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Chair

Mr. James Maloney

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● (1530)

[*English*]

The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)): I call the meeting to order.

Good afternoon, everybody. We will get going right on time, which is not always the case.

We have two people standing in. David and Ron, thank you for coming today.

To our witnesses, Mr. Love, Mr. Finet, and Ms. Bak, thank you for joining us today to participate in our study.

I will give each group up to 10 minutes to do their presentation, which will be followed by questions. You are free to deliver your remarks or answer questions in either official language. In all likelihood, you will be asked questions in French and English.

I won't take any more time. I will open the floor to Mr. Love and Mr. Finet first. I hope I pronounced your names correctly.

Mr. Jean-Pierre Finet (Vice-President, Energy Services Association of Canada): Yes.

Mr. Peter Love (President, Energy Services Association of Canada): Yes. Thank you very much.

I appreciate the opportunity to come and speak to you. My name is Peter Love and I'm the president of the Energy Services Association of Canada. J.P. Finet is the vice-president responsible for our Quebec office.

I will make some comments in English. J.P. will add to them, and if there are questions, J.P. can respond to those in French. He may respond to the ones in English, too, depending on how hard they are.

I wanted to give you a bit of background on our industry because we think we can play an important role here.

We represent what's called the ESCOs, the energy service companies. There is a number of them in Canada. Many of them are large companies that you would recognize: Siemens, Honeywell, Johnson Controls, Trane. These are large multinational companies that do many things. One of the things they do is a guaranteed energy service performance contract. That's what we're here to talk to you about.

Our association was created in 2010 to advocate the use of these performance contracts. Most of these contracts are in the public sector, for government buildings, hospitals, universities, colleges, or schools. They've been used in Canada for over 30 years. The industry accounts for about $300 million a year in doing these projects. We've done about 280 of them over the last 10 years. It's an existing industry. It has been here for a number of years, and the essential feature of these contracts is that it's a competitive industry. As much as our members would love to think they can get a sole-sourced contract, it's all for public entities, and so it's bid, and there's a competitive process.

They do a detailed assessment of the building. They identify the measures that they think should be undertaken. They undertake those measures. They guarantee that the energy savings from those measures are sufficient to pay back the project, and if they're not, they make up the difference.

As part of this process, they spend quite a bit of time as well in monitoring the project to make sure it's on schedule and on budget and making sure that the performance guarantee is being met, because they're actually guaranteeing it with their own money. They are obviously very conscious of that. It's a guaranteed project.

They also spend quite a bit of time in terms of commissioning the project once the equipment has been installed to make sure it's working correctly. They also spend quite a bit of time in education, talking to the staff and the custodians who are actually operating the building. It's one thing to talk to the CEO or the CFO about the project, but it's also really important to talk to the people in the mechanical room and the electrical room so they understand the system that's put in place and can fully utilize its benefits to achieve the results we're looking for.

That's the nature of the industry. Some of you may know that Natural Resources Canada has had a program to promote the use of these contracts in the Canadian government. It's called the federal buildings initiative. I don't have to tell you what the acronym is. It's an unusual one, but that's what they've called it, and it has been very successful.

The program has a qualified bidders list of companies. They have to fill out information to ensure that they are qualified to do this work and NRCan maintains it on an ongoing basis. They have model RFPs, model contracts, and they actively promote these sorts of contracts to departments to achieve energy efficiency.

Almost a hundred projects have been done over the last 25 to 30 years. It has gone up and down. It's in a real upswing right now. The former assistant deputy minister of defence, Jaime Pitfield, committed to having all 35 of Canada's military bases retrofitted to increase their energy efficiency. Some of those RFPs have already been issued and some have already been contracted. You're going to see that work in almost every one of your ridings, and in every one of your provinces at least. That's under way.

● (1535)

We've actually just come from a meeting with Treasury Board. As you may know, the Office of Greening Government Operations is now part of Treasury Board. It is interested in using these contracts and this type of solution to achieve the government's greenhouse gas emissions reduction target and in working with us to do that.

That's a little bit of background on our industry. I'd be delighted to take any questions on that and give you more background on it. However, I think the main thing we wanted to come and talk to the committee about was the role our industry could play in encouraging innovative technology and in encouraging new companies with innovative technology that are approaching you and have opportunities. We would love to see these technologies included in the performance contracts that we do. This is something our members would be very interested in including.

However, because it's unproven technology, we would not be able to take on the performance risk of those technologies. Our suggestion is that that risk be taken on by the government in some fashion. We don't have an exact idea of what that would be, but in some way a contract would be structured so that the winning bids using a performance contract would include some elements of these technologies. They would be then tested as part of this performance contract. We would be delighted to see how that technology, or those groups of technologies, are performing and then report back on whether they're better than expected, they're about the same, or they really had problems.

We see this as an ideal opportunity to be a testing ground for these new technologies. Often our members can get a price on these new technologies, so that's not a risk; we know going in what the price is. It's the performance that we just don't know how to guarantee.

That's our main suggestion: that the government could address those types of performance risks. Some of these technologies, as well, may not be at mass-production size, so their pricing may be a little bit higher than it would be once they became more mainstream. Again, there's a little bit of risk...well, it's not risk; it just means the project would be a bit more expensive, but we think that expense could be included in contracts.

You had three questions. One of them was the types of risks the federal government could address. I think that performance risk is the key one for our industry. In terms of best practices, we think the federal government's FBI program is a best practice. We do a lot of work with provinces, and we highlight this as a best practice when we're talking to people across the country. We know that the Quebec government is looking at some version of an FBI program to promote the use of performance contracts in Quebec. We're talking to B.C., Ontario, and Alberta, which in particular are looking at this. You have a best practice. It's not perfect—it can be improved—but certainly it is something that's very effective.

The other element of best practice that we identified in our presentation was the idea that Alberta has a borrowing act. They actually encourage school boards to borrow money for energy efficiency, but there is a condition that they must get a performance guarantee. There was a recent report in Alberta that recommended to the government that it extend that to other public entities—hospitals, schools, and universities—to encourage them to borrow for energy efficiency, but to have a performance opportunity.

I think there's a list of products that you already have, so we'd like to work with you on that. As I said, I think the FBI program could be encouraged to help us in the de-risking of that technology. We think that would be a great vehicle to use.

I know my time is almost up, so I'll just end with one comment about performance contracts.

A lot of people believe, first of all, that ESCOs are financial institutions. They're not. They are indifferent to who provides financing. If the federal government has money it wants to invest in these projects, we're delighted to use that instead of just going to banks, insurance companies, or life insurance companies.

● (1540)

The other thing is that these contracts are cost-effective, especially when you look at the cost of multiple contracts, multiple RFPs, multiple winners, multiple losers. The cost to a department of managing all those contracts and all those negotiations is very high. NRCan, in its 25 years of experience, has found that the cost of these performance contracts is about the same as conventional costs, yet they get a lot more done. They're more comprehensive, and of course the big thing is that they're guaranteed by the private sector.

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

Ms. Bak, we go over to you.

[*Translation*]

Ms. Céline Bak (President, Analytica Advisors): Hello, ladies and gentlemen. Thank you for inviting me.

I am very pleased to appear before the Standing Committee on Natural Resources.

[*English*]

I will start with a brief introduction on the Paris agreement and the nature of clean technology firms. I will address three barriers to adoption of clean technology and will make three recommendations on de-risking its adoption.

Despite the collective ambition that yielded the landmark Paris agreement and despite the enhanced commitments to climate action by countries embodied in their nationally determined contributions, including Canada's, the world is still far away from collective action to keep global temperature increases to well under 2°C.

I would like the committee to know that after Russia and China, Canada's is the world's third most GHG-intensive economy on a GDP basis, the most GHG-intensive economy on a per capita basis, and the ninth-largest emitter in absolute terms. Your work on de-risking clean technology adoption is therefore vitally important.

In regard to clean technology innovation, Canada invests a great deal in de-risking technology, whose primary purpose is remediating or preventing environmental damage. According to firm-level research, in 2015 some 28% of R and D for Canada's more than 800 clean technology companies was publicly funded. Two-thirds of Canada's clean technology firms are engaged in commercializing their products; that is to say, they have proven that the technology works at scale and are looking for markets in which they both can improve environmental performance and also either increase revenue or decrease costs. This has just been described by Mr. Love.

The committee's work on methods for de-risking technology is vital. I would like to focus my remarks on recommendations to de-risk the markets for these solutions, the markets that I have just described. This is because clean innovation solutions are ready now, before markets for these solutions have formed. This situation is due to Canada's investment in programs during the past 15 years.

Clean technology firms operate capital-intensive business models because they invest in all three of R and D, manufacturing, and distribution. Think of the way Henry Ford and Massey Ferguson established the concept of dealerships for their products. Their dealers put forward their homes as security; that's how they attracted capital to the industry.

I'll speak about three risks to the adoption of clean technology solutions.

The first is that there are no net prices on carbon pollution because fossil fuel subsidies are in place today. Clean technology firms operate in areas in which prices for the commodities they replace, including energy derived from oil and gas, are volatile and in which prices for the externalities they reduce, including carbon, are in fact still negative.

Yes, we will have negative carbon prices in Canada for some time. This is because in Canada we have tax expenditures in the form of subsidies to the fossil fuel industry. In Canada these tax expenditures, under the most conservative method of calculation, are estimated to be $3.5 billion in direct fiscal subsidies and $3 billion in publicly funded loans.

The second risk to adoption of clean technology solutions is that regulators assume no innovation in setting environmental performance standards. Canada does not have accountability methods requiring that environmental regulation, whether federal or provincial, stipulate that best available technology be used as the benchmark to establish environmental performance standards.

This means, for example, that when methane regulations are established today, there is no requirement to consult with either academic researchers or clean technology firms to ensure that regulatory standards reflect what is made possible by innovation. In the U.S., civil society ensures that this happens; in Canada, it's not yet the case. There's a very good example of that quite recently with methane regulation.

Also, where permits and approvals are required to implement new technologies, delays are lengthy, because authorities grapple with assessing new technologies based on precautionary principles and legacy technology.

For example, they're used to regulating a certain kind of solution to an environmental problem, and when a new solution comes up, it's hard to figure out how to give permits for these new solutions. If we were to imagine clean technology firms in a sports league, we would picture on the one hand a newly established and very talented team of millennials playing on a field not yet served by lighting, a stadium, or a transportation system for the spectators. Their older opponents—people of my generation—are on the other hand playing on a covered field that is level, well-lit, and well-served by public transportation and other regulatory infrastructure.

● (1545)

A third barrier, speaking of infrastructure, is within infrastructure investments. There is predetermination of how electricity, mobility, water, and waste water services should be delivered, and therefore it tilts the playing field away from innovation towards legacy solutions. Meeting environmental protection goals such as Canada's commitment to the Paris agreement will require investment in infrastructure, and innovation can play a role in this to both improve performance and reduce costs. However, today Canada has no mechanisms to stimulate the adoption of best available technology as part of project assessments for infrastructure.

I'd like to make three proposals for Canada.

The first is for increasingly stringent standards for energy infrastructure. In November 2016, Minister Catherine McKenna set an aspirational goal for Canada's electricity sector to be 90% non-emitting by 2030. Today, it's at 83%, and getting to 90% will be largely achieved by phasing out coal. However, if natural gas is the primary replacement for coal, getting beyond this target will be difficult to achieve, so how will we avoid lock-in and stranded assets, for example, in natural gas infrastructure? Implementing increasingly stringent performance standards will de-risk markets for technological innovation for the natural gas industry.

Second, I'd like to recommend a principles-based approach to capital cost allowance. Today, fiscal advantages are in place for the fossil fuel industry and for sectors that can lobby to their advantage. If our tax code was subjected to a principles-based assessment of its alignment with our Paris treaty obligations, these tax expenditures would be identified and the money they represent—in the case of fossil fuel subsidies, $6 billion—could be redeployed much more cost-effectively and in a way that is transparent in terms of both outcome- and performance-based principles, such that markets for innovation would be de-risked.

My third recommendation is for full cost accounting of infrastructure, including a price on carbon for the length of the useful life of the infrastructure. In establishing criteria for long-lived infrastructure, full life-cycle cost accounting for these projects, including a shadow price on carbon for the life of the project, will stimulate innovation. This, combined with the principles of best available technology, will ensure value for money while de-risking markets for innovation.

I applaud the committee's work on de-risking clean technology adoption, and I look forward to your questions.

In regard to de-risking technology in terms of performance, you have a policy paper from my research at the Centre for International Governance Innovation, both in French and in English. In its policy recommendations section, there is a reference to a de-risking fund, which you may refer to in regard to Mr. Love's matter.

Thank you.

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

Mr. Serré, you're up first.

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

Thank you for your very thoughtful presentations and the preparation for today's presentations.

My first question is for Mr. Love.

In your presentation, you highlighted the federal government's success in upgrading its office facilities cost-effectively with the NRCan federal buildings initiative.

I wonder if you could provide us with an overview of whether and how the ESPCs are being used to upgrade buildings in the private sector. Are there any recommendations along those lines that you could provide to us?

● (1550)

Mr. Peter Love: Thank you.

The private sector represents about 10% of the work we do. One of the more high-profile buildings recently was the Empire State Building, done by Johnson Controls and using a performance contract. It was heavily monitored, so there is a great deal of data available on it. One of the pieces of information that I use in presentations is the employment impact, because they monitored that quite carefully and found it very positive. It was very labour-intensive. That was something that people had known.

We do have some projects in Canada. Typically, in the private sector they are looking for very fast payback, and five years is a long time for many of them. Some of the owners of properties have a lot of access to capital owned by pension funds or very wealthy companies, so they just don't seem to be as active. I think it's a growth opportunity for our industry, as some of these companies look to go beyond making smaller, incremental changes to their building performance. We'd be delighted to do more of that work.

There was a very interesting example of a fairly small project here in Ottawa. They did a $2-million project through a performance contract, and part of that performance contract improved the accessibility, the elevators, and the washrooms, because it was an older building. They were then able to rent to the federal government, which they had not been able to do before, and the value of the building went from $15 million to $20 million, so their $2-million investment was immediately paid back on the value of the real estate. That's a little unusual. I'd love to see more examples of that.

Mr. Marc Serré: Thank you.

[*Translation*]

My second question is for you, Ms. Bak.

Your 2016 report on green technology states that, in the past six years, the economy of the green industry has slowed down after a period of strong growth, which was approximately four times the growth rate of Canada's economy.

Can you tell us about the specific factors that led to the slowing of the industry in Canada as compared to that in other countries? What could the federal government do to offset these factors in order to better support the industry?

Ms. Céline Bak: It is a new industry in which Canada has invested a great deal. We have the capacity to create companies. These companies already employ more than 55,000 people. It is a very promising sector in terms of economic benefits.

In the 2016 report, we noted a drop in the revenue growth rate. According to our analysis, if the economy in this sector has slowed, it is simply because the markets to which the companies are selling their solutions are not yet robust enough. I am here today to talk about ways of making the market system more effective so companies can sell their solutions.

If companies sell a solution that reduces carbon emissions and carbon pollution has no price, they will clearly not be profitable. Trying to sell a solution to remedy something that has no cost will not work. That is why we maintain that there is a very important link between the price of pollution and the ability of companies to achieve the profitability that their investors deserve.

Mr. Marc Serré: Thank you.

[*English*]

I have another question for Ms. Bak.

Mr. Love talked about the issue of performance risks and de-risking the fund, and you indicated you had some specific recommendations on that. Can you elaborate a bit about de-risking infrastructure and the barriers there, again linked to the federal government?

● (1555)

Ms. Céline Bak: We've taken the metaphor of the CMHC for the low-carbon economy.

All of you, I'm sure, are well aware of what the CMHC does. It makes it possible for Canadians to guarantee their mortgages by taking the last part of risk in the loan that the bank, the private sector, makes. We have nothing like that for performance, for innovation. The federal government could create the equivalent of the CMHC for the low-carbon economy, and this type of fund could be last in and first out in the sense that if there were a performance problem for a particular technology within an application in the federal government, then the government could provide that guarantee.

That's strategic for many reasons, in that it would enable financial institutions to learn how to do that. Actually learning how to underwrite performance risk is not something that financial institutions do today, so it's a very strategic approach in that it not only addresses a priority today but it also teaches the private sector how to do it for the future, because you don't want to be in the business of doing this forever.

Mr. Marc Serré: I have seven seconds.

Thank you, Mr. Chair.

The Chair: Ms. Stubbs is next.

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

Thanks to the witnesses for being here.

I just want to start off with some broad comments. I have to say it probably won't surprise you that I am a little concerned when there are comments made about contracts the government is undertaking along the lines of it's “a bit more expensive”, or a risk to government, because I am concerned that what that actually means is it's a risk to taxpayers and potentially to future generations. Therefore, if you'd like to comment a little bit more around that concern in your responses, I'd welcome you to take that opportunity.

Mr. Love, given your knowledge and experience with these programs in the past, can you give us more information in terms of your understanding of what investments are picked and what contracts are picked and what the measures for those are, and how the best options are determined?

Mr. Peter Love: I'll ask JP to think about that as well.

It depends on the building. Labs are different from air force bases, and they are different from office buildings, and they are different from hospitals.

One of the advantages is that the performance contracting industry has been around, as I say, for 25 years, so there's a lot of experience with almost every type of building, but it's not simple. It's not a cookie cutter.

Some of them have moved pretty quickly from innovation at an early stage to wide adoption. LED lighting is an example. Ten years ago, it was really expensive. The colour quality wasn't very good. The white on the Christmas tree lights was pretty blue, and of course, in a home application it was very expensive. A few crazy people like me had it, but that was.... I wouldn't expect the federal government to take on that large a risk.

Over a fairly short period of time, the performance has improved hugely, almost like a Moore's law, and the cost has come down, and now it's competitive. That's a model we would love to see for other technologies.

Having been with a government agency in Ontario, I think the biggest challenge for governments occurs when they start to try to pick winners and losers. They end up saying, “That's a good technology; sorry you didn't make it.” That's very dangerous, because they never have the information available. They're listening to people who have interests, and it's hard for them to balance that.

The lesson I take from this is a really interesting role, a trend that we're starting to see in more of the provincial programs on energy efficiency. It's performance-based. They're not going to say they want that and that; they're going to say they want this level of performance, this level of carbon reduction, and this level of energy reduction. That's what they'll say they want. Now, private sector, you go figure it out. Use your innovation and creativity and come back to us with what you think is the best way to achieve that.

We're starting to see a bit of a move for that with the building code, which has gone from what they call prescriptive—thou shalt have R16 here or R40 there—to a performance basis, saying to an architect or a builder, “Here's the performance I want for your building. Figure it out.” It's harder to monitor it and harder to know whether that actually happened or not, but it's that performance base that really encourages innovation.

I agree with you. The government has to know what its risk is. This is why Céline's idea of putting something together.... Say that we're not going to blow our brains out, but we want to have this innovative technology and we want Canadians to play a role in it, so here's some money and here's a program to apply to. Again, you're going to have to have somebody say, “We got 50 applications, but we can only support 20. We're going to use some criteria to select them.” You have to do that because you can't do everything.

● (1600)

Mr. Jean-Pierre Finet: I would like to add that our members already take a lot of innovative risk on their own, but past some thresholds it would be nice to share that risk of innovating in clean technology. We don't want to give you the impression that we want to dump the whole risk on you for clean technologies. We're ready to do our share. We already do, actually, but the more ambitious your objectives are.... We're part of the solution, but we can't take on all the risk by ourselves.

Mrs. Shannon Stubbs: Certainly I would say that goes for the vast majority of investors and developers in Canada's natural resources sectors. They also have a long track record of innovation and technology to minimize their environmental footprint while also producing their products under the strongest standards and strongest regulations in the world.

I had that here in a letter your organization sent to the Ontario department of energy in 2013. I just want to draw this link between contracts and performance, because I think what you're saying is important in relation to Ontario's long-term energy plan. I think your conclusion was that it actually discourages conservation.

We've seen that Ontarians' power bills have increased, even though they have also decreased their consumption. I think it has increased 60% since 2006, which is nearly four times the rate of inflation, while they have decreased their consumption by 10%. At least it's clear in that case that even if the costs are rising astronomically because of contracts that governments have imposed, it is consumers who are being gouged by that decision. I think it is important, if you can, to give more specifics around how exactly you protect consumers and taxpayers.

Mr. Peter Love: That's a good point. I'll give you a 20-second response on electricity prices in Ontario—

The Chair: Good, because that's all you have.

Voices: Oh, oh!

Mr. Peter Love: It was about $15 billion that was invested in the electricity system in Ontario. There was all-party support for a decision to close coal-fired generation plants. That was 25% of the fleet. No matter who was in power, that was going to cost a great deal of money, and it did, and there have also not been significant investments in the transmission or the distribution systems. Ontario had gone through some peaks and valleys and had a big building boom in the eighties, and then not much happened. Then we began to have brown-outs in the early 2000s, so no matter what party was in power, a large investment was needed in Ontario's electricity system, and that investment was made.

Was it perfectly made? Were there mistakes made along the way? I think conservation did play an important role in that. I think it still has an important role to play in any energy policy, and that was part of our submission to the long-term energy plan.

The Chair: Thank you very much.

Mr. Cannings, we'll go over to you.

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

Thank you all for being here.

Mr. Love, Mr. Serré asked you a question, and you mentioned concerns around payback time for some private sector firms.

When these investments are made, the way I understand it is that there's an investment made that reduces your energy consumption, so there would obviously be a reduction, and the amount that the company would be paying would somehow relate to that. What are the usual payback times? I assume that their power bills are going down right away.

● (1605)

Mr. Peter Love: Right. The typical payback for most of the FBI projects would be 10 to 12 years, and that would be a 10- to 12-year contract. In order of magnitude, a $10-million project would pay back a million dollars a year, and at the end of 10 years we're done, and that building continues to have reduced energy bills for the life of the equipment, another 15 to 20 years.

That has been traditionally how it goes. We are seeing, though, some longer contracts now. We've seen them as long as 35 years. The longer the contract, the deeper the retrofit. Typically, most of the projects done to date would have achieved savings in the 20% to 25% range for that 10- to 12-year payback. The government now is looking to go much deeper than that, with a 40% target. It can be done, but not with that 10-year term. It would need an extension of that term, and I think that's part of the challenge .

We actually made a presentation to the federal building initiative a week and a half ago, suggesting that they alter their RFP process to focus on greenhouse gas emissions, and this isn't going to happen quickly. If that's what you want, ask for it in an RFP and judge people on how much your greenhouse gas emission reductions would be. It has to be cost-effective. It has to be certainly a positive, net present value.

We've seen the FBI program. It's interesting. When it first started off, it was mainly to save money. Then it was to save energy, just because that was a good thing, and we believe now, with the current interest and Canada's commitments, it should really be focused on carbon. The advantage is you're getting all three. You're going to save money, you're going to reduce energy, and you're going to address carbon. You're also going to be hiring a lot of people. It's very labour-intensive, and that's what that Empire State Building project really confirmed.

Mr. Jean-Pierre Finet: Were you talking specifically about the commercial sector?

Mr. Richard Cannings: Yes, but I want to move on because I don't have much time.

Ms. Bak, you mentioned the fiscal subsidies on fossil fuels, and I think you put it at $3.5 billion. Could you expand on where that comes from? It went by me quickly.

Ms. Céline Bak: That's okay.

There is a global initiative under the G20, and there has been for many years, for there to be a prompt phase-out of fossil fuel subsidies so there can actually be positive carbon pricing, because if you have subsidies and carbon pricing, you end up with negative carbon pricing. Canada actually is the world hub of all of the data on fossil fuel subsidies. It's at the International Institute for Sustainable Development, which is in Winnipeg, and their data says that our fossil fuel subsidies are $3.3 billion in tax expenditures, and then our export credit agency, EDC, makes working capital loans, which are publicly financed loans, for about another $3 billion to oil and gas companies.

Mr. Richard Cannings: So that's—

Ms. Céline Bak: In total, it's $6.3 billion. You could underwrite a lot of performance contract risk with that.

The G7 and G20 are now moving toward fossil fuel subsidies being wound down in order to enable carbon-reducing infrastructure investments and risk mitigation.

Mr. Richard Cannings: Again, quickly, you mentioned something about the difference between Canada and the United States, and you used methane regulation as an example.

Ms. Céline Bak: I can give you a quick explanation of that.

When Alberta did the methane regulations, the innovators who are now helping to mitigate methane in the U.S., as an example, were not invited to the regulatory consultations. We established a methane regulation target that did not account for innovation.

Oddly enough, in the U.S., civil society makes that happen. The ENGOs make sure of it, and we have examples. For example, in natural gas being used for middle-distance heavy trucking, civil society, which is the Environmental Defense Fund in the U.S., sat down with a technology provider and made them prove their figures for emissions, for costs, etc. That technology is part of the road map for emissions reductions in transportation in the U.S. It's all based on science, on proof, and it's all done transparently.

We don't do that in Canada. When we do methane regulation reviews, we don't have the innovators or the scientists at the table to say, “Well, you know, we don't need to use the methodology that we've used for 25 years. We can use a different one. It's more cost-effective, and we'll get more methane abatement.”

● (1610)

Mr. Richard Cannings: Mr. Love, regarding retrofits or whatever work you do on buildings or the companies that you finance, what are the most effective? What's the low-hanging fruit?

Mr. Peter Love: It's lighting, definitely. If anyone still has T12s, change that out, or use incandescents. Lighting would probably be less than a two-year payback. Controls would be a very quick payback, two or three years. If there's an older boiler or chiller, that would be a medium length of time for payback.

Where the big jump comes in—and it differs for different buildings—is when you start looking at the envelope. You'll start looking at the walls and the windows. That's expensive. In order to get to the 40%, you're probably starting to look at the envelope. You're probably also starting to look at on-site generation, either with gas or with renewables of some sort. Certainly when people talk about zero carbon, you're definitely making major investments in on-site generation.

To take an existing building to zero carbon is.... People are just getting there with new buildings. You'd be looking at reskinning. Again, in Europe, where the energy prices are much higher, we see examples of that. People are just starting to look at that now in Canada, but the pricing is still difficult.

The Chair: Thank you, Mr. Love. I'm going to stop you there.

Mr. Harvey is next.

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

I was really intrigued by some of your comments, Mr. Love, as well as by yours, Ms. Bak. This study is on de-risking the adoption of clean technology in Canada's natural resources sector. I'm a big believer in a fair playing field, and I agree with something you said earlier, which was the idea that we need to develop these technologies without pitting one side of the sector against the other. Some of what I hear from witnesses—not necessarily you guys, but in general—is in fact doing that. Unintentionally it pits one side of the sector against the other.

I come from agriculture, so I always use agricultural analogies. I believe in broad-based policy and I believe 100% that we need to be pushing for technologies based on the idea that we have a goal we want to get to, and then developing the sector so that it meets those goals. I agree 100% with that.

This means to me, however, that if I'm a tractor manufacturer and determine that I can build an electric tractor, which John Deere has just done, and it meets the goal, then that's great, or if I figure out a way to convert the carbon created by a traditional tractor, I'm okay with that too. It's whatever gets us to where we need to get to as a goal. It needs to be goal-oriented and focused in that way, so that we don't....

When we talk about de-risking and the idea of government funding the risk to industry from the adoption of technology, we always need to be cognizant that at the end of the day we fund that de-risking with taxpayers' money. Moral hazard dictates that we need to be cognizant of what we're doing with that money. I think it's important that we do it in a manner that allows the adaptation and development of new technologies across the board, but that we don't do it in such a way that we pit one side of the sector against the other.

In that spirit, I want to ask you, Ms. Bak, how you feel government can play a progressive role in creating the environment that will allow for the adoption of clean technologies, recognizing that we don't live in a static environment. Companies and government have been pushing for the creation and adaptation of cleaner technologies for years. Yes, we're in an accelerated growth state right now, in which there's a higher focus on achieving those goals in a timely manner, but we don't live in a static environment. We need to continue to push in the same manner as we have done , but how can we do a better job of creating broad-based policy that doesn't pit one sector against the other and that creates the type of environment in which you really do have a level playing field?

● (1615)

Ms. Céline Bak: As I said, there are two things: performance and best available technology. If you have a performance goal, which is carbon intensity of some kind, and you have a commitment to making sure that all technologies are considered and that the best available technology is the standard, then that's the way to do it.

I'll give you an example of how agricultural services can be used for methane mitigation, for watershed services, for many things. In Halifax, for example, they have a nitrate problem in the harbour. You could use water treatment technology to address the methane problem. Well, you could also ask the farmers to use land-use services such that a certain proportion of the land was used as a watershed to make sure that no nitrate actually went into the harbour. The best available technology in this case is land-use services; it's not water treatment. The difference in cost is $1,000 for land-use services and $500,000 for water treatment.

We need to have performance-based approaches that require best available technologies and are cognizant of those best available technologies. Some of them will be traditional clean technologies, some of them will be agricultural.

Mr. T.J. Harvey: Okay. That's good.

Mr. Serré has a question, so I'm going to give him the rest of my time. Thank you for that.

Mr. Marc Serré: Thank you, Mr. Harvey. I have a question for both witnesses and probably a minute each for them to answer.

The U.S. and China are our biggest competitors on the clean tech export side. What do you believe the federal government should do to ensure that Canadian tech companies remain competitive against such other countries as the U.S., China, and Europe?

Mr. Peter Love: Do you want to start?

Ms. Céline Bak: Shall I go first?

The U.S. has grown its exports of environmental goods quite smartly, but obviously China has grown them more quickly. I think we have an opportunity to partner with China. We've recently received a guest editorial from the Chinese minister counsellor, second in command to the ambassador, saying that they would like to partner with Canada on our expertise, whereas they have labour and can manufacture. We can guarantee our position internationally by partnering smartly with our erstwhile Chinese competitors.

In terms of the U.S., I would suggest that under the renegotiation of NAFTA we consider bilateral reciprocity for SME procurement. The U.S. has had SME procurement in part of its policy mix for many years, since 1958. If we gave the U.S. access to our SME procurement market and they did the same, there would be an overall innovative impact on the economy, because SMEs are the ones that are investing in innovation. Also, we would have a 10 times greater access to market than they would have, but it would be consistent with the policy environment in the U.S. It would be a bilateral approach to SME procurement with an environmental dimension to it.

Mr. Peter Love: I agree with that.

The other thing—it's hard to do, but I think it's a role governments can play—is to be strategic and put on almost a private sector hat. Do a SWOT analysis. What are our strengths? Where are our weaknesses? What are the opportunities, and what are the threats?

China dominates these markets. There's no sense going there, and the U.S. is here.

Here are some that are really strong. Ontario did this a few years ago. It looked at the technology sector and identified five sectors in which it thought it had particular innovation skills. That's not easy to do, but if you can do that—because you can't do everything—I think that would be one of the challenges.

This risks picking winners and losers, but at some level you probably want to say, what are our core strengths? Is it our educational system? Is it our resource base? We have some unique things that we probably should be looking to build on. If something mind-blowing comes up in other areas, that's fine, but let's really focus.

I'm also a big believer in making an appeal to the private sector by saying, as Céline described, “Here's our objective. This is what we want to achieve. Come to us. Here's a fund of money; we have some money available. We'll guarantee orders for a number of your units. Come to us with what you think is most creative.”

It's competitive—

● (1620)

The Chair: Thank you, Mr. Love—

Mr. Peter Love: —and we're not going to give it to everybody. The criteria could be greenhouse gas costs or whatever. We're going to pick some winners and we're going to evaluate them. We're going to do this on a regular basis, and then you can control it.

Getting back to your idea—

The Chair: Mr. Love, I'm going to have to stop you there. I'm sorry. We have to move on.

Mr. Yurdiga is next.

Mr. David Yurdiga (Fort McMurray—Cold Lake, CPC): Thank you, Mr. Chair.

I would like to thank the witnesses for participating in the study, because it's a very important study.

Before I ask any questions, I want to make a comment.

Innovation does have a certain risk, and a lot of times that risk is put on the taxpayer. The taxpayer only has so many dollars. What may work in one community in one part of the country may not work in another.

I was involved in.... They constructed a government building, and they had solar heating to heat a certain part of the building—well, to subsidize it, anyway. It worked well in the south. It did what it was supposed to do. However, moving north, we had challenges. It was not producing enough heat. Actually, it was costing, as new boilers had to be put in to heat the space that was supposed to use solar heating.

Then in the summertime the heat load was too much, so we had to put a bigger chiller in. All of this innovation probably cost, operation-wise, in excess of 20%. Not all innovation works everywhere.

I'm going to ask Peter a question.

Are you aware of any of the performance contracts that went south and didn't work out the way they were supposed to?

Mr. Peter Love: Yes, not by name, but I know my members have had to make good on guarantees that didn't work. They'll tell me that it's a baseline problem that they were given. They made assumptions about the building that were not right and they did have to make good on those. They don't like to talk about it. You won't find it in the press, but they do exist.

They do guarantee their projects. There is a performance metric that's agreed to in the contract using an international protocol, and if it comes out that the performance is not there, they do make up the difference. That's part of the contract.

Mr. David Yurdiga: If they're still in business....

Mr. Peter Love: Yes, they are, absolutely, because that doesn't happen often.

Mr. David Yurdiga: Yes, but that's still a risk.

Mr. Peter Love: They are at risk, yes.

Mr. David Yurdiga: Let's say I have a commercial building. What are their first steps before entering a contract? Is there an analysis of the building? What types of things are you looking for?

Mr. Jean-Pierre Finet: There will be a preliminary audit at first, and then normally a full-blown audit once the contract is given. It's a competitive process, so every firm has to file its proposal of the measures they favour, what the payback period is, and so on. All the firms present their different strategies based on their assumptions and based on their evaluation of the current building. One might propose a ground-source heat pump and the other might propose some other technologies to achieve cooling and space heating savings.

Mr. David Yurdiga: What I'm referring to, for example, is looking at the building envelope. Would you do thermal imaging in the envelope to see whether you would be adding insulation, and then look at the energy usage to see whether you have to change fan motors to DC?

Mr. Peter Love: They typically use modelling. It may involve infrared, but often it can be captured just by a thorough engineer going through the site and looking at the wall structure and the sizes, at the vintage of the technology, the vintage of the building. Once you've modelled it, then you can do all sorts of iterations and what-ifs. What if I put a separate skin on? What if I change the boiler? What if I improve it? They're really doing a fairly detailed modelling exercise.

● (1625)

Mr. David Yurdiga: When we enter into a contract, what is the average payback?

Mr. Peter Love: The FBI programs now would be in the 10-to12-year payback period. They're talking about extending those periods because they're looking to get deeper greenhouse gas emission savings.

Mr. David Yurdiga: Are you paid on the savings for a number of years?

Mr. Peter Love: Yes, for the life of the contract. The contract is typically for less time than the equipment lasts, so the equipment will last 25 to 30 years and the contract will be for 10 or 15 years.

Mr. David Yurdiga: Okay.

My next—

The Chair: We're at our time. It's a five-minute round.

Mr. David Yurdiga: Really? I had a good question. I was saving it for last.

The Chair: You could ask it in five seconds.

Mr. McLeod, we have about three minutes left, which is all yours.

Mr. Michael McLeod (Northwest Territories, Lib.): I'm very interested in some of the comments that Céline Bak was making regarding some of the recommendations.

I'm from the Northwest Territories, where we have a fairly small community that had to replace their power plants. They were all diesel-generating power, so they went to a combination of diesel and solar panels, which is fine, but if we did a full cost accounting of it, I'm not sure if it would pass the test, because the panels are nice, but the batteries have a limited lifespan. The actual cost to install them was amortized over 10 years, but in 10 years all of it has to be replaced, so we'll start again.

The people who put it in had a subsidy. The territorial government subsidized it and said it's really a good project, but what do you measure? When you're talking about the full-cost accounting, what are you measuring? Is it greenhouse gas emissions? What's the formula made up of?

Ms. Céline Bak: That's a great question. There are many people who are thinking about this now because infrastructure is recognized as being vital to meeting our climate goals, and yet we don't actually have a lot of experience in building infrastructure while knowing that we have to have a price on carbon that will increase over time.

Germany, for example, has full life-cycle cost accounting for its infrastructure. I'll give you an example. For water infrastructure, in some cases they now have a shadow price on carbon. It's not a rising price in the way we probably need to do it, but when they look at new water purification infrastructure, they're including a price on carbon that is like a proxy for energy. They're thinking about energy efficiency, then, when they're looking at water purification. The energy that goes into the water purification actually causes carbon emissions, so if you approach it in this way, you get a better understanding of the cost.

The world, not just Canada, is at a stage right now of trying to understand how to make smart investments in infrastructure. By "smart" we mean that the infrastructure really serves the purposes of the community. It achieves the social goal and also address the environmental goals, and they're done it in a way that yields value for money.

Mr. Michael McLeod: That leads me to my next question. The measuring stick to be used is not really out there yet, is it?

Ms. Céline Bak: No, and we need to work on that.

Mr. Michael McLeod: Is this the reason the regulatory bodies don't actually measure energy efficiency and other things when looking at projects and approving them?

Ms. Céline Bak: If, whenever we updated regulation, we had a test that specified that we need to have the best available technology and need only to specify performance, not the means to achieve it, then we would probably get closer to a regulatory system that was consistent with our fiscal desires and our obligations under the Paris agreement. We do not have that today.

Mr. Michael McLeod: I think the measuring stick should apply to some of the buildings and facilities that are built. I personally bought a house that I'm told has an Arctic package. I live in the Northwest Territories, so it was important for me to have eight-inch walls with double insulation, and I got a thermal imaging company to come in. They tested everything and realized that everything's nice, except that whoever built the house didn't put in the proper windows, so I'm basically losing everything I was intending to save.

My next question is to Mr. Love.

The Chair: It will have to be very short.

● (1630)

Mr. Michael McLeod: When you're talking about these new facilities, you're talking about design and build. Are you talking about energy efficiency, not alternative energy, to heat the buildings or power up the lights, or...?

Mr. Peter Love: There are two things. It can include alternative energy, absolutely, and a number of projects do. We talked about things being really cost-effective, such as the lighting and the controls. Alternative energy in the past has been the other way, but it is coming down.

I know you're from the Northwest Territories. I'll just say that there was a performance contract done in Nunavik. The Government of Nunavut did a fairly large one; I'll send you information on it. There's also an RFP out right now for the military base in Alert.

These projects, then, can be done in the north, but as you fully recognize, it is a very different environment. To address an earlier comment here, Canada is a huge country, and there are huge differences in our electricity system, in our temperature, and in how things work, yet I think the basic models can apply across the country. In our case, a performance contract has been shown to work out in the far north as well.

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

Thank you, Mr. McLeod.

We're going to have to stop there, unfortunately. We have time restrictions, which you now appreciate as well as we do restrict our ability to go on for as long as we'd like.

Thank you, the three of you, for taking the time to be here today. It's been very helpful.

We will suspend for two minutes exactly, and then we're going to start again.

● (1630)

(Pause)

● (1635)

The Chair: We are going to resume.

Good afternoon.

We have two more witnesses today. One of them is known to us: Mr. Simon Irish, from Terrestrial Energy. He's not here just because it's March and his name is Irish. We're glad, however, to have you back. Thank you.

From the Conference Board of Canada we have Mr. Louis Thériault, vice-president of public policy.

Thank you both, gentlemen, for being here. I think you heard me explain the process earlier. Mr. Irish, you're familiar with it. You'll each get up to 10 minutes to do your presentation, and then we'll get into questions. We are going to try to stick to timelines as much as possible.

Mr. Irish, perhaps we'll start with you.

Mr. Simon Irish (Chief Executive, Terrestrial Energy Inc.): Thank you very much, Mr. Chairman.

Good afternoon, Mr. Chairman and honourable members. Thank you for inviting me back before your committee as you continue your hearings into clean technology in Canada's natural resources sector.

I'm delighted that you have included a representative of the nuclear sector in your deliberations, because it is all too rare for Canadians to remember that nuclear is a clean technology and one that has enormous potential to achieve our goal of deep decarbonization of our electric grid and industrial sectors.

When NRCan's Mr. Des Rosiers appeared before you last month, he said that the government was looking for bold solutions. Instead of greenhouse gas reductions of a few percent here and there, he said you were looking for sharp and dramatic reductions in the order of 50%, 60%, and 70%.

I'm here before you again today to declare that advanced nuclear is one of the very few clean energy technologies that can realistically and demonstrably deliver on that goal.

Moreover, our ability to deliver does not depend on someone inventing a new device or a new process—for example, a breakthrough grid battery or some other energy storage device. Advanced nuclear technologies exist today. Many are proven, and all we have to do is take the commercialization step. Many in the private sector are doing just that today. I know the members of this committee understand this, and I thank you for continuing to include nuclear in the conversation.

Your current study is an important one. To find the right policy instruments that will accelerate the early adoption of clean technology in Canada's natural resources sector, the first step, I would submit, is to be willing to talk about nuclear innovation. One of the simplest ways for policy-makers to de-risk the adoption of clean technologies is to acknowledge them and to talk about them. That does not cost a penny.

This means that our government needs to acknowledge that advanced nuclear is one of those clean technologies, and it needs to recognize the enormous potential it represents. Sadly, our government seems loath to utter the "N" word when we talk about clean energy. Nuclear, in particular advanced nuclear, which I believe must be recognized in a category of its own, must become part of the conversation. We should not be talking about the promise of wind and solar without giving equal mention to the promise of advanced nuclear.

Again to reference the testimony of Mr. Des Rosiers last month, which I thought hit the mark in so many respects, the assistant deputy minister—who is, I remind you, the ADM responsible for innovation and energy technology—did not utter the word "nuclear" once during the hearing. Terrestrial Energy has sought to meet with the Minister of the Environment, who is responsible for climate change, to describe how advanced nuclear could play an important role in the deep decarbonization of our electric grid and industrial sectors, yet we have so far been unsuccessful.

In Ontario, the premier is right to brag about how the province has the cleanest grid in North America, if not the world. When she does, the role of nuclear in that success usually goes unsaid. Ironically, the refurbishment of Ontario's nuclear plants and the possible refurbishment of Point Lepreau must qualify as among the largest carbon abatement projects in the world, yet they are rarely part of the discussion.

My big ask of this committee is to urge the government to put nuclear back on the table, and not just in the context of conventional nuclear but in the context of advanced nuclear, the most promising scalable clean technology today, especially if we desire Mr. Des Rosiers's bold 50%, 60%, or 70% solution.

At Terrestrial Energy, we believe that our integral molten salt reactor power plant, or IMSR, has enormous potential for the electrical grid and natural resource sectors. Advanced nuclear's true value is its use in industrial heat applications. In this huge part of the energy market, conventional nuclear and wind and solar technologies cannot play a role. They don't produce the required heat that fossil fuels do or that the IMSR could do.

● (1640)

Our IMSR provides heat of roughly 600° C, and this heat can be simply coupled to many existing industrial applications. If we are content to continue to extract crude from the oil sands, then we should at the very least try to minimize the carbon production footprint. Instead of burning natural gas for production, why not use the heat from an IMSR? The promise is Alberta crude with the same carbon production footprint as Saudi crude.

In mining, we should think about exploiting the Ring of Fire with advanced nuclear. The biggest impediment to Ring of Fire development is the lack of power and heat access, because the deposits are far from grid, but since the IMSR is grid-independent, it could be deployed in these remote regions to meet the needs of the mining sector.

Many of the alternatives we are talking about today are geography-dependent—solar farms in sunny locations, wind farms in windy locations, hydro in rivers—and are not commonly close to points of demand. Advanced nuclear has no such geographical constraints.

Why, then, doesn't the mining sector adopt this technology? Why aren't the producers of the oil sands knocking on our door? I think the reasons are clear. They look to mitigate business risk in a sector that is risky, and not to add risk. They are hence reluctant to be first adopters of any new technology.

How can the government help? Loan guarantees provide one way to support early deployment of a new industrial technology. They allow the private sector to spread risk. Terrestrial Energy's U.S. affiliate, for example, is seeking to deploy an IMSR power plant in the U.S. It is in the second part of an application process for a $1-billion U.S. loan guarantee from the U.S. Department of Energy, and that company is moving along well with that process.

Unfortunately, the Canadian government has not shown the same interest in advanced nuclear. Compare the level of support here, for example, with that of the U.S. House of Representatives, which in January of this year, with strong bipartisan support, passed the Advanced Nuclear Technology Act of 2017,which is intended

> To foster civilian research and development of advanced nuclear energy technologies and enhance the licensing and commercial deployment of such technologies.

There is also a companion bill before the U.S. Senate. This U.S. interest is in part due to the environmental promise of advanced nuclear.

I have a few suggestions that I would like to leave with the committee.

First, we need a level playing field for all technologies that meet our objective definition of a clean technology. We must look at options on a relative basis. No clean technology is without externalities, but we need to look at them in honest and relative terms, and the discussions must be objective, based on facts and evidence.

Also, if we're going to have a level playing field, it should extend to the incentives offered. One technology should not be favoured over another if they achieve the same goal, namely a cleaner industry and a cleaner electricity grid. I don't need to tell you that some technologies in some jurisdictions have been given enormous preferential subsidies and incentives that are not available, for example, in my sector.

Second, policy should be developed to stimulate private capital formation around the most innovative ideas. Policy instruments should be clear, reliable, and dependable, to be capital-friendly.

I like the idea of the multi-stage view that Mr. Des Rosiers described when he was here: providing early-, mid-, and late-stage commercialization support in a more seamless fashion. There should be a portfolio of mechanisms, including loan guarantees, production tax credits, investment tax credits, and straight-up grants.

Third, for highly regulated industries like my own, let me also suggest a specific policy initiative that would be helpful. A quick fix would be to ameliorate some of the costs of regulatory actions. As it now stands, Terrestrial Energy bears 100% of the cost of its regulatory actions with the CNSC, which can add up to many millions of dollars. I think the current framework may be reasonable for licensing on an ongoing basis, but when licensing a new and novel concept, I believe these fees act as a brake upon private sector-led innovation.

● (1645)

Finally, I return to my initial comment. Please, let's make advanced nuclear part of our clean, sustainable energy discussion.

With that, Mr. Chairman, I'll be happy to respond to your questions.

Thank you.

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

Go ahead, Mr. Thériault.

Mr. Louis Thériault (Vice-President, Public Policy, The Conference Board of Canada): Thank you, Mr. Chairman. Thank you to the committee members.

Just to provide a word on the Conference Board, we're a research organization, independent and not for profit. In fact, we're a charity by law. All the work we do in public policy and on public policy questions is driven by facts and hard evidence. We have a large team of economists. I'm an economist myself by training.

In fact, it turns out that today my training is in connection with the question at hand: I'm an energy economist by training and I started working for Natural Resources Canada back in 1990. That ties to some of the things I want to talk about.

Your question for today, as I received it, indicates that you want to hear about an assessment of policy instruments designed to de-risk adoption of clean technology in Canada's natural resources sector. We haven't written on this question in particular, but I have some reports you might be interested in looking at afterwards. I'd be glad to share these with the committee.

Let me offer two perspectives. One perspective is a macro policy perspective on development and adoption—I would put them together—of clean tech. The other is more traditional or more micro-financial perspective on the development and adoption of clean tech.

On the macro side, where my background is—I find it interesting to bring it back—25 years ago, when I started in March 1990, negotiations for the Rio summit were starting. If you remember, the goal at that time was stabilizing emissions at 1990 levels by the year 2000. Do you remember that?

Others might remember more closely Kyoto, and then the recent Paris agreement. There was Copenhagen in between.

You all know that we didn't meet Rio and we didn't meet Kyoto, and now we're looking at “80 by '50”, to put things in perspective a little bit.

I left this file in 1997 and have just come back to it in the last couple of years. I must say there has been a lot of progress. One thing we were talking about back then was that clean tech was the ace in the back pocket. The problem was that we didn't know where to find it.

It turns out that technology has played a huge role. So have standards and regulation. You should look at the car industry, for example, with huge progress on the technology front, offset by consumer preferences for bigger engines and different kinds of cars. In terms of energy efficiency, though, there has been a lot of improvement in buildings, appliances, etc.—you name it. There has been a lot of progress on many fronts.

That said, nothing has happened even close to meeting what you would consider maybe a conservative target, such as the one in 1990, the Rio one.

What we're talking about with “80 by '50” is a paradigm shift altogether. We're really redefining the industrial structure of this country. We haven't really come to grips collectively, I think, with the implications of it. In fact, the Conference Board has a public conference in a month about it; we're looking at the economic and social implications of moving to “80 by '50”.

It turns out that we're using work from McGill, the David Suzuki Foundation, and the Canadian Academy of Engineering, which has defined a technical path forward to meet “80 by '50”. In fact, the best they could achieve on the technical pathways was a 70% reduction in emissions by 2050, and it brings in assumptions that are politically unfeasible and in fact, given the timelines, not doable. What you learn when you go through all the details is that we don't know how to get there yet.

One major element that comes out systematically is around greening the grid, the electricity grid. Hydro, of course, is fundamental in that process, and nuclear comes in as really big, particularly in Alberta and Saskatchewan in these scenarios, and in Nova Scotia. This is work that is coming out, I think, in time to inform the committee. I think it would be really useful to consider it when we produce it.

There are four things I see from what has happened since the conversations in Rio, up to now.

● (1650)

Some things have been missing from the macro side, and the first one is policy certainty about where we're going collectively. Even if we ratified Rio...Jean Chrétien ratified Kyoto, and then Stephen Harper over the years managed that whole file totally differently. The outcome is the same. Overall we've never really had political certainty.

Do the Paris agreement and the political ambition mean policy certainty? I'm still unsure. If you want to get there, if you are serious about it, this is the golden principle.

The second thing is that relative prices matter and incentives matter. Over the years clean tech solutions would be here if they were financially viable. They are not, because implicitly there is an environmental cost associated with producing energy from carbon-emitting sources. If you produce with oil, gas, or coal, there is an environmental footprint that is not priced into the cost of producing energy from these sources.

This is the reason there are subsidies for clean tech. It's to make up for that exclusion. This is trying to play with the market. It's really hard to tune things right. First of all, pricing that environmental cost through a carbon tax is a core principle that is also really important to respect.

Standards and regulations remain. Given the level of the ambition, they are still part of the mix. We've been employing them, but given the scale, I think we're going to have to rethink the framework in which we set standards and regulations and start looking at the implications of setting them to the levels needed to reach the target.

Finally—and this ties to the next point I want to make about that clean tech ace that is hidden somewhere in our back pocket—we need to foster innovation in a way that we've never done before, which ties directly to the mandate of the committee, of course. If the pre-conditions are not in place, however, everything else falls apart.

The second point I want to make here is about the way the question is phrased, which is around policy instruments designed to de-risk the “adoption”. I'm not sure whether it's by design that the question was specifically pointed at adoption, but I think you have to think about development in that process. There is a huge economic development strategy tied to it. Development and adoption need to go hand in hand, I would argue.

The reason is that if you can figure out the process for development and adoption—and I have some suggestions here—you create a market for new technology. You start de-risking the commercialization of new ideas and you can start thinking about the scale. Again, there are really innovative tools to get to that, which I will mention here.

First of all, as part of it, the financial ROI calculation plays a part in the context in which you have that carbon tax.

The second thing is that the adoption needs to be integrated with clean development strategy, as I mentioned. Otherwise, even if we have some support through SR and ED and other tools and from other credit agencies in Canada—EDC, BDC, etc., and all the regional or provincial authorities that are also providing support—what we are finding is that we're really pushing the implementation of existing solutions when they get bigger, solutions that we typically import. They are not tailor-made for Canadian needs, and I would argue that we have particular challenges.

Among all developed economies, having an energy industry that is so strong, so central to Canada's economy, is unique. The usage of energy that goes with it is unique, and our geography, with all the implications associated with it, is also unique. To look at Canadian-made solutions and start articulating an economic development strategy that ties solutions to our current reality is much more effective.

The funding—the money available—exists. There are many sources. You know all these, and I've mentioned a couple. The only point I'd like to make on that is that there is a total lack of coordination right now. Coordination and intermediaries form a central element of the equation that right now is missing, to bring the scale of commercializing ideas to the level we need.

● (1655)

The final point I'd like to make is around the specific things we can do to start changing the way we've been doing things over the years.

One thing that government has total control over is procurement. There's a whole agenda around procurement innovation and health innovation procurement that applies really well for infrastructure development or for what we're talking about today. It means starting to use the procurement tool as a way to drive solutions to problems, rather than pre-crafting solutions and having minimizing costs as the ultimate standard that we comply with.

I'd like to talk about this, if I may, during the Q and A, if you're interested in it. We've done some work in this area at the Conference Board. It's a tool that's been applied within government to trigger some fundamental change in how partnerships are developed among private sector participants, and also how P3s—private-public partnerships—can evolve.

The Chair: Thank you very much. Unfortunately, we have to stop there.

Mr. Louis Thériault: I'll leave it at that. I an happy to answer questions.

Thank you.

The Chair: Mr. Tan, I believe you're going first.

Mr. Geng Tan (Don Valley North, Lib.): Thank you, Chair. I'm going to share my time with my colleague, Mr. McLeod.

My first question goes to Mr. Thériault.

I'm sorry, how do you pronounce—?

Mr. Louis Thériault: Think of "Ontario"; I could be one.

Some hon. members: Oh, oh!

Mr. Geng Tan: Your company provides analysis reports on public policy issues, economic forecasting, and also the value of innovations. Quite often those clean technologies or innovative technologies are relatively new, with many things uncertain, many things that people don't know. I guess there might be considerable risks, financially or technically, involved in those new technologies or in those evaluations.

Why do you think your company has the expertise to evaluate those new technologies and give us the right recommendations?

Mr. Louis Thériault: I wouldn't say that the Conference Board would assist with specific technologies, but in terms of establishing a framework in order to de-risk as much as possible the process of bringing a concept to the lab, to the commercialization phase, and the scaling phase, I think we can offer some insights.

The Conference Board has an initiative called the Centre for Business Innovation. It has talked a lot about managerial capacity in the infancy of Canada's credit experience in risk capital—not the lack of capital, but the risk capital, and how angel investors, for example, come in, and that culture of risk capital that is not well established in Canada.

As part of the work we've done—in fact, as part of this report—we talk about core principles in funding Canada's emerging innovators. The report talks about the whole notion of financial risk and ROI. We come at this being totally disinterested, as I mentioned. We're not in favour of one technology versus another. It's about some core principles that are applied to funding new ideas throughout, I would say, the innovator's supply chain, from concept to bringing a product to market and scaling it.

● (1700)

Mr. Geng Tan: Thanks.

Mr. Irish, thank you very much for your advocacy for nuclear technology.

I know you have an agreement with the University of New Brunswick, probably with Professor Lister or his colleagues. By the way, I used to be a member of a technology advisory committee for Dr. Lister's NSERC project.

In addition to that, do you have any co-operation with any other nuclear technology developers? Your design, your IMSR, is one type of Generation IV design. Do you have any co-operation with other technical developers, either in Canada or outside?

Also, is there a prototype of this type of reactor, built either in Canada or outside? If not, when will there be, in your opinion?

Mr. Simon Irish: Thank you, Mr. Chairman.

With respect to our co-operation with other vendors, we consider ourselves to be a vendor of an advanced reactor, just as much as Westinghouse or SNC considers itself to be a vendor of an advanced reactor. We're not co-operating with other vendors. We view our market ultimately as a competitive market.

What we are seeking to do is to work with universities and national labs in a partnership to develop the expertise and the capabilities, and to move through our engineering program and our regulatory actions to bring our product to market. We announced our relationship with the University of New Brunswick earlier today, but we have relationships with other Canadian universities and other universities in North America as well.

With respect to your second question...I'm sorry; could you repeat your second question?

Mr. Geng Tan: It was about the prototype.

Mr. Simon Irish: There has been a prototype built of this reactor. If you look at the advanced reactors, many prototypes have been built and operated. The interesting thing about this technology comes from asking why these technologies were never brought to market.

There were some very good reasons when you look back 30, 40, or 25 years ago. If you look in the context of market needs 25 years ago, yes, it's clear why they didn't progress to market. It was because the current product was good enough, and we didn't have an existential threat from climate change. When you now revisit that decision in the context of today's market needs, in the context of where the current product is, it is too expensive and too complex to build. That's the principal problem with conventional nuclear: it's become too complicated, too risky, and too costly to build. When you revisit those decisions, you realize that the better product is advanced nuclear, for which there are many different types of designs and technologies.

These technologies have been proven at the national lab level. The commercial opportunity is to recognize that their commercial time has arrived. That's the interesting insight.

Mr. Geng Tan: Thank you.

The Chair: You have one minute.

Mr. Michael McLeod: I just have a quick question on the IMSRs. What stage are they at? Are they being utilized yet? Are they still being tested? Where are they at?

I'm from the Northwest Territories. We don't have a grid. We don't have a lot of the infrastructure that's required. This looks like a good fit, but we don't have any presence.

Mr. Simon Irish: Our key commercial claim is that we are looking to deploy our first systems in North America in the 2020s—so not the 2030s, the 2020s—and this technology is capable of delivering power to the grid at a levelized cost of 5¢ U.S. or 6.5¢ Canadian per kilowatt hour, about $65 Canadian per megawatt hour.

The Chair: Thank you.

Mr. Liepert is next.

Mr. Ron Liepert (Calgary Signal Hill, CPC): She's going first, and then I will.

The Chair: Oh, sorry. Okay. Go ahead, Ms. Stubbs.

Mrs. Shannon Stubbs: Thanks, Mr. Chair. Thanks to both of you for being here. I just want to say I really appreciated the comments from both of you, particularly around pitting sectors against each other and in recognizing the strengths of Canada because of all the strong natural resources opportunities we have. Those were comments made by my colleague across the table during the earlier presentation, which I just want to say I found heartwarming to hear.

I also appreciated your comments about the implications of cost drivers and of a regulatory burden in the venture and the endeavour of developing and adopting new technologies.

I want to highlight a concern of my own that has to do with the kind of carbon tax that is being proposed in Canada. Often the B.C. model is hailed as a great example, and it would be closest to what the Liberals have said they want to impose across Canada. Of course, in B.C., as both of you have mentioned in tying public policy with outcomes and goals, emissions have increased every year since 2010, and there have been no significant reductions in gasoline purchases there. This is significant, as it's the second-highest emitting sector. Also, the federal government hasn't proposed the carbon tax in the context of equivalent reductions of regulation and red tape in order to unleash innovation and allow private sector entrepreneurs and developers to absorb those costs while also continuing to develop innovation.

Like my colleague, I have some questions about MSRs and your IMSR technology. I just wonder if you are able to expand on their applicability to the oil sands and any other context you'd like to give us, in terms of challenges you foresee in that application and any specific recommendations on tools that legislators could support to enhance that adoption.

I think my colleague's going to have more questions around this area later.

● (1705)

Mr. Simon Irish: Thank you, Mr. Chairman.

In terms of its applicability to the oil sands, this technology is potentially very applicable. The product is 600°C heat. You can create steam very efficiently with that.

You can also potentially drive chemical synthesis for hydrogen production. The Canadian petrochemical industry has a tremendous hydrogen demand to upgrade its Alberta crudes. With nuclear heat you have, then, the capability of both creating the steam necessary for the extraction of the oil from the oil sands and also upgrading it chemically with hydrogen.

The opportunity here is to offer technology that is potentially cost-competitive with natural gas combustion. The challenge is that you have an industry.... The natural resource sector is a risky business; it's defined by booms and busts, and commodities are volatile. If you're an executive at one of those companies, you seek to mitigate your risks. What you wouldn't naturally want to do is to take on new technology risk. Your job is to extract, for profit to shareholders, as efficiently as possible your product from your natural resource and then sell it to your market.

This problem is generic for all clean technology capital equipment companies. We're a capital equipment company. We're looking to develop our capital equipment, and that has certain risks to it that we are looking to mitigate as well. Then we're looking to sell it to our customers.

The customers are the natural resource firms in, for example, Alberta. They have to be incentivized to adopt new technology. They can be incentivized through the bottom line—namely, it's cheaper. We can provide that incentive, but to really support early adoption, as has been the case in wind and solar, you have to provide the customer who's going to buy that capital equipment—going to be the first adopter and early adopter of that capital equipment—with some risk mitigation support, either through a loan guarantee, a production tax credit, or some type of mechanism to encourage early adoption. Otherwise, you will have a wait-and-see attitude.

We want the lowest risk point for the adoption of this technology, and that lowest risk point is when three other people have done it already. If everyone in your community does it, no one is the first mover.

You would not expect anyone in the Alberta oil sands business to become an operator of a nuclear power plant. That won't happen. However, they would potentially be very interested in taking our product, which is hot salt, just as much as they'd be interested in the takeoff of power. We as a company have to develop that capital product, that capital equipment, and seek to mitigate the risks as well, and then our customers have to be incentivized to actually be early adopters.

● (1710)

Mrs. Shannon Stubbs: Thank you.

The federal government, then, could be looking in earnest into those incentives in order to capitalize on all of Canada's strengths and enable clean tech to be adopted by the oil sands sector, instead of, for example, having the Prime Minister talking about phasing the sector out.

Do I have time to ask about bridging the valley of death?

The Chair: You have one minute and 20 seconds. You're free to use it as you see fit.

Mrs. Shannon Stubbs: You made a comment about your partnerships with post-secondary institutions. Your organization has done work, I think, on liberalizing incentives for professors aiding in bridging the valley of death, in a report in May 2015. Is that right? Do you want to provide any comments on specific tools or suggestions for bridging that gap between developing new technology and commercialization?

I don't know whether either of you wants to comment on it.

Mr. Louis Thériault: I'm not sure about that specific.... We produce, I think, 500 reports a year. I wasn't personally involved in that one.

On the whole question of the innovation agenda in Canada and the productivity challenge we have collectively and the way innovation plays into it, we identified through surveys, through round tables, through some original research that it's really in the commercialization aspect that we're missing the boat. We use our current funding and funding mechanisms through from the concept to lab testing to that level of pre-commercialization, at least, and then we need to provide some guarantees and some support.

I think what they're talking about here is not tinkering at the margins; it's really big things. The first example that comes to mind is Hibernia and the way we developed—

The Chair: Mr. Thériault, unfortunately I'm going to have to stop you there so we can move on to Mr. Cannings.

Mr. Louis Thériault: —the offshore technology that became a Canadian-made solution. That's starting to be applied to other things, for example, but the government took a risk and the private sector took a risk.

The Chair: Mr. Cannings, please go ahead.

Mr. Richard Cannings: Thank you.

I'd like to start with Mr. Irish. You mentioned how the government could help the nuclear industry through various incentives, tax credits, and loan guarantees. You mentioned that in the United States, they have a $1 billion loan guarantee to get their industry going. How much money do you think the federal government would be investing in the nuclear industry to get these IMSRs of various sorts going and level that playing field? How much money would the taxpayers be shouldering?

Mr. Simon Irish: Thank you, Mr. Chairman.

My first ask is a very simple ask. It is—when talking about the opportunities in the natural resource sector, the decolonization of the Canadian industrial economy, and the “80 by '50” paradigm that Louis described earlier—simply to include the opportunity for advanced nuclear in the public narrative. It's not included now. That's my first request.

Now, in terms of how much money we actually need to build the first power plant, it will cost about $1.5 billion. That $1.5 billion will be shared by two important constituencies: ourselves as a capital equipment manufacturer, and our partner, being the first customer and the first owner of that capital equipment. That sharing will be a point of commercial discussion, but the total project cost shared by those two participants will be $1.5 billion.

We also will be seeking to reach out to the Canadian government to be a participant in those early projects. Our U.S. affiliate is doing so with respect to its project in the United States with the American government.

Mr. Richard Cannings: Okay.

To follow up on Mr. McLeod's questions about small communities in the north, you mentioned some relatively inexpensive electricity costs there. What are the upfront costs for a community that, say, wanted to get out of diesel and move to IMSRs, and how long a period are those costs amortized over to get those prices that you mentioned?

Mr. Simon Irish: The power plant that we are engineering and seeking and developing is 190 megawatt electrical. I'm sure it would work for some communities in the north, but it would not be a substitute for diesel generation in all communities in the north, because diesel generation usually exists in a single megawatt level.

● (1715)

Mr. Richard Cannings: Okay, thanks.

Mr. Thériault, you mentioned a lack of coordination in funding as a big problem. I want to give you the opportunity to expand on that and to describe how we can help.

Mr. Louis Thériault: As you know, there's a list of agencies. There's SR and ED, which is a tax credit. First of all, by design, you need to make money to save money, and SR and ED has been pointed out as a tool that Canada uses that generates a lot of action but not necessarily a lot of outcome in terms of the ultimate purpose of all of this.

You start thinking about how BDC also plays a role with small and medium-sized enterprises, the ones that will probably be originators of new ideas. EDC plays a role. You have Alberta Innovates, for example, which is also engaged. The innovation file is financed through many agencies. We have our venture trading floor, the TSX venture exchange, which also provides capital. There's a lot of action.

The point is that although there are a lot of possibilities, what we've heard—in fact, in this report it comes out quite clearly—is that from a developer's standpoint, it's not clear how to take advantage of them. It's also not clear that you will be supported on the scale you need to be when you're ready to commercialize on a larger scale. That's coming out quite systematically.

Mr. Richard Cannings: I wanted to follow up on comments around the price on carbon tax.

In British Columbia, it's my understanding from reading economic studies that the program was actually having a very positive effect on reducing people's purchase of fuels. B.C. was reducing its GHG footprint while that tax was being increased, as it was first designed to, and it's only since that increase stopped that things have drifted. I wondered if you could comment on that.

Mr. Louis Thériault: I did look at that. Frankly, I can't draw a causality link. There might have been a correlation in some sectors. I would say, though, that we're tinkering at the margin at $30 a tonne.

Just to give you a sense of proportion, in the work done by the Canadian Academy of Engineering and the David Suzuki Foundation with the McGill researchers, they come in with an implicit carbon tax of $1,200. With the latest fringe technology available, if you were to bring that technology into the market, it would mean that to make that technology financially viable, carbon would have to be taxed at $1,200 a tonne. That's just to give a sense of perspective.

What I would have to give credit to B.C. for is doing something that in fact alleviates some of the pressures on groups that are left behind when you implement such a fiscal tool. It has also been successful in terms of public acceptability, which is a big thing on its own. It's starting to move the needle on the notion that if carbon is something we want to eliminate, we need to price it somehow.

The other thing I'd like to mention, and I think it's really important, is that it's always about the carbon. It's not about the fuel. I'm totally with Simon that the sectors shouldn't be put against each other; every sector should have a fair chance at this.

I would propose that there are some solutions that could be encouraged for oil, gas, and probably even coal. It's not the fuel itself; it's the carbon in it. If we find solutions that get rid of the carbon in it, then we're there. Carbon sequestration is one example, but there could be other solutions we haven't thought through yet.

Mr. Richard Cannings: How much do they cost?

Mr. Louis Thériault: Well, that's part of that cycle. I'm not saying this is the solution. I'm just saying that it's the carbon that's the problem. The technological solution, whatever it is, that could eliminate the carbon in the fuel gets away from one of the problems we have, which is around the industrial fabric of the country right now.

The Chair: Thank you very much.

We're going to have to move on to Mr. Serré.

Mr. Marc Serré: Thank you, Mr. Chair. I'll be sharing my time with Mr. Harvey.

Mr. Irish, over the course of our last study, as you indicated, we looked at the opportunities and challenges of the nuclear sector, especially in the SMR component. Can you explain the difference between your IMSR technology and the SMR technologies and what disadvantages and advantages your technology has compared with the SMRs?

● (1720)

Mr. Simon Irish: Thank you, Mr. Chair.

The SMR is a small modular reactor; it's a commercial formulation. If you have any reactor design, you can choose to make it small and modular; it's not an expression of the technology that's actually used within it.

Our technology is a molten salt reactor technology. It's fundamentally very different; it uses a liquid fuel rather than a solid fuel. We have also chosen to formulate it as a small modular reactor, a 190-megawatt electrical reactor. That, we believe, gives us the biggest commercial footprint. We can use it in industrial applications, for example, in Alberta, or to drive mining in the far north, or even in traditional grid-based power provision.

Mr. Marc Serré: Thank you.

I also want to ask about the question Mr. McLeod asked. You indicated that it will be commercially available in the 2020s. That's a rather broad number. I'm pretty excited about what you indicated in your presentation in talking about the Ring of Fire or looking at northwestern Canada or the oil sands.

There are two things here. What can we do, as a federal government, to help expedite commercialization earlier—say, in the early 2020s rather than the late 2020s?

Also, we haven't heard from the nuclear sector in our previous study concerning the lack of engagement with the first nations. Many of the first nations communities are concerned about nuclear, but only because, it appears, the nuclear sector—and I don't know whether your company has done a better job—hasn't done a good job of hiring first nations, explaining to them the technology, and engaging them.

What have you done on that front?

Mr. Simon Irish: With respect to your question, I believe we could probably do more. Given where we are in our development program, we have just started siting studies.

Those siting studies are with the actual owners of those sites. They are, I think, much more capable of the communication necessary with the first nations to address those points. We're simply a capital equipment company seeking to develop capital equipment and find our first customer, who also will have a site.

They are much more experienced on these regional matters, these important matters, than we are.

[*Translation*]

Mr. Marc Serré: Mr. Thériault, I asked the previous witnesses this question.

In green energy export markets, China is Canada's biggest competitor. What could the federal government do to help Canadian companies be more competitive with China and the United States in the green energy market?

Mr. Louis Thériault: That is a fundamental question. Let me give you the Conference Board's and my own perspective on this.

We are in a period of globalization and integration of value chains. Intellectual property is created where the value of the assembly is created. The iPod is a very good example of this. Nearly half of the iPod's value is created in the United States, but it is considered an import from China, even though just 1% of the iPod's value is created in China. I would say the same logic applies here. With the integration of value chains, I would not look at countries in the industry as competitors, but rather as players with whom we can create partnerships.

You are absolutely right about China. For political reasons, we have to work towards the objective of reducing emissions by 80% by 2050, but for China, it is a matter of survival. Pollution is so bad there that China does not have a choice. China wants to be “green” because it has no other choice. Coal is still the greatest source of electricity generation in China.

We can use the solutions coming out of China; we can collaborate. I see this more as a potential opportunity for international trade and international investment.

We have not talked about this here yet, but at the time of Rio and Kyoto, there was talk of joint ventures, with Canada investing abroad. Since climate change is a global problem, if Canada were able to help reduce greenhouse gas emissions elsewhere, that could be credited towards its objectives. There is major stocktaking involved, which is complex, but the idea of encouraging trade and contributing to Canadian solutions aborad is an essential part of the conversation. If you pursue this argument, you will see that this is probably where Canada has the most to gain.

● (1725)

Mr. Marc Serré: Thank you.

You have one minute left, Mr. Harvey.

[*English*]

Mr. T.J. Harvey: I have your press release here. I was wondering if you could elaborate a little bit about your future partnership with UNB and what this next phase will look like. Also, I'd be interested to know if you have some ideas about where you intend to test this reactor.

Mr. Simon Irish: First, we're very excited about the broad opportunities in New Brunswick. Second, New Brunswick is a province of Canada that does have its own indigenous nuclear expertise. It operates the Point Lepreau site and it has a nuclear engineering department in Fredericton at the University of New Brunswick, which has the capabilities that we seek for the components of our business plan.

We're certainly very interested and very excited about our relationship in New Brunswick. We also see it as a nice confluence at the provincial level of an indigenous nuclear capability combined with a market need. We recognize a desire in New Brunswick to deal with some legacy co-production. We think that defines a market need to embrace new power technologies that can replace that co-production in a clean and cost-competitive way for New Brunswick customers.

Mr. T.J. Harvey: I appreciate that.

The Chair: Thank you.

I'm very sorry, Mr. Harvey.

Mr. Liepert, I'm going to be able to give you about two minutes or less.

Mr. Ron Liepert: I'll make your job really easy, Mr. Chair. I don't have any deep questions, but I just want to make a couple of comments.

I want to echo Mr. Harvey's comments earlier about not pitting one sector against the other, just as we shouldn't be pitting fish against beef. I hope that you're successful in convincing your government members of the same thing.

Mr. Irish, in a previous life, I was energy minister in Alberta. I think in many ways nuclear suffers from some of the same things that the fossil fuel industry suffers from.

I remember—with all due respect to my good friend Mr. Cannings—the NDP, as the opposition, just lighting their hair on fire with the scare tactics about nuclear. You don't, but they did.

I think it's that fear factor that we have to get over with the.... I'm a big fan of nuclear and I think what you're proposing sounds like it makes a lot of sense.

Mr. Thériault, I don't have any questions for you either, but I'm a big fan of the Conference Board.

My recommendation to the committee, Mr. Chair, is that you should hire this guy to help you with your study.

The Chair: On that note, we're going to have to stop for the day.

Mr. Thériault, it's a positive note to end on. Mr. Irish, it was very nice of you to come back and join us again. Thank you both.

The meeting is adjourned.