HOUSE OF COMMONS
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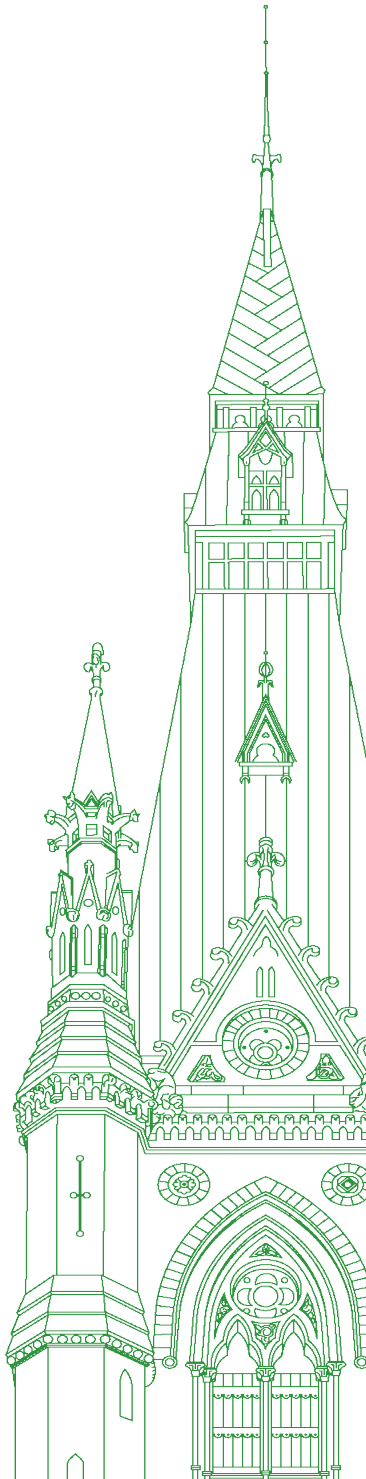
45th PARLIAMENT, 1st SESSION

Standing Committee on Natural Resources

EVIDENCE

NUMBER 050

Wednesday, October 28, 2026



Chair: Terry Duguid

Standing Committee on Natural Resources

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● (1645)

[*English*]

The Chair (Hon. Terry Duguid (Winnipeg South, Lib.)): I call this meeting to order.

Colleagues, welcome. Let me acknowledge, as we always do, that we're gathered on the unceded territory of the Algonquin Anishinabe.

Welcome to meeting number 50 of the House of Commons Standing Committee on Natural Resources. It seems like yesterday. Today's meeting is taking place in hybrid format, pursuant to the Standing Orders. Members are attending in person in the room or remotely using the Zoom application.

I would like to remind participants of the following points.

Please wait until I recognize you by name before speaking. For those participating by video conference, click on the microphone icon to activate your mic, and please mute yourself when you are not speaking. For those on Zoom, at the bottom of your screen, you can select the appropriate channel for interpretation: floor audio, English or French. For those in the room, you can use the earpiece and select the desired channel.

Speaking of interpreters, folks, I ask your indulgence: Speak at a measured pace, so the interpreters can translate your words.

I remind you that all comments should be addressed through the chair. For members in the room, if you wish to speak, please raise your hand. For members on Zoom, please use the raise hand function. The clerk and I will manage the speaking order as best as we can. We appreciate your patience and understanding in this regard.

Mr. Patzer.

Jeremy Patzer (Swift Current—Grasslands—Kindersley, CPC): Thank you.

I want to do this quickly, before we start: At the last meeting, there was one motion that we said we could defer to today. I wonder if, right off the top, we could get that business out of the way. I wonder if I could move that motion.

Do you want me to read it quickly?

The Chair: Colleagues, do we need to read it? It was a procedural motion.

Jeremy Patzer: It was one that the parties had all agreed upon already. At the last meeting, it's one that we talked about passing, but we agreed to defer it to today.

Should we pass it quickly, before we start?

The Chair: It was to give members associate membership so they can receive materials.

We're good. There's no need for a motion if we are all agreed.

Some hon. members: Agreed.

Jeremy Patzer: That's perfect.

Thank you.

The Chair: Thank you, Mr. Patzer.

Pursuant to Standing Order 108(2) and the motion adopted by the committee on Wednesday, October 7, 2026, the committee resumes its study of Canada's nuclear future.

I'd like to welcome our witnesses.

As an individual, we have Normand Mousseau, scientific director, Institut de l'énergie Trottier, Polytechnique Montréal, by video conference. From AtkinsRéalis, we have Sam Boutziouvis, chief of staff international for nuclear. From X-energy, we have Steve Coupland, senior adviser.

Welcome, all.

Colleagues, as you know, all virtual witnesses have conducted a mandatory witness onboarding test.

Gentlemen, you will each have five minutes for your opening remarks, after which we will open the floor to questions.

We're going to start with you, Mr. Mousseau. You have the floor for five minutes.

[*Translation*]

Normand Mousseau (Scientific Director, Trottier Energy Institute, Polytechnique Montréal, As an Individual): Mr. Chair, members of the committee, thank you for inviting me to appear.

Before I begin, allow me to briefly introduce myself. I am a professor of physics at the University of Montreal and Scientific Director of the Trottier Energy Institute at Polytechnique Montréal. Among other things, my remarks draw on the work we are conducting at the Institute on transforming Canada's energy system within a global context of energy transition based on the accelerated electrification of energy services. This work includes our flagship publication, Canadian Energy Outlook, from the Trottier Energy Institute.

The global energy crises of recent years, caused largely by Russia's war against Ukraine and the attacks by the United States and Israel against Iran, coupled with global efforts to reduce greenhouse gas emissions—which are continuing despite Canada's marked setback in this area—and the emergence of new electricity-intensive sectors, have reignited interest in nuclear power worldwide. This trend, as you know, is very positive for Canada. I'd like to raise three specific points on this matter.

First, let's consider the strengths and weaknesses of nuclear energy. The strengths of nuclear energy are significant: a small footprint, a high capacity factor, low greenhouse gas emissions and, in the case of Canadian nuclear reactor technology, or CANDU, a wholly domestic industry. However, nuclear power continues to suffer from high costs at a time when the price of renewable technologies, particularly solar and batteries, continues to fall. It also lacks the flexibility to respond swiftly to major fluctuations in demand, particularly in the context of the electrification of heating, has a long deployment time frame—often exceeding a decade—and faces uncertainties regarding related technologies, including, among others, small modular nuclear reactors.

Thus, it is important not to be blinded by the industry's sweeping promises, but to properly understand the true role of nuclear power in a rapidly electrifying world.

First, despite its costs, nuclear power ensures a basic energy supply and public safety while reducing the public's exposure to global crises. However, its lack of flexibility means it cannot directly support intermittent renewable energy sources or manage seasonal peaks in demand. Therefore, the share of nuclear power must remain relatively small within the electricity generation mix in order to keep costs down while still providing a reliable service.

Then, if Canada wishes to maintain an industrial sector, it must prioritize technologies it already owns rather than importing American technologies.

Finally, we must draw on lessons learned from the refurbishment of CANDU reactor cores when planning new builds, as this will reduce some of the risks associated with reactors during the construction of new units.

That was my first point about nuclear energy.

Second, we must not forget to support research in the nuclear sector by allocating funds to it. If Canada is serious about developing the nuclear market, both at home and internationally, we must focus on training the workforce, which requires substantial and sustained support for fundamental and applied research. But support programs come and go, which greatly complicates the recruitment of lecturers, the development of training programs and the recruitment of students.

Although it is possible, in the world of research, to receive support from non-targeted funding, it is absolutely essential that, in a context that seeks to deploy nuclear power, sustainable research and maintenance funding be established to ensure the training of staff, but also to ensure access to the high value-added knowledge that requires.

Finally, Canada cannot be content merely to support the nuclear sector in the electricity or energy fields—it must also explore and support other cutting-edge sectors. Photovoltaic solar and wind power technologies are already mature, so there is little room for further gains in those areas. However, in other sectors, such as large-scale, long-term energy storage, for example, technologies are still being developed. Canada, given its climate, has a direct interest in this area. It therefore seems urgent to me that Canada identify sectors beyond nuclear power where its contribution could also be significant, and that it make efforts similar to those that led to the creation of the CANDU reactor.

Those are my three points. I'll stop there.

Thank you very much. I'd be very pleased to answer your questions.

● (1650)

The Chair: Thank you, Mr. Mousseau.

[*English*]

Mr. Boutziouvis, you have the floor for five minutes.

Sam Boutziouvis (Chief of Staff International—Nuclear, AtkinsRéalis): Thank you, Mr. Chair.

Thank you for the opportunity to appear before your committee. AtkinsRéalis and the Canadian nuclear industry have long asked for the development of a Canadian nuclear energy strategy. We're pleased that through the work done by this committee, members of Parliament and broader consultations with industry, the government has developed a very strong nuclear energy strategy.

CANDU technology figures prominently throughout the strategy, which will benefit employees of some 300 to 400 suppliers, communities, and fundamentally energy users, both domestically and internationally. The world is turning to nuclear energy as a safe, reliable source of non-emitting energy. Canada is one of only six countries that export nuclear power reactor technology. CANDU is the only technology that does not require enriched fuel. It's a proven technology, as was just indicated earlier by Professor Mousseau, and we are working expeditiously through the regulatory design assessment process, getting ready to build.

There are many opportunities to export our CANDU technology—your CANDU technology. Just last week, AtkinsRéalis was very pleased and honoured to join Prime Minister Carney, Minister Hodgson, Minister Anand and several MPs highlighting the benefits of CANDU technology in Turkey. Minister Hodgson, Minister Anand and others have noted the importance of this export opportunity and others. Certainly Prime Minister Carney did at the end of his state visit.

Equally important is that there are multiple opportunities to deploy CANDU units in Canada. Ontario is looking to develop at least 12 large conventional reactors. New Brunswick, Saskatchewan and Alberta are also looking at building large conventional nuclear reactors and potentially small modular reactors and microreactors as well. CANDU is actively involved in all these opportunities and is competing for them.

AtkinsRéalis is currently offering three updated versions of the CANDU reactor. Enhanced CANDU 6 is a 750-megawatt electric unit based on the very successful reactors built around the world in the 2000s. The second offering is the Monark-D, a replication of the current Darlington four-pack design in southwestern Ontario and the Bruce Peninsula, with the same reactor core, updated for today's codes and standards, offering 950 megawatts electric. The third, to Professor Mousseau's point, is a previously approved advanced fuel CANDU reactor, which burns spent fuel from light water reactors developed in collaboration, in a very intensive joint research effort, with China National Nuclear Corporation in the 2000s. That reactor is also ready to go. We have a lot of interest in burning spent fuel.

The Monark-D design is being developed in collaboration with both Ontario utilities and represents what they consider the ideal CANDU technology to meet Ontario's growing electricity needs, with the added benefit of the production of life-saving medical isotopes.

AtkinsRéalis and its team Canada partners and utility clients have been working closely with the Canadian Nuclear Safety Commission. AtkinsRéalis and its partners have been engaged with the Canadian Nuclear Safety Commission in a preliminary regulatory design assessment process. Based on the productive dialogue we've had with CNSC, our team Canada partners, and utilities, there is a credible path for the Monark-D to meet Canadian regulatory requirements without significant design changes. Those team Canada partners include BWXT, Kinectrics, Hatch and Aecon, to name a few, in the development of the standard plant. This puts the Monark-D in a position to move forward with site-specific design ahead of any other reactor design.

As members are fully aware, Canada is currently facing a strong trade challenge from our neighbour to the south. Over the past decade plus, the Canadian nuclear industry has been involved in the refurbishment of Ontario's nuclear fleet. It's been on time and on budget. Professor Mousseau referred to it in his opening remarks. There are over 300 companies involved in the CANDU ecosystem, and over 92% of a new CANDU unit is Canadian content. Our supply chain is already fully operational, spooled up and ready to go. This is a major advantage for the CANDU technology. No other technology comes close to having such a fully developed and operationally ready Canadian supply chain.

● (1655)

In addition to providing energy security, a domestic Monark-D build-out would provide a major economic boost. Studies indicate that a build would provide over $90 billion of Canadian GDP across Canada over an 88-year lifespan of a four-unit project: $41 billion would be for construction and $50 billion would be for operations. In addition, 33,500 full-time equivalent jobs per year over the nine years of construction would be created.

The Chair: I'll have to ask you to finish up.

Sam Boutziouvis: In closing, I'd like to emphasize that Atkins is proud to be the custodian of CANDU's homegrown nuclear technology and is looking forward to building new CANDU units in Canada and around the world.

Make no mistake, distinguished members and Chair: The selling of CANDU around the world must begin at home, with a strong endorsement of the homegrown, Canadian-owned CANDU technology in Ontario, New Brunswick, Alberta and Saskatchewan.

I look forward to your questions. Thanks.

The Chair: Thank you so much.

We're now on to Mr. Coupland.

You have the floor for five minutes.

Steve Coupland (Senior Adviser, X-energy Canada): Thank you very much for the opportunity. I'm pleased to be here.

By way of background, I spent 20 years as Bruce Power's representative here in Ottawa. For part of that time, I was seconded to the Canadian Nuclear Association, where I was the director of regulatory and environmental affairs. I raise this because during that period I was given an opportunity to participate in a number of studies and reviews of various SMR technologies. When I retired from Bruce Power at the end of 2022, I made a beeline for X-energy, because I believe its technology is a perfect fit for Canada.

As committee members know, much of our wealth and standard of living depend on our resource extraction industry and the industrial base that supports it. The world is increasingly demanding that those resources be developed with minimal emissions. X-energy's technology can be used to reduce the greenhouse gases from those facilities.

X-energy is an advanced reactor-engineering, fuel-design and manufacturing company. Our flagship products are the generation four high-temperature, gas-cooled reactor and the tristructural, isotopic advanced nuclear fuel that powers it, commonly known as Triso-X. Our 80-megawatt electric 200 thermal reactors are grouped in sets of four, totalling what we call a four-unit plant. Up to 12 units can be put together, totalling roughly one gigawatt, and they can be combined to use a single control room to operate. The versatile and scalable Xe-100 design meets a wide range of energy needs across a variety of geographic conditions and markets.

As noted in Canada's national nuclear energy strategy, generation four high-temperature reactors like the Xe-100 can play a vital role in decarbonizing heavy industry. Our ability to generate highly reliable electricity and high-temperature steam at 565°C can readily replace current fossil fuel cogeneration capacity, which is integral to reducing emissions from multiple industrial applications across Canada. These emissions are some of the most challenging to abate. The Xe-100 reactor is an excellent alternative to generate the steam required for these facilities, while simultaneously supplying excess power to the grid.

Our proprietary Triso-X fuel fabrication process encapsulates uranium kernels in high-temperature-tolerant carbon and ceramic layers and then embeds them in a graphite matrix to form our Triso-X fuel pebbles, which largely look like cue balls. Triso fuel has more than 60 years of demonstrated performance in prototype and full-scale reactors.

The U.S. DOE has invested over $500 million in developing, irradiating and testing the fuel, which has led to its strong safety and proliferation-resistant characteristics. The fuel is designed to retain all radioactive waste and fission products under all conditions. It therefore leads to an exceptional safety case. The U.S. DOE has referred to it as “the most robust...fuel on earth”.

Our Xe-100 uses a helium coolant in the reactor and requires no spent-fuel cooling ponds. It can use air-cooled condensers. This significantly reduces water consumption compared with traditional large reactors and other light water SMRs. It enables deployment in locations where traditional nuclear reactors cannot be sited due to limited water availability, such as parts of Alberta and Saskatchewan.

X-energy has a commercial pipeline of approximately 11.5 gigawatts, or 140 units. Our first 320-megawatt project is a cogeneration plant with Dow Chemical in Texas and is targeted to begin operations in the early 2030s. At that point, it will be the first SMR deployed on an industrial site in the western world. Our additional projects in the U.S. are with Energy Northwest in Washington state and American Electric Power in Indiana. These are backed by Amazon, with both projects targeted to supply nearly one gigawatt to AWS data centres. Amazon is a significant investor in X-energy and has provided early project development capital for X-energy projects that will supply power to their data centres, with a minimum target of five gigawatts by the end of the 2030s.

In the U.K., X-energy has partnered with Centrica to deploy up to six gigawatts, with Hartlepool identified as the first potential site.

● (1700)

Here in Canada, we've been actively involved in the nuclear and energy sector for over five years. In 2022, X-energy and OPG entered into a framework agreement to work exclusively with each other to advance nuclear power industrial applications in Ontario. We are also keenly interested in other provinces looking to deploy SMRs, particularly Saskatchewan and Alberta, where we think our technology is an excellent fit.

Additionally, we have completed phase one of two of the CNSC vendor design review program, resulting in the CNSC concluding that there are no fundamental barriers to licensing the Xe-100 in Canada.

While we don't currently have an approved Canadian project, Canada remains one of our top-priority markets. We continue to work with potential customers and explore supply chain opportunities.

Thank you. I look forward to the questions.

● (1705)

The Chair: Thank you, Mr. Coupland.

Thank you to all of our witnesses.

We'll start our rounds of questions.

Madam Anstey, we'll start with you for six minutes.

Carol Anstey (Long Range Mountains, CPC): Thank you, Mr. Chair, and thank you to the witnesses for being here with us today.

Mr. Coupland, I'd like to start with you.

You've referenced other projects that you've been a part of. X-energy previously identified Alberta as a potential location for its first advanced small modular reactor in Canada by the early 2030s. Meanwhile, as you've mentioned, your company has been advancing reactor projects in the United States and the United Kingdom.

What are the biggest barriers preventing X-energy from moving forward with the commercial reactor project in Canada?

Steve Coupland: I would say that there are two things.

The first is that we'd be the first of a kind in Canada. My old CEO used to have an expression that nuclear is a mad dash to go second.

Voices: Oh, oh!

Steve Coupland: Part of the challenge, frankly, is upfront capital.

One of the reasons we've moved forward in the United States is that the Department of Energy developed something called the “advanced reactor deployment program”, which puts significant funding to first-of-a-kind programs.

In our pre-budget submission, we were asking the Government of Canada to consider doing something similar here. It doesn't need to be to the same level as the program in the United States, because by the time we put forward a first-of-a-kind project here, we will already have projects in the U.S. Some of that initial work will have already been done, but there are different projects and differences in regulatory regimes and other things here in Canada that will need to be addressed.

I think the other challenge for us is that we are in fact a technology new to Canada, and it's about getting Canadians used to it. Alberta and Saskatchewan are both quite keen on nuclear, but they are new to it—in terms of the reactor side, anyhow. Both governments have done significant work. We've had a number of conversations out there. I'm reasonably optimistic that we're moving forward with some opportunities, but it's a slow process.

Carol Anstey: You mentioned regulatory. I'm wondering, are our regulatory timelines competitive with those of the United States?

Steve Coupland: They are not anymore, to be blunt. It's much easier to build a reactor in the U.S. than it is in Canada right now.

I will say we're very pleased to see the government's decision to move to a single project authority. It's been our view and the view of the Canadian industry for a long time that the full life cycle regulator, the CNSC, should have been the correct place to have the regulatory process, including impact assessment. We're pleased to see that.

The CNSC itself is one of the most respected regulators in the world, but improvement could still be made to its processes. I would suggest several different things. The U.S. and the U.K. have undergone a reset of their process. There has been a consolidation of the approvals process, establishment of firm timelines and a shift toward a risk-informed framework that, frankly, has eliminated a lot of the prescriptive requirements and those not tied directly to safety outcomes. We think there's a lot the CNSC could learn from the U.K. and the U.S. in that format.

There are also several things specific to X-energy that I'd like to raise with this committee. I've raised them with CNSC and NRCan. First, as I mentioned, by the time X-energy files a licence application in Canada, we'll have a licence in the United States from the NRC, and possibly one from the U.K. as well. While the CNSC has to review the technology from a Canadian perspective, the fundamentals on nuclear physics, fuel and other nuclear components won't change. CNSC should take advantage of the work done by the NRC or the U.K. to make it a more efficient process.

Also, because the Xe standard design is less complex than larger reactors and we have a much smaller nuclear island, reviews for subsequent sites should focus on site-specific issues and any changes to standard design—most likely seismic qualifications, for example—rather than make us go through a process design for a first-of-a-kind reactor.

Last, if I might, we'd also like to see a streamlined regulatory approach for projects that are industrial brownfield sites, particularly ones that have a previous federal or provincial EA, are well-characterized, are already monitored and have significant background. Again, we don't think we need to go to square one on that.

● (1710)

Carol Anstey: Based on all those things that you outlined, what specific change do you think would make the biggest impact?

Steve Coupland: I think there are two things. You said one; I'm going to go with two.

One is putting everything under the life cycle regulator, as the government is intending to do. The other is the CNSC adapting some of the improvements that have been made by other regulators.

The Chair: Thank you both.

Mr. Hogan, you have six minutes.

Corey Hogan (Calgary Confederation, Lib.): Thank you all for being here today. This is an important study. To those of you I know as witnesses, and your teams in the gallery, it's nice to see you again. To those I don't know, it's still nice to see you, just in a different context.

It does feel like we are looking at a bit of a global nuclear renaissance. I think that comes at the right time as Canada looks at its electricity plans going out to 2050 and beyond. Of course, nuclear is 15% of our nation's generation right now. It's an important part of our mix. If we wanted even just to sustain that mix, it would mean significant build-outs.

I really want to focus my questions in this round on nuclear as a global industry, including medical isotopes. I want to, in particular, canvass all three of our witnesses for their view of global opportunities as well as global challenges and do a bit of a tour of the table for what we need to think about in terms of Canada as a player in a global industry and building on the success that we've seen in this space.

Maybe we can start with you, Mr. Boutziouvis.

Sam Boutziouvis: Thank you.

First, Canada has a tremendous advantage. CANDU reactors can produce medical isotopes. It's because of their physics, but I won't get into it.

Canada is a world leader in the production of several types of isotopes, both at Bruce Power and at Ontario Power Generation, and looks forward to exporting even more isotopes abroad, including exotic isotopes that fight cancer, such as those in the lutetium class, or that make sure that instruments are clean, such as cobalt-60. Starting from that base is an incredible, positive, competitive advantage.

Provinces like Ontario have been looking to expand and develop the isotope business by getting further into the market by adding value and developing even more exotic-type isotopes. That's because the market for isotope production could reach over $33 billion in the near future. It has taken off, and it is set to dramatically expand as countries develop greater capacity in their health care systems in order to be able to provide such life-saving health improvements.

The market for isotope development in Canada, as I said, is quite strong. I think it's in moving up the value chain that more could be done. At present, a lot of the isotope production is exported. Value is added, and then it's reimported back. Where we could really use some kind of industrial development is in entering into that higher-value-added space. At the same time, if CANDU is chosen for various projects across Canada, each of the provinces will have that capacity to produce more isotopes.

● (1715)

Corey Hogan: I wouldn't mind asking you if you could talk about that isotope opportunity, as well as the broader opportunities in other markets.

When I talk to other nations, I know that one of the things we tell them about CANDU reactors is this isotope capacity. How are you seeing the global opportunities and global views of CANDU technology at this time?

Sam Boutziouvis: There's very strong interest in CANDU technology around the world. Our top markets at present, in terms of prospects, are Poland, Turkey, the United States of course, China perhaps, and ASEAN nations such as the Philippines, Indonesia and potentially even Vietnam. We are actively pursuing those markets in competition with the other five, and we're up for it. We're game. We have very strong support from Export Development Canada, the Canadian Commercial Corporation and Global Affairs Canada, as well as, broadly, members of the Canadian cabinet.

With respect to isotopes, here is one anecdote. Sixty per cent of China's production of isotopes is done right beside the two CANDU reactors. They've built an isotope production unit and development unit right beside the two little CANDUs, as they call them.

I can also say to you that Poland, Turkey and Romania all want to build CANDUs in order to develop their health sciences and to develop isotopes.

Corey Hogan: Thank you.

Mr. Coupland, you said, “nuclear is a mad dash to go second”, which I love. I think that's going to be a very quotable quote in our report.

Let's broaden that. What should we keep in mind when we look at the streamlining efforts of the U.S. and the U.K.? Are there lessons to be learned? If we were going to streamline based on how they have approached it, what have they learned about streamlining that we might be able to take into the Canadian context?

The Chair: Give a quick answer, please.

Steve Coupland: The primary things are focusing on safety concerns and getting rid of extra layers of duplication in terms of the regulatory process. They've done a good job of streamlining. They've streamlined some of their hearing processes in the way they look at projects.

Corey Hogan: Thank you.

The Chair: Thank you both.

[*Translation*]

Mr. Simard, you have the floor for six minutes.

Mario Simard (Jonquière—Hébertville—Pays-des-Bleuets, BQ): Thank you very much, Mr. Chair.

Thank you to the witnesses who've joined us.

Mr. Mousseau, I see this study as an opportunity to define the government's best strategy in line with its aim to double the electricity supply. I found it interesting that you concluded your opening statement by saying that we might need to identify other sectors.

One of your colleagues, Mr. Pineau, with whom I know you disagree on occasion, appeared before us earlier this week. Perhaps you will find common ground on one point. Mr. Pineau told us that he estimated the cost of nuclear-generated electricity at $110 per megawatt-hour, that of hydroelectricity in Quebec at $40 per megawatt-hour and that of electricity generated by small modular nuclear reactors at $150 per megawatt-hour, excluding operating costs. This shows that these are very high costs—these are very expensive projects. Government resources are not unlimited.

Is it a good strategy right now for Canada to invest significant resources in nuclear power—knowing, as you said, that storage technologies and intermittent electricity generation technologies, such as solar and wind, are developing so quickly?

Normand Mousseau: There are two roles. Nuclear power, as I was saying, has an advantage due to its predictability and high capacity factor. Therefore, I believe that in a system which, unlike Quebec's, does not have hydroelectricity with storage capacity, nuclear power can play a foundational role—but further studies are needed to determine the extent to which it is useful for reasons of resilience. Nuclear power is very expensive compared to other technologies, but it offers certain advantages in terms of resilience, safety and diversification. That, in my view, is how we should assess nuclear power's role.

For instance, the Ontario project, in my opinion, relies far too heavily on nuclear power, especially given the differences between summer and winter, which make generation very costly. That's the required analysis, in my view.

In addition, in this context, we must also look at other technologies that will support the rest of the electricity generation fleet, such as large-scale and long-term storage. We're talking about dozens or even hundreds of terawatt hours of storage for more than a few days, a few weeks or a few months. We can then put together a system that will not be too costly, but will provide the security needed to deal with the problems. If we end up with a month without wind, or with little wind or little sun, we still need a minimum amount of electricity to keep things running.

● (1720)

Mario Simard: Thank you very much.

I don't know if the type of analysis you're talking about currently exists.

Normand Mousseau: No.

Mario Simard: That's unfortunate.

I'd like to talk to you about one of my concerns.

We know that a nuclear project takes quite a long time to complete, and I often see advances in storage, particularly in China. Since I started following the issue of electrification, I've noticed quite considerable progress. I wonder whether other countries facing energy challenges see things the same way as I do—and whether, as part of their strategy, they might be more inclined to consider intermittent electricity generation combined with storage solutions, rather than investing in technologies such as CANDU reactors, for example.

If we bear in mind the cost and time frame for these projects, is there a future for nuclear power, given the storage developments on the horizon?

Normand Mousseau: Once again, it is a question of balance. If we want to move away from gas and oil, we cannot have an energy mix consisting solely of intermittent renewable sources. In Europe, for example, it was very hot last May, and there wasn't much wind. There was plenty of sunshine, but little wind. That meant running other thermal power stations—particularly gas-fired ones—to meet demand. We still need a guaranteed supply of electricity, whatever the weather conditions. That, to me, is where the value of nuclear power lies.

As I said, no studies have been carried out in Canada to determine whether nuclear power should account for 5%, 10% or 15% of electricity generation, taking into account how this balances with new electricity transmission lines that would reduce risks across Canada. We therefore need to carry out more sophisticated analyses, rather than simply saying that we are going to build more nuclear reactors or that we don't want any nuclear reactors in the rest of Canada. Once again, some provinces—such as Quebec—are different because they are so self-sufficient in hydroelectricity that nuclear power has no significant strategic role to play.

Mario Simard: If you were to make a recommendation, then, it would be to determine the level of nuclear energy we need. I'm not trying to put words in your mouth. I wonder whether, at some point—

[*English*]

The Chair: That was a yes, and you're out of time.

Mario Simard: That was a yes. Okay.

The Chair: Colleagues, we're going to go on to our second round.

Mr. Patzer, we're going to start with you.

Jeremy Patzer: Thank you very much, Mr. Chair, and thank you to all the witnesses for being here.

I'm going to start with you, Mr. Coupland.

You've talked about X-energy being a different type of reactor from existing ones and being a perfect fit for Canada. Could you go into maybe a bit more detail as to why you say that?

Steve Coupland: Thank you.

If I were to sum up what makes X-energy distinct in a single word, it would be flexibility. The Xe-100 provides a flexibility that the large reactors and light water SMRs do not provide. I talked earlier about our ability to produce both electricity and high-temperature steam that can be used for cogeneration. It will enable us, as I mentioned, to decarbonize high-emitting industry. That's one significant advantage that other reactors don't have.

The use of a four-pack design, which we have, allows a lot of flexibility in location, use and construction of units. Some sites, like our Dow project, are only going to use four units. Others, such as AWS, which needs all the electricity it can get, will use the full 12-pack. We can also be used for distributed generation, depending upon the locations. Maybe you have a need for 320 megawatts of electricity. Maybe you have a location that needs a certain amount of thermal heat, and you can put the rest to the grid. Maybe you have a location that needs 600. There's a lot of flexibility in that.

The other thing is that we can provide variations, any combination of heat and electricity—again, flexibility. Because we use helium as a coolant, and we can use air-cooled condensers, there is much lower water usage. We use about two Olympic-sized swimming pools per reactor per month. It's a lot of flexibility. We don't have to be on the Great Lakes. We don't have to be on a large body of water. That differentiates us from other reactors.

We have the ability to load-follow. That was something that the professor mentioned. Our reactor can reduce or raise power from 100% to 40% in 5% intervals over 12 minutes. We can go up and down. That provides us an opportunity to be a good partner for intermittent technologies or renewables like wind and solar.

The other thing I'll note is that we have a very small footprint. It's 35 to 60 acres for a four-pack. By using the intrinsically safe Triso-X fuel, our reactors have a much smaller emergency planning zone, so it allows our units to be put much closer to the end-user.

For all those reasons, I think we're a very good fit. There are multiple uses in multiple places that our technology can fit where the larger reactors can't fit. That's not to say there's not a use for the larger reactors. I don't mean to imply that, but we can do things they can't do and in places they can't go.

● (1725)

Jeremy Patzer: Is there any concern, with the way the government is pursuing its nuclear strategy, that they might be putting a bit of weight on the scale towards one technology over another technology, or do you feel that the current approach is going to allow that flexibility?

Steve Coupland: I think the government has done a pretty good job of putting out a solid nuclear energy strategy, something we in the industry have asked for a long time. We were pleased to see the reference to advanced reactors in there and our ability to do stuff. The reality is, like any strategy, it's implementation that counts, and there's a lot of work to be done on that front.

Again, the implementation is the challenge. In our case, it's helping us get the initial project off the ground. First-of-a-kind projects have some challenges. We need that assistance and support from the government.

One of the things we'd like to see is the extension of the clean energy ITCs until 2040. Give us a bit more time for first-of-a-kind projects. The other thing I would say the government is doing that we support is making low-cost loans available through the Canada Infrastructure Bank, and we support the continued funding of the first nation infrastructure fund, all of which are helpful.

Sam Boutziouvis: May I make a contribution, Mr. Chair?

The Chair: Mr. Patzer.

Jeremy Patzer: Yes, absolutely. Go for it.

The Chair: Yes, please.

Sam Boutziouvis: Not to compete with Mr. Coupland for "isms", but we tend to say inside our company, "Big or small, we need them all." Because there is so much electricity demand for clean—or that should be clean—we feel very strongly that eventually there will be SMRs and microreactors developed, per Mr. Simard's point, once they become more economical in terms of electricity price and once they start getting built. This is what's happening in southwestern Ontario with DNNP, in the U.K. with respect to Rolls-Royce SMR, and in the United States in Texas and in the Pacific northwest, where we're helping out.

To your point, sir, about the current government's position, my perspective is that there have been tremendous investments made in SMR technologies, the first of a kind. There's been a tremendous weeding-out period, especially with those first-of-a-kind technologies. Some have gone on, and some have gone away, because they just have not been economical.

● (1730)

The Chair: Thank you, all.

Mr. Saini, you have five minutes.

Gurbux Saini (Fleetwood—Port Kells, Lib.): Thank you, Mr. Chair.

Thank you to the witnesses for this important work that you are doing.

I'm going to go to Sam.

The nuclear energy strategy identified CANDU exports as an important opportunity for Canada. What would close coordination among the federal government, province, utility and industry help achieve in securing new international markets?

Sam Boutziouvis: From my perspective, especially for large conventional nuclear but also for SMRs, governments need to be hand in glove with the private sector in the world. That's simply because we're not just competing technology to technology; we're actually competing against other governments and their ecosystems.

We greatly appreciate that the Government of Canada has recognized that. We're joining forces around the world in order to develop not just the technical expertise in order to sell the Canadian expertise, but also the financial, regulatory and other aspects related to the Canadian nuclear ecosystem being accepted abroad as viable in terms of a 100-year partnership with those countries.

I raise a very important point about regulatory, and it's been raised before. The Canadian Nuclear Safety Commission, yes, of course, needs to make constant improvements, but it is a world-class regulatory agency. It is in high demand around the world, and that's because it does its job really well. We find that, in particular, countries new to nuclear are very interested to learn from the CNSC with the Government of Canada and the entire ecosystem.

The provinces are a very important point. The ministers of energy for Ontario, Saskatchewan.... The premier of Saskatchewan has been abroad, promoting nuclear from a Canadian standpoint, and this is really welcome. The same goes for other provinces that already have nuclear, such as New Brunswick.

There is a drought of capacity building. Professor Mousseau did raise it very much. We see the expertise of existing utilities as part and parcel of selling CANDU abroad as folded into a total package to sell capacity building abroad as well. There are discussions under way now with various provinces and their utilities in order to take the expertise they have in terms of operating CANDU plants and export it abroad. It is very much a federal-provincial major agency effort in the Canadian ecosystem.

Thank you.

Gurbux Saini: Thank you.

My next question will be for Steve Coupland.

The federal government is investing in Canada's nuclear innovation ecosystem, including $2.2 billion over 10 years for Chalk River Laboratories, with an initial $40 million in 2026-27 to assess Canadian-controlled microreactors for potential use at remote and northern defence facilities.

How can federal research infrastructure and early development opportunities help Canadian companies develop the expertise and supply chains needed to compete in the advanced reactor market?

Steve Coupland: There are two parts to that. We're not a microreactor. We are developing a microreactor, but we don't have one that's operational right now. We're a little bit larger than microreactors. They're generally considered to be 10 megawatts and under. We're not in that field.

Ours is a little larger and costs a bit more, but advanced reactors cost a lot of money to develop. There is a reason the leading advanced reactor companies, including mine, are based in the U.S. It is capital. There were two companies in Canada that tried to develop reactors here—ARC and Terrestrial. Both ended up moving to the U.S. for the ability to get capital.

● (1735)

The Chair: I'll have to stop you there, unfortunately, Mr. Coupland.

Thank you both.

[*Translation*]

Mr. Simard, you have the floor for two and a half minutes.

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

I'm going to address all three of you.

I've been here since 2019, I've been hearing about small modular reactors since 2019—and not one has been built yet. If I understand correctly, one is being built in Ontario. So I have questions about Canada's capacity to carry out this type of project.

First, do we have the required workforce and expertise?

Second, if they try to build a new CANDU reactor, how long might it take?

I suppose they can't carry out two projects concurrently, so there must be considerable logistical problems and challenges. So how long does it take to build a small modular reactor? Can two or three be built simultaneously, and is it the same for CANDU technology? How long does it take?

Is it possible to envision building two or three projects at the same time, or is that unthinkable?

[*English*]

Sam Boutziouvis: It's a great question.

The shortest time in which a CANDU reactor has been built was four years and 11 months. That's really incredible. We hope to achieve similar construction times, should CANDU be chosen in Ontario, around the world or in other provinces. That does not include site development and final engineering, which could take one, two or three years. Overall, therefore, from start to finish, from final engineering of the site to nuclear concrete, where you turn on the reactor, is between eight and nine years, as long as the construction is approximately five years in length, based on the very quick construction time I indicated.

In the 1970s and 1980s, the Government of Canada, with AECL and the province, was building reactors two at a time. They built 22 reactors in approximately 20 years, if memory serves.

The Chair: Thank you both.

Mr. Kelly, you have five minutes.

Pat Kelly (Calgary Crowfoot, CPC): I misunderstood you, Mr. Chair. I thought we were wrapping up.

The Chair: Ms. Romanado is chomping at the bit. We're doing five and five.

Pat Kelly: I'd like to pick up on the same line of questioning that Mr. Patzer had about—if I remember correctly—what the regulatory bottlenecks are that might exist in the current regulations for your industry and solutions that you might want to propose to this committee, if you have any.

Go ahead. Each of you can take a turn on that one.

Steve Coupland: I'll jump in to start.

I did try to touch on a couple of things. Taking some of the lessons from the U.S. and the U.K., in particular the shift, they've moved towards a risk-informed framework and the elimination of what we would call “overly prescriptive” requirements that are not tied directly to safety benefits.

There is the Canadian Nuclear Safety Commission. As Sam said, they are one of the best in the world, but safety starts with the operators and with the developers. The job of the regulator is to oversee that and to ensure that we don't slip up on any of that. They do a great job of it. We've never had problems in this country. We have a very good track record. However, I do think they could benefit by putting in a more risk-informed approach. I don't think that treating a small modular reactor with a very safe fuel is the same as a multi-station, multisized 4,000-megawatt unit. I think things could be looked at based on being risk-informed and based on, frankly, operating records in other countries.

● (1740)

Pat Kelly: It would require regulatory change in Canada to remove some of the barriers, notwithstanding which technology....

Steve Coupland: Yes, a change in.... I would suggest there are some changes in the legislation and, frankly, some in regulations, a lot in regulatory documents and in how the CNSC looks at things. They include an awful lot of “shall” and “will” statements in their regulatory documents, which don't allow the flexibility. One thing we based our regulatory system on was the flexibility to prove your safety case. When you start putting “shall” and “will” in regulatory documents, that takes away the flexibility.

Pat Kelly: Okay. Do you have any really narrow, specific ones that you could...? We're going to table a report in Parliament, and this is your chance to get evidence in for recommendations.

Steve Coupland: I don't have it off the top of my head, but I could come back with a few or submit some.

Pat Kelly: Okay, you can table them later if you'd like.

Steve Coupland: Absolutely.

Pat Kelly: I'll maybe give whatever time we have left to Mr. Boutziouvis to add to that.

Sam Boutziouvis: Sure.

First of all, the legislation currently before you for voting is extremely strong and broadly supported by the Canadian Chamber of Commerce, the Canadian Nuclear Association, other associations and various actors in the private sector, including us, broadly. It brings greater certainty and faster project approvals. There are benefits for major energy and nuclear projects. There's increased investment attractiveness, because there are clearer timelines and coordinated reviews. It helps with respect to our export ambitions because of that clarity. There is a one project, one review model, which is extremely important for the Canadian private sector, speaking broadly beyond AtkinsRéalis.

There is a *Groundhog Day* problem or challenge, which could encourage refinement, and it is this: When the one-year clock begins, you could repeatedly request additional information once the one-year clock starts, and then what? When you request information, does it restart the clock? I think clarity with respect to starting the clock and ending it on a timely basis is a relevant refinement that could be considered.

Really clarifying regulator accountability, I think, would be welcomed among the CNSC, the Impact Assessment Agency and the Canadian Energy Regulator. I realize you need to get this bill passed as soon as you possibly can. However, very importantly, you need to ensure that the agencies have capacity. If there's one thing I would advocate, it's to increase the dollars and the number of people associated with the regulator, so they can do their jobs. More—

The Chair: Thank you. It's a good way to end.

Ms. Romanado, you have the floor for five minutes.

Sherry Romanado (Longueuil—Charles-LeMoyne—Greenfield Park, Lib.): Thank you, Chair.

Through you, I'd like to thank the witnesses for being here today.

I have quite a few questions. If you could keep your responses concise, that would be greatly appreciated.

On August 26, 2026, the U.S. Army announced plans to deploy nuclear microreactors at five military installations, under its Janus program, to strengthen their energy resilience. From a defence readiness perspective, could small nuclear reactors provide reliable power to Canadian military bases and critical defence infrastructure? If so, what would make a base a suitable candidate?

● (1745)

Steve Coupland: The short answer is yes, there's a role for microreactors at military bases. We don't currently have one. We have a number of companies working at them.

What I said earlier applies: It takes significant funding and a lot of resources to move quickly. The DOD in the U.S. doesn't appear to have a budget, so they are able to move things quite rapidly. They've put a lot of money forward. That's why those projects are moving quickly.

Sherry Romanado: If we were to explore the connection between energy security and Arctic sovereignty, what role, if any, could a smaller micronuclear reactor realistically play in powering northern defence infrastructure?

Steve Coupland: I'm not an expert on defence infrastructure, but you will need a significant amount of power 24-7. That's the advantage of nuclear, especially with the microreactors, because you're not going to need to refuel them once they start. They're on, 24-7, for the life of the reactor, and that gives a big advantage. You have the constant power that you can build on.

I should say, stepping away from defence for half a second if I could, that there are also big advantages for northern communities in having microreactors.

Sherry Romanado: That was going to be my follow-up question. Could this also provide reliable electricity and heat to nearby northern communities? We're talking a lot about dual use in terms of our defence investments, so what conditions could make that a viable opportunity or option for us, in terms of our northern defence infrastructures that will also be operating in communities?

Steve Coupland: I think it's a huge opportunity for communities. I will put it in the context of quality of life. Some of our communities that have problems with water have problems because they don't have enough power to run the systems. You'll have enough power, with the microreactors, to do that. Also, if you have, frankly, excess power, you can put greenhouses up and actually grow some fresh food, which is a major advantage as well.

Sam Boutziouvis: However, you have to plan for the dual use.

Sherry Romanado: Is that from the get-go?

Sam Boutziouvis: If you plan for the dual use from the get-go, then you'll know how much electricity you'll need, what the size of the microreactor should be or whether it should indeed be a very small one, an SMR.

Sherry Romanado: Now, just a bit off the defence topic, as an MP from Quebec.... Sam, your firm examined the possibility of restarting Gentilly-2 in Quebec.

Sam Boutziouvis: We did.

Sherry Romanado: What lessons came out of that assessment about the cost and timelines of restarting a retired reactor compared to building a new nuclear capacity?

Sam Boutziouvis: We have learned, from the $25-billion refurbishment program from Ontario, to be much more efficient, on time and on budget—actually, ahead of schedule. What has happened since the days of Madame Pauline Marois is that there have been tremendous efficiencies put into place in terms of doing refurbishments. That's the first thing. Our learnings from Ontario, Romania and around the world help with Quebec.

Number two, Hydro-Québec has done a fantastic job preserving Gentilly-2, and it can be opened very economically. It's just a matter of whether the current government and the people of Quebec would like to see that plant open.

The Chair: Ms. Romanado, Mr. Mousseau has had his hand up for a little while. I just wonder if you—

Sherry Romanado: Are we out of time, though? I don't want to....

The Chair: I'll give time for a quick answer, because he's obviously responding to a question.

[*Translation*]

Sherry Romanado: Mr. Mousseau, do you have anything to add?

Normand Mousseau: I'll add a comment on the issue of the north.

It's important to understand, once again, that energy demand varies greatly between summer and winter. If we run a nuclear power station at full capacity in winter, that means it's virtually useless in summer, even if we had greenhouses dotted around the region. So, we need to have alternative solutions and combine them with storage solutions and other measures.

We always have to think about nuclear energy not as the ultimate solution, but as part of the solution, if we don't want to face completely disproportionate costs for electricity production.

Sherry Romanado: Thank you very much.

[*English*]

The Chair: That is your time.

Colleagues, thank you for that good round of questions.

Thank you to our witnesses. I think you'll agree that it was a good exchange.

Colleagues, we're going to take a five-minute break, and we'll be ready for the next panel.

● (1745)

_____(Pause)_____

● (1755)

The Chair: Colleagues, we're back in session.

On your behalf, let me welcome our witnesses. From Cameco Corporation, we have Mr. Tim Gitzel, chief executive officer. From the Canadian Nuclear Isotope Council, we have Mr. Evan Cameron, manager, public affairs and communications. From GHD Limited, we have Mr. Tej Gidda, global leader, future energy; and Mr. Sam Varah, nuclear energy leader.

I have a few comments for the benefit of our witnesses. Before speaking, please wait until I recognize you by name. This is a reminder that all comments should be made through the chair—although, as you may notice, nobody does that.

Some hon. members: Oh, oh!

The Chair: You will each have five minutes for your opening remarks, after which we will open the floor for questions.

Mr. Gitzel, we're going to start with you. You have the floor for five minutes.

[*Translation*]

Tim Gitzel (Chief Executive Officer, Cameco Corporation): Thank you, Mr. Chair.

Good morning, everyone. It's a pleasure to be here with you.

[*English*]

Thank you for the opportunity to appear before the committee today on behalf of Cameco and our nearly 5,000 Canadian nuclear sector employees and contractors.

Your study now on Canada's nuclear future could not be better timed. The global momentum for nuclear is unlike anything I have seen in my over 45 years in the nuclear industry.

Cameco, which stands for “Canadian Mining and Energy Company”, is headquartered in my hometown of Saskatoon, Saskatchewan, with strategic control of Canadian and global nuclear assets and investments and capabilities that serve a global customer base. We have worked very hard at building Cameco into a Canadian nuclear champion.

As Canada's nuclear champion, Cameco is engaged in nearly every nuclear energy conversation happening around the world. Canada's prominence on the global nuclear stage, to a very large extent, is due to our strategic interests in uranium mining, nuclear fuel and reactor technology capabilities, which are all acquired through our interest in Westinghouse.

Canada can be a global nuclear superstar. Nuclear energy can be the cornerstone of long-term Canadian economic growth, energy security and geopolitical influence, but only if Canada takes advantage of the strategic and competitive advantages that come with Cameco's credibility and capabilities to deliver secure, stable and clean nuclear energy around the world.

At a recent OECD presentation in Vienna on nuclear fuel security, the Canadian government said of Canada's nuclear fuel capabilities that we are the OECD's leading uranium producer, we are a strategic global supplier of nuclear fuel, we have a strong domestic nuclear fuel supply chain, and we have critical conversion capacity. All of those statements are true, and they describe exactly Cameco's capabilities, not Canada's. Cameco is the nuclear fuel supply chain in Canada and is the reason that Canada has a seat at the global nuclear fuel table. Nuclear energy is Cameco's business, and we're good at it. Electrical utilities in Canada and around the world rely on Cameco to provide uranium, nuclear fuel and reactor technologies to generate nuclear power.

We've worked very hard to build this global champion. Our capabilities include every component of the nuclear value chain: exploration; uranium mining, refining and conversion; and nuclear fuel fabrication and enrichment. We do this with a world-class Canadian workforce. By the way, Cameco is the largest industrial employer in Canada of indigenous people.

Cameco's operational assets provide strategic leverage for Canada to provide energy security for our allies. A secure nuclear fuel cycle that is backed up by a reliable nation like Canada and operated by a reliable Canadian commercial partner like Cameco is of strategic importance for our allies and for our trading partners.

Cameco's place as Canada's nuclear champion does not end with nuclear fuel. We also own and control the AP1000, a generation three-plus nuclear reactor that has moved beyond design and early deployment into commercial operation.

Light water reactor designs like the AP1000 account for 92% of the world's operating and under-construction reactors. The world has made a nuclear technology choice, and that choice is predominantly light water reactors.

The world does not lack capital to invest in new nuclear projects. It lacks good projects. Good projects are based on reactors like the AP1000 that are fully designed and buildable and do not require vast sums of taxpayer and ratepayer funding to produce a design, have been deployed or are operational, have eliminated all first-of-a-kind risks, have global market demand and have an existing commercial fuel cycle.

Countries around the world recognize the deployable and operational AP1000 as a Canadian-owned reactor and are currently entering into decades-long nuclear relationships with Canada based on Cameco's AP1000 technology. We currently have six AP1000s in operation, 14 under construction and a global pipeline of up to 91 more.

Despite this global interest in our success, we've done this without support from our own country. In fact, the federal government is actively advocating against Cameco's technology in markets like Poland, where AP1000s are already under construction.

● (1800)

Canada cannot become the nuclear energy superpower it desires to be if it limits technology diversification by putting its weight on the scale in favour of a single technology that needs taxpayer funding to design and has significant first-of-a-kind risks, and that the large majority of the global market has decided it doesn't want.

It seems unfair to me that Canadian champions have to compete with their own government to be successful. It's worth reiterating that Canada's strategic and competitive nuclear advantages are a result of Cameco's corporate strategy and capital investments in a market where the bulk of our competitors are state-owned enterprises backed by national treasuries. We don't ask for government handouts, and every dollar that Cameco earns is returned to Canada and invested back into our operations. Our competitors have the full support of their national governments. We don't.

To sum up, Canada benefits from having Cameco as a Canadian champion with strategic control over multiple globally important nuclear facilities and reactor technologies. The federal government, we believe, is minimizing those benefits by actively advocating against the Canadian-owned AP1000 technology. Our ask is that the federal government not put its finger on the scale, remain technology-neutral, and advocate for all Canadian nuclear companies and all technologies to enhance our country's reputation and meet global demand.

Market diversification, supply chain resilience, economic growth and enhanced energy and national security at home and for our allies will be built on the strengths of the Canadian nuclear industry, technology diversification and the global reach of the AP1000 technology.

Canada's nuclear future calls for ambition backed by proven capability. As Canada's nuclear champion, Cameco brings the strength of a fully integrated nuclear energy company, from ground to grid, to help turn that ambition into reliable power, skilled jobs and long-term energy security. With our proven capabilities across the fuel cycle and our ownership interest in Westinghouse, we believe we're built for this moment.

The Chair: Thank you, Mr. Gitzel.

We move on to Mr. Cameron from the Canadian Nuclear Isotope Council.

Evan Cameron (Manager, Public Affairs and Communications, Canadian Nuclear Isotope Council): Chair Duguid and members of the committee, thank you very much for the opportunity to join you here today.

My name is Evan Cameron, and I'm the manager of public affairs and communications at the Canadian Nuclear Isotope Council. As the voice of Canada's isotope sector, the CNIC represents 130 leading organizations across Canada's nuclear industry, as well as in academia and health care. As this committee undertakes its study on Canada's nuclear future, it is critical that Canada's growing isotope ecosystem be part of the conversation.

Canada has a long history of isotope innovation. From the world's first cancer treatment using cobalt-60—which took place in London, Ontario, back in 1951—to the innovative production of dozens of emerging isotopes in our fleet of CANDU power reactors, along with McMaster's research reactor and our network of cyclotrons from coast to coast, we have a strong foundation to build upon.

Today, our industry is at a critical moment. With a strong track record and a rapidly growing nuclear medicine market, Canada has a fresh opportunity to cement its leadership as an isotope innovator. In its nuclear energy strategy for Canada, the government committed to the development of a comprehensive radioisotope strategy—something the CNIC has advocated since its inception. We're glad to see this first important step.

At this important juncture, there are several key opportunities for the Government of Canada to unlock growth across the isotope ecosystem.

First, the nature of Canada's isotope industry means that it operates at the intersection of several federal departments and regulators. The forthcoming strategy should establish the foundation for a coordinated, long-term federal approach to fostering isotope innovation, with consideration for the rapid pace of advancement within the sector.

Secondly, the radioisotope strategy should be informed by a broad group of experts, potentially through an advisory council, in order to help Natural Resources Canada achieve its goal of growing Canada's share of the global medical isotope market by at least 10% while enabling sector-wide implementation of this strategy.

Beyond the development of the radioisotope strategy, there are several other levers the federal government can pull to catalyze growth, attract investment and save lives. These levers include expanding access to federal financing through the Canada Infrastructure Bank, for example, broadening eligibility under relevant clean-technology investment tax credits to support isotope-related infrastructure and production, investing in workforce development, supporting access to talent, and modernizing assessment procedures through Canada's drug agency.

More directly, the federal government can strengthen Canada's radiopharmaceutical pipeline by renewing and expanding support for the ISED-funded Canadian Medical Isotope Ecosystem initiative, which has supported more than a dozen projects from coast to coast since 2023. This initiative has enabled more than 60,000 additional patient doses while catalyzing over $278 million in follow-on investment—an 8:1 ratio of follow-on investment to ISED's initial $35-million contribution.

Canada's isotope sector also sees significant potential for growth beyond medicine, with important applications for Canadian-produced isotopes in agriculture, construction, quantum technologies, fusion, non-destructive testing and even radioisotope power systems used to power deep-space exploration. Canada's isotope sector illustrates the broader value of our nuclear industry. From the research legacy of Chalk River to the CANDU fleet that supports commercial-scale isotope production today, Canada's nuclear capabilities provide a foundation for innovation well beyond electricity generation. With isotope and radiopharmaceutical innovation hubs emerging across the country, continued investment in production and clinical infrastructure, and support across party and jurisdictional lines, Canada's isotope sector is well placed to build on this global legacy.

All of us are affected by cancer, and its impacts are far-reaching. As this committee considers Canada's nuclear future, it is important to recognize our sector's role in providing hope to patients and families globally. By investing in Canada's nuclear isotope supply chain, we can advance next-generation diagnostics and cancer therapies, supply critical isotopes for industrial and advanced technology applications, and catalyze investments in our community. When you think of Canada's nuclear future, think of hope. That is our legacy.

Thank you for your time. I'm happy to take your questions.

● (1805)

The Chair: Thank you, Mr. Cameron.

Mr. Gidda and Mr. Varah, you have the floor for five minutes.

Tej Gidda (Global Leader, Future Energy, GHD Limited): Good afternoon, Chair and members of the committee. Thank you for inviting us to contribute to your study on Canada's nuclear future.

I'm Tej Gidda, GHD's global leader for what we call future energy. With me is Sam Varah, who leads our nuclear energy business.

GHD is a global, employee-owned engineering, environment and advisory consulting firm. We're about 12,000 people globally. We've worked in Canada for 50 years, and our 2,500 people here help clients plan, permit, design and engineer complex energy and infrastructure projects. Our international work includes nuclear projects like the Sellafield infrastructure delivery partnership project in the U.K.

We have two messages for your study.

First, Canada's nuclear advantage is only as strong as our capacity to deliver it.

Second, nuclear is how Canada will keep the lights on as demand grows. It's how we'll control our energy future.

Sam will begin.

Sam Varah (Nuclear Energy Leader, GHD Limited): Canada begins from a position of strength. We have domestic reactor technology, a mature CANDU fuel supply chain and advanced engineering, automation and manufacturing expertise. Recent work at the Darlington nuclear station also shows that Canada can deliver large and complex nuclear projects on time and under budget.

We cannot assume those strengths will be enough capacity to meet what comes next. Canada has not completed a new power reactor since 1993, and much of the workforce that built our fleet has retired. At the same time, new nuclear plant development is moving forward, starting with the G7's first small modular reactor at Darlington.

As nuclear activity grows again, we need to make sure that our expertise grows with it. The question is whether we have the people and skills to deliver. That is a question GHD is actively considering as part of its work with the Canadian Nuclear Association's workforce council, where we participate in discussions about the future. GHD also works with universities to explore how the industry can attract new talent and upscale the existing workforce to develop the skills employees will need.

Delivering nuclear projects requires a wide range of capabilities. We need engineers, environmental scientists, skilled trades, designers, project managers and manufacturers. We also need people who understand and respect the regulatory environment, the environmental conditions and the indigenous partnerships that are key to delivering for communities across Canada.

Firms like GHD, with decades of large infrastructure and environmental experience, are ready to help. We are building on that to help the Canadian nuclear sector build skills, businesses and supply chains that can compete globally.

As the global nuclear renaissance accelerates, Canada should be its proving ground. Build it here, prove it here and benefit from it here, and then take it to the world.

I'll go back to you, Tej.

● (1810)

Tej Gidda: Thank you, Sam.

The nuclear renaissance is real. It is driven by the need for energy sovereignty, increased power demand and the energy transition, which is ongoing.

Energy sovereignty starts with fuel. Mr. Gitzel provided a lot of information around Cameco and its place in the fuel supply chain network. I would like to give an example about a different kind of fuel, which we commonly call natural gas. Nearly half the world's proven natural gas reserves sit in Russia, Iran and Qatar. That is a fact with which we will need to contest in the future. That is a depleting resource. Nations that import their energy live with supply uncertainty and pricing that is controlled by others. We're seeing that today.

Canada is different. We are the world's second-largest uranium producer—I hope I have that right, Mr. Gitzel. Saskatchewan holds the highest-grade deposits on earth. We have the fuel, but we also have the expertise to control our energy destiny and to offer our allies a secure path to energy security.

We will need nuclear at home too, of course. Ontario's grid operator forecasts that electricity demand will grow 65% by 2050, an unprecedented increase, driven by data centres, industry, electrification and population growth. Nuclear already supplies about half of Ontario's electricity and one-third of New Brunswick's. Alberta and Saskatchewan, as you've heard today, are also exploring nuclear generation. It works, and it can scale.

We are not suggesting that nuclear will do it all. The grid of the future will balance renewables, energy storage and nuclear, but nuclear is the dependable, clean, around-the-clock foundation that keeps the lights on. It's part of the clean energy future that GHD specializes in.

To close, Canada has the fuel, the technology, the expertise and the track record. What we need now is the capacity to deliver. Build that, and Canada will power not only its own future but the world's.

Thank you. We look forward to your questions.

The Chair: Thank you to you both.

Thank you to all the witnesses.

We're going to start our questions.

Colleagues, we're going to have two rounds, as we always do, but we're going to end with Mr. Simard.

Mr. Kelly, we'll start with you for six minutes.

Pat Kelly: Thank you.

I'll start with our witness from Cameco.

Is there a domestic uranium enrichment capacity in Canada?

Tim Gitzel: Not today, there isn't. We've never needed it. We use CANDU reactors without enrichment, but we are building an SMR that requires enrichment at Darlington, so we're over that hurdle. We need it.

Pat Kelly: That was my next question. Is there a need for such capacity in Canada?

Tim Gitzel: We need enrichment in Canada. Are we ready to build an enrichment facility? We are not—not based on one SMR. You would need a fleet of probably 10 large light water reactors—let me put it that way—to justify building one here. In the meantime, we can get it from Europe or the U.S.

Pat Kelly: Would there be export opportunities if we had the enrichment capacity that exceeded the need for generation?

● (1815)

Tim Gitzel: Yes, there would be, 100%. The steps are uranium conversion, enrichment and fuel fabrication. We have them all, except for the enrichment part. We could build that. We have enrichment technology in the U.S. It's part of our plans for the future.

Pat Kelly: Is there investment appetite to build generation that requires enrichment in Canada?

Tim Gitzel: Absolutely. We're not anti any technology. We're just saying they should put them all on the table and let the utilities decide. You have the brightest minds running Bruce Power, OPG and SaskPower. Let them decide which technology they want. Canada happens to have a few of them, as you heard already, so we're blessed. Then we have to go out and really take on the world. We can do that from Canada.

Pat Kelly: You mentioned in your opening statement that you have the investment, or there is sufficient investment appetite that your model of power generation could be built without subsidy.

Tim Gitzel: That depends on which country you're in, but I can tell you we have three that we're building in Poland, and we have two in Bulgaria. Ukraine wants nine, but they're not building any at the moment. Obviously, we're working in the U.S., where the Department of Energy has put up $17.5 billion to order long-lead items. They say, "We have to compete with the Russians and the Chinese, who are really taking over the world in nuclear, and we can't let that happen. North America started the nuclear business, and we have to get back in the game."

The U.S. is moving ahead on that. They put in orders for 10 AP1000s in the U.S., and they've gone ahead and ordered long-lead items not even knowing who's going to build them or where, because it takes five years to get some of the component parts—just like gas, by the way.

Pat Kelly: The specific ask in your opening statement was to ensure that Canada's decision-making process on projects is technology-neutral. Is it your testimony that it currently is not?

Tim Gitzel: Let me tell you a story.

Cameco has been in the nuclear business for 40 years. I've been there for most of those 40 years, doing this. We went through 10 really tough years after Fukushima, from 2011 to 2020. We just about lost the company, but in 2020, with climate change, energy security and national security, we started seeing some tailwinds. A company called Westinghouse, which is American technology, came up for sale, and we went out and bought it, because we thought it was the best technology in the world.

We've seen Canada hollowed out. Inco, Falconbridge, Noranda, Nexen and Stelco, maybe—I can name the ones that we've lost. We went out and bought an American technology, brought it to Canada and domiciled it here. It's 100% Canadian-owned, and we hear, "Well, you can't build that in Canada." That doesn't even make sense.

If you heard a little frustration from me in my comments.... We're not anti anything. We make all the fuel for the CANDU fleet. We're pro-CANDU as far as that goes. We make all the fuel for Bruce Power, OPG and New Brunswick Power. We're not anti anything. We're just saying that if Canada wants to compete on an international scale and domestically, you have to look at all the technologies.

Pat Kelly: All right. I have only about a minute left.

If I may steer you toward the mining part of Cameco, what are the regulatory obstacles to mining and new mines in Canada?

Tim Gitzel: The regulatory process has taken a long time. We see Bill C-39. I'm not an expert, but I think I heard the phrase "one project, one review, one year". I'm not sure that includes nuclear and the CNSC, but if that's the direction we're going in, we just have to get faster without reducing the regulatory standards. We're not in favour of that. The reason we get to do our business is that people believe we have a strong regulator that watches what we do and keeps its eye on us, but we need to speed it up for sure.

Pat Kelly: It's been said that it takes 18 years to get a mine up and running. What's a reasonable length of time in Canada to go from application to production?

Tim Gitzel: That 18 years would include a lot of exploration in northern Saskatchewan, where it's -50°C in the winter, so we're limited.

Pat Kelly: I'm not talking about the exploration.

Tim Gitzel: The NRC in the U.S. has said 18 months, so we think that's a reasonable period of time.

The Chair: Thank you, both.

We are going to move on to Madam McKelvie for six minutes.

● (1820)

Jennifer McKelvie (Ajax, Lib.): Thank you, Mr. Chair.

Firstly, I have to say this is the greatest day I've had here, because I'm getting to talk about both geology and isotopes. It couldn't get any better for a former isotope geochemist.

I'm going to start with Mr. Gitzel.

Cigar Lake has one of the coolest deposits in the world. Of course, it's only one of several that you have. I'm wondering if you could speak to what volume you're able to produce right now, where you think you'll be and how it all fits in with the recent deal that you participated in whereby we're going to be exporting more to the world.

Tim Gitzel: Thanks for that question, and thanks for your knowledge of Cigar Lake. We're very proud. McArthur River and Cigar Lake are the world's two largest high-grade mines. Nobody's even close. Its grade is 100 times the average grade of uranium in most deposits, such as in Kazakhstan and maybe everywhere else. We're very proud that they're in Canada and in Saskatchewan.

We export to the world. Cigar Lake still has many years in front of it. We're spending hundreds of millions to extend the operation there. We're going after some new ore bodies. McArthur River will have 20 to 25 more years of production, so Canada will be the leader.

We just signed a deal in India, as you might have seen, on March 2. The Prime Minister was there, and Prime Minister Modi was there with us. It's for 10 years' supply to India. They would have bought all of our supply forever if they could have. We didn't sell it to them. We don't do that, but they would buy everything.

If you look at a country like India, they have 8,000 megawatts of nuclear electricity, and they want 100,000 by 2047. They need lots of uranium.

China's building eight to 10 new big reactors every year. That's why I say I'm a bit frustrated; we have to get going to catch up.

We're going to need more uranium. The government has approved a couple of new ones in Saskatchewan. They're hard to get going. I've been involved in every one in Saskatchewan over the last 40 years. They're hard, but we have more uranium and more exploration dollars, and we'll continue to be.... We're number two behind Kazakhstan right now, but there's a chance we could turn into the world's largest producer of uranium.

Jennifer McKelvie: On exploration, which you mentioned briefly, we have geological surveys with really low-resolution data. As the government looks to invest in critical minerals, and as we work on Arctic sovereignty, for example, and we have more drones out there, should part of our strategy be improving the resolution of our geophysics data in this country?

Tim Gitzel: Absolutely, it should. We're going to need more. We use the GEOTEM. You'll know all of the resistivity surveys we do. It comes down to drilling at the end, because you have to see what's down there, but yes, there have to be new technologies.

We're applying AI now to all of the data—the core that's out there, which you'd know more about than I would, has been there for 50 years—to see if it can help us pinpoint, so yes, absolutely.

Jennifer McKelvie: Certainly, there's really interesting core logging that's happening—going back through old cores with higher-resolution data. There's a lot of potential in that.

I can't forget the isotopes. We have Mr. Cameron here.

First, as we're investing in new nuclear projects—and we have a very ambitious strategy—is it important that we're considering isotope production, particularly radioisotope and medical isotope production, at the beginning as opposed to considering it as an afterthought? Should this be embedded in the process?

Second, we are committed to a national radioisotope strategy. What are the things you want to see in that?

Evan Cameron: To answer your first question, very simply, yes. We should 100% be thinking about it from the very start.

Something that some other jurisdictions are doing, which we're starting to do but haven't historically done in Canada, is co-locating, for example, processing at the facilities where isotopes are being produced. Bruce Power has just installed some hot cells at their facility to start doing some of the processing, but historically a lot of the processing of isotopes has happened abroad.

As we're looking at new nuclear, if we're going to be selecting reactors that can produce isotopes, certainly, we should be thinking about that from the start and seeing how we can do things like processing locally to the reactors.

On your second question, I don't think we have enough time for me to tell you everything I'd like to see in the radioisotope strategy. The key for us is broad engagement, first of all, not just with industry—obviously, we're an industry association—but also with health care. We can produce endless volumes of isotopes, but if we don't have the medical workforce in Canada to deliver those isotopes to patients, that's a real barrier.

Not to harp on processing, but I also think an expanded focus on processing would be key in that strategy. As I say, historically, using the lutetium example at Bruce Power, a lot of that has been processed in Germany. Some of that could be brought to Canada, potentially, to shore up our domestic supply chain. That's a big one for me.

We do process. For example, cobalt-60 is processed just down the road in Kanata, Ontario, so we do have some capabilities domestically, but from the CNIC's perspective, bringing some more processing to Canada would be key as part of that strategy.

● (1825)

Jennifer McKelvie: Mr. Gidda, you talked about the ability to deliver. What I think of particularly are the skilled trades and the workforce. What are some of the predictions about things we should be building a pipeline for to start to encourage people to get into those fields?

Tej Gidda: From our side, we're primarily an engineering and science-based company, and we see limitations in the amount of engineering that can go into a full plant of this scale. These are very unprecedentedly big pieces of equipment being integrated into the site. More engineering that's specific to this field is required at this point.

The Chair: Thank you both.

We are moving on to Monsieur Simard.

[*Translation*]

You have the floor for six minutes.

Mario Simard: Thank you, Mr. Chair.

Mr. Gitzel, I'd like to understand the distinction between AP1000 technology and CANDU technology. Is there a cost benefit or a production time benefit?

What does the production of an AP1000 reactor, in megawatts, look like compared to that of a CANDU reactor?

Tim Gitzel: That's a good question.

[*English*]

The AP1000 is a reactor that's built already, so you've taken away the design risk. There's no design risk. It's built. It's locked down. It's ready to go. It's licensed in the United States and in the U.K. We have regulatory approval to go ahead with it. We know the fuel that goes into it. We produce it, by the way, which is part of our strategy to build the reactor and then provide the fuel for it.

The risk is on the construction side, as in any large project. The AP1000 can generate 1,100 megawatts, but it requires enriched fuel. We can supply that.

With a CANDU reactor, it depends on which one. Sam talked about, I think, three different varieties they have. I'm not going to say anything about that, because I don't know. They're smaller, for sure. They don't require enriched uranium. They require natural uranium, which we also produce at Cameco.

The difference is that one's a heavy water reactor and requires heavy water, which we also don't produce in Canada right now. We'd have to come up with that somewhere.

They're two different technologies. You know what? In one place, one is the right fit, and in another place, a different one is the right fit. That's why we're of the view that it should be opened up to let the utilities decide what fits best for them. What fits best for Bruce site C? What fits best for Wesleyville? Saskatchewan is going to make a decision, and it's the same thing.

[*Translation*]

Mario Simard: Thank you very much, that's quite enlightening. If you have any further information on this, perhaps to draw a comparison, I think it might be of interest to the analysts as they draft our report.

This summer, in June, if I remember correctly, the minister announced the federal government's intention to build 10 reactors within 15 years. The mix would include small modular reactors as well. Earlier, Mr. Varah said that no reactors had been built in Canada since 1993. So I wonder how, in 15 years, we are going to manage to build 10 nuclear reactors, even with a mix that includes small modular reactors.

Does that seem feasible to you?

It would be interesting for us to hear your comments on that, Mr. Gitzel and Mr. Varah.

Tim Gitzel: Thank you for the question.

[*English*]

We have to get started. We have to move from ambition to action, if you want a keyword. We have to get started and get the first one built. We heard about the race to be second or the race to be third. Nobody wants to take the risk on the first one. OPG is taking it on an SMR, so they're going to build that one.

There are three key words: simplify, standardize and sequence. You can't build them all at the same time. It's like what Bruce Power is doing with their refurbs: They're doing one and then moving on to the next one and the next one. You move the workforce along.

That's the same as where we are with building reactors. We do that. We simplify. You have to lock down the design. You can't build a reactor if the design is only 20% complete. It will kill you, and that's what has gotten us into trouble in the past. Standardize and build the same one. Don't let everybody pick their own variety. If you go to the U.S., out of the 94 reactors, I think there are 68 different models. It's terrible.

You have to standardize. That's what the Chinese do. The Chinese can build them in five years for $5 billion. That's about half of what it would be in Canada. You have to do it that way.

We think Canada could probably build four to six at a time, maybe, but you'd have to build them in sequence. You'd start with one, and then a year later you'd start another one. The U.A.E. just did that with their four reactors, and they were successful.

That would be my advice.

● (1830)

Sam Varah: It's difficult, for sure. I think the key is to have a trained workforce that understands all the technologies we're trying to implement and to try to upskill existing employees and staff at companies that are not currently in nuclear. Give them training that makes them able to work in nuclear design, and make sure they're adaptable. We need a workforce that understands all the technologies and can go from one to the next.

If we diversify our technology, we risk overextending ourselves. We have to make sure that we make those decisions really thoughtfully, consider the long-term implications, and make sure we have a plan for how we're going to resource the design and construction of these things. They're not going to be simple to design or build. We have to really use a lot of foresight there.

[*Translation*]

Mario Simard: In short, if I understand you correctly, to build 10 reactors, it may not be the best strategy to have a mix of technologies that would include, among other things, small modular reactors. I don't know whether there would be any AP1000 reactors, as you seem to be saying that the government has no interest in that technology, but it would not be the best strategy for the government to use different technologies if it wants to proceed fairly quickly.

Did I understand correctly?

[*English*]

Tim Gitzel: Pick a technology and get going. Get those first ones going.

There's room for 20 reactors or more in Canada. More than one technology can be used. Let's pick a technology. Let's get going with the first one, and we'll go from there.

Canada can do it. We did it in the past. We built 20 reactors in the past. We can do it again.

The Chair: Thank you.

Monsieur Malette, you have the floor for five minutes.

Gaétan Malette (Kapuskasing—Timmins—Mushkegowuk, CPC): My question is for Mr. Cameron.

If I heard correctly from one of the witnesses, China produces 60% of its isotopes from two CANDU reactors. Those two CANDU reactors supply a facility for the isotopes. Did I understand that correctly?

Evan Cameron: I'm not familiar with that particular example, so I'm hesitant to confirm it on the record.

Gaétan Malette: This is where my question is going: Does producing isotopes reduce the cost of electricity from your reactors?

Evan Cameron: Not inherently, no.

From the CNIC's understanding, it's more of a bonus. It doesn't really have any implication for the production of power. For example, two of Bruce Power's CANDU units do currently have isotope production capabilities. It has no implication on the production of power. It's just a real bonus for patients and families globally.

Gaétan Malette: I've heard that producing megawatt hours is more expensive with nuclear. I believe we have to put a cost on this bonus.

Evan Cameron: I would be inclined to agree with that. Absolutely.

Gaétan Malette: Has anyone done that? It becomes very important when you're saving lives.

Evan Cameron: The CNIC has not put that cost together. I would certainly be inclined to agree with you, sir.

The role that the CANDU reactors currently are playing.... I do have a stat here. Bruce Power and its two units that are producing an isotope called Lutetium-177 supply 70% of the supply of Lutetium-177 for a drug called Pluvicto, which treats late-stage prostate cancer. That is really changing lives around the world, so there is certainly some inherent value on that front.

We obviously deal predominantly on the isotope file. We don't stray too much into nuclear energy in terms of the costs, etc., that you've described. There's clearly inherent value for human health globally.

Gaétan Malette: Would you add to that, Mr. Gitzel?

Tim Gitzel: I think nuclear power is fantastic. It's 24-7 baseload power and all of the attributes that you have with that. If you can produce isotopes on top of that, there's huge value to that. It's not just financial value. There's value in selling the technology. You can say, “Do you know that we save lives with this nuclear power as well, and that you can produce lutetium, cobalt and the other pieces that are used?”

Part of Bruce Power's story is that it's producing great electricity 24-7, but it's also sending a lot of isotopes to hospitals to save lives. It's a great addition to the nuclear power.

● (1835)

Gaétan Malette: This goes to you again, Mr. Gitzel.

You have 45 years in the nuclear sector. With your experience, if you could change one thing in the federal regulatory process to make us the world leader, what would you do tomorrow morning?

Tim Gitzel: Thank you for the question.

When I started, I think Joe Clark was the prime minister. I was 17.

I would speed up the approval process, if we can. Move more quickly. Learn from other jurisdictions. Work with the U.S. Work with the U.K. Work with France. France has 54 reactors, and 70% of their power is nuclear. Let's work with them to share experiences. They do that. They had all of them up at Cigar Lake last summer. All the regulators got together and came up.

Don't replicate the same studies every time on a reactor design. The U.S. and the U.K. have approved the AP1000. I know Canada's looking at it. I know Pierre Tremblay and his team are looking at it. Use some of the work that's already done; don't replicate the work every time.

Gaétan Malette: I have another question for you, Mr. Gitzel.

I'm representing northern Ontario, and in many of our communities, you fly in diesel. You don't even barge it in; you fly it in.

Are the small reactors a technology that could benefit some of these communities?

Tim Gitzel: That's a great question. Yes, 100%, and guess what? We're looking at that for our mines in northern Saskatchewan, which are 750 kilometres north of Saskatoon, where we truck in diesel and propane every day.

Westinghouse, for instance, has a five-megawatt reactor—the eVinci—that we're working on. Somebody mentioned that the U.S. is looking at putting them on their military bases. Yes, we can do that, and Canada's doing it now as well. I think it's in New Brunswick that they picked BWXT to work on a microreactor. Yes, and it would save all the diesel, for sure.

Gaétan Malette: Thank you.

The Chair: Thank you both.

Mr. Danko, you are the most popular politician in the House today.

Some hon. members: Oh, Oh!

Sherry Romanado: You have the mic.

John-Paul Danko (Hamilton West—Ancaster—Dundas, Lib.): Thank you, Chair.

I want to start by saying how refreshing it is to be having this conversation in the context of the understanding that Canada, along with the rest of the world, is transitioning to an electric economy. That's the baseline that we're having this discussion on, which, as I said, I find very refreshing.

I want to start on the radioisotope side. I'm a representative of Hamilton West—Ancaster—Dundas. McMaster is in my riding. We have AtomVie and Fusion Pharmaceuticals as those next-generation pharmaceutical companies that are, as you said, Mr. Cameron, located local to the production. They're also doing the processing. Fusion Pharmaceuticals, in particular, was sold to AstraZeneca recently for $2.4 billion.

It's not just the sale of the isotopes or the market for isotopes; the real growth industry that I see is in the processing facilities and the expertise that's needed.

You talked about having production and processing together, but part of the nature of radioisotopes is that they have to be together. How important is it for the growth of those industries to build on both those factors?

Evan Cameron: As you say, it's inherent. I think you're referring to the half-lives. These isotopes have very short half-lives in some cases.

For example, lutetium has a half-life of about five days, give or take. It's currently processed in Germany. Think of it going from Bruce Power to Pearson and over to Germany to be processed, and then to patients, sometimes back in Canada, sometimes abroad. It's really quite a trek.

That is exactly why the CNIC feels so strongly that processing should be happening locally. I'll clarify that I don't mean locally as in 20 minutes away, like McMaster to AtomVie. Several jurisdictions—China is certainly one, but there are others—are doing the complete processing on site where they're producing the isotope. It's under one licence.

Obviously, there would be some regulatory factors that would need to be considered, and I don't have the regulations in front of me, but the key opportunity is really to not just do it locally but to co-locate processing and production. As I mentioned, Bruce Power is beginning to do so with lutetium. That's really the missing piece of the puzzle, in our view. We have the entire isotope supply chain in Canada, here at home, but it's just the processing, particularly on emerging isotopes, that is really the barrier. I would say that's very important.

● (1840)

John-Paul Danko: Thank you.

Mr. Gidda and Mr. Varah, in your opening statements you talked about the workforce development and developing the people and skills that we will need for the nuclear industry. I think that's a core consideration for the government. As we're investing in nuclear, whatever the technology is, whether it's AP1000, CANDU, SMRs or microreactors, we still need that skilled workforce to build them and operate them.

How do we make sure we have that specialized workforce? What steps can we take as we move forward with Canada's nuclear strategy?

Tej Gidda: I do hold the title of adjunct professor at a couple of Ontario universities, and I think this problem is endemic, not just among the specialist side of nuclear but in the rest of it as well—the so-called “balance of plant”, as we call it.

If I think of Ontario Tech University and how many nuclear specialists they're putting out per year, it's a very small number. If I think about the number of civil engineers, electrical engineers, mechanical engineers and geotechnical engineers we need to support those specialist trades in actually building these things and designing these things, the number of construction specialists is also very limited in reality when you look at the figures. There's a competition here between infrastructures. This is not just about nuclear. We are building many different pieces of infrastructure across this country that also have a demand for that talent. We are seeing that demand and that competition for talent across markets at the moment.

Part of our message is, if we really want to build 10 reactors, which I think is eminently possible, we're going to have to think differently about who we're training and in what quantity across this country.

The Chair: Thank you so much. Thanks to you both.

[*Translation*]

Mr. Simard, you have the floor for two and a half minutes.

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

There are currently four nuclear power plants in Canada: three in Ontario and one in New Brunswick. That's roughly 15% of Canada's electricity generation. If the government pursues its goal of doubling electricity generation by 2050, that suggests that four additional nuclear power plants could be built.

What might it cost to build these power stations? I'm not asking you to go out on a limb and speculate too much, but let's say we settle on a particular technology and try to double nuclear generation—what might that cost, roughly speaking?

Tim Gitzel: Thank you very much.

[*English*]

Right now, there are 20 nuclear reactors in Canada. I think there are 19 that are operating or available in Ontario. Gentilly, of course, is not. Then there's Point Lepreau in New Brunswick. Also, of course, OPG is building the first SMR.

To double, you'd need another 14 or 15 nuclear plants, which is exactly what Ontario has planned: four big units, 4,800 megawatts, at Bruce Power; 10,000 megawatts, OPG, at Wesleyville; plus the other three SMRs they're talking about building.

Our good friend Scott Moe in Saskatchewan is talking about two or three large reactors. Why? Artificial intelligence. We haven't talked about that yet. Keep your eye on that. Whether you believe it or not, they're building a $52-billion artificial intelligence data centre outside of Regina. It takes one reactor just to run that alone. The power needs are astronomical.

How much does it cost? I guess we'll see. We put estimates...I think you heard Sam talk about $8 billion to $10 billion per 1,000 megawatt to 1,100 megawatt unit. It'll be something like that.

We built two in the U.S., Vogtle 3 and Vogtle 4, at Augusta, Georgia. Vogtle 3 was expensive and overpriced, and it took a long time. The second one took 30% less time and 30% less money. We have to build the first one, and that's why everybody wants to be second. They don't want to build that first one, but once you get going.... As I said, the Chinese are building them in five years for $5 billion. They're good. They're cookie cutter. That's how they build them.

● (1845)

The Chair: Thank you both.

Thank you to all of our witnesses.

Thank you, colleagues, for great questions with great answers. There were some pithy phrases today: “a mad dash to go second”, “big or small, we need them all”, and a great geochemistry lesson—thank you, Ms. McKelvie.

Colleagues, thank you.

Again, thank you to our witnesses.

We're adjourned.

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