systems sector; and Michael Rau, director general, policy and planning branch, fuels sector.

From Environment and Climate Change Canada, we have Megan Nichols, assistant deputy minister, and Karishma Boroowa, director, electricity and combustion division.

All of our virtual witnesses have conducted a mandatory witness onboarding test, and each of our delegations will have five minutes for their opening remarks. Then we will open the floor to questions.

I'll go first to Mr. Christie, representing the Canadian Energy Regulator.

You have the floor for five minutes, Mr. Christie.

Darren Christie (Chief Economist, Canadian Energy Regulator): Thank you. Good morning.

[*Translation*]

Good morning, everyone.

Thank you for inviting the Canada Energy Regulator to appear before you today.

My name is Darren Christie, chief economist at the CER. I am joined today by Dr. Ganesh Doluweera, our technical leader for energy outlooks.

I am appearing before you today from Calgary, Alberta, located within Treaty 7 Territory, the traditional territories of the Blackfoot Confederacy, which includes the Siksika, Piikani and Kainai first nations. Treaty 7 is also home to the Tsuut'ina first nation, and the Stoney Nakoda, including the Chiniki, Bearspaw and Goodstoney first nations.

I would also like to recognize the Métis that have settled in southern Alberta and call this place home.

● (1105)

[*English*]

Recognizing that the CER has broadly described its mandate in other recent appearances before this committee, I will briefly elaborate on the CER's electricity mandate today, given its prominence in your study.

The CER's electricity mandate, as set out in the CER Act, includes regulating the construction and operation of international power lines and designated interprovincial power lines, offshore renewable energy projects and offshore power lines, and electricity exports. The mandate also includes providing supply and markets information.

Provinces regulate development, conservation and management of sites within a province for the generation and production of electrical energy, as expressly stated in the Constitution. As a result, the CER's role in electricity is relatively limited. The electricity mandate that we do have comprises two broad components: the adjudication function and the energy information function. I will address each in turn.

[*Translation*]

There are two separate aspects to the CER's electricity adjudication function: construction and operation of international and interprovincial power lines; and electricity exports.

Before constructing an international power line, applicants must apply for either a permit or a certificate. Currently, there are approximately 125 CER-issued permits and certificates, and the CER regulates approximately 1,500 km of international power lines.

The second aspect of our adjudication process concerns electricity exports. The commission issues permits or licenses to companies to export electricity internationally. In assessing an export application, the CER can only consider the effect of the exports on neighbouring provinces and fair market access for Canadians.

The CER does not regulate electricity imports or interprovincial electricity trade.

[*English*]

Beyond adjudication, the CER is also responsible for advising and reporting on energy matters. As part of this, in March, the CER released the latest edition of its flagship energy future series, “Canada's Energy Future 2026: Energy Supply and Demand Projections to 2050”, which explores four possible scenarios for Canadian energy over the long term. These include a baseline current measures scenario, reflecting policies in place as of November 2025, as well as higher and lower scenarios that produce a range around the current measures scenario and a net-zero emissions scenario.

I'd like to highlight a few key findings from EF 2026 that we believe are relevant to your current study.

First, electricity generation grows in every scenario through 2050, driven by electrification of existing energy end uses, economic and population growth, and new demands in areas such as hydrogen production and data centres. Depending on the scenario, electricity demand is expected to increase between 30% and 120% from 2023 levels, resulting in installed generation capacity's rising substantially from roughly 160 gigawatts in 2023 to between 270 and 400 gigawatts by 2050.

Wind power accounts for the largest share of new capacity, supported by growth in hydro, solar, nuclear batteries and natural gas with carbon capture. Additionally, interprovincial transmission interties play a growing role in balancing supply and demand variations across provincial systems, with interprovincial transmission capacity growing roughly 70% by 2050 in all scenarios.

“Canada's Energy Future 2026” also provides some analysis of energy self-sufficiency and security. In particular, it highlights that, in most scenarios, central Canada's substantial dependence on natural gas and crude oil produced in, or transiting through, the U.S. would continue based on current pipeline configuration. Only in the Canada net-zero scenario does central Canada use significantly less natural gas and refined petroleum products by 2050, which could reduce the region's reliance on energy coming from or through the U.S.

● (1110)

[*Translation*]

In closing, the CER remains ready to assess all applications we receive and will continue to provide timely, evidence-based energy information to inform the energy conversation in Canada.

Thank you for the opportunity to discuss these issues with you today.

We look forward to answering your questions.

[*English*]

The Chair: Thank you so much, Mr. Christie.

We're now going to move on to Mr. Leyburne, who's representing NRCan.

You have five minutes, sir.

Drew Leyburne (Assistant Deputy Minister, Energy Systems Sector, Department of Natural Resources): Good morning. Thank you, Chair.

As you know, energy is foundational to Canada's economy, competitiveness and national resilience. Canadians rely on secure and affordable energy every day to heat their homes, power businesses, move goods, support industry and connect communities across our country.

Canada starts from a position of considerable strength. We have abundant resources, a diverse energy mix, strong institutions, significant infrastructure and deeply integrated trade relationships.

[*Translation*]

However, energy security is never a given. Current geopolitical instability reminds us just how interconnected global energy markets are. Events taking place thousands of miles away can have repercussions on our energy systems, and thus on our economy and daily lives.

[*English*]

Changing trade dynamics, extreme weather, aging infrastructure, cyber-threats, supply chain pressures and rising demand affect not only global markets but also Canada's domestic ability to produce, move, store and deliver energy reliably and affordably. That is why energy security must be understood as more than supply alone. It is about the resilience of the full energy system: production, transportation, storage, refining, distribution, emergency preparedness, infrastructure protection and the ability to respond quickly when disruptions occur.

In the Canadian context, the concept of energy independence also requires nuance. As a major energy producer and exporter, energy independence should not mean self-isolation. It is better understood as the capacity to make sovereign choices to produce, move, secure and trade energy in ways that best support Canadian interests.

[*Translation*]

With this in mind, we recently published a national strategy for an electricity-based Canadian economy.

[*English*]

The national electricity strategy is anchored on the idea that electricity is foundational to competitiveness and that growing the electricity sector in an affordable manner is key to both economic prosperity and reducing emissions. Canada already has one of the cleanest grids in the world, with about 80% of electricity powered by non-emitting sources. Building the infrastructure to double Canada's electricity systems will require generational investments in transmission, generation, distribution, storage and grid modernization.

[*Translation*]

The electrification of the economy is essential to reducing emissions while supporting long-term competitiveness.

[*English*]

The strategy acknowledges where electricity is provincial or territorial jurisdiction and calls for even closer collaboration with provinces and territories, utilities, indigenous partners, industry investors and other partners.

[*Translation*]

Work has already begun, notably with Bill S-4, which aims to modernize the Energy Efficiency Act and pave the way for modern demand management programs.

[*English*]

We will expand support for energy-saving retrofits for up to one million households through financing, grants and complementary measures. We have also committed to exploring expanded support for interprovincial transmission through investment tax credits and the development of a new comprehensive transmission interconnect investment strategy for interties.

● (1115)

[*Translation*]

However, national energy security is obviously not limited to electricity. It encompasses all energy sources, systems, infrastructure and capabilities on which Canadians and the Canadian economy depend. Canada has a major asset: the abundance and diversity of its energy resources, ranging from oil and natural gas to hydroelectricity, nuclear power and renewable energy.

[*English*]

Canada is also a fuels leader, holding about 10% of the world's proven oil reserves and 3% of its proven natural gas reserves, while accounting for roughly 9% of global exports and 7% of gas exports. However, the ongoing conflict in the Middle East has contributed to a significant and sustained disruption in global oil and gas markets.

[*Translation*]

Although Canada is less exposed to direct crude oil shortages thanks to integrated and diversified supply chains, it is not immune to the effects of the global context, which Canadians are already feeling through rising and volatile energy prices.

[*English*]

Canada supports global stability as a dependable supplier of responsibly produced energy, with LNG Canada exporting approximately 14 million tonnes per year and the Trans Mountain pipeline with the capacity to send up to 890,000 barrels of crude oil per day.

Alongside future LNG, LPG and oil exports from projects under construction, we are reinforcing our alliances while supporting economic growth and prosperity at home.

Energy security requires hand in hand co-operation between the federal government and provincial and territorial partners.

[*Translation*]

It is not a matter of dictating solutions to them, but of understanding their reality and challenges and strengthening joint planning, coordination and a collective response to emergencies.

[*English*]

In closing, Canada approaches this study from a position of strength, but it is also a time of growing pressure on energy systems. Electricity, energy security and energy independence are closely connected. The common objective is a reliable, affordable and resilient energy system for Canadians now and in the future.

Thank you.

The Chair: Thank you, Mr. Leyburne.

Thank you to our presenters for two very comprehensive presentations.

We will now move on to questions, as we always do.

We're going to start with Mr. Tochor for six minutes.

Corey Tochor (Saskatoon—University, CPC): Thank you, Chair.

Thank you to our witnesses for appearing today.

For our natural resources officials, we hear of modelling in which we need to double electricity. I've heard it from multiple sources. I want to understand. Has the department modelled out what that would look like?

Drew Leyburne: Mr. Chair, I might direct the question to the energy regulator, which has done some of that scenario building.

Darren Christie: Thank you for the question.

In our energy futures report, we have four different scenarios.

The amount of demand growth is endogenous and is a result of the kind of bottom-up construction scenario we've done. What we see, as I mentioned in my opening remarks, depending on the scenario, is that demand goes up by 30% to 120% above 2023 levels by 2050.

We model how the electricity grid responds, based on assumptions around such things as costs of different generation technologies, the efficiencies of those technologies and so on.

Corey Tochor: On that example, then, let's take the low end. If there's a 30% increase by 2050, what does that cost?

Darren Christie: I don't have the exact cost numbers at my fingertips. What I can say, as noted in the report, is that when we look at the cost of electricity on a per unit basis, we see it increasing in the future. That increase is fairly similar to the rate of increase that we've seen in recent history, and it's also going forward pretty close to the general rate of inflation.

Corey Tochor: Just to confirm, you have the numbers. They're just not with you right now.

Darren Christie: What we have is the cost. We have a cost number. It doesn't include some elements of the provincial systems specifically, but it includes large transmission as well as generation. What I just noted in terms of the cost impacts relative to inflation does include some assumptions around those provincial components as well.

Corey Tochor: Could I get you to table those costs, along with which costs are associated with which provinces? We have a concern about affordability in Canada. There are some provinces that are suffering more than others. As much as all Canadians have been suffering for the last 10 years, it's been more acute in other areas. I would be interested in the tabling of those numbers.

On the process of this modelling that you guys have done, when was the last time this modelling was done? Say it's 20 years ago: Is there a report that showed what we might need today?

Darren Christie: Yes, over time, the exact frequency has varied, but it's a report that has at times come out annually. This most recent one was almost three years after the last one, but somewhere in that 20-year range, certainly, we would have another one.

● (1120)

Corey Tochor: Could you table the report that came out 20 to 25 years ago and your response on how accurate that modelling would be? I'll ask you to table that after the meeting.

Also, I question what assurances Canadians would have that this electricity strategy is not another white elephant.

Drew Leyburne: I can take that one, given that we were responsible for the electricity strategy.

We took a pragmatic approach to developing the electricity strategy in working really closely with our colleagues in provinces and territories. We spoke to electricity utilities and end-users and tried to get at the best sense of what some of the most realistic expectations were about the progression of the electricity system over the next few decades.

As for your earlier question, our strategy notes that this is a significant financial undertaking. It's over $1 trillion. Actually, if you ask Electricity Canada, the number they see is closer to $2 trillion, but that needs to be observed against the baseline of tens of billions of dollars of electricity spending that is already happening and has been happening year over year for decades.

Corey Tochor: So that viewers at home understand, when was the last time we had electricity shortfalls as we're experiencing now or are modelled for the near future?

Drew Leyburne: The last couple of years have been somewhat anomalous, in that a number of hydro projects have underproduced compared with traditional production because of climate-induced drought.

André, you might be able to talk about the longer trajectory.

André Bernier (Director General, Electricity Systems Branch, Energy Systems Sector, Department of Natural Resources): Thank you very much for the question.

Canada is fortunate to have a very reliable electricity system. The challenge—if I could propose a reframing—would be less shortfall and more constrained opportunity, in the sense that, if you don't have the power available, you're not necessarily able to attract new power-intensive industry. There are moments when you come up a bit short. I know Alberta's grid was a little more challenged a couple of years ago, but they've added a lot of capacity since then.

From Canada's perspective, it's probably more about a limit on opportunity as opposed to the active risk of not having enough electricity at any given moment.

Corey Tochor: Thank you very much to the witnesses for being here today. Thanks for giving us a strategy to keep the lights on.

The Chair: Thank you, Mr. Tochor.

We're going on to Mr. Guay for six minutes.

Claude Guay (LaSalle—Émard—Verdun, Lib.): Thank you, Mr. Chair.

Mr. Leyburne, you mentioned that the national electricity strategy is produced under the leadership of NRCan. The one thing that touched everyone's imagination is the ambition to double it by 2050.

Can you go further into NRCan's role in helping provinces and territories plan the scale to build out, while respecting the jurisdiction of each province?

Drew Leyburne: I'm going to hand it over to my colleague André because he's dealing with this every day.

André Bernier: Thank you for the question.

I want to begin by acknowledging that the Constitution is the beginning point and end point for understanding who the primary decision-maker is.

The federal government is looking at this from the perspective of partnership. As you go from east to west, geography plays a large role in determining what options provinces have. Some have abundant hydro resources. Others have wind or natural gas. Others have built out a nuclear fleet. The posture of the strategy is one of partnership and collaboration. It would not be for us to dictate what the priority should be, but rather to be responsive to the provinces' initiatives. For example, Ontario clearly has ambitions to build out its available nuclear supply. It's about acting in support of that.

Bilateral conversations and regional conversations are critical to success, from our perspective. We don't want to be dictating what the electricity mix should look like from Ottawa.

[*Translation*]

Claude Guay: I will now speak in French.

You mentioned different regions. Let's talk about eastern Canada and Quebec. We know that as we speak, Quebec is facing certain capacity constraints. Meanwhile, there are projects under discussion, such as wind projects in the Maritimes, in Nova Scotia and the Gull Island hydroelectric project in Labrador.

Can you tell us how Natural Resources Canada views these projects, and discuss the positive impacts they can have for Canadians and Quebeckers?

● (1125)

André Bernier: I won't provide a specific answer for each project. I believe the decision to launch projects that provide additional electricity addresses challenges and offers opportunities for economic growth. However, I find it somewhat difficult to comment on any given project. We play a rather peripheral role with respect to individual projects.

Claude Guay: I understand what you're saying, but the electrification strategy talks about interconnection between provinces. Perhaps you could talk about that and the benefits of interconnection.

Furthermore, the strategy also promises that, ultimately, Canadian consumers could potentially benefit from savings. So, how do we get there?

André Bernier: Currently, provincial systems are not completely isolated, but the level of integration is very limited. However, integration provides benefits in terms of managing variable energy resources, such as wind and solar power. Having a larger region for managing these resources is more efficient. Each province has its advantages and drawbacks. For example, in British Columbia, wind potential is slightly lower than in Alberta. Interconnection can thus benefit consumers in each province.

Integration does not necessarily have to occur under all circumstances. However, since the current level of integration is very limited, our view is that increased interconnection would be beneficial.

[*English*]

Claude Guay: Mr. Leyburne, perhaps you can direct the next question to whoever can best answer it. It's about “one project, one review”. We hear this theme again and again. How does it work? How do we negotiate that with the provinces? How do we get to the benefits of that quickly?

The Chair: Please give a quick answer. There are just 20 seconds left.

Drew Leyburne: The shortest answer is that there were some significant measures put forward a few weeks ago through the “Getting Major Projects Built in Canada” discussion paper, which touched on some of the various ways we can modernize our regulatory system and streamline some processes.

The Chair: Thank you.

[*Translation*]

Mr. Simard, you have six minutes.

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

I am pleased to undertake this study, but I do not share Mr. Guay's enthusiasm.

We are talking about doubling Canada's electricity production. I read Professor Mousseau's paper. When you put the figures into perspective, you quickly realize that Canada is truly lagging behind. In fact, if we look at the energy mix, electricity accounts for 17%. In Quebec, it's 40%. In China, it's currently around 32%. That means that if, by 2050, Canada doubles that 17%, it will reach 34%. China has already achieved 32%, and it is the world's largest economy.

So, we need to put things into perspective. I understand the goal, and it is highly commendable, but I don't think it's all that ambitious. We could use that as a starting point for this discussion. Personally, I'm concerned because I'm hearing more and more about how electrification technologies are being widely deployed in China. So the Chinese, for their part, are building the value chain and infrastructure.

I don't know whether your strategy specifically includes that. How will we achieve a value chain that is truly Canadian and Quebec-based with regard to the issue of electrification? The network is important, but so are value chains. I would like to hear your thoughts on this.

● (1130)

[*English*]

Drew Leyburne: I'm happy to start, and maybe André can jump in.

Yes, you are correct that electricity has been a relatively stable contributor to the overall energy mix in Canada. We are approximately at the OECD average for electrification of our economy, which means we're not an outlier on either end of that equation. As part of the doubling we talked about, we see electricity taking an ever-increasing role in the overall energy mix.

I would say as well that what we have, and what China and most OECD members don't have, is an abundant fuel resource. This explains part of the reason a country like China might be more tempted to move into electricity, where they can be less dependent on imported fuel resources.

[*Translation*]

Mario Simard: One of the major concerns, which seems quite glaring to me, is the fact that Quebec has already developed its own power grid. Quebec paid to develop its power grid without any support from the federal government. So, we already have infrastructure. Furthermore, Quebec is probably the province with the most ambitious action plan. Hydro-Québec's plan is for $200 billion by 2035. To me, 2035 is right around the corner.

How will we achieve a fair strategy?

I get the impression that Ontario's needs, given the cost of nuclear power, will be much greater than what you might be able to offer in support to Quebec—which already has its own infrastructure and investment plan. So, in rolling out your strategy, will you take into account the specific needs of each province and of Quebec to ensure a fair distribution of the funds that will be allocated? At first glance, I get the impression that this strategy is being implemented to allow other provinces to catch up. That strikes me as fundamentally unfair.

[*English*]

Drew Leyburne: My starting response would be that the purpose of the strategy, as André and others have said, is to work closely with the provinces and territories.

Most of the tool kit that we currently have available to support the transition towards greater electrification is pan-Canadian. For example, the investment tax credits are applicable regardless of which province or territory the activity is taking place in, and they provide significant benefit to the province or territory that's using them.

We have our SREPs—$4.5 billion—where expenditures are being made in every province across Canada. Making sure that we have an electricity strategy that reflects the unique differences of every province, territory and region means that we won't use the tools symmetrically or in a cookie-cutter way across every jurisdiction. However, I am confident that we have a tool kit that does support every province, including Quebec.

[*Translation*]

Mario Simard: As I recall, there has been a recurring request from Hydro-Québec for less than ten years. I believe that only interprovincial infrastructure is eligible for certain tax credits. Hydro-Québec has requested that intra-provincial infrastructure also be eligible for this type of tax credit.

Will this part of the strategy be changed?

● (1135)

André Bernier: Thank you for the question.

As stated in the strategy, the federal government intends to introduce support for these intra-provincial transmission lines. The details have not been finalized, but that is the intention.

Mario Simard: You see, Mr. Guay, I'm not always acting in bad faith.

[*English*]

The Chair: Thank you, Mr. Simard.

Colleagues, that completes our first round of questioning. We'll go on to our second round, but before we do, I welcome Mr. Rowe back. He seems to be a permanent fixture, and we're happy about that. I also welcome Mr. Gunn and Mr. Watchorn, two members sitting in for other members today.

With that, Mr. Rowe, you have five minutes.

Jonathan Rowe (Terra Nova—The Peninsulas, CPC): Thank you for having me here today. I'm looking for a lot of answers. Perhaps Mr. Leyburne could help me out. He's the assistant deputy minister of energy systems.

I'm wondering what the plan is here. I mean, energy demand is exploding in Canada. We have the resources. It seems to me that all we need is the access to markets, whether interprovincial or international, and then to build these facilities.

Does the government have a plan for funding the construction of the generation? I guess it's a yes-or-no question. Is there a plan right now to fund these generation plants in Canada?

Drew Leyburne: It's not yes or no, but I would say the federal government will be involved in much of the development. Ultimately, it will be provinces, territories, the utilities and private finance that produce the vast majority of expenditure to get the systems involved.

Jonathan Rowe: There are very limited loans and grants to Crown corporations, or even private industry, to jump-start the generation facilities to meet this energy demand.

Drew Leyburne: No, we have a pretty extensive tool kit. We're talking about trillions of dollars. The federal government will not be producing trillions of dollars for that investment, but we have tens of billions of dollars in support already in play. The investment tax credits for clean electricity are worth tens of billions of dollars alone.

I mentioned the $4.5-billion program we have at NRCan for renewable energy, SREPs. We have the Canada Infrastructure Bank and the Canada Growth Fund. We're talking about dozens of billions of dollars that have been put towards modernizing energy.

Jonathan Rowe: It's good to see that you're putting in that investment, because it's very needed. Developing our resources has always been a struggle for Newfoundland and Labrador because we need someone to write the cheque. That's very good.

The other issue we have in Canada is interprovincial trade barriers. Some provinces put up big trade barriers against other provinces trying to push it through. The new Liberal government talks big about reducing those interprovincial trade barriers in order to get to international markets.

Is this part of the government's plan? Are we planning to use that money—those loans and grants—to eliminate interprovincial trade barriers, or are we just going to hand out money without those conditions attached to the cheque?

Drew Leyburne: The federal government will do everything it can to support greater energy trade, if we're specifically talking about energy.

On electricity, that comes through supporting interties, which we've said are a major focus. One of the early focuses of the investment tax credits was on giving additional support to interties among provinces. We have multiple examples of the federal government recently and traditionally funding those interties. The most recent, probably, is the New Brunswick-Nova Scotia intertie. The government contributed funding earlier this year.

Mike, I don't know whether you want to talk a bit about interprovincial trade for other products, such as fuel products and refined products.

Michael Rau (Director General, Policy and Planning Branch, Fuels Sector, Department of Natural Resources): There's really not much in terms of interprovincial trade barriers in the refined product space, at this point. Flow is pretty freely done among provinces and territories, so I don't think there's a big issue on that particular front.

Jonathan Rowe: Wow. I think people in Newfoundland would be very surprised to hear that, because we've been struggling to get our electricity through other provinces for a very long time. There are some big barriers there, whether or not they're physical, so there's definitely some work we have to do. It's disappointing to hear that we're not attaching conditions to those cheques for grants and loans in order to make sure we can build a Canada that's united under one flag. We would like to work together to create the energy superpower we all dream about being, in order to encourage geopolitical leverage against our friends down south. This is something Conservatives have been very strong on, and it's something Newfoundlanders and Labradorians are also very passionate about. As Canadians, we're very passionate about this, and it's an avenue we could definitely work on.

With this plan we have, what's going on? I'm concerned about how much money we're giving to different projects. Right now, there's an MOU being signed between Newfoundland and Labrador and another province, but I don't see the federal government sitting down at that table. Perhaps it's happening. Maybe conversations are happening behind the scenes.

Are you guys telling both provinces, “Look, this is what our plan is. This is what we're going to contribute, and this is what we're going to do”, or is the federal government going to wait until after the MOU is signed and the deal is done before it comes in and says, “This is what we're going to do”? Does everyone know what's happening before the deal comes out?

● (1140)

The Chair: We have time for a short answer.

Drew Leyburne: Are you referring to a specific MOU?

Jonathan Rowe: Yes.

Drew Leyburne: Is it the Alberta MOU?

Jonathan Rowe: It's the Newfoundland and Labrador MOU.

Drew Leyburne: Oh, I see. I can quickly respond to that.

We were very heartened to see a willingness to get to the table again. Both provinces have appointed very strong negotiators.

In terms of the federal government, this is mostly a deal between two parties. We think the project has significant interest for Canada, and we'll certainly do anything we can to help those two parties come to an agreement.

Jonathan Rowe: [*Inaudible—Editor*] writing the cheque.

The Chair: Thank you both for that exchange.

Mr. Watchorn, welcome to the committee. You have five minutes.

[*Translation*]

Tim Watchorn (Les Pays-d'en-Haut, Lib.): Thank you, Mr. Chair.

I'd like to thank the witnesses for joining us today.

I have the honour of sitting on the Standing Committee on National Defence. Currently, we are hearing a lot about security in the north. I will therefore direct my questions to Ms. Ankersmit.

First, I would like to know how the energy strategy will help the north secure its energy supply. How will we gradually move away from diesel to promote other energy sources?

[*English*]

Joanna Ankersmit (Acting Assistant Deputy Minister, Northern Affairs Organization, Department of Crown-Indigenous Relations and Northern Affairs): Yes, we're working closely in the north with a number of departments. This isn't just a national defence issue. We are working with our partners in NRCan, CIRNAC, CanNor and a number of departments that have to be involved in this.

Most important are our territorial partners, the utilities and our indigenous partners across the north. It's a collective effort to work toward increasing the capacity of the north to meet the energy needs that will be coming with Arctic sovereignty. It will play into the execution of NRCan's strategy. We look forward to working with NRCan on that.

Tim Watchorn: That's great. We're also talking a lot about dual-use technology. There are dual-use technologies for bases and communities.

Do you see that as something that can be developed as we establish our security bases in the north?

Joanna Ankersmit: Certainly. That has been a very active conversation between our colleagues at National Defence and communities, including territorial government and indigenous partners.

Tim Watchorn: Thank you.

[*Translation*]

I would also like to know how the federal government can support indigenous equity in energy projects.

[*English*]

Gurbux Saini (Fleetwood—Port Kells, Lib.): Mr. Chair, I'm having difficulty with interpretation.

The Chair: One moment, we'll check with our interpreters and the clerk.

Mr. Watchorn, please continue. You have a little over three minutes left.

Tim Watchorn: Thank you, Mr. Chair.

[*Translation*]

I'll repeat my question: how can the federal government support indigenous equity in energy projects?

[*English*]

Joanna Ankersmit: There are many ways. That's a big question.

One of the programs that we have been running out of CIRNAC is the northern REACHE program. That's a program that has been working with indigenous communities over the last decade to really promote their own innovation in their communities. Across the three territories, there are 55 independent diesel grids. There are three minor, or relatively small, regional grids. There's a lot of opportunity for growth and development in the indigenous space. The communities have been very active in projects across the three territories and in Inuit Nunangat.

I expect there will be plenty of opportunities to work in partnership with the other partners and indigenous leadership in this exercise to increase the off-diesel component and the renewable technology, which will increase the energy security of the territories in Inuit Nunangat.

We have a number of projects, most recently with Iqaluit hydro, which has the potential to significantly reduce the diesel needed to power Iqaluit, the capital of Nunavut. That is an indigenous-led project that we really look forward to working on with our partners.

● (1145)

[*Translation*]

Tim Watchorn: Thank you very much.

I have one last question: Is the established indigenous loan guarantee program helpful for indigenous participation in these projects?

[*English*]

Joanna Ankersmit: There have been a number of positive reactions to that fund. My colleagues at NRCan may have some further comments on that, but I know that it has been very well received by our indigenous partners across the country and in the north.

[*Translation*]

Tim Watchorn: Mr. Bernier, do you have anything to add?

[*English*]

André Bernier: I would also mention, beyond the indigenous loan guarantee program, that the Canada Infrastructure Bank has been working in partnership and facilitating indigenous ownership of a number of projects across the country. The CIB has become an increasingly prominent player in terms of supporting equity and debt participation of indigenous partners.

[*Translation*]

Tim Watchorn: Thank you, Mr. Chair.

The Chair: Mr. Simard, you have two and a half minutes.

Mario Simard: Thank you, Mr. Chair.

Mr. Guay and I had a very interesting meeting with a service provider for peak demand management, and it reminded me of two components of your strategy.

On the one hand, there is infrastructure for electricity producers. That involves developing infrastructure and interconnections. However, on the other hand, I don't see how you can support the value chain that is developing around electrification and small service providers, who play a particularly crucial role. Indeed, in your opening statement, you mentioned storage strategies. I think we're lagging behind in that area in Canada.

How can you provide support to these service providers within your strategy?

André Bernier: Thank you very much for the question.

The strategy identified eight areas for action. One of these areas is capacity building across the value chain. However, we need to conduct analyses, have conversations and collaborate to identify specific opportunities. At this point, we fully agree that this is a pressing issue, but there is still work to be done to identify which industries or companies are among the most important.

Mario Simard: In other words, we'll have to wait a few more years before seeing this materialize.

André Bernier: I hope it will be months rather than years. However, that is part of the work.

Mario Simard: Very well.

Has this been presented yet? You mentioned eight sectors.

André Bernier: There are eight sectors.

Mario Simard: Have those eight areas been made public?

André Bernier: Yes, they are part of the strategy.

Mario Simard: So the eight areas are identified in the strategy.

[*English*]

The Chair: Thank you both.

Mr. Gunn, welcome to the committee. You have five minutes.

Aaron Gunn (North Island—Powell River, CPC): Thank you, Chair.

Mr. Christie, as I'm sure you know, there are two hydroelectric dams located in the city of Powell River. The dams were built more than 100 years ago to power the local pulp mill, creating thousands of jobs. They quite literally built the city of Powell River. About 10 years ago, that mill fell into financial trouble. It was forced to sell the dams as distressed assets to a small company called Brookfield Renewables. That company has since applied for an electricity export permit to send that electricity out of Canada to the United States, in the middle of a trade war, with no or very little benefit to the people who live in the region, the province and the country.

About one month ago, as the local member of Parliament, I submitted a letter to the Canada Energy Regulator demanding public hearings in the city of Powell River at the earliest possible opportunity regarding Brookfield's permit request. This would give the people who the regulator's decision will affect the most the chance to have their say. Here we are, one month later, and there is still no response.

My question for you is, why the silence? Will the regulator commit to holding public hearings in the city of Powell River regarding this very important issue?

● (1150)

Darren Christie: I'll have to start by noting that the decision of where and exactly when to hold an oral public hearing is a decision of the independent commission. It's not a decision that I can make. It's my understanding that the commission has committed to holding an oral hearing. The commission has not yet communicated the location and the exact dates. I'm not in a position to elaborate on where it will be.

Aaron Gunn: Okay. Thank you. Well, I hope you can pass it along to some of the people you're working with to try to have a more rapid correspondence with the local member of Parliament. We have been waiting a month. If there have been developments, we would like to know. It is very important for the people who live in Powell River, regardless of political persuasion, to have their say on this very important issue.

In Canada we like to talk a lot about clean renewable energy, electrification and domestic self-sufficiency, and yet in provinces like British Columbia, endowed with massive hydroelectric resources, in recent years we've become an electricity importer, primarily from the United States. In this context, does the Canada Energy Regulator believe it makes sense to be granting export permits to corporately owned power producers so that they can send the finite electricity that is being generated here out of the country, or is that something that is even part of the consideration?

Darren Christie: What gets looked at in the context of applications to export electricity is spelled out in the Canadian Energy Regulator Act. There are two specific requirements.

One is related to impacts on neighbouring provinces, and the other is what we refer to as the fair market access requirement. That effectively requires that if electricity is to be exported, would-be Canadian buyers of that electricity have an opportunity to purchase the electricity on, I would say, similar enough terms and conditions. The considerations beyond that are not contemplated in the act, but that fair market access requirement, I understand, is the core issue that's being considered as part of that hearing on the Powell River export application.

Aaron Gunn: Thank you very much for your answer.

Really quickly, Mr. Leyburne, if I can direct a question towards you, how reliant are east coast refineries on foreign oil or oil that transits through the United States at the moment? Do you have that information?

Drew Leyburne: I'll pass that on to my colleague, Mike Rau.

Michael Rau: Sure.

I'll try to get the numbers off the top of my head, but eastern Canada imports about 500,000 barrels per day. I think that about 80% of that is from the U.S., with the rest from other countries. In and around 700,000 barrels per day transit the U.S. into southern Ontario and go into Montreal. Eventually, some of that gets into Lévis.

I would say that most of the region is supplied by Canadian crude. My understanding is that the biggest rationale for eastern Canadian refiners' bringing in crude is that it has to come in by ship at this point, so there are some infrastructure constraints.

● (1155)

The Chair: Thanks to both of you.

We'll move on to our final speaker.

Mr. Saini, you have five minutes.

Gurbux Saini: Thank you, witnesses, for being here.

We are talking about doubling the capacity of the grid by 2050. How many jobs is that going to create? Do we have any idea?

Drew Leyburne: The short answer is that we don't have a specific number. The electricity strategy refers to the hundreds of thousands of Canadians who work in and around the energy system.

Part of it will depend on the type of build-out we see. Different types of electricity infrastructure have different types of employment patterns, but suffice it to say that, with this amount of economic activity, it's not just in electricity jobs that we'll see benefits. It's in the caterers, the construction companies, the fleet managers and others. There will be a spillover effect across the entire Canadian economy because electricity is so prevalent in every part of the country.

Gurbux Saini: In the recent announcement about the major projects, there's a northwest grid proposed for British Columbia that is going to link British Columbia with the Northwest Territories. Is that the type of development we should be seeing across Canada to help reduce all the barriers we have?

André Bernier: Thank you very much for the question.

Without commenting on that specific project—although it is referenced as part of the northwest conservation corridor project—I think the contention is that the more we're able to connect east-west and then north-south, including up to the territories in particular, the more we are likely to see benefits.

It's very challenging to run an isolated grid where you're heavily reliant on diesel for the most part. It means you're constrained for energy supply. Costs tend to be much higher. Over time, connecting the territories to the continental grid in the provinces could be very advantageous. It's a long-term, expensive endeavour, but it could be transformational for their energy systems.

Gurbux Saini: Thank you.

Mr. Christie, in your opening remarks, you said that we are issuing about 170 international permits. Is that only in the U.S., or do we have other countries that are also participating in that?

Darren Christie: Specifically in the context of electricity power lines, as well as electricity export authorizations, those would all be to the United States. The CER is not involved in authorizing trade between provinces. At this point, there are no designated interprovincial power lines either. That's why, currently, our jurisdiction of active facilities and export authorizations is all to the U.S.

Gurbux Saini: Thank you.

Mr. Leyburne, can you detail the electricity projects being advanced by the federal government to make Canada more energy secure in both clean and conventional energy?

Drew Leyburne: I would say that it would be a very long list. There are hundreds of projects that the federal government is actively supporting across the energy system right now, and dozens of programs that, in their different ways, are supporting it—and that's before we talk about the broad-based investment tax credit regime that supports every kind of project that qualifies.

Every year, Natural Resources Canada publishes a major projects inventory. We've been doing so for over a decade now—almost 20 years. You can very quickly, through that resource, see what some of the trends for major projects are in energy and other natural resources. It may be a useful reference for this report.

Gurbux Saini: Thank you, Mr. Chair.

The Chair: Colleagues, that brings to an end our first panel. Let me, on your behalf, thank our witnesses.

Mr. Leyburne, I wonder, because the electricity strategy has come up a number of times, whether you might formally table that with the committee. Mr. Tochor also had a request, and the committee would appreciate receiving those numbers, that evidence.

With that, colleagues, we are going to suspend for a few moments, and we'll start our new panel in about five to seven minutes.

● (1200)

_____(Pause)_____

● (1205)

The Chair: Welcome back, colleagues. We'll now resume the meeting.

I'd like to welcome our second set of witnesses. A number of them—all, in fact—are on the screen, as you see, via video conference.

As individuals, we have with us Normand Mousseau, scientific director at Trottier Energy Institute and professor of physics at Université de Montréal, and Blake Shaffer, associate professor, University of Calgary.

Professor Shaffer, you have two University of Calgary grads—

Corey Hogan (Calgary Confederation, Lib.): I'm not a grad, not at U of C. I was the vice-president.

Some hon. members: Oh, oh!

The Chair: Oh, all right. Well, I am a grad, so there you go. I'm going to give Professor Shaffer extra special treatment.

From HEC Montréal, we have Pierre-Olivier Pineau, professor, and the chair in energy sector management.

All witnesses have conducted a mandatory witness onboarding test, so they can participate virtually.

I'd like to make a few comments for the benefit of the new witnesses. Committee members may ask questions in either English or French. If you need interpretation, please take a moment now to prepare your earpiece and select the listening channel you need in order to take full advantage of the time allotted for questions and answers. This is a reminder that all comments should be addressed through the chair. Each of you will have five minutes for your opening remarks, after which we will open the floor to questions.

Mr. Mousseau, we're going to start with you. You have the floor for five minutes.

[*Translation*]

Normand Mousseau (Scientific Director and Professor of Physics, Trottier Energy Institute, University of Montreal, As an Individual): Mr. Chair, members of Parliament, thank you for this invitation.

The issues involving this consultation are very broad, and I cannot touch on all of them in five minutes. I will therefore focus on one point: the electrification of energy services in Canada—namely, transportation, heat generation and so on.

This is not only a climate issue, but also—increasingly—an issue of productivity and competitiveness with the rest of the world. It must therefore be addressed head-on.

While Canada's proportion of electricity use has stagnated at 17% to 18% of the total energy mix for more than 40 years, that of other Organisation for Economic Co-operation and Development, or OECD, countries has been growing for decades. China's proportion, however, increased from 15% in 2005 to over 32% in 2025.

This progress has been accompanied by development, expertise, production and large-scale deployment of electrical technologies in all sectors. While these countries are inventing and using 21st-century energy technologies, Canada is settling for 20th- and even 19th-century technologies.

The national electricity strategy that was announced last week, which seeks to double Canada's electricity generation, is a step in the right direction to close the technology and climate gap Canada is facing, but it is far from enough.

New generation must be deployed, and it is essential to ensure that most of it is used to replace fossil technologies and modernize our electricity use, rather than simply meeting new demands in data centres, for example. To do so, we need strategic approaches. We must shift from our climate approach—rather than focusing on short-term reduction targets, we should prioritize structural changes that will electrify our systems.

An asymmetric decarbonization strategy should be adopted, meaning that policies need to be tailored to the transition phase of each sector. Some sectors can transform rapidly, and we should accelerate the deployment of technologies in those areas. In other cases, we should support research and development and experimentation.

Support the new instead of punishing the old: Society will move away from fossil fuels when renewable technologies are superior. They are increasingly practical and less and less expensive. New policies should encourage the deployment of new technologies rather than targeting fossil energy.

Regardless, we must always pay attention to prices. In Canada, as we've seen, this is critical. However, we've observed that price fluctuations in the fossil fuel sector present opportunities that should be seized to decarbonize more quickly.

To move forward, we must adopt a planning and implementation approach that accelerates transformation while also ensuring greater benefits for Canada. It is not enough to review our approach from a high level—we need effective strategies for supporting and deploying technologies.

We must first envision a carbon-neutral economy and see how such an economy organizes heating and electricity transmission with net-zero emissions.

We must also identify the sequence of physical changes. We cannot electrify services if electricity is not available. We must ensure that we put things in place, together, to foster the adoption of new technologies and the development of innovations.

Finally, we must examine barriers, support catalysts and truly move forward by adopting appropriate regulatory measures as well as strategic support. We must measure progress and adapt quickly using key indicators updated in real time, or nearly so.

At the same time, innovation should be supported. Massive investments have been announced in electricity generation and distribution. We must also electrify end-use applications. All of this depends on significant investments. However, in Canada, there is a tendency not to believe that these investments can simultaneously foster innovation. We should therefore open markets. It is not simply a matter of supporting university research and basic research; we must also ensure that new products entering the market are integrated into reality through better-structured tenders and regulations. This will truly help establish a Canadian presence in these electric technologies, where our presence is currently lacking.

For a cautious country like Canada, faced with the risks of innovation, accelerating the pace—as we are doing now—without a genuine innovation policy risks pushing public services and contracting authorities toward well-established solutions, without importing innovation. It is absolutely essential to combine the two.

● (1210)

In conclusion, the massive electrification of our society is at the core of the transformation needed to achieve our climate goals, but also, and increasingly, to maintain the competitiveness of the Canadian economy. The announcement of the national electricity strategy is a step in the right direction. However, while deploying electricity generation infrastructure falls under provincial jurisdiction, the federal government must adopt a robust plan to electrify energy services, with a coherent strategic approach that ensures the modernization of our energy use while increasing the country's competitiveness. There is an urgent need to fill this void.

Thank you.

The Chair: Thank you, Mr. Mousseau.

[*English*]

We will move now to Professor Shaffer for five minutes.

Blake Shaffer (Associate Professor, University of Calgary, As an Individual): Thank you.

Mr. Chair, ladies and gentlemen, and committee members, thank you for the invitation to appear today. My name is Blake Shaffer. I'm an associate professor of economics at the University of Calgary, where I co-founded the university's electricity centre. I also co-direct Canada's energy modelling hub and lead a new initiative, western transmission catalysts. I'm a frequent policy adviser to the governments of Alberta, British Columbia and Canada. Before academia, I spent 15 years in industry, trading electricity and natural gas.

Let me begin today with the big picture. The IEA has recently declared that we are entering “the age of electricity”. That phrase captures two simultaneous shifts. The first is cleaner supply, which means more wind, solar, nuclear, geothermal and hydro in the generation mix. The second is greater electrification, which means more of our vehicles, furnaces and factories running on electricity instead of fossil fuels. Canada has a strong starting point on both. Nationally, we are already over 80% clean, although that number differs greatly from province to province. We also have a flexibility advantage from our large hydro fleet that the rest of the world can only envy.

Other countries are moving faster on the second dimension, which is electrification. In the last 15 years, China has gone from electricity making up 15% of its final energy demand to over 30%. Over the same period, Canada has moved from 21% to only 24%. The world is electrifying. Canada has every natural advantage to lead, but we can also be left behind if we don't act.

Today I want to flag two areas, one macro and one micro, in which I see significant wins on the table if we seize them.

The first area is interprovincial transmission. Forty-three years ago, my father testified before a federal committee, much like this one, arguing for stronger interties between the western provinces. The case he made then is essentially the same one I will make today. Critically, much has changed to make this idea even more compelling. We now have far more variable renewables that benefit enormously from geographic diversity—for example, pairing BC Hydro's reservoirs with Alberta's abundant and cheap wind and solar. Similarly, Manitoba offers flexibility that can help enable Saskatchewan's nuclear ambitions. A surge in expected load growth, from data centres and broader electrification, means opportunities abound. These are opportunities we simply cannot capture working province by province.

Finally, our relationship with the United States has become more tenuous. Canada still trades more power with the U.S. than we do across our own provincial borders. That trade is valuable, but we should also look within to reduce our dependence and to strengthen our competitiveness. The political ambition to expand interprovincial transmission is here. What's missing is the “how”. This is where the western transmission catalysts project comes in. With the support of all four western provinces, and working with utilities, grid operators and first nations across the west, our team is tackling the long-standing commercial, regulatory and physical barriers that have kept stronger interprovincial transmission stuck on the drawing board. We will have more to share publicly on this initiative in the coming months, but I will tell you this: In 25 years in this sector, I have never seen a stronger likelihood of success.

The second big win is flexible demand. Consider electric vehicles: one million EVs in my home province of Alberta would add roughly 3% to 4% to annual electricity demand. That is manageable. However, one million EVs all charging at the same time would increase our province's peak capacity needs by 50%. That is not manageable.

We stand at a fork in the road. One path leads to the bad place: higher peaks, massive upgrades to our distribution networks and higher costs spread across everyone. It doesn't need to be that way. The other path is flexible demand: consumers shifting consumption away from peak periods, making fuller use of existing networks and spreading system costs over a larger base, resulting in lower average costs for all. Around the world, we're seeing the growth of time-varying rates and demand flexibility services as low-cost alternatives to expensive peaking supply.

Mr. Chair, Canada has an enviable starting position, and all the tools needed to succeed, but we must act. In the age of electricity, a robust and affordable electricity system will be a key competitive advantage. Interprovincial transmission and a concerted push on demand flexibility are two big wins on the table.

Thank you.

● (1215)

The Chair: Thank you, Professor Shaffer.

We'll now go to Mr. Pineau.

You have five minutes.

Pierre-Olivier Pineau (Professor, Chair in Energy Sector Management, HEC Montréal): Thank you very much for the invitation. It's really a pleasure to be here.

I'm Pierre-Olivier Pineau. I'm the chair of energy sector management at HEC Montréal. I have published a report on the state of energy in Quebec every year for the last 12 years. For the last 30 years, I've been looking at, and have specialized in, energy and electricity policy.

It was with great pleasure that I heard the Canadian government recently mention its national electricity strategy with the key element of interprovincial trade and interconnections, as Blake mentioned. This is also a key aspect of the personal research I've been working on. I was extremely pleased to see that priority come in at the highest level—the federal level. I really think more interprovincial collaboration is key for the future of our country.

In 2013, I published a chapter called “Fragmented Markets: Canadian Electricity Sectors' Underperformance” to explain that we were underperforming in Canada because we were not better integrated due to our 10 different electricity markets. I strongly believe in integration.

In 2016, I published a paper that looked at Ontario and Quebec, one that exactly described what Blake was mentioning: the benefits of integrating a thermal jurisdiction with a hydro jurisdiction, by which you could reduce greenhouse gas emissions while creating welfare. In such cases, it pays to reduce greenhouse gases because you can substitute hydroelectricity and thermal generation to increase welfare, especially if you use marginal cost pricing in both jurisdictions. This is not the case in hydro jurisdictions, such as British Columbia, Manitoba and Quebec. We are using average cost pricing, which brings some inefficiencies to the market.

Interties are very important. I am a strong advocate of increasing interconnections among provinces. It's not only a matter of transmission lines but also a matter of how you design markets and how trade is settled. You really need to move pricing to a different level if you want to optimize our markets. That's an important point that I think the government needs to hear.

In the strategy presented by the federal government, doubling electricity production was emphasized. This is something we need to be extremely concerned about, because there is one aspect we don't pay enough attention to: Canada is suffering from energy obesity. We are using so much energy in Canada that it places us eighth in the world in terms of per capita energy consumption, between Oman and Saudi Arabia. Not only are we using a lot of energy in general, but we are using it extremely poorly. We are among the least-productive countries when it comes to energy productivity. We are in the same group as Kazakhstan and North Korea when it comes to energy productivity.

What is energy productivity? It's the amount of wealth or GDP we generate with one gigajoule, or unit, of energy. In Canada, we basically produce $146 for every gigajoule we consume. In the U.S., they produce $223. In Australia—a country we can compare with Canada because it has a strong natural resources basis to its economy—they produce $217 of GDP per gigajoule. We are not extracting as much wealth from every gigajoule we're using. That's for a good reason: We're blessed with an abundance of energy. We've never really paid attention to how much energy we're using to generate wealth. That has to change.

Both Blake and Normand, my esteemed colleagues, mentioned the low level of electricity in our final consumption in Canada—around 24%—but they omitted to mention that, on average, per capita, Canada uses 13,000 kilowatt hours per year, compared with China's 6,000 kilowatt hours per year. It is the same amount in Germany and France, or about the same.

● (1220)

We're already using twice the amount of electricity per capita as China, Germany or France is using. The goal is not to double electricity generation just for the sake of using even more electricity than what we're using now to generate very little wealth. The real goal to make Canada stronger and more productive is to use energy and electricity more efficiently and more wisely.

Our session's title is “Canada's Electrification, Energy Self-Sufficiency and Domestic Energy Security”. The energy security part has to be important. You don't become more secure by having bigger infrastructure. If you want to become more secure, you make sure that you're less vulnerable and less exposed, and you make sure that you use less energy while providing the same services so as not to overexpose yourself to the many different risks—geopolitics, climate risks and cybersecurity threats—that will come in the future.

I believe my time is over. I will stop here.

● (1225)

The Chair: Thank you, Professor Pineau.

Those were three very interesting presentations. I know that colleagues will have some good questions for you.

We are going to start with Mr. Tochor.

Corey Tochor: Thank you, Chair.

Thank you to our witnesses.

Mr. Shaffer, it is a very interesting personal story that your father was in front of a committee similar to this 43 years ago to talk about what we needed to do for interchanges between provinces.

Can you give a quick update on all the projects that have gone forward in the last 43 years that have achieved what your father testified about 43 years ago?

Blake Shaffer: At the time, they were talking about a western power grid from Manitoba across to British Columbia, which was going to be fully integrated. That didn't come to fruition. Most of the provinces looked southward towards more trade with the United States.

We have seen, over that period, the expansion of the Alberta-British Columbia tie-line to its current state, which remains a relatively small share, I would say, of both provinces' expansion. We've seen some minor additions between Saskatchewan and Manitoba as well, but the broader idea of a more integrated western power grid never came to fruition.

Corey Tochor: If anything in this country, it's unfortunate that the past Liberal governments have made some decisions that have weakened us and made us more reliant on our neighbours.

You brought up the interchanges with America, and there are reports that, on the business side of things, we sell natural gas to the States. They create electricity, and then we buy it back. Can you unpack that a bit? How does that make sense?

Blake Shaffer: I would say that, on electricity trade, there's one thing to keep in mind: Last year was quite a special year. If not net importers, we came very close to it, which is rare for our country. Normally we're a net exporter. The large reason for that was the droughts in the major hydro provinces—Quebec, Manitoba and B.C.

An important thing to note is that, while we were net importing in those provinces, we also continued to be a net importer of dollars. The benefit of hydro is that we're quite flexible. You can think of it as a large battery. We tend to export when prices are high and import when prices are low. That flexibility earns our provincial Crown corporations in those three places significant amounts of money.

All of those three provinces were net importers last year. I believe Quebec was almost break-even on dollars. Manitoba and British Columbia continue to earn net trade revenue on that. Our selectivity makes it quite advantageous for the hydro provinces to transact with their neighbours.

Corey Tochor: That's on hydro, but what about on natural gas? Are we shipping that much natural gas to the States to create electricity for us to buy back?

Blake Shaffer: It's a good question. If I'm looking at Alberta natural gas, the stuff going to the Pacific northwest, there are limited natural gas resources in the Pacific northwest. We tend to buy from the Pacific northwest and the western system as a whole when the renewables are in abundance, because that's when prices are low. If you look at flows across the B.C. intertie, that tends to be when natural gas is not on the margin. Those are expensive time periods for the United States. We tend to be importing in the middle of the day when California has too much solar or when it's extremely windy.

Corey Tochor: Let's go back to the natural gas share of our grid right now. I understand there's a bit of a shifting of percentages. Renewables have a role to play, and using them is encouraged. However, we're hearing increasing concerns that the regulatory processes in the States make it much easier than up here to bring out a natural gas plant. Would you agree with that statement: that it's easier, on the regulatory and permitting side, to get one built in the States right now?

● (1230)

Blake Shaffer: I can't say with definiteness, because I'm not a developer. However, I can say that currently one of the biggest impediments to natural gas power investment is equipment lead times. Right now, you can't buy a turbine for delivery before about 2032. We're at a point at which the supply chain is almost more of a limiter than any permitting process.

Corey Tochor: Thank you for your testimony today.

The Chair: Thank you, Mr. Tochor.

Thank you, both of you.

Mr. Hogan, you have six minutes.

Corey Hogan: Thank you, Mr. Chair.

Thank you to all of our witnesses today.

Professor Schaffer, it's good to see you again, a former colleague of mine at the University of Calgary. The university, Alberta and Canada benefit from your knowledge, as we benefit from the knowledge of all of our witnesses today.

Canada has many grids. Canada has many energy clusters. It is a north-south continent, and integrations are often north-south rather than east-west. That's true of gas, oil and electricity. In some ways, that makes a great deal of sense. Geography and market size push us that way; they push us south. Economics drive us that way. There is easier terrain, and there are better customer bases in the sense that they're bigger customer bases. This study is looking at both energy security and opportunities in electricity at the same time, I think in part because we know our energy future is an electricity future.

Professor Schaffer and Professor Pineau, you both talked about flexible demand and interprovincial ties, and you underlined that these are not just technical challenges. I think about my home jurisdiction of Alberta and how very different the market design is between Alberta and B.C. in particular. Could you both expand on some of the considerations or hurdles for interprovincial interties—and maybe not even just interties, because that's a physical thing, but also the trading of electricity between markets, technical and otherwise?

Maybe we can start with you, Mr. Schaffer.

Blake Shaffer: I can offer some of my professional background. I started my career at Powerex, the trading arm of BC Hydro, for seven years. I went to New York, and then I returned to Canada. I was head trader at TransAlta, which is Alberta's largest merchant. I'm well versed in the trading activity across the two.

There are many things that become an impediment beyond the physical act of linear infrastructure—simple things, such as scheduling timelines. In the western U.S., we schedule 60 minutes to the hour; in Alberta, schedules need to be in two hours before. We call them seams issues, and they make inefficiencies between the two. The biggest challenge for the B.C.-Alberta tie-up—as compared to, say, Saskatchewan-Manitoba, where our western transmission catalyst is already working—is market differences.

As Pierre-Olivier mentioned, in B.C. you have a Crown corporation and average cost pricing vertically integrated from generation all the way down to the retail level. In Alberta, we have a disaggregated market. We have competitive generation. We have regulated transmission and distribution and a competitive retail. That introduces a lot of complexity, because you're going to get elements of winners and losers, as in any trade, and you have a multitude of participants that you need to find some alignment on. This is in addition to the fact that you have what we call marginal cost pricing in Alberta and average cost pricing in British Columbia, and bridging that is challenging. However, that's exactly the type of thing that we're working on: those concrete details for commercial arrangements not to gloss over that really important issue.

I'll hand it over to Pierre-Olivier.

Pierre-Olivier Pineau: We've seen different countries in the world trying to integrate their markets. I spent some years in Finland during my Ph.D., and I experienced how four different countries—Norway, Sweden, Finland and Denmark—converged and changed their market designs to adopt a similar market design and solve the issues Blake labelled extremely well and then presented very well.

In a way, it's really a pity that our 10 Canadian provinces—even two of these provinces—cannot converge towards a similar market design to make sure that they can trade and plan in a more integrated manner to basically save on so many aspects that I won't detail here. Every time the OECD reviews Canadian energy policies—it's not every year; it's every four or five years—it always mentions in its reports that Canadian provinces should better integrate and open up to trade and competition, because there are so many barriers between provinces.

Part of the problem is that we don't trade enough. Also, we have very different systems, 10 different systems. We really need to integrate at all the levels of planning, systems operation and dispatch.

● (1235)

Corey Hogan: Thank you.

When we think about trying to push the country as a government to think more east-west and less north-south to increase energy security as we move forward—as I've said, that's tied to electricity intrinsically—what should we be thinking about?

It seems to me that there are going to be trade-offs when we do that, not least of which is that many of our provinces work on commercial terms with the United States. They make a lot of money trading with the U.S., as has already been mentioned. Our interests are broader than that. We are trying to make sure that Canada can have a secure energy future.

What do we need to be thinking about, and what should be reflected in this report?

Blake Shaffer: I can offer two quick things.

In my activity with the provinces, one thing that's become abundantly clear—not to be disrespectful to anyone in the federal government—is that the feds need to support and not lead. The provinces fiercely guard their provincial jurisdiction on this matter. They have the expertise, so we're really looking for support from the federal government. Of course, financial support is something no one turns down, but the real goal is coordinating and convening that support while leaving the leadership to the provinces.

The other thing, on an optimistic note, is that there's a broad recognition at this point that we aren't fighting over the division of the pie. That has held us back all the years I talked about, those intervening between my father's remarks and today. There really is an expanded pie of opportunities here, because of this looming large-load growth going on in electricity. The provinces are recognizing that they can't fully capture it without looking at co-operation. That's important to recognize.

Corey Hogan: That's great.

Pierre-Olivier Pineau: I may add that not only is there a bigger pie, but there are also efficiency gains to be made. Basically, the pie gets bigger if we collaborate. That's the conclusion in one of my papers. It's an easy economic conclusion. Whenever you trade, you generate welfare through efficiencies. We need to document benefits. We need to better document the benefits of collaboration with different provinces. Yes, there will be losers, as Blake mentioned, but these losers could be compensated, because there is a bigger pie. There are ways to make everyone win in the new system.

The Chair: Thank you to all.

As we say at every one of our meetings, we welcome briefs and papers.

Professor Pineau, if you want to table that paper, we'd appreciate it.

We're on now to Monsieur Simard for six minutes.

[*Translation*]

Mario Simard: Thank you, Mr. Chair.

I will try to ask non-controversial questions so as not to escalate the dispute between Mr. Pineau and Mr. Mousseau, which I am already aware of. I will try to reconcile them today.

Mr. Mousseau, we have often had this discussion about the technological lag in Canada's electrification efforts.

It seems to me that there are two elements that are quite interesting, and perhaps this is where I will help you reconcile your views. We have the challenge of peak load management, and we have the challenge of energy efficiency. In the context of this technological lag, if you had to identify sectors on which the government should perhaps focus its efforts in the short or medium term, what might that look like?

My question is also directed to Mr. Pineau.

Normand Mousseau: Thank you.

In a report we published last October, titled “Changing Course”, which we can submit after the meeting, we identify sectors such as construction, where we can work on decarbonization using heat pumps, and the manufacturing industry, where we can use industrial heat pumps. There is expertise to be developed in Canada, and even globally. So, Canada could position itself in an interesting way.

As for transportation, there is passenger transportation, but there is also off-road transportation, for example. So, there are different sectors where Canada could be active and contribute to innovation in a context where we still need to incorporate current technologies.

Pierre-Olivier Pineau: I could simply say that, indeed, the building sector is extremely energy-intensive. We have much to gain from having more energy-efficient buildings, and that efficiency can come from heat pumps and geothermal energy. However, above all, the thermal envelopes of buildings must be improved.

We must strengthen building codes. We must also ensure that building owners are aware of their energy consumption and receive an energy rating for their buildings. Natural Resources Canada establishes building performance ratings, but this is not mandatory, which means that building owners are not even aware of their own consumption and are not incentivized to improve the performance of their buildings.

So, obviously, there are plenty of electric technologies that have a role to play, but the federal government could play a much bigger role in building energy ratings and in transportation systems. Yes, we need electric vehicles, but above all, we need to reduce the share of private vehicles and promote rail and public transit more, which are both cheaper and use far less energy. We need to be mindful of Canadians' wallets. However, these are sustainable modes of transportation that cost less than buying an electric or gas-powered SUV.

● (1240)

Mario Simard: Thank you.

I would like to ask for your insights, gentlemen, and return to the question my colleague Mr. Hogan asked you earlier regarding the idea of developing east-west corridors rather than north-south corridors.

Not long ago, I had a meeting with representatives from Electricity Canada, in which Hydro-Québec participated. We were told that in terms of costs and efficiency, we might need to set aside this idea of an east-west corridor since they are instead focusing on areas of interest that they have already defined.

I'm telling you this simply to understand what would be most efficient in the short and medium term. Since resources are not unlimited, shouldn't we, when it comes to investments in these new corridors, focus on sectors where there is greater growth potential before considering east-west interconnections? I'm just saying this. It's not a trick question. I want to understand your thinking on this, since there seems to be a discrepancy with Hydro-Québec's position.

Normand Mousseau: An interconnection running south or west—for example, from Quebec to Ontario—will still enhance the grid's flexibility. So, for me, it's not a matter of maintaining the north-south orientation. By going in an east-west direction, especially if we want to develop wind energy or intermittent renewable energy sources, we still have a greater diversity of winds. So, there are benefits for balancing the grid.

Pierre-Olivier Pineau: A few years ago, Natural Resources Canada funded studies in Alberta, British Columbia and the Atlantic provinces, which showed that interconnection projects would already be cost-effective. However, local and provincial stakeholders were unwilling to move forward. We know that Natural Resources Canada has long sought to promote an Atlantic loop that would benefit all Atlantic provinces. Unfortunately, they are having tremendous difficulty reaching an agreement. Yet there are real gains to be made, especially if we plan for more renewable energy, as is the case in Nova Scotia, which wants to build offshore wind farms off the coast of the island.

So, we absolutely need these east-west transmission lines. Obviously, we're not thinking of a line running from Nova Scotia all the way to British Columbia, but rather of regional east-west zones. That would necessarily be the case, since in Canada the provinces are all either east or west of one another.

The Chair: Thank you, Mr. Simard.

Mr. Martel, you have the floor for five minutes.

Richard Martel (Chicoutimi—Le Fjord, CPC): Thank you, Mr. Chair.

Mr. Mousseau, I would like to know how you assess the reliability of production forecasts for new wind farms in a context of increasing climate instability.

Normand Mousseau: This isn't my area of expertise, but organizations like Ouranos do assess climate effects to some extent.

As for wind farms, I don't see any major issues regarding their productivity. These farms are improving in terms of production; that is, their uptime is also improving thanks to advances in knowledge, blade design and other factors.

I would therefore say that, on the contrary, we are gaining a better understanding of the overall predictability of these facilities' production.

● (1245)

Richard Martel: We're wondering a bit about how Quebec can guarantee its energy security. For example, changes in precipitation patterns limit the inflow of water into dam reservoirs. What are your thoughts on that?

Normand Mousseau: This isn't actually anything new. We know this happens roughly every 10 years, and we know that a year of drought is typically followed by a second year of drought. This is something we're familiar with.

However, models actually show that climate change will lead to increased precipitation levels in the north and in Quebec, on average. So, that doesn't mean it will be the case every year. Despite what we've seen over the past two or three years, when we run the models again and reanalyze the data, we can clearly see that the gains will be positive in terms of water supply.

Richard Martel: That's interesting.

In Quebec, we know there's a strong focus on the electrification of transportation, of course, but that will significantly increase winter electricity demand. In your opinion, is there, currently, sufficient capacity to ensure energy security during peak consumption periods?

Normand Mousseau: We are working on peak consumption. We need to manage winter peak consumption more intelligently, and the technologies exist. This will primarily be achieved through technologies and demand-shifting approaches, but it is feasible. We are analyzing the costs, and it is entirely cost-effective today.

However, Hydro-Québec is planning significant investments that should generate approximately 50 terawatt-hours, which will be more than enough to meet the electrification needs of the vehicle fleet. This is what we're seeing in the rest of the world. We mustn't delude ourselves. This is the direction the rest of the world is moving in. These are the best technologies. We could turn a blind eye and say we should stick with the old technologies of the last century, but it's in our best interest to ensure we remain competitive and master today's technologies.

Richard Martel: Given the rapid growth in demand, is it realistic to rely almost exclusively on hydropower and intermittent energy sources without maintaining dispatchable capacity such as natural gas, biomass and nuclear power?

Normand Mousseau: We must ensure we have a diversity of supply sources, even when it comes to electricity, and this diversity is multi-faceted. We have solar and wind power. We will also have biomass, as you mentioned. So there are ways to maintain a diversity of supply sources that will still have a low environmental impact. That is the direction we need to take.

Richard Martel: Mr. Pineau, from an economic standpoint, what is the real risk that new clean energy projects will turn into financial black holes?

Pierre-Olivier Pineau: The risk is mainly related to pricing, since these are projects that cost between 12¢ and 13¢ per kilowatt-hour produced. However, buyers are not willing to pay that price. There is a risk in developing projects and raising prices for everyone without social acceptance.

Today, unfortunately, on Hydro-Québec's side—and it's the same in Ontario with nuclear power—they're promoting major projects but aren't clearly communicating how the bill will be distributed. Ontario subsidizes nuclear projects with federal assistance, among other sources. In Quebec, all consumers pay a higher average cost to finance these projects, but there is no clear price signal regarding the actual cost of this electricity and the actual bill. Having electricity is beneficial, but unfortunately, in terms of social acceptability, the costs of these projects need to be better communicated.

The Chair: Thank you.

[*English*]

Next is Mr. St-Pierre for five minutes.

[*Translation*]

Eric St-Pierre (Honoré-Mercier, Lib.): Mr. Chair, I thank the witnesses for being with us.

We currently have among us the three leading energy experts in Canada, as well as the two stars from Quebec.

Mr. Mousseau and Mr. Pineau, perhaps a decade ago, we worked together at the Trottier Energy Institute and at HEC. It is always a pleasure to see you virtually. My comments and questions will be for both of you.

Mr. Mousseau, in your introduction, you briefly mentioned the new technologies that Canada could use. Could you quickly give us a few examples of these new technologies?

Normand Mousseau: In fact, we have mastered new technologies, such as heat pumps for buildings. However, when it comes to large buildings and the manufacturing sector, we are still learning how to use this technology worldwide. If Canada were to deploy these technologies within a framework that fosters the emergence of new service industries, it could establish itself on the global stage, even in terms of expertise. Installing an industrial heat pump is no easy task. It requires a thorough understanding of heat flow and other factors. We have seen several examples of failures in recent years in Canada, where money had to be invested. In short, this is one of the technologies.

In the transport sector, we must not only focus on personal electric vehicles, but also target underdeveloped sectors globally. These are sectors where Canada can decarbonize whilst developing economic competitiveness.

● (1250)

Eric St-Pierre: Perfect.

There is a strong focus on technology today, but I am curious to hear about social concerns or governance challenges. I'm thinking of the political aspects in the provinces and the complexity of the OSI reference model.

Mr. Mousseau, could you tell us about the social concerns and governance challenges linked to the electrification strategy? Are there any lessons our government could learn to help us double our electricity production?

Normand Mousseau: One of the problems, as Mr. Pineau said, is the cost of electricity. In itself, the cost is rising. It remains low compared to the cost of oil, but the question is how we ensure that all citizens can benefit from it. If you had a large vehicle, converted it to electric power and electricity prices rose, you would still make significant savings. If you lived in town and didn't own a vehicle, the rise in electricity prices would be a net loss. I believe it is absolutely essential to consider those programs and how to redistribute these resources fairly.

Planners also need to understand that it is not possible to fine-tune electricity production and demand. We will need to produce more electricity than we need initially to facilitate this. Here too, there are tensions over who will pay for the supply during these periods.

Eric St-Pierre: Perfect.

Mr. Pineau, I liked your use of the English words

[*English*]

“energy obesity”. It made me think of the analogy that maybe we should go on an energy diet or do energy intermittent fasting.

[*Translation*]

Some hon. members: Ha, ha!

Eric St-Pierre: I therefore thank you for using those terms.

Energy efficiency is often overlooked. Personally, I think it’s an easy goal to adopt. It’s a great opportunity to seize. Can you explain why we should focus on energy efficiency as our primary objective?

Pierre-Olivier Pineau: There are two or three main reasons for this.

The first reason is that it costs less to consume less, but it requires adjustments. If it costs less, why don't we do it? It's because we lack the incentives and aren't used to thinking efficiently.

In Canada, fortunately, we have this abundance of energy and batteries. That has led to complacency in our energy consumption. Europeans face higher prices and geopolitical challenges, and they're much quicker to adopt energy-efficient habits. If we did the same, we'd be more productive. It's good for the economy in terms of productivity.

We've also discussed energy security. On the day there are power outages due to an attack or a tornado, we'll be much better off in passive houses—which are extremely well-insulated thermal envelopes—than in homes that rely on electric heating.

If we have highly energy-efficient buildings, it will be better not only for productivity but also for performance and safety.

Eric St-Pierre: Thank you very much.

[*English*]

The Chair: Thank you.

That's the time for Mr. St-Pierre.

[*Translation*]

Mr. Simard, you have the floor for two and a half minutes.

Mario Simard: Thank you, Mr. Chair.

It's very short, gentlemen—two and a half minutes. So I'll be very brief.

As politicians, we're often called upon regarding economic projects and industrial development projects. The problem is always the same: who will succeed in securing an energy block. We know that without an energy block, it's partly a peak-load management issue, and that's often the case for Hydro-Québec. As Mr. Pineau said, it may also be due to poor energy efficiency management.

I know we won't fully resolve this issue. However, how can we in Quebec develop practices that are more conducive to getting economic projects off the ground?

Mr. Guay and I—I'll be brief—met earlier with representatives from a company that offers a peak management battery strategy. However, there must be other methods, other ways of doing things.

How can we support our industrial sector by giving it access to energy blocks?

● (1255)

Normand Mousseau: We conducted a detailed analysis of winter peak load management, which shows that we could shift several thousand megawatts or several gigawatts of power by managing thermal storage or an electric battery for a few days.

This is a challenge that is not limited to Quebec. The rest of Canada will also electrify its heating sooner or later, and this electrification will come with winter peak management. So we have to do it.

We believe it will be primarily a technical issue. When we conduct analyses, behavioural changes are minimal when considering a winter peak during extreme cold spells.

Pierre-Olivier Pineau: I'm not sure I fully understood the question, but regarding new energy projects, I believe we should let the market operate freely and not politicize energy or industrial development.

We need to tell industries that if they want a block of energy, they must obtain it from energy suppliers like Boralex or Innergex. They need to approach companies that produce energy for them. We also need to tell them not to wait for the government or Hydro-Québec to grant them a block. They must purchase it, obviously in accordance with the environmental regulations specified by the government.

We must let the market take its course. We are already energy-obsessed. It is not up to the government to take consumers by the hand and decide yet again who will have energy. It is up to consumers to take charge and procure their own energy from suppliers.

The Chair: Thank you, gentlemen.

[*English*]

We have two additional speaking spots—Mr. Tochor and Ms. McKelvie. We're going to be going a bit over, colleagues, but I think that's all right.

Mr. Tochor, you have five minutes or less.

Corey Tochor: Thank you, Chair. We'll see how we get through my questions.

Mr. Pineau, are you concerned about the low rainfall that is forcing Quebec to import more electricity from other jurisdictions?

Pierre-Olivier Pineau: It's a concern, but it's not such a big problem because, fortunately, we do have interties with Ontario, so we import cheap nuclear power at night. It helps Ontario, and it helps us to keep water in the reservoir. That's why I am in favour of more interties with neighbours to better manage these situations.

Corey Tochor: How would you square that with the support of nuclear by the people of Quebec?

Pierre-Olivier Pineau: We don't really need nuclear power in Quebec at this point, because we have a large supply of hydro. We have multi-year reservoirs—

Corey Tochor: Hold on. I want to clarify. You just said that you relied on low water, but now you don't want to rely on it, or the province doesn't.

Pierre-Olivier Pineau: We rely on access to imports from different places. One place is Ontario. We benefit from the current overgeneration at night in Ontario. Ontario has overgeneration at night that benefits both Quebec and Ontario, because Ontario finds a market for its surplus nuclear power and Quebec finds some sources for imports. Quebec has been doing that for decades.

It's important, but I will—

Corey Tochor: Is it widely known among the public of Quebec how reliant they are on—

Pierre-Olivier Pineau: No, I don't think it's widely known. They rely...partly for their supply, but it's not widely known that Quebec imports so much. Those who look at the system know that.

Corey Tochor: Do you think the federal government should be advertising and communicating that in Quebec, so there's a better understanding of where its electricity is coming from?

Pierre-Olivier Pineau: Yes, everyone should know and better understand the role of interconnections and the diversity of supply.

Corey Tochor: To wrap up, I have one question. If you had a magic wand, and you had one regulation or one thing to change that would help our country out.... I know you've talked a lot about interchanges and some of the other ones. I'm interested in whether there's one thing the current government isn't doing that should be done in the future. Could you submit one idea?

Pierre-Olivier Pineau: For electricity, it's the promotion of one single market design for all 10 provinces. The Norwegian market design was adopted by Sweden, Finland and Denmark. I would say, let's follow that lead and look at Norway and how its market design was adopted by other countries.

● (1300)

Corey Tochor: Thank you so much for your testimony today.

Pierre-Olivier Pineau: It's my pleasure. Thank you for the questions.

The Chair: Thank you, Mr. Tochor.

To wrap it up, Ms. McKelvie has five minutes or less.

Jennifer McKelvie (Ajax, Lib.): Thank you, Mr. Chair.

I think it was Professor Shaffer who said that the federal government has an important convening role and that there's a big role for the provinces that needs to play out. This builds on what we just heard. I'm wondering if you can speak to what those different electricity market structures are provincially across the country. Which ones are best suited for enabling the big capital investments that need to happen for electrification? Who is doing this well in the country, and from whom can we learn?

Blake Shaffer: That's an excellent question. The different market structures, broadly speaking, would be something like a vertically integrated, regulated market, which is most of the Canadian provinces. Then you have competitive markets in which you have private actors, which is what Alberta looks like—and to some degree Ontario, although it's a mixed bag.

The answer to your second part is very difficult because, in some ways, these vertically integrated—especially Crown—corporations can enact the will of the province quite quickly if they so choose. A government can decide that it wants to do X on electric vehicles and enable them, and it can make that happen relatively quickly, whereas in Alberta, we have to align incentives to make that happen. In some ways, you can steer that ship centrally.

Such things as renewables are a very good example. Before Alberta's moratorium, Alberta was the capital of renewable investment in Canada because of that open market and some of the things Pierre-Olivier talked about. The market was open for investments. I believe that 93% of data centre applications are in Alberta for that same reason: It's a place where, if you want to do something, you can apply to do it.

The openness to private entry can be a bit more challenging in the vertically integrated markets.

Jennifer McKelvie: As a quick follow-up on the distribution systems—the utilities on the ground—a lot of times they're municipally owned and rate-based. Do you have any recommendations on how we can get over those structural constraints they have to ensure that they can make the capital investments needed?

Because they have only a certain amount of debt they can get and, of course, the regulatory process for rate applications is very long, how can we improve on that final delivery of electricity to homes and really ramp up electrification for the green transition?

Blake Shaffer: Thank you very much for that question. The distribution network, in my view, does not get enough attention from the big three sectors. We tend to focus on generation. Today, we've been talking a lot about high-voltage transmission.

The challenge with distribution networks is that they're necessarily regulated because they have a franchise monopoly—you don't want dual competing grids—and that can distort incentives. Getting incentives right to do the cost-minimizing thing is always a challenge.

There are some concrete things we can look at. There's performance-based regulation, in which you're incentivizing non-wires alternatives—this might be cheaper than expanding the system. There is such a thing as total expenditure rate basing, rather than capital expenditure rate basing. We tend to allow only capital expenditures in rate base, which distorts decisions away from, say, operating expense, which can sometimes be cheaper. A totex rate basing is something that other jurisdictions have done.

There's one very niche thing. I brought over folks from the U.K. recently to Alberta—the regulator and companies—to learn from them on the distribution network. We can use telemetry technology in places where we don't have a full rollout of smart meters: meters that are capable of recording consumption at an hourly level, which is essential for demand flexibility measurement. You can meter off somebody's phone connection to your electric vehicle. These are things that are allowed in the U.K. It's almost skipping past the landline.

I'm not suggesting that we do full utility metering off telemetry, but for some of these flexibility programs, this would be an area for Measurement Canada to look at for potential relaxation. I think we could get a lot of gains if we were a bit more flexible there.

The Chair: Thank you, colleagues.

Thanks to our witnesses.

This brings the meeting to an end.

Colleagues, I think you'll agree that those were two great panels that have helped us to kick off our study on Canada's electrification, energy self-sufficiency and domestic energy security. We've had three national-level experts before us. It was great testimony, and there were great questions from colleagues.

We really appreciate your being with us today. I'll say, as we always do, that we welcome briefs. We welcome additional information. Please send them along if the spirit moves you.

With that, colleagues, we are adjourned.