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Chair

Mr. James Maloney

Standing Committee on Natural Resources

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• (1535)

[*English*]

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

Welcome back. It's our first week back in session. I hope everybody had an enjoyable summer, as fast as it was.

We have some new members on the committee.

Mr. Falk, I understand you are—

Mr. Ted Falk (Provencher, CPC): Official.

The Chair: Mr. Shipley—

Mr. Bev Shipley (Lambton—Kent—Middlesex, CPC): I'm not.

The Chair: Mr. Shipley is not official, but he keeps showing up. We're grateful for that. Thank you for being here.

Ms. Stubbs, congratulations on your new critic role. You'll continue to be with us on the committee, which we're all very pleased about.

We have two sets of witnesses today. We have the department officials, who are joining us for the first hour. Thank you very much for being here. Then we have two witnesses in the second hour.

Before we get to that, I'm going to turn it over to our clerk. We have to elect a new deputy chair.

The Clerk of the Committee (Mr. Marc-Olivier Girard): Thank you, Mr. Chair.

For your information, pursuant to your Standing Orders, the first chair of this committee must be a member of the official opposition.

I'm now prepared to receive motions for the first vice-chair.

[*Translation*]

I'm listening, Mr. Serré.

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

I would like to move that Ms. Stubbs be elected first vice-chair of the committee.

The Clerk: Are there any other motions?

It has been moved by Marc Serré that Shannon Stubbs be elected first vice-chair of the committee.

[*English*]

Is it the pleasure of the committee to adopt this motion?

(Motion agreed to)

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

The Chair: In this case, I'll congratulate you for a second time today.

Mrs. Shannon Stubbs: Only on this day.

The Chair: All right, without any further ado, I'm going to turn it over to the department officials.

You don't need any explanation on the process or how this operates, so I will not consume any time going through that explanation. I'll give you the floor for up to 10 minutes.

Thank you for joining us.

[*Translation*]

Mr. Niall O'Dea (Director General, Electricity Resources Branch, Energy Sector, Department of Natural Resources): Thank you, Mr. Chair.

My name is Niall O'Dea and I'm the director general of the electricity resources branch at Natural Resources Canada. I'm joined today by two members of my team, André Bernier and Darcy Blais.

Thank you for the opportunity to speak about this matter. I'll start by providing some context. I'll then share some thoughts on the need to establish strategic interconnections and on what Natural Resources Canada is doing to support this priority.

I'll move on to the second slide.

The pan-Canadian framework on clean growth and climate change defines electricity as the cornerstone of a modern, clean growth economy.

The federal government's goal is to put Canada on a path to move from 80 to 90% non-emitting sources by 2030 and to phase out the conventional coal-fired electricity generation. Along with addressing these challenges, the electricity sector must provide an additional clean supply to support electrification in other sectors.

The pan-Canadian framework proposes an approach that includes four elements. Today's presentation concerns the second element, which consists of connecting clean power with places that need it.

The pan-Canadian framework aligns well with the Council of the Federation's Canadian energy strategy, in particular with areas of focus six and seven. These areas concern the development of clean energy sources and the enhancement of transportation networks.

• (1540)

[*English*]

Since 2005, Canada's electricity sector has made significant progress in reversing the upward trend in greenhouse gas emissions. Ontario and Manitoba have phased out coal-fired electricity generation, and Alberta and New Brunswick have seen some shutdown of coal capacity. All provinces have put in place policies or programs that have supported a significant increase in wind and solar energy. New hydroelectric generating capacity has been built, or is being built, in B.C., Manitoba, Ontario, Quebec, and Newfoundland and Labrador. The 2012 federal GHG regulations for coal-fired electricity set the stage for a nationwide conventional coal phase-out, and the Government of Alberta's 2015 announcement and Environment and Climate Change Canada's 2016 announcement of accelerated coal phase-out will help expedite that phase-out by 2030.

In addition to having to continue to make emission reduction progress, the electricity sector will have to increase electricity generation to supply other sectors electrifying their processes to reduce emissions.

Another challenge we face is aging infrastructure. Back in 2012, The Conference Board of Canada estimated that the electricity sector would have to invest up to \$347 billion between 2012 and 2030. This translates into an annual average investment of more than \$15 billion simply to replace the existing infrastructure. Actual investments since 2012 have averaged over \$20 billion. This investment level will need to be maintained, and decisions that we make now will affect the sector for the next 30 to 40 years, given the lifetime of those infrastructures.

The challenge we look to is great, but fortunately Canada's electricity sector is starting, we think, from a position of strength. Our electricity supply mix is among the cleanest in the world, with about 80% of electricity supply coming from non-emitting sources, about 60% of which comes from hydro. That said, certain regions rely significantly, even heavily, on fossil fuels for their electricity supply, notably Alberta, Saskatchewan, New Brunswick, and Nova Scotia. In many cases, these regions are bounded by provinces with abundant hydroelectric resources.

[*Translation*]

Let's move on to slide six.

The improvement of interconnections between the provinces can help fossil fuel-reliant provinces transition to clean electricity. Other interconnections can also help manage the variability of wind and solar resources.

At the same time, we must mention the importance of our trading relationships with the United States in terms of electricity. In general, the interconnections with the United States are stronger than the interconnections between the provinces. New interconnections with the United States are being considered, and these will create trade

opportunities. However, from the federal government's perspective, our main priority should still be to reduce emissions here.

On slide seven, the chart shows the existing electricity transfer capability between the provinces and the United States. It illustrates the north-south predominance of our existing connections. In particular, the map shows the six major power lines being constructed in Canada and the United States. This north-south relationship has developed for historic reasons.

Many major hydroelectric plants were initially built and funded partly to meet the American demand. In many cases, the load centres in the United States are closer to the plants than the Canadian cities. However, when we look to the future, we can see that the arguments in favour of increasing transportation between the Canadian provinces have become more prevalent given the phase out of coal-fired electricity and the need to reduce greenhouse gas emissions in this sector.

[*English*]

In budget 2016, the Government of Canada announced the two-year, \$2.5-million regional electricity co-operation and strategic infrastructure initiative to identify promising electricity infrastructure projects with the greatest potential for greenhouse gas emission reductions. Two dialogues were formed, one in the west and one in the Atlantic. Results are expected by the end of this year, and final reports are due in early 2018.

The results will include some important economic aspects, particularly costs of various options to electricity consumers. More project-specific analysis will then be required to examine broader economic impacts on things like jobs. The results will help inform discussions between neighbouring provinces and the federal government, potentially leading to infrastructure investment decisions by provinces, and decisions by the federal government or federal agencies to lend support.

In the near term there is an opportunity for focus on well-advanced foundational projects. The communiqué that was issued after the 2017 Energy and Mines Ministers' Conference identified the reinforcement of the Nova Scotia-New Brunswick intertie or interconnection as an example of a project to advance in the near term. Such projects we believe will be foundational to Atlantic Canada's longer-term transition to clean electricity.

• (1545)

[*Translation*]

Let's move on to slide 10.

Ultimately, the provinces determine the pace and scale of the development of new electricity generation and transportation assets in Canada. That's why the collaboration with the provinces and territories is the key to success. The federal government can play a productive role in this process by inviting the provinces to review the regional options for reducing greenhouse gases.

All projects being considered for implementation must undergo an environmental assessment. The projects must also be subject to a robust review and consultation with the indigenous peoples concerned.

In some cases, the electricity transportation projects will have a positive impact in remote communities and will connect the communities to the system. As a result, less diesel fuel will be used for electricity generation and home heating.

The Pikangikum project in northern Ontario, which was announced recently, illustrates the benefits that can result from this type of project.

[English]

Finally, to sum up, electric utilities across the country face a challenge. While meeting growing demand, they have to constantly invest in replacing aging infrastructure and, in some cases, shut down coal-fired plants. This is exacerbated by the interest of other industries in using electricity as a means to reduce their sectors' emissions. This challenge presents an opportunity to establish a robust foundation that will form the basis of the country's electricity system of the future. Interties can contribute to that foundation by connecting clean energy to the places that need it. They can also help in integrating variable renewable energy.

Speaking of the future of the sector, I would like to take this opportunity to mention the generation energy event that will be taking place in Winnipeg this October. At this event, stakeholders and experts will have a full debate on the potential pathways to an affordable, low-carbon energy future for the country. Interested participants should visit www.generationenergy.ca for that one.

To conclude my opening remarks I would like to thank you, on behalf of the department, for allowing us to contribute and open your discussion on this important topic. I wish you well in your study of electricity interties, and I look forward to answering any questions that you may have.

Thank you.

The Chair: Thank you.

You must have rehearsed that because you were at 10 minutes on the dot. I don't think that's ever happened before. It's a good sign to start off the session.

Mr. Arseneault, I believe you're going to start us off.

[Translation]

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

I want to thank Mr. O'Dea, Mr. Bernier and Mr. Blais for sharing their knowledge today as witnesses.

Will the carbon pricing regulations implemented by the Government of Canada last year help the electrical power sector increase its high percentage of low-carbon electricity generation and why?

Mr. Niall O'Dea: Thank you, Mr. Arseneault. That's a good question.

The carbon pricing regulations will significantly help the entire country make progress in reducing greenhouse gases, especially since the regulations apply to the whole economy. However, in the initial years, the basic pricing may be too flexible to immediately transform the energy or electricity sector, given the fairly high costs of such a transformation. The important thing is that the regulations

will enable businesses to include the costs of this transformation in their spending. This will lead to more businesses looking at moving in this direction. The estimate of long-term investments is more important than the initial basic cost. The electricity producers will base their decisions on this estimate.

• (1550)

Mr. René Arseneault: Thank you.

What technology shows the most potential for the future of the low-carbon electricity system? What technology is best able to benefit from it?

Mr. Niall O'Dea: That's another good question.

I think Canada's strength lies in the diversity of the technological options, which enables the country to address this challenge. Obviously, Canada has a number of hydroelectric resources and a good capacity to develop this type of technology. In Canada, the nuclear component is currently very important, especially in Ontario, but also in New Brunswick. We have the chance to further explore the small modular reactors and assess their potential contribution in the future. We're also noticing very fast growth in solar and wind power. These two technologies are slightly more distributed, but they can make a major contribution. I think this will give us an idea of the natural resources of specific regions and the way those resources can be developed and associated with other resources to develop a low-cost system that will reduce greenhouse gas emissions.

Lastly, I want to say that these are generation technologies. However, there are also transmission and distribution technologies, which are very important. Canada has the chance to be a leader in smart grid technologies. This type of technology will help us use the current systems more effectively.

Mr. René Arseneault: Would an interconnection strategy provide benefits with regard to reducing greenhouse gases?

Mr. Niall O'Dea: Yes, certainly. It's obvious. That's why we're currently conducting a study.

For Canada, the future will be the combination of distributed clean energy systems and centralized systems. When distributed systems are connected to centralized systems, the system becomes more flexible and reliable. This is an important point.

Regarding strategic interconnections, we must determine where to make these connections so that we have a greater chance of developing power such as wind and solar power. We must also assess the entire system on a national basis. We must find out which infrastructure framework helps obtain the best price in terms of electricity, the quickest possible access to power, and the lowest possible greenhouse gas emission rate.

Mr. René Arseneault: Thank you.

You referred earlier to indigenous peoples. Can you give us some examples of low-carbon electricity developments that create sustainable economic opportunities for indigenous peoples in the energy sector?

Mr. Niall O'Dea: Yes, certainly. I can give you a few examples, and I'll then ask my colleagues to give you other more specific examples.

I can talk about Pikangikum and the interconnection I mentioned earlier. It's an interconnection in northern Ontario that will connect the indigenous community of Pikangikum to Ontario's major grid. For the first time, this isolated community will be connected to the major system. This will enable the community to obtain electricity on an ongoing and sufficient basis, in order to support the other services provided in the community. It will also ensure the economic development of the community. As a result of this reliable connection to the system, certain types of businesses will have access to more power.

Other small remote indigenous communities will also have the chance to obtain electricity through wind turbines and solar power projects. In addition, indigenous communities in Canada that are directly connected to the electrical system will have the chance to provide electricity to the system, as demonstrated by certain recent projects in Ontario. Although I've forgotten the name of the project, I know that Ontario Power Generation is currently pursuing a project in south-western Ontario. The project, which was developed as an equity partnership between indigenous peoples and the business, is helping to provide opportunities to indigenous communities.

• (1555)

Mr. René Arseneault: Thank you.

Mr. Niall O'Dea: I don't know whether my colleagues have other examples.

[*English*]

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

Ms. Stubbs.

Mrs. Shannon Stubbs: Thank you all for spending your time with us this afternoon. I appreciated your comments about Canada's strength being the diversity of our energy sources.

Just before I start with my questions, I want to thank my Liberal colleagues for inserting into this study specific references to the Canadian energy strategy. I want to note on the record that it was an initiative launched by an Alberta premier at the time and adapted and accepted by all premiers precisely because it voices its support for diverse natural resources and energy development within Canada, from every region and from all sources.

In hindsight, I somewhat regret that we didn't include the Canadian energy strategy in our previous study on oil and gas, since it talks about the importance of regulatory certainty in critical energy infrastructure and the importance of diversifying export markets. It speaks to what is Canada's long track record, which you have already touched upon, in everything from our regulatory system to our investments in innovation and our long-standing commitment to balancing environmental stewardship with energy and economic development, with all of the prosperity and jobs such development provides to every Canadian and every community across the country.

I note at the outset—I have colleagues opposite who feel strongly about this as well—that I hope that throughout this study we can continue to talk about supporting responsible natural resources development and enhancing investment opportunities for responsible natural resources development in every sector, in every province in the country, and that we aren't in a scenario in which we are pitting

sectors against sectors, as that might have disproportionate impacts in some regions or provinces.

I would note, of course, that this discussion around the development and investment of low-carbon and alternative and renewable energies goes hand in hand with a thriving oil and gas sector. The biggest private investors in alternative and renewable energy, such as wind and solar, are indeed conventional oil and gas companies and pipeline companies, such, for example, as Enbridge.

I want to thank you for your comments at the outset. Perhaps one day we can talk again about the goals and the recommendations in the Canadian energy strategy also, in the context of ensuring the sustainability and long-term prosperity of oil and gas development in Alberta, or in Canada as well.

Could you expand a little concerning these regional dialogues and give us, just for our knowledge, any specifics that you'd like to highlight about past challenges you see involving federal, provincial, and regional co-operation and any specifics you'd like to highlight about gaps you've identified or things that need to improve?

Connected to that, has this been or is it going to be part of the four major regulatory reviews? Will there be any impact on regulatory changes or adjustments stemming from those dialogues? If you could, just illuminate some of that for us.

Mr. Niall O'Dea: That's a very good question, and I will seek to unpack it.

I'm certainly happy to provide further context on the studies that are currently ongoing. I didn't cover it in my presentation, because I wanted to cleave to our 10-minute time limit, but on slide 14 of the deck we have provided a bit of a snapshot on the regional dialogues and on the specific questions that they are each addressing and that we are addressing in partnership with the provinces and territories and their utilities.

To turn to the west first, the main challenge in the west relates to the need to phase out coal in Alberta and Saskatchewan. That will require a combination of new wind and solar generation as well as dispatchable resources such as hydro, natural gas, or imports from neighbouring provinces. Natural gas is currently the lowest cost dispatchable option, but it is likely to become more costly as carbon pricing is phased in.

The main options under consideration for that western dialogue include transmission between Saskatchewan and Manitoba, as well as between B.C. and Alberta. The second is new hydroelectric developments in Alberta, Saskatchewan, and the Northwest Territories. Third is the electrification of natural gas processing and the potential for future LNG terminals. All these things are on the table in that western dialogue, and that's to address some of these gaps you spoke to.

In the Atlantic region, Nova Scotia and New Brunswick face a supply gap due to the coal phase-out, and they are constrained in that area by the limited current existing natural gas infrastructure for distribution. There is not the similar network we have elsewhere in Canada. Renewable resources such as wind and solar will be able to contribute in that space, but dispatchable capacities—so, again, firm capacity like hydro and nuclear—will be required to back up those variable resources. The main options being considered there are new hydro, be it Gull Island or some other smaller hydro opportunities; potentially new nuclear in New Brunswick, which is on the table as well in terms of this modelling study; and long-term electricity supply contracts with Quebec. Again, we're trying to take as broad a base as we can in order to work through that.

In terms of the history, I think Canada has traditionally developed most of its resources and connections north-south primarily—as I spoke to—because that's where the load centres and markets were for that electricity. I think the acceleration of the coal phase-out has created an incentive for co-operation. We see a great

• (1600)

[Translation]

open-mindedness

[English]

in the conversations among the provinces and utilities around exploring that. However, there is not a tradition of doing it, so a bit of it is information gaps around what that form of co-operation could be and also resolving very real market differentiation challenges. For instance, in Alberta you have a fully privatized electricity market, whereas in neighbouring provinces you may have vertically integrated, crown-owned utilities. The ability to co-operate across those borders, then, requires some pretty precise negotiations, ones that the federal government is happy to facilitate but ones that, clearly, we wouldn't be determinative in.

Then, in terms of the four reviews you mentioned, clearly those are a critical priority of the government currently. Our hope would be that they, once completed, would only strengthen the basis on which these projects, once identified, would move through. Clearly, each project that would be undertaken would need to undergo a thorough environmental assessment, thorough consultation, and engagement with indigenous peoples. That process, once the architecture following from those four reviews is established, should help greatly in moving those projects forward.

The Chair: Thank you.

Mr. Cannings.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you for being here today.

It seems to me, if I can summarize what I've heard, that if we want to move electricity or create green, clean electricity in provinces such as Alberta, Saskatchewan, and Nova Scotia—and under the new framework you'll be wanting to encourage cleaner electrical sources—there are two options. One is to facilitate the transmission of clean energy and hydro between British Columbia and Alberta or between Manitoba and Saskatchewan and Ontario, etc. The other is that we can develop more regional renewable energy sources; so Alberta would be, and is, developing solar and wind.

I just wondered if you could comment on two parts of that. One is just in the engineering part of it. What is the minimum ratio of the dispatchable type of energy the grid needs right now? Is it something that can change if we modernize the grid? Also, what are the relative costs of these energy sources: wind, solar, and hydro? Big hydro projects all seem to be fairly expensive. I know you talked about a study that was going to come up with some answers to this, but are there any kinds of ideas right now?

• (1605)

Mr. Niall O'Dea: I'd be happy to offer commentary on that. I think this question of regionalized versus localized is a key question. The regional electricity corporation and strategic infrastructure dialogue and studies that I spoke about are focused on looking at that regional picture. But they are modelling in, as well, the contribution that more localized forms of electricity supply could provide.

Our sense is that ultimately, based on cost, efficiency, and driving most rapidly to GHG emission reductions, a combination of both those interconnections and localized, smaller-scale electricity production will form part of the equation.

In terms of the minimum ratio of dispatchable to variable, that really is contingent on how well connected your supply is. You can imagine a system in one area of southern Alberta where the wind blows very strong and there is a superb wind resource, but when the wind is not blowing there, that resource is not there, so that can be a weakness. When that resource is connected to other places that can balance that wind resource—so say the wind is blowing stronger in the middle of the U.S. Midwest at that point—if you can get a broader area interconnected, you can balance to have a higher portion of variable renewables in your overall mix. Part of the rationale for strategic interconnections is that they allow you to achieve more of that balancing of resources across a greater geography.

Mr. Richard Cannings: Is the concept of a smart grid part of that or is that more part of a smaller, more urban grid? Or is the smart grid part of what is making those second-by-second decisions?

Mr. Niall O'Dea: The smart grid is absolutely critical to both in fact. At the localized level, at the level of distribution to individual households, smart grid technologies are critical to doing things like being able to plug in your electric vehicle at night and have it be used as a battery for the grid as a whole and then unplug it in the morning and still be able to get to work. Smart grid technologies are critical there.

In the broader scale and in terms of transmission, we want to be able to manage a higher degree of variability within our broader transmission lines. Now we tend to use less than the total load that a given line is able to carry, based on engineering parameters, but if we know more about what's happening at any given time along that transmission line, we can actually get more electricity and a more variable amount of electricity across it, and that allows us to better utilize the resources we have.

Mr. Richard Cannings: You mentioned electric vehicles. I was just wondering how often your department models or looks at this increased demand for electricity that we will be seeing as the world becomes more electrified and, especially with electric vehicles, that demand goes up. Every week there seems to be some new article saying this is happening far faster than we had thought. I assume you're on top of this. I just wonder what your current projections are for that increased need.

Mr. Niall O'Dea: Certainly. As to specific projections, I can turn to the team to ask if we have them.

Mr. André Bernier (Senior Director, Electricity Resources Branch, Energy Sector, Department of Natural Resources): We're looking at it, but I think there's a big question mark next to what the path is, because you could have a number of scenarios. Just to create a distinction, it's not just sort of a transmission generation challenge in the sense of quantity of electricity; part of the bottleneck is also what happens at the distribution level as households themselves take on a different role as energy consumers.

As Niall indicated, it also creates an opportunity, because with that comes storage capacity. I wouldn't want to put a specific number out there. We've looked at relatively modest scenarios, but there are also explosive ones. I think planning-wise it's good to have in mind as a constant right now that the range around those estimates can be quite wide.

•(1610)

Mr. Niall O'Dea: It is a question that utilities are seized with. In the context of the Atlantic regional electricity dialogue, it's one of the sensitivities that we're modelling in. We're modelling in not our projection of where the future will be in terms of electric vehicle penetration but, if you forecast different amounts of electric vehicle penetration, what you will need to support that.

The Chair: Mr. Serré.

[*Translation*]

Mr. Marc Serré: I want to thank the witnesses for their presentations.

You spoke earlier about interconnections between certain provinces.

Can you provide examples of successful strategic interconnections?

Mr. Niall O'Dea: Certainly. We'll be pleased to do so.

My first example is a case in which the federal government wasn't very involved. It was the power-sharing agreement between Quebec and Ontario. The agreement involved the construction of infrastructure for the two provinces. A few years ago, a power exchange agreement was reached. The agreement concerned 500 megawatts in both winter and summer, to address the peak periods in each province. This summer, the provinces announced that they would increase this exchange. It's the example of a political agreement that involves infrastructure and that establishes this type of cooperation.

[*English*]

Mr. Marc Serré: Can you elaborate also a little the opportunities with the U.S.? Obviously we're a net exporter of electricity to the U.S., and exports have been increasing in the last few years. What

other opportunities do we have as provinces to expand that selling to the United States? Is NAFTA playing a role in it? Without talking about the current negotiations, but historically, has NAFTA played a role in supporting that north-south trade?

Mr. Niall O'Dea: I'd be happy to speak to that.

NAFTA in its current form has produced no impediment and if anything has been a facilitator of trade in electricity. As a commodity, it is tariff-free and has remained so, which has certainly eased our ability to continue that trading relationship with the U.S.

In terms of the opportunity, there are currently six different transmission lines proposed across the country to expand our interconnection with the U.S. to facilitate exports. There have also been some key decisions in the U.S., including in the U.S. northeast, to count Canadian hydroelectricity as contributing towards their renewable portfolio standards. This has been key, because it allows them to count what is clean—Canadian clean energy—as clean when contributing to meeting their own emission reduction goals. We see utilities such as Hydro-Québec, Emera, and others participating in bid processes in New England and elsewhere, seeking to expand those opportunities.

Obviously those will be hyper-competitive bid processes, but I think Canada has great strength, particularly because what we can offer is the firm capacity of such things as hydro to combine with the variability of other resources that states may wish to develop locally. Firming that product allows them to build a higher proportion of variable renewable energy than they would be able to otherwise. This is something we see in Manitoba in its interaction with the Midwest as well.

[*Translation*]

Mr. Marc Serré: Energy costs greatly influence the competitiveness of our businesses. The costs are therefore very significant for the Canadian economy.

How do electricity costs in Canada compare with the costs in other G7 markets?

Mr. Niall O'Dea: Good question. In Canada, electricity costs are relatively low because our electricity resources are fairly well developed. It's mostly clean energy. Regarding the cost, we're talking about approximately 7¢ per kilowatt hour in Montreal, 16¢ per kilowatt hour in Prince Edward Island, but 30¢ per kilowatt hour in New York. The cost in Germany or elsewhere in Europe is even higher. This substantially contributes to our competitiveness. That's why in the future we're aiming to establish the most effective system possible. The system will be low cost, but will provide clean energy.

•(1615)

Mr. Marc Serré: Excellent.

In Budget 2016, funds were allocated to clean energy. Can you tell us the results of this investment?

Mr. Niall O'Dea: You're talking about the \$2.5 million?

The money is being used to support the dialogue between the western and Atlantic provinces. We've already hired the consultants who will manage these studies. The companies are GE and Hatch. These people are currently finalizing the results. We've spoken to provincial representatives about the value of carrying out these studies and about the data, in particular the confidential data provided to conduct this analysis. We plan to release these results in early 2018 in two separate reports.

[English]

Mr. Marc Serré: I'm not sure that there is time to answer, but I'll ask if you could submit a report to the committee to give us a bit of a landscape about deregulation. Each province has its own regulatory system, and then the BES oversees nationally.

If you could give us a framework of the interconnection of the provinces and how that relates to the BES nationally, that would be helpful.

Mr. Niall O'Dea: We'd be happy to do so.

The Chair: Thank you.

Mr. Shipley.

Mr. Bev Shipley: Thank you for coming.

On the first page, the pan-Canadian framework, I find it interesting. I don't know anywhere where a definition is low-emitting sources, a definition of clean power...and then the goal is to have non-emitting sources. To me, that sounds like a good political realm, where we don't have to actually close in on anything in particular. It gives us a bit of room.

Actually, I don't know how you get non-emitting. Wind energy cannot be non-emitting. Anything that turns emits something.

I think we're using words that are used in a place to help convince our public that, my gosh, we're doing a really great thing. When I say that, I don't know what the definition is, but I think you should consider cleaning that up and being specific about what we mean in terms of production.

It was brought up that in terms of regional electricity, Canada-United States trade, we're a net exporter. I'm from Ontario. I would like to understand, if you would help me a little, what the cost-revenue balance is from Ontario to our exports to the United States. If you don't have that today, I would like to get it, because you know and I know that under the policies we actually give it away at times. Help me understand a little, then, in terms of the policy of generation of electricity.

In my area, in part of Ontario, we have a lot of green energy under the Green Energy Act.

What kind of duplication is needed in production of electricity for windmills and solar where in the winter we have 10 hours of sunlight and we have intermittent wind? What sort of duplication do we have to have with natural gas, or coal, which we don't have? We haven't built...for 30 years in Ontario.

I wonder if you could give me the cost analysis of what the revenue generation is as compared to the cost of the electricity in Ontario that we ship to the States as a net exporter?

• (1620)

Mr. Niall O'Dea: Maybe to first address the point about non-emitting, when we speak to non-emitting, we're talking about greenhouse gas emissions specifically, and that's in the production of energy once the facility is built. That's what our definition is for something like a nuclear plant, a hydro plant, a wind turbine, a solar panel. All are non-emitting at the stage of producing electricity, recognizing that from a life-cycle perspective, there may be greenhouse gases emitted in their production and manufacture.

In terms of the issue of Ontario, I might recommend speaking to OPG specifically about that balance and how they calculate it, but I can give you some broad framework for how to look at that question.

Mr. Bev Shipley: I can do that, and I have.

I wanted to know in terms of a policy.... This is the director general of the energy policy branch, so that's what we're talking about in terms of policy. That affects all of Canada. We're talking about the green energy we can produce.

I have absolutely no resistance against green energy, but I'm thinking about the top of your statement, talking about a modern, clean, growth economy. There's a point missing there, and that is sustainability. My concern is that in my area I had a gas plant. I had a coal plant that became a gas plant, and is now idle. Right across the river I have two coal-fired plants. I have businesses in my area that are now going across the river because we're leaving a word out in terms of sustainability or successful economy.

In Ontario we're now adding a carbon tax, and you said natural gas will likely get phased out because it'll be more expensive because of carbon pricing. Is it a low emitter or a clean power emitter?

The Chair: You're going to have to answer that question in about 20 seconds.

Mr. Niall O'Dea: I'll give it a shot. Provinces make the choices on generation, transmission, and distribution, so many of those choices—including ones made by Ontario—are very much to be relayed and discussed with them. However, the federal government is working actively with the provinces to help facilitate investments in new infrastructure, so \$21.9 billion is being invested in that territory, which will ultimately reduce the burden on taxpayers.

I think that's critical. The better connected a system like Ontario is to its neighbours, to the east and west and south, the better able it is to leverage the best possible price for the electrons that are produced. That's the best way to achieve the economic rents you want from the energy you're producing.

The Chair: Thank you.

I forgot to mention we're in a five-minute round now, so Ms. Ng, over to you.

Ms. Mary Ng (Markham—Thornhill, Lib.): Thank you so much for coming here, and that was really informative.

I'll just pick up on where this is ending, and maybe you can help us understand how the strategic interconnections will help reduce those greenhouse gases in the electricity sector. While we were talking about Ontario, it would be interesting for you to help us understand how those strategic interconnections can actually help us achieve the reduction of greenhouse gases nationally.

Mr. Niall O'Dea: This is how we think it works. New electricity interconnections reduce emissions by enabling transfers of non-emitting electricity into a jurisdiction that would otherwise produce its electricity from fossil fuels, coal being the key example.

Electricity interconnections will allow for a greater utilization rate for existing hydro resources. Some hydro-rich provinces currently have a surplus of that hydroelectricity, so new transmission will allow for this surplus to be used by neighbouring jurisdictions that currently rely on fossil resources. Enhancing that two-way flow of electricity between regions may also help balance generation associated with variable renewable power, as I said before, by enhancing the geographic scope of the supply mix.

If we look at GHG emission reductions from transmission interconnection projects, it really depends on the size of the projects, the amount of power transmitted, whether the power is non-emitting, and what type of fossil fuel plant they're replacing. Just to give you a concrete example, for a 500-megawatt line that's used to move non-emitting electricity from B.C. to Alberta, for instance, you would expect to get between one and two megatonnes of GHG emission reductions, depending on the utilization rate of that line and whether non-emitting electricity in that instance was directly displacing coal, which has a higher greenhouse gas intensity, or natural gas, which has a significantly lower greenhouse gas intensity.

• (1625)

Ms. Mary Ng: Maybe you already covered this and I'm asking it again, but can you talk to us about where you see some of those strategic interconnections? Is there work already done on where they could be?

Mr. Niall O'Dea: Yes, certainly.

That's a big part of the study. I spoke to it a little when I spoke to the last slide in the annex of the deck. The key places where we see opportunities for interties are between B.C. and Alberta. There are two different locations where there are potentials for interties there. In some cases, these are simply strengthening existing capacity, so you may have an existing line but it doesn't have sufficient capacity to support the ambition of export that you might seek to achieve. The other place is between Manitoba and Saskatchewan. There are some opportunities, given that Manitoba is hydro-rich and Saskatchewan is currently, to some degree, coal-dependent and having ambitions to transform towards renewables.

If we look at the Atlantic provinces, they are interesting because they are all, broadly speaking, quite close together. They have a number of existing interconnections, but there are areas where reinforced connections or potential relatively small new connections can actually build out a grid wherein you can do system-wide planning and balancing of electricity resources across the region. There are specific examples there as well. Those specific lines are the subject matter of the studies that we are currently undertaking. When those reports come out in early 2018, you'll be able to look at

the greenhouse gas cost per tonne of each of those different options. That, we hope, will support the next level, which is the policy dialogue and the political discussion that needs to happen around advancing any one of those specific projects.

Ms. Mary Ng: In your view, what can the government do to advance the interconnections?

Mr. Niall O'Dea: What we've done to date is support the convening of these dialogues and the analytical work to set the evidentiary groundwork for making these decisions. I think the federal government recognizes that the decisions remain in the hands of the provinces and territories. The Canadian energy strategy under the Council of the Federation is very clear to articulate that, and we are fully respectful of that. We can provide the space for that continued discussion, as well as potentially provide the opportunity to leverage some of the federal resources available to provinces to address their priorities, including through infrastructure funding, to help start tackling some of these bigger projects that have a public interest benefit.

The Chair: We're going to have to stop there.

Gentlemen, thank you very much for joining us today to get us started on this study. Your contribution was very valuable.

We are going to suspend for a couple of minutes until we get ready for the next set of witnesses.

• (1625)

_____ (Pause) _____

• (1630)

The Chair: We're going to get started again. We have two witnesses for the second hour. From Manitoba Hydro we have David Cormie, director of wholesale power and operations, by video conference.

From Nova Scotia Power Inc., we have Mark Sidebottom, chief operating officer, utility. Thank you both for joining us today.

Mr. Sidebottom, since you are here in person why don't we start with you?

• (1635)

Mr. Mark Sidebottom (Chief Operating Officer, Utility, Nova Scotia Power Inc.): I would like to sincerely thank you, Mr. Chair and the members of the committee, for inviting me here today.

Nova Scotia Power is a subsidiary of Emera, which is the 16th largest utility in North America and both are headquartered in Halifax. Nova Scotia Power serves approximately half a million customers and owns and maintains more than 25,000 kilometres of transmission and distribution lines in Nova Scotia. Our goal is to provide clean, affordable, and "always on" energy to our customers, but we face challenges.

Nova Scotia has no access to large-scale hydro assets within the province. Our natural gas supply is limited and local offshore gas supplies continue to dwindle. Unlike other provinces such as Ontario and Alberta, using natural gas as a bridge to transition to low carbon is not an affordable option for us.

Over the past decade Nova Scotians have invested more than \$5 billion in new wind and renewable electricity generation and contracts in Nova Scotia. Nova Scotia Power has tripled our use of renewable energy generation from 9% in 2007 to 28% in 2016. We have reduced greenhouse gas emissions by 34% from our 2005 levels, already exceeding Canada's national target. We expect to nearly double those reductions by 2030 to a targeted reduction of 58% in the electricity sector.

We have also reduced by one-third the amount of coal that we've used in electricity generation, which is equivalent to reducing three coal units or closing the emissions from those coal units. However, we haven't been able to put a lock in the door of those units because we require the capacity from those units to meet reliability. Transforming to cleaner electricity isn't as simple as replacing energy from one type, such as coal, or energy with another type like wind or solar because our renewable energy is intermittent. We need firm sources of clean energy that can quickly ramp up to compensate when the wind isn't blowing or the sun isn't shining. Our customers don't consume energy intermittently. We must match their lifestyle by providing a total energy package every minute of every day.

Strong electricity interconnections with our neighbours are essential to our energy future. Transmission that provides Nova Scotia with access to clean energy gives us the opportunity, not only to address renewable energy deficits but, potentially to share with our neighbours the new clean energy infrastructure that has been built in Nova Scotia.

Our vision for electrification of our economy and stronger interconnections is directly aligned with our national and regional climate action plans. Opportunities include new cross-border transmission connections, adding even more renewables to the whole North American power grid and the promotion of clean and efficient electricity transportation.

For Atlantic Canada, new and stronger interconnections will leverage large-scale hydro assets from both Quebec and Newfoundland and Labrador, creating long-term energy sustainability for all of eastern Canada, contributing to stability in electricity prices for customers here in Canada and in the U.S. and enabling significant carbon reduction. Incremental jobs would also be created for the new infrastructure.

Emera and Nova Scotia Power recognize the value of strategic electricity interconnections and regional collaboration and we have invested in developing expertise in that area. We have connected Nova Scotia to New Brunswick, New Brunswick to Maine, and now Newfoundland and Labrador to the rest of North America for the first time in history.

Emera Energy is an active trading and marketing presence in eastern Canada and New England, and Nova Scotia Power is actively engaged with New Brunswick Power to dispatch electricity generation regionally and find efficiencies together.

Recently, Emera has proposed a 500- to 600-kilometre submarine transmission link to carry clean energy from Atlantic Canada to Massachusetts, known as the Atlantic link, in collaboration with New Brunswick Power and independent power producers.

● (1640)

Building infrastructure takes time, and the cost is significant. Infrastructure lasts many decades, and it should be maintained for the long term and used for its full life to extract the best value for customers from the investment.

What helps developers is a clear view about the ultimate objective and some certainty that there is a commitment to stay on that path. Whether it's through legislative, regulatory, or funding mechanisms, all of these can contribute to the feasibility of large electricity interconnection projects.

Planning on a regional basis, whether for transmission infrastructure or even emission reduction, presents an opportunity to reduce or eliminate in-region transmission tariffs. The tariffs create trade barriers for clean energy to move to market.

We see great opportunity in Atlantic Canada, as well as the neighbouring provinces and states. We see alignment and opportunity between our vision, efforts, and government priorities.

We are aligned on the priority to reduce carbon emissions from the electricity sector. We see alignment in terms of our country's relationship with the United States on the need for regional solutions and export opportunities that reduce carbon emissions, both in clean energy generation and in the transmission infrastructure to move that clean energy where it is needed. Looking forward, we see the possibility of moving Atlantic Canada towards a regional self-sufficiency with zero-carbon energy.

Our strategy is straightforward. We want to see cleaner electricity generation used for more purposes: more renewable generation, better regional transmission interconnections, and electrification of home heating and transportation. This will lead to permanent economy-wide emission reductions and regional collaboration and sharing of resources, such as clean generation and transmission infrastructure, and it will create new clean energy jobs.

Thank you.

The Chair: Thank you very much.

Over to you, Mr. Cormie.

Mr. David Cormie (Director, Wholesale Power and Operations, Manitoba Hydro): Good afternoon, Mr. Chair, and committee members.

It's a pleasure to appear before you today. I am video conferencing from my office in Winnipeg this afternoon. I appreciate the opportunity to provide input for your study on the value of electricity interties.

My qualifications in this area are that I am a practising, registered, professional engineer in Manitoba, and I am employed at Manitoba Hydro in the position of director of wholesale power and operations. I've held that position for the last 17 years. I've been involved in the operation of the Manitoba hydro system for the last 38 years.

My main responsibilities at Manitoba Hydro include directing the activities of Manitoba Hydro in the wholesale electricity markets, including marketing, sales, and training activities outside of Manitoba, both in Canada and in the United States. I'm involved in Manitoba Hydro's wind procurement program in contracts in Manitoba, and I am involved in the day-to-day management of our electricity supply, including the production and planning that involves the regulation of the Manitoba hydro system of rivers and reservoirs for hydro power purposes.

I have participated as an expert witness in many rate, environmental, and regulatory hearings in Manitoba, where I have provided evidence on matters under my responsibility.

My involvement in Manitoba Hydro's transmission and development plans includes the responsibility for the commercial arrangements that underpin our new 500,000-volt interconnection to the United States, and the proposed new 230-kilovolt interconnection between Manitoba and Saskatchewan.

In addition, I am involved in discussions with SaskPower on exports of surplus hydroelectricity, and I provide oversight to Manitoba Hydro's contribution to the NRCan regional electricity cooperation and strategic infrastructure initiative.

By nature, large Canadian hydro utilities like Manitoba Hydro have the potential to produce surplus electricity beyond that required by their customers, and routinely do so. The amount of surplus varies depending on the water supply and the amount of available reservoir storage. In high rainfall years, the hydro surplus can be very large. In drought years, there may be no surplus, and other generation sources must be used to meet the power demand.

In Manitoba, over the past few years, our surplus supply has been about 30% of our production, or about 10 billion to 11 billion kilowatt hours. Manitoba Hydro has been able to create value from this surplus by selling the electricity in the wholesale electricity markets in Canada and the United States. Revenue from these out-of-province sales reduces the cost of supplying Manitobans with electricity and is the major factor in Manitoba Hydro having some of the lowest electricity rates in North America.

However, none of these economic benefits or other benefits such as increased grid reliability and energy security would be possible without the interties that were built by Manitoba Hydro and its neighbours over the past 50 years. These interties connect us to those utilities and to the wholesale electricity markets of North America.

With that introduction, I want to provide a few comments today that address the following questions: regional electricity independence, low-carbon energy distribution, opportunities for alignment with the Canadian energy strategy, Canada-U.S. energy trade and relations, and employment and economic impacts.

On the first topic of regional electricity independence, to date, generation and transmission planning, and development across

Canada has been largely focused within provincial boundaries. This is a consequence of geographic and political barriers. The exception to this is provinces with large hydro utilities such as Manitoba Hydro, BC Hydro, Hydro-Québec, and—in the past—Ontario Hydro. These utilities, which usually have large hydro surpluses to market, have optimized the development of their systems in conjunction with investments in large interconnections to the United States. Because of cost and small market size, it has not been economically viable to build, on a similar scale, east-west transmission in western Canada.

Transmission projects to interconnect Calgary with Winnipeg, or Winnipeg with Sudbury have been studied but haven't proceeded. To date, other lower cost alternatives have been found. That's not to say that no transmission has been built, but the existing interconnections between the western prairie provinces are, at most, modest when compared to the existing north-south capability we have with the United States. Utility benefits from large east-west interties just haven't been sufficient, to date, to justify the huge cost of building long-distance transmission lines.

Generation portfolios of utilities across Canada usually have had a low-cost, dominant fuel that's been exploited. The exception is Ontario, which has a diversified portfolio of hydro, nuclear, wind, natural gas, and—previously—coal. In Manitoba, B.C., and Quebec, the dominant supply source remains hydroelectricity. In Alberta, Saskatchewan, and the Maritimes, historically it's been low-cost coal.

• (1645)

A barrier to coordinated cross-jurisdictional resource development is time. Cross-jurisdictional co-operation involving major infrastructure investments like transmission interconnections require long-term planning and commitment on time frames measured in decades. These commitment times exceed the lifetimes of most provincial governments and potentially their policy priorities. As such, generation portfolios, with the exception of Ontario, lack diversity, and this makes them vulnerable to economic and political change, commodity price fluctuations, fuel availability, and technological and climate change risks.

For those jurisdictions that have relied on carbon-based fuels, transitioning to a low-carbon economy and renewable-energy technologies has additional challenges. The most widely available new, renewable-generation resource, such as wind generation, is intermittent and variable, whereas customers require a continuous, reliable supply of electricity. As a result, widespread use of wind and solar technologies is only feasible in conjunction with dispatchable resources such as hydro turbines, natural gas turbines, or battery technology that can adjust output quickly so that the supply and demand always remain in balance.

The questions we have in western Canada are, firstly, are there opportunities for jurisdictions like Saskatchewan and Alberta, which have to transform their generation fleets to work with their hydro-rich neighbours? Secondly, what are the benefits of improved and expanded interconnections, specifically a stronger interconnection between Manitoba and Saskatchewan, or a stronger interconnection between B.C. and Alberta? What is the value of a stronger, complete connection across the west? Do these interties help achieve the Canadian goal of the low-carbon economy at a lower cost?

To investigate these questions, NRCan is conducting the regional electricity cooperation and strategic infrastructure initiative, working with the western utilities and market operators.

With regard to the low-carbon electricity distribution, in western Canada low-carbon, renewable-resource options are not equally distributed. Alberta does have a good wind resource, but so do other western provinces. Saskatchewan has a good solar resource, but the other western prairie provinces share that same resource. All the western provinces have undeveloped hydro power potential. Thus, all western provinces have the potential of developing local, low-carbon electricity sources. However, the cost, variability, flexibility, and energy storage potential of the potential resources can vary dramatically. Developing new, low-carbon electricity supplies at least cost will require more intertie capacity so that the specific benefits of each potential energy source can be optimally utilized.

As for opportunities for alignment with the Canadian energy strategy, the strategy is a macro view of energy production, transmission, and use in Canada and in an international context. In western Canada, significantly increasing intertie capacity aligns with several of the strategy priority areas such as improving electrical interconnections, increasing connectedness, and addressing transmission constraints. Large new interconnections would facilitate the development of new, renewable-generation technologies, which would in turn help in the transition to a new low-carbon economy, another focus of the strategy.

With regard to Canada-U.S. energy trade and relationships, as I mentioned at the beginning, Manitoba Hydro has a long history of exporting its surplus electricity to the U.S. These exports occur over a large interconnection that has been developed incrementally over the last half century as Manitoba has developed its hydro potential. To put the size and significance of that interconnection in perspective, we have the capability to export approximately 50% of our hydro production into the United States. In contrast, our capability to export either east or west is only 5% of our production capability.

Given the importance of the U.S. market to Manitoba Hydro, both from an export and an import perspective, Manitoba Hydro is a coordinating member of the huge, mid-continent independent system operator, which we refer to as MISO for short. MISO is a regional transmission organization and a market operator that guides the secure and economic operation of the large portion of the North American electric grid. Its span reaches all the way from Hudson Bay in the north, to the Gulf of Mexico, across 15 states, and includes Manitoba. Access to the MISO electricity market in the United States is important to Manitoba Hydro. It is a deep, high-value, sophisticated, and open market. Manitoba Hydro, in co-

operation with our neighbouring utility, Minnesota Power, is expanding our intertie capacity with MISO.

• (1650)

The existing Manitoba-U.S. interconnection capability will increase 50%, from 2,000 megawatts to about 3,000 megawatts in the export direction and 700 megawatts to 1,400 megawatts or a 100% increase in the import direction. This project is being done in conjunction with the development of the new hydro resources we're building in northern Manitoba.

This intertie expansion is still subject to regulatory approval in Canada, but the plan is to bring the second 500,000-volt intertie into service in 2020. It will be one of the most significant transmission developments across the Canada-U.S. border between Quebec and British Columbia.

Manitoba Hydro is just one of the Canadian utilities that are significant participants in the U.S. electricity supply. In 2014 Canadian electricity supplied 12% of retail load in Minnesota and North Dakota and 12% to 16% of electricity sales in New York and New England. In total, 30 states transact with Canada for electricity, with Michigan, California, Oregon, Washington, Montana, and Vermont being the major purchasers.

Initially, electricity trade with the U.S. developed to be largely north-south and seasonal, but in recent years Manitoba Hydro has been expanding its service offerings in the United States electricity markets. Now when the U.S. Midwest has a sudden surge or shortage of electricity due to wind power changes, electricity from Manitoba can be injected into or withdrawn from reservoir storage in Manitoba within five minutes to counteract changes in wind generation and help bring the grid back into balance. This is all done automatically, consistent with Manitoba Hydro's price and energy offers in the MISO market.

A landmark 2013 MISO study looked at the value of our proposed 500,000-volt intertie to the United States and at the way market-responsive new hydro generation in Manitoba could bring value to the MISO region. In addition to helping smooth out fluctuations in wind power in the northern midwestern states, this study showed that high-cost generators in MISO would run less often and use less fuel, resulting in emission reductions and production cost savings in the MISO footprint estimated to approach half a billion dollars per year in the 2027 study year.

The U.S. approach is to strongly encourage regional transmission planning, consistent with public policy goals. The approach exerts pressure to resolve cost allocation issues and remove barriers to the development of beneficial regional transmission.

This approach is not applicable in Canada; however, targeted federal government support to facilitate the development of expanded interties would be an appropriate made-in-Canada approach and would be consistent with optimum cross-jurisdictional transmission planning and public policy goals.

● (1655)

The Chair: Mr. Cormie, I'm going to interrupt you for a second. I'm going to have to ask you to wrap up in about 30 seconds, if that's possible.

Mr. David Cormie: Okay.

MISO will continue to be a premium market for Manitoba Hydro; however, more intertie capacity between western provinces, particularly between Manitoba and Saskatchewan, will permit significant wind-hydro synergies, and the benefits to accrue will also accrue in Canada, becoming as significant to Saskatchewan as they are to MISO.

As it now stands, with a very limited connection capability between Manitoba and Saskatchewan, most of these synergies and emission reduction benefits will continue to flow across the Manitoba-Minnesota border.

Manitoba Hydro is of the view that significantly more intertie capacity between Manitoba and Saskatchewan is critical to the achievement of integrated operations on the scale that exists between Manitoba Hydro and MISO and to maximum emission reductions in Saskatchewan. More intertie capacity between the two provinces would also permit hydro to share a portion of the other market reliability benefits that exist from being an active participant in MISO.

Thank you. That completes my presentation.

The Chair: Thank you very much.

Mr. Harvey, you're first.

Mr. T.J. Harvey (Tobique—Mactaquac, Lib.): First, thank you for being here, Mark. Thank you both for being here.

I'm from New Brunswick. I recognize the unique position you're in in Nova Scotia. We have spent a lot of time in New Brunswick over the past few years talking about smart grid technology and how it is going to change the playing field within our province, signalling a shift from being more an energy producer to being an energy manager over time.

The more evolved the grid becomes, the less dependent we are on the natural sources of energy that we traditionally use. If you start using people's homes as batteries and start using their vehicles as batteries, that's an evolution that compounds itself over time.

With the close proximity not only geographically but politically among the Atlantic provinces, how do you feel the four provinces can work proactively together, through strengthening these interties, to create a viable proposition that works for all four provinces as we look to create synergies that will allow us to export to the U.S.?

Mr. Mark Sidebottom: Maybe I'll answer that in two parts. First off, I believe smart grid solutions are absolutely part of our future. It's like any number of things. We're going to need a suite of solutions to actually get us to where we want to be and smart grid is absolutely part of that.

There are a couple of things going on right now. There is a lot of work between NB Power and Nova Scotia Power. We're keeping closely in touch on the smart grid front. We're actually working closely together on the type of infrastructure that can advance for the provinces, and then, of course, actually having the interties to transport any of the controlled energy between the two is going to be important.

The other piece that's quite valuable—and the witnesses who were speaking just before me spoke to it—is the regional study work. That kind of work is really important. So doing long-term, multi-province studies really starts to give you some insight on the most valuable ways to strengthen the connections amongst the provinces. You can start to highlight which ones are most valuable. You can start to look at those things and ask that when you look at the future for which of those connections will there be no regrets, which ones are going to just facilitate the future in just about every possible scenario. I think that's the other highlighted piece out of the study.

Those are very instructive to policy development and how we go forward from there.

Mr. T.J. Harvey: I'll ask this question to both of you. What do you think is the single biggest challenge that we face, in each of your respective opinions, between jurisdictions in trying to overcome some of these jurisdictional boundaries in order to increase these interconnections?

● (1700)

Mr. Mark Sidebottom: I think it was touched on a bit before, which is we have multiple regulatory bodies. We have provincial regulatory bodies and we have federal ones.

When you're talking interties there's a conversation around the proportion of value to each of the jurisdictions and how that gets funded and the formula around that. In my experience I've seen that to be the most complex part of the equation.

We successfully advanced the maritime link project, which is connecting Newfoundland and Labrador to Nova Scotia and the rest of the grid. That's a complex multi-jurisdictional effort. It evolved over what is now close to nine years. That complexity was one of the biggest challenges as they moved forward from a pace.

Mr. T.J. Harvey: David, did you want to speak to that?

Mr. David Cormie: Yes. The single biggest challenge between Manitoba and Saskatchewan is funding. Manitoba's electric sector is already 100% renewable. We already have a very large and adequate interconnected capability into the United States. For us to invest a half a billion dollars or a billion dollars in more transmission lines to connect to Saskatchewan doesn't bring the province any more value than we already have.

To the extent that the federal government is able to fund the Manitoba portion of that transmission line, it would make it a much more viable project for Saskatchewan. But it's hard to expect the ratepayers in Manitoba to invest in transmission it doesn't need for the benefit of Canadian public policy, for example.

This was a national objective, to get Canadian emissions down. Right now Manitoba provides emission-free electricity that is benefiting the U.S. It's helping them achieve their targets. It's not helping achieve the Canadian targets, and by investing in connections between Manitoba and Saskatchewan, that non-emitting electricity can be diverted into Saskatchewan and help them achieve getting their electric sector within target. It is a funding issue.

Mr. T.J. Harvey: In a previous study we spent a lot of time talking about SMRs and the potential liability of SMRs in the future. When we talk about that we talk about smaller-scale energy production in geographic locations that are strategic to increasing the viability of networks and that fits right in with interties as well.

What are your thoughts on not only smaller-scale generation that's strategically located, but also perhaps partnership opportunities with private industries with things such as steam recapturing to produce clean power from existing sources that are already there?

Mr. Mark Sidebottom: David, do you want to take a...?

The Chair: You have about a minute between the two of you.

Mr. Mark Sidebottom: Okay. I think I can go back to my first theme. I think we need to take a look at many tools in the tool box to get us there. It's important that whatever goes into the grid has a level of coordination. When I spoke of electricity being every moment of every day, the technical challenge is to match what a customer wants to do when the customer wants to do it with when the electricity is produced. So we can look at that as a solution, but it needs to be in a coordinated fashion.

Mr. T.J. Harvey: Finally—and I have about 30 seconds—since you're from Nova Scotia, how big a role do you feel that tidal will play in the value proposition that will be offered by Nova Scotia?

Mr. Mark Sidebottom: I think it has some real possibilities. Again, it's about the investment required to understand how the cost will evolve through time. Today, it's expensive, but as with any number of technologies in the electricity sector, the prices are coming down. When the technology reaches that price point, as we all know, there's a remarkable resource, and that resource would still need to be re-timed. The tide runs twice a day, and customers use energy every day. It's a piece of the solution; it's not the complete solution, but we're certainly very interested in advancing it.

Mr. T.J. Harvey: Thank you very much.

• (1705)

The Chair: Mr. Falk.

Mr. Ted Falk: Thank you to our witnesses, Mr. Sidebottom and Mr. Cormie, for presenting at committee here today.

Mr. Cormie, being from Manitoba, I represent the riding of Provencher, which is in the southeast corner of Manitoba, and it's the corner of Manitoba that your entire Minnesota transmission line will run through once it's been built. Just looking back at the construction of Bipole III, which is almost complete, I recognize that under the mandate of the previous government you were required to go around

the west side of the lake when going around the east side would have made much more economic sense at the outset of the project. In the process of doing that, you actually built large poles and transgressed over some of the most pristine agricultural land in the province. I'm wondering what efforts are being made by Manitoba Hydro to not make that same mistake with the Minnesota transmission line.

Mr. David Cormie: I'm not that familiar with the environmental process that has been taken to route the line, but I do understand that the values that were put into the line routing study represented the values of the communities through which the line was routed, and the balance that was made reflected the local values in locating the line. I can just say that the study considered those local requirements.

I'm really not involved in the transmission line routing selection process, so it's hard for me to really be more specific than that.

Mr. Ted Falk: Okay, and I appreciate that.

I also want to recognize that Manitoba Hydro, operating within the constraints of the mandate from the previous government, did its best to work with landowners within those constraints.

Further to that, when you're building interties and interconnections and transmission lines, outside of funding what are your major challenges?

Mr. David Cormie: There are potentially four regulatory processes that we have to go through because it's an international transmission line. You have the state process in Minnesota. You also have the federal process in the United States. We have to go through the provincial environmental licensing process in Manitoba, and we also need to get a National Energy Board licence to build the line and to export the power. So you can imagine that there are four regulatory processes that have to be undertaken. Doing that is very expensive; it takes a long time, and a lot of the processes aren't consistent.

For example, in the United States we're required to have three rights-of-way, three potential paths for the transmission line. In Manitoba, we're allowed to apply for only one. The three lines don't necessarily join at one, so there are inconsistencies in the routing process on the international line. That's a complexity that takes a long time to work through.

I've been working on the Manitoba-Minnesota project since 2007; that's 10 years. The world changes in 10 years, and we need to have committed proponents who are willing to invest their time and money and bet their future on this project, so the commercial relationships have to be very strong and they need to be committed, not just for a few years but through all the changes that we can expect in these projects.

Mr. Ted Falk: From a cost-sharing perspective, when you build a line such as the Minnesota transmission line, which is primarily being built to service the Americans, do we have a cost-sharing arrangement with them? Are we responsible to foot the bill to the U. S. border entirely, or do they help us with that as well?

Mr. David Cormie: Remember, not only do these transmission lines allow us to export; they also allow us to import. The main value for this line is our ability to import and defer the need to build new generation resources some time in the future. We felt there was value in the line even if Manitoba Hydro had to bear the whole cost in both Canada and the United States. Through our power purchase agreement with Minnesota Power, their ratepayers were able to pay for 25% of the cost of the line, so it became a value proposition to have them as a partner.

We're much better off having them contribute to a line. All the electricity that will flow on that line is Manitoba Hydro electricity. Whether it's purchased power or electricity that we're exporting, the value is almost all to us. What we have with a partner in the United States is someone who's willing to fund a portion of a line that we would otherwise have to pay the full cost of.

• (1710)

Mr. Ted Falk: Okay.

Judging by a chart provided to us earlier from the electricity resources branch by the director general, Niall O'Dea, it looks as though—and I think you mentioned this as well—we have capacity currently of about 2,000 megawatts going south and about 700 coming north. That's the capacity.

Are those capacities consistently used?

Mr. David Cormie: Yes.

Most of our surplus water supply is in the summertime, when Manitoba is experiencing light loads, so the transmission line is mainly used in the summertime when we have large surpluses available and limited reservoir storage capability to store the energy. Then in the wintertime, the import capability is there to increase our electricity supply to serve our loads in the wintertime. Both import and export capability are thus used consistently.

Mr. Ted Falk: You touched on this briefly when you spoke about the possibility of providing power to Saskatchewan, but from your perspective, what do you see the federal government's role as being in interconnections?

Mr. David Cormie: I think right now Saskatchewan is looking at its options to achieve its emission reduction targets. It can look at the options that exist in the province or it can look to take advantage of the large surplus hydroelectricity supplies that are available in Manitoba.

Without more transmission capacity to Manitoba, our surpluses have no value to them. As I mentioned to a committee member earlier, there's no value to Manitoba Hydro to invest in more transmission to Saskatchewan. We have all the access we need to market our surplus power.

To make it a viable option for them, Saskatchewan will need help in financing that transmission interconnection.

Mr. Ted Falk: Thank you.

Mr. David Cormie: It's not something that the Manitoba electricity ratepayers need to invest in. This would be an investment for the benefit of ratepayers in Saskatchewan, then, to help Canada achieve its policy goals.

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

Mr. Cannings, we go over to you.

Mr. Richard Cannings: Thank you.

Mr. Cormie, I'll just let you continue to provide more detail on the possibility of Manitoba supplying Saskatchewan.

You mentioned that there's no financial reason for Manitoba Hydro to do it. For Saskatchewan, or perhaps the federal government and Saskatchewan, what are the costs involved in providing that intertie between Manitoba and Saskatchewan if, say, we were looking at quite a big project that would satisfy a lot of Saskatchewan's needs?

Mr. David Cormie: Right now there are five transmission lines that connect the provinces. They're generally at a 230,000-volt capability. To add one more line of that size to increase our export capability by 100 megawatts would cost a couple of hundred million dollars. A 500-kilovolt line that might allow us to transfer another 900 megawatts from Manitoba to Saskatchewan is probably in the order of a billion dollars.

A small project is \$200 million, a big project is a billion dollars, and half of it is in Manitoba and half of it is in Saskatchewan. You need to have an investment of a half a billion dollars in Manitoba to help Saskatchewan gain access to the large volumes of surplus.

A 900-megawatt transmission line to Saskatchewan would only divert a small portion of the surplus energy that is now going into the United States. For us to divert all the surplus that's going into the United States and keep all those emission reduction benefits in Canada would require several large interconnections of a 500,000 volt so the capacity is there to move Manitoba's surplus into Saskatchewan and divert it from the United States.

You're talking potentially billions of dollars of infrastructure investment. As I mentioned in my testimony, Saskatchewan has lots of renewable options on its own. It has a very strong wind resource, it has solar, and it has its own hydro, so the way to achieve their goal at least cost.... It may be just too expensive to invest in that transmission on its own. It would tend to invest in its local options, and it would then remain essentially isolated from the rest of the North American grid.

If it's thinking of investing in several thousand megawatts of wind and managing that wind variability, it will do that on its own. It doesn't have access to hydro storage or to the market to manage its surplus, so not only do these large transmission lines give it access to our surplus, but they help us manage the variability as it develops its own local renewable resources.

In the 1960s and 1970s our interconnections with the United States transformed Manitoba from essentially being an island that was isolated from the North American grid into one where we are a key participant in the North American electricity marketplace. The same kind of transformation would occur with Saskatchewan. It would not then just be dependent on its local options. There could be market solutions to a lot of the problems that it's facing. The funding by the federal government would help it achieve that integration into the North American grid.

• (1715)

Mr. Richard Cannings: Thank you.

Mr. Sidebottom, to continue on that theme of interprovincial interties. Emera, your parent company, has been involved with interconnecting the island of Newfoundland with both Labrador and Nova Scotia. Can you provide more details on that—the timelines and the costs?

Mr. Mark Sidebottom: I can speak to the part Emera is involved with. We're part of the interconnection between ourselves and Newfoundland called the maritime link, that is a 500-megawatt underwater interconnection. The cost of that is \$1.55 billion Canadian and we expect to energize that line at the end of this year, so effectively on time, on budget for that interconnection.

Nalcor has said that the Muskrat Falls is going to be coming on line in late 2019 through to 2020. At that point, there will also be the flow of renewable energy coming back from that generation facility at that point in time.

The interesting thing is that just the connection alone is going to be valuable. When you connect Nova Scotia to Newfoundland, all of a sudden there's a much more secure grid. We look forward to working very closely with Newfoundland in balancing our energy portfolio. Nova Scotia has nearly 600 megawatts of wind in a small energy grid that's just over 2,000 megawatts at peak in the winter. Being very close to islanded now—there is an interconnection to New Brunswick—I would say that is quite a learning experience on the system. We have reached what we believe is the threshold for our current system on the amount of intermittent wind we can have in Nova Scotia.

I think there was a question earlier from yourself, which was how much can you have on the grid? It's very grid-dependent, so it all depends on the number of interconnections, and how much are the resources you have in your jurisdiction, and that very much determines how far you can go. So in Nova Scotia we believe it's 600 megawatts of wind. That wind in the run of a week will go below 10% of its output twice a week, so you have to be ready for that. Then it will go to full load quite often as well. You have to have a solution for every moment of every day around that.

The intertie with Newfoundland is going to allow us to work very closely together to use their hydro systems and our wind systems collaboratively to bring value to customers in Newfoundland and Labrador and in Nova Scotia. That's going to be the first phase of value and that's before the generating station comes online.

• (1720)

The Chair: Thank you.

Mr. Tan.

Mr. Geng Tan (Don Valley North, Lib.): Thank you, Chair.

Let's say there is a small, remote community or there's some business entity, for example, a mining operation, and they need access to the energy sources but there's no way to build a transmission line to the community, so they have to go to different options: mega, solar, wind, biomass or SMR. Sorry, I don't think SMR is a reality right now.

I know this is a decision made by the government and the community, but has the community or government ever approached you as the power generation company for advice? If they did, what kind of a recommendation did you provide for them? How do you make this kind of a recommendation to them? Could I have a quick answer from both of you?

Mr. Mark Sidebottom: From Nova Scotia we're lucky enough to be able to connect virtually every community just because of our geography, so we don't run into that quite as much. Maybe the question is more appropriate for David.

Mr. Geng Tan: You mentioned the Manitoba effect.

Mr. David Cormie: Right. We do have four isolated northern communities that are still on diesel fuel. Do you build very long transmission lines to connect those communities? Those investments are in the order of hundreds of millions of dollars. Or do you invest in windmills and in solar farms to help reduce the amount of diesel fuel that's consumed? That ends up being an economic decision. Can you achieve your emission reduction goals and do it reliably with renewable technologies or is the best solution, but the least cost in the long-run solution, to build transmission lines and get all those isolated communities on the central grid and have them benefit from that central supply?

Mr. Geng Tan: Was that decision made by the government, or did they ever approach you for these kinds of comments before making decisions?

Mr. David Cormie: I can't really speak to what conversations have happened between government and Manitoba Hydro on that issue. It's outside of my expertise.

Mr. Geng Tan: Okay. Thanks.

We've already had a lot of talk on interties and how to use them as a strategy to seal the gaps for the energy needed between provinces.

I still want to look into another scenario. Let's talk about Ontario. Ontario has no problem with energy needs—they have enough energy supply—but they rely on nuclear to provide more than 50% of their energy. Some public opinion suggests that we should stop nuclear and buy cheap power—hydro power from Quebec, for example. It's a different scenario.

I know that the generation and transmission of electricity is under provincial jurisdiction. There might be a few options for Ontario. Either they can remain self-sufficient, even though they have to pay presumably a slightly higher electricity price, or they can rely on electricity supplied by other provinces—for example, Quebec—but then they take the risk of losing their capacity. Suddenly they become dependent on other provinces. Or maybe Canada should provide a national strategy that addresses this kind of contingency, or should even provide some kind of guarantee to Ontario, so that they're willing to shut down their nuclear or other power plants to buy electricity from other provinces.

What are your comments on this kind of scenario?

• (1725)

Mr. Mark Sidebottom: My experience would be that having a portfolio of energy is a more robust solution. Having a number of sources of energy is an appropriate strategy. I think it's very much a decision of a particular jurisdiction how much they want to put in the hands of another jurisdiction.

From a reliability standpoint, the bulk power grid has mandated requirements for how big the lines are, where the generation is located, and how the capacity is counted. There are bulk system reliability requirements that always need to be adhered to. There are some guiding principles around these.

What I think your question goes to is more the commercial risk between various jurisdictions, and I don't think I can answer that one clearly. I can talk about the bulk power system. I know that you can build a bulk power system that takes generation from afar and brings it near. You can do it reliably; there are ways to do it.

The question, then, is your comfort with the counterparty.

Mr. Geng Tan: Mr. Cormie.

Mr. David Cormie: We were involved in discussions between Ontario and Manitoba 15 years ago on building large interconnections between northern Manitoba and Sudbury and Winnipeg and Sudbury. The ultimate goal was to deliver renewable energy from Manitoba into Ontario.

The reason those discussions didn't go anywhere is that Ontario had lots of its own undeveloped hydro much closer. To import renewable energy from Manitoba that was 1,000 miles farther away was just more expensive. Ultimately it came down to an issue of long-term economics.

We've never had any concern about supply reliability in energy trade within Canada; it's not an issue. We're fortunate enough that Manitoba is an exporter of electricity, and so we've never had any concern; we've never been dependent on the United States for imported power.

I can tell you that we've had thousands of emergencies in Manitoba over the last many years, and each time those emergencies have been met because of the reserve-sharing arrangements with U.

S. utilities, which have always been able to keep the lights on in Manitoba. Our customers don't even know that disaster has happened. The power instantly flows from export to import, and the benefits of interties are invisible to our customers. It's only the wisdom of those who preceded us, who ultimately made the decisions to interconnect with the United States, that we can thank for that.

Our thoughts of bringing those same kinds of benefits to Canadians because of interconnections have been proven by history to be a path to success. All those who have built transmission at interconnection regions have shown the benefits. Now it's time for us to provide those provinces, like Manitoba, with the same things.

The Chair: Thank you.

Mr. Falk, I can give you about a minute and a half.

Mr. Ted Falk: Mr. Cormie, I just want to ask you a bit more about the Keeyask generating station that you're building in northern Manitoba right now. It's projected to come online about four years from now, and it's a 700-kilowatt project I believe. I just want to commend you on working with four first nations up there. You're working with the Tataskeyak Cree Nation, the York Factory First Nation, the War Lake First Nation, and the Fox Lake Cree Nation, and you're doing that project in a partnership. You're creating a tremendous opportunity for these first nations communities to find employment for their folks. I think that's just tremendous and I want to commend you on that.

Can you talk about your experience with that partnership and any ongoing partnerships you may have with the first nations?

Mr. David Cormie: On the Keeyask partnership with the four indigenous communities in whose resource area we're building the Keeyask generating station, we couldn't have built the project without their involvement and their support. The project has provided them with economic development opportunities and job training, will provide lasting employment opportunities through the life of the project, and will also result in a revenue stream as they share in its long-term profitability.

It takes a long time from the time you begin consultations with the aboriginal and indigenous communities until the benefit stream flows, and in the meantime they have significant needs to just get through the day-to-day requirements of living. Patience has to be a virtue in these partnerships, and in the meantime we have to work with them to ensure they hang in there for the long run.

• (1730)

The Chair: Thank you, that's all the time we have. Gentlemen, thank you both very much for joining us today. Your contribution is very much appreciated.

We'll see everybody on Monday.

The meeting is adjourned.

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