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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 after the weekend.

Today we are dealing with our last witnesses and the end of our study on strategic electricity interties, a fact that Mr. Schmale was lamenting in a discussion on the bus on the way over here.

We have three sets of witnesses. In the first hour, we're joined by Mike Marsh and Tim Eckel, from SaskPower.

The format for today is that we're going to give you the floor for up to 10 minutes to make your presentation. Following that, you'll be asked questions by members from around the table.

I'm assuming you have some technology there that will allow you to get the interpretation, should you need it. You will have questions put to you in both official languages, I expect. Of course you're welcome to answer them in either official language, as well.

On that note, I will turn it over to the two of you. The floor is yours.

Mr. Mike Marsh (President and Chief Executive Officer, SaskPower): Good afternoon, Mr. Chair and committee members.

My name is Mike Marsh. I'm the president and CEO of SaskPower. I'm joined here in Regina today by Mr. Tim Eckel, vice-president of asset management, planning, and sustainability.

First of all, thank you for the opportunity to share SaskPower's views on interconnection infrastructure between provinces and building cross-jurisdictional co-operation for a cleaner, more reliable electrical system in Canada.

I have some opening remarks and will then be pleased to take your questions. To begin, I'll briefly introduce you to our company.

SaskPower is Saskatchewan's largest crown corporation and the primary supplier of electricity in Saskatchewan. We are a fully integrated power utility. We operate natural gas facilities, coal-fired stations, hydro stations, and wind power facilities. We also purchase electricity from independent power producers, as well as from Manitoba Hydro, to bring our total generating capacity to approximately 4,500 megawatts.

As we look to the future, we know that the way we do business today is not the way we will continue to do business. Our industry is changing, and we recognize that the electrical system in our province and our country must evolve to meet future challenges.

I've had the pleasure of serving as SaskPower's president and CEO since 2015. My history with SaskPower dates back 26 years, when I began working at the Boundary Dam power station in Estevan, Saskatchewan. I've seen many changes over the years, but I can truly say that this is a period of profound transformation. Our vision of a cleaner energy future will require fundamental shifts in the way we operate every aspect of our business, from generation to delivery.

For example, we hit a record system load of 3,747 megawatts in January. As well, we saw a number of summer records broken, including hitting 3,470 megawatts in August of this year. All indications are that demand will continue to grow in our province.

To meet this demand, SaskPower has invested approximately $1 billion a year since 2012 in our aging infrastructure. We are also meeting the challenge of reducing greenhouse gas emissions. SaskPower is a world leader in carbon capture and storage. Boundary Dam 3 produces the cleanest fossil fuel electricity in Canada—it's two to three times cleaner than natural gas—and our work here has the ability to dramatically reduce emissions both in Canada and around the world.

SaskPower is committed to managing our emissions, with a goal of having 50% renewable generating capacity by the year 2030. We'll meet this target by adding more wind power—our long-term goal is to increase wind power from about 5% today to as much as 30% by 2030—and installing about 60 megawatts of utility-scale solar by 2021 and potentially up to 300 megawatts of solar by the year 2030.

SaskPower will need reliable baseload electricity to support our wind and solar generation. It's for that reason that we support further research and study of interties between provinces, especially between Manitoba and Saskatchewan. Not only does Saskatchewan's economy need reliable electricity. It needs cost-effective electricity. Saskatchewan ratepayers expect and deserve fair pricing and will not tolerate subsidizing other provinces' electrical rates. I'm sure this is also true for the customers of Manitoba Hydro.

For this reason, we must ensure that appropriate supports are in place to study how to best optimize interconnections that benefit both our provinces. The intertie connections must be built on a relationship. It must be a true partnership between the two utilities and must ensure that one side does not lose its electrical independence. Saskatchewan's economy cannot afford to have instability or unreliability in its power supply.

For example, we have strongly encouraged that serious thought be given to moving electricity beyond our provincial borders. Currently, SaskPower can build its generation close to where it's needed, meaning higher efficiency of electricity movement with minimal line loss. As well, building transmission and distribution infrastructure costs billions of dollars, and that should not be unduly shouldered by SaskPower's customers.

Before we even begin building, we must also consider the tremendous administrative effort needed to secure approvals. Red tape can result in delays, and it can add years to the process and make planning extremely difficult. This uncertainty slows down our progress on delivering new generation that will reduce greenhouse gas emissions. We need support from all levels of government to move forward in a way that meets the public's expectation and the needs of the economy.

● (1535)

To close, we would like to reiterate our support for intertie development between provinces. The western regional electricity co-operation and strategic infrastructure study led by NRCan consists of electric utilities and system operators from British Columbia, Alberta, Saskatchewan, and Manitoba. Working together, the participants are collaboratively looking to identify promising electricity infrastructure projects in western Canada with the potential to achieve significant greenhouse gas reductions.

General Electric consulting has been contracted to perform a technical and economic study to assess potential projects that will increase the use of clean energy across western Canada and accelerate GHG emissions reductions. Saskatchewan feels this is an important initiative and that it is important to have the following related projects assessed: a new intertie between Saskatchewan and Manitoba; new internal transmission to aid in development of new renewable capacity; new hydroelectric capacity; coal conversion, to lower greenhouse gas emissions; bulk storage additions; and potentially a new intertie between Alberta and Saskatchewan as well.

Results are expected to start flowing in shortly, and we hope we will significantly strengthen capacity and cost-effectiveness between Saskatchewan and our western Canadian partners. SaskPower recognizes that having a well-developed east-west distribution system will make Canada's electrical system stronger, and we know that will benefit all Canadians. That said, we must work together to ensure that the decisions made are fair to all Canadians in a way that supports growth in both provinces in an environmentally sustainable way.

Mr. Chair, that concludes our presentation. We'd be pleased to take your questions now.

The Chair: Thank you.

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

Hon. Larry Bagnell (Yukon, Lib.): Thank you very much. In a way, that was music to my ears. I applaud your efforts to cut greenhouse gases.

I want to change the focus a bit for the sake of my personal agenda. You did a lot of east-west. I want to do some north-south to use your experience. We only have 37,000 people, so the situation is a bit different, but we have a lot of remote diesel communities. I want to get at your experience in connecting those to, as you said, make more efficient use of power to connect everyone across the nation.

We're a long way from having the grid at the moment. Roughly how much line loss is there if you were to add 1,000 kilometres to get to the north, either 1,000 kilometres or 1,000 miles? I know there's line loss. Is it enough to make it not worth the effort? That's what I'm trying to get at, a sort of rough idea.

● (1540)

Mr. Mike Marsh: I believe so, Larry. I'm going to let Tim answer that question. He probably has a little more technical knowledge on this than I have.

Tim.

Mr. Tim Eckel (Vice-President, Asset Management, Planning and Sustainability, SaskPower): If you look across the north part of Saskatchewan, we have an 1,100-kilometre transmission line that ties those northern communities and some small hydro sites to the mines and the people who live up there. We looked at bringing some power in from the Northwest Territories, and approximately 40% to 50% of that energy would be lost by the time it got to the south part of Saskatchewan, if you tried to feed it all the way.

Hon. Larry Bagnell: How far was that?

Mr. Tim Eckel: It's 1,100 kilometres.

Hon. Larry Bagnell: From the Northwest Territories...?

Mr. Tim Eckel: It would be from a couple of hundred kilometres into the Northwest Territories.

Hon. Larry Bagnell: Okay.

Mr. Tim Eckel: This line is 138,000 volts. If you went to a higher voltage, you would have less loss and you could transport more power, but you're probably looking at about a 40% loss of energy.

Hon. Larry Bagnell: That's for 1,100 kilometres.

Mr. Tim Eckel: Yes.

Hon. Larry Bagnell: We have a number of communities on diesel, but they're not as big as the ones you're serving. There are only several hundred people in each community.

We do distances by time, actually. I don't know how you do it, but in our area, some of them are two hours away, and then another two hours, and then another two hours, to join these small communities. Have you found it economically efficient to join your small communities with the cost of the line? Was the cost of those lines subsidized so that you could get those rural communities off diesel?

Mr. Mike Marsh: The initial transmission line was built in the late 1980s into northern Saskatchewan to serve the mining load as well as to tap off into distribution substations to feed local communities in that area. To date, we only have one community that's left on diesel. It's a community by the name of Kinoosao. It's on Reindeer Lake and is very remote from any transmission or distribution line. The cost to serve that line is very high, because in a sense it would require a submarine cable to go under the lake and over to serve a community of just a few hundred people.

Hon. Larry Bagnell: Our thoughts are that, perhaps with a subsidy, if we could join everyone in the north, which would be a bit expensive, but as you said, east-west too, it would be great for the nation. It's sort of like the railway, in a way. It would not only connect everyone so that they had power, but you also wouldn't have to overbuild power because if you had a shortage somewhere you could get it from somewhere else.

Are you basically supportive of the philosophy of joining the nation by transmission lines so that, as you said, you would only have to use diesel in very limited cases? That could probably be offset a bit by wind and solar.

Mr. Mike Marsh: We've been working for quite some time with Manitoba Hydro. Our relationship goes back many years. Certainly, we're looking at intertie capability along our border. I believe that today we have five interties with Manitoba Hydro. We're looking at potential expansion of some of those interties, depending on how we need to bring the power and where we need to bring the power into the province.

For remote communities, though, they are sufficiently far away from the grid that perhaps other options for renewable energy might be more viable for those. I know Manitoba Hydro also had a number of remote communities that are on diesel, but they are sufficiently far away from the grid. There is potential for wind and solar and some storage to be the renewable fuel of choice for those communities, and it may be able to be done less expensively than building a line to those communities. That's being explored today.

The major east-west intertie between Manitoba and Saskatchewan, for example, may allow us to bring in significantly more hydroelectricity than we do today. If the opportunity is available for SaskPower to take advantage of that capacity and energy that Manitoba Hydro is willing to contract with us on, then we would be very much into looking at what intertie would suffice. Whether that is for a small number of megawatts or a large number of megawatts, at this point in time, we're looking at all options.

The potential to move big amounts of electricity is certainly there. That would require a significant transmission investment. I think once you get up into the 500 or 1,000 megawatts of intertie capability, we're talking about $1 billion-plus investments to move energy from one province to another.

● (1545)

Hon. Larry Bagnell: Just to end, I'll say that thanks to indigenous affairs, we have two communities from north of the Arctic Circle doing studies on wind, and one on wind and solar, so it's possible.

Thank you, Mr. Chair.

The Chair: Thank you.

Mr. Falk.

Mr. Ted Falk (Provencher, CPC): Thank you, Mr. Chair, and thank you to our presenters from SaskPower.

I'm from Manitoba so obviously I have some interest in the comments relating to Manitoba Hydro and your relationship with them.

I want to start off by asking another question. A recent presenter here at committee suggested that provinces should be left on their own with the development of power, be free from federal policy when it comes to interties, and instead be driven by incentives. I'm wondering what your opinion on that would be.

Mr. Mike Marsh: Traditionally, energy policy has been the purview of the provinces, as everyone knows, and that's why we have strong north-south interconnections from those “heavily blessed with hydro” provinces: British Columbia, Manitoba, Ontario, and Quebec.

Where there's an opportunity to provide energy security in Canada, I think that's where the federal government can really play a part. They can provide the incentive to encourage some east-west movement of energy—whether it's from B.C. into Alberta, from Manitoba into Saskatchewan, or even from Manitoba east into the Ontario area—to build that bridge, to move cleaner energy east and west, and to make sure that communities in Canada can benefit from the abundant supply that we have today.

Mr. Ted Falk: Do you think that should be driven by a federal policy, or do you think rather that we should attach incentives to meeting carbon emissions, and things like that?

Mr. Mike Marsh: I think we would prefer to see incentives tied to carbon emissions.

As everyone knows, Alberta and Saskatchewan have the heavy lifting to do in moving off fossil fuels. Today we are 75% fossil fuels, and we need to move that down to 50% by 2030. Beyond 2030, we can only imagine a number that's going to get higher and higher in terms of renewable capacity, so finding a way to introduce hydro, in addition to wind and potentially solar, would be a very good mix for our province. We would certainly look at every available opportunity.

If the federal government can help with that movement of clean energy, we would be very happy to work with it on that.

Mr. Ted Falk: You indicated to Mr. Bagnell that currently you have four or five interties with Manitoba and that you're looking to upgrade those interties. Are you thinking of an additional intertie or of upgrading existing interties?

You also talked about transmission, and you threw out the number of a billion dollars. Can you be a little more specific about what you're thinking?

Mr. Mike Marsh: The existing intertie we're looking at right now is to facilitate a contract we currently have with Manitoba Hydro to move 100 megawatts. That contract will not start moving energy until about 2021-22, the early 2020s, so we're busy looking at an upgrade to one of the existing interties. That will not be a significant transmission infrastructure compared with the north-south transmission interties from Manitoba into the United States.

When you start to look at 500 megawatts or 1,000 megawatts being moved into a province, from Manitoba to Saskatchewan for example, you're looking at substantial costs for transmission lines and for switching stations, which would require, potentially, a high-voltage direct current, HVDC, to AC conversion. Those are extremely expensive facilities. I said a billion dollars-plus. It could be two billion. I think this is what the studies are intended to show us.

If the potential were there and we were to look at the block of energy that we could move—what transmission would be required and how much that would cost—then we could see what kind of case could be made for that type of investment.

● (1550)

Mr. Ted Falk: Other than the costs that you've indicated, what other types of barriers are there to moving power interprovincially?

Mr. Mike Marsh: One barrier is certainly around permitting and regulation. A lot of that is federal but some is certainly provincial, on the environmental side of the equation. Once you get into big transmission towers and big lines crossing several hundred kilometres of territory, it becomes a significant issue. Site and permit approval processes on these projects take one to two years.

Anything we can do to help streamline that process and identify these barriers up front would be very helpful.

Mr. Tim Eckel: In terms of the other barriers we have, from a technical point of view, if you install a generating plant within your own system, you can put it by a load and it will help keep the whole system stable. As soon as you start to bring power in from a fair distance away, its ability to support your system locally declines. You have to put in extra equipment just to keep the system reliable and stable, even as you start importing more power. Those are some of the things you have to do.

The other thing is that you have to get to the load. Bringing it to the border is one thing. In Saskatchewan, Regina and Saskatoon are our big load areas. Once we get it to the border, we still have to move that power to those load centres.

Mr. Ted Falk: Addressing the baseload issue with importing power is a significant issue for you folks, and one of the barriers that you contemplate.

Mr. Mike Marsh: Absolutely. Baseload power is a big requirement for us.

Two-thirds of the energy we produce here in Saskatchewan goes to serve the industrial load: potash mining, steel mills, uranium mining, the oil and gas sector, and pipeline capacity as well.

Mr. Ted Falk: I have just a quick question. Do you have any capability to store power in Saskatchewan? Do you store power?

Mr. Mike Marsh: Yes. We have about 900 megawatts of hydro today. We manage our hydro very carefully so that we can store energy throughout the off-peak hours and run our hydro facilities in our peak times during the day.

We have one small pilot project now that's looking at wind battery storage, and we're looking at other options for storage pilot projects in the very near future.

Mr. Ted Falk: Thank you for letting me get that in. I'm out of time.

The Chair: You took the words out of my mouth.

Mr. Cannings.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you for taking the time to come before us today.

I want to start with this, which you touched on in your presentation. Previous witnesses have talked about it. One put it in these words: that the future of energy production will be “local generation” for “local load”. I think you mentioned this. I just wondered how SaskPower is approaching that opportunity, I guess you could say, with plans for future generation projects in Saskatchewan.

Mr. Mike Marsh: I'll start and then let Tim add in here.

We have embarked on a grid modernization program, certainly, much like other utilities in Canada. The future of electricity is very exciting, but it's also very transformative for our industry. Distributed generation, whether it's located at the residential premise or is a community project, will certainly have the benefit of having that capacity and those electrons available very close to the load, which would eliminate the need for a lot of transmission and distribution facilities.

The speed at which that transformation occurs, however, is as yet unknown. There's a lot of work to be done on battery storage technology that can be integrated into the grid and will allow the safe and secure movement of electrons in two or more directions, which is what the future ultimately holds. As to whether there's going to be a transition phase here of 10, 20, or 30 years, I think that's what the industry is wrestling with.

High baseload requirements will require a substantial amount of our generation to come from current baseload stations today, including coal, until the coal fleet meets that retirement date and we're able to do something with it. Natural gas combined cycle plants and hydro are the two main areas where we would see baseload providing that opportunity.

As this technology becomes available, storage becomes available, and we modernize our grid, we'll be looking to have those supply sources close to the load sources everywhere in the province. Currently, we have about 600 people with residential solar in Saskatchewan. We have about five megawatts of installed solar. We are proceeding through an RFP process for 10 megawatts of utility-scale solar, and the announcement of that successful proponent will be made early in 2018.

● (1555)

Mr. Richard Cannings: Moving on, you made a comment about interties and expressed some caution as to who is going to pay for these. I don't know if you were talking about between Saskatchewan and Manitoba. I wonder if you could expand on that concern.

Mr. Mike Marsh: Traditionally, because the energy decisions within provinces are developed on business cases within the province with the available technologies we have today, there's been very little incentive to look east or west. That's precisely why you don't see the intertie capability today.

There have been substantial opportunities for Manitoba Hydro to sell their energy into the United States. That's where the contracts have been and that's why they have developed it.

If there is an opportunity to look at moving large amounts of energy but the business case for moving off fossil fuels faster can't help make that business case come alive, then the addition of federal incentives to help accelerate that development is important.

Mr. Richard Cannings: As you mentioned, and as I think we all know, Saskatchewan was a leader in the carbon capture and storage technology. I wondered if you have plans to do any more of that in Saskatchewan.

You've just mentioned the retirement date for your coal fleet. Is that going to move ahead and you'll stay with the one...? I'd like you to comment on the future of carbon capture and storage in energy production in Saskatchewan.

Mr. Mike Marsh: We have about 1,650 megawatts of conventional coal in the fleet today. Most of that, except for one 300-megawatt unit, is scheduled to retire before 2030.

We will have to be making a decision on the next two units—our units four and five at Boundary Dam—by the end of 2019. We're working through that decision process today. Of course, in the first place, it has to be an economic decision, and we have to look at all the alternatives that are available to us.

It's a very complex decision that we are undertaking here, and it certainly will be a big decision for SaskPower and for the province, but we have not made that decision yet. We expect that decision to be coming forward probably in the spring of 2018.

Mr. Richard Cannings: Okay.

Just quickly, then, you've talked about how you've invested a billion dollars, more or less, annually in upgrading your infrastructure. Can you perhaps describe what that upgrading entails and how much of it now deals with planning for the future smart grids or these changes that will allow that sort of technology to happen?

● (1600)

Mr. Mike Marsh: I'll make just a brief comment.

Yes, we spend about $1 billion a year. About $400 million of that is for sustainment infrastructure on existing assets in the ground. Given the growth we've had in the province over the last decade, about $500 million of that is to deal with growth: connecting new customers, adding new line capacity, and adding new generation capacity. We also have about $100 million tagged for what we call “strategic investment options”, whether that's new buildings, IT systems, or other technology platforms.

With respect to modernizing the grid, I'm going to turn it over to Tim to explain what we're doing in that area.

Mr. Tim Eckel: First, as we're replacing aging assets on the distribution side, we're looking especially at how we modernize the grid, so we're putting in equipment at the same time to facilitate that. It's a cost-effective way of introducing this new technology into our distribution system.

As well, we have a grid modernization program going on right now, and we're starting off with a few projects. Our AMI meters, the commercial and industrial meters, are starting to roll out. We have an enhanced distribution management system that we're implementing so that as the numbers of customers with renewables come online, we're able to operate the system effectively and have good visibility and control of everything.

Those are the first two stages of the system we're working on. We're probably spending in the order of about $100 million on the distribution side just for sustaining assets and preparing for grid modernization.

The Chair: Thank you.

Ms. Ng.

Ms. Mary Ng (Markham—Thornhill, Lib.): Hello, gentlemen. Thank you very much for coming and for providing us your testimony and your thoughts.

I'm going to begin by commending the work that you're doing in modernizing your grid and trying to achieve ambitious targets to reduce greenhouse gas emissions. Maybe I'll follow up on the point that you were talking about both in your testimony and in one of the questions, which was around the role that the federal government could play.

As you said, there are some jurisdictions in the country that have developed clean energy and have done the work around north-south. Could you talk to us and give this committee some advice about what some of those barriers are and what it is that we could be doing that would actually enable Saskatchewan to have greater interties and reach targets faster, for example? If you could talk to us about that, I'd appreciate it. What would it take?

Mr. Mike Marsh: It's going to take a lot.

I think that when you look at where we are placed geographically in Canada, at where Alberta is placed, and at the abundance of fossil fuels that we have had the benefit of being able to use for the past many decades now, you can see that as the world shifts to a cleaner future, both Alberta and Saskatchewan have to move relatively quickly to move off fossil fuels, or to reduce emissions in some way, shape, or form.

I think the expense that we in the electricity sector see relative to other utilities in Canada is going to be significantly higher. Because we're paying relatively much, much more in order to move by the year 2030 to that cleaner emissions environment that has been directed, there should be an opportunity, I think, to leverage some federal funds if the federal direction is to clean up emissions on coal-fired generating stations, on conventional coal. We either move to gas or we move to carbon capture. Also, if there's another opportunity to import hydro to help reduce emissions and move to an even cleaner grid faster, I think that incentivizing the western provinces that have the high fossil fuels component is a realistic option that should be looked at and potentially exercised.

As I've said, between now and 2030, there will be 1,650 megawatts of conventional coal potentially retired. At the same time, we are also building a combined cycle natural gas facility. Potentially in the 2020s we would have to build one or two more combined cycle natural gas facilities in order to keep up with our baseload requirements, but also in order to follow the wind because of the intermittency of wind and solar. The combination of gas and wind still allows some emissions into the environment. If the interest is in taking advantage of Canadian opportunities to help Saskatchewan, or where other provinces help Alberta, then I would suggest that having a federal incentive to help us do that would be very welcome.

● (1605)

Ms. Mary Ng: What about any role that the federal government could or should be doing around collaboration among the provinces? Is there anything that could be done that is helpful in that way and, obviously, is respectful of provincial jurisdiction? Is there anything the federal government can do in that regard around the interprovincial collaboration to facilitate this, aside from money?

Mr. Mike Marsh: The work that's being done with NRCan is certainly helpful. It's a chance for common interests to be put on the table and for technical solutions to be developed that would help promote east-west co-operation in an east-west grid.

As for where there's an opportunity to be more actively engaged with the provinces, I'm not sure that I can name it today. I think there has to be a technical solution. There has to be some economic value established. Then you look at what it will take to get those projects over the line and whether it requires a little bit of federal incentive or a lot of federal incentive. I think each project would have to be looked at on its own merits.

Ms. Mary Ng: I'm going to pick up really quickly on the point that my colleague MP Bagnell made on getting reliable electricity. On getting reliable energy to some of the remote areas of the province, are there challenges or opportunities that you see in strategic interties that will also accomplish that initiative and that may include our indigenous communities as well?

Mr. Mike Marsh: Yes, I see opportunities. I've had many discussions with the Northwest Territories power company and with Manitoba Hydro. We have common interests when it comes to finding technical ways to serve communities that are on diesel.

The problem is just the vast geography that we deal with in western Canada, and the hundreds of kilometres of distance between communities and between potential supply sources. For hydro stations in the Northwest Territories and potential other hydro sources in northern Saskatchewan and Manitoba, getting it to those sites takes hundreds and hundreds of kilometres. That's where the economics break down very, very fast.

Certainly, there's an opportunity to move that energy long distances—as Tim indicated, you're going to experience line loss—perhaps with the emergence of good storage and the opportunity to use solar-hydro, and maybe in the longer term there might even be a potential for much safer and smaller nuclear reactor technology that might come into play for those types of communities.

Ms. Mary Ng: Thank you so much, gentlemen.

The Chair: We're out of time.

Mr. Maguire, you have five minutes.

Mr. Larry Maguire (Brandon—Souris, CPC): Thank you, Mr. Chair.

I appreciate your comments.

Mr. Marsh, you indicated that you had coal conversion, and you have natural gas, hydroelectric power, wind, and solar. Obviously you're building a lot of hydro power in your province, as well. Over my years as the critic for conservation in Manitoba, and coming from the Brandon area, I have watched closely the developments that you've made with your coal-burning facilities in the Estevan area.

I'm wondering if you can you elaborate on the reduction of greenhouse gases presently in that area and how that competes with the other forms of power you're using in your province.

● (1610)

Mr. Mike Marsh: First of all, to touch on a comment you made on hydro, we are not adding any hydro generation at the present time. We did have a potential project in northern Saskatchewan, a river diversion project, which was very clean, renewable, and environmentally responsible. It was a 50-megawatt project. We just put that project on hold because the mining load in the north has dropped off considerably, and that's a predominant driver. That project has been deferred to a later date for a decision. It may materialize in the next few years—we do not know—but that was the only project on the books currently.

With respect to coal, we have our carbon capture facility at Boundary Dam. It's a nominal 160-megawatt unit. When it's operating on carbon capture, it produces about 120 megawatts. When it's operating at full design, it achieves a 90% reduction in carbon dioxide, and it's technology that works. It's now three years since we've had commercial operation of that facility. We continue to get improved performance each and every year.

The issue with that facility right now is that we are under contract with one offtaker, and that offtaker, because of the price of oil in the area, has elected to take a minimum amount of carbon dioxide. That means the revenue stream we can earn from that is somewhat reduced from our initial projections. The cost for doing carbon capture and storage, of course, is significantly more than conventional coal. I think the other aspect is that the substantial reduction in the price of natural gas in North America over the past number of years has shifted the equation significantly in favour of combined cycle gas technology in most jurisdictions.

One of the latest reports I have read said that, even in the U.S., natural gas is displacing conventional coal, and over 51,000 megawatts of conventional coal has been retired in North America in the last five years.

It is technology that is working. It does reduce emissions on one plant. Remember, we still have six other operating units in our fleet, and two of those we will be making a decision on in 2018.

Mr. Larry Maguire: Then the same would go with the reduction in gas prices, I assume, for expansion of any nuclear opportunities you would have in Saskatchewan as well.

Mr. Mike Marsh: Absolutely.

As you're making that economic decision and putting that business case together, you have to look at all the options and alternatives. The risk of natural gas prices climbing in the long term is certainly a big factor that you have to look at. The long-term risks of the nuclear fuel cycle have to be looked at. Right now we're not looking at nuclear in any firm way. We're keeping an eye on the technology and, as that small modular reactor technology develops, we will see if there's an opportunity. However, we haven't built that into any of our forward plans at this point in time.

Mr. Larry Maguire: Have you had any other discussions with other jurisdictions in Canada in regard to your natural gas use in their jurisdictions?

Mr. Mike Marsh: We don't operate the natural gas system here in the province. We just purchase the gas and use it in our generating stations. SaskEnergy looks after gas distribution here.

Mr. Larry Maguire: Thank you.

I'll pass my time on to my colleague.

The Chair: Actually, you're right on time there, so we'll have to move on.

Mr. Harvey.

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

I want to start by asking a quick question on the 40% line loss. I'm assuming that's due to the length of the line. How can that be affected by the size of the line? In terms of the bigger the line relative to the amount of power that's transferred across it, is there less line loss? Also, is there a substantial difference between AC and DC? Is your system there AC or DC?

Mr. Tim Eckel: The system is AC, and yes, there's a substantial difference between the AC and DC systems. DC systems have very little loss.

That's why, if they're going long distances, a lot of the utilities, such as Manitoba's and Quebec's, have DC lines. With very little loss, they can move a lot of power.

With the DC lines, too, you have control at each end. You can really control the amount of power that flows on that line. With AC lines, there's a factor.... Wire has a resistance, so it heats up, and you lose power as you transmit it a long way.

● (1615)

Mr. T.J. Harvey: As a utility, is converting over to a DC system something that you've considered?

Mr. Tim Eckel: The cost would be significant to do that for the amount of generation and load that we have in the north right now. For today, because of the small amount of load and generation we have, the AC system is okay. The losses aren't that high, but if we were to put in large amounts in the north somewhere, or bring them in from the Northwest Territories, we'd have to consider that as an option.

Mr. T.J. Harvey: For the most part in the southern part of Saskatchewan, then, you wouldn't have that 40% line loss.

Mr. Tim Eckel: That's correct. Typically, our transmission system would have maybe a 5% to 6% loss in the south part of the province.

Mr. T.J. Harvey: Okay. That clarifies it.

In terms of the north, and following up on what Larry was talking about earlier, we briefly did touch on SMRs and the inevitability that this technology will come about. What about isolated microgrids in those northern regions? Is that something that could be done between communities but could be completely set aside from the rest of your grid?

Mr. Mike Marsh: Absolutely. The technology is starting to emerge that would allow it to be a real possibility, but it will require storage and additional control systems that will allow the storage and, for example, the ability for batteries to manage that intermittency. You may need substantial battery capacity in the north, but with a very small amount of generation capacity. Currently, those pilot projects are numbered today; there are not very many of them. In northern communities such as those in Alaska and in the Northwest Territories, I know, and in Scandinavian countries, that technology is certainly being developed at a relatively fast pace.

We at SaskPower have been working with the University of Saskatchewan and their school of environment and sustainability. They're looking at a program that would enhance renewable energy for northern and indigenous communities. They're looking at all of this technology and, indeed, we're starting to look at what pilot projects we might be able to help them with here in Canada, in Manitoba, Saskatchewan, and the Northwest Territories.

Mr. T.J. Harvey: You've touched on the 1,600 and some megawatts of coal. Have there been conversations around converting that coal-fired generation to gas? What are the economic constraints of doing so?

Mr. Mike Marsh: Yes, we're certainly looking at it. There's a substantial difference just in technology between the boilers used in Alberta and the boilers we use in Saskatchewan. The boilers in Alberta burn sub-bituminous coal. We burn lignite coal. There are also different design characteristics, which don't lend themselves as efficiently to gas conversion as do the boilers in Alberta.

The efficiencies are not as great, and therefore the CO2 emissions would be higher in any coal-to-gas conversion project. We're looking at that carefully, but right now it doesn't look like it might be feasible to do that.

Mr. T.J. Harvey: Thank you.

The Chair: Mr. Schmale.

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

Thank you, gentlemen. Those were very interesting comments.

I just want to go back to what you were talking about, if I could, regarding nuclear. According to what I've been able to find, there was a panel appointed in 2009 to look at the process of, possibly, nuclear power in Saskatchewan, and I noticed you did mention that a few moments ago. Could you go back to that? Where are you in that process? You did say that you're not looking at it any further. Can I ask where that is and why?

● (1620)

Mr. Mike Marsh: The decision to move down a nuclear path would have to be something that the provincial government would speak to and direct. As a utility, we want to remain agnostic to the technology. We want to understand what technologies are available to be integrated into our grid, but until that bigger political decision is made to move forward, we're just keeping abreast of the technology. If and when it becomes of a size and a cost that would allow it to be integrated into the Saskatchewan grid, we may make a recommendation at that point in time. That's where it sits with us today.

Mr. Jamie Schmale: Did I hear you correctly? You said you currently do business with the United States by exporting your power. Is that correct?

Mr. Mike Marsh: No, we don't. We have had small contracts with North Dakota over the years, but our connection into the U.S. is very small. It's 150 megawatts into the United States, so it's not big enough.

Mr. Jamie Schmale: Okay, so it's not very much.

If you had something like nuclear power, could you see yourself doing more business? Would that help the business case potentially?

Mr. Mike Marsh: It's very premature for me to say. It would depend on the economics, and that's a really big question. I couldn't answer that today.

Mr. Jamie Schmale: Do you see more of a role in some of the remote communities for maybe an opportunity for wind, solar, SMRs, or something like that, rather than spending dollars—a lot of them—on interties? The reason I'm saying that is that as we go through this process, I'm trying to get my head around the business case for moving this forward and why the federal government should invest in this. I noticed in this document here from the Library of Parliament—and Mr. Bagnell did point it out—about 4% of Yukon power is from diesel.

Now I know, obviously, that you're Saskatchewan and not Yukon. Would it not make more sense to look into helping out the northern remote communities using wind, solar, or maybe an SMR somewhere if it makes sense, rather than to spend billions on putting these interties into effect? Would that not be somewhere we should be looking at instead, considering, as well, that it's so far out it takes a lot to build this?

Mr. Mike Marsh: I agree. As I said earlier, I think the technology is coming of age to allow wind and solar, together with battery storage, to adequately serve some of these remote communities. It's just a matter of getting the right technologies together and the right control system to allow that grid to be stable in that local microgrid area. SMR technology is just beginning development now, and to my knowledge, they're looking at it, certainly, in the United States. The only units in production are in China today. That's a long-term play, and I think it has to be looked at as a very long-term play beyond the 10- to 15-year time horizon that we can see today for SMRs.

Mr. Jamie Schmale: Go ahead.

Mr. Tim Eckel: I'll add one more thing. Renewables are a good possibility. The one issue they deal with in the north is that winter is their heaviest load because they have heating load as well as lighting and everything else. There's not much daylight for things like solar. They have to have more storage, and sometimes on the coldest days, there's very little wind. They need a lot of storage in those areas to make it work, and that's the challenge.

Mr. Jamie Schmale: With regard to improving interties, we're probably looking at that same time frame, that 10-year window, as you mentioned. You said 10 to 15 years with regard to SMRs. I'm still trying to get my head around whether or not this is something the federal government should be putting dollars into.

I guess that's my time. I've made a comment rather than a question.

The Chair: Thank you.

Mr. Tan, you have about three minutes.

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

In your testimony, you mentioned lots about the challenges of providing electricity to low-population density areas or very remote areas that are far from interties or from the grid. No matter what, those communities need power, so they have to choose, to make a decision from a whole bunch of technologies: solar, wind, nuclear, other co-generational, or natural gas. I don't think those communities have the capacity to decide which technology is the best for them, or the good side or bad side of each technology.

I wonder if your company is involved in this decision process or if it's the sole responsibility of the local government. Where does the local community get expertise to make the final decision?

● (1625)

Mr. Mike Marsh: That's a very good question. I had indicated a few minutes ago that we are currently working with the University of Saskatchewan's department of environment and sustainability, which is looking at exactly that issue—how to develop a policy around integrating renewables into northern communities. What's the right business model? What are the right policy options available, both provincially and federally?

We're certainly going to assist our local university as they pursue this and expand their role in this area. They're working with Scandinavian countries and Alaska because they have a head start in this area. Indeed, they held the first symposium on northern and indigenous communities with respect to solar and renewable integration, back in September. It's starting to take hold.

Certainly, we would look at technology options that we would traditionally look at for our community in Saskatchewan. However, if we can learn as well what's working in other parts of the world and find a way to utilize that technology here in our province, and if Manitoba, the Northwest Territories, and Yukon can do the same, we may have the ability to move a lot faster with a lot less cost because we'll learn from others who have gone before. I think that's the work that's being undertaken today. We're not leading that work, but we're certainly helping wherever we can.

Mr. Geng Tan: Okay.

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

Gentlemen, thank you very much for joining us today and being part of this discussion.

We're going to suspend our meeting now for a couple of minutes and then reconvene with our next witnesses.

Thank you again. We're signing off.

Mr. Mike Marsh: Thank you very much.

● (1625)

(Pause)

● (1630)

The Chair: We're going to resume, ladies and gentlemen.

We have Ms. Judith Bossé and Alexandre Prieur from the Department of Natural Resources. From Siemens Canada, we have Rocco Delvecchio and Theresa Cooke, joining us from Oakville, Ontario.

The process this afternoon for our witnesses is that each set of witnesses will be given up to 10 minutes to do their presentation. You can do it in English and/or French. You will be asked questions in either or both official languages. Let's hope you have interpretation technology available at your disposal.

I'm speaking quickly because we're a little bit short of time. I'm going to open the floor.

Mr. Delvecchio and Ms. Cooke, why don't you start us off.

Mr. Rocco Delvecchio (Vice-President, Government Affairs, Siemens Canada Limited): Thank you very much. It's good to be here with you, committee members. You've done the introduction, so I'll start with our opening statement.

Let me say that it's a pleasure to participate in today's hearings. Energy is a very hot topic these days, with tremendous changes taking place, driven largely by technology, customer needs, and climate change. With the democratization of energy systems, particularly in the electricity sector, consumers are becoming more engaged in decision-making, and are increasingly becoming consumers, generators, and active participants in the electricity system.

Climate change and both physical and cybersecurity threats are also impacting the grid, with several notable storms this past winter impacting hundreds of thousands of Canadians. Distributed energy and resilient grid equipment, coupled with smart grid platforms, can radically improve the resiliency of today's grid, improve energy efficiency, reduce emissions, and keep operational costs stable.

A key term in this transition is the concept of “smart grid”, which is a class of technologies that enables all elements of the electricity system to connect, including generation, transmission, distribution, and end-users. Each element can be monitored. They can share information with one another, react in real time, and manage the overall system for optimal performance.

Today, our electricity transmission system is already fairly smart, but it is the extension of these smarts to other elements of the system, including the power lines and transformers near our homes, that will lead this transformation. This will allow us to optimize the performance of the system, facilitate the introduction of electric vehicles, connect community solar projects, add home storage, and connect smart appliances and other smart devices. We believe that these factors will drive the next wave of transformation.

Today, I'd like to focus on four key elements of the energy system, and some of the key developments in each of these areas. The first is electricity generation, the second is the grid, the third is the electricity demand of end-users, and finally, some comments about economic value creation.

Let me start with electricity generation. There are two trends here that are quite notable. The first is the shift to cleaner sources of energy. This is being driven by increased renewable power, primarily wind and solar, which is moving onto the grid. These sources are intermittent. They need to be managed intelligently and backed by some combination of natural gas generation and storage.

The second major trend we see is the decentralization of power generation. In the past, power has been generated mostly by large, central generating facilities, but we are now seeing a major shift toward distributed power generation. On the one hand, this is driven by renewable energy adoption; on the other, it is driven by businesses and individuals who wish to generate their own power. The business case for doing so is becoming more attractive, as a result of the falling costs of storage in solar, low natural gas prices, increased electricity rates, and the desire for reliable backup power.

In an interesting recent example, Siemens is involved in a project in Brooklyn, New York, whereby neighbours are able to trade the electricity generated on their own rooftops using blockchain technology. Both of these trends, but in particular the rise of distributed energy resources, create a much greater need for monitoring, control, and optimization. The distribution grid must become more intelligent, able to control generating assets and move power in many directions.

The second element is the grid. There are two elements to this that I'd like to highlight, the first being transmission. By transmitting and distributing power, the grid connects generators to end-users. On the transmission side, advances in high-voltage direct current transmission, or what is termed HVDC, now enable the transmission of electricity over long distances with virtually no losses. It can also reduce the costs of traditional overhead power lines. HVDC is also the only way to interconnect technically with transmission systems that are incompatible with other power networks. We see several of these in North America.

The implications of this are significant for Canada. For example, by extending the integration of energy-generating assets, one increases the prospect of greater use of hydro, wind, and other renewable resources across the country. This enables us to create a balanced mix of energy sources across regional grids, and export and share renewable power with other jurisdictions, including, of course, the United States.

● (1635)

Siemens has been involved in HVDC projects around the world, some of the longest of which are in China, although we've also recently completed two major projects in Alberta.

The second element of the grid that I'd highlight is distribution. We see that the distribution side of the grid is expected to undergo a massive transformation in the next five to 10 years, as the costs of solar storage drop, smart devices are connected to the grid, and consumers become active participants in generating and trading electricity.

The distribution grid, which currently sends power only in one direction is, for the most part, manually operated and is being digitalized. This offers greater flexibility and control over the generation and distribution of power, offering greater resiliency and the introduction of larger numbers of electric vehicles, including fast electric vehicle charging stations.

Local demand, generation, and storage are becoming more intelligently managed by software and being operated as microgrids. These microgrids in turn support distributed energy by enabling local renewable power generation to connect to the grid. These microgrids also increase resiliency and enable the electricity system to increase sufficiency and reduce emissions. For example, we have worked with Algonquin College in Ottawa to develop a microgrid that increases energy efficiency, reduces emissions, and enables the college to generate its own power while sharing power with a local utility. We've also developed this system in a way that creates a learning environment for students and supports the development of a new class of energy management skill sets.

The third element I'd focus on is the management of power consumption and the participation of end-users, the latter moving from passive consumers to active managers and producers, or “prosumers” as the term has come to be known. From smart thermostats to water heaters, to home solar and storage, consumers are taking an active role in managing their use of electricity. This is true not only for individuals but for businesses and institutions.

For example, we are working with New Brunswick Power to develop and deploy demand management technologies that will allow the shifting of peak power demands, with all the benefits this entails. This technology, for example, will enable the utility, businesses, campuses, and individual consumers to adjust time of use of electricity consumption. This opens up dramatic improvements in our ability to manage peak load and thereby reduce the need to build capacity and the costs of operating the grid. This flexibility will become even more critical with the adoption of electric vehicles, which will place unprecedented demands on the distribution grid.

My final comments relate to economic value creation. The energy system that is being transformed creates a unique opportunity for Canada to take the lead in this global transformation. By investing in smart grid innovation, Canada can develop and commercialize smart grid technology that can be exported worldwide. With the diversity of our provincial energy systems and their corresponding challenges, the blueprints created in Canada can be adopted to a broad spectrum of international jurisdictions.

Canada already has many strong leaders in the smart grid space who are eager to collaborate to make this vision a reality. Developing these technologies will require a strong body of software developers, power systems engineers, highly skilled technicians, and program managers. At Siemens Canada, we are committed to developing this talent pool via our engineering and technology dual education program. This is part of a broader transition in our educational system, which includes work-integrated learning. This allows students to gain direct hands-on experience and training with the advanced technologies that are driving this and other transformations, including defence manufacturing.

In summary and closing, the electricity sector is in transition and getting this transformation right is critical for Canada. Done right, a holistic and proactive approach will lower costs, increase resilience and reliability, reduce emissions, and create significant economic value for our country.

Mr. Chairman and committee members, that concludes my opening remarks.

● (1640)

The Chair: Thank you very much.

We'll move over to Ms. Bossé and Mr. Prieur.

[*Translation*]

Dr. Judith Bossé (Director General, Innovation and Energy Technology Sector, CanmetENERGY-Varennes, Department of Natural Resources): Mr. Chair, I would first like to thank you for this opportunity to speak. We appreciate your interest in our work, as it relates to your study.

In our opinion, interties are one of the many tools available that, when used together, could improve the supply and demand of the current electricity grid in Canada.

To illustrate this point, I would like to provide you with some insight into our centre's research in electricity, as well as explain how our work complements or supports the use of interties in Canada.

[*English*]

Our work articulates itself around two main areas: electricity generation and supply, as well as transmission and distribution.

Under the first area, electricity generation and supply, we have examined the solar photovoltaic trends across Canada in terms of both technology adoption and its cost. While increased distributed renewables will contribute to a low-carbon future, they will require a series of tools to ensure Canada's electricity supply remains stable and reliable. Among these tools are increased interconnections between systems, geographically adaptable renewable technology, and smart grid control, which I will discuss further later on.

Costs of PV are dropping, especially for installation, and rooftop installation is becoming increasingly common. The cost of installing PV is decreasing, but residential electricity rates are rising. Therefore, consumers are installing PVs on their own, but utilities must now find solutions to make this new reality technically and financially feasible.

[*Translation*]

To this end, our centre is participating in international efforts to test smart inverters, which are power conversion units. These can be used to integrate PV, storage and wind energy into the electricity grid. Inverter research therefore aims to understand how generation equipment can supply additional grid services and enable greater use of renewables in the current electrical grid. Inverters represent an additional tool, alongside interties, to enhance electricity services.

[*English*]

Our centre is working with the National Research Council on standards and regulations related to energy storage. Canadian industry will benefit from the identification and mitigation of challenges associated with energy storage, which will constitute another tool to facilitate the integration of renewables in the electricity grid. Much like interties, storage is one of the tools in the tool kit. It does not generate energy but helps bring additional flexibility to the grid.

The second area of work related to electricity transmission and distribution that we focus on [*Technical difficulty—Editor*].

● (1645)

The Chair: We have lost the audio, so we'll maybe give it a minute to get it back online.

Can you hear us okay now?

Dr. Judith Bossé: I hear you well.

The Chair: Okay, and that works both ways.

Could you carry on from where we lost you? I think it was from when you said the word “second”.

Dr. Judith Bossé: As I was saying, Mr. Chair, the second area of work that we focus on is related to smart grid.

Historically, utilities have had to rely on supply to get the flexibility required to meet demand. The smart control of electricity loads gives utilities an added source of flexibility to enable clean energy solutions. The smart grid gives utilities a better sense of what is going on in their system and where energy is being consumed. In the near future, it will also allow utilities to exercise a certain amount of control on how, when, and how much energy is being consumed. This will make it easier to integrate renewable energy by matching loads with the variable output of renewable technologies. The smart grid is necessary to support Canada's continued electrification.

● (1650)

[*Translation*]

To this end, we are working on measuring the potential of residential heating devices, such as water and space heaters, to be controlled and to store electricity. This involves working with device manufacturers, utilities, and telecommunications experts to cover the entire supply chain, from start to finish.

We are also working to increase the number of small local renewable technologies, such as wind and PV. The objective is to make it possible to install these technologies close to a load, which helps optimize the use of grid assets.

[*English*]

A concrete example of both the areas is found in our collaboration with the City of Summerside in P.E.I. The city is actively converting from oil to electric heating with renewable energy. Here we are working to better understand and manage the distribution system that uses large quantities of wind power using state-of-the-art smart grid technology. Summerside has interties connected to the New Brunswick power system, which it uses for balancing. However, by maximizing its use of local resources and having a smarter grid, Summerside frees up its intertie, thereby saving that capacity for other uses.

Finally, through the Canadian smart grid action network, a network of Canadian smart grid stakeholders, we are directly engaging provincial and territorial policy-makers, utilities associations, and other smart grid development, demonstration and deployment in Canada and internationally. Efforts around the development of policy, codes, and standards make it possible to increase the adoption of clean energy technology in Canada, thereby broadening the possibilities for enhancing the electricity grid.

[*Translation*]

In conclusion, we feel that a diversity of tools, including inverters, storage, smart grid, and interties, will be required to help Canada reach its clean energy goals. The most economical option will likely be a well-planned mix of all these tools, adapted to the variety of climates and geographic contexts in Canada.

Thank you again for this opportunity to present our work.

[*English*]

The Chair: Thank you very much.

We're going to open the floor to questioning now.

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

Mr. Geng Tan: Thank you, Chair.

My first questions go to CanmetENERGY.

People buy additional electricity for their grid from independent power producers. Quite often, those kinds of so-called independent power producers are small in size, and quite often they use renewable energy.

I have a report that was published by NRCan called “Connecting MicroPower to the Grid”. In section 2.4, “Interconnection”, the report says:

> Perhaps the number one interconnection barrier for small renewable systems has been the lack of uniformity in interconnection standards from utility to utility. This is a result of the traditional discretion given to utilities to deal with their own generation, transmission, and distribution systems.
>
> To be more accurate, it is a problem of many utilities not having any standards at all for small grid-tied generators.

As a result:

> ...interconnection is addressed on either a case-by-case basis or through existing standards usually used for larger industrial systems.

Can you comment on that?

Also, in your opinion, how urgent is the need to have this kind of standard, and how difficult is it to create this standard?

● (1655)

Dr. Judith Bossé: I will ask Alexandre to answer your question.

Mr. Alexandre Prieur (Smart Grid Project Leader, Innovation and Energy Technology Sector, CanmetENERGY-Varennes, Department of Natural Resources): Thank you.

The answer to your question is that there are different levels. First, there is the interconnection for a utility-sized power plant. Right now the standard for interconnection is being reviewed in Canada. We are participating in this activity to review the distributed energy generation interconnection standard.

It is true that, at the utility scale level, it is decided by the utility. If you do a big power plant of photovoltaic generation, it is an agreement with the utility where you are, but for the small-scale residential installation, it is the interconnection requirement that is standardized that will resolve that.

That report you cited, if I recall properly, was a few years ago. Right now, the review of the actual standard will hopefully solve the problem. We obviously don't control the end result of a committee like that, but we're actively involved to make sure that it's harmonized with the U.S. side of interconnection, which is also under review right now.

Mr. Geng Tan: Thanks.

Your centre has the expertise and technical resources for scientific research, studies, and R and D activities. When you work on an area like a smart grid, how closely do you work with the other stakeholders, for example, collaboration with other universities or engagement with the government? How do you provide or share information with the industries?

To me, your centre is still modest in size, so I don't think you can handle everything by yourself.

Mr. Alexandre Prieur: I agree that because of our size we don't handle everything. We generally deal with partnerships.

To give you a clear example, it was mentioned that we manage the Canadian smart grid action network. That's a way to transfer the information to the industry. That's an example of a mechanism; we have multiple mechanisms.

We generally try to target our research to do very specific.... As an example, we're doing research on demand response. We collaborate with some manufacturers and utilities. We host workshops or webinars to disseminate that to different audiences and stakeholders in Canada. We always try to make sure that our research is reusable and presented to a good stakeholder audience.

Mr. Geng Tan: Okay. My last question is a quick one.

I'm sure you recommend some policies to the decision-makers. You are part of NRCan but you are not the government, you are a research institute. How do you make sure that your recommendations or your resources can reach, be considered, or be made use of by the decision-makers?

Dr. Judith Bossé: Our research is decided and reviewed by peers within the department. Definitely, as you're well aware, there was the pan-Canadian framework on climate change. Numerous programs have been announced, and our work is aligned to support those programs. Whether we're talking about smart grids or off diesel, the way we're aligning our resources for research has to do with government policy, and we're just there in support.

Obviously, as you mentioned, we're small, so while we may have unique expertise or convening powers, we'll usually seek a partnership to expand our capacity.

● (1700)

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

Just so everybody knows, we've lost Siemens. It may be permanent, but that remains to be seen. Apparently, we are trying to reconnect.

Mr. Schmale, go ahead.

Mr. Jamie Schmale: There are problems in Oakville.

The Chair: We have bad interties between here and Oakville.

Mr. Jamie Schmale: I thought my area had bad Internet connection.

Thank you very much for appearing here today. It's always great to get the department's views on these matters.

As you probably know, we've had a number of meetings and we've heard from a wide variety of individuals on the issues of interties. Even though the study has been mostly about improving the flexibility of our grid across Canada through improved intertie connections, the general message that I think we are getting is that interties are only part of the solution. In fact, they are not on the top list of possible solutions. As you mentioned in your remarks, you are talking more about storage capabilities and—as Siemens mentioned as well—more flexible, local mini-grids.

My question is about these mini-grids. You mentioned a pilot project in Summerside, Prince Edward Island. What do you see the future of energy transmission looking like in Canada if things continue to go well in Summerside and it's spread across the country?

Mr. Alexandre Prieur: I think it's hard to tell how transmission will evolve, but it's definitely a tool that needs to continue to be used. Even though we try to optimize more locally, I think that transmission is part of the solution and it won't disappear soon. The diversity and the geographic spreading of resources allow us to compensate for the variability of new, renewable resources like wind and solar. Transmission will definitely be an asset.

If we look at the North American context, there are places where a large amount of hydro power is available, and these places could be seen as a kind of battery that will allow more integration of renewables. Transmission will definitely be useful for that. Even though the microgrid context, the small local grids, is becoming more important and more a part of the discussion, in the end a truly smart grid would still be microgrids interconnected and interacting through interties.

Mr. Jamie Schmale: Is the pilot project in Summerside, P.E.I. mainly focused on residential rate users, or is it taking into account industrial as well?

Mr. Alexandre Prieur: There is some industrial in the P.E.I. project. If I recall properly, there is a dairy processing farm and some commercial also involved. I could follow up on that, if required.

Mr. Jamie Schmale: I know that technology and innovation sometimes can be hard to predict, especially at the rate it's moving so quickly. Whether it be the SMRs or these new mini-grids, or what have you, can you foresee at some point handling a large-scale industrial operation manufacturing facility without any problems?

Where I'm going with this is.... We continue to hear about the interties, the cost it would take to expand them and the length of time it would take to possibly approve and build them. Technology is moving so fast. If we are going to get there first, I'm just trying to figure out whether there might be a different direction, rather than looking at this long-term intertie connection and billions of dollars.

● (1705)

Mr. Alexandre Prieur: Actually, the other tools that we are talking about—and please tell me if you want to clarify the question—are options that, in the end, will help interties, because if you have a better local optimization that goes up to a better interaction between the different interties, you will allow a better use of these interties. It's not necessarily a competition. It's more that a truly smart grid will be an optimized use of the available resources.

I'm not sure if I'm answering the question clearly. Basically, it's a complement tool.

Mr. Jamie Schmale: In Ontario we have a surplus of power, and a number of other provinces like Quebec and Manitoba have surpluses of power. Right now, especially in Ontario, we are selling that power to the United States, which seems to be a good market to go to.

Looking ahead, considering the forecast and the costs involved in the approval process and in getting facilities built within the intertie system, would we be smarter to focus our energy and resources on a market of possibly 306 million people to the south of us, rather than going east and west, where a number of provinces have surpluses in power and could maybe do a better business bilaterally rather than focusing on the interties in general?

Mr. Alexandre Prieur: I'm not sure I'm in a position to say if it's better to have east-west or north-south, but definitely increasing interties between provinces is something that makes sense technically. In the end, I guess it's a decision based on economics for the jurisdictions. Right now there's a study looking at the North American context to see, with future production and so on, how and where the interconnections should be improved.

I don't have a good answer on that, but I guess the Canadian study on that would also be useful.

Mr. Jamie Schmale: Going back to the pilot project in—

The Chair: Sorry, you're right on the button. You'll get back to that.

Mr. Cannings.

Mr. Richard Cannings: Thank you for being here today.

I assume we still don't have Siemens.

Ms. Bossé, you talked about smart grids and moving towards a situation in which we have more control over actual consumption rather than just generation. I want to give you an example of my understanding of this.

A couple of years ago, I was talking to an electrical engineer who was working with clients around North America, and one of the examples he gave was about Tucson, where they have a lot of solar. He was helping the utility there work with large users such as Walmart. For example, if the sun went behind a cloud for half an hour or something and the generation dropped, they would compensate for that by getting energy users like Walmart to reduce their air conditioning load for a period of time instead of paying the extra amount to fire up some baseload generation, and I think he even said that Walmart would get a cheque for providing that service. That's an example of what these smart grid technologies would do.

Is that what you were talking about, and how do you see that working in Canada?

Dr. Judith Bossé: I'll turn to Alexandre. He has more expertise in this than I have.

Mr. Alexandre Prieur: The Walmart example of production is actually a good one. You go to the demand side and you use the flexibility that you have to help the grid. This is an example, I would say, of a truly smart grid application in which you don't just consume electricity blindly; you consume it when it's better for the grid. In the end, this could be done with financial incentives or it could be done with controls, but it's not necessarily about trying to control the loads. If you want to take your shower with hot water, you can still have hot water. It's more to use your water heater—as an example—as a storage unit and to play with the flexibility.

A lot of loads on the electrical grid have this flexibility inherent in their usage, so with the Walmart example, if you cut the air conditioning for a minute or two, it won't have a lot of impact on the store itself. If you cut it for two hours when it's very hot in the summer, then you will have impact. It's a kind of management of the variability. Right now electrical networks are doing that all the time. Now it's a question of using more of that flexibility that is out there, which can support the grid when it's needed.

● (1710)

Mr. Richard Cannings: Thank you.

I had a bunch of questions for the witnesses from Siemens. Maybe I'll just ask them to you and get your comments on them.

They mentioned commercialization of smart grid technologies that perhaps we could incentivize in Canada. Could you give some examples of smart grid technologies that companies in Canada are working on and that the federal government could perhaps help with? Are we leaders in some of those technologies on a world scale?

Mr. Alexandre Prieur: Yes, I can try to answer that for Siemens.

I know that Siemens is working on software solutions to control that variability and that flexible potential that is out there. A company like Siemens is pretty big, and it's at many different levels in the system grid.

Basically, we want to have integration from the generation up to the end-user. Siemens named the “prosumer”. Talking of prosumers, I could mention another project in Ottawa: the GREAT-DR project. Basically, they will integrate photovoltaic generation with inverters, with demand response, with storage batteries—all together.

We definitely have companies in that area in Canada. Maybe it could be on the follow-up because I see thermostat companies, smart thermostats, inverter technology, all the intelligence behind the use of the predictive tools for utilities to plan how to use that flexibility. All these are areas that are well positioned in Canada. We have companies that work in that field.

Mr. Richard Cannings: To finish off then.... They also mentioned something about shifting peak demand times. Is that part of that flexibility you were just mentioning? How does that work?

Mr. Alexandre Prieur: You can store energy to use it at another moment. I'm going to go to an example with interties. At the peak in winter, when everybody needs to eat and make their dinner and all that, if you can delay some usage and use it during the night when everybody's sleeping and you have less demand, that's an example of peak shifting. It is part of the flexibility, and it is one of the first areas where there's a value for it in the market.

Right now, for the grid services that can be offered by different smart grid solutions, there are many grid services. One place that utilities are right now seeing the value and need to have an immediate solution is the peak. That goes to intertie production and all that because in Canada when it's cold, everybody needs to eat and use electricity at the same time. That's when you need to invest in more grid assets.

● (1715)

Mr. Richard Cannings: Thank you.

The Chair: We're going to stop there.

Thank you both for joining us today, and thanks for answering questions on behalf of Siemens as well.

We will disconnect now, and the committee will suspend for about one minute. Then we're going to get to committee business, which I don't expect will take too long.

Thank you very much for joining us.

[*Proceedings continue in camera*]