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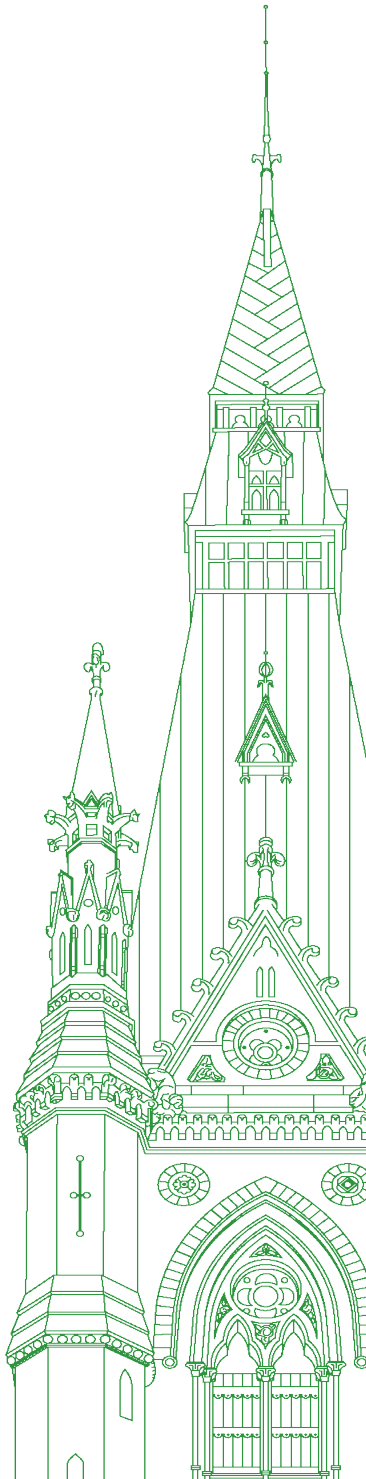

Chair: Mr. George Chahal

Standing Committee on Natural Resources

Thursday, June 13, 2024

● (1550)

[*English*]

The Chair (Mr. George Chahal (Calgary Skyview, Lib.)): I call this meeting to order.

Welcome to meeting 101 of the House of Commons Standing Committee on Natural Resources. Pursuant to Standing Order 108(2) and the motion adopted by the committee on Tuesday, November 29, 2022, the committee is resuming its study of Canada's electricity grid and network.

Since today's meeting is taking place in a hybrid format, I will make a few comments for the benefit of all.

Before we begin, I ask all members and other in-person participants to consult the cards on the table for guidelines to prevent audio feedback incidents. Please take note of the following preventive measures in place to protect the health and safety of all participants, including the interpreters. Use only an approved black earpiece. The former grey earpieces must no longer be used. Keep your earpiece away from all microphones at all times. When you are not using your earpiece, place it face down on the sticker placed on the table for this purpose. Thank you for your co-operation.

As a Zoom reminder, please wait until I recognize you by name before speaking. I remind you that all comments should be addressed through the chair. Additionally, screenshots or taking photos of your screen is not permitted. In accordance with the committee's routine motion concerning connection tests for the witnesses, I inform the committee that all witnesses have completed the required connection test in advance of this meeting.

I now welcome our witnesses with us today. From Capital Power—

Mr. Charlie Angus (Timmins—James Bay, NDP): I have a point of order.

The Chair: Yes, Mr. Angus, go ahead on a point of order.

Mr. Charlie Angus: Thank you.

I'm sorry. I don't want to interrupt our witnesses, but I just want to get clarity on the witnesses that we have for TMX for the next meeting. I understand that some of the witnesses aren't coming. Can you confirm whether or not they're unable to meet because it's a short deadline or because they do not want to come to our committee?

The Chair: Thank you, Mr. Angus—I'll go to you right after, Monsieur Simard—and I just ask you to hold for a second.

From what the clerk advised me, Mr. Angus, they indicated they would like to come, but at a future date. Because of the short notice they are unable to make the meeting on Monday. That answers....

Monsieur Simard, go ahead on a point of order.

[*Translation*]

Mr. Mario Simard (Jonquière, BQ): To follow up on what Mr. Angus said, our motion stated that we would invite the Parliamentary Budget Officer for next Thursday, June 20. However, we may not be sitting next Thursday, which would mean that we would not see him before September.

I want the committee to officially request that the PBO prepare an update to the document he tabled on Trans Mountain and that he send it to us before his appearance, likely to be in September. We weren't at $34 billion at the time he tabled his document. He should be able to prepare the update before his appearance.

[*English*]

The Chair: Thank you, Monsieur Simard.

I don't see any objections to having updated information from them for the meeting that may take place sometime in the future. You referenced possibly in September; that's something we can do, unless anybody has an objection. I'm looking across and I don't see any objections to getting updated information at the appropriate time.

(Motion agreed to [*See Minutes of Proceedings*])

The Chair: I go back to you, Mr. Angus.

[*Translation*]

Mr. Charlie Angus: Yes. There may be a small problem, as I'm not getting interpretation.

[*English*]

The Chair: Mr. Angus, I heard Monsieur Simard through the interpretation. I believe Mr. Steinley has also indicated the same. You might be on the wrong channel.

Were you clear with my response that was given to Monsieur Simard's question? I think so. Everybody's clear with what I stated?

Okay. We're good. There are no objections to proceeding.

Thank you to the witnesses for being patient.

We'll now proceed with the witnesses for today.

We have, from Capital Power, May Wong, senior vice-president, strategy, planning and sustainability, by video conference, and Daniel Jurijew, vice-president, regulatory, siting and stakeholder engagement, by video conference.

From Geothermal Canada, we have Catherine Hickson, president, by video conference; from Greengate Power Corporation, Dan Balaban, chief executive officer, by video conference; and from Western Copper and Gold, Paul West-Sells, president, by video conference.

You have up to five minutes for opening remarks. After that, we will proceed with the round of questions. I will be using two cards: a yellow to give you a warning of 30 seconds, and a red that your time is up. I'll try not to cut you off in mid-sentence, but I ask you to wrap up if you do see a red card. Thank you so much.

We'll now begin with Ms. May Wong from Capital Power for her opening five-minute statement.

Ms. May Wong (Senior Vice-President, Strategy, Planning and Sustainability, Capital Power): Good afternoon, chair, ladies and gentlemen and honourable members of the Standing Committee on Natural Resources.

My name is May Wong. I'm the senior vice-president of strategy, planning and sustainability for Capital Power. I'm joined by Daniel Jurijew, our VP of regulatory, siting and stakeholder engagements for SMRs. Capital Power appreciates the opportunity to appear before you and provide our perspective on Canada's electricity grid and network.

We are a North American power producer headquartered in Edmonton, Alberta. We currently operate over 9.2 gigawatts of capacity at 32 facilities across Canada and the U.S. Roughly half of this capacity is in Canada, where we operate facilities in Alberta, Ontario and B.C. and employ more than 700 people.

We have invested and continue to invest in a range of technologies to provide reliable, affordable and clean power solutions to customers. These include our $1.35-billion Genesee re-powering project in Alberta that is nearing completion and that has enabled us and Alberta to be off coal. We are also investing in efficient natural gas and batteries in Ontario and pursuing renewable energy developments across North America. We have established a goal of achieving net zero by 2045 and continue to actively explore and assess technologies such as CCS and SMRs. We're committed to meaningful engagement with indigenous communities and pursuing opportunities for economic participation in our existing and future developments.

The focus of our remarks today will be to highlight what we believe are key considerations in developing the framework necessary to attract and sustain the scale of investment in generation capacity to meet expected load growth and achieve decarbonization for our grids and to ensure continued reliability and affordability. We would note at the outset that the central themes of our remarks—reliability, affordability and respect for regional differences—also feature prominently in the Canada electricity advisory council's final report that was released this week.

Every province and territory is unique in the way it has structured its operation, oversight, planning and participation across the different components of the electricity systems. There are two aspects of particular importance.

First, differences in natural resources across provinces have driven differences in the supply mix to meet provincial demand and support affordable and competitive rates. They also present different opportunities and challenges for provinces' pathways to decarbonization.

Second, provincial systems vary in terms of how decisions are made regarding the timing and types of generation additions or retirements and how the costs and risks of generation investment decisions are allocated. This is a fundamental distinction between Alberta's system and systems in other provinces. Generation investments are made by a range of parties on an at-risk basis with no guarantee of a return on investment or backstop recovery by ratepayers.

These differences and circumstances in the regions need to be recognized and respected as part of any review or path forward for Canada's electricity system. They also highlight the need for collaboration among governments, industry, indigenous communities and other stakeholders to consider policies to advance decarbonization while ensuring that reliable and affordable objectives in each province are maintained.

The impressive volume and speed of renewable additions in the last few years have created challenges for system operators. This energy transition period highlights the importance of having a reliable source of power that can provide firm and dispatchable capacity over extended periods. This is why the combination of flexible generation technologies, such as natural gas and energy storage, will continue to be critical in supporting our grid's reliability, as levels of renewable penetration continue to increase until technologies such as long-duration storage, CCS and SMRs can be deployed at scale.

We are now moving beyond energy transition into energy expansion as demand from data centres, electric vehicles and broader electrification will drive even higher growth of demand. The need for additional reliable baseload and dispatchable capacity at all times and all hours will become even more critical.

To meet longer-term decarbonization objectives, a full portfolio of decarbonization technologies will be needed. The components that we need for our approach include policy and regulatory frameworks to enable and accelerate development and deployment of newer technologies, provide clarity and certainty regarding future carbon pricing at the industrial level, appropriate support to mitigate cost challenges and support for the network infrastructure required.

● (1555)

Projects in Canada will be competing with projects around the world; therefore, we need to provide timely resolution and clarity for policy frameworks to provide the confidence and certainty to move forward.

This concludes my opening remarks. I look forward to any questions that honourable committee members may have.

The Chair: Thank you for your opening statement.

We will now go to Geothermal Canada.

Ms. Catherine Hickson, you have five minutes.

Ms. Catherine Hickson (President, Geothermal Canada): Good afternoon, everyone. Thank you very much for the opportunity to speak to you today.

I think what I bring to this table is not so much something specific about transmission but kind of the forgotten resource, which is the deep geothermal heat beneath our feet.

Geothermal Canada was formed in 1974. This is our 50th year. Canadians have been active globally in geothermal energy, but not in Canada. Why? There are a number of reasons, but what I want to bring to the table today is really what geothermal energy is.

It covers a spectrum of technologies. That spectrum of technologies starts with ground base. This is shallow geothermal. These are heat pumps. Often you will hear somebody say, “I have geothermal.” It is most likely that they in fact have a ground-based or geoexchange system.

We move to conventional geothermal, which is a deep extraction of brines naturally occurring in the subsurface and extracting that energy from them to produce power or thermal energy.

There's a lot of research and development today around what are called advanced systems or engineered systems. In fact, the American government has invested approximately $300 million in the last two years in the advancement of engineered geothermal systems.

As a note, there are over 16,000 megawatts of geothermal power installed globally. That doesn't sound like very much, but we have to remember that geothermal is baseload—it is firm and dispatchable—and that 16,000 megawatts is equivalent to 5.5 billion megawatt-hours annually.

I want to make 10 points about geothermal. It can help in Canada's decarbonization. It can provide baseload electricity as well as thermal energy. I want to stress that these facilities do not require battery backup or storage. They are grid stable and are able to provide dispatchable power on a 24-7 basis.

They provide a heat option for northern communities and allow for decarbonization without reverting to heat produced by electrical means. They provide a potential energy source for off-grid communities—indigenous, remote and rural—as well as rural industry, like mining operations.

Geothermal energy systems can be used as part of a hybrid system when combined with waste heat recovery and other forms of renewable energy, such as solar and wind, and can help reduce the dependence of remote, rural or indigenous communities on hydrocarbons.

Conventional deep geothermal facilities are carbon neutral. Work that I and my colleagues have been doing with the University of Alberta has shown that we can actually do carbon sequestration, so we can take a geothermal project and make it not just carbon neutral but carbon negative by sequestering carbon that other emitters are producing.

Although conventional geothermal has a high CapEx, it has a very low OpEx, and it is deployable in many parts of Canada. Unconventional or new generation geothermal, such as these advanced and engineered systems, will potentially have a higher cost, but these systems are under development, and as I've already said, the American government has invested more than $300 million in EGS, engineered geothermal systems.

Geothermal can support food stability by producing locally grown food. With additional research and testing, a small portion of the existing drilled wells, particularly the deep wells that have what's called a high water cut, have some potential to be, in fact, repurposed to produce an energy stream, either as thermal or as electrical energy.

● (1600)

Exploration and development of geothermal energy uses Canadian technology. This is something that we know how to do. We know how to drill and we know how to explore the deep subsurface. In fact, the reason that Geothermal Canada has been around since 1974 is that Canadian expertise and technology have been deployed and been used globally —but not here in Canada.

Thank you.

● (1605)

The Chair: Thank you, Ms. Hickson, for your opening remarks.

We'll now go to Mr. Dan Balaban from Greengate Power Corporation. You have five minutes.

Mr. Dan Balaban (Chief Executive Officer, Greengate Power Corporation): Good afternoon. Thank you for the invitation to present to the committee today.

I'm the co-founder and CEO of Greengate Power. Greengate is a renewable energy development company based in Calgary, Alberta, which has been behind some of the largest renewable energy projects in Canadian history.

For background, though, perhaps I could share a bit of my professional story.

I graduated with with a computer science degree from the University of Toronto. I started my career in technology consulting, helping companies apply Internet-based technology to solve business problems.

In my mid-twenties I left consulting to start my own software company, which was an Internet-based software solution for oil and gas. We successfully commercialized the software, and eventually it became an industry-leading solution.

Amongst the many capabilities of the software was helping oil and gas companies track and report their greenhouse gas emissions during a time when greenhouse gas emissions were not nearly the issue that they are today. This gave me early insight into the looming environmental challenges I could see the energy industry facing.

I had a successful exit from that company at the age of 30, and I knew the next business I wanted to start would be something that would leave a lasting positive environmental impact.

With no prior experience in power, I started Greengate with my brother Jordan, with our own capital, more than 17 years ago. The goal was simple: to prove that large-scale renewable energy projects could work in Alberta, the heart of oil country. How hard could that be?

Yet Greengate has successfully developed over $2 billion of operating renewable energy projects in Alberta. representing about one-third of all the renewables in the province today. These projects produce enough energy to power more than half a million homes.

This includes several of the largest wind projects in the country and the largest solar project in Canadian history, a nearly $1-billion project called Travers Solar.

The projects we developed have secured power purchase agreements with Amazon and Microsoft. Multi-billion-dollar data centre investments are now planned in the province, proving that a clean grid and new economic development opportunities go hand in hand.

For the last five years Alberta has been the leading destination for renewables investment in Canada and one of the top such destinations in North America. We have certainly proven what is possible, and demonstrated to the world that Canada can lead in oil and gas and renewables.

Unfortunately, energy in Canada has become highly politicized and polarized, with different political forces taking on high-profile opposing stances. This was recently demonstrated by Alberta's decision to impose a seven-month moratorium on new renewables projects in the province. This sent a profoundly negative signal throughout the industry. It was recently lifted, but the new rules and uncertainty coming out of the moratorium have put the future of the booming renewables industry in the province at risk.

On one side we have the federal government, which is pushing the provinces, including my home province of Alberta, towards a very ambitious target of a net-zero grid by 2035. On the other hand, we have our provincial government, which is pushing back very hard against that target, with the renewables industry caught in the crossfire. We need to be working on solutions that will be providing us with the clean, affordable and reliable energy we need to meet our future needs. The fight does not serve us.

The world is going through an energy transition, moving from molecules to clean electrons as our primary source of energy. However, this transition will take time, and for the time being we need all forms of energy to meet our quickly growing energy demands. The demand for electricity in particular is expected to increase rapidly, not only due to our growing population, but also due to the electrification of transportation and industry, as well as the rising demands from data centres and AI.

As we move towards a net-zero future, it is important to recognize the opportunities and challenges ahead. We have the triangle of clean, affordable and reliable. Given the current state of technology, we can have two out of three corners covered, but having all three corners covered remains elusive.

This is why incentives such as the federal investment tax credit and the smart renewables and electrification pathways program are so vital in ensuring that industry can attract the necessary capital to build up the energy infrastructure of the future. This includes technology such as renewables, energy storage and carbon capture.

Now is the time to move past polarization, take on the challenge and seize the opportunity ahead for all Canadians.

● (1610)

Again, thank you for the invitation. I look forward to a productive discussion.

The Chair: Thank you, Mr. Balaban, for your opening remarks.

We'll go to Western Copper and Gold and Mr. Paul West-Sells.

You have five minutes. The floor is yours, sir.

Mr. Paul West-Sells (President, Western Copper and Gold): Thank you.

Good afternoon, Mr. Chair and members of the committee. Thank you for the invitation and honour of speaking today.

My name is Paul West-Sells. I'm the president of Western Copper and Gold.

Our flagship project, the Casino project, is one of Canada's largest and most significant critical mineral projects and is located in Yukon. I'm here to discuss the significant role our project plays in supporting the transition to a green economy and the development of a resilient and modern electricity grid.

Over its life, the Casino project mine is estimated to contribute $44.3 billion to Canada's GDP, create over 132,000 full-time equivalent jobs and contribute $11.2 billion in taxes and royalties to various levels of government.

The Casino project will be a key contributor to Canada's supply of critical minerals essential for the key energy transition. With an anticipated lifespan of 27 years and the potential to extend for decades beyond that, the project is expected to produce substantial quantities of copper and molybdenum along with gold and silver. As you know, these minerals are crucial for the development of renewable energy technologies such as wind turbines, solar panels and electric vehicles, aligning with Canada's goals for a more sustainable electricity grid.

As the biggest mining development in the Yukon territory, we're committed to ensuring that the Casino project becomes a model of green copper production. To achieve this, we need access to a stable, reliable green power connection. This is why Western has been such a proponent of the B.C.-Yukon grid interconnect.

Simply put, the Yukon is running out of power. Every year, as the population grows, the territory is forced to tack on more diesel generators to meet increasing demand. In the winter, they just can't keep up. The B.C.-Yukon grid interconnect not only represents a source of green power but also would bring reliability to the Yukon grid. The interconnect opens the opportunity for our project and for others to run on a reliable power source. It would strengthen our northern sovereignty and unlock future prosperity for our northern communities.

The Government of Yukon has already put in an application to begin doing the exploratory work on the grid interconnect through the critical minerals infrastructure fund. This would mean beginning work on the planning, site and route selections and continuing engagement with indigenous communities in B.C. and the territory. We understand that any project of this size will take time, but in every year that we wait, the costs and the demand for transmission grow higher. We need to start making tangible first steps towards making this project a reality.

As it stands right now, because of the size of our project and the nature of Yukon's grid, the Casino project is forecast to spend $1.8 billion on the carbon tax over the life of the mine. That's because to power the mine, we need to build and operate our own LNG power plant. In other parts of Canada, we would be able to connect to grid power, but development of the electrical grid in Yukon has not kept up with demand, and it is not equipped to power the next wave of critical minerals projects, such as our Casino project. We believe that if we are paying into the carbon tax, the money should go towards projects that strengthen energy security for Yukoners.

Canada's electricity grid and sector are a competitive advantage in the 21st century. As the nation transitions to green energy sources, projects like ours play a crucial role. Copper from the Casino project will support the modernization of grid infrastructure. We will be a reliable, ethical and sustainable source of critical minerals for manufacturers who use our critical minerals in transmission equipment, generators and batteries. Canadian critical minerals are essential in friendshoring our domestic industry, ensuring that Canada and its allies have access to the resources we need.

The financial barriers to reaching net-zero electricity by 2035 are significant. We recognize that. Our project contributes to this transition by attracting private sector investment. The Casino project's economic benefits, including job creation and regional development, are a generational opportunity for the Yukon and for the country. Canada's commitment to decarbonizing its electricity grid by 2035 and achieving a net-zero economy by 2050 is a challenging yet necessary path. Our project exemplifies how private sector initiatives can support national decarbonization efforts, contributing to cleaner electricity and a reduced carbon footprint.

Western Copper and Gold is proud to be at the forefront of supporting Canada's transition to a green economy through the Casino project. We are committed to contributing positively to the nation's electricity infrastructure, environmental goals and indigenous engagement strategies. Our role in providing critical minerals, supporting grid modernization and fostering economic growth positions us as a key player in Canada's sustainable future.

● (1615)

Thank you for the opportunity to share our vision and our commitment. I look forward to your questions.

The Chair: Thank you, Mr. West-Sells, for your opening remarks.

Now we will proceed to our first round of questioning.

We will begin with Mr. Patzer. You have six minutes.

Mr. Jeremy Patzer (Cypress Hills—Grasslands, CPC): Thank you very much, Chair.

Thank you to the witnesses.

I'll start with Western Copper and Gold.

When did you guys start the initial process for the Casino project?

Mr. Paul West-Sells: Do you mean start the process to get the project regulated, or start the process to...?

The Yukon government has started the process to look towards a grid intertie between British Columbia and the Yukon.

Mr. Jeremy Patzer: For the mine you're talking about building, you're still in some of the permitting stage, doing feasibility studies and all of that. Am I right?

Mr. Paul West-Sells: The project has a completed feasibility study from 2022. We're currently in the first stages of the regulatory process. In the Yukon, that's called the YESAB process. It's anticipated that it'll take approximately four years from today to get through that process, and there are another three years of construction.

This is an early-2030 project.

Mr. Jeremy Patzer: When it comes to all of the applications, when were the first ones submitted for your feasibility study and YESAB? When did permitting start?

Mr. Paul West-Sells: There have been a couple of fits and starts, but this current application, with the current design from 2022.... The establishment of the guidelines kicked off at the beginning of 2023. Those were reviewed. It went back and forth. The final guidelines were issued in September 2023.

Essentially, it's now back to us to put together the application, which we will be doing over the next year.

Mr. Jeremy Patzer: We're trying to get to a net-zero grid by 2035. This project will not be producing until close to that date. What does that do for the target the government set of trying to hit net zero by 2035?

Mr. Paul West-Sells: We're moving the project forward. We're looking at liquefied natural gas as our power source, because it's the only option available to us. We would love for it to not be liquefied natural gas. We would love for it to be green power producing green copper.

We will continue to advance our project through the regulatory process. We're hopeful that by the time we get through that process, the concept of a grid intertie is sufficiently advanced that we can connect to that or, at worst, delay the start of the project for a couple of years in order to connect to that green power.

● (1620)

Mr. Jeremy Patzer: Can you tell us a bit more about some of these delays? What's happened? What's going on? What's causing them?

Mr. Paul West-Sells: In 2023, there were a number of delays with the regulatory process. The positive is that you have first nations, federal and territorial governments all working together on comments. The negative is that it takes a long time to get all those comments collected. Sometimes there are delays through that.

When we look at 2023 on the guidelines.... We saw a lot of comments that were potentially a bit unnecessary or more detailed than they needed to be. These were from the federal government. The territorial and first nations government comments were as expected. The federal government comments were quite deep and not environmental assessment-related. Rather, they were permitting-related comments, which is a subsequent process after environmental assessment.

Mr. Jeremy Patzer: It sounds like there's going to be some duplication going on. Would that be correct?

Mr. Paul West-Sells: With the comments heard from the territorial and federal governments, there's duplication going on, absolutely.

Mr. Jeremy Patzer: Would it be helpful to have a streamlined process that would, hopefully, eliminate a lot of that duplication?

Mr. Paul West-Sells: Absolutely, yes. I certainly am encouraged by what we're hearing from the federal government in terms of streamlining the process, but excited to see what that actually means, particularly for northern locations such as the Yukon, which has a somewhat unique regulatory process.

Mr. Jeremy Patzer: Yes, absolutely. We've had some similar comments from other witnesses in other studies as well.

How might your experience in the Yukon compare to any proposed projects in a different province? Is there a difference between where you're located and one of the other provinces in the country?

Mr. Paul West-Sells: I think one of the key differences specific to what we're talking about here today is that access to power.

You have an isolated grid in the Yukon that is completely over capacity at this point in time. You're looking at any additional mining projects that come on and that need to either generate their own electricity or connect to a grid.

Right now, the last megawatts that are being added are with rental diesel generators, so essentially the Yukon right now is being developed on carbon-based power, and any future development is looking at that at this point in time.

Mr. Jeremy Patzer: Thank you.

The Chair: Thank you.

We will now go to Mr. Brendan Hanley.

Welcome to the committee, Mr. Hanley. It's great to have you here. You have six minutes.

Mr. Brendan Hanley (Yukon, Lib.): Thank you.

I want to thank my colleagues and committee members for allowing me to take a turn on this committee.

I think this is a really important study to explore, develop and build. To me, electricity and the national grid should be looked at as a nation-building exercise. I want to make sure that the northern perspective and northern needs and opportunities are included in this study.

I will concentrate my questions on Mr. West-Sells—and thank you to all of the witnesses, by the way—but first, I'm really interested in your testimony, Ms. Hickson. I'm interested to know if you can comment on the geothermal potential for northern Canada. Of course, I'm particularly interested in the Yukon territory. I know there has been some activity there. Can you perhaps update me very briefly on geothermal energy in the north?

Ms. Catherine Hickson: Yes, I would be happy to. Actually, coincidentally, I have just been working with the Yukon government to develop a geothermal regulation.

I have global expertise. I've been in the geothermal industry for 43 years now and have been working not just with the Yukon government, but also with the Government of Northwest Territories and with the Government of Nunavut.

Yes, the Yukon certainly has a better potential than Nunavut. The southern western part of the Northwest Territories has very good potential as well. In the rest of Nunavut, mostly, and the northern NWT, what we need to do is more research and development into these enhanced or engineered geothermal systems.

● (1625)

Mr. Brendan Hanley: Thank you very much. That's very interesting.

Mr. West-Sells, it's very good to see you. We've had many conversations on this particular topic and others around the Casino project. You've already discussed some of the unique features of Yukon's energy grid as an isolated northern grid.

What do you see as the opportunities in connecting to B.C. and in what I would like to phrase as really connecting to the national grid? What specifically is the support that you think you need, particularly at the federal level?

Mr. Paul West-Sells: Thank you, MP Hanley. It's good to see you again.

Obviously, the opportunity I'm presenting here is Canada's largest critical minerals mine: copper and molybdenum for 27 years, plus a number of decades, and likely up to 100 years. That's a large opportunity in and of itself. Behind us, there are a number of other critical minerals projects as well, but that isn't the only thing we're talking about.

Since this idea has has been floated—and it has been floated really at the territorial government level for the past year or so—there is opportunity in terms of generation that has been brought to my attention, particularly in northern British Columbia. There has been opportunity in terms of other northern British Columbia mining projects that would be opened up by this.

Essentially, the way I think about this is that one of the key things that opened up the Yukon was the Alaska Highway. That was built around World War II. The next big highway that needs to be built is the electrical highway, and that electrical highway needs to go up into the Yukon.

Mr. Brendan Hanley: I think Casino is a really interesting case study of the relationship between modern mining, critical mineral development, and then the need for the energy to support it. At the same time, of course, critical mineral development is critical to support the energy transition.

Can you talk about what your understanding is of where British Columbia is in pursuit of a B.C.-Yukon connection?

Mr. Paul West-Sells: It's my understanding that Premier Eby from British Columbia has publicly put his support behind this. I believe the application that was forwarded by the Yukon government into the critical minerals infrastructure fund includes a letter of support from Premier Eby. At that political level, there's absolutely alignment on this.

As I said, this is not just about opening up the Yukon. It's about opening up northern British Columbia and the Yukon as well.

Mr. Brendan Hanley: That's a great point.

We've heard, of course, the presentation on the potential for geothermal. We talked about the only choice apart from grid connectivity, really, being LNG.

Can you talk about the role of renewable technologies, either in the medium term or in the long term, if we really are looking at decades of mining potential at Casino and other sites around the north?

Mr. Paul West-Sells: It's part of our regulatory application. We need to show what potential there is for green energy. Those studies have been done.

What we found is that there wasn't really a cost-effective opportunity for our mine specifically. That doesn't mean to say that there isn't an opportunity, if you expand the grid, to look at a number of different opportunities around the area, that that can't be brought into the Yukon and added to the energy mix.

Mr. Brendan Hanley: Thank you very much.

The Chair: Thank you.

We'll now go to Monsieur Simard for six minutes.

[*Translation*]

Mr. Mario Simard: Thank you very much, Mr. Chair.

Mr. Balaban, could you confirm that interpretation is working?

[*English*]

Mr. Dan Balaban: I can hear you. Thank you.

● (1630)

[*Translation*]

Mr. Mario Simard: Thank you.

Mr. Balaban, you finished your presentation saying that the renewable energy industry is unfortunately suffering from political polarization and that some politicians tended to demonize the costs associated with the necessary transition. We see it constantly here, in the House of Commons.

This leads me to ask all the witnesses the following. Do you think carbon pricing is essential if we truly want to transition to renewable energy?

[*English*]

The Chair: Who would you like to begin with, Mr. Simard?

[*Translation*]

Mr. Mario Simard: I'd first like to hear from Mr. Balaban.

[*English*]

Mr. Dan Balaban: You touched on a point that I made, which is the polarization around the energy discussion in this country.

I'm not trying to point fingers at any one side. Just to be clear in what I'm saying, I think it's polarized on both sides. On one side, we have those who think we can make a very rapid transition to an all-renewables system, which unfortunately is not technically feasible today. I think we can get more and more renewables and increase penetration over time, certainly, but to get to an all-renewables system today is unrealistic.

You then have those on the other side who say renewables are unreliable and expensive, and there are all sorts of false narratives there.

The truth is in the middle. What we really need to be doing is working beyond these polarizing sorts of narratives and working on the solutions that we need to get us to where we need to go.

As far as the industrial carbon tax goes, the industrial carbon regime that exists in Alberta specifically has been very effective in terms of incentivizing the right sorts of developments in infrastructure in Alberta around renewables. The retail carbon tax, though, has not had a direct impact on the work that we are doing.

[*Translation*]

Mr. Mario Simard: Mr. Balaban, please rest easy. I'm not asking you to point fingers. It's my job to point fingers unfairly.

Still, I would like you to tell the committee what we can do, politically, to promote investments in the renewable energy sector. Are there specific actions the government could take to promote investments in the renewables sector?

[*English*]

Mr. Dan Balaban: Is that follow-up for me?

[*Translation*]

Mr. Mario Simard: Yes, that's right.

[*English*]

Mr. Dan Balaban: Okay. Thank you.

There are some policies being put forward that are in place right now. The investment tax credits that were put forward are very critical in ensuring the further build-out of renewable technologies. They will ensure that Canada remains competitive with other global opportunities where capital can be deployed, specifically south of the border in the United States, which has its Inflation Reduction Act that has been very good for investment.

We need to respond, and we have done that with the investment tax credits. Things like the smart renewables and electrification pathways program, which has been deploying capital into various renewables projects across the country, have been very effective. Things like the Canada clean growth program, which has been providing assurances for long-term carbon revenues, have been very effective. Some of the work that the Canada Infrastructure Bank has been doing has been effective.

It's really a tool kit of things that we need to seize the opportunity, and it's important that we move relatively quickly on those opportunities so that we can remain globally competitive.

● (1635)

[*Translation*]

Mr. Mario Simard: Thank you.

I will end by asking each witness to answer, with a quick yes or no, whether they support carbon pricing to encourage the switch to electric.

[*English*]

Ms. Catherine Hickson: This is Cathy Hickson from Geothermal Canada. Yes.

Ms. May Wong: This is Capital Power. Yes.

Mr. Paul West-Sells: This is Western Copper and Gold. No, because I have no other alternative to using carbon at this point in time.

[*Translation*]

Mr. Mario Simard: Thank you.

[*English*]

The Chair: Thank you, Monsieur Simard.

We'll now go to Mr. Angus for six minutes. The floor is yours.

Mr. Charlie Angus: Thank you, Mr. Chair.

Thanks to our witnesses. This is a fascinating discussion.

I want to begin with you, Madam Wong, because you represent a company that has enormous expertise in power and diversified power. I'm interested because you recently walked away from the Genesee project near Edmonton, which was a big $2.4-billion carbon capture project. That really took everyone by surprise.

Some analysts suggested that you guys walked away because of financial and technical uncertainty around the project. Could you explain why the Genesee project was shelved?

Ms. May Wong: Thank you for the question.

I'm going to pass this question to be answered by my colleague Daniel Jurijew.

Mr. Daniel Jurijew (Vice-President, Regulatory, Siting and Stakeholder Engagement, Capital Power): Thank you, May.

Mr. Chair, I assume it's okay for me to proceed?

The Chair: Yes, proceed.

Mr. Daniel Jurijew: Thank you.

In terms of the Genesee announcement, as we stated publicly at the time of the announcement, there were two parts to it.

We completed a front-end engineering and design study, which confirmed that the technology is viable and practical in the mode of operations we were envisioning, but at this time, it is not economically viable, taking into account a number of considerations. Therefore, the decision was made to step down on it for this time.

We also stated—and we stand by this—that we would definitely reassess it if economic circumstances and conditions changed. That relates to things such as the cost of the technology itself, commodity pricing and other factors.

Mr. Charlie Angus: Thank you for that.

I'm interested because I was reading that the Business Council of Alberta had said it raised serious questions about the Canada Energy Regulator's performance standard for CCS. It said that technologically it is “currently unachievable”.

That report was done before the Genesee project was mothballed. Do you think the Business Council of Alberta is wrong in saying that the technology is currently unachievable at the rate that is required for CCS?

Mr. Daniel Jurijew: I haven't seen the business council report.

The technical work that we did identified the expected level of performance of the technology, given the mode of operations.

In the context of the discussions that are under way regarding the clean electricity standards, there is a discussion about whether the assumed standard that would be included in that reflects the capability of the technology. That may have been what the report was referring to.

There is a distinction between what the vendors have assured us the technology can achieve and what may or may not be reflected in any regulations.

Mr. Charlie Angus: The regulation is 95% containment. There have been complaints that this is not technologically feasible.

I guess my concern is that the CER says that in order to meet our targets, there's going to have to be a 39-times increase in CCS from current levels. If it's not financially feasible for you—and you guys have crunched the math and are forefront in terms of power generation—what's it going to take? Is it going to have to be public subsidies to make CCS work, or is it financially just not doable?

● (1640)

Mr. Daniel Jurijew: At this time, it's not viable, given current costs, the commodity cost outlook and the suite of support mechanisms that are in place.

Mr. Charlie Angus: Certainly our Liberal friends keep telling us that this thing is going to take off and to deal with it, but you're dealing with it from a practical point of view. You say you've looked at the technology. You have a big project. This was $2.4 billion near Edmonton. You're saying it's not financially feasible.

Would you make suggestions for more public money to operate these plants, or is it just not doable?

Mr. Daniel Jurijew: It just reflected the economics for our project at this time. CCS and other sectors face different cost considerations. I can't speculate on what may or may not work for other projects of different sizes.

Mr. Charlie Angus: You're a natural gas plant. Wasn't it a natural gas plant?

Mr. Daniel Jurijew: We were proposing putting the carbon capture unit on the back end of the two new combined cycle units that are nearing completion at Genesee, as Ms. Wong noted.

Mr. Charlie Angus: I guess my concern is that this would be hugely beneficial for continuing to use natural gas, which is coming under a lot of pressure for its fossil fuel use. If we had a new plant that used natural gas and we could capture 95% of it, that would make a huge difference in being able to sell that to the public.

If there's no financial case, then we're going to have to look at other options, are we not?

Mr. Daniel Jurijew: It's not economic today, but we are looking. We will need to look at other options in any event because CCS, small modular reactors, hydrogen and geothermal all have a role. They all provide that zero-emitting, dispatchable power that markets need.

We think there's still a pathway to CCS in the future, but we do need to advance other technologies as well.

Mr. Charlie Angus: Thank you very much.

The Chair: Thank you.

We'll now go to our second round of questioning. We will begin with Mr. Falk for five minutes.

Mr. Ted Falk (Provencher, CPC): Thank you, Mr. Chair, and thank you to all of our witnesses who have provided testimony for us here today.

Ms. Hickson, I'd like to ask you some questions about geothermal.

I actually am a fan of geothermal. I have several buildings with geothermal in them. When it works, it works well. When it doesn't, it's expensive.

When it comes to electricity generation with geothermal, what does it cost per kilowatt hour compared to other forms of electrical generation?

Ms. Catherine Hickson: The cost for electrical generation depends on where you are. In Canada it is currently quite high, simply because of the development costs, but if we go globally and look at other resources, we see it can be very low, in the $40 to $50 per megawatt-hour range. In the United States, their stated goal for the investment they are making in engineered geothermal systems is to create power at $45 per megawatt-hour.

Mr. Ted Falk: How does that compare to hydroelectricity or gas turbine electricity?

Ms. Catherine Hickson: This is higher, certainly, than gas, but what we bring to the table is the fact that....

I don't want to argue that geothermal is better than natural gas. What I want to point out is that if we're producing power from geothermal or using it for thermal energy, it can actually offset that natural gas. If that natural gas can be sold much more profitably offshore—hopefully, with the new pipelines that are going to get it there—it can help other countries actually reduce their carbon footprints.

As an Albertan, I think geothermal has a significant role to play as an offset in essentially liberating that natural gas to go to other markets, where it can be used to reduce their greenhouse gas production.

Mr. Ted Falk: Thank you.

Is it feasible, in today's environment, to actually construct a geothermal electricity generating plant in Canada? What are the roadblocks?

● (1645)

Ms. Catherine Hickson: We're talking about conventional geothermal. The roadblocks are financial: Convincing capital to be deployed within geothermal is a huge problem.

The federal government has been deploying capital into projects. There are three electrical generation projects supported by the emerging renewable energy program. Those are DEEP in Saskatchewan; Alberta No. 1 in Alberta—I happen to be the CEO of that one—and a project called Tu Deh-Kah in British Columbia.

However, on the question about the carbon tax, in Alberta No. 1, our financial model is built on three pillars: One of them is carbon taxes, one is the sale of thermal energy and the other is the sale of electricity. Currently we have to price that sale of thermal energy at a discount to natural gas. This makes geothermal very difficult in terms of competition with natural gas and other forms of electrical generation.

If we're talking about this new generation of advanced and engineered geothermal systems, these are, right now, very costly, but I want to focus on conventional geothermal, of which—

Mr. Ted Falk: I have limited time here, Ms. Hickson, so I have to move on, because I want to ask Mr. Balaban a question as well.

Mr. Balaban, you're quite involved in setting up green energy solutions. Can you tell me your experience with connecting to the grid? Does it work? Are there any obstacles in doing that? Do we have capacity for the extra generation that you can provide?

Mr. Dan Balaban: That's a good question.

Connecting to the grid is a very complicated process. I can speak from my experience of developing projects in Alberta. It's a well-regulated process, but it takes several years to get through. It's very costly.

However, what we are starting to see now in Alberta—it's not just here; it's in many places across Canada and around the world, in fact—are grid constraints: The grid can't keep up with all of the new power generation that is requested. That is a challenge facing the growth of the industry.

The Chair: Thank you.

We now go to Ms. Lapointe for five minutes.

Ms. Viviane Lapointe (Sudbury, Lib.): Thank you, Chair. My question is to Mr. Balaban.

Your organization developed several solar power projects. You had been working on the MidNite Solar project, but it's my understanding that you have since sold the project. I have some questions surrounding the technology.

We're talking about a project with a battery storage component that is capable of providing power to the grid at peak times and hours, even during periods of no sunlight. At times this committee has heard critics say that solar power is unreliable and is not well suited for Canada's cold climate. In your opinion, will battery storage projects of this magnitude help to make solar power better suited to our climate?

Mr. Dan Balaban: First, I'd respond that solar is very reliable and very well suited for our northern climate. The challenge with solar is that it only produces when the sun shines—but very reliably so during those conditions.

What we need battery storage for is to extend the operating hours for renewables projects to produce stored energy when the sun doesn't shine, for example. There are different types of storage technologies that are vying to help solve the market issue that exists. Battery storage is one of them.

Batteries typically have a relatively short duration; they can store energy economically for two to four hours. There are other technologies that are not yet as mature that are trying to provide storage solutions for longer, for eight to 12 hours or possibly even longer.

However, I think it's really important to look at the energy system as a mix. There is a mix of solutions, a mix of power generation technologies that we require. There is no one solution that alone is going to meet all our needs, but certainly the combination of renewables—which are primarily solar and wind today—with battery storage is something that is looking very promising, assuming that the regulatory framework is in place to accommodate it.

● (1650)

Ms. Viviane Lapointe: In your opinion, what are the main challenges or obstacles that Greengate faces in scaling up wind and solar power capacity in Canada? What do you need to see from the different levels of government to overcome these challenges?

Mr. Dan Balaban: I'd say that, as of late, the biggest challenge our industry is facing is the extreme polarization around energy that I referred to in my opening comments. What that fight is doing is creating a lot of regulatory and market uncertainty at the moment in Alberta, and that has significantly slowed down investments.

This is because for investors to make a significant long-term investment in something like a renewables project, which typically has an operating life of 30 or more years, there needs to be long-term certainty around what the revenue stream will look like. While that is up in the air, it's difficult to make those long-term investment decisions.

I think it's really trying to move beyond the polarization on this issue to work on solutions. Solutions that are very important are some of the federal incentives that have been talked about, which I mentioned—the investment tax credits and some of the other programs—looking at collaboration around a national grid, and connecting more of our provinces. Alberta, for example, is relatively isolated compared to its neighbours, and I think that's a problem that exists across the country. There is no reason that we shouldn't be connecting the western provinces so that hydro in B.C. and Manitoba, for example, could be used to supply and clean up the grids in Alberta and Saskatchewan, which typically have relied on fossil fuels for generation. We just need certainty to the extent that we can have it, and we need to try to work together collaboratively.

Ms. Viviane Lapointe: Thank you.

I have about one minute left, so I'm going to ask you a question very quickly.

Just so that we really understand what's on the line here when you talk about that polarization, can you speak to the socio-economic benefits of Greengate's renewable energy projects, such as job creation, community engagement and economic development?

The Chair: Mr. Balaban, I'll ask you to be very quick, because we are out of time. You have 10 seconds, please.

Mr. Dan Balaban: There were over 1,000 local jobs created during construction for a project like Travers, with millions of dollars per year in municipal tax revenues and a clean source of energy for future generations.

The Chair: Thank you.

Mr. Simard, you have two and a half minutes. The floor is yours.

[*Translation*]

Mr. Mario Simard: Thank you.

Since I'm a gentleman, I let Mr. Angus ask a question in my stead earlier, out of the goodness of my own heart.

However, Ms. Wong and Mr. Jurijew from Capital Power, I still have questions about the fact that you abandoned the $2.4 billion carbon capture project. You talked earlier about the various power plants you operate. Are they mainly natural gas plants?

[*English*]

Ms. May Wong: In terms of the generation mix, we have natural gas and solar renewables as well in our portfolio.

In terms of the CCS project, while we have discontinued the Genesee CCS project due to economic reasons, we continue to look at other opportunities to deploy not just CCS but other decarbonization technologies in clean power, such as SMRs.

[*Translation*]

Mr. Mario Simard: Regarding your various facilities, do you have an idea of cost per kilowatt hour? To the extent possible, I would like you to provide the committee with the cost per kilowatt hour for a wind project compared to the cost per kilowatt hour for a natural gas project with a carbon capture strategy. Do you think you could provide that information to the committee?

● (1655)

[*English*]

Ms. May Wong: I can speak to that at a high level.

The cost of wind and solar renewables, on a energy basis before firming, is lower than the cost of natural gas generation. However, when factoring in the holistic costs of delivering that energy on a firm basis, in order to be dispatchable and provided at all hours, there's a significant increase in terms of firming up dispatchable resources like solar and natural gas.

[*Translation*]

Mr. Mario Simard: I completely understand that you can't reveal company secrets. However, it could be very helpful if you could provide the committee with a document showing a breakdown of the different costs. Thank you.

[*English*]

The Chair: Thank you.

That is a reminder for everyone. We still have a number of folks to go through in the rounds, but if anything is missed or asked for, you can provide a brief after the meeting to the clerk.

We'll now proceed to Mr. Angus for two and a half minutes.

Mr. Charlie Angus: Thank you.

Ms. Hickson, I would like to speak with you about the potential you were talking about of 16,000 megawatts internationally. Canada doesn't seem to be really on the map in terms of geothermal, and yet what I find surprising is that I would think we'd have enormous resources. I see that the old Springhill mine, which caused such a human disaster, is being refitted for geothermal.

In my little town of Cobalt, I have at least six abandoned shafts on the hill behind my house. We have at least a hundred in the surrounding bush. In Timmins we have shafts that go down 5,000, 6,000 or 8,000 feet into very, very hot water, because the shafts have filled up.

Is that a potential for using geothermal, from the infrastructure from closed mining operations?

Ms. Catherine Hickson: Yes, absolutely. Another one is in Yellowknife, where there are two deep mine shafts. These are geothermal projects that are ripe for the picking. They're not being picked because you cannot make the finances work.

Why can't you make the finances work? A lot of it has to do with that upfront high CapEx that I was speaking about. For investors, essentially what geothermal is up against is providing that thermal energy through natural gas. When I answered the question about the carbon credit, it really was about that. Geothermal cannot compete against natural gas without that added bonus of essentially a carbon credit. That's what a geothermal project—

Mr. Charlie Angus: I'm sorry. I have a very short amount of time here.

You're saying that, for example, for the old McIntyre number 11 shaft that my grandfather worked on, which is 6,000 feet deep and full of hot water, we can't just stick a pipe down and be doing heat transfer. That's the technology they tell me they can use at my house if I get a heat pump.

Why are the upfront costs so high to make something like that doable?

Ms. Catherine Hickson: It's because we're competing with natural gas. My guess—I do not know the specifics of it—is that your community probably already has natural gas pipelines in place. What we have to do is build a district heating system as well as recovering that heat. That's where the cost comes in.

The Chair: Thank you.

We'll now go to Mr. Dreeshen for five minutes.

Mr. Earl Dreeshen (Red Deer—Mountain View, CPC): Thank you very much, Mr. Chair.

Thanks to all of the witnesses. It's a very interesting discussion we're having this afternoon.

First of all, I'll go to Ms. Wong and Capital Power.

You spoke about the holistic cost of delivery and energy. Of course, in Alberta, most of the natural gas goes out to all the farms and all the communities. That network is already there. I think it's critical to talk about projects that are already in the ground. We have the same scenario in other provinces. They've developed their systems, and we're happy for them. We seem to have a bit of a concern, though, as we continue on our natural gas journey.

One of the other things—Mr. Simard mentioned this—is cost breakdown. That's something I would like all of the energy producers we're talking to today to give some thought to. Maybe you can give us this information.

There is a cost to all aspects of a project. I've always said it's important to measure the commitment—the greenhouse gas emissions and whatever it is you have to use from the first shovel that digs something up to the last shovel that covers it up. Yes, we have the use of it, and the length of time you're going to run a project. All of those things are important, but it's also important to make sure you analyze all the environmental aspects, because it's the environment we're dealing with. The greenhouse gas aspect is a thing that everybody wants to focus on, it seems, but it's the environment we're concerned about. I'm curious about whether we could look at that.

First of all, Ms. Wong, do you have those types of numbers available for, as I said, the full life cycle of projects you're engaged in?

● (1700)

Ms. May Wong: For some of the projects, we have some of the costs for the entire ecosystem.

One of the challenges in being able to quantify the holistic cost is information not always being available, and also not consistently being able to holistically look at the life cycle on an end-to-end basis. Many pieces of the value chain, and consideration of risk and opportunity, are part of the assessment, in terms of an investment process we look at.

Mr. Earl Dreeshen: Thank you very much.

Mr. Balaban, I'll go to you as well, because you're primarily speaking on the renewables we already have in Alberta.

Do you have those metrics available for the different types of projects you work with?

Mr. Dan Balaban: I don't, unfortunately, have them available at my fingertips.

Mr. Earl Dreeshen: Thanks.

Let me go to Ms. Hickson, then.

I think you've been talking about actual costs when we're dealing with geothermal. That's the part you've been dealing with. It's distribution, and transmission after that.

Do you have any figures you could share?

Ms. Catherine Hickson: In what aspect? Is it in terms of the total project investment?

Mr. Earl Dreeshen: Basically. It's not just the investment, but also the actual types of work required to drill the shafts and do all of those other things.

What energy sources are you using to make sure this works? If a project has to be decommissioned, what are the costs associated with that?

Ms. Catherine Hickson: Geothermal has a very low decommissioning cost because it's not a pollutant in the same way hydrocarbons are. We don't have the orphaned well issue that you do with oil and gas—suspended wells and abandoned wells.

Maybe the best thing is the Alberta No. 1 project. We started that project in 2017. We are not able to move it forward because we have not been able to get the capital investment we need. Our target, in terms of the cost of power, is that we would like a power purchase agreement at $75 per megawatt-hour. Currently on the Alberta grid, the price of power is significantly lower than that, so the project is not yet economically viable.

Mr. Earl Dreeshen: I'll go back to Mr. Balaban.

You spoke about the moratorium that took place in Alberta. Of course, it was there to establish a consistent legislative and regulatory environment. You said this caused grief because you had projects that were under way.

Were you part of the discussion? It says they had interested stakeholders meeting with the government. Is that part of it? Certainly, in connection with that reclamation security requirement, these were the things we were hearing on the ground that farmers wanted to know about. They wanted that sort of assurance.

Did you meet with the provincial government?

Mr. Dan Balaban: Yes. I've discussed some of my concerns, but just to be clear, I had no concerns with any of the specific things that were being evaluated. I think that in the context of a fast-growing industry, that makes sense, but the moratorium was unnecessary.

Mr. Earl Dreeshen: Thank you.

The Chair: Thank you.

We'll now go to Mr. Jowhari for five minutes.

● (1705)

Mr. Majid Jowhari (Richmond Hill, Lib.): Thank you, Mr. Chair.

Welcome to all of our witnesses.

Madam Hickson, I'm going to come back to you.

I was looking at the submission that was made to the committee from Geothermal Canada, which is entitled “Deep Geothermal Energy in Canada”. Paragraph number 2 says, “Deployment of the various types of geothermal systems in the spectrum is dependent on [the] local geological conditions, population/industrial requirements, decarbonization targets and other factors.”

Can you explain something to us? You've talked about the spectrum, and I think you've talked about three different technologies and you've talked about some of the recent ones, but can you expand on that one?

It's very interesting. The way I read it is that we could implement geothermal depending on where it would be in the jurisdiction. Province by province, we can go and do the analysis and recommend the type of geothermal. You also highlighted here the “population/industrial requirements” and “decarbonization targets”. Can you expand on those? Why are these required?

Ms. Catherine Hickson: They're required because of that high CapEx. Geothermal projects, unlike wind and solar, have a high CapEx and the return on your investment is.... Our financial modelling for Alberta No. 1 puts our return on investment at about 10% to 15% in that eight- to 10-year time frame. The problem with this is that we are competing directly with investors who are putting their money into hydrocarbons. Those hydrocarbon investments will pay significantly better ROIs than a geothermal project.

There needs to be a population that needs the power or needs the thermal energy. I already mentioned, in answering the other gentleman, that it's not just putting a heat exchanger down into a well; particularly in the case of thermal energy, we have to build a district energy system. Those district energy systems, because we're talking about digging up the ground, are expensive.

Again, we are competing in many localities across Canada with already built infrastructure that is based on natural gas. The best place to put in geothermal is in new development, where we can build that thermal energy requirement or extraction into a new facility.

Mr. Majid Jowhari: Okay. That's great.

Can you give us a sense—

Ms. Catherine Hickson: Does that answer—

Mr. Majid Jowhari: Yes. That was great.

Can you give us a sense of the size of the CapEx that's needed?

Also, in your 10 points that you highlighted, in number 7, you're saying that “Although [they] have a high Capex...[it's] a very low OPEX”. Can you also give us a sense of the size of the CapEx and the size of the OpEx as compared to the others?

Ms. Catherine Hickson: I can't give you exact figures, but what I can say is that I was involved in the project with the City of Regina. They have put forward a geothermal project to heat with thermal energy only—no power—a very large aquatic centre. It probably doesn't mean much to you, but the geothermal system was to provide 22.7 million BTUs per hour for that aquatic centre. The capital cost of that was $25 million.

On the flip side, with our Alberta No. 1 project, we are looking at an investment of $100 million, but that is to provide over 83,000 megawatt-hours per year of energy. That 83,000 megawatt-hours per year is equivalent to basically 70 megawatts of solar or about 30 megawatts of wind to produce that same amount of megawatt hours, and that's not without....

The other piece in terms of the financials is that for the geothermal project, we don't need battery backup or the natural gas peakers. We are firm and can feed directly to the grid.

Mr. Majid Jowhari: I have only about 10 seconds. Can you tell me about the OpEx? You're saying the OpEx is very low. Do you have any numbers around the OpEx?

● (1710)

Ms. Catherine Hickson: I don't have them specifically from Canada, because we have no operating electrical plants, but we based—

Mr. Majid Jowhari: Do you have them from anywhere?

Ms. Catherine Hickson: Yes. The OpEx, in terms of.... I don't know how to phrase it. It's 10% of your total costs per year.

Mr. Majid Jowhari: Thank you.

Thank you, Mr. Chair.

The Chair: Thank you.

Now we are in our final round.

Colleagues, I propose we do five minutes, five minutes, two and a half minutes, two and a half minutes, and then end after that. That should take us pretty close to the end of the meeting.

Mr. Patzer, you have five minutes.

Mr. Jeremy Patzer: Thank you very much, Mr. Chair.

Ms. Wong, if you're going to be tabling a document to this committee about the cost per kilowatt-hour for wind, solar and natural gas, I'm wondering if you would be able to also include in that a breakdown of what the cost would be if there wasn't a federal government-imposed carbon tax on natural gas, just so we can get a good snapshot of all things being equal.

With that, Mr. Chair, I'm going to give notice of a motion quickly with part of my time here:

> Given that,
>
> The Liberal government released its internal economic data on the carbon tax, revealing it costs Canadians $30.5 billion and over $1800 for every household in Canada,
>
> This is in addition to the increased costs the carbon tax puts on gas, groceries and home heating, and
>
> The Liberal government tried to cover up this information from Canadians,
>
> When the Parliamentary Budget Officer revealed that the Liberal government had this data, they placed him under a gag order, and attempted to disparage his reputation;
>
> The committee report to the House that the environment minister must resign immediately

I'm just giving notice of that motion. I'm not asking to move it or debate it. I'm just putting that out there. Because we are talking about costs of energy here, I do think that it ties in quite nicely with some of the points that we've heard here today.

For Capital Power, I'm wondering if you can you talk a little bit more about some of the obstacles or maybe disincentives that exist for you guys in trying to get your carbon capture project up and going.

Ms. May Wong: Sure.

I think one of the challenges with this newer technology is the scale of investment required and the level of uncertainty that exists about the longer-term trajectory of industrial carbon pricing, and there is also increased risk related to technology, given where they're at in their cycle of development. If it's first of its kind or one of the more immature technologies, it factors into our consideration when we're looking at whether there is too much risk to take on in order to proceed with the investment.

Mr. Jeremy Patzer: I'm going to go to Greengate Power here.

Mr. Balaban, have you done any calculations on how many wind turbines would have to be built and operational from today to 2035 in order to be net zero by 2035?

Mr. Dan Balaban: I don't have that specific calculation, but I would acknowledge that for a province like Alberta, getting to net zero by 2035 is uniquely challenging.

Mr. Jeremy Patzer: Why is that? Is it because they would have to replace more coal and natural gas with wind, or what?

Mr. Dan Balaban: I think this is part of the polarizing discussion that I'm referring to.

We can see significantly more renewables on the grid as time goes on, but net zero as an absolute goal is very challenging. In the case of Alberta, we don't have hydro resources of the kind that many other provinces have. We rely a lot on thermal generation. It used to be coal; now it's natural gas and a lot more renewables, but to take that thermal generation out of the mix and replace it entirely with renewables is not technically feasible at this time.

Mr. Jeremy Patzer: Okay, so you would probably be willing to say that a 2035 target, that mandate, is completely unrealistic.

● (1715)

Mr. Dan Balaban: It's very challenging for Alberta, and I think it certainly requires some acknowledgement of the specific conditions and easing of some of the particular parts of it to apply to Alberta.

Mr. Jeremy Patzer: Yes, and I think across the entire country as well, because next door in Saskatchewan, we're kind of in that same boat; it's the same situation there.

In regard to the interties, though, this past winter, for example, Saskatchewan had to come to the rescue of Alberta in January. Some of the new proposed CERs are creating some hesitancy about whether or not provinces would be able to share power back and forth smoothly.

Do you have that same concern?

Mr. Dan Balaban: I think we should look at this as a national problem and remove any barriers that might exist between the provinces to try to solve this together.

The Chair: Thank you.

We'll move to Ms. Dabrusin for five minutes.

Ms. Julie Dabrusin (Toronto—Danforth, Lib.): Thank you.

I have a few questions, actually. It's kind of an interesting place to be as the final person, because I get to pick up on threads I've been hearing in testimony until now.

Maybe I'll start with Greengate, but I was actually hoping to go around to everyone.

You talked about the Infrastructure Bank, SREPs and ITCs being very useful and supportive to building out renewables as part of our energy mix. Can you tell me if you have seen any of these programs support projects that you're working on or that you have been adjacent to in your work?

Mr. Dan Balaban: A project we developed called Jurassic solar, which we no longer own, signed a contribution agreement for SREP funding.

Ms. Julie Dabrusin: Great.

I'll go to the others, starting with Capital Power.

Ms. May Wong: Yes, on these programs, we have been in conversations to look for ways to advance some of our projects.

Ms. Julie Dabrusin: Would that be through the Infrastructure Bank or SREPs, or is there another federal program that has been supportive?

Ms. May Wong: The programs that you mentioned are the ones that, through SIF and CIB, are related to conversations we have had on our Genesee project.

Ms. Julie Dabrusin: Thank you.

What about for Geothermal Canada?

Ms. Catherine Hickson: For us, it's the predecessor to the SREPs, the emerging renewable power program.

I also wanted to add that internationally, in other countries, there is no need to subsidize geothermal energy. It is only in Canada.

Ms. Julie Dabrusin: I was just trying to figure out about the federal programs, because it had come up through some of the other witnesses, so that was basically where I was going. Maybe you—

Ms. Catherine Hickson: The ERPP and SREPs have been very good.

Ms. Julie Dabrusin: Okay, perfect. Thanks.

One of my questions had come up the last time we had testimony It was about the need to build to anticipate electrical technology through, for example, building codes. One of the witnesses had testified that this would be helpful in promoting a cleaner grid.

Do any of you have any thoughts about that? I'll start with Greengate and do the circle again.

Mr. Dan Balaban: Sorry; could you repeat the question?

Ms. Julie Dabrusin: It's the idea of whether building codes and the like would encourage building new to anticipate that we'd be moving to electrical as opposed to building on older technologies.

Mr. Dan Balaban: Certainly things that we're seeing—like heat pumps, for example—are more efficient ways of heating, and they drive more electrical demand. That only makes sense if our electricity comes from clean sources, but things like that certainly drive more demand for renewables.

Ms. Julie Dabrusin: Do any of the others, if we go through again to Capital Power and Geothermal Canada, have any thoughts about building codes and building new buildings with the anticipation of moving to electrical power?

Ms. May Wong: Yes, I would second the comment from Greengate. It's helpful to have more certainty in understanding the need for power going forward and the way we can then plan to provide solutions that are affordable and reliable while also looking for ways to get clean power. That alone would not be sufficient.

● (1720)

Ms. Julie Dabrusin: I'm just adding it as one of the things that came up the last time we had testimony.

Geothermal is my last answer on that.

Ms. Catherine Hickson: Geo-exchange systems actually use the produced heat and then store it in the subsurface. Basically, every Canadian home and business should be using geo-exchange, meaning shallow subsurface heat recovery and storage.

Ms. Julie Dabrusin: I love that you mentioned it, because the University of Toronto just moved to a large geo-exchange system that's a district energy system. It actually helps to support the city of Toronto as well. I'm always glad to cheer that on.

I think that brings me to the end of my time, though.

The Chair: Thank you, Ms. Dabrusin.

We'll now go to Monsieur Simard for two and a half minutes.

[*Translation*]

Mr. Mario Simard: Thank you, Mr. Chair.

I am not very familiar with the realities of the electricity generators in the rest of Canada, but I'm very familiar with the situation in Quebec. In Quebec, we tabled a bill amending various laws to allow self-producers—and not Hydro-Québec—to undertake clean energy projects with businesses. I wanted to mention it because I know a number of businesses are looking for sources of clean energy.

I'd like to hear from both of you, Mr. Balaban and Capital Power, about whether you've been contacted by any energy-intensive businesses to develop clean energy projects specifically.

[*English*]

Mr. Dan Balaban: In the case of my company, we've had projects that we developed enter into long-term agreements with Amazon and Microsoft. Those players are in the Alberta market.

Yes, there seem to be a number of companies all over the world that are making very strong renewable commitments and have come to Canada, and Alberta specifically, to source that type of power. They come to Alberta because it's the only deregulated power market in the country and the only market where those sorts of bilateral arrangements are currently possible.

[*Translation*]

Mr. Mario Simard: Thank you, Mr. Balaban.

Can Capital Power answer that question as well, please?

[*English*]

Ms. May Wong: Yes, we have large C and I customers, commercial and industrial customers, who have an interest in looking for ways to have clean energy. We have virtual PPA customers for renewable projects. We also have customers looking for energy for new needs, like data centres and other industrial processes.

[*Translation*]

Mr. Mario Simard: Thank you.

[*English*]

The Chair: Thank you.

We'll now go to Mr. Angus for two and a half minutes.

Mr. Charlie Angus: Thank you.

Mr. Balaban, I've spoken with a lot of people over the years on the clean energy file, and I've been told many times that there was no jurisdiction as ready to kick off the clean energy revolution as Alberta was, given the enormous potential for solar and wind, and also the expertise. Would you agree?

Mr. Dan Balaban: I agree. I think we've seen that over the last number of years. Alberta has been the leading province in the country for renewables growth.

Mr. Charlie Angus: Thank you for that.

You talked about political polarization and the damage it's doing. I certainly see that from the moratorium. I've talked again to businesses, which said they're not going to go somewhere where they don't know if there is a climate that would support it.

I look at California, which went from 770 megawatts of clean energy in 2019 to over 10,379 megawatts in five years. Texas is even more impressive. I don't know if I'm stepping over the line here, but I'd say Texas has even more right-wing politicians than the UCP, yet on any given day, Texas can generate with clean energy over half the power that is produced all across Canada.

Would you say Alberta is losing out from these battles?

Given what we're seeing in jurisdictions like California and Texas, it's political will that gets us to those enormous amounts of clean energy. If we had the political will, could Alberta and the west compete with competitors like California and Texas?

● (1725)

Mr. Dan Balaban: Absolutely, and up until recently, we were competing. Alberta, as I said, was one of the leading jurisdictions in North America for renewables investment. We have a great resource. We have a market that was working to attract investment. Corporate buyers were coming in to source energy.

Unfortunately, the moratorium has introduced a lot of uncertainty, and folks are now waiting for that to unfold, but in fairness, I think we need—

Mr. Charlie Angus: I have to end here because I'm running out of time, but could I ask you one more thing?

There is one thing I would ask your opinion on. From my time in Alberta, I have found that we have enormously skilled workers. The union workers I've spoken to in IBEW, the building trades and the carpenters' unions have all spoken about their willingness to participate. If we can get this ideological hex off clean energy in Alberta, are there going to be well-paid jobs and sustainable jobs from the projects you're supporting?

Mr. Dan Balaban: Yes. A lot of construction jobs could be created with a massive build-out of renewables, but we need all forms of energy—oil and gas and renewables.

The Chair: Thank you, Mr. Balaban.

Thank you to all of our witnesses for joining us today and providing your testimony.

As a reminder, if you would like to provide an additional brief to the committee, please send it over to our committee clerk.

Thank you so much. Have a great day.

I believe it's the will of the committee to adjourn.

Ms. Julie Dabrusin: Yes.

The Chair: Everybody's in favour, so we will adjourn. The meeting is adjourned.