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Chair

Mr. James Maloney

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● (1530)

[*English*]

The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)): Good afternoon, everybody. Welcome back.

We have two witnesses joining us in the first hour to further our discussion on strategic electricity interties. We have, from DeMarco Allan, Lisa DeMarco, senior partner. We have Chris Benedetti from Sussex Strategy Group Inc. Thank you both for joining us today.

The format, in case you don't know, is that we'll give each of you up to 10 minutes to make a presentation, following which we'll open the floor to questions from around the table. There are earpieces for you should you need them for translation, because you will certainly be asked questions in French and English.

I will turn the floor over to Ms. DeMarco.

Ms. Lisa DeMarco (Senior Partner, DeMarco Allan): Thank you very much, Mr. Chair.

[*Translation*]

Thank you very much, everyone, for the invitation to appear.

My name is Lisa DeMarco.

[*English*]

I am the senior partner of DeMarco Allan. What I'd like to do today is cover four main things with you. First let me tell you a bit about where our perspective comes from, a little bit about DeMarco Allan. Secondly I'd like to contextualize our comments today, look at interties in the context of the indigenous, the trade, and the climate context, and within that context, highlight what in my view are the real problems that the Canadian energy strategy and the pan-Canadian framework are trying to solve.

Finally, I will put forward some thoughts for your consideration on a path forward, a path forward that leverages on co-operative federalism, indigenous partnerships, and strategic trade.

I'll note that in the future you will have a copy of the presentation that we're working from, which includes a map that we've taken some time to develop. It outlines all of the interties in the country, and it juxtaposes the emissions in each jurisdiction. It does so by giving relative sizes of dots. In that context, we have overarching NAFTA negotiations that are now ongoing, and we have a host of indigenous considerations and partnerships that are working their way out and leveraging on the Truth and Reconciliation Commission and the developments with indigenous peoples of Canada.

In general, as the world transitions to a lower-carbon economy, we want to see electricity move from areas of tiny dots, low-emissions jurisdictions, to jurisdictions of big dots, high-emitting jurisdictions. Canada has a wealth of tiny dots. It's my strong view that in particular we should capitalize on the wealth of clean energy resources that we have.

Where is that view developed? What is the perspective that we're bringing to bear?

DeMarco Allan LLP is Canada's first clean energy and climate boutique law firm. I made the decision to literally throw all my eggs in the confidence of this committee, this table, and leave a global leadership position in a global law firm practising energy and climate law to start up a boutique firm. We've grown from three partners to 10 in the course of the last three years. We provide services to oil and gas companies, environmental groups, first nations, electricity companies, governments domestically and around the world, and we've been actively involved in the United Nations negotiations for a period of almost 20 years.

Our perspective is intensely Canadian but internationally informed, so it's from that perspective that I'm of the strong view that we are sitting on a wealth of clean energy resources. In particular, we have the opportunity to be an extraordinary clean electricity exporter. We can do that not simply through exporting the commodities but also by exporting services: clean energy know-how; fantastic engineering services; world-leading expertise on carbon capture and storage, in the nuclear area, in renewables; and last but certainly not least, world-leading expertise in electricity storage, effectively the holy grail that we've all been trying for.

● (1535)

You'll see once you have the associated map in front of you that there is considerable opportunity for all of the low-emitting jurisdictions within Canada to export south, and particularly in the central Canada region, for exports between lower-emitting jurisdictions in B.C., Manitoba, Ontario, and Quebec inward to Alberta and Saskatchewan to facilitate a transition to a lower-carbon economy in an efficient manner that does not effectively strand economic assets. Many of my comments really look at what the key problems are. How do we get to that end goal through the Canadian energy strategy, through the pan-Canadian framework, and solve for what I believe are four key problems?

The first challenge that we're facing is facilitating an economic transition to a low-carbon economy via the electricity system. A 30% reduction by 2030 is not a simple goal. We will need to facilitate electrification and fuel optimization in transportation, which constitutes 24% of our emissions profile; in buildings, which constitute 12% of the country's emissions profile; and in oil and gas, which constitute 26% of our emissions profile. Specifically, much of the oil and gas sector is powered through higher-emitting electricity and has the opportunity to move to a lower-emission source.

The second problem or challenge that we're trying to solve is with regard to optimization and innovation in the Canadian energy system. It's my strong view that efficiency is lost in fuelism. Instead of solving for how much of what type of fuel should produce what type of electricity, we should be solving for carbon. Let the system, the system operators, and the companies bring to bear their wealth of knowledge to solve for a carbon target.

Third—this is a big one that's near and dear to my heart—we are blessed with extraordinary zero-emissions power in this country, so much so that we waste a massive amount of clean, green, cheap electrons. Out-of-date electricity market rules, a lack of energy storage, and trade dynamics resulted in 4.7 terawatt hours, not gigawatt hours, of spillage of the cleanest, greenest, hydro power and a total of 7.6 terawatt hours of zero-emissions power in Ontario alone in 2016. Just to put that in context, that's about equivalent to a 1,100-megawatt power plant operating at 80% efficiency being wasted. We have to solve this problem.

Last, but certainly not least, we have to solve the problem of indigenous energy poverty. Reliability in certain indigenous communities was 2,081% worse than for their southern neighbours, and 400% worse than similarly situated northern neighbours. This is a problem.

Where do we go? What's the path forward? We have six recommendations for you.

The first is that Canadian clean energy and energy services should be a dominant Canadian export. The second is that enhanced intertie capability in jurisdictions with large GHG intensity disparity and economically efficient export opportunities are part of the solution, but not the whole solution.

● (1540)

Innovation in the form of energy storage, carbon capture and storage, very small modular nuclear reactors, enhanced trade, indigenous partnerships, and measures to minimize electron waste are also integral. Consider whether it would be appropriate to have a provincially led, federally supported, industry staffed committee to work through in a co-operative federalist manner how to maximize clean energy exports.

Consider also how you can use article 6.2 of the Paris agreement on climate change to maximize opportunity, and finally, respect the constitutional division of powers in a way that enhances the benefits of regional diversity and does not emphasize the challenges in an east-west manner.

Those are my comments. Thank you.

The Chair: Thank you very much.

Mr. Benedetti.

Mr. Chris Benedetti (Principal, Energy and Environment Practice, Sussex Strategy Group Inc.): Thank you very much for inviting me to be here today.

As the head of the largest energy and environment public affairs practice in Canada, I am proud to lead a team that has had a lengthy history of representing and advising energy stakeholders on the intricacies of electricity system planning, policy, regulation, and procurement. Having entered the consulting area during the period of electricity market opening and deregulation across North America in the late 1990s, I have seen a myriad of policies and imperatives that affect the shape and scope of electricity markets, particularly in my home province of Ontario.

From the initial thrust to encourage private sector investment in a system that had become overwhelmed by aging assets and questionable reliability, to the transition of coal-fired generation to natural gas and renewables starting in the 2000s, to the emergence of expanded conservation and demand management, embedded generation at the distribution level, new technologies, products, and services have been emerging at an incredible pace, challenging conventional notions of how we supply and we use electricity.

Many of the witnesses who have appeared before this committee on various facets have spoken on regional differences in our electricity markets. They've also noted the importance of carbon policies and how moving to cleaner and lower-emitting forms of power is of increasing importance on both sides of the border.

Notwithstanding the recent proposed repeal of the clean power plan by the Environmental Protection Agency in the United States, I believe that economic rationalism, securing the lowest marginal resources to maintain electricity reliability across markets and jurisdictions, and doing so through low and non-emitting resources, is completely possible, if not probable.

The topic for today is the strategic role that interties can play in that process. No doubt can be given on the various attributes of an integrated Canadian electricity market from east to west or, perhaps more appropriately, from Ontario east and from Manitoba west. Some have noted the importance of seeking new markets in the United States, and the historical and continued importance of resources in Quebec and Atlantic Canada serving the eastern seaboard.

I will focus my comments on the future of the Ontario electricity market and how system planning and policy value related to interties will increase in the future.

Two dynamics are arising that will support additional intertie usage and development in the future. First, there is a need for greater flexibility to maintain reliability while securing new capacity and regulation services that support added variable and embedded generation in the province. Second, there is a value in utilizing interties to help secure new, low-cost energy supply when needs arise in the coming decade.

As reinforced in the Ontario Independent Electricity System Operator's, May 2017, Ontario-Quebec interconnection capability technical review, on an hourly basis, Ontario's wholesale electricity market economically schedules energy transactions to and from Ontario via the interties, providing an important balancing function that helps address the peaks and valleys of electricity demand, and ultimately, lowers costs to consumers.

Electricity trade provides valuable operational flexibility that helps the IESO manage increased variability as more wind and solar resources are integrated into the system, as more generation is connected at the distribution level affecting demand for grid-supplied energy, and as consumption patterns become less predictable.

Ontario continues to witness significant growth in these types of resources. Reliability in the Ontario market today is strong due to a continued build-out of conventional, utility-scale, and distribution-enabled resources across the province. Regulatory and policy areas have adjusted to support the growth of these resources over time. However, as we add these types of resources into the Ontario supply mix, and as residential and consumer businesses are looking to self-generation through mechanisms such as net metering and cleaner forms of supply, enhanced resilience in the market will be required to support future needs.

Intertie transactions can be beneficial, as they can measurably improve the reliable, cost-effective operation of Ontario's power system. According to the IESO, interconnected electricity markets provide a significant opportunity to officially utilize the energy generated from a diverse range of resources over a much greater geographic area, thereby lowering the cost of producing and managing electricity for all parties. Interties with neighbouring jurisdictions expand the options available to meet system needs, and Ontario's interties have, according to the IESO, provided both reliability and economic benefits to the province for over a century.

● (1545)

The need for new resources in Ontario for the coming years is clear, and we expect that this will be outlined in the anticipated release of the long-term energy plan. As we can see from the IESO's 2016 Ontario planning outlook, under all scenarios the need for new supply resources will arise in the early 2020s, particularly to maintain reliability following the decommissioning of the Pickering nuclear generating station.

Interties can provide a beneficial option to system planners in securing new resources. This was underscored in the recent approval by the National Energy Board of the Lake Erie connector, a merchant HVDC intertie proposed to connect Ontario to the PJM market via an underwater cable.

As was stated by the NEB, “the NEB...determined that the project would provide benefits to Indigenous, local, regional, and provincial economies, allow greater flexibility for two large energy markets to meet changing energy needs, and increase market efficiency for Ontario and its rate payers.”

To conclude, as more and more jurisdictions set carbon policies and emission regulations that dictate the supply mix and emission profiles of the electricity sector, understanding and tracking the attributes of electricity generation is a developing and evolving need for electricity system operators and policy-makers.

Numerous jurisdictions have implemented some form of tracking system that collects and tracks generation attribute data. The key elements provided by these tracking systems vary across jurisdictions but generally include tracking emissions attributes for every megawatt hour generated, calculating average and residual emission rates, tagging emissions attributes from power source to sink, tracking interjurisdictional power transactions and inter-registry imports and exports, supporting carbon allowance adjustments for voluntary markets, and making public reports to provide transparency.

Ultimately the goal of these tracking systems is to avoid the double-counting of attributes or emissions savings tagged to specific imports and exports. Today, robust registry and tracking systems exist in PJM, NE Power Pool, and the New York ISO, while Michigan has a renewable energy certification system in place. We believe that Ontario will also develop such a protocol as a matter of course.

I hope this provides some additional usefulness to the committee in its deliberations, and I look forward to your questions.

Thank you.

The Chair: Thank you very much.

Mr. Harvey, you're going to start us off.

Mr. T.J. Harvey (Tobique—Mactaquac, Lib.): Thank you, Mr. Chair.

I'd like to thank you both for being here, of course.

Ms. DeMarco, I want to start with you. I'm really intrigued by the last page of the handout, which I know most of us didn't get, but I did. Specifically, I want to start with the last two points, because I think they're really tied together. I'd just like you to elaborate a little on how you think a collaborative conversation amongst multiple levels of government and indigenous people might start, what you think the first steps of that should or could be, and what you think the strengths are to approaching it from that angle.

● (1550)

Ms. Lisa DeMarco: As the youngest of nine children, I often say the power to convene—who holds the wooden spoon—is very, very powerful. To the extent that the federal government can facilitate the convening of provincial entities and provincial entities can facilitate the industry expertise being at the table, it will be extraordinarily powerful.

I understand that a number of those initiatives are already under way, but the one that's top of mind for me is in relation to the NAFTA negotiations, particularly in relation to NAFTA chapter 6, article 605, which is up for considerable debate. This appears to be a bit of a sleeper issue right now, but in my view, it has very extraordinary potential impacts. If we can leverage an existing process that relies on co-operative federalism to be successfully achieved, that's one way.

As well, just last week we started additional dialogue regarding the energy generation process and really getting people through each and every forum around the table to be talking constructively, and not destructively, about how the country can co-operate and really enhance the benefits of diversity. That's certainly one aspect.

The second point would be in relation to the Paris negotiations. We've been sleeping on the negotiating floor for the last 20 years, helping out with a number of governments as they have transitioned to trying to get what happened in Paris to happen. Certainly, as Canada has taken the lead on the markets provisions of the Paris agreement, specifically article 6.2, and given that the U.S. has withdrawn from Paris, there is opportunity. There is considerable opportunity for Canada to leverage the emission-reducing effect of its clean electricity exports to a soon-to-be non-Paris member, and we should be negotiating that accounting and those provisions into any agreements with the U.S.

Those would be two top-of-mind concerns.

Mr. T.J. Harvey: Thank you.

In your presentation you spoke about carbon targets. Although it's not directly related to interties specifically, it follows up on an earlier conversation we've had in this community around emitting sources, and I think at the time it was specifically around clean tech.

I've always been a big believer that we should fund outcomes, where we want to get to. Maybe you could elaborate on that a little bit. What are your thoughts around carbon targets, and how can that tie into this greater conversation?

Ms. Lisa DeMarco: Looking at carbon targets, and specifically an emissions outcome, what I've called solving for greenhouse gases as opposed to solving for specific elements of the economy that may or may not emit is the way to go. That's certainly a very principled approach, where you can put regionalized creativity and specificity into achieving a goal. The way that goal gets achieved in Alberta might be quite different from the way that goal gets achieved in Nova Scotia, and may be quite different from the way it gets achieved in Ontario or Quebec, and each is valid.

Mr. T.J. Harvey: Perfect. That was the answer I was looking for.

My last question is related to your map and the idea of the distance between the smaller circles, the lower- to the higher-emitting areas. One of the common themes we've heard is the cost of getting that energy to market because of the distance it is from the marketplace.

How do you think the federal government can play a role in helping to facilitate that part of the conversation around levelling the playing field so that we can access some of those lower-emitting sources as part of a broader conversation around our energy sovereignty in this country?

Ms. Lisa DeMarco: That's also a great question, and let me start with an answer that's going to appear trade protectionist but is entirely trade valid. Under the NAFTA now, under the WTO GATT agreements, labelling is appropriate, and I don't think even we, as Canadians, appreciate just how clean and green our energy is. We are among the top three world-leading jurisdictions. I'm going to say it again, the top three world-leading jurisdictions on clean energy. I would love to see a label slapped on our exports and have it done in a trade-compliant manner.

Secondly, Chris alluded to the process of NERC tagging and to the associated currently existing infrastructure to tag the emissions associated with a particular electron to facilitate the export of the cleanest electrons at a premium. There's no reason we shouldn't be looking to ensure that our imports are at least as clean as our existing generation, and our exports see a benefit from that. Certainly I think there are extraordinary opportunities there and lots to come over the next years.

● (1555)

Mr. T.J. Harvey: Perfect.

Chris, my next question was for you. I'm going to run out of time, but hopefully Mark will get to you.

The Chair: You have run out of time. Sorry about that.

Mr. Schmale.

Mr. Jamie Schmale (Haliburton—Kawartha Lakes—Brock, CPC): Thank you very much, Chair.

I appreciate you both being here.

I will start with Mr. Benedetti. I have a question for you as well.

Mr. Benedetti, you were talking in your speech about a number of issues. I just want to get your thoughts because you are from Ontario, as am I, on how the provincial government has handled the energy situation so far.

Mr. Chris Benedetti: That's an expansive question, and I thank you for that.

It goes back to some of my remarks about when the current provincial government came into office in 2003, I believe. I recall, at that time, the province was in a deficiency situation. There was talk about putting in diesel gensets in the Toronto harbour to deal with reliability issues to the grid.

We were in a very different place. Over the last many years we have transitioned, largely, the electricity system, both from a generation standpoint, from a wires standpoint, as well as at the load from a conservation standpoint to, in effect, modernize the system quite a bit. That's certainly come at a cost, and I know the province has addressed that, even as recently as within the last 12 months.

Those are trends that are being replicated in many other jurisdictions. To Lisa's point, in Canada, we have the benefit of having a very robust and relatively clean electricity system. In the United States, it's not so much the case. Quite often when the Ontario market is compared, we are compared to American markets and Canadian markets, but a lot of those markets still have aging infrastructure. They haven't modernized their generation fleet, and we're starting to see a bit of churn happening in some of those markets. They are going through many of the same types of undulations that we've seen in Ontario.

The one Canadian example that we're seeing of that today is in Alberta, of course, as it transitions away from its coal fleet to natural gas as well as renewables.

We continue to be in a system where we have good reliability. The lights are on in Ontario. That will change over time as older resources come off, particularly on the nuclear side. That will require greater—as I mentioned—resiliency in the market. A lot of the tools that have been put into the system, ranging from smart meters all the way through to cleaner forms of generation, and more generation at the source of demand—or "in the load" as we often refer to it—will help the market adapt to some of those changes over time and to maintain the reliability in the system.

Mr. Jamie Schmale: What was that called, when it was in demand? You just had a word for it.

Mr. Chris Benedetti: Load...?

Mr. Jamie Schmale: Yes, it was "in the load".

When we look at all of that, there are wind turbines coming in and the Green Energy Act is basically steamrolling municipal jurisdictions. As you pointed out, most of the time when the energy is needed, many of the times the wind is not blowing. This goes back to the storage issue. How close, in general, are we to getting there?

It seems that everyone's talking about it, but we're not quite there, and I'm sure when the wind turbines are turning at night, that would be helpful to store that energy. We can't, so we're selling it on pennies to the dollar and we're overpaying for hydro. How far out are we?

● (1600)

Mr. Chris Benedetti: Certainly, the perspective of the system operator is always a good one to solicit in terms of looking to see how these resources are being deployed in the market and at what marginal cost.

There's been a lot of learning in Ontario in terms of adapting to variable generation, generation that isn't on demand when you need it. For example, one of the things, the evolutions, that we've seen in the market is the manoeuvring of nuclear, particularly at the Bruce Power asset in Kincardine.

The system has adapted quite a bit, and there are new tools in place to better predict, not only when that variable generation will be able to supply into the market but also how the system operator is optimizing the use of those assets to lower costs. We're seeing that this is continuing. The technology is evolving quite a bit.

I'll pick up on a comment that Lisa made about storage and the opportunities for storage. Obviously, part of the challenge with any electrical system is that when you supply the electricity, it might not align perfectly with when you require it. Of course, the thing about electricity is that it's all about physics, in terms of the creation of the electrons and when they're actually consumed. The opportunity that lies in harnessing storage is quite vast in terms of helping to level the balance of the system between periods of high demand, or as we refer to it "on the peak", and periods of low demand, or the "off peak".

In the context of interties, which I know is the subject matter for this committee, they have always been used by the system operators as "virtual storage", in their ability to transmit electricity across the tie lines to maintain reliability in the system. You move electricity out of your market when you don't need it, to a market that might require it and vice versa. We see that quite a bit between Ontario and Quebec, but we see it between Ontario and New York, and Ontario and Michigan as well. That's something that will increase, we predict, in the future as well.

Mr. Jamie Schmale: How do we fix the problem we have in Ontario with some of the highest energy rates and people overpaying in the billions? How do we fix that? Interties are a long-term solution. I think you've both said it. How about the people who need help now? How do we fix this problem? I know this is mostly provincial, but I'm curious.

Ms. DeMarco, do you want to start? Then I'll get to Mr. Benedetti.

Ms. Lisa DeMarco: Let me follow up first and foremost on his comments on storage. You asked very specifically about how far away we are.

We're there. This is not a science project. This is now the third procurement for storage, which just closed. We have a total of almost 100 megawatts developed commercially. I use the term "commercially" to bridge to my next answer. In the province, these make sense. They have an associated economic benefit across the energy spectrum: from customer to distribution, to transmission, and to generation. It provides the kind of flexibility between each of the four elements of the electricity sector. It's effectively the Swiss Army knife of electricity.

I think that enhancing our storage capability.... The ratio that's come up in Texas in PJM and elsewhere is about 10:1. For every 10 megawatts of renewables, you need one megawatt of storage to facilitate the electricity balance. As a Canadian leader in storage now, we need to enhance our ability to actually provide it at an appropriate scale. That's one element.

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

Mr. Cannings.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thanks to both of you for being here today.

I'm going to start with you, Ms. DeMarco, and maybe give you a chance to expand on some of the challenges that you whipped through too fast for me to write down. Thanks to the Chair, I did get a copy of what you said.

Let's start with the waste piece that you mentioned, the challenge around waste. You mentioned outdated market rules, lack of storage, and trade dynamics. How does that relate to these elements you have on the path forward? What do we have to do to get rid of that waste?

Ms. Lisa DeMarco: One thing that is currently underworked is the development of appropriate market rules. For many of our competitive markets for electricity, the rules were developed before storage was a twinkle in the eye. The technology is different at this point. Similarly, we have more distributed energy resources that are coming to bear. Facilitating enhanced and updated market rules that make sense is one element. Secondly, there are a number of regulatory barriers in place.

For example, in Ontario there are rules that stipulate that energy storage is paid wholesale charges when it actually generates, but has to pay much higher retail charges when it loads at the least-cost times. It doesn't make sense. It should in fact be the exact opposite. We've been undertaking a number of initiatives to work with the Ontario Energy Board, the Ontario Ministry of Energy, and all regulators, including the Independent Electricity System Operator, to start getting those anachronisms out of the system.

In particular, given the amount of spillage of zero-emission power, we need to up our game, because 7.6 terawatt hours is a huge amount of green, cheap, Canadian electron waste that we should not be incurring. Looking at enhancing intertie capability in accordance with and in coordination with storage, so we can manoeuvre as efficiently and effectively as possible, is very important.

● (1605)

Mr. Richard Cannings: Your first point was on the economic transition to a low-carbon economy, this transition that we've all heard of and would love to work toward through electrification. What do you think the top priorities there should be? What is the low-hanging fruit for the federal government, especially in terms of what we could recommend?

Ms. Lisa DeMarco: Transportation is a very significant area. We should be facilitating electric vehicles and electric vehicle infrastructure, not just as a mode of transportation but also as a form of energy storage. Those batteries are in effect storage vehicles, so looking at optimizing vehicle fleets—buses, and particularly school buses—fits squarely within the context of exactly what you want. They're idle in the summer, so if they're electrified and have batteries, they could provide residual power when they're largely idle. They work in the morning, they work in the evening, and then they're idle for the bulk of the rest of the day. These are things we should really be enhancing in the near term.

Similarly, we should be looking to optimize building heating, ventilation, and cooling—not the elimination of a resource, not stranding assets, but optimizing the integration of gas and electricity in the building context, really avoiding dogma. Our mantra at the firm is ditch your dogma at the door and take a fact-based approach to getting to an outcome. We need to do that as a federal government, working in a co-operative relationship with provincial governments and in coordination with some of the best and brightest minds in industry in the country.

Mr. Richard Cannings: You mentioned labelling, and I wanted to address that in two ways. First, you talked about it being done in a trade deal. I forget your words, but they were along the lines that it would not be slapped with some American action, demanding made-in-America power or something.

The other was the domestic situation. In my riding I have a producer of very clean electricity who was approached by the City of Calgary, which wanted to use his electricity—his electrons—to run its buses and transit. He couldn't get an agreement with B.C. Hydro to move his electrons to Calgary from central British Columbia. They were going to charge him an inordinate amount of money, so it was just not feasible.

I just wondered what the solution to that is. It might be beyond the remit of the federal government, but we need to remedy those sorts of situations.

Either of you can jump in if you want.

● (1610)

Mr. Chris Benedetti: Maybe I'll just comment that one thing Canada lacks that the United States has is a federal electricity regulator in the sense of a FERC-type entity that can work with regional ISOs in helping to implement policies around the integration of markets, looking for lower-cost resources, and whatnot. These are mechanisms that have developed over time. In Canada we still organize our electrical markets very much along provincial boundaries, and many of the regulations—the rules that exist between those markets—are stuck in the 1900s. These are things that have been around for 100 years or so and haven't really adapted very well to this notion of the ability to move electricity across provincial jurisdictions.

Ironically, it wasn't always the case. We have hydroelectric power plants in Quebec that are tapped into Ottawa. Their original purpose was to support the pulp and paper industry that existed here at one time, and they were established for the resources that were going to be developed. It didn't matter so much that there was a political boundary between the two. Increasingly, it's something we should look at more carefully and think about how we modernize regulations. How can the federal government work with provincial system operators to help support the integration of markets and ease the flow of electricity across those markets, particularly if it's characteristic of the type of electricity that we believe is right: low-carbon electricity to meet our needs when we need them?

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

Mr. Serré.

Mr. Marc Serré (Nickel Belt, Lib.): Thank you, Mr. Chair, and thank you for your presentation and the time you took to come to present to us. I have a few questions.

Ms. DeMarco, in regard to your comment earlier about battery storage, how can the smart grid technology help us bridge the short-term concerns in regard to energy storage of intermittent supply sources of wind, solar, or tidal?

Ms. Lisa DeMarco: Certainly smart grid technology is the enabler that allows for two-way flow of electricity. We can look at the ability to use battery resources, whether they be community resources such as buses or a community battery program, or an intertie support or line support battery, or a flywheel. There's a flywheel in Ontario that's being used that way. The grid operator can use the data regarding line losses to know when to deploy that flywheel to either charge or load as the case may be. Anything in relation to a market signal that pushes for the need or support of an electricity storage resource is now within the clear capability of the system operators to deploy and/or load through an integrated grid.

Mr. Marc Serré: Thank you.

You talked about Canada being at the top-three level of clean energy in the world. I like your idea about exporting at a premium. How do we label that? That's something I think we have to work on.

I just want to understand a bit more about how we got there because you mentioned Ontario. I know our honourable colleagues across the way often reference Ontario and price. When I looked at a report from Hydro-Québec for North America, I saw that Ontario has a lower kilowatt-per-hour cost than many of the states.

I want to understand. With regard to the modernization we have done here in Ontario, from the blackouts we've had and a lot of the smog days, do you believe that other jurisdictions should be learning from the experience here in Ontario and moving forward?

Mr. Chris Benedetti: Without a doubt, but there's an important point. I think they quite often view that these attributes of moving to lower forms of generation and markets is done purely for environmental reasons.

What we've seen is that one of the greatest attributes of low-emitting resources is that the variable cost of generation is almost nothing, the marginal costs. The fuel cost is zero compared to conventional resources. When we develop gas assets, for example, typically we look at the capital costs required, the O and M costs, but also the fuel costs. These three components go into the cost of the assets. For storage, as well as for renewable assets, that isn't the case.

The one thing I will note about the reference to Quebec is that historically Quebec made the decision to build far greater than its own needs its ability to produce power, specifically from an economic development standpoint, to export to the eastern seaboard, and it has been very successful in doing so. B.C. has done that as well.

Ontario is like many markets that historically built to Ontario's needs. We used to refer to it as the “fortressed Ontario” approach. Increasingly recognizing the modernization and the value attributes of a low-emitting system, we're now seeing a movement towards greater use of interties, with an ability to export those resources to markets like PJM, for example, that still have a big carbon footprint but represent the largest electrical market in the world.

From a trading standpoint, harnessing the value of what has been invested in for the last many years to access markets, similar to how Quebec has managed its electricity resources in the last many decades, is something many markets are now looking at.

● (1615)

Ms. Lisa DeMarco: I just want to put some numbers on Chris' exact points, which I fully agree with. A 60-year-old hydro-generating plant has fully paid off the capital cost, can produce power for half a cent a kilowatt hour, and can export to U.S. markets that are paying 13¢ and 14¢ a kilowatt hour. I like those profit dynamics. They work.

How do you do that in a way that facilitates the premium of the greenness of that hydro asset?

To get back to Mr. Cannings question in relation to your question, there are opportunities—and I'm going to take you into the depths of trade law here—to have the customer distinguish between a plain old electron and a green electron. Once the customer does that, you're in a much better position from the likeness test under trade law—a much better position.

The more we can do to facilitate our customers south of the border in making that distinction, the much better off we'll all be from facilitating the export of our product.

Mr. Marc Serré: Thank you. I have about a minute.

You both talked about indigenous communities. In Ontario there are 130 first nations, and 100 are in northern Ontario. Recently, the provincial government added about 16 first nations to the power grid, but there are still many, many other first nations, when you look at a third of the land mass of Ontario, that don't have a power grid. Do you have any insight into what we could do better with indigenous communities, maybe with interties with Manitoba?

Mr. Chris Benedetti: We have a project that's near and dear to my heart that we've worked on for a few years now. It's called Wataynikaneyap Power. It's an indigenous-led, indigenous-owned entity of 22 first nation communities in the northwestern part of Ontario to connect 17 indigenous communities that are currently dependent on diesel generation. There is an absolute need for the federal government and the provincial government to work together to find ways to transition and build out that capital infrastructure. We're not there yet, but hopefully we'll get there soon.

That's an opportunity, quite frankly, that can be replicated not only in other communities in Ontario, for example, on the east side of Lake Nipigon, but also in other communities in Nunavut, in northern Manitoba, and in other places where there are significant opportunities to look within our own borders at communities that are not only heavily dependent on diesel generation, but suffer from significant outages, reliability issues, people who can't operate dialysis machines when the power goes out, and boiled water advisories.

Quite frankly, having been to some of those communities, I'd say it's a crisis of energy independence, but it's also something that is integral to the social fabric of these communities.

● (1620)

The Chair: Thank you.

Ms. Stubbs has five minutes, and then Mr. Arseneault after that.

Mrs. Shannon Stubbs (Lakeland, CPC): Thank you, Mr. Chair.

Thanks to both of you for spending your time with us this afternoon.

I come from Alberta. I just mention that because I think sometimes that shapes the way we view the issues we discuss in this committee in particular and probably our world view on priorities.

I wanted to recognize—and my colleague T.J. and I often get along on this issue—your point about co-operative federalism, respect for our constitutional division of powers, and celebrating regional energy diversity. I personally think that Canada's diverse energy mix is one of our greatest strengths.

Before my political career, I spent several years in the Government of Alberta in the department of energy, in the international offices and trade division, in economic development on policy and communications, business rules, and legislative development on oil sands and heavy oil development in Alberta, which I believe benefits every Canadian in every community across the country. It's certainly a source of major revenue that's shared across the country so that Canadians can enjoy roughly similar programs and services in their respective provinces.

Lisa, in your slide about innovation, you mentioned small modular reactors. You probably know that previously in this committee we did a study on the nuclear file, and it also came up a couple of times maybe in our clean-tech study on oil and gas, the potential applicability of SMRs in oil sands and oil and gas recovery. At that time, I think there was a discussion about partnerships but not about any pilots or anything happening at that point.

Do either of you have an update for us, or do you know any details about that applicability and the timelines?

Ms. Lisa DeMarco: My comments were particularly directed to very small reactors, and it goes to the first nations issue. I encourage you to look at the reference in the presentation where we indicate that evidence was led and confirmed before the Ontario Energy Board that there was 2,081% worse reliability in first nation communities. That's 20-plus times worse, yet they're paying among the highest rates. That's a problem.

I know that, last week or within the last two weeks, there have been associated meetings with the federal government to try to facilitate very small modular reactors to help solve the rural and remote and off-diesel challenges. We need to be open-minded around anything and everything that can help us solve the four key challenges that I think we're going after.

Yes, I believe, through natural resources and through the Canadian energy strategy dialogue, there were meetings among companies that had nuclear capability in relation to VSMRs—very small modular reactors—and small modular reactors to help solve the rural and remote and off-diesel challenges.

Mrs. Shannon Stubbs: Okay.

Do you have anything to add, Chris?

Mr. Chris Benedetti: I might just add that I know Canadian Nuclear Labs, CNL, and the CANDU industry have been doing quite a bit of work on SMR development, particularly with the Chalk River lab. There's an extensive network of, particularly, Ontario nuclear expertise that is looking at SMR development.

The one things that perhaps is a bit unfortunate is that we know the Tennessee Valley power authority is working on a test site right now. There are other American companies, Westinghouse and others, that are looking at SMR development, and companies from Korea, China, Japan, Germany, and others.

This is a great opportunity to harness our Canadian scientific expertise and the Canadian nuclear expertise to see what might be developed from an SMR standpoint and a made-in-Canada solution. It's not just an Ontario story obviously; it's a Canadian story.

Mrs. Shannon Stubbs: Right.

I think Canada is a world leader, not just on responsible energy production but also as an exporter of innovative and technological expertise. Legislators and policy-makers should aim to continue that trend.

I know that of the $2 billion invested in R and D across the natural resources sector, $1.5 billion of that came from oil and gas companies, in terms of the last stats that were compiled. It was a disappointment to see that they were excluded from the government's $950-million plan for superclusters.

I mention that, I guess, being mindful that we're talking about not pitting sectors against each other.

● (1625)

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

Mr. Arseneault.

[*Translation*]

Mr. René Arseneault (Madawaska—Restigouche, Lib.): Thank you, Mr. Chair.

I would like to thank our witnesses for being here today.

Since I'm not a regular member of the Standing Committee on Natural Resources, this isn't a topic I understand much about, but it's quite exciting to hear about green energy and everything that can be done in Canada, such as producing the greenest aluminum in the world in Quebec using hydroelectric power.

As for inter-ties, I understand that the goal is to facilitate access to electricity across the country. It might be beneficial and increase Canada's economic development. That is what I understood from your remarks.

I don't know who could answer my question. Perhaps Ms. DeMarco.

Do you see any regulatory barriers to moving electricity from one province to another, or even from Canada to the United States, which buys our electricity?

Ms. Lisa DeMarco: I will try to answer in French. I will say—

[*English*]

Mr. René Arseneault: You can speak in English.

Ms. Lisa DeMarco: I was going to try to answer in French but my children tell me all the time, “Mom, when you speak French,

[*Translation*]

it hurts our ears.”

[*English*]

Certainly I will try to do a bit of both.

In particular, I think there are regulatory challenges in enhancing the maximal amount of export from Canada of the cleanest, greenest energy to the United States.

Between provinces, predominantly there are intertie constraints that are problematic, as well as differences in the intertie capabilities —AC versus DC—particularly between Ontario and Quebec. If you look at those dots on the map when you eventually get it, we want to go from small dot to big dot. Really, with the exception of Alberta and Saskatchewan, it looks like it's going north-south, and it should be going north-south.

What are some of the regulatory barriers?

In terms of how we schedule and connect our markets, there are a number of issues associated with what we call “uplift” charges and how that is applied and used in the context of exporting.

Number two is in relation to facilitating what we need when we need it to go south of the border. With our storage assets, we have this disconnect between being charged retail costs when we're loading and charging only wholesale costs when we're discharging. That's problematic.

Number three is not having the associated benefit of an overarching policy and integration between some of the IESOs, the IESO in Ontario in particular, and PJM. That is problematic. There are a number of rules that need to be harmonized between the FERC and the IESO. We've done a bit of this with FERC 686 historically. We have more work to do in that regard.

Those are a number of regulatory barriers that we really do need to address.

[*Translation*]

Mr. René Arseneault: Thank you very much.

[*English*]

Mr. Chris Benedetti: I think Canada has done a good job and needs to continue to do a good job in advocating to American markets, American states, to accept clean energy resources from Canada. We were concerned for a while that Massachusetts would not enable hydroelectric power exports from Canada to serve their market. They're going through a very large-scale, clean-power call today, and I think because of efforts both in Canada, as well as from industry, Massachusetts opened up and now we're seeing Hydro-Québec put a very significant bid into that market, as did Emera.

Those opportunities will continue to manifest themselves on the eastern seaboard, in the Midwest, and on the west coast, so we need to be prepared. I think the government can play a vital role in making sure that Americans remain open to receiving our energy exports.

[*Translation*]

Mr. René Arseneault: Thank you very much.

Do I have any time left, Mr. Chair?

[*English*]

The Chair: I think we're going to have to stop there.

Ms. DeMarco, Mr. Benedetti, thank you very much for coming today. It's been incredibly helpful. On behalf of our committee, I'd like to express our gratitude.

We will suspend for two minutes and then pick up for the second hour.

● (1625)

(Pause)

● (1630)

The Chair: We're going to get started on the second hour. We have two sets of witnesses.

From the Conference Board of Canada, we have Louis Thériault. We appreciate your coming.

For a second time—and hopefully there won't be bells today, gentlemen; we appreciate your coming back—we have Mike MacDougall and Tom Bechard from Powerex. Since you got cut off last time, why don't we start with you?

Each group will get up to 10 minutes to do their presentation, followed by a series of questions.

● (1635)

Mr. Mike MacDougall (Director, Trade Policy, Powerex): Good afternoon, Mr. Chair and members of the committee.

Thank you for this opportunity to address the committee on the topic of strategic interties.

My name is Mike MacDougall, and I'm the director of trade policy with Powerex. My colleague is Tom Bechard, and he's the managing director of gas and Canadian power.

Powerex is a wholly owned subsidiary of B.C. Hydro, responsible for marketing electricity, natural gas, and renewable energy products across western Canada and the U.S. Today we would like to give you the perspective of a user of the transmission system as to how the existing interties function, how additional value might be gained from the existing facilities, and some of the circumstances necessary for new interties to provide benefits, including greenhouse gas reduction benefits, to users of the system and the ratepayers of the utilities that build them.

First, I will give you a bit more perspective on Powerex so you can understand what informs our perspective on these issues. Second, I will discuss the nature of these interties from the everyday perspective, that is, what is available for use by customers of these systems. Then Mr. Bechard will provide you some information on how the various markets provide signals or not to make use of the facilities for economic exchange and how they incent or not the use of external clean generation resources to reduce greenhouse gas emissions. Lastly, he will cover what economic incentives might be necessary to support the expansion of new intertie facilities.

As I mentioned, Powerex is the wholly owned subsidiary of B.C. Hydro. We were formed in 1988 and have nearly 30 years' experience participating in energy markets across North America. In 2016 we were the second-largest exporter of electricity from Canada to the U.S., responsible for roughly 13,600 gigawatt hours, or 19% of Canada's total exports to the U.S. We were also the largest importer of electricity from the U.S. into Canada in 2016, bringing 8,000 gigawatt hours, or 86.5% of all imports to Canada. We also buy and sell electricity in the Alberta market, with volumes representing on average 10% of our export activity and 3% of our import activity over the past five years.

In order to transact this volume of electricity, Powerex must purchase transmission services from a wide variety of transmission providers. Within the U.S., Powerex holds over 5,000 megawatts of long-term transmission capacity, spending in excess of $125 million per year on transmission services. One key concept we would like to share with the committee is the difference between the design capacity of transmission facilities and their everyday operational capacity.

For a user of transmission services what really matters is the operational capacity. B.C.'s connection with Alberta is nominally 1,200 megawatts when moving from B.C. to Alberta; however, the actual operational capacity is usually in the range of 430 to 600 megawatts, or only 35% to 50% of the design limits. Likewise, B.C.'s connection to the U.S. is nominally 3,150 megawatts, with a typical operating capacity of 2,500 megawatts, or roughly 80% of the design limit.

This difference is caused by a multitude of factors related to the design of the facilities, along with the operation of the grid itself; however, from a customer perspective, only the lower capacity is available to be used to move power. In the case where transmission rights are sold to users to support the cost recovery, as in B.C., this lower operational limit is also the amount that can reasonably be sold. In the case of B.C. to Alberta, roughly half the capacity is stranded and unable to be sold to recover the costs of B.C. Hydro's facilities.

When reviewing investments in strategic interties, we should first be considering whether we are getting the most out of the existing facilities. In the case of B.C. and Alberta, much of the limitation lies within the Alberta system itself, including choices made when the Montana-Alberta intertie was connected to the Alberta grid in 2013, resulting in a facility that did not increase Alberta's overall ability to import electricity.

● (1640)

Addressing the usable capacity of the existing interties is important from an efficiency perspective and could be substantially more economic than the cost of new construction.

In addition to the available capacity, one must consider whether users of the transmission system would see sufficient incentives to purchase the capacity made available by the transmission facilities and hence support the cost recovery of the investment.

For that discussion, I will turn to Mr. Bechard.

Mr. Tom Bechard (Managing Director, Gas and Canadian Power, Powerex): Thanks, Mike.

I would like to thank the committee for inviting us to speak today regarding strategic interties.

At a high level, it seems pretty clear that there is much to be gained, both economically and environmentally, from improved and expanded wholesale electricity trade between B.C. and Alberta. Alberta is a province transitioning from coal generation to additional natural gas and wind generation, and perhaps eventually solar generation as well. B.C. is a province rich in clean, flexible hydroelectric generation. This diversity in generation technologies between B.C. and Alberta should support mutually beneficial trade between the provinces. However, there are two key barriers that have hindered maximizing these wholesale electricity trade opportunities: transmission transfer limitations and market design.

As Mr. MacDougall noted, B.C. has had a significant surplus of electricity available for export; however, in recent years, very little of that surplus electricity has found its way to Alberta. Over the past few years, Powerex has exported the vast majority of this surplus to California, while less than 10% has been delivered to Alberta. In effect, clean electricity from B.C. has travelled thousands of kilometres to California, generally reducing natural gas generation levels in California. From the perspective of reducing carbon emissions, this seems inefficient, as B.C.'s clean surplus electricity could have been sent right next door to Alberta to reduce coal output.

Aside from the challenges with transmission transfer capability, as described by Mr. MacDougall, a primary reason for this outcome is the relative price signals provided by California's organized market, compared with Alberta's, for clean generation imports.

Fortunately, Powerex expects this situation to shift to some extent in 2018, as Alberta implements its carbon competitiveness regulation, or CCR. This CCR program will have the important effect of pricing Alberta's carbon emissions and raising the value of electricity imports. We expect that this will make Alberta a more attractive destination for B.C.'s clean surplus electricity, which is expected to displace Alberta's coal generation.

Although we expect that the introduction of the CCR program is likely to increase trade between the provinces, providing mutually beneficial economic and environmental benefits, opportunities exist to expand these benefits further.

In particular, as Alberta installs qualifying renewable resources, largely expected to be wind generation, under its climate leadership plan, it will require additional flexible resources to provide renewable integration services. While some of these flexibility services will be provided from Alberta's current and expanded natural gas generation fleet, B.C.'s resource mix is well situated to compete to provide these services, while further reducing greenhouse gases. For example, B.C. may be able to back down its flexible hydro generation and utilize Alberta's surplus wind generation when the wind output exceeds Alberta's ability to use it. Later, B.C. can return clean electricity to Alberta, displacing fossil fuel generation, when Alberta wind is not producing.

Achieving this outcome, however, requires at least two key areas of co-operation. The first one is a commitment to a fair, efficient, and robust market design and/or a long-term commercial arrangement that results in an equitable allocation of the short-term production cost savings, the environmental cost savings, and the investment cost savings, compared with Alberta going it alone. The second one requires expanding the limited transmission transfer capability between the provinces.

Importantly, both of these areas of co-operation must occur together. The economic and environmental benefits of market design improvements and/or long-term commercial arrangement will be significantly limited without expanding the current transmission transfer capability between the provinces. Similarly, expanding the transmission capability under the current market framework without a new commercial arrangement is unlikely to achieve the economic and environmental benefits required to justify the necessary investments in the new transmission facilities, or to equitably distribute those benefits between the provinces.

We thank you for your attention and will be happy to answer any questions.

● (1645)

The Chair: Thank you very much.

Mr. Thériault.

Mr. Louis Thériault (Vice-President, Industry Strategy and Public Policy, The Conference Board of Canada): Thank you, Mr. Chair.

[*Translation*]

I would like to thank the committee members.

[*English*]

It's a pleasure to present again today in front of all of you.

At the Conference Board recently, we did a report called “The Cost of a Cleaner Future”, and a lot of what we talk about in the report is on electricity and the electrification of the economy.

My role today is to discuss with you the main results of this exercise, this analysis of Canada's options for a lower-carbon future. In doing so, I will draw heavily on the results of a joint research effort of the Conference Board and the Canadian Academy of Engineering. We partnered with the Canadian Academy of Engineering to develop these scenarios.

The analysis studies three distinct policy measures: the impact of carbon pricing and a shift in the electricity generation mix; the impact of substantially decarbonizing our electricity generation sector; and the impact of investments that will allow Canada to reduce its emissions by 60% by 2050. The key findings are a couple of main points here.

Carbon pricing and a shift in our electricity generation mix will have a small negative impact on the economy, but there are distributional impacts that will need to be considered by policy-makers.

The other key finding is that pricing carbon and decarbonizing our electricity system will need to be accompanied by trillions of dollars in spending on clean energy infrastructure and significant changes to the way we consume energy. In that context, changing public behaviour will play a crucial role. This will require significant participation by Canadians, and it needs to be made clear that they're part of the solution in this transition. This requires policy-makers to present and to make more clear the plan to reduce greenhouse gas emissions going forward.

These findings, as I've mentioned, are the result of a technical modelling exercise with the Canadian Academy of Engineering; the economic modelling that we do at the Conference Board, which is what we're known for; policy analysis; and I must say in this case, given the magnitude of what we're talking about, a fair share of head-scratching.

The main results were presented at our Reshaping Energy conference here in Ottawa last spring, which involved industry, government, and academic presenters. As you know, the Conference Board is a non-partisan evidence-based research organization. We're non-partisan in all of this. We try to bring the facts to inform the policy in the transition to a low-carbon world. That event was a good example of how the Conference Board does this.

There are two overarching messages.

Simply pricing carbon and moving away from fossil fuels are insufficient measures to achieve the deep reductions that we were talking about in the Paris agreement. While technology and innovation will play a role in the long term, they can't get us to the 2030 target given the relatively short window available to develop and adopt these solutions. The second overarching message is that, given that the required investment will be in the trillions of dollars, policy-makers need to communicate to Canadians the scale of what we're talking about in terms of this transformation that will have impacts on everyday life.

I don't want to get into the details of the report, but there are a couple of highlights that I think are important in the context of what we've talked about today and the zooming in on electrification. The report examines the impacts of carbon pricing and of the investments needed to help Canada achieve the deep reductions—significant reductions—in greenhouse gas emissions. It finds that even taxing carbon at $200 a tonne by 2025 would result in only a 1.5% reduction in greenhouse gas emissions outside of the power generation sector, so it's not that much. We're talking about much more if we want to make a bigger dent.

Carbon tax revenues, in the context of our scenarios, significantly add to government coffers. In fact, the rule of thumb here is $6 billion for each tranche of $10 a tonne for carbon. Our assumption in this scenario is that the revenues collected are expected to be put back into the economy through tax cuts and higher public spending and investment. The assumption that carbon revenues will be recycled into the economy is, frankly, the key reason why the total impact on the economy is small.

The research also quantifies the economic impact of making deep greenhouse gas emission reductions. The investment requirements are based on—as I mentioned—the work of the Canadian Academy of Engineering, under the overarching Trottier energy futures project analysis. Outlined in this technical piece of work are several technical pathways, and in fact, over eight scenarios.

● (1650)

Those scenarios were developed by a combination of engineers, the David Suzuki Foundation, and some academic researchers at McGill University, who are experts in technical modelling. They didn't get into the policy options to get there, but they really describe, if we put everything on the table that's available today, how deep the reductions could be. They have various scenarios going from 30% to 60% by 2050. Of course, the 30% reduction below 1990 levels by 2050 leaves us far away from the Paris agreement. The 60% gets us closer, but none of those scenarios gets to 80% according to the technical analysis that was done.

I'll just talk about the 60% reduction, because this is the most ambitious and the one we signed up for. The 60% reduction in emissions will require a $3.4-trillion investment. That's about $100 billion annually, or just to put it in context, about half of what Canada spends on non-residential business investment every year. It's a significant amount relative to what's spent today on other things. Just to put that amount in perspective, those big numbers at a certain point become meaningless, so I think that's kind of a way to see what it means in terms of relative spending that happens today.

Of course, in that—and I've talked about electrification being a central theme of this—more than half of the investment would be directed towards power generation to enable the electrification of Canada's economy. One challenge that needs to be kept in mind—and we've heard Stephen Poloz, the Governor of the Bank of Canada, talk many times about this—is that the potential growth of Canada's economy going forward is coming down, largely due to the aging of our labour force. In other words, when we talk about the potential of Canada's economy, we're approaching a capacity to grow at the level of 1.5% to 2% a year versus 3% to 3.5%, which we were used to hearing about a few years ago.

We're reaching the capacity of our economy to absorb new investment. What we're saying in the scenarios is that this new investment would have to crowd out other investments that would have taken place if this policy wasn't in place. In other words, or as a different way to present that, our capital is in place currently in the economy and our labour force is fully employed. There's no large pool of labour capital waiting to be redirected towards these new investments, so the simple fact is that Canada is unable to leverage the funds, capital, and labour resources required to generate these investments without taking funds and productive capacity away from other economic activity.

One element to keep in mind, which I think is really important in terms of the solutions going forward, is that all scenarios of emission reductions analyzed in our study do not account for carbon leakage. To the extent that trade adjustments include declining exports of carbon-intensive goods without corresponding reductions in consumption of those goods by our trading partners, the emissions reductions in Canada could be fully offset by increases elsewhere. In other words, if we don't produce it here, it could be produced somewhere else.

We've identified five priorities for action in our work. The first is end-user acceptance. I think it's impossible to overstate the importance of this. The policy-makers for that low-carbon transition journey need to clearly communicate what is needed from households and businesses to achieve large emissions reductions and communicate that society is ready to make those commitments. History has taught us that long-term change cannot be successfully imposed by governments; rather, it must be desired by their citizens.

The second point is the acceptance of large-scale projects. I think really central to the electrification context is that substantial investment in large-scale hydro, nuclear, and wind transmission projects is required in all parts of the country. Large-scale projects typically attract their share of controversy. Acceptance of these projects among environmentalist groups, indigenous groups, and the public is necessary.

The third point is that an effective environmental assessment process for large projects is needed. This takes time. Cumulative effects over time need to be included in these environmental studies. The development life cycle for a large project can easily extend over a decade, so this needs to be included in our policy objectives.

The fourth element is regulatory acceptance of the need for investment and cost recovery. Of course, it's a business decision to invest in these projects. Business needs certainty over the long run.

● (1655)

The final point, which is the greatest opportunity for Canada, is that we need to think of all of this transition to a low-carbon world and to a net-negative greenhouse gas emission in context. At the end of the day, this is what matters worldwide.

An effective made-in-Canada greenhouse gas reduction policy needs to consider the global competitiveness impact on trade, and the net change on world greenhouse gas emissions. This is particularly important in the context where Canada is an open economy, dependent on trade, which was built over the years by a key competitive advantage, with an abundance of natural resources and low energy prices, so of course our economic fabric today reflects that.

Policy options where Canada gets credited for net greenhouse gas reductions from exports of Canada's expertise in technological solutions represents a major opportunity for Canada. It demonstrates leadership, and it creates employment and economic opportunity for Canadians. It's something that hasn't been talked about yet. It used to be talked about in the nineties quite a bit when Rio and Kyoto were signed, but it hasn't come back on the radar screen. I would encourage you to seriously consider that as an option. That's a clear win-win for Canada and the planet.

Thank you.

The Chair: Thank you very much.

Mr. Lemieux.

[*Translation*]

Mr. Denis Lemieux (Chicoutimi—Le Fjord, Lib.): Thank you, Mr. Chair.

I would like to thank the witnesses.

Mr. Thériault, what a lot of interesting information you have given us in such a short amount of time! I am a little overwhelmed because I know you are a renowned economist. I know more about engineering. You know that I'm from Saguenay, a region that is a major producer of hydroelectricity. In fact, Quebec produces around 35,000 megawatts of hydroelectricity a year.

An initial question comes to my mind as a result of your reflections. Earlier, we talked with witnesses about the possibility of having premiums for exporting our green energy. In a province like Quebec, if there was a premium to export our green energy, with the economic spinoffs it would bring, do you think we could adopt the vision you mentioned, in other words, doing research and development and raising awareness? As I understand it, if we want to achieve our goals, the idea is not only to improve our practices, but to consume less.

I would like to hear your opinion on this.

Mr. Louis Thériault: I think I understand your question. Clearly, there is a whole exercise of strategic economic development that can be done on the basis of policy options to reduce greenhouse gases. Quebec has a comparative advantage: it produces green energy. In the current context, it is an extraordinary option that can help with the export of electricity, but it can also help industries such as aluminum.

We have been talking for a long time about how we could bring more local added-value to the Saguenay and Quebec economy, including through the secondary and tertiary processing of aluminum products. But all these processes are very energy intensive. The fact that the energy we produce is green at the outset is part of an economic development policy. That's clear.

All of these opportunities that are tied to a more strategic and climate-focused investment can be very attractive to citizens, and bring about changes in their attitudes and in how they do things. I would say that Quebec is well-positioned, as you mentioned, directly and indirectly.

I believe that, in the context of our work, it is clear that we need an interprovincial transmission system for electricity. Right now, by definition, these are systems that are managed by province. The big challenge is how to create an east-west harmonization of our distribution network, in the context. This is a central question.

Mr. Denis Lemieux: A very good question indeed. We have long been asking it, in committee.

I'll take the example of Ontario and Quebec. These two provinces have surplus electricity production. All the inter-ties that are considered between these two provinces, for example, are therefore more related to the reliability of the networks than to the commercial aspect of meeting the needs of the two provinces.

How do you think this could be extended to other provinces in Canada?

● (1700)

Mr. Louis Thériault: That's what we heard from other witnesses earlier today. It's a question of negotiation and long-term contracts, a question of certainty of availability. You have to know how it fits into the different types of electricity we need. Peak load and base load must be taken into account. It's a complex system. Each province has structured its network based on basic needs and advanced needs.

How should this logic be respected on a pan-Canadian basis, during a transition period when the facilities, which are largely coal-fired, need to be redesigned? In Alberta, Saskatchewan, New Brunswick in part, and other provinces, there are still plants that use natural gas and oil.

If green electrification is a central option of this energy transition policy, we must hold this conversation to adopt a much more coherent system at the national level. It's something that is very fragmented. So it's a challenge.

Mr. Denis Lemieux: I would like to make a parallel. Last year, along with my colleague René Arseneault and other MPs, we visited US auto industry facilities to discuss green aluminum produced using hydroelectricity to gauge the interest of American consumers. Based on the reaction we got, people want to be eco-responsible, but they wonder what price they are willing to pay to be eco-responsible.

Have you ever interviewed the various market leaders about the price they are willing to pay for eco-friendly behaviour?

Mr. Louis Thériault: Your committee deals with natural resources. But the challenge of the climate program is precisely the one you mention. Everyone is for virtue. In other words, everyone is ready to be environmentally responsible as long as they don't have to pay for it. If we can continue to do things as we do now and at the same price, everyone is ready, that's for sure. Everyone is for virtue, by definition.

So this is the big test. I would say that the climate program is secondary for consumers. They will make decisions about buying a car or a house based on priorities other than the environment. If environmental well-being is added, so much the better. The challenge is to put the environmental agenda in a value proposition for the consumer, where everything is integrated. Right now, it's something you think about after the fact. People think they are in favour of it, but they aren't prepared to pay for it.

Mr. Denis Lemieux: Pardon the pun, but how could we shock Canadians to convince them to make this shift?

Mr. Louis Thériault: It is in this sense that I consider that we can't exclude the carbon price policy from this consideration. You have to send a price message. If we accept there is a carbon-related environmental cost, it has to be reflected in the price in a certain way. I don't think we can ignore the role of the carbon pricing policy.

However, as we have seen in our analysis—and I could expand on this—the carbon tax should be so high that we would create a huge competitiveness challenge for the Canadian economy. We can't do this overnight. It's part of the toolkit, but it's not the ultimate solution.

Mr. Denis Lemieux: Thank you, Mr. Thériault.

[*English*]

The Chair: Ms. Stubbs.

Mrs. Shannon Stubbs: Thank you, Mr. Chair.

All of my colleagues sitting at the table should listen very carefully when you, as an expert, present evidence—of which all my colleagues love to say they found their policies—cautioning about the global context for emissions policy in Canada, and about the trade exposure of our economy overall.

I wanted to expand on your comments about the carbon tax. I know that even one of the co-chairs of the recent climate change leadership panel in Alberta made the comment on what he called the sweet spot for the carbon tax and priced it at $150. You mentioned $200. I know there are experts in Europe who have said $1,200 would be the amount required to significantly reduce emissions.

It's quite clear from your testimony and others, when you actually look at the evidence, that the current policy for the carbon tax proposal is very obviously a revenue generator for government, and really isn't attached very much at all to the stated goal of emissions reductions.

Would you expand on this issue a little bit more, and on the importance of citizens driving the transition to a low-carbon economy with personal responsibilities, actions, and choices as well?

● (1705)

Mr. Louis Thériault: You're right. The $1,200 you mentioned is part of the work done with the Canadian Academy of Engineering. That's what we call in technical terms a shadow price on carbon. In other words, if you were to bring in the latest, greenest technology available on the market, the final technology that's available, and you throw everything at that final piece of technology to make it economically and commercially viable. That would require that you have a tax of $1,200 a tonne. That will change over time. Abatement curves around these technologies go down typically; it's true. That's what we know today. We know over time these cost curves come down, but right now that's what we're talking about.

Another thing to put in perspective is that in that whole conversation on low-carbon transition we need to recognize our starting point. We're an economy that benefited tremendously from our abundance of energy, carbon and non-carbon. Its low price reflects the electrification of our economy in Quebec. The aluminum industry, there's a good reason there's so much. Pulp and paper is another one, or mining. Those are heavy, intensive, energy-consuming industries, and the abundance of it at a low price makes us really competitive in world markets. That's part of what we are. The same thing in Alberta, of course, for oil and gas. There's been a lot of innovation in the oil and gas industry, and I think that innovation could be exported because we're not going off carbon around the planet overnight.

That element of a carbon tax is in the mix for the second point you raise, which is to send a signal to consumers that if collectively we're embarking on this ambitious agenda, there's a cost we implicitly think consuming carbon imposes on the environment, and we should be prepared to pay something for it. If you compare $200 or $150 for the consumer for motor gasoline in Canada, that would compare to about $1.40 or $1.50 a litre for gasoline. You compare that with Europe, where they pay on average $2.00 a litre, and that translates into about $400 to $500 a tonne, if you do the math around it. If you look at Europe and their fleet of cars and their economic fabric, the cost of energy over time has created different decision-making by consumers, but that's over decades.

Mrs. Shannon Stubbs: It's long term.

Mr. Louis Thériault: It's long term. It's not because they wanted to be necessarily clean or eco-sensitive 50 years ago. It's just that for economic competitiveness reasons that's the price they had to pay.

We have to reflect that in our policy transitioning. There's no way we can get up there overnight without having a huge impact. I think the element to keep in mind here is the solutions we develop for ourselves, because we make money if we save energy in our processes. We've developed a lot of expertise and we haven't talked about those joint international venture projects, which we used to talk about under Rio and Kyoto, and how, when Canada invests abroad...

Frankly, the overall climate challenge for the planet is coming from China, India, and Africa, which don't always have the financial means to get the latest technology. They still consume a lot of coal, gas, and oil, so we can export our expertise to bring the global balance of greenhouse gas emissions lower. I think as part of the policy for Canada, we need to include that element.

Mrs. Shannon Stubbs: Many of those major energy producers certainly don't have anywhere near the environmental standards, regulations, compliance, enforcement, performance, or transparency that Canada does.

In the suite of policy options available to governments around this issue of emissions, you probably know the Liberals have recommended upstream emissions assessments as a condition to pipeline approvals in Canada. I wonder if the Liberals are also going to move to apply that same condition to major infrastructure in other sectors, as well as to mining, manufacturing, transportation, construction of renewable alternative energies, if the priority is overall emissions reduction.

It seems to me that if they are emphasizing this upstream emissions condition on one piece of major infrastructure and one sector, then I'm sure I look forward to their being consistent and applying that to all the sectors and all major infrastructure. I don't actually look forward to it. I think it's problematic, but I'm sure they will be interested in being consistent.

Earlier this year I know your organization published a paper entitled “Shaping the Canadian Low-Carbon Economy”. I just want to read out a section and then ask you to comment on it.

You said, “The production of Canadian oil is also rising, even as production from renewable energy sources is growing. Canada’s hydrocarbon producers are working hard to reduce the energy they use to produce and process their product, thereby reshaping the sector’s carbon emissions footprint.”

● (1710)

The Chair: You've had seven minutes. I'm going to have to stop you.

Mrs. Shannon Stubbs: Am I out of time?

The Chair: Yes, you're out of time.

Mr. Cannings.

Mr. Richard Cannings: Thank you.

Thanks to the witnesses for being here today.

I'm from British Columbia, so I'd like to start with Powerex and ask a few questions to expand on what you were talking about, especially around the barriers you mentioned to the transmission. You have transmission transfer limitations, and market design. You talked about exports to California, exports to Alberta.

Perhaps I should start by thinking about the Alberta situation and what it would take in terms of new interties between B.C. and Alberta to change that formula for Powerex, and Alberta for that matter, in interchange of electrons.

Mr. Mike MacDougall: We really need to focus on the usable capacity we're going to get for the investment. As I mentioned in my introductory remarks, the existing facilities don't operate anywhere near their design capabilities. The very first things we should be looking at are investments that could be made that could bring that capacity back up to get another 300 megawatts, maybe 400 megawatts, on those existing facilities, at far less money than what new facilities would cost.

Then, when we start talking about the new facilities, again we have to be cognizant that electricity is a tricky commodity. There are a lot of interactions with how electricity flows over the grid. In designing the interties, there are ways that you can put in facilities that don't get you very much transfer capability, and then there are ways we can put in facilities that will get us much more.

I gave the example in my talk about when Alberta was connected to Montana. The design choices that were made ended up not changing Alberta's overall ability to bring electricity in, but just allocated capacity that was already there with B.C. over to Montana. If we were to build a new link between B.C. and Alberta, we'd want to minimize the amount of capacity that would ultimately get bled out among all the existing facilities and try to create as much incremental capacity as possible.

In getting to the next piece, the incentives, I'll turn it over to Mr. Bechard, in terms of what would be necessary to support that investment.

Mr. Tom Bechard: Before we go too far along the road of trying to figure out how we're going to build more transmission capacity, we're working right now on trying to figure out whether there's an economic case to be made for better coordination between the provinces. We also have to work out how we're going to use the line.

There's no point in building a line if you don't have some agreement on how it's going to be used. Whether that's used to displace building new gas generation in Alberta, or simply to get operational efficiencies for when there's excess in Alberta.... You know, if they turn to wind as their new source for replacing all of the coal, there will be times when the wind is blowing and times when the wind is not blowing. Rather than using only gas generation to help them with that, if we had a long-term agreement on intertie to help them out, maybe they could reduce some of the spending on building gas plants and we could achieve some capital cost savings with the intertie build.

That was kind of a long-winded answer, but I think the short answer is that we need to get the commercial entities together on both sides of the intertie, figure out how we could use an intertie if we had it, and then work out what we need to build.

● (1715)

Mr. Richard Cannings: To follow up on the electricity market situation, this is all new to me. I'm trying to learn.

We just heard from Ms. DeMarco in the previous hour about some strange pricing mechanisms where you're paying retail prices in situations where it would be better to pay wholesale, and vice versa. I'm thinking more of your exports to California now and how that market works and what your profits are, or when you make a profit and when you don't. How does that work?

Is there any way we could have better market regulation or a market model that would facilitate the movement of electricity between...well, both California, and Alberta and B.C.?

Mr. Tom Bechard: As I said in my verbal address, the carbon tax in Alberta is going to go a long way to helping that. In January next year, when they start to implement their CCR in Alberta—that's the carbon competitiveness regulation—that's going to raise the price of coal generation there relative to other sources of generation, and it's going to send more power flow to Alberta from B.C. That in itself will do that.

We'll have to see how that pans out. At that point, we could start to see the intertie actually limit deliveries that go to Alberta. The intertie hasn't been much of a limitation in the last couple of years because Alberta prices have been low relative to California prices, so there really hasn't been much of a limitation on what we can send from B.C. to Alberta at most hours. I think maybe when we see the CCR go in place, and as that CCR gets more stringent, I expect there to be more demand for transmission to Alberta. That in itself will help a lot. Carbon taxes do work. Where they've been put in, they certainly work, and I think that's a great mechanism to make things happen in our business.

The Chair: You're right on time.

Mr. Tan.

Mr. Geng Tan (Don Valley North, Lib.): Mr. Thériault, the Conference Board of Canada recently published a report called “Power Shift: Electricity for Canada's Remote Communities”. I want to focus on the word “remote” and how the interties can benefit remote areas.

In your opinion, how many remote areas can benefit from one intertie going through a typical rural region? How many remote communities can be linked to these interties? I'd like just a rough number.

In the case of a very remote community, where a connection to any intertie is not feasible, what other technologies or solutions can be used to help with those remote communities? Furthermore, can proximity to an intertie connection, for example, 100 miles away or even a few hundred miles away, provide any benefit for very remote areas?

Mr. Louis Thériault: There's no easy answer to this. If it was straightforward and economically viable to supply electricity to remote communities, it would happen now. If it's not happening, it's because there's a major cost associated with bringing all that infrastructure to communities that are spread throughout a really large territory. It's a challenge for a country like Canada.

On top of that, you have weather and so on. Then you start moving jurisdiction by jurisdiction: how the base load is constructed, how the peak loads are constructed, and how the system's designed by the province. There's no easy answer.

You mentioned a general average. That's the challenge. There's no general average, because remote communities are really different in terms of their economic development and in terms of which group you're talking about. If you're talking about indigenous groups, whether you are talking to Inuit groups that are farther north or to first nations—depending on which first nations and even within those first nations—then you have different levels of knowledge and socio-economic development.

As part of the board's work on remote communities, we have an initiative called the “Centre for the North”, and we've been exploring that for the last six years. The overarching message from all the work is that it's really hard to find a homogeneous, blanket solution to some of the challenges, whether it's about infrastructure development, indigenous youth, or governance. Each region has its own specific fabric, characteristics, and DNA, so I'm sorry to say it but I can't answer that with a rule of thumb.

The second point of your question, around solutions for really remote communities and probably those that are further north, is this challenge of storage. Right now, diesel is the main source of fuel. It comes once or twice a year based on a guess as to how much is going to be needed for the season, and then you just hope it's going to work out. It's really polluting, it's not really efficient, it's noisy, and there are all kinds of challenges associated with it.

Wind power and storage capacity is starting to emerge as an option. It's not the case for hydro and nuclear, but for a lot of the renewables—say, if you're thinking of offshore or onshore wind—the big challenge is the battery and how you accumulate that energy. Some technologies are starting to emerge on that front. We've talked about this, in fact, as part of our work. It's not scalable and economically viable yet, but as part of the low-carbon transition, it's definitely something that needs to be considered.

I'm sorry, can you rephrase your third question for me, please?

● (1720)

Mr. Geng Tan: Suppose my community is 200 miles away from an intertie. Can it get any benefit from that construction or intertie, or any infrastructure?

Mr. Louis Thériault: There's a financial component to that. It can be either a political decision to bring it, or there are some technologies around local grid options that could be deployed. If you're thinking of low-carbon options, we're back to my point about batteries—or storage, more largely defined—for options like solar or wind.

Mr. Geng Tan: Thank you.

My second question is actually for both witnesses. We can clearly see the benefit of the increase in the number of interties in Canada. We know that building transmission capacity is important, but what about also improving the efficiency of the existing energy transportation system in order to reduce waste and energy loss? Just how focused should we be on upgrading the energy transmission efficiency in order to reduce energy loss?

For example, on one side, I can invest money in building more interties, and on the other hand I can also invest money on upgrading the aged infrastructure, like the transmission lines. How do we find this balance? Do you want more interties or do you want more money for...?

Mr. Mike MacDougall: That's a tricky question for me, not being an engineer. I'm aware that there are options since some of these lines have been built. I think there are new conductors that could decrease the losses. Some of the change, I think, in the technology from the AC to HVDC for going longer distances can also help, but I don't think we've seen any kind of analysis of the cost benefit on that.

In fact, the place where you might want to be focusing such a thing is how much mileage you can get out of the electricity that is delivered already, the efficiency at the end points of use as opposed to the efficiency of the delivery over the wider grid. I think a lot more of the losses occur as you step down into distribution and the end point as opposed to bulk transmission.

● (1725)

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

Mr. Falk, we're going over to you.

Mr. Ted Falk (Provencher, CPC): Thank you, Mr. Chair.

I'd like to start with Powerex. During your presentation, you indicated you exported 10% of your power to Alberta, or 10% of your exports were to Alberta. You brought back 3%.

What are the pricing models for exporting and importing? Are they equivalent? Are you paying them the same as they're paying you?

Mr. Tom Bechard: The two provinces have very different market models. Alberta—

Mr. Ted Falk: In other words, no.

Mr. Tom Bechard: We tend to buy overnight when they have surplus, so either their generation is backed off or they're not running any of their expensive generation, and—

Mr. Ted Falk: So they may as well give it to you.

Mr. Tom Bechard: —we buy when it's inexpensive, and then we provide energy when it has higher value to them. On a peak when they'd have to run an $800 facility, we're selling it to them and keeping the costs down for Albertans.

Mr. Ted Falk: The pricing models are very different, depending on whether you're exporting or importing power.

Mr. Mike MacDougall: The prices are set by the Alberta market through the operation of its power pool. The model is the same in both cases. The result of the value of energy is different depending on the level of demand. We tend to be a buyer when the demand in Alberta is low, they're in surplus, and the prices are lower, and we tend to be a seller when demand is high in Alberta and the value is higher.

Mr. Ted Falk: Thank you.

Mr. Thériault, I'd like to ask you some questions, as well. This government is moving our economy very quickly and aggressively into electrification. I'm not totally opposed to that, but looking at our existing energy sources, fossil fuels, we have multiple ways of transmitting that energy, be they trains, transport trucks, ships, flying into northern communities, and pipelines.

With electricity we have one source of transmission, and that's through the grid. We're talking about interchanges here, and I'm wondering, in your opinion, do we have sufficient redundancy in the system? We're now sole-sourcing an energy product, and I'm concerned about sole-sourcing energy products because there's a vulnerability there.

You've done a lot of work in the past on national security issues. How vulnerable is our grid? Are we as a country susceptible to terrorist attacks on our grid or malfunctions of our grid the more we become electrified?

Mr. Louis Thériault: Cyber-risks or international security risks are there all the time. In fact, we responded to the OPEC crisis in 1973 exactly for these reasons, because we felt we were exposed. It's part of the equation.

In our work, we talk about what it would take to meet the Paris agreement to decarbonize the economy. In that context, you need to think of electricity and clean electricity. There are no technological solutions or any other way out. It goes with cars, how we move, how we play, how we work, how we do business. It's throughout, and electrification through clean energy electricity is a central element. When you bring the other dimensions to this, it adds an element to the analysis that definitely needs to be considered.

That's why I like to insist on a made-in-Canada carbon policy that includes options for delivering to the rest of the world, where it's much more carbon intensive, where the regulatory standards are not Canada's standards, and where security systems are not just in Canada but across the world. We are a provider of solutions, and we can turn that into a great opportunity for Canada.

A domestic-only, made-in-Canada within our geography, approach is extremely self-limiting. We need to start opening up options that go beyond, because at the end of the day, that 450 parts per million we're talking about when we consider limiting temperature growth to two degrees, it's a world problem. We need to find a world solution. Canada, by definition, is a small, open economy, and it turns out we can offer a lot of elegant solutions to the rest of the world in this new carbon transition.

● (1730)

The Chair: Thank you very much. That's where we're going to stop for the day.

Gentlemen, thank you very much for joining us today—in the case of Powerex, we thank you for joining us twice. We appreciate your contribution to the committee.

We will see everybody on Wednesday. This meeting is adjourned.