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Chair

Mr. Leon Benoit

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● (1535)

[*English*]

The Chair (Mr. Leon Benoit (Vegreville—Wainwright, CPC)): Good afternoon, everyone.

We have two orders of business today. The first is the election of the second vice-chair for our committee.

Mr. Calkins.

Mr. Blaine Calkins (Wetaskiwin, CPC): Mr. Chair, I'd like to nominate Mr. Hsu as vice-chair.

The Chair: I'll actually turn this over to the clerk to handle the election here.

The Clerk of the Committee (Mr. Rémi Bourgault): Pursuant to Standing Order 106(2), the second vice-chair must be a member of an opposition party other than the official opposition. We received a motion from Mr. Calkins to nominate Mr. Hsu.

Is there any other motion?

Mr. Blaine Calkins: Is there any other choice?

Mr. Rémi Bourgault: Is it the pleasure of the committee to adopt the motion?

Mr. Peter Julian (Burnaby—New Westminster, NDP): I do believe we have comments.

The Clerk: No, I cannot enter into any comments during the election of a vice-chair or any points of order.

Mr. Peter Julian: I wanted to second the nomination and welcome him to the committee.

The Clerk: Is it the pleasure of the committee to adopt the motion?

The motion is carried.

Mr. Ted Hsu is the duly elected second vice-chair of the committee.

The Chair: Good choice, great choice.

Thank you very much.

Now we move on to the second part of our agenda for today, the continuation of our study on innovation in the energy sector. This is our first meeting on the transmission portion of that.

We have four groups of witnesses here today.

The first two by video conference from Calgary are, from the Canadian Energy Pipeline Association, Brenda Kenny, president and chief executive officer; and from the Canadian Geothermal Energy Association, Timothy Thompson, chief executive officer of Borealis GeoPower Inc.

Welcome to both of you.

By video conference from Edmonton, Alberta, from TransAlta Corporation, we have Donald Wharton, vice-president, policy and sustainability.

Welcome to you, Mr. Wharton.

By video conference from Toronto, from SmartGrid Canada, we have Alex Bettencourt, managing director.

Welcome to you, sir.

Normally we go in the order on the agenda but, Mr. Bettencourt, are you ready to go? If you're ready to go, could you make your presentation for the committee in case you have to leave? I understand that could happen. We'll go ahead just in case.

Go ahead, please.

Mr. Alex Bettencourt (Managing Director, SmartGrid Canada): I appreciate the opportunity. I'm expecting a baby any moment now. There was a false alarm yesterday. I have an eye on the phone just in case.

The Chair: Congratulations.

Mr. Alex Bettencourt: Thank you.

I want to thank the committee for the opportunity to speak today.

My name is Alex Bettencourt. I'm the managing director of SmartGrid Canada. We're a national organization made up of the full spectrum of the power industry. Our members include utilities, key industry players, and academic institutions. We're proud to have Hydro-Québec, Hydro One, IBM, and the University of British Columbia, amongst others, as our members.

Many of you are probably asking, “What is a smart grid?” Simply put, a smart grid is bringing 21st-century technology to a 20th-century grid. There's a great anecdote about Alexander Graham Bell and Thomas Edison that we use in our industry in explaining the relative differences in the evolution of our industries. If Alexander Graham Bell were to see the telephone system today, he wouldn't recognize it, with all its computers and fibre optics, but if Thomas Edison were to come back and see the electricity system today, not only would he recognize it, but he would probably be able to fix it.

We find ourselves with an electricity system that has not evolved very much in the last 30 years. It has missed out on some of the opportunities of the new telecommunications and computing technologies. The smart grid will upgrade our electricity system with the latest technology, making it more efficient, resilient, and flexible.

A question that usually gets asked is, “Why do you need this smart grid and what is it going to do?” In Canada, one of the big drivers is reliability. This is a great week to talk about reliability because we've had such a good example recently. For 34 minutes on Sunday, millions of Canadians, more than seven million of them, waited for the power to come back on as they watched the Super Bowl south of the border. While we haven't isolated the cause of that outage, a smart grid could have prevented that outage entirely by rerouting power automatically from another feeder within milliseconds. If it weren't able to do that, it would have at least shortened the restoration time by providing more information more quickly to operators and engineers.

In 2011 Canadians experienced five hours of outages, on average, and these outages cost Canadian business and industry billions of dollars. When an average medium-sized business experiences one hour of outage, it usually costs them about $12,000 on average.

Another key driver of the smart grid is efficiency. About 10% of the power that's generated is lost on its way to the end customers, due to heat and other factors, and a smart grid can reduce these losses in energy that occur along the transmission and distribution systems. It can also help us isolate and identify energy theft so that Canadians are not paying for criminal activities through their hydro bills. Moreover, and specific to the mandate of this committee, it sets the foundation for our future needs in our electricity system.

Many Canadian provinces are blessed with hydroelectricity. However, some parts of Canada still rely on fossil fuel and nuclear power, and provincial governments are looking to reduce our dependency on these sources of power. They're increasingly turning towards renewables. As we cannot control when the wind blows or the sun shines, using these renewables on the grid requires much more intelligence and flexibility than our current one-way distribution system was engineered for.

The other major feature that the electricity system needs to prepare itself for is the electric vehicle. Now, there is a debate as to how quickly electric vehicles will be adopted, but we know that the cost of running an electric vehicle can be as little as one-tenth of the cost of running a gas-powered vehicle, especially in jurisdictions of Canada where electricity is inexpensive.

As technology and batteries get better and cars get cheaper, we will see more electric vehicles on the road, and although we don't represent the electric vehicle industry, we represent the utilities that are going to need to provide the electricity for them. We need to start being prepared for that. Charging an electric vehicle in your home can be equivalent to doubling your electricity demand. We're going to need a smart and flexible system that allows us to absorb all of this extra demand without doubling the size of our distribution system, which would be very costly.

There are also great economic opportunities from the smart grid in Canada, and great job prospects. Recently I had the opportunity to visit Brazil and meet with their utilities. I went to Rio and met with the local utility there, Light. It is a very large utility. Light serves the city and region of Rio de Janeiro, and it's going to be the utility that will serve power to the 2016 Olympics.

● (1540)

They took me to their boardroom, which is called the Sale Canadense, or the Canadian Room. It was Canadians who founded Light more than a hundred years ago. These Brazilians at this utility were very proud of the Canadian heritage they have at their company, and they had pictures there of all the Canadian leaders who were the initial leaders of the utility.

There was a time when Canada was leading in electricity technology in the world. There was a time when Niagara Falls was one of the biggest infrastructure projects. Canada is again being seen as a leader around the world and a model to emulate when it comes to the smart grid. We have delegations from China, Brazil, and Europe coming to Canada to meet with our leading utilities and companies to learn from our experience with smart meters and integrating renewable energy into our distribution systems.

There are many examples of new jobs being created through the smart grid. There's a small start-up company in British Columbia called Awesense Wireless that's making energy theft detection software and selling it into Brazil. There's a medium-sized manufacturing company in Quebec named Vizimax that's selling the new smart grid technologies into China and India. Another one of our members, General Electric, just completed its Grid IQ centre outside Toronto, and it's where they're focusing their smart grid engineering and manufacturing. All these companies are creating jobs in the smart grid sector for Canadians, and it's a great opportunity for Canada.

How can we get a smart grid? The building of the smart grid is primarily driven by utilities, and most utilities in Canada are owned by provincial governments and are regulated. The utilities themselves are facing a bow wave of assets that were built in the 1950s and 1960s, when we went through a round of economic expansion. These assets have reached the end of their lives, and it is now time for us to renew our infrastructure. The renewal of our infrastructure will take decades to accomplish and will cause electricity rates to go up as we invest all these new assets into our system.

We can replace them with the same old equipment, or we can take the opportunity, spend a little more money, and equip them with smart grid technology that will serve us for the next 30 years. Consumers will be provided more choice. Consumers will have more choice in how and when they consume electricity. Consumers and businesses will have the choice to produce some of their own electricity and sell it back to the grid. Consumers will have the choice to buy an electric vehicle and charge it at home or at work. Consumers will benefit from the higher reliability and the more efficient electricity system that comes from a smart grid.

All of these benefits will improve the lives of Canadians and set us as a leader in the world.

Many countries in the world are using smart grids to further their policy goals, be they national energy security, economic growth, or environmental targets. However, the burden of these policy goals is being placed on the ratepayer, when it was traditionally placed on the taxpayer. People are paying for it on their electricity bills. Although they're the same people, the taxpayer and the ratepayer, it makes utility business cases very hard to get past regulators to meet the economic policy goals of the governments.

While electricity is firmly within provincial jurisdiction, there is a role for the federal government to play. In the U.S., Korea, Europe, and around the world, governments are endorsing smart grids with official policies and plans. Korea has set out a plan where they will enable smart grids in all their cities by 2020 and across the whole country by 2030. It's a very ambitious plan. They've marshalled the entire industry and the government agencies around that goal. Now, I don't think we have the same type of economy that Korea does, but it's an example for us to learn from.

The Canadian government can provide leadership by setting a national vision. Many other countries have commissioned studies on the economic, national security, and social benefits of a smart grid, and we would like the support of this committee to coordinate a similar effort in Canada. We would like to bring together NRCan, the CEA, the provincial ministries of energy, utilities, regulators, and industry to create a national vision and bring it back to this committee for your consideration.

To accelerate investments in smart grids, the federal government can also improve the economics of the business case through tax policy, switching some of the burden from the ratepayers to the taxpayers. This can be accomplished in a few ways. One is accelerated depreciation classes for smart grid investments that utilities make, which has proven to be successful in the United States and India. Another is tax incentives for consumers who are looking to install smart grid appliances in their homes, things such as smart thermostats and controls for their air conditioning.

Lastly, we can use the resources of the federal government to promote Canada and its industry abroad, branding Canada not only as an energy leader, but as an energy technology leader for this century.

Thank you for your time. I'm happy to take any questions you have, now or later.

● (1545)

The Chair: Thank you, Mr. Bettencourt.

We do hear from all of the witnesses before we go to questions and comments.

We now go to the top of the agenda again. From the Canadian Energy Pipeline Association, we have Brenda Kenny, president and chief executive officer.

Go ahead, please, Ms. Kenny, with your presentation, for around seven minutes.

Dr. Brenda Kenny (President and Chief Executive Officer, Canadian Energy Pipeline Association): Thank you very much for having me here today. It's a pleasure to appear before you.

For those of you who are not familiar with the Canadian Energy Pipeline Association, we represent all of the major transmission pipeline companies in Canada. Together every day they ship more than 97% of all the oil and natural gas used across the country as well as for export, and together they operate over 110,000 kilometres of pipeline.

As we transition to support new sources of energy and smarter approaches to the conservation of energy such as those mentioned by our last presenter, pipelines will remain an integral part of the creation of reliable energy systems for Canadians, both enabling quality of life that we enjoy and tying our country together. Pipelines are fundamental to safe, reliable, and affordable energy today, and by most reasonable expectations will be required for many decades to come.

We make important contributions to the economy and to quality of life for Canadians. There are over $20 billion worth of investments currently planned, but that's just the tip of the iceberg, because in fact since we provide transport for the majority of energy produced and used, we actually are the enablers for vast numbers of further investments worth hundreds of billions of dollars.

On top of that, every day fully one-quarter of Canada's mercantile exports move through Canadian pipelines. One in four export dollars is thanks to pipelines. So we take this very seriously as a duty to Canadians. We recognize this type of infrastructure has a very high profile. Our performance is fundamental. We accept and welcome the scrutiny and are absolutely committed to more transparency and continuous improvement. We take great pride in our safety record, and in fact the Transportation Safety Board of Canada statistics indicate unequivocally that the frequency of accidents in pipelines is far lower than for any other mode of transportation. In fact, our industry is over 99.99% reliable, but we will not rest until we get to zero incidents.

I open with these comments today because the link to your study is our industry's ongoing commitment to continuously improve that service to Canadians, and safety is the first priority. So let's talk about innovation, because for us it covers technology; it covers knowledge sharing; and it covers system. I want to provide you with a view from a technology perspective first.

When you think about the life cycle of a pipeline, there are many services, contractors, and types of expertise brought to bear from outside pipeline companies themselves. In pulling them together, the first step in safety is to have advanced design, quality of construction, quality materials, and everything from welding to field testing. Getting it right at the beginning is very important. Across Canada, the technology innovation around these many services and sector components is very impressive.

Next comes prevention of any incidents during operations. The big technology news there is in-line inspection. Much in the way MRIs or CAT scans have had a revolutionary impact on health, we use in-line inspection technologies to detect any problems before they develop into major safety issues. We work with partners in advanced technology sectors to achieve that, and that is one of the largest commitments and largest investment areas.

Next, if there is a leak, we need to detect it quickly. Again, technology plays a big role there in the response, in terms of the types of science and techniques to unequivocally respond quickly and to fully and completely remediate any environmental issues that might have occurred as a result of that spill. I will say for the record that with today's technology, on average we're seeing cleanup rates in excess of 95% recovery, with environmental sign-offs by regulators within the course of no more than a couple of years, generally speaking. We want that to be even better, but that is a part of technology.

Exchanging knowledge and operating practices is something that Canadians require us to do. There are collective and collaborative efforts. Although our industry is a competitive one, I can tell you from the seat I'm in, in assisting with that collaboration, that there is firm recognition by the CEOs and others across this industry that anybody's incident is everybody's incident. This is no longer a space for competition.

● (1550)

Collaboration in safety is fundamental, and our association provides a very important vehicle in that.

We also work through groups like the Pipeline Research Council International, the Canadian Standards Association, and a variety of other industry groups with regard to various best practices.

One example that I want to highlight, where technology and innovation have had a very positive impact and where Canada has been in the lead, is with respect to something called “stress corrosion cracking”. This was an unknown phenomenon until the early nineties and mid-nineties. It was through Canadian efforts that the metallurgical challenge was well understood, the technology was advanced, and the best practices to manage it directly were improved.

The second example is with regard to knowledge sharing. We host in Canada every second year the International Pipeline Conference, and I can tell you, having travelled in Asia and Australia, that this is seen as the go-to conference for pipeline safety and innovation. Last year's conference, held in Calgary, had representatives from over 45 countries, with over 350 technical papers provided in the sharing of knowledge.

Finally, just briefly, systems are important. As you would have seen in innovation across many other sectors, a systematic approach to understanding where to move next and what to develop and push forward is fundamental. These management systems have been a backbone for chemicals, in Responsible Care, and for forests in forestry practices. The pipeline sector is committed to our own program, called CEPA Integrity First. This brings together leadership across the industry. The members of our board of directors, all executives from across the pipeline industry in Canada, are absolutely committed to this.

One other system I would point to is damage prevention. We will do everything in our power to advance technologies and improve safety records. At the end of the day, one of the growing concerns we have is that an excavator might inadvertently hit a pipe. The stats tell us that our near misses are increasing.

Fortunately, we've gone for decades without a single death in the public. Despite this massive industry under the ground in Canada—110,000 kilometres—we've had not a single public death. But we want to keep it that way. In damage prevention, regulation and innovation across the country are fundamental.

I'll close simply by restating that we take our social contract to Canadians extremely seriously. We are here to serve Canadian interests. If we weren't doing this with private dollars, we would probably be doing it with public dollars. This kind of infrastructure, handling over a quarter of our mercantile exports, is fundamental. Reliability and safety are embedded in technology and innovation as we move forward.

I look forward to your questions. Thank you.

The Chair: Thank you very much, Ms. Kenny.

We go now to Timothy Thompson, the representative of the Canadian Geothermal Energy Association. He's also chief executive officer of Borealis GeoPower Incorporated.

Welcome to you. Go ahead with your presentation.

Mr. Timothy Thompson (Representative, Chief Executive Officer, Borealis GeoPower Inc., Canadian Geothermal Energy Association): On behalf of the Canadian Geothermal Energy Association or CanGEA, I would like to thank the chair and the committee for the opportunity to address this issue before them today. As noted, my name is Tim Thompson. I am the CEO of Borealis GeoPower, one of the few geothermal companies operating in Canada and a founding member of CanGEA.

My intent is to directly address the questions put forward by the committee on behalf of CanGEA and the geothermal industry in general. I'm noting with a slight smile that I used to be in the pipeline business with TransCanada PipeLines, so there's an old connection here, but we have a very different situation in the geothermal industry relative to what we see with CEPA.

What is the current status of research, innovation, and technology development in the geothermal sector? Geothermal innovation and technology development in Canada are at this point insignificant. Some small initiatives are currently under way. With government assistance, CanGEA is pursuing some preliminary resource maps for western regions of Canada and also putting together a technology road map with respect to what might materially improve the delivery of geothermal projects in Canada.

My company, Borealis, is currently in discussions with the government over potentially funding a novel geothermal exploration methodology that would significantly change the risk-return profile associated with geothermal exploration. The total current government commitment to these initiatives is $100,000. This support stands in contrast to the situation in the United States where in fiscal 2012-13 the U.S. Department of Energy is spending $102 million on geothermal technologies and has invested in excess of $1.7 billion over the last 25 years for undeveloped resources that are markedly poorer in quality than those currently seen in Canada. The point is even more stark when we examine the commitment at the provincial and territorial level where the four jurisdictions with the greatest of the resources—those being B.C., the Northwest Territories, Yukon, and Alberta—are spending quite literally nothing to advance their development.

Our perspective is that this is unfortunate, not because of the limited budgets but because Canada is squandering our unique position of having significant geothermal resources and world-leading subsurface capabilities, especially when it comes to thermal reservoirs.

This brings me to the committee's second question: How does it compare to that of other countries, and in which areas is Canada a leader, and in which areas can it improve?

The first part of the question is on how the status of research in Canada compares to that of other countries. As Canada has both abundant resources and uniquely strong capabilities for developing them, the continued absence of any geothermal energy development puts Canada at the very bottom of the list when compared to other nations. There is simply no nation on earth with a worse record of development than Canada. To some degree, this stems from a wealth of good options. Historically, we've enjoyed a large supply of hydro and hydrocarbon options that most nations simply do not have access to and would envy. However, as those halcyon days are behind us, Canada's continued dormancy is to some degree inexcusable.

The second half of the question is about in which areas Canada is a leader and in which areas can Canada improve. Paradoxically, we have the opportunity to become a global leader in geothermal technology development. As one of the world's largest mineral and hydrocarbon producers, we have internal capabilities regarding subsurface exploitation that few nations can match. Further, our experience in the oil sands in situ production has provided a wealth of significant learning with respect to thermal operations and thermal reservoirs that would provide a unique capability and advantage if it were repurposed to deliver geothermal energy.

It is our view that Canada could quickly improve from worst to first in the areas of geothermal exploration, thermal reservoir mapping and modelling, thermal field management, and geothermal drilling and completions. Further, given our inherently cold winters, we would also expect to see leadership around the constructive use of byproduct heat generated by any geothermal power plants.

The committee's third question was what the most promising innovative technologies that could be implemented in the near future are. Our view is that there is a gamut of existing technologies that could be repurposed into geothermal applications. This does not mean that we have market-ready solutions but rather that we have technologies that we have demonstrated as having value for hydrocarbon applications, which, with some work and relevant field trials, could materially change the economics related to geothermal resource exploitation.

As noted earlier, Borealis is currently engaged with various arms of the government in demonstrating one such technology. However, the opportunity is broader than our single project and covers a wide swath of subsurface activities including subsurface imaging and processing, exploration methods, reservoir modelling software, field management algorithms, well bore designs, completion designs, and drilling technologies.

● (1555)

What are the main challenges or barriers to innovation development and deployment of new technologies in the respective energy sectors? In Canada and in the geothermal sector, there are a number of challenges holding up innovation and development. First is clear resource rights, and I'm speaking directly, if you will, to the national resources component of this committee. British Columbia is the only jurisdiction with legislation recognizing geothermal rights. However, in this context when and if permits are obtained, they are typically issued in a form that is not actionable, i.e., all first nations claims are not resolved with respect to resource development. This means that a developer with a permit cannot move their project forward but first must address relevant first nations claims in the area. The only other jurisdictions that have recognized geothermal rights in any form are the Northwest Territories, which has developed a framework for granting one-off permits through the Mackenzie Valley Land and Water Board, and Saskatchewan, which is about to allow a geothermal demonstration project to proceed outside of Estevan, Saskatchewan.

The second barrier is the risk-return ratio that we see on investment. A geothermal energy project can be the low-cost energy producer in many regions; however, the risk-return profile of the sequence development steps usually identifies a chasm that equity investors are predominantly reluctant to bridge. As development timelines are often unclear, mostly as a result of permitting issues, any heat sales contracts are added post factum, meaning that the project must stand alone on its power sales, despite the fact that it could often deliver anywhere from six to 10 times this volume of energy as additional and often very valuable low-grade heat.

From a technology perspective, current geothermal exploration methods do not represent the best available option. When this fact is played against the potential returns from sales into a power market, which has very different return levels from those of hydrocarbon markets, we find that the early risks are not warranted by future returns. The upshot is that funding for geothermal exploration is virtually unavailable in today's investment climate. However, it's not as if there isn't a market for funding subsurface exploration. With the right technological advances, we believe the risk-reward opportunity could be broadly engaged by Canada's financial markets.

The third barrier is the development timeline. Geothermal energy projects take longer to develop than natural gas, diesel, wind, or solar projects do. Their average development timeline is six to seven years. In a context where large crown corporations or individual projects offer up blocks of power for bid on a three- to four-year development timeline, geothermal never gets an opportunity to secure an EPA or a PPA. As these agreements represent the fundamental bankability of any project, i.e., its ability to obtain financing, this virtually precludes geothermal from participating in Canada's western energy markets, unless a direct bilateral deal could be negotiated, and the latter is often precluded on the basis of fair procurement practices.

The last significant barrier is entrenched perspectives. While it is difficult to quantify, there's a clear bias to developing what you know, even when the facts clearly demonstrate that better alternatives exist. The most glaring example of this is Site C in northeast British Columbia, the last big dam for BC Hydro. BC Hydro stated that this is the best long-term development option for delivering low-cost power in British Columbia. However, northeast British Columbia is home to some of the best geothermal resources in Canada—and, by the way, the best in the world—and we strongly dispute their claim.

Site C currently has a capacity of about 900 megawatts, and would be developed at a capital intensity just shy of $9 million per megawatt. According to BC Hydro, with a load factor of 51%, it will have an average cost per megawatt hour of $87 to $95, and it has a large environmental impact.

The hydrothermal and geothermal options existing in northeast B. C. have a capacity of 1,500 megawatts, at a capital intensity range of between $5.5 million and $6 million per megawatt, with load factors greater than 95%, delivering power at an average cost of $67 to $75 per megawatt hour, with a minimal environmental impact. In every important metric, geothermal is a superior option to hydro, but it is not even being addressed in B.C.

The last question was on the role the federal government can play in strengthening the foundation of energy innovation in Canada, in particular in the geothermal sector.

We at CanGEA would recommend that the Government of Canada adequately support CanGEA's efforts to map Canadian geothermal resources and prepare a technology road map and implementation plan. The American experience has shown that investment in clearly identifying the resources and relevant new technologies is of net benefit to the state. CanGEA proposes a similar model for developing our own geothermal resources.

We also recommend that the Government of Canada directly invest in exploring and developing geothermal resources, and specifically construct the first geothermal power plant in each significant resource, and do so with each significant geothermal technique. Geothermal resources are not homogeneous; they differ quite extensively in quality and kind.

● (1600)

As such, there is a distinct set of techniques that address the exploitation of heat in each of the different reservoirs.

The demonstration of the reserves and the technology and its potential to materially impact power and heat markets would be a bellwether for follow-on private investment. We are advocating direct investment, as the various public and private partnering models lack the sufficient wherewithal to overcome relevant institutional barriers related to being the “first of” application of a technology that’s new to Canada.

The industry, and I have some personal experience in this, has shown that these models are insufficient to move projects ahead. Against this backdrop, we comprehend the need for the federal government to manage the public purse in a fiscally prudent fashion. Accordingly, we would advocate for purely federally owned plant developments, which the government would commit to sell in the private market after their fifth year of operation. In this way, the government could seed the market, exit appropriately, and likely make a decent return on the public investment.

In summary, CanGEA has identified that at current market pricing we have approximately 5,000 megawatts of immediately developable geothermal power generation in Canada. In turn, this implies approximately 15,000 megawatts, at a minimum, of usable geothermal heat. This is 100% green, no greenhouse gas emissions, baseload energy with extremely high availability, which, when managed properly, is renewable on a geologic time scale.

Further, recent work by the Geological Survey of Canada suggests that geothermal energy could become the largest single source of green energy in this nation. It is our view that all that's lacking is the serious commitment from various levels of government that this is a prize worth reaching for.

Our request is that the Government of Canada commit to developing its geothermal resources on a par with other commitments made to new developments in the Canadian hydrocarbon, mining, or even green energy markets.

Thank you for your time.

● (1605)

The Chair: Thank you, Mr. Thompson.

We go to our final witness for today. We have by video conference from Edmonton from TransAlta Corporation, Donald Wharton, vice-president, policy and sustainability.

Welcome to you, Mr. Wharton. Go ahead with your presentation, please.

Mr. Donald Wharton (Vice-President, Policy and Sustainability, TransAlta Corporation): Good afternoon, Mr. Chairman, and honourable committee members. Thank you for the opportunity to talk to you today.

In addition to speaking on behalf of TransAlta Corporation, I'd also like to speak in a second role that I hold, which is the chair of the Canadian Clean Power Coalition in Canada, an industry-government group focused on developing new technologies for clean use of fossil fuels in the generation of electricity.

TransAlta is Canada's largest investor-owned electricity company, with a broad portfolio of fuels, both renewable and non-renewable. We do business in five provinces in Canada as well as the U.S. and Australia.

I'd like to focus my remarks today on the innovation in the generation of electricity as a key part of our business. Let me begin with the observation that the electricity sector has historically been slow to innovate. Historically, we construct large, purpose-built capital stock, largely determined by the region in which we're operating, and often driven by regulation which requires us to ensure the lowest cost power to consumers.

However, this paradigm is changing for several reasons.

First, the cost and performance of various generation technologies are converging. This is a function of newer technologies providing better performance and, in some cases, lower capital costs per megawatt installed. Generation companies like ours now have tougher decisions to make in selecting a technology and a fuel type that we will live with for the next 30 to 50 years.

Second, externalities introduced by governments in response to public demands have become much more important in the selection of generation technologies. I'm thinking specifically about environmental requirements and objectives to build more renewable energy.

These are admirable goals, but they do change the historic practice of utility companies, which has historically been focused on selecting the lowest cost near-term technology for consumers.

Finally, a factor of change is the introduction of new innovative generation technologies, which is accelerating in pace and complexity. Examples are long, but include things like high-pressure combustion, oxy firing, biomass torrefaction, gasification, underground production of syngases for power production, hydrogen-fired turbines, high-performance wind turbines, new run-of-river turbines, and tidal power, not to mention emerging thermal and PV solar technologies.

Let me note at this point that most companies in the electricity sector in Canada are not in the business of developing new generation technologies. In fact, the companies that do so are large international companies often much bigger in scale than utility companies here in Canada or for that matter in the United States.

What our companies do is focus on the adoption and cost-effective employment of these technologies. Let me give you some examples from TransAlta's perspective of how this might work to give you a sense of context.

We don't develop mercury capture technology, but through intensive experimentation, we have learned how to optimize its performance in terms of the use of catalysts and additives that result in lower costs and better performance.

We don't develop monitoring equipment for wind machines, but over the past two years, we developed, installed, and operationalized smart wind monitoring systems that have allowed predictive analysis on maintenance requirements, meaning less downtime, fewer major equipment issues, and a great ability to be able to predict problems before they occur.

We don't develop carbon capture technology, but we did lead extensive design work to explore and aggregate components, carbon capture, and pipeline sequestration; and enhanced oil recovery in order to understand the technical and financial aspects of carbon capture and storage.

We don't build coal-fired boilers, but we did develop a new device using digital radiography technology that dramatically changes our ability to check for boiler leaks during shutdowns, resulting in our ability to view not 100 pictures from radiology today but somewhere in the order of 17,000 pictures per day, and allowing us to again avoid potential future leakages and downtime.

● (1610)

That perhaps gives an idea of how many utility companies in Canada actually look at innovation and technology more as deployment as opposed to development.

Let me also talk about some of the work we are doing through the Canadian Clean Power Coalition. This coalition involves joint RD and D work, which also, by the way, has a partner, through the Natural Resources Canada CANMET laboratories. That is becoming a great partnership.

This organization, which I chair, is looking at things like biomass coal-firing, being able to reduce emissions associated with power generation in conjunction with other fossil fuels; and coal beneficiation, in order to improve coal, for example, before it's combusted, such that impurities are removed, emissions are reduced, and that sort of thing. Underground coal gasification is another area of study with this industry-government group, which has proven, remarkably, to be of interest to many of the members, in terms of being able to produce synthetic gas underground prior to production and use that synthetic gas as fuel for power generation. I believe that's a model for us to continue to look at new developments, in a joint and leveraged fashion, in the electricity sector.

Let me make a couple of points about things that drive innovation in our sector, or perhaps that sometimes don't drive them. The first is to know that, almost without exception, new generation costs more than existing generation on a megawatt-hour basis. This is important because utilities' traditional responsibility to keep electricity prices low creates an interesting dynamic as to whether to maintain and extend the lives of existing generation units and technologies as opposed to investing in new generation technologies that would perform better but at a higher cost.

This is not an issue to be taken lightly. In many jurisdictions in Canada, our sector is regulated by governments that are also the owners of the utility. Whether utility companies in these regions can adopt new, more expensive, generation is largely a factor of whether their governments will allow these costs to be added to the rate base. In more competitive markets, such as Alberta, and to some extent Ontario, this issue is slightly different. There, the markets determine the price and therefore the economics of alternative forms of generation of power based on supply and demand. Choice of generation fuels and technologies is made on forecasts of future power prices; the costs of fuel; and trade-offs between low-capital, high-operating technologies like natural gas, or high-capital, low-operating technologies like hydro.

Let me close by talking briefly about what we see as the role of government in supporting innovation in the electricity generation sector. I think there are some very clear areas where the government is already performing, and perhaps continued emphasis in these areas would be beneficial.

First of all, I would ask that the government continue to support participation in international trade and technology dialogues with other countries that develop generation technologies. I'm thinking particularly of the U.S., Japan, Korea, and Germany. Those have proven extremely useful to industry, in terms of maintaining an active dialogue about new generation technology; to us, as users and deployers in a cost-efficient way; and to those countries as developers of these technologies.

Second, I would encourage the government to continue support for the leading work being done by the CANMET laboratory of Natural Resources Canada. They are truly a world-class organization and are doing some brilliant work in terms of developing and exploring and researching new generations. I believe that work needs to continue.

Finally, I would ask that the government continue to support joint industry-government collaboration in specific areas of development, such as carbon capture and storage, wind technology, and through associations like the one I chair, the Canadian Clean Power Coalition.

I think there's also a role to ensure that our energy policy and strategy for the nation is consistent with and cognizant of environmental policies that we wish to install within the country.

● (1615)

We believe it's extremely important to make sure those things are done hand in hand as opposed to separate streams.

With that I'd like to close and I look forward to your questions.

Thank you very much.

The Chair: Thank you very much, Mr. Wharton.

We go now to questions and comments.

We have Mr. Leef, Mr. Julian, Mr. Nicholls, and Mr. Hsu in the seven-minute round.

We'll start with Mr. Leef; you have up to seven minutes. Go ahead, please.

Mr. Ryan Leef (Yukon, CPC): Thank you to all of our witnesses today.

My first bit of questioning is for Mr. Thompson. I'm keeping in mind a couple of the points that I picked up from Mr. Wharton in terms of new generation costs being more than those of existing technologies, an issue not to be taken lightly in terms of determining where the government and where even individual industries invest in what they do. My question will eventually round back to his assessment of hydro being high capital and low operating. I'm just wondering if that will be a similar reality for geothermal.

In the Yukon right now, the interest in geothermal has primarily been focused on heat pump systems. I can think of the town of Mayo as an example for the Na-Cho Nyak Dun First Nation. An investment of about $3 million is going into a project that's going to provide housing energy and efficient, sustainable, low-cost central heating for the houses there.

Currently I know the city of Whitehorse uses low-grade geothermal resources as does Mayo to heat their pipes in the winter to keep them from freezing. There's been an investment in the exploration of an artesian well in Haines Junction for geothermal exploration. Certainly we've been familiar with geothermal energy in the Yukon for a long time with the Takhini Hot Springs and there it is right in front of you. This heat energy is used to heat the buildings but hasn't really exploded, although there's been significant investment by the Canadian government and the territorial government in some geothermal projects in Mayo and Haines Junction.

When you look at the studies, and I'm not sure if you know these well, Mr. Thompson, but the Yukon is estimated to have around 500 to 1,500 megawatts of geothermal energy available for electricity production, which is substantial.

Without straying too far from our innovation aspect of this study, I'm wondering what the future looks like in terms of innovation that may bring down those capital costs. Is that what it will take or is it, in your assessment, purely a political and social drive to move to that geothermal technology that exists there? Or are we going to see some positive innovative shifts that might have the territory move in that direction to maximize those 500 to 1,500 megawatts to take advantage of the approximately 13 geothermal wells right in the Yukon, eight in northern B.C. along the border, and another 18 that are close to the Northwest Territories/Yukon border?

I guess that's all combined with the reality that mining is really exploding up there, an opportunity. So they're looking for more affordable, greener, cleaner ways of providing energy to the mines. It seems like an opportunity that would be ripe for private investment. I know there's not a really specific comment there. This is not a specific question, but I'm wondering if you have any comments on that? Where do you think we go from here?

● (1620)

Mr. Timothy Thompson: Mr. Leef, thank you. It's almost as if you've planted the witness.

I've done a geothermal study for the Takhini Hot Springs for David Morrison of the Yukon Energy Corporation. I've also been retained by the Na-Cho Nyak Dun to examine the geothermal potential of Mayo.

I can unequivocally state that using current technologies, the supply side for electrical power in those regions using geothermal ranges between 11¢ and 13¢ per kilowatt hour, depending upon the development scenario. That is using what we would call fairly standard development packages from a technological perspective.

Our belief is that with some innovative exploration techniques you can reduce the number of basically dry wells, which is the only removable expense, and to some degree with some new materials you can have more efficient heat exchange. Our expectation of the upside would be something on the 3¢ to 4¢ range, say 10 years from today. So I would expect the geothermal resources in your region would be able to produce in the 7¢ to 9¢ range all in.

Now the issue we have with regard to the market in Whitehorse—and this is an issue that Mr. Morrison is struggling with—is both on the demand side, which of those mining projects are going to show up, and where, because geothermal is a very resource-based activity, so to some degree we're beholden to paying attention to where it is. Also there are a few very low-cost hydro options that are in the 7¢ to 8¢ range that he might be pursuing, but with differential environmental impacts.

So trying to address the strategic thrust of your question—whether this is motivated by a move to green—I don't think so. I think geothermal needs to be cost-competitive with all forms of supply, and if it can't be all in, it shouldn't be entertained. However, there are many places in the Yukon where it is the most cost-competitive form of supply, and we're currently in discussions with Yukon Energy Corporation.

In terms of the sidebar with regard to private investment in the Yukon and the Yukon power sector, that's somewhat problematic because it's run by a crown corporation. So until that mandate is relieved or adjusted or negotiated away by the Government of the Yukon, we are not permitted to invest in energy facilities in the Yukon.

Does that answer your question?

Mr. Ryan Leef: Yes, that does. Thank you for that. That's helpful.

I have a little bit of time, one minute, so I'll make this fast.

Ms. Kenny, I'm glad you noted the response rate's being about 95% recovery when we're talking about spills. The safety record is one thing, and then people think you can have a 99.9% safety record, but what happens to that 0.1%? How great an impact is that?

I just wonder if there are technological differences between land recovery, water recovery, or different environmental recovery statistics that you could provide us a little insight on.

Dr. Brenda Kenny: That's a great question.

Yes, when it comes to emergency response you need to be very clear about where it is happening. Is it on land, is it on water, what type of water, what type of land? There are technologies well suited to each type.

I can tell you that for the large transition pipeline companies, their emergency response plans take all of that into account. Their stashes of specialized equipment, their training of staff, their collaboration of training with other emergency responders in the areas affiliated with the potential for any kind of leak or a spill take all of that into account. They are heavily regulated and checked. The exercises are done routinely.

What's interesting is to see where we can go next. I do think we are continuing to press forward on various remediation techniques and knowledge. It was only 20 years ago that I remember some very large pipeline companies creating their own bioremediation sites. In simple terms, that is taking oily soil and putting it into a well-controlled, contained compost heap and monitoring it until the microbes have done their job in breaking down long-chain hydrocarbons.

The substance and the science of it is well known. The practice of advancing those within the field and making sure that they get continuously better is something we're paying close attention to.

● (1625)

The Chair: Thank you, Mr. Leef.

We go now to the NDP. Mr. Julian, for up to seven minutes.

Mr. Peter Julian: I'll be sharing my time with Mr. Nicholls.

Thanks to all the witnesses for their very interesting presentations.

I'd like to start with you, Ms. Kenny, particularly around the issue of safety innovations with pipelines.

I represent a province, as you know, that has real concerns about a possible proposal around Northern Gateway, and I think it's fair to say that pipelines, to a certain extent, have lost their social licence, at least in my province. There's a strong reaction from the public, and the reasons are quite valid. When we look at the Transportation Safety Board statistics on incidents, we've gone from about 30 incidents a year in 2002 to about 145 incidents in 2011. These are oil spills that are happening with increasing frequency, unfortunately, particularly larger ones of more than 1,000 cubic metres.

As far as safety innovation is concerned for the industry, people talk about double walled, they talk about pipe rotation, and they talk about a more rigorous replacement regime. From the industry standpoint, what do you think are the innovations that need to be brought in so we can turn this record around?

Dr. Brenda Kenny: Thank you for that.

First of all, just as a point of clarification, certainly the number of reported incidents over time have, in some cases, gone up. These do not all represent oil spills. The vast majority of them are within contained property and many of them are equally gas and oil. I would also point out that the rigour with which the industry has stepped forward to ensure that all reporting is handled means that you will see a pipeline company phone in if they see a smudge of oil on a valve stem, so the analysis of what these actually mean is very important before people get too alarmed.

I would take exception to your statistics with regard to the larger incidents. They are very few in number. Last year there was only one. We've had many years of zero. Granted, 2011 was an exception. There were five, and only one of those was a large spill.

First of all, yes, of course, I have deep sympathy for the concerns being expressed within your province in particular, but what we are doing specifically is both education and technology. On the technology, the detection from inside the pipe, just like the analogy of the medical technologies, is one of the most important breakthroughs. It has resulted in increasing safety in the sector over the last couple of decades and we're nearing some further breakthroughs in terms of the sensitivity of those instruments to guard against any unknown defects creating a problem.

Mr. Peter Julian: You didn't answer my other question around double walled or pipe rotation and a more rigorous replacement regime. Are those things that the industry is looking toward as well?

Dr. Brenda Kenny: I would say that I've not heard of people looking seriously at double walled. That's a suggestion that is put out there without a clear understanding of what the actual safety risks are.

As far as retirements are concerned, the aggressive use of management systems and those internal technologies give us very good insights in terms of understanding which parts of the system can be safety maintained and run, and which would deserve some early retirement. We're very well aware of those and they're heavily regulated.

Mr. Peter Julian: Okay, thank you.

I'll turn the floor over to Mr. Nicholls.

Mr. Jamie Nicholls (Vaudreuil-Soulanges, NDP): Mr. Bettencourt, the smart grid technology sounds very interesting. Has your organization done a cost-benefit analysis or value-for-money analysis for implementation of a smart grid to show the economic benefits that would come from this?

Mr. Alex Bettencourt: We have not done a study on the economic benefits for Canada. That's one of the things we want to ask for, and it's something we've already started to talk with NRCan about, doing an economic benefits analysis for Canada. Other studies we have done for the U.K., the U.S., but it's a large study and we need a lot of stakeholders engaged. That's one of the activities we have planned for this year—

● (1630)

Mr. Jamie Nicholls: With the collaboration of the federal government, it would give a clearer picture, basically a vision for the future for updating those assets, correct?

Mr. Alex Bettencourt: Yes.

Mr. Jamie Nicholls: Thank you.

Mr. Thompson, thank you for your testimony as well. It illustrates some of the gaps in the progress of the energy sector, certainly in innovation, and where we need to improve, and that's part of the purpose of this study.

In terms of geothermal mapping and modelling, there was a 2008 study done by one of your members, Michal Moore, of the Institute for Sustainable Energy, and the result of that study was that the federal government should commission a Canadian national survey to give companies a better idea of where they might best locate geothermal projects.

I think I heard correctly, but were you suggesting that the federal government give federal-backed loan guarantees to utilities wishing to explore geothermal projects such as they did with the Lower Churchill Project in Newfoundland and Labrador?

Mr. Timothy Thompson: I'd like to clarify something about Dr. Moore's study: he's not actually a member of CanGEA, he's a member of the ISEEE Group. However, he's a very august member of the geothermal community. With regard to his conclusion, yes, he is advocating that Canada engage in a significant mapping exercise. The expenditure that would be associated with that would be something on the order of $250 million.

With regard to loan-backed guarantees, while welcome at any corporate level, they won't necessarily unlock the development deadlock we have. I think there would be issues with higher priority projects.

Does that address your question?

Mr. Jamie Nicholls: Yes, thank you.

During the 2008 period, when that study came out, Shell was interested in looking at geothermal for oil sands operations, but it said it was about a decade away from realizing geothermal for oil sands production.

We're five years in from that prediction of a decade away. Do you think there's been any progress? Has Shell stayed interested in the idea of using geothermal?

Mr. Timothy Thompson: This may not be part of your briefing notes. In the intervening period, Shell has essentially backed away from the oil sands. It has reduced its contingent in Calgary with regard to heavy oil by approximately 90%. It's just maintaining its existing plants.

With regard to use of geothermal energy in the oil sands, it really was an inverted application, where it would be applied in a cooling function, to recapture the energy that comes up with the hot oil or hot bitumen in the separation phase. I don't think we've seen any material progress on that front.

The Chair: Thank you, Mr. Nicholls.

We go now to Mr. Hsu.

Mr. Ted Hsu (Kingston and the Islands, Lib.): The first question is for Mr. Wharton. Let me point out that I think I share something with some of my colleagues across the way, which is that TransAlta is generating electricity in my riding.

I want to talk about something that researchers in my riding have been working on. You mentioned using biomass in coal-fired power plants. One of the important issues in Ontario, economically speaking, is the availability of water transport for biomass, to make it economical to transport the biomass to the existing coal-fired plants.

I think a lot of your generation is out west and doesn't have the kind of water transport you might get on the Great Lakes. Is that a correct economic assessment of using biomass to replace coal-fired generation out west?

Mr. Donald Wharton: Thank you. That's a very insightful question.

The answer is yes. In fact, we've looked at using biomass in our coal-fired plants in Alberta. Clearly, the biggest factor is the transportation cost and logistics of moving biomass. We're talking about huge volumes. To give you an example, one coal-fired power plant might look at a volume of 200 or 250 truckloads of biomass to supply approximately 10% to 15% of the daily energy requirements to a typical coal-fired unit. So transportation is extremely important.

You're correct, we haven't looked at water transportation. I believe that if one could solve that problem, with water as a transportation vehicle, it would go a long way towards overcoming some of the economic barriers that face coal-firing today.

● (1635)

Mr. Ted Hsu: I'll just mention something. This is not a question. Researchers in my riding have also looked at using pipelines to transport pellets of biomass in water from one place to another, so there's a lot of potential innovation.

Mr. Thompson, I want to understand a little bit better the number one request of the federal government, which is to help with the mapping of geothermal resources. Natural Resources Canada has mapped the wind resources on a large scale. For people building turbines, they need to measure wind resources on a smaller scale. That's very valuable on a proprietary basis.

I'm wondering if you could clarify for me if the same thing exists for geothermal resources, whether there's a place for Natural Resources Canada to do some large-scale mapping. Then, whoever's going to try to develop and finance a project might be responsible for the shorter-length scale mapping, the cost, and the value of it.

Mr. Timothy Thompson: Thank you very much, sir.

I understand that your question comes in two parts. The first part is, is there a role for NRCan to play? Absolutely. NRCan has some of the most well-informed and educated thermal geoscientists in the country, and we've always enjoyed their participation in the geothermal sector and would like to continue to do so.

With regard to mapping, the value to private corporations such as mine of very general maps is very low. Effectively, they tell me things such as there is heat in tectonically active areas, which is a very pedantic statement. At a certain level you need to go granular and when you go granular, it gets very expensive.

I would suggest that the way to do that is with a series of pilots. No one corporation seems to want to take the lead with regard to significant exploration expenses in this regard, but if the government were to prove that it could work in one instance, I think the industry would wake up, as we have seen in the United States. Does that answer your question, sir?

Mr. Ted Hsu: I think so, but it's suggesting to me that it's really proprietary knowledge to know a detailed map of thermal resources, and so it might not be good for the public sector to pay for it. Am I mistaken?

Mr. Timothy Thompson: I would define what's good for the public sector as being good for Canada and whatever creates a net benefit for the country. If the development of the geothermal sector, through some seeding efforts of the Canadian government—similar, for instance, to what we saw in the wind market—are to the net benefit of the country, I would define benefit that way, if you will.

With that in mind, I think there is a real role for the federal government to play.

Mr. Ted Hsu: Okay, thank you very much.

The last question is for Mr. Bettencourt.

I was intrigued by the possibility of exporting all the technology related to tools to run a smart grid. I know that smart grids are becoming more and more important as we have distributed generation from renewable energy.

I'm wondering if you can quantify or expand a little on your remarks about the possibility of developing that particular sector of our economy for export.

Mr. Alex Bettencourt: Sure.

The same renewal of our infrastructure that we're facing in Canada is also being faced in the United States and in Europe. They estimate that we'll spend tens of billions of dollars renewing our electricity infrastructure in Canada, hundreds of billions of dollars in the United States, and hundreds of billions of dollars in Europe.

Because these utilities are already spending these massive quantities of money renewing their infrastructure, and they will over the next 10 to 20 years, now is the opportunity to set the technologies that are smart grid, that are going to ride that wave of investment over the next 10 to 20 years. That's one of the reasons why a country like Korea, which has very few natural resources and has to import almost all of their energy, really sees the smart grid as a way of improving their national energy security, but also, if we make the technologies, we'll be able to sell these technologies abroad for the next 20 years, and that's a real cornerstone of their policies.

For Canada, I think the real opportunity is for us to take the investments we've already made. In Canada, we're also fairly unique in that our utilities are mostly publicly owned across the country; Hydro-Québec is owned by the Province of Quebec, BC Hydro is owned by the Province of British Columbia. These are crown corporations that are for the public good and they've already started to make investments in smart grids. Because of that, we have a nascent industry of smart grids in Canada that got early investments because of the early smart meter implementations in Ontario and B. C. and the early integration of renewables in Ontario.

Because these companies had real world experience cutting their teeth on Canadian markets, now is a good time to get in front of those other world markets so they can take advantage of it for the next 20 years.

● (1640)

The Chair: Thank you very much, Mr. Hsu.

We go now to the five-minute round starting with Ms. Crockatt, then Mr. Calkins, and then Ms. Liu.

Go ahead, please, Ms. Crockatt.

Ms. Joan Crockatt (Calgary Centre, CPC): My question is for Brenda Kenny. Hi, Brenda.

I think my friend talked about social licence to operate, and I'm wondering if you can let us know what innovations your members have undertaken that actually give you a social licence to operate.

Dr. Brenda Kenny: I think anything that goes toward transparent, effective improvements in performance contributes to social licence to operate. That is exactly the path we have been on for a number of decades, and the numbers are clear. At this point, we need to continue that journey and press forward, particularly on prevention of incidents. They are driving towards zero, and that's our goal.

We need to help people have that information available to them, so in our world we have launched something called aboutpipelines.com, a go-to place for pipeline information. We'll continue to host the international pipeline conference every second year in Calgary, which is the world go-to pipeline conference, and—

Ms. Joan Crockatt: Excuse me. May I interrupt you?

Dr. Brenda Kenny: Yes.

Ms. Joan Crockatt: Can you tell us specifically what the public does not know about the innovations, which I know are ongoing and myriad? What don't they understand about the way pipelines are being operated today in terms of innovations?

Dr. Brenda Kenny: Firstly, I think that for many folks in the public, pipelines have been out of sight and out of mind for so long that they have never really understood the scale of them, and that's our fault.

They've also been subjected to some terrible myths, one of which is the diluted bitumen myth, which is ridiculous. We almost never get any problems with internal corrosion. We absolutely do not get any problems with abrasion. All the sand stays in Fort McMurray. The bumph around diluted bitumen has been a construct purely to breed fear. I think that also undermines the social licence to operate, which I suppose was probably the design of that action.

For ourselves, first and foremost, innovation on continuing to improve the quality of materials going into construction and the internal line inspection to know exactly what we're targeting for maintenance. All of that information is readily available, and we're happy to answer any questions on it in detail.

Ms. Joan Crockatt: Okay.

Now, can you tell me, if you do have a release.... I understand you've said that the numbers of your releases have gone way down and that the amount now being reported is a very, very small amount, so people might have a view that it's more than it is, but what is the recovery rate of oil that your members can deliver if there happens to be a spill?

Dr. Brenda Kenny: We are working on getting clarity on that number. We have initiated case studies that are telling us the numbers are pretty good. The numbers are available through regulators who oversee any and all cleanup, even in a large incident such as the one in Michigan, outside of Canadian territory, but nonetheless a very proud and stable Canadian company, Enbridge. It's in a state of remediation, where sections of that river are progressively being cleared, and then they are approved by their EPA regulators as clean.

In the work we have looked at so far, we see that the majority of cleanup is a very high percentage after just two or three years. We want to gather more and clear evidence of that and make sure it's transparent to the public. We are still working on that now. We're not going to hide anything. We just have never, at an industry level, tried to pull those numbers together.

● (1645)

Ms. Joan Crockatt: We don't actually have a number for that right now, then, the cleanup percentage that you're at now.

Dr. Brenda Kenny: What I can tell you is that of the case studies we have done, the two more significant Canadian incidents that we looked at were close to 95% recovered after two years, but I would not want to count on that as an unequivocal figure on average. Of the cases we've looked at so far, that's what we're seeing.

Ms. Joan Crockatt: Okay. I want to go quickly because I have two more questions that I'm hoping we can get to.

Is it in your self-interest as pipeline companies to operate them safely?

Dr. Brenda Kenny: Absolutely, yes. Our shippers need us to be reliable. It is absolutely the ethical thing to do. These people wake up every day and that's what's on their minds.

Let's face it. A spill is extraordinarily expensive, not only for the shutdown entailed, but of course for the cleanup, to do it well, which we're committed to doing right through to the end. It's the kind of cost that people will work very, very, very hard to avoid. So even in the most crass sort of corporatist view, which is, I can tell you, not at all the only thing on people's minds—there's a lot of responsibility that goes into this—the actual dollars and cents drive you to push forward on these innovations.

We have to get to zero. It's the right thing to do and it saves money.

The Chair: Thank you, Ms. Crockatt. Your time is up.

Mr. Calkins, you have up to five minutes. Go ahead, please.

Mr. Blaine Calkins: I'm going to ask Ms. Kenny some questions and if I have some time, I'll go to you, Mr. Thompson. I've got a couple of questions about the testimony that you gave.

To the other two witnesses, you did a great job, but I've only got five minutes and I don't know if I'm going to be able to get to you. But thank you all for coming.

Ms. Kenny, are you familiar with the report by the Canada West Foundation that says the projects that we're not getting done cost anywhere between $30 million and $70 million? This is called the pipeline squeeze. Are you familiar with that report?

Dr. Brenda Kenny: I am somewhat. I've not read it in detail but I'm certainly aware of the general issue.

Mr. Blaine Calkins: Are your member companies able to keep up with today's current market demand?

Dr. Brenda Kenny: Clearly, no. I think it's well understood that there is a market distortion due to a shortage of pipeline capacity at this point in time that is costing Canadians billions of dollars every year.

Mr. Blaine Calkins: And that's a cost directly associated to our economy. People could be at work supplying that demand, and of course, this artificial demand that is being created by a lack of ability to get product to market is increasing costs for consumers as well. Is that correct?

Dr. Brenda Kenny: Yes, that's correct. What is happening right now on any given day—and the numbers change depending on the price of crude, but for the sake of argument this is what happens on a typical day—we are essentially giving to our American friends $40 million of Canadian dollars. We're getting ripped off and that money in sum total through the year leads to many billions of dollars being either tax revenue or recycled and reinvested.

Let's keep in mind that for the upstream oil and gas, as I've been told—you can confirm this—the cash flow reinvestment rate is the highest of any sector in Canada, upwards of about 80%. So when you see tens of billions of dollars flying down south of the border, that's a reinvestment that is a direct job creation that is lost to Canadians forever.

Mr. Blaine Calkins: Thank you.

You touched on line location being an issue. Most of the incidents that have happened recently have probably.... I don't remember this... a catastrophic event being caused by a rupture from excavation or whatever the case might be.

Line location is very critical. As an Alberta MP, I know lots of line location companies are out there. Can you speak a little bit about any advancements in the technologies for line location or geographic information system mapping so that we know where the pipelines are? Have there been any innovations in leak and pressure detection which would increase or speed up the response to a loss of pressure event in the pipelines, which would then reduce the amount being spilled?

And Mr. Thompson, if there's time left over and if my more than gracious chair doesn't cut me off, you talked about unsettled land claims being one of the issues that's a barrier to economic development for geothermal. Could you elaborate on that for me, please?

● (1650)

Dr. Brenda Kenny: I'll try to be quick to leave Mr. Thompson some time.

First, I have a correction. There have been very few oil spills but of the ones in Canada over the last five to 10 years, the one that occurred in British Columbia was directly related to a third-party hit. That was a municipal worker, a contractor, who hit the Kinder Morgan line in Burnaby. Fortunately, no one has been killed but it is something that is entirely avoidable.

Leak detection is something we are working on. I mentioned that in my testimony. It is an area that we can work harder on. We have met, for example, with the space agency. There are some really interesting technology innovations that we could use, going forward. Acoustics is another one we are looking at. They are very important.

Third, in terms of line locations, certainly better mapping is being done periodically, particularly in dense urban areas as we work with cities and over time get more accurate maps. That's a very positive thing. It's not the only solution, though, to third-party damage because even if you had very accurate line location, if you still have somebody who decides to put in a fence post and not call before digging.... We're not going to have markers running across every field, and with 110,000 kilometres of buried utility across the country. A lot of it has fence post markers, but we need people to call before they dig.

Mr. Timothy Thompson: On my end, with regards to geothermal permitting, in B.C., unlike an oil and gas permit that is issued which will have pre-cleared first nations approval, a geothermal permit does not have that. This means the first step in my business plan when I go to seek venture equity is to negotiate a deal with first nations, and I have to put a number on that and a timeline on that. That is a very difficult thing, no matter what number or time I put on, for private equity investors to swallow.

Does that address your question?

Mr. Blaine Calkins: It certainly does. Thank you.

The Chair: Thank you, Mr. Calkins.

We go now to Ms. Liu, for up to five minutes.

Go ahead, please.

[*Translation*]

Ms. Laurin Liu (Rivière-des-Mille-Îles, NDP): Thank you, Mr. Chair.

I would like to thank the witnesses for their presentations. They were very informative.

First, I would like to point out one thing. I know, Mr. Chair, that you wrote a letter last week to the Royal Canadian Mounted Police. It is very difficult for me not to say something because that letter affected me deeply. I think this matter seriously calls into question your ability to lead our work. You said that you were not sure about the meaning of the letter you signed. If that is true, that's worse, because it shows that we cannot trust what you say.

[*English*]

Mr. Scott Armstrong: Mr. Chair, I have a point of order.

The Chair: Ms. Liu, this has nothing to do with the business of this committee. You're talking about some political work I have done —work of which I'm proud, by the way; I in no way tried to distance myself from that.

Please stick to the agenda of the meeting today.

[*Translation*]

Ms. Laurin Liu: Thank you. The point is noted. I will think about how I want to follow up on your actions.

I will move on to questions for the witnesses.

My question is for Mr. Bettencourt.

In your presentation, you mentioned several recommendations that you made to the federal government about regulation and taxation. You said that you wanted to transfer a portion of the costs from the ratepayers to the taxpayers. Do you have any other recommendations you would like to elaborate on?

[*English*]

Mr. Alex Bettencourt: Sure.

The point we were trying to make was with regard to a lot of the things our utilities are being asked for in Canada, and it's true around the world: we're trying to accomplish environmental goals—not so much in Canada—but national security goals, economic goals, job growth goals. These are things that utilities didn't do before. Utilities really just tried to make power as cheaply as possible and deliver it reliably.

Because of the technology that's available, utilities now do have the opportunity to be the best agents to deliver on environmental goals, economic job growth goals, reliability goals. However, when they go to their regulators—all utilities need to go to regulators to ask before they spend the money—they need to do it using a business case.

For us to enhance the grid in order to get more renewable energy, or to enhance the grid to improve the reliability so that fewer people experience the costs associated with outages, it increases the cost of the grid and it increases the amount of money that ratepayers need to pay for it.

The point we're really trying to make is this: are there opportunities where we can transfer the responsibility, the costs, away from the ratepayers and onto the taxpayers? One of our ideas, an idea that's been used in other countries, is that when utilities—which are crown corporations themselves, so all this money stays in the system—make investments in the smart grid that improve reliability and help the integration of renewables, they be allowed to depreciate those assets over a shorter period of time, which helps them make their business cases to their regulators.

● (1655)

[*Translation*]

Ms. Laurin Liu: Thank you.

We have heard a lot of comments from witnesses about the tax credit for scientific research and experimental development. What do you think about these criteria and the impact they may have on your sector?

[*English*]

Mr. Alex Bettencourt: Is this a question for me?

Ms. Laurin Liu: Yes.

Mr. Alex Bettencourt: One of our members, Hydro One, finished up the first release of their smart grid project. They did apply for the SR and ED tax credit, and they received funding from the SR and ED tax credit—which we didn't expect, so thank you to the federal government for providing that funding, because it was an unexpected help to our business case. I imagine that utilities across the country....

Now, a very small proportion of the project qualified for the SR and ED tax credit, but the credit is something that some utilities in Canada have successfully applied for.

The Chair: Thank you.

We now go to Mr. Trost, then Mr. Gravelle, then Mr. Armstrong.

Mr. Trost, go ahead for up to five minutes, please.

Mr. Brad Trost (Saskatoon—Humboldt, CPC): A few years ago I was on a bit of a field trip—I think it was in the Sarnia area—and there was a really intelligent inventor who had worked out a system to create a turbine taking off the heat from the heat towers and the heat distribution. It was a great idea. You could see where he was going. It would massively increase efficiency, etc. But like a fair number of my engineering physics classmates over the years, he wasn't exactly—how should we put this?—the best communicator or the most knowledgeable about how to get to business. So I'm throwing out this question to some of the people here representing industry groups. You often represent technologies that have made it this far, which is good, and people who have good business plans and so forth, but what have you done, and what can the government do to help people who have these really good ideas and bring them up in areas like geothermal, smart grid, and others?

I'm sure even though you work with good technologies, you're always seeing new and innovative ideas. What do we need to do to bring those innovative ideas along for those people who have talent but maybe don't have the necessary skills to get them all the way?

The Chair: We'll start with Mr. Bettencourt.

Mr. Alex Bettencourt: What I've seen work, especially for the new technologies, is that—and it's largely been provincial governments that I've seen do the work, one good example of which is the MaRS facility in Toronto. MaRS is an institute funded by the Ontario government that takes new medical technologies, clean technologies, and other sciences, when it's really just a mentor and his idea, and they professionalize him. They give him lawyers, they give him accountants, they coach him on how to make presentations, and they get him to a stage where the idea is bolstered by all the other support services.

I've seen those models work in Ontario and British Columbia, and my best suggestion would be to try to have more of these institutes across the country.

● (1700)

The Chair: Mr. Wharton, do you have something to add to that?

Mr. Donald Wharton: Yes, I do. I want to use as an example something that's happening in Alberta, which I think gets at exactly your question. The Alberta government in 2007 established what they call the Alberta technology fund, which is a fund created by contributions from Alberta industry to offset carbon emissions in the province.

That fund accumulates somewhere in the order of $80 million a year. The objective of the fund is to support emerging clean technologies of all forms that are low carbon in nature. We believe that would be a great model to look at on a broader basis, should there be some value or price put on carbon in other jurisdictions. That technology fund concept is actually highly functional and operational, and to date it has funded over $200 million of investments in new technologies, which are leveraged by industry contributions as well.

The Chair: Mr. Thompson and then Ms. Kenny.

Mr. Timothy Thompson: As I think I probably agree with everything Ms. Kenny's going to say, I'll defer my time to her.

Dr. Brenda Kenny: Well, thank you. I really just wanted to build on what Mr. Wharton was saying. I happen to be on the board of Climate Change Emissions Management Corporation, and Don's absolutely right that the level of investment from essentially the carbon-pricing mechanism and that tech fund has been well distributed through a very thorough practice. But I just want to boost his number by saying that the over $200 million invested is actually being leveraged up with in-kind contributions to over a billion dollars of technology projects being in play today.

That goes to the heart of Mr. Trost's question about what more can be done. I also think that tech fund example that Don pointed to was very specific—

Mr. Brad Trost: My question was how we connect the nerd with the project to applying it, not necessarily how we spend. I'll take my final question—

Dr. Brenda Kenny: I was just going to get there actually—

Mr. Brad Trost: I have only 30 seconds here.

My final question is about the role that human resources play as far as what we're doing goes. Mr. Bettencourt got to it: how do we develop the human resources, the engineers, the scientists who can tie in with the business to move forward new ideas?

The Chair: Who would you like to answer that?

Mr. Brad Trost: Ms. Kenny or Mr. Thompson, since they didn't answer.

Dr. Brenda Kenny: I'll make one point.

The Chair: Sure.

Go ahead, Ms. Kenny.

Dr. Brenda Kenny: I will just give a very quick finishing to the other point, because it goes right to the heart of this. Through those kinds of mechanisms you can seek tailored, big-splash adventures that invite people to come forward with cool ideas and ways to vet, support and grow those ideas.

Mr. Timothy Thompson: Parallel to that point by Ms. Kenny, I've been through the CCEMC and SDTC processes myself. I think what you'll find, and I find particularly valuable, is the partnering processes that are part of the admissions intake. They require you to marry up good ideas with good people across a set of disciplines so that you come as a stronger whole, if you will. I think those elements of managing the human capital that are a part of the intake process are extremely valuable.

The Chair: Thank you very much, Mr. Trost.

We go now to Mr. Gravelle, for six minutes, and you've indicated you might want to share it with Mr. Nicholls if you finish yours.

Mr. Claude Gravelle (Nickel Belt, NDP): Sure.

My line of questioning is going to be for Mr. Thompson because I'd like to learn a bit more about geothermal.

Mr. Thompson, can you tell us how much money is being spent right now in Canada on research and development?

Mr. Timothy Thompson: Specifically, in the geothermal sector, there's $100,000 committed.

Mr. Claude Gravelle: How is that compared to other countries?

Mr. Timothy Thompson: It doesn't, frankly. It doesn't matter what metric you use, per capita, as a function of the resource, as a function of the potential, we're lowest on all metrics.

Mr. Claude Gravelle: Can you give me an idea of what other countries with the population size of Canada are spending on research and development for geothermal? Any idea?

Mr. Timothy Thompson: Population's not necessarily the right view, but if you have a potential resource of a certain size, let's say you had between 4,000 and 10,000 megawatts of potential resource, which is what we have and, identically, what the United States has, the United States' expenditure is running $120 million a year on technology and ours is one one-thousandth of that.

● (1705)

Mr. Claude Gravelle: Why is that?

Mr. Timothy Thompson: As I presented, there are two possible reasons. One, I think we've enjoyed an abundance of really good options, both from a hydrocarbon point of view—cheap coal, cheap gas, lots of oil—and we've had some really great hydro. But as Mr. Bettencourt was mentioning, incremental generation is going to become increasingly more expensive. So geothermal, while it may not have played a prominent role in our history, should play a prominent role in our future, and we're trying to make that transition come about, if you will.

Mr. Claude Gravelle: You mentioned something about a geothermal power plant. Can you give me an idea of how much it would cost to build a geothermal plant that would service a certain amount of the population, and what the cost per kilowatt hour would be?

Mr. Timothy Thompson: In terms of the capital cost to build a geothermal power plant based in B.C., which has some of the best resources, the first merit order of plants are probably going to cost $5 million per megawatt, and the minimum plant size is probably 20 megawatts, so $100 million a plant.

In terms of the net cost per kilowatt hour, so I'm going to quote this in cents, for the best plants, it's going to be about 6.5¢ per kilowatt hour, significantly lower than many of the other options. The worst plants that you'll economically bring on will be in probably the 9.5¢ range, because you've got a limited ability to sell into that market at any price that's higher than that.

Does that answer your question?

Mr. Claude Gravelle: Yes.

Is it feasible or possible to have a geothermal power plant in northern Canada and the Yukon and Northwest Territories? And if we had one of those in a native community, could we take them off diesel power?

Mr. Timothy Thompson: The answer to that question is yes. We were recently pursuing a project at Fort Liard, to take the town of Fort Liard off diesel power. It has, however, not progressed primarily because of the entrenched bias I spoke of. The project was both technically and economically feasible.

Mr. Claude Gravelle: Biased by whom?

Mr. Timothy Thompson: I have to sell power to a utility or a crown corp. If they're not interested in buying the power from me, I have nowhere to go.

The Chair: Mr. Nicholls, you have two minutes.

Mr. Jamie Nicholls: Mr. Bettencourt, I'd like to ask you a question about renewables and smart grid technology. You talked about the old one-way distribution. I'd like you to expand for the committee on how a smart grid increases efficiency of transmission for renewables and the challenges. As you said, the wind doesn't blow all the time, the sun doesn't shine all the time, so how does a smart grid increase the efficiency?

Mr. Alex Bettencourt: Especially in Ontario.... Ontario has some of the most generous feed-in tariffs in the world. Right now they're paying 13¢ a kilowatt hour for wind, 40¢ for solar, 60¢ for small-based rooftop. That's been creating quite a lot of new renewable energy projects in Ontario. Ontario's doing it in order to meet some environmental policies, but as well to create jobs in Ontario. That's creating—

Mr. Jamie Nicholls: I'm sorry, could I just interrupt you for one second?

The policy framework in Ontario has added to interest in the smart grid. There's actually a policy framework from the provincial level that has driven research and action in this sector. Is that correct?

Mr. Alex Bettencourt: That is correct. It started primarily with their Green Energy and Green Economy Act. Largely, they were trying to encourage renewable energy manufacturers to locate in the province, and to do that they encouraged developers to build renewable energy in Ontario.

However, to get that renewable energy onto that distribution system causes lots of local issues, right? When the wind blows really hard it's feeding a lot of power into a part of the grid that wasn't designed for it. It can cause voltage to come up. Voltage has to be stable within a very limited band. So what you need to do is put these voltage-regulating devices along the line that will tick the voltage up and down, based on whether the wind's blowing hard or not. We were never able to do that before, because to run the communications between all those devices would have been very expensive. One thing the federal government did that's been great for the industry is that they granted the utility industry, the electric companies, wireless spectrum—something that they usually sell to the Bells and Rogers of the world—and they granted it for a very nominal fee so we can use it for our utility operations.

So in some of the projects that the utilities are doing, they're saying let's use this wireless spectrum that we got from the government for free, and try to get all these devices to talk fast enough in a way to accommodate the renewables. Now, the same technology—

I'm out of time, sure.

● (1710)

The Chair: Thank you, Mr. Nicholls.

I didn't mean to interrupt.

Go ahead, Mr. Armstrong, for up to five minutes.

Mr. Scott Armstrong (Cumberland—Colchester—Musquodoboit Valley, CPC): Thank you, Mr. Chair, and just for the information of our panellists, I'm the only member today from Atlantic Canada, so I'm going to ask a couple of questions that pertain to my region of the country.

First, we were very excited on the east coast at the possibility of reversing a pipeline that currently runs east to west to running west to east. You might have seen Premier Alward from New Brunswick out visiting Alberta, talking to Premier Redford this week.

Mrs. Kenny, I wonder what the position of your association is in terms of reversing that pipeline and trying to bring some oil sands oil out to the east coast.

Dr. Brenda Kenny: The pipeline in question, Line 9, which is owned and operated by Enbridge, was built in the mid-seventies for the express purpose of bringing western crude oil into Montreal. The direction that's being proposed now is actually a re-reversal and a return to normal.

The added possibility of extending into New Brunswick or Halifax is entirely within the hands of economics. Normally, what we see is that rail can be a good interim option. When you have sustained, larger volumes, they are more efficient and safer a metre under the ground in a pipeline. I think that's where people are looking very seriously at least in connecting between Montreal and the Irving refinery.

Mr. Scott Armstrong: In terms of environmental concerns around re-reversing this pipeline, because the pipeline already exists, because it has already run in both directions in its history, do you see any environmental concerns popping up that would slow down that project?

Dr. Brenda Kenny: No, I see none at all. I'm pleased to see that it is going forward into a major hearing, as it should, under the National Energy Board. It's heavily regulated across environment, safety, economics, etc., and there will be ample opportunity for public participation and crown consultations through that process.

Fundamentally, I wish pipelines were more special, but they're just the cheapest deal, a metre under the ground, and we run them all over all kinds of territory, halfway up the Mackenzie Valley to Norman Wells and on down to Montreal and down into the port of Vancouver. They're really well understood. There's nothing tricky about this re-reversal that should cause any concern.

The Chair: Mr. Armstrong, it's a very important issue, but we are dealing with innovation. If you could tie your questions in with innovation, that would be great.

Mr. Scott Armstrong: There could be some innovation tied into that, but I'll move on to another subject.

The next subject I'm going to talk about is innovative. We have a tidal power project in the Bay of Fundy, which the federal government is strongly supporting. It involves some undersea electrical cables.

We're also going to see four new technologies from four different companies put into the Bay of Fundy. We already had Nova Scotia Power put one technology down there, and it received some damage almost immediately because of the power in the Bay of Fundy.

Mr. Wharton, do you have any knowledge of this project, and what do you see for the future of tidal power on the east coast?

Mr. Donald Wharton: If you like second-hand knowledge, from speaking with my colleagues from Nova Scotia Power, I would say it's extremely exciting from our perspective. The Bay of Fundy is essentially world-class in terms of its power capabilities, and we think Nova Scotia Power is doing some great work, particularly with firms in the U.K., looking at developing that technology. It's still in its infancy, but we see it as a great renewable energy resource, probably 10 years away from full commercialization.

Mr. Scott Armstrong: In 2013 we're hoping to see the four different technologies put in there and hopefully a request for proposals to see which company has the best technology, and moving forward on that.

As you're probably all aware, the other major project is the implementation of the Lower Churchill hydro project. The innovative nature of this is the undersea electrical cables, which are going to be put in place between not only Newfoundland and Labrador, but also Newfoundland and Nova Scotia, and run through Nova Scotia right into New Brunswick. Hopefully, any excess energy could be exported to Ontario, Quebec, and of course the eastern seaboard of the United States. The federal government has supported that with a loan guarantee, and I know that the NDP premier of Nova Scotia is strongly behind it. I know that the premier of Quebec is against it. We're not quite sure where the federal NDP are in supporting that loan guarantee.

This type of loan guarantee to support innovative technology in these projects, is that something you would all support?

Maybe Mr. Wharton could start.

● (1715)

The Chair: There's just half a minute left, Mr. Wharton. Go ahead, please.

Mr. Donald Wharton: In principle, yes, but I would also say that our company is a strong proponent that, in the long haul, technologies and the economics of those technologies need to stand on their own and need to be sustainable, so we need to be quite careful that we can get things started, but we can't continue to subsidize over the long haul.

The Chair: Thank you very much, Mr. Armstrong.

We go now to Ms. Day. Welcome back to our committee for today's meeting. Go ahead, please.

[*Translation*]

Mrs. Anne-Marie Day (Charlesbourg—Haute-Saint-Charles, NDP): Good afternoon, Mr. Chair. I am glad to be back at the committee.

First, I would like to correct something that Mr. Armstrong said. The premier is not opposed to energy loans. It is because it was offered to another province, and Quebec had not benefited from that same kind of loan. That's why she was opposed to it.

Why does Canada lag so far behind in developing geothermal energy? We need only think of a country like Iceland, which has been developing this energy since the 1970s and 1980s.

My question is for Mr. Thompson.

[*English*]

Mr. Timothy Thompson: I'll go back to my original two answers. We've an abundance of other easier options to develop first. Now that we have exhausted those options to the greatest extent, we don't really have the regulatory infrastructure in place to allow projects to proceed, summing up a variety of other points.

[*Translation*]

Mrs. Anne-Marie Day: Could you please give us some concrete examples of large-scale use of smart grids?

[*English*]

The Chair: Mr. Bettencourt, go ahead, please.

Mr. Alex Bettencourt: In the province of Quebec, Hydro-Québec undertook a project over the last five years to add something we call "distribution automation". There are many switches on the distribution system, and before you would always have to wait for a customer to call to say his power was out, and then people would take that information, map it out either on paper or in a computer system, guess where the power outage was, and then send a truck to search for the power outage. Now Hydro-Québec has installed, I think, close to a thousand of these remotely controllable motorized switches, so instead of waiting for us to send a truck to switch it out, we're able to do it from the control centre and get people's power going much faster.

Hydro-Québec is a very large utility, a very leading utility, and they did that project with very, not rudimentary technology, but it wasn't rocket science in any way. It was adding a motor to a switch on the pole. It was a good model for the rest of Canada to emulate. That's one good example.

[*Translation*]

Mrs. Anne-Marie Day: So, smart meters are part of what you offered when you created this system.

Does Hydro-Québec use smart meters?

[*English*]

Mr. Alex Bettencourt: Smart meters are very useful when you're trying to change customers' behaviour as to when they use electricity. For example, in Ontario they had quite a large peak demand, meaning that the majority of energy was used in the middle of the day. Just to meet that peak, they were having to build new power plants. In Ontario it made sense to implement smart meters; they could tell which time of day power was being used and charge more for the middle parts of the day, so they could avoid building those new power plants. That made sense in Ontario.

In Quebec, where they have such an abundance of hydroelectricity, Hydro-Québec is able to supply that peak power need. Now it's good for Quebec to conserve power so that they have more power to sell to the States to make money for the people of Quebec.

In Quebec I don't think it's part of their strategy. Use of smart meters is definitely not a universal strategy for every jurisdiction. It's a decision that each province will have to make case by case.

[*Translation*]

Mrs. Anne-Marie Day: With respect to research and development, how would you describe what you have undertaken? Are we on the cutting edge?

● (1720)

[*English*]

Mr. Alex Bettencourt: On smart grid?

Mrs. Anne-Marie Day: Yes.

Mr. Alex Bettencourt: I would say that in some areas we're at the forefront. For example, the smart meter project in Ontario is the largest implementation of time-of-use rates in the world.

California and Ontario took on their projects at about the same time, starting in 2007. Both projects are finishing up about now, but Ontario is the only one that's charging customers based on the time they use power.

Other innovative projects are around renewable energy. We've all seen the large wind farms and the large solar plants. However, in some jurisdictions in Canada they're getting renewable energy near local country roads. This is on the low voltage distribution system. Being able to accommodate that renewable energy is also very innovative.

The third part of innovation, for which we're getting a lot of interest from around the world, is using wireless spectrum. That involves being able to use wireless signals over the WiMax network in a very fast time frame, which allows you to do protection in hundreds of milliseconds. That's also very innovative, and that's where we are leading.

[*Translation*]

The Chair: Thank you, Mrs. Day.

[*English*]

We go now to Mr. Anderson for up to five minutes.

Go ahead, please.

Mr. David Anderson (Cypress Hills—Grasslands, CPC): I would like to follow up on some of the questions Ms. Day had.

Mr. Bettencourt, I'd like you to talk about—and I'm going to use the word carefully here—the delicacy of these systems. We've had questions, and we actually did a study on integrated energy systems, and smart grids were part of that. But as these systems become more complicated, they seem to become more delicate, or they have a tendency...if one thing goes wrong, an entire system is impacted.

It's as simple as something at my home. I had a generator in the past and it was a case of flipping a switch, turning the generator on, and I had power again. I have a new system there now that relies on a 400-amp switch and a generator relying on a 9-volt battery that has to be charged in order for that entire system to work.

I just wonder if you'd speak to that issue a little bit.

Mr. Alex Bettencourt: The smart grid is really being laid on top of its existing technology. At the end of the day, the distribution system is transmitting electricity—electrons over copper wire—into your home, and they are going to be the same systems transmitting that electricity. The physics of transmitting electricity have not changed.

What is being changed is that on top of it there is the ability to add sensors. So instead of waiting for customers to call in to say they're out of power, we'll know in advance; we'll know at the control centre, and we'll be able to do something about it at the control centre without needing to send out a crew to find the outage. We'll be able to remotely control those switches.

If there are provinces that are pursuing a policy of integrating renewable energy onto their distribution systems, they'll be able to add in all that new flexible voltage regulation technology that can accommodate those renewables without causing the power to be of bad quality for everybody else along that feeder.

Mr. David Anderson: I guess the challenge is to make sure the system that's overlaid the other system doesn't interfere with it in terms of reliability.

I'd just like to switch to Ms. Kenny for a minute. A couple of weeks ago, I understand about 16 environmental groups wrote a letter to one of the railways—I think it was CP. Basically they were trying to convince them that they should stop shipping oil because they said that railcars weren't as safe as pipelines. I think we have a pretty good safety record in terms of rail, but I just wonder if you are aware of that and if you have any comments to make about the safety record you have. You made a couple of comments earlier. Are you aware of that letter that went out?

Dr. Brenda Kenny: Yes, I was aware of that letter. I think that is further evidence of any and all tactics to try to undermine the safe delivery of energy across the country. The purpose of rail and pipelines is very different. Their functioning is very different. One is a tube of steel, a metre under the ground; the other is large, heavy equipment running across the countryside. Rail, in its class, has a fantastic safety record. We should all as Canadians be very proud of that and know the scale of effort that goes into that safety record every day.

When you're moving large quantities of energy, occasionally there can be incidents. Both pipelines and rail are heavily, heavily regulated. We happen to have fewer incidents, I think largely just because we are under the ground. But still, in all, there are many options, in terms of transport, and they're all important to Canada in their own way.

Mr. David Anderson: Could you talk for a minute about the corrosivity of bitumen? A lot people think that there's some issue there. Is there an issue? If so, what's the solution? If not, why has that idea caught on?

● (1725)

Dr. Brenda Kenny: There is no issue in bitumen, in terms of pipeline safety or corrosivity. It is a complete fallacy. We've done a lot of science on this. In the simplest possible terms, I would point to the operating record of systems that have operated moving dilbit. They are not experience any abrasion. There is no internal corrosion. When and if we have a break because of corrosion, it's 99.9% of the time from external corrosion. We know that well. The metallurgy's clear. This is an absolute falsehood. I can't suggest why someone would intentionally mislead the public or create fear, but, nonetheless, it is patently false.

Mr. David Anderson: I'd like to change direction a bit.

Mr. Wharton, I wanted to follow up on Mr. Trost's line of questioning a bit here.

You said that Canadian utilities aren't the ones that usually develop the new technology; that competitors across the United States or the bigger companies do that. I'm just wondering, can you tell us what is the connection between them developing it and you using it? How do you get access to that? Are you given access to the latest and greatest technologies? How is that gap closed? And you're dealing with some of your competitors, of course.

Mr. Donald Wharton: It's quite true. I wouldn't call it a gap, actually. I'd say it's a system that's developed over decades now. There are probably only a handful of companies that develop large generation facilities. You could count them on one hand: General Electric, Siemens, Alstom, Hitachi, right? Those are huge manufacturing companies that build the kind of equipment that power plants need, which is enormous and very small in volume, small in terms of the number of them required to power, say, even the North American industry.

The relationship has been very synergistic over the past and continues to be that way. Those companies do invest in research and development, they do make their money designing, developing, and building large-scale generation technologies. That, in most cases, would be uneconomic for utility companies to do. There are smaller examples of investment in R and D and smaller technologies, but, as I pointed out in my testimony, most of the work of utilities is around using those technologies efficiently and lowering the costs of doing so.

I think that's a good synergy, I think that's a good situation. I don't actually believe Canada needs to get into the manufacturing business in any significant way here. That's a workable mechanism globally, quite frankly.

Mr. David Anderson: Thank you.

Mr. Thompson, I just wanted to talk to you.

It sounds like your main challenge is actually convincing provincial utilities that you have a product that they should be using. I'm just wondering whether you have a plan for dealing with that. In earlier questions, it seemed like that's the main thing that's holding you back, trying to convince them that you've got a product that's apparently cheaper, you say, than some of the other products, and yet they don't want to use it. What are you doing to convince them that that's a poor decision?

Mr. Timothy Thompson: Well, I have to be careful.

Mr. David Anderson: Is there anything innovative you can do? We're talking about innovation. What are the innovations that you're making to convince them?

Mr. Timothy Thompson: I'm a developer so I'll use a practical example.

BC Hydro in the early seventies went of its own accord to drill its own geothermal wells, and if you know anything about the subsurface business, you should know that you should actually have some experience in it before you start. So the results of BC Hydro's experience was that they spent about $75 million—this is seventies money—on three wells that produced nothing. So their institutional memory around that experience, I think, is quite sharp.

What we try to do, both at the industry level and at the individual organization level, is convince them that the risk-return—a sort of cost-benefit analysis—can be influenced by applying new technologies. In our case, since we're dealing with subsurface reservoirs, we really are taking a lot of what has been learned from the oil sands, frankly, and reapplying it. So they're not necessarily new technologies in the sense that they've come out of nothing or that they've just been created. We've seen them used intelligently and productively in other applications. We want to repurpose them to change that cost-benefit ratio and if they believe that, which to some degree I can never force that belief, then they'll take us up on it. I can't explain why, but to date we have not been successful.

Does that answer your question?

● (1730)

Mr. David Anderson: Yes, I think so. Absolutely.

You seem to think that you have the geo-mapping information that you need. Have the government's programs helped you there at all? They have been primarily focused north of 60, I understand, but has the geo-mapping that has been done in the past, either by the government or privately, helped you in your arguments to promote your industry?

Mr. Timothy Thompson: Those are two separate issues. The issue with the geo-mapping is that it has been done at a very broad level by the geological survey and typically oriented towards mining or hydrocarbon investigation. We actually look for different markers. There is some overlap.

It is of some utility if it's in the public domain. A lot of this information, however, is not in the public domain, so if it is private information, we have no access to it.

Mr. David Anderson: Do you have a recommendation for the committee?

I think the chairman is going to cut me off fairly quickly here.

Mr. Timothy Thompson: The recommendation would be for the committee to support CanGEA's proposed mapping program for western Canada.

The Chair: Thank you, Mr. Anderson, and thank you all very much. I appreciate you all coming, Ms. Kenny, Mr. Thompson, Mr. Wharton, and Mr. Bettencourt.

Mr. Anderson.

Mr. David Anderson: Mr. Julian and I had a discussion at the beginning to suggest that perhaps we could open the witness list until Tuesday. There were some other people who may be interested in coming on to the supply and distribution side, if that's all right.

The Chair: Is it just till Tuesday? Is there agreement to do that?

Mr. Jamie Nicholls: There has been agreement on that.

The Chair: Okay. Thank you very much for that cooperation and we will have the witness list open again.

Thank you all very much. Have a good weekend in your constituencies doing your constituency work.

The meeting is adjourned.