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Chair: Mr. James Maloney



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• (1105)

[English]

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

Welcome back, everybody. I hope you all enjoyed your time in your constituency and were able to get caught up on quite a lot of things—unless you're in Toronto, where you still can't get things like a haircut. Such is the case; we soldier on.

Anyway, it is good to see everybody, at least virtually. This is the 19th meeting of this committee, and it also happens to be our last meeting on this study topic. We have a very interesting panel today, which is going to bring us to a conclusion.

For our guests today and for our members, all of the sound checks and equipment checks have taken place in accordance with the motions we've passed previously at this committee.

To our witnesses, you have translation services available to you on your machine. You're welcome to and encouraged to speak in either official language, and you will be asked questions in French and English. Because we are doing this virtually, it requires a little bit of patience, meaning you should wait until somebody else is finished talking before you start answering a question. Similarly, I will remind our members to wait until witnesses finish speaking before they start their next question.

On that note, why don't we jump in? Each of our witness groups will be given up to five minutes to make a presentation, and at the conclusion of all of the witness presentations, I'll open the floor to questions. I will warn our guests today that we do have a time limit on presentations, which is five minutes, and time limits on questions for each member. It is my job to interrupt from time to time to remind people that they are running out or have run out of time, and I apologize in advance for doing so.

Today we have, from BlackRock Metals, Mr. Sean Cleary; from Electric Mobility Canada, Daniel Breton; from Nano One Materials, Dan Blondal; and from Propulsion Québec, Sarah Houde and Simon Thibault.

Welcome, everybody, and thank you for coming. Why don't we proceed in the order I just ran through?

That means, Mr. Cleary, you have the floor for five minutes, sir.

Mr. Sean Cleary (Chairman and Chief Executive Officer, BlackRock Metals Inc.): Thank you, Mr. Chairman and committee.

My name is Sean Cleary. I'm chairman and CEO at BlackRock Metals. We're building a \$1.3-billion critical minerals project in Quebec. You can visit www.blackrockmetals.com for a summary of the project.

This project consists of a fully integrated mine and metallurgical complex that will be built in the federally controlled industrial deep-sea port located in Saguenay, with access to the St. Lawrence and global markets. We will produce three critical minerals, which are vanadium, titanium and nodular iron. The BlackRock project is fully permitted by all governments and is one of the few projects in Canada that is shovel-ready. We're now working to complete construction financing and start construction next year, with full production in 2024.

BlackRock is a commercial hydrogen user and early adopter. It is uniquely designed to use grey hydrogen and is enabled for the conversion to green hydrogen once it is commercially available. This is not a pilot project. The plant will be an example to the world that Canada can lead the way in zero-emissions mining and metals production. The BlackRock project is where the critical minerals strategy and the hydrogen strategy meet.

We have developed close relations with aboriginal communities, having signed agreements with the Innu nations of Mashteuiatsh, Essipit and Pessamit, the Cree Nation Government and the Oujé-Bougoumou band. These are major accomplishments.

Recently, Dr. Abel Bosum, the grand chief of the Cree, spoke to this committee and specifically indicated that the Cree territory in Quebec is rich in vanadium. The Cree have been our strong supporters. They realize that the economic future of their youth passes through the responsible development of their mining potential and specifically critical minerals, which will offer long-lasting and stable careers to aboriginal youth across Canada.

Almost all vanadium comes from China, Brazil, South Africa and Russia. However, vanadium has not been discussed at length in this committee. Vanadium is a critical mineral. It's on your list. It has been extremely important as a steel alloy and battery metal. Currently, North America has vanadium processing plants, but no primary source of vanadium. Canada has a world-class deposit of vanadium in Quebec, which is the BlackRock project.

Vanadium is a critical ingredient for batteries and steel. There is no steel without vanadium. We believe that a strong steel industry focused on zero emissions is at the core of every great nation. Without vanadium, Canada and our allies in America and Europe cannot have a steel industry. Vanadium doubles the strength of steel, resulting in stronger bridges and buildings and safer cars that use less steel. This is vital for meeting product specs, and it is beneficial for the environment. Life-cycle analysis shows that the vanadium related to the steel rebar from the BlackRock project alone will save over 26 million tonnes of CO₂ per year. Also, there is no direct substitute for vanadium.

Vanadium is also a key ingredient in electric flow batteries, which are increasingly being used to store wind and solar electricity and balance the electric grid. In fact, the National Research Council of Canada has had a project investigating vanadium flow batteries to secure Canada's electric grid. Time will show that vanadium is a more important critical mineral than even lithium when it comes to battery production and electricity storage. Vanadium batteries can easily be recycled and the importance of vanadium will grow accordingly over the next decade as utilities look to store green energy safely and economically.

Canada can be a global leader in vanadium since BlackRock can produce over 5% of total global output of vanadium per year for the next 70 years.

There are certain things that we could agree on. First is that we have a critical minerals list, but that won't change anything unless major funding, policy and strategy follow.

Second is that the capital markets are knowledgeable on base and precious metals, but there are no pools of capital available for critical minerals.

Third is that unfair trade practices from foreign regimes that manipulate markets and do not follow market rules, including for vanadium, stifle competition and new entrants.

Fourth is that we need appropriate government engagement and willpower to drive critical minerals forward and secure the steel supply chain.

Fifth is that the BlackRock project is entirely centred around ESG. Government should follow this lead to place the critical minerals industry within such a framework to help attract major capital.

Sixth is that we need the federal government to be openly supportive if we want to be a major player in the critical mineral space. It will be necessary to invest significant capital.

• (1110)

Lastly, we would say that we've been having the same talk about this. Right now, it's really just talk. If we don't do something concrete about it, Canada will be left behind on critical mineral supply.

I thank everybody. That concludes my remarks. Thank you to the members of the committee for having invited me and taking the time to listen.

I look forward to answering any questions.

The Chair: Thank you, Mr. Cleary, particularly for staying right on time.

Mr. Breton, now we'll go over to you.

Mr. Dan Blondal (Chief Executive Officer, Nano One Materials Corp.): Thank you. I think you actually have the names mixed up. This is Dan Blondal from Nano One, as opposed to Dan Breton from the other company.

Do you want Nano One to go next?

The Chair: Actually, no, I was going get Electric Mobility to go next. However, if you're ready to go, that's fine too.

Mr. Dan Blondal: That's fine.

The Chair: Go ahead.

[*Translation*]

Mr. Dan Blondal: Good morning, everyone.

My name is Dan Blondal. I speak French fairly well, but I'm going to address you in English, because it's much easier for me.

I left Montreal a long time ago,

[*English*]

so English comes easier.

I am the CEO and founder of Nano One Materials. I'm based here in Burnaby, British Columbia.

Nano One is a clean technology company. We're changing how the world makes battery materials. We have developed a battery agnostic platform for the industrial production of cathode materials used inside lithium-ion batteries.

We have 35 employees. We have 100% Canadian-grown expertise in engineering, materials science, business and financing. We have 16 patents now issued and at least another 30 pending in jurisdictions around the world, which include Canada, the U.S., China, Japan, Korea and Taiwan. We are publicly listed on the TSX Venture Exchange. We are well financed, and we are also honoured and privileged to have the ongoing financial support of SDTC and B.C.'s ICE fund.

Our processing technology uses critical mineral inputs such as lithium, nickel, manganese and cobalt to make high-performance cathode materials used in lithium-ion batteries. We differ from other chemical producers because our technology eliminates the need for intermediate products, energy and the associated costs and environmental footprint. It uses one-twentieth of the water and eliminates a significant waste stream.

As I said, this reduces cost, energy, logistics, waste, water and carbon footprint, while enhancing battery durability. Just for reference, it could save up to \$1 billion for every one and half to two million electric vehicles that are made.

It all starts with mining, of course, but where does all this go? Who turns those metals into battery materials? Who puts them into cells? Who builds the battery packs that go into cars?

Unless we start making battery materials and battery cells here in North America, we will continue to ship our raw materials to Asia, only to bring them back to Canada for production. Europe is busy playing catch-up, and North America is really still at ground zero in these terms. I believe this presents a tremendous opportunity in North America.

China and the rest of Asia are well established and they did so very early, but this has left them with a fragmented and entrenched domestic supply chain that we believe is vulnerable to disruption. Necessity is also driving Europe, of course, and to a domestic, low-carbon, integrated supply chain, yet all this legacy cathode production and chemical production and supply chains persist with lots of water, waste and carbon footprint issues.

Canada is not beholden to these incumbent ways, because those systems are not yet in place. Herein lies the opportunity to be a better technology and value chain leader.

A process such as Nano One's can help integrate the supply chain in Canada and lead the world away from entrenched and wasteful methods. It can help Canadian miners gain an ESG and premium advantage over foreign producers of sulfate, hydroxide and other intermediary products. It can help car companies with ESG, cost and performance imperatives, but it will require government stimulus, private sector collaboration, implementation and supply chain integration.

We are innovators, but we are also collaborators and we are looking to move mountains. Nano One's relationships span the global battery supply chain, from responsible miners to cathode producers and OEMs. If we can leverage Canada's rich experience in responsible mining, clean energy generation, environmental stewardship, technology leadership and battery innovation, we can establish Canada as the greenest, most technologically advanced and highly integrated battery materials production ecosystem in the world.

Before it's too late and before we are forced to be reactive with me-too solutions, it is a Canada-wide strategic imperative to support the build-out of this very ecosystem.

Clearly, it's a global effort and there are opportunities all around the world, so how can we make Canada the centre of gravity for these efforts?

Thank you very much for the opportunity to speak here today.

• (1115)

The Chair: Thank you, Mr. Blondal.

Now we will go to Mr. Breton.

[*Translation*]

Mr. Daniel Breton (President and Chief Executive Officer, Electric Mobility Canada): Good morning.

We would like to thank the members of the Standing Committee on Natural Resources for taking the time to hear from us on the very important topic of critical and strategic minerals.

My name is Daniel Breton and I am the president and chief executive officer of Electric Mobility Canada, or EMC.

Founded in 2006, Electric Mobility Canada is one of the very first organizations in the world dedicated to electric mobility. EMC's members include infrastructure utilities, electric utilities, mining companies, vehicle manufacturers, charging infrastructure providers, technology companies, research centres, government departments, cities, universities, fleet managers, unions, environmental NGOs and electric vehicle owner groups. As a result, Electric Mobility Canada is the Canadian organization with the most experience and expertise to help advance thinking, regulation and projects in transportation electrification.

According to a 2020 analysis by Electric Mobility Canada, a Canadian transportation electrification strategy modelled on those in British Columbia, Quebec or California could generate at least \$200 billion...

[*English*]

Mr. Bob Zimmer (Prince George—Peace River—Northern Rockies, CPC): I have a point of order, Mr. Chair.

I'm sorry to interrupt our witness, but the volume of the interpretation is a little quieter than the witness. We can't really hear the English interpretation. I wanted to see if that could be corrected.

The Chair: Is anybody else having a problem?

Mr. Dane Lloyd (Sturgeon River—Parkland, CPC): I'm having a similar issue.

The Chair: You are. Okay.

Mr. Bob Zimmer: We'll give it a go. We'll make it work. Don't worry.

I don't want to interrupt the witness again.

Thanks, Chair.

The Chair: Okay.

Carry on, Mr. Breton.

[*Translation*]

Mr. Daniel Breton: A 2020 analysis by Electric Mobility Canada suggests that a Canadian transportation electrification strategy modelled on those in British Columbia, Quebec or California could generate up to \$200 billion in revenue between 2021 and 2030, and create tens of thousands of new jobs.

Also, in collaboration with other Canadian industry stakeholders, in May, Electric Mobility Canada will formally announce the launch of a Canadian electric vehicle supply chain initiative to help accelerate Canada's industrial transition in transportation electrification.

In addition, we will soon be releasing a report on the state of play in transportation electrification in Canada, which would include natural resource aspects.

• (1120)

[*English*]

EMC, therefore, recommends that our government adjust its views and emphasis on certain critical minerals, metals and materials, specifically to recognize the importance of securing and maintaining a Canadian and North American energy independence; to shift our focus from fossil fuel-based energy to securing a robust supply of all key metals, minerals and materials needed for our emerging North American battery supply chain; and to develop the industrial policy needed to unlock the critical North American production needed to mine the metals and minerals and to build the batteries, charging stations and electric vehicles needed to transition our economy to a zero-emissions transportation system.

According to the "Electric Vehicle Outlook 2020" from Bloomberg New Energy Finance, EV growth, from passenger cars to light trucks to heavy-duty trucks to electric buses, will be exponential in the years to come. Passenger EV sales jumped from 450,000 in 2015 to 2.1 million in 2019. They are expected to reach 8.5 million in 2025 and 26 million by 2030. New EV sales should grow from 2.7% in 2020 to 28% in 2030, and 58% in 2040.

According to a newly released report by TD Economics, it is estimated that by 2050, up to 450,000 of Canada's current 600,000 direct and indirect jobs in oil and gas could become casualties of

falling demand for fossil fuels as more countries and companies commit to net-zero greenhouse gas emissions.

According to another report called "The Fast Lane: Tracking the Energy Revolution 2019" from Clean Energy Canada, there will be approximately 560,000 clean jobs by 2030, almost 50% clean jobs in transportation. Demand for clean energy and clean transportation jobs will keep growing at a very fast rate. This means that there will be a job transition over the next decades, just like we saw at the beginning of 20th century when transportation went from horse and buggy to automobiles. These new jobs will be in mining, assembly, research and development, design, sales, maintenance, electricity and construction. These high-quality, high-paying jobs will be across the country, from B.C. to Atlantic Canada.

As we can see in the graph that we have in the document we sent you, China is comfortably ahead of other countries in controlling the supply chain of strategic minerals needed for electric vehicles, electronics, gas vehicles, military equipment, etc.

According to Bloomberg New Energy Finance, China presently controls 80% of the refining of these materials and 77% of the world's battery-cell manufacturing capacity. When we add South Korea and Japan, we can see that 96% of the battery production capacity is controlled by Asian companies.

Just like we saw in the 20th century with the world's dependence on oil coming from the Middle East, the geopolitical implications of the world's dependence on rare earths and battery capacity from China are at the heart of the discussion for the future of electric mobility from an economic, environmental and geopolitical point of view. That's why Electric Mobility Canada fully supports the Canadian and U.S. governments' agreement on the importance of the development of a zero-emission vehicle future and a Canada-U.S. battery strategy.

Thank you.

The Chair: Thank you, Mr. Breton.

Lastly, from Propulsion Québec.... I don't know who is going to start, whether it's Ms. Houde or Mr. Thibault.

Ms. Houde, I see that fingers are pointed at you, so you have the floor.

[*Translation*]

Ms. Sarah Houde (President and Chief Executive Officer, Propulsion Québec): Thank you very much.

I am joined by my colleague Simon Thibault, who is our battery expert. As president and chief executive officer of Propulsion Québec, Quebec's electric and intelligent transportation industry cluster, and on behalf of our 220 or so members, I would like to thank you, members of the Standing Committee on Natural Resources, for this invitation to present to you our vision for, on the one hand, positioning Canada as a responsible source of strategic and critical minerals, or SCMs, and, on the other hand, the development of Canada's electric vehicle battery industry.

As you know, Canada is in a unique position globally. Indeed, our country not only has vast SCM resources, especially those in high demand in the context of an energy transition, deployment of clean technologies and a sustainable economic recovery after COVID-19, but it also has recognized expertise in responsible industrial development. I'm thinking of the mining and chemical sectors, for example.

We also have an energy mix that is dominated, in some parts of the country, by low-carbon renewable energy that is available at low cost. We have one of the most demanding environmental regulatory frameworks in the world, a skilled workforce, and most importantly, a stable and predictable geopolitical environment.

These strengths consolidate, in our view, Canada's positioning as a safe, stable and responsible supplier of SCMs and battery components, three terms that must be at the heart of any sustainable Canada-wide strategy for the development of the SCM and battery industries.

If Canada wishes to make the development of these value chains a success, a fourth dimension must be added to these key factors, namely the pan-Canadian approach to this strategy. Indeed—as other major international players active in these same sectors have already demonstrated—there is no regional entity capable, on its own, of bringing together both the natural mining resources, the technical and technological capacities required to develop these resources, as well as the indispensable financial resources to develop these sectors on its territory alone without an interstate synergy.

That is why it is of the utmost importance that the Canadian government play a role in coordinating the actions of each of the provinces and territories through the creation of a broad Canadian alliance dedicated to the development of the SCM and battery industries, building on the strengths and assets of each of these provinces and territories.

In addition, Canada must leverage its historical position as an ally of the United States to work towards the creation of a North American coalition that will enable Canada's SCM and battery industry ecosystem to define itself as a secure, stable and responsible supplier of value-added materials and components, not just a supplier of raw materials that are not processed, for high-growth markets such as electric vehicles and the energy transition.

This same continental positioning not only appears to us to be highly strategic on a North American scale, but it is equally strategic with our European partners. The latter have also decided, in the wake of the recent adoption of the battery directive by the European Commission, to focus on consolidating, on European soil, competitive, green and circular supply chains for battery materials

and components for their own electric vehicle and energy storage markets.

Canada today faces an economic opportunity that it cannot and should not ignore. Moreover, this is a unique chance to rebuild our economy on a new and promising foundation for the future by integrating best practices in circular environmental and social responsibility, particularly with respect to the recycling of these batteries and the development of industrial residues; we can also increase transparency, for example, by integrating the traceability of battery supply chains.

To do this, Canada must work to build a Canada-wide alliance to leverage the strengths of each of the provinces and territories, with the goal of defining itself as a global leader in the responsible production of value-added components for western industrial supply chains that are dependent on a secure and stable supply of SCMs. In our view, if we do not, Canada will miss the opportunity to take full advantage of this unprecedented opportunity for our country.

I will turn the floor over to my colleague Simon Thibault for the remaining few minutes.

• (1125)

Mr. Simon Thibault (Director, Regulation and Public Policy, Propulsion Québec): Thank you, Ms. Houde. Actually, I see that there are a few seconds left.

Very briefly, before we take your questions on the topic, I'll clarify what we mean by “value-added components” in the Canadian context. This includes everything that is a precursor: cathode materials, anode materials, in short all the active components of batteries and cells. These are the priority targets, in our view, for developing vertical integration within the battery and electric vehicle supply chain, which starts with our critical and strategic minerals.

[English]

The Chair: Thank you.

Now we'll begin our first round of questions for six minutes, starting with Mr. McLean.

Mr. Greg McLean (Calgary Centre, CPC): Thank you, Mr. Chair.

Welcome to all our guests today. I think it's going to be a very informative meeting from what we've seen so far. I really appreciate all the input we're getting.

I'm going to focus my questions this morning on Mr. Breton, please, from Electric Mobility Canada.

Mr. Breton, very quickly, can you tell us the budget of your organization and where you get your revenue from?

• (1130)

Mr. Daniel Breton: Ninety-five per cent of the budget comes from the members.

Mr. Greg McLean: Can you extrapolate on that, please, on the members and which members, as in government members, and how much they're contributing?

Mr. Daniel Breton: I'd say less than 5%. I would say that most of our members are vehicle manufacturers, utilities, infrastructure providers or research centres, so basically—

Mr. Greg McLean: Are they research centres that are funded by government and utilities that are funded by the public?

Mr. Daniel Breton: Some utilities are funded by the public. Some of them are private. It depends on.... If you talk to OPG or Hydro-Québec, they're differently funded, because some of them are private and some of them are public.

Mr. Greg McLean: OPG is significantly funded by the Government of Ontario and Hydro-Québec is a Crown corporation, so really, they're all organizations subsidized by the taxpayer and the governments of Canada and the provinces.

Tell me the size of your budget.

Mr. Daniel Breton: We have a budget of about \$2 million a year.

Mr. Greg McLean: Okay. Good.

Mr. Daniel Breton: As I said, infrastructure providers, EV groups, environmental groups or vehicle manufacturing companies like New Flyer, these are all private companies.

Mr. Greg McLean: Thank you.

Mr. Daniel Breton: Most of our members are private companies.

Mr. Greg McLean: Thank you very much. I appreciate it.

I'm going to go through a bit of an indication of statistics here. The federal government funds electric vehicles with \$5,000 per vehicle right now in a program. They fund \$300 million to vehicle buyers, \$72 million of which goes to Tesla; \$130 million to charging stations, most of which are sourced in the United States; \$500 million to automakers that have plants in Canada and are American companies; and 100% writeoffs to companies that are buying electric vehicles at this point in time.

I would say that we're at the edge of a very subsidized industry, an industry subsidized by the people of Canada. I'm going to read a quote about the CFO from Transport Canada, when he was asked about this at the Senate committee in October 2020:

...the biggest winner among the car companies so far has been California-based Tesla, with more than \$72 million....

But what are these sales doing to lower emissions?

The Trudeau government doesn't know, according to...[Mr.] Pilgrim, who testified before the Senate...committee.

This is something we're looking at right now. Can you tell us at the end of the day, with some definitiveness—which the government hasn't been able to provide so far—what the net emissions associated with electric vehicles are?

Mr. Daniel Breton: Actually, there will be a report out in a few weeks talking about net emissions from electric vehicles compared with equivalent gas vehicles, which are between 20% and 50% lower by vehicle, I'd say, whether you are in Quebec, Manitoba or Alberta. Even in Alberta, greenhouse gas emissions from electric

vehicles are lower than that of gas vehicles. There will be an NRC report published in a few months, and an EMC report in a few weeks, actually, that will be giving all the details on that.

All in all, if what you're saying is that we are subsidizing an industry, we are also subsidizing other industries. We are making a transition, so if you want to transition from fossil fuel industry to a greener industry, it's a shift that the government wants to support, and that's what's happening across the world. Yes, we are lowering greenhouse gas emissions where we are going from gas vehicles to electric vehicles, whether it's light-duty or heavy-duty vehicles.

Mr. Greg McLean: It's safe to say that you're lowering emissions at the tailpipe, but the effect of—

Mr. Daniel Breton: No, I'm talking about all life-cycle emissions, not just the tailpipe.

Mr. Greg McLean: Most studies show that the life-cycle emissions in Canada are not that significant at all. The amount we're getting in bang for buck is actually very little in the switchover to electric vehicles.

Mr. Daniel Breton: The data you have must be obsolete, because I can show you the data where we see that we have a significant difference in greenhouse gas emissions from cradle to grave from extraction of natural resources, to assembly of vehicles, to the use of vehicles, to the [*Technical difficulty—Editor*].

Mr. Greg McLean: Okay.

Tell me where the power comes from once we do away with the internal combustion engine. Right now electricity provides about one-third of the power in Canada. If we do away with self-sustained diesel, internal combustion engines, etc., where will the electric power come from?

• (1135)

Mr. Daniel Breton: Already 82% of electricity production in Canada comes from non-emitting sources, whether it's—

Mr. Greg McLean: We're not talking about electricity. We're talking about replacing power from other sources besides electricity and moving them to electricity. Where is the extra electricity going to come from?

Mr. Daniel Breton: Actually, since electric vehicles, whether they're light duty or heavy duty, are much more efficient than gas vehicles, you need pretty much one-third of the energy that you use in a gas vehicle for an electric vehicle. This means that you need proportionately less energy to make electric vehicles run than gas vehicles. We will need more electricity. That's for sure, but there's huge potential in renewables, like wind, solar—

Mr. Greg McLean: The question remains, where are we going to source this electricity?

The Chair: I'm going to have to interrupt both of you, unfortunately. We're a little bit over time on that segment.

We'll move on to Mr. Weiler.

Mr. Patrick Weiler (West Vancouver—Sunshine Coast—Sea to Sky Country, Lib.): Thank you, Mr. Chair.

I'd also like to thank all the witnesses for joining today.

I'd like to pick up where my colleague left off with asking some questions to Mr. Breton from EMC.

I've had a chance to read through some of your advocacy, and it seems it really does revolve around driving demand in Canada for EVs. I hadn't seen so much reporting on natural resources and how they fit into this, so I look forward to seeing your new reporting on this that you mentioned earlier in your opening.

Looking at your board, it's quite a diverse group—utilities, EV charging infrastructure, EV manufacturers, mining companies—and it's a good example of how the whole ecosystem works together or could work together.

In this committee so far, we've heard that we have many of the critical minerals that we need in Canada, but there is an opportunity for the transformation and value addition to be happening here. How do we make sure that what's mined in Canada is also processed in Canada and not just shipped abroad as raw materials to come back to Canada as a finished product?

Mr. Daniel Breton: That's a very good question. That's why we will announce in May that we will put together the ZEV supply chain alliance, and Propulsion Québec will be part of that group. We have to work together to come up with a national strategy if we don't want to make the same mistakes that we've made in the past with wood, for instance, or oil. We want to refine as many products as we can in Canada and work in partnership with the U.S. as well.

As Sarah Houde very aptly said, the Europeans are moving forward with a European strategy. The Chinese are leading the way. If we want to have a Canadian and/or North American strategy, we have to make sure that all the key players in Canada work together and see that there's a big [*Technical difficulty—Editor*] opportunity for Canada to become a key player in the world.

But we have to have a plan. We don't have a plan yet. We don't have an electric mobility strategy yet. That's why we think that working with the Canadian government and the provinces will ensure that people see the great opportunity that is there right now, but we don't have five years to act. I can tell you that, because right now things are moving really quickly across the world. Things are moving really quickly, especially with the Biden administration coming into power, so we have to act quickly. The time is now.

Mr. Patrick Weiler: I appreciate that answer, and I think we want to make sure we don't fall into the IKEA model, where we're just assembling here. The Government of Canada has made some very strategic investments recently, both within Ontario and then more recently in Quebec with one of your members, Lion Electric.

I'm curious as to where you would see the strategic investments of government best placed to ensure that we have those transformation activities happening in Canada.

Mr. Daniel Breton: We have to make sure that people across Canada see that there's an opportunity. In Nova Scotia we have expertise. In Quebec we have expertise, as well as in Ontario, Manitoba, Alberta, Saskatchewan, B.C. That's why when Sarah said we

have to find some ways to coordinate actions to make sure that we don't work in silos, I think that's the best way for us to move forward. I think the Canadian government should invest in research and development—that's for sure—but we have to invest in policies as well to make the transition not only for critical minerals and metals but also for the training and retraining of workers.

In the document, one thing that I forgot to mention is the fact that we will have to train and retrain a lot of people right now who will lose their jobs. We've seen that with Kodak. We've seen that with Blockbuster. Many new technologies are disruptive, so they create a new economy. We have to get the Canadian government to help those workers be trained and retrained.

● (1140)

Mr. Patrick Weiler: Absolutely.

I'd like to switch gears a bit, and ask some questions of Mr. Blondal. I had a chance to be at your facility about a year and a half ago for an important announcement.

Where do you source your lithium from for your lithium-ion batteries?

Mr. Dan Blondal: As a technology company, we're developing the methods to make the cathode materials. We source it from any number of different areas. We're not using large volumes of it in our laboratories right now. We are not aiming to be a producer. Rather, we are a technology provider. It would be our customer who would then source large volumes of lithium, cobalt, nickel and manganese from various areas.

Primarily, the bulk of the world's lithium is coming out of a central few areas in the world. It's going to be coming out of South America, from Chile and Argentina. There's obviously a lot of lithium coming out of China and Australia as well, and quite possibly Canada, if we can get our lithium production up to the volumes we need. [*Technical difficulty—Editor*] in terms of where it comes from.

We would prefer to see it coming from Canada. We would prefer to see cathode production happening in Canada. We believe we can make it not only more efficient, but we can also help to drive down some of the costs of converting lithium into a battery-ready material, because our process simplifies the in-between processes.

Mr. Patrick Weiler: As a follow-up to that, what level of coordination and partnership are you having with some of the Canadian EV manufacturers and other companies involved in the supply chain?

Mr. Dan Blondal: The bulk of our coordination is happening with the large multinational OEMs. We have relationships with the large American, European and Asian OEMs on the automotive side of things.

We also work upstream with the miners. That would include a number of the critical miners around the world. On the metals side, that's what used to be the Canadian company, Inco, which is now Vale, Russian entities like Nornickel, or Australian BHP. That's the metals side of things.

On the lithium side of things, we have a relationship in Chile with the Chilean government, working with its lithium producers.

The Chair: Thanks, Mr. Blondal. I'm going to have to stop you there.

Mr. Simard, we'll move over to you.

[Translation]

Mr. Mario Simard (Jonquière, BQ): Thank you, Mr. Chair.

My colleague Mr. McLean's remarks today give me a little more insight into why Conservatives believe that climate change does not exist. That said, I would just like to point out to him that over the last four years, \$24 billion has been allocated to the oil and gas industry, and if transportation electrification ever gets one-twentieth of that money, I will be the happiest man in Quebec.

The next question is for Mr. Cleary.

I thought that your project, here in Saguenay-Lac-Saint-Jean, would be developed around 2019, but it has been pushed back. There is the context of COVID-19, but I would like to know why your project has not been started in Saguenay-Lac-Saint-Jean.

[English]

Mr. Sean Cleary: We've been working on environmental permitting, and that's largely completed. We have a certificate of authorization for both the mine, which is located near Chibougamau, and the metallurgical complex in Saguenay. There are a lot of conditions tied to responsibly developing this project from an environmental perspective. Funding for these projects, which are large, is difficult. Capital is scarce.

As I mentioned in my presentation, the area of critical minerals for the large part, especially niche minerals like vanadium and titanium, which are on the critical minerals list, are not well followed by the capital markets. This has to be financed privately and with public-private partnerships. We've been working with all of the finance team to be able to do that. We hope to complete that later this year, but it's ongoing right now.

[Translation]

Mr. Mario Simard: Thank you.

My next question is for Mr. Breton.

During your presentation, you said that you and various partners would make an announcement by May. Could you tell us more about that?

• (1145)

Mr. Daniel Breton: We have been working for several months to create a Canada-wide transportation electrification alliance for the industrial supply chain. We see this as a historic opportunity. In 2009, when GM and Chrysler were on the verge of bankruptcy, the U.S. provided aid in exchange for investments in transportation

electrification. The same was not done north of the border. In our view, a significant opportunity was missed.

Twelve years have passed since then and it is now 2021. In our view, the opportunity is there again, but there will not be another one. Right now, the electrification market is taking off around the world, including in China, Europe and the United States. A historic opportunity is presenting itself, and that's why we've been working for months to bring together major players, including Propulsion Québec. We will soon be announcing the participation of other players, including workers, auto parts manufacturers and mining companies. We want everyone to sit down at the same table to begin a discussion with the federal government in order to act as effectively and quickly as possible. Indeed, the next few months will be critical.

When comparing electric vehicle subsidies with fossil fuel subsidies, one thing is often overlooked. A Health Canada report released a few weeks ago reveals that the cost of air pollution is \$120 billion a year. Yet 31% of black carbon emissions, 33% of carbon monoxide emissions and 40% of nitrogen oxide emissions come from transportation. This means that the electrification of transportation will not only reduce greenhouse gas emissions, but will also reduce health care costs for Canadians. It will save thousands of lives, because air pollution causes 15,300 deaths a year—about eight times the number of deaths caused by traffic accidents. And it will save billions of dollars. So electrification of transportation is desirable for economic reasons, but also for health reasons.

Mr. Mario Simard: Thank you.

If I have some time left, I'd like to ask one more question quickly.

You said that 450,000 to 600,000 direct and indirect jobs would be lost if fossil fuels were eliminated. How can we get those jobs back? You also said that new technologies could generate 560,000 new jobs. Isn't this an opportunity, even for Alberta, to transition to a low-carbon economy?

Mr. Daniel Breton: This is a historic opportunity for all provinces. Whether it's Alberta or [Technical difficulty] that workers can make the transition. On the one hand, the Unifor union, which is one of our members and represents workers in the oil and gas sector, wants to prevent its members from becoming unemployed. On the other hand, transportation electrification companies are unable to find qualified workers. The federal and provincial governments will need to be willing to provide retraining for existing workers. If not, we risk missing an extremely important historic opportunity. The transition is happening all over the world and it must not exclude workers or entire sections or regions of Canada. Alberta and Saskatchewan are two perfect examples.

The work that my parents used to do no longer exists today because it has been moved to Mexico. If all we do is create jobs outside the country while we decrease greenhouse gas emissions, it is not a win-win situation for our children and grandchildren. We want to fight climate change and air pollution while creating quality jobs across Canada. Transportation electrification can help, including research, extraction, sales, maintenance and infrastructure.

Mr. Mario Simard: Do I have a little more time, Mr. Chair?

[*English*]

The Chair: Thank you, Mr. Simard. You don't, unfortunately.

We will go to you, Mr. Cannings.

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

Thanks to all the witnesses here today.

I'll start by echoing what Monsieur Simard said in that I'm disappointed in the line of questioning that Mr. McLean took. It seems that Conservatives are really desperately trying to find ways that this transition cannot work, when the science is telling us that we must find ways to make it work. It would seem there are challenges, but there are also these immense opportunities for us that we've been talking about.

I'd like to let Mr. Breton continue on that theme by talking about... You cited statistics on how many, how fast the shift to electric vehicles will be happening. I read a KPMG report that said 70% of Canadians said their next vehicle would be an electric vehicle.

I think this is happening faster than most people think. As you say, as that proceeds, jobs will be lost in the oil sector, but 500,000 jobs could be created in the clean energy sector in mining, assembly, construction.

I was wondering if you could go into more detail on what we need to do to get those workers ready. How much training will be needed? A lot of construction work is probably fairly transferable. In mining, I assume those jobs are transferable, but what kind of training do we need?

• (1150)

Mr. Daniel Breton: I can answer quickly. First, there will be a fast transition toward electric mobility. We've seen that with personal computers. Thirty years ago hardly anybody had a personal computer. Twenty years ago, who had Internet? Ten years ago, how many people had a smartphone? The switch will be exponential, as we've seen with those technologies.

If we want to be ahead to embrace the switch to cleaner technologies, we have to understand that these 560,000 jobs that we're talking about in clean mobility, clean energy, will be in assembly. We've seen that. There was an announcement last fall from Ford, Chrysler and GM. Workers in these assembly plants will be retooling and will be retrained so they can start assembling electric vehicles. That's one part.

There's also the part in research and development. We have to emphasize research and development on electric mobility, on critical minerals and metals. We have to make sure that people see

there's great potential for infrastructure deployment as well. However, there are some issues with infrastructure because you don't need the same infrastructure when you're at home, for instance, than when you are in downtown Montreal, Calgary or Toronto. We will need to do research and development to make sure we can make a clean transition. All that will be part of the job transition.

Plus selling an electric vehicle is not the same as selling a gas vehicle, I can tell you that because I was the first amalgamated trainer in Quebec regarding electric vehicles, so I trained a lot of people. People have to know how to operate the electric vehicles, whether they're light or heavy duty. We will need to do courses for high school, colleges and universities. These are all new jobs. We've been talking to many colleges and universities over the past few months, because they're looking at new programs to help train and educate these people so that we have the future engineers and the future chemists.

[*Technical difficulty—Editor*] but the federal government and the provinces have to be in tune with that transition. The Trudeau government said they wanted to create more than a million jobs in clean technologies. We have to make sure we are there to help not only the future workers but the present workers.

Mr. Richard Cannings: I'd like to follow up again on some of these challenges. Mr. McLean mentioned the challenge of where we are going to get the clean energy to fuel these electric vehicles.

Could you comment on some of the ways we can overcome that and the ways we have to overcome that?

Mr. Daniel Breton: First of all, Canada is better positioned than most countries in the world regarding electricity production, because already 82% of our electricity production comes from non-emitting sources like wind power, hydroelectric and nuclear. That means that already a lot of the job has been done. Also, the Government of Alberta has announced that by 2023 it will close its last coal plants. That means we are already much cleaner than, let's say, the U.S., China, India or Europe for that matter.

For more electricity, there is great potential in wind power, energy efficiency, hydro power and even solar power, not to mention the fact that with what we call vehicle-to-grid and vehicle-to-home, we will make part of the storage of energy come from the vehicles themselves. The electric vehicles will be part of the smart management of energy in the future, meaning that during rush hour, for instance, if we need a lot of electricity, we won't charge the vehicles. We will use the energy from the electric vehicles. When we are outside of peak time or peak power capacity, we will use that capacity to recharge the vehicles, so we will make sure that the electric vehicles are part of the power grid as well.

• (1155)

The Chair: Thank you, Mr. Cannings.

Now we are moving into our second round of five minutes, starting with Mr. Lloyd.

Mr. Dane Lloyd: Thank you, Mr. Chair.

I'll start by pushing back against some of the assertions that it is irresponsible somehow for Conservatives to be asking questions about what our electricity makeup is going to be in the future when there are more electric vehicles. We're looking at the problem two or three steps ahead of us, not at the problem immediately in front of us.

The fact is that for many decades one of Canada's greatest comparative economic advantages has been our cheap electricity. As Mr. Breton noted, 60% is hydroelectricity, 15% is from nuclear and just about 7% is from renewable power sources like wind and solar. My huge concern is that we've seen a new hydroelectric dam being built in British Columbia, which is now at \$16 billion—billions—over cost. In Alberta, in my own riding, shutting down coal-fired electrical units cost billions in taxpayer dollars to bail out the companies that were shutting down their coal and transitioning to natural gas. In the province of Ontario we see taxpayers—due to experiments with developing green energy back in the 2000s—now subsidizing electrical rates [*Technical difficulty—Editor*] per cent.

To my question, Mr. Breton, following up on Mr. McLean's question, when we see that these electric vehicles are going to create a huge pull on the electrical grid and we've already seen that electricity costs are growing faster than inflation, where is the new electricity going to come from to pay for this? Are we going to see electrical rates go through the roof and make electric vehicles less affordable?

Mr. Daniel Breton: Actually, no. As I said before, because of vehicle-to-grid and vehicle-to-home management, we will be able to save money in the end and even get customers money in their pockets because we will be able to use more smartly the grid that we have right now.

I spoke to a scientist in the U.S. a few months ago, and he said something very interesting, which was let's say that Nikola Tesla or Thomas Edison or Alexander Graham Bell came back to life today. Alexander Graham Bell would be very impressed by the new technologies in the phone, in smartphones. There's the big difference.

When you're looking at grid technology, not much has changed over a hundred years, so we have to be smarter with our grid so that we are more efficient in the way we manage it. Electric vehicles, whether light duty or heavy duty, will not only make the rate be reasonable but also help rates go down for customers because of vehicle-to-grid and vehicle-to-home management.

That's something that people don't know about, very often. It's a new way of thinking about the future of energy. Smart energy management with electric mobility will make a huge difference for its customers.

Mr. Dane Lloyd: I find that very hard to believe, Mr. Breton. If we have 20 million or 30 million Canadians driving electric vehicles, that is going to create the need for huge capacity. I would

agree there is always room for more efficiencies on the grid and updating of the grid, but we are going to need new capacity. However, I'll move on to the next question.

Mr. Daniel Breton: Can I answer that?

Mr. Dane Lloyd: You can answer maybe after I just finish this next question, but thank you, or you can send it in writing afterwards.

We know that with fossil fuel vehicles there's a diesel excise tax and a gasoline excise tax of 10¢ a litre and 4¢ a litre, and then there are the provincial excise taxes. This is somewhat of a public policy question, but these billions of dollars raised every year go toward building our road infrastructure. We know that electric vehicles need to use roads as much as fossil fuel vehicles do.

Do you have any sort of suggestions as to how the government is going to be able to pay for this road infrastructure in the future when it's losing billions of dollars in fuel excise revenues?

Mr. Daniel Breton: Thank you for that great question.

Actually, what that shows is that the business model for financing the roads is obsolete. If we want to lower our greenhouse gas emissions, our oil consumption anywhere in the world, we will have to stop relying solely on the gas tax to finance the roads.

We have to have a national discussion on that. It's the same issue in Quebec or Europe or Toronto or the U.S. It is a very important issue, but we can find a solution. As I said earlier, if we save billions of dollars in health costs, this is a way for us to help finance the roads—if you want to look at it that way.

We have to think about a new way to finance the roads. Your question makes total sense.

• (1200)

Mr. Dane Lloyd: Mr. Chair, how much time do I have left?

The Chair: You have about 15 seconds.

Mr. Dane Lloyd: Okay, I'll just thank the witness for our great back and forth. Thank you.

The Chair: Thanks, Mr. Lloyd.

We will go on now to Mr. Lefebvre.

[*Translation*]

Mr. Paul Lefebvre (Sudbury, Lib.): Thank you, Mr. Chair.

[English]

Before I ask my questions to the great panel we have today, I would maybe rephrase it.... As a member of the sitting government, we believe that climate change is real, and we see that clean energy—and certainly this study we are embarking on about critical minerals—is a huge opportunity for Canada. There is an economic opportunity. There are jobs. This is the way of the future, and we want to be leaders in this sector.

That being said, I really want to thank the panellists. It's been very informative.

[Translation]

I'll start with Ms. Houde. We haven't talked much with you, unfortunately, nor with your colleague Mr. Thibault. We know you have a lot to say. We want to hear from you about the solutions we can provide.

[Technical difficulty] the world leader that we should be in this sector. I'm talking about Sudbury today. Behind me, there are nine mines operating right now, with more coming on stream. There's more research, but at the same time, we realize the importance of nickel, copper and all the rare minerals that are found.

You talked about a Canada-wide alliance and a North American coalition. You talked about circularity and traceability. These are all extremely important things in terms of the national strategy that we are designing.

I would like you to give us some more examples of how important they are and then compare them to other countries or other regions, like Europe. I find all of this very interesting.

You have one minute; I'm listening.

Ms. Sarah Houde: In Canada, several provinces are part of the answer. When the provinces are put together, we can win. That's why the federal government must coordinate each province's share to ensure that we have a complete set.

The nickel that comes from your mines in Sudbury and that you're talking about is an excellent example. You're producing nickel in Ontario, which could complement the Quebec mine supply and allow for cell production and all the components required for this production.

These same cells could then be assembled into battery packs and integrated into vehicles in Ontario. We could continue the research and development with all the expertise in Nova Scotia, for example.

In addition to automotive manufacturers, there are non-passenger vehicle and electric vehicle manufacturers in Quebec. There are also some in Manitoba. From this perspective, the role of the Canadian government is to coordinate the provincial shares in order to establish continental autonomy in North America. We could then ultimately emulate Europe's approach to battery production.

Europe is developing continental autonomy, and Asia has already established it. We mustn't be dependent on other parts of the world or dependent on various conditions, such as a pandemic or difficulties in trade relations. It's important to have full control over this

strategic resource that will help millions of Canadians move into the future.

Mr. Paul Lefebvre: I completely agree.

A few weeks ago, we met with a witness from Europe. I asked him about the number of critical and rare minerals in Europe, which made him laugh.

I find it interesting that Europeans want to develop the chain there, but they'll come and get the minerals here. They'll take the minerals from somewhere else and bring them back there. We won't have any left.

My next question is for Mr. Cleary from BlackRock Metals.

You said that more federal and government support was needed for investment in the mining sector. We're talking about mineral extraction in particular.

In your business plan, in terms of the smelters and the whole process around that, where will this happen?

Are you planning to refine your rare minerals?

• (1205)

[English]

Mr. Sean Cleary: In the case of the BlackRock project, the vanadium and titanium and the iron fraction will be refined in Saguenay. An important element of our project is that it's an integrated project and we will be able to send these to market.

We are fully permitted for an additional ferrovanadium plant to be located in Saguenay, which would supply both the steel industry and the battery industry. That is phase two of our overall construction plan. We would look to have that put in place a couple of years after the start of production. Initially, we will process some of these materials at existing facilities that are partnered with us out of Europe.

The Chair: Thanks, Mr. Cleary and Mr. Lefebvre.

Mr. Simard, you have two and a half minutes.

[Translation]

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

My question is for the representatives of Propulsion Québec.

Mr. Thibault, you ended your brief remarks earlier by talking about value-added components.

A few weeks ago, we met with a representative from Torngat Metals, which processes rare earth oxides to make permanent magnets. This process is similar to the production of aluminum by electrolysis, which requires a great deal of electricity. I thought that this factor was quite interesting.

Can you give us other examples of value-added products that we can manufacture in Quebec?

Mr. Simon Thibault: Yes. Torngat Metals is a good example. The company, which is also a member of Propulsion Québec, works in the rare earth industry.

There are several examples in the Quebec ecosystem alone. However, we can also look at the examples in the Ontario ecosystem, as Mr. Lefebvre suggested. There are lithium mines, such as Nemaska Lithium, Sayona Mining, Critical Elements Lithium Corporation, Galaxy Lithium and North American Lithium. As for graphite, there are Nouveau Monde Graphite and Mason Graphite. Lastly, there's nickel on the Ontario side, but some Quebec mines that supply Ontario nickel plants could re-supply plants on the Quebec side. There are several examples, such as Torngat Metals, whose process could easily be developed in Quebec or even across Canada.

Based on our studies and various meetings with our members, which are the mining companies, no projects in Quebec or Canada are unable to carry out secondary, tertiary or quaternary processing in Canada. Right now, no technological barriers prevent us from doing something of this nature in Canada. In my opinion, it's really a matter of incentives. We need to support companies in order to develop these types of processing here, in Canada.

Mr. Mario Simard: I believe that Ms. Houde pointed out earlier that the best way to put these incentives in place is for the federal government to play a coordinator role. Beyond that, in terms of funding, there's no Canadian strategy for the processing of these critical metals.

Mr. Simon Thibault: The Investissement Québec model is quite good in Quebec. I would like to share it with you here.

Clearly, it would be very good to see a similar entity created in Canada, or an increase in the budgets of the Canada Infrastructure Bank, in order to strategically and specifically support flagship projects throughout the battery and critical and strategic minerals, or CSM, industries. Of course, this all fits in with the ultimate goal of having electric vehicles on our roads, and wind turbines and solar panels made entirely with Canadian materials.

[English]

The Chair: Thank you, Mr. Thibault and Mr. Simard.

Mr. Cannings.

Mr. Richard Cannings: Thank you.

Mr. Blondal, throughout this study, we have been hearing so much about the value-added chains that we need to create in Canada. You mentioned the battery value chain. I talked previously in this study about the graphite mine in my riding that really would like to produce graphite for battery anodes manufactured in Canada instead of in China.

Can you expand on your comments as to what the government can and should be doing to incentivize those value chains and integrate them? What really needs to be done in the short time we have to make this move?

• (1210)

Mr. Dan Blondal: Thank you very much for the question, Mr. Cannings.

We hear a lot about the mining end of it. We hear a lot about the electric vehicles, charging and everything, but there's a lot of stuff that happens in between. That's all the value-added. You mine the ore and then it has to be refined into a useful metal. Then it has to be converted into a useful battery chemical, and all that comes together combined into a cathode material. The anode's a little bit simpler because it's just graphite. It might get mixed with silicone, but the same kind of thing happens on either of the electrodes. That's all before it ever gets into a battery cell, battery module or battery pack, and then into an electric vehicle. There are many transformation steps throughout this whole process.

I'm here as a witness to talk about critical minerals and the transformation of those critical minerals. My agenda, of course, is the transformation of those critical minerals into something useful in a battery. What I want to underscore is that we need to fix that middle supply chain. We need to be making cathode materials and anode materials for assembly into a battery cell here in North America, and preferably in Canada, if we're going to avoid shipping our raw materials overseas and having them come back in the form of a battery. I think, ultimately, that's critical.

What can the government do? The government is already supporting a company like Nano One through SDTC and a variety of other mechanisms to commercialize their technology, to pilot it and prove it. I believe we can do it with a pan-Canadian effort. We can bring together the nickel miners and the lithium miners, and the graphite miners for that matter on the other side of things, to form a completely integrated supply chain.

The value to integrating the supply chain is not only just creating the—

The Chair: Thank you, Mr. Blondal. I apologize again but I do have to cut you short there.

Thanks, Mr. Cannings.

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

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

I'm going to start with Mr. Cleary here. It's great to see that you have a mining project under way. I'm just curious to know how long of a process it takes to go from the beginning phase to the operation phase. How long is that process and what's that journey been like for you and your company?

Mr. Sean Cleary: We started as a greenfield project in 2008 and have worked all the way from, essentially, discovering the deposit to developing the geological dataset, to going through feasibility and environmental studies over the years. We garnered local support with the natives, municipalities and the province, and we worked and reworked various studies to make sure that the project would meet the ESG requirements that we set out as an organization.

We travelled the world to sell the project in terms of finding investors, because there aren't a lot of them in this space and it requires speciality expertise to understand some of the details of projects like this. It's not as simple as maybe a gold project or a copper project. There are many steps to it.

We reworked the business plan a number of times to make sure that the economic returns to those investors were sufficient, and we worked with government in terms of related infrastructure. We have power that goes by our project, about 25 kilometres away, but it has to be brought to site. There are other things that have to be done. We had to build a management team that was capable of managing the construction and then doing the ramp up in operations.

It's a long journey. We've invested over \$150 million to date in this project, and we expect to see its fruition in the next couple of years.

Mr. Jeremy Patzer: You're looking, probably, at around 15 years as a timeline.

• (1215)

Mr. Sean Cleary: I would say 10 to 15 years.

Mr. Jeremy Patzer: If you were in the United States, Australia or some other jurisdiction around the world, would it be 10 to 15 years as well?

Mr. Sean Cleary: It could be, depending on the political incentive.

A lot of this is about social acceptance and political will. You have to have the rocks and minerals to be able to do that. In Canada, we're blessed with this.

What could reduce the timeline from conception of a project to its commercial production would be, from my perspective, if the government had a strategy to allow big projects to come to market. I think this is partly what Canada is missing. We have all the rocks and we have most of the minerals. We have a tremendous amount of expertise. We have some—but not all—of the capital, but we really don't have a plan.

It's not easy to see how these things can be done, without just the sheer will of the entrepreneurs who have backed me and my team at BlackRock Metals.

Mr. Jeremy Patzer: One other thing that you said earlier that I found interesting was that, when you're seeking capital for this project, you're going around the world looking for it because there's expertise in other regions of the world. Does that leave the Canadian industry susceptible to nefarious players like.... We know that the Chinese government, per se, is involved in a lot of operations and taking over companies. They do that for a strategic advantage for China, but it leaves the rest of us at a disadvantage.

Are there any potential problems with that scenario, where, because we don't have the production capacity and the timeline approvals here in Canada, we're susceptible to takeovers from other countries or companies that don't have the best intentions at heart?

Mr. Sean Cleary: Intentions aside—because it's always hard to see what those are—we have all the expertise here to be able to do it. We should be building our own projects. We should be developing and growing our own companies. We know that's what creates economic wealth in our country.

As a management team, we've been to every country in the world looking for capital for our project. It does open us up to the agendas of others, which aren't necessarily aligned with our national agenda. I would say it's a give and take. We want to bring in foreign direct investment. This project alone is bringing over \$700 million of foreign direct investment into the country. We want to be sure that we're dealing with credible and responsible players who are bringing that capital.

That's just what responsible Canadian companies should be doing and, in fact, are doing. We have rules around that.

The Chair: Thank, Mr. Cleary. I'm going to have to stop you there, unfortunately.

Thank you, Mr. Patzer.

Mr. May, I believe you're next.

Mr. Bryan May (Cambridge, Lib.): Thank you very much, Mr. Chair.

I'll be directing my questions to Mr. Cleary from BlackRock.

Before I get into that, I want to remind my colleagues who just asked a few questions there that they were in government for most of that time, for the scenario that we're talking about. There were a series of acquisitions from foreign countries under their watch. I'm not sure they want to be throwing too many stones there.

I will suggest, Mr. Cleary, that one of the reasons we're doing this study right now is that we recognize that a plan is necessary. I agree with you that getting to the point of getting to a plan is something that we all agree would be beneficial, providing certainty and recognition for the industry.

My first question is going to be very specific. The members of this committee won't be surprised as my interests lie very much in the nuclear industry, having ATS, BWXT and others in my riding. I was very interested in your opening comments about vanadium, specifically. I recognize that it is a very critical element within the nuclear industry.

I'm wondering if you have any insight on potential threats, with expansion and with the refurbishment projects at say, Bruce Power, if we don't have a proper supply chain of this particular mineral.

• (1220)

Mr. Sean Cleary: I think it's critical. It's critical for nuclear and many other uses in industries, albeit it's niche compared to other minerals like precious metals and base metals like copper and nickel. The processing of those components can be done for the most part in North America, although that has been under pressure, I would say, over the last 20 years.

More and more of this processing is going offshore to Asia and other parts of the world, and that is dangerous. That's why I'm talking about securing the supply chain. It is as critical to secure the supply chain for nuclear as it is for steel. Without these two things, we don't really have a modern economy in the modern world. These are at the forefront. From my perspective, that's where government should start: What are the most important elements of our modern society and how do we secure those elements that are already here? We have them, and it's building an integrated supply chain along the line of what some of the other witnesses have suggested.

You have entrepreneurs who want to do that. The challenge has been the ability to do it, the capital to do it and the environmental steps. It's difficult to get these projects approved environmentally, so red tape removal from environmental but dealing with responsible companies that are focused on ESG is the way to go—and having a plan.

Mr. Bryan May: Can you elaborate on how the market has shifted over, say, the last decade in this space, and how has that affected BlackRock's plans to develop and process these minerals?

Mr. Sean Cleary: By market, do you mean the minerals market or the capital market?

Mr. Bryan May: I mean specifically minerals.

Mr. Sean Cleary: I would say, in terms of titanium, that we have good productions of titanium out of Canada in Quebec, really from one supplier, but we have massive titanium resources in the country that are undeveloped. Quebec could be a world leader in vanadium, and it could be a world leader in refined iron products done in a very sustainable way, using the processes that we're using in terms of grey hydrogen and moving to green hydrogen when these things are available.

Quebec is uniquely set up to be able to do this, because we have the iron resources and we have green electrical energy. Canada, in general, is very well set up, because we also have large supplies of natural gas that can supply grey hydrogen.

I think it's important for the government to recognize that, if you're going to have a hydrogen strategy, you have to start with grey hydrogen, which comes from natural gas. Yes, in the early days you're going to have emissions from that, but you can quickly move to a green hydrogen strategy or a blue hydrogen strategy over time. However, that has to be driven by the willpower of government.

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

Mr. Bryan May: Thank you, Mr. Chair.

The Chair: Thank you, Mr. May.

Members, that takes us to the end of the second round. We're supposed to stop at 12:30 p.m. and move on to committee business.

We have two options. We can proceed into the third round, in which case we'll get to Mr. Zimmer and Ms. Jones and we can stop there, or we can amend the time and give the Liberals and Conservatives each three minutes and stick to the two and a half minutes for the Bloc and the NDP. That will take us past 12:30 p.m. and get us through this whole round. I still think we can probably get our committee business done in that time.

Does anybody object to amending it, or do you want to stick to the schedule?

There's no objection. Okay.

Mr. Zimmer, I'll give you the floor, then, for three minutes.

Mr. Bob Zimmer: Thank you, Mr. Chair.

Thanks to our witnesses.

Mr. Cleary, I only have three minutes, so I'll get after it.

You talked about Canada being left behind unless we do something about it, and then you talked about securing our future. You also talked about red tape being a limiter in what our industry is capable of doing. I'm up in northern B.C. We do natural resources here. We mine and go after oil and gas, forestry, etc. How do we not get left behind?

I know that's a really broad question for two minutes, but do your best.

• (1225)

Mr. Sean Cleary: My suggestion would be to focus on the big industries where we could use capital injection.

I would focus, at least in eastern Canada, on iron and producing green steel. If we were to have a green steel strategy in this country, it would drive so much innovation in mining, metallurgy and everything in between. All of a sudden, we would have a driving need for ferroalloys, which would drive the supply of the battery minerals. Those critical minerals for batteries are all related to these other supply chains. If you already have an existing demand from, for example, the steel industry, and you can produce.... The world steel industry is going through a global shift. We want to make sure we're not left behind on that.

The shift to green steel, driven by hydrogen and existing technologies, which are commercialized, is the way to go. Once we have that, then we have a built-in demand for ferroalloys. Many of those ferroalloys are critical minerals. That's going to be the supply for the batteries and electric vehicles.

I hear a lot of talk here about electric vehicles. To me, that's the end. It's not the beginning. How do you make a car? You need steel, and you need the other materials for the cars, the batteries and everything else. That's where it starts and stops.

We have a massive supply of iron. We have a massive supply of hydroelectric power and the ability to make hydrogen in this country. That's where we should be focused.

Mr. Bob Zimmer: If you were to remove red tape, specifically, could you give us a general focus on what that would look like?

Mr. Sean Cleary: The number one area where we spend time and money on is answering questions from government analysts at the environmental agencies. It's not that these questions aren't good, but they're continuous, for years. It's the re-asking of certain questions in different ways. Asking us to retest things that we've already tested, or whether we could interpret the results one way or the other.

The Chair: Thank you, Mr. Cleary. I'm going to have to stop you there. We've amended the schedule, so I'm going to have to be pretty strict here.

Ms. Jones, we will go to you for three minutes.

Ms. Yvonne Jones (Labrador, Lib.): Thank you, Mr. Chair.

My question is for Ms. Houde.

In November, the Government of Canada partnered with the Government of Quebec to invest \$2 million to develop a 135-tonne electric dump truck that was to be tested and validated at the ArcelorMittal mine. Can you tell us about this project, and what its implications are in the electrification of other heavy vehicles?

Also, can you answer a question around the Government of Canada's critical mineral list and how it aligns with the manufacturing process for many of the components of a project like this?

Ms. Sarah Houde: Regarding the truck, it's a good example of an ecosystem coming together to prototype a new type of truck, 100% electric, that will be tested at the Nouveau Monde Graphite mining site next year. It's a good example of a 100% Canadian, locally manufactured, locally developed with Quebec expertise truck, which will be tested here and then could be exported around the world. This is a very interesting example of an alliance for a local supply chain.

I don't know if you have other specific questions on that project.

• (1230)

Ms. Yvonne Jones: No, that's good.

I'll move to Mr. Blondal if I have enough time, Chair.

When he spoke earlier, he said he was really agnostic in terms of where they sourced their lithium from. What are his thoughts on the idea of Canada developing more critical minerals domestically to

ensure low risk to the supply for businesses like the one's operating?

Ms. Sarah Houde: Did you first want me to answer your second question? I did not yet do so.

Ms. Yvonne Jones: I'm sorry. If there's enough time, you can go ahead.

The Chair: You have about 30 seconds for whatever is going to happen here. Somebody just jump in.

Ms. Sarah Houde: I'll reply very quickly. For the list you mentioned, I think it's a very important first step so that we can identify what we need to work on strategically, and then really work on a second transformation to attract foreign direct investment and to work on all the other next steps.

It's the first strategic step to really go further, integrated with all the other actions that we are taking in that field.

The Chair: Thank you very much.

Thank you, Ms. Jones.

Ms. Yvonne Jones: Thank you.

The Chair: Now we'll go to Mr. Simard, for two and a half minutes.

[*Translation*]

Mr. Mario Simard: I remember one speaker talking about the need for strategic reserves of critical minerals. This brings up the whole issue of national security, which we haven't necessarily addressed.

Having participated in the battle over aluminum, I know that, in the United States, aluminum produced here in Saguenay—Lac-Saint-Jean is a national security issue.

Mr. Breton, do you think that there should be the same type of policy for critical minerals? What can you tell us about this?

Mr. Daniel Breton: Absolutely. We see this as a national security issue. If we don't make sure to maintain some control over our strategic mineral resources, we may not be able to ensure our Canadian supply chain for the electrification of transportation.

There are precedents for this. You spoke about aluminum. I remember that, in the 2000s and 2010s, in the United States, some businesses wanted to buy an oil company, which I won't name. The United States federal government said that it wouldn't allow these businesses to acquire the company for national security reasons. In Canada, we can remember talk of potash being purchased by foreign interests. However, Stephen Harper's Conservative government decided to block the sale for reasons of national interest.

Although we're talking about the electrification of transportation, when we discuss critical and strategic minerals and rare earths, we're also talking about electronic issues, meaning electronic products that we use more and more often. We're also talking about military issues. A few years ago, the Pentagon pointed out that we were losing control for strategic reasons. The Pentagon said that, if we didn't wake up, we would end up with China, which had stopped letting these strategic minerals out of the country for reasons of national interest.

For strategic reasons, the agreement between Joe Biden and Justin Trudeau was potentially to determine how Canada could ensure that it didn't end up in a position of dependency, as was the case with oil in the Middle East in the 20th century. This type of position could cause major international geopolitical tensions.

We believe that this issue must be looked at very carefully.

[English]

The Chair: Thank you, Mr. Breton and Mr. Simard.

Mr. Cannings.

Mr. Richard Cannings: Thank you.

I'll turn to Mr. Cleary and talk about hydrogen again and what the government can do there.

I was talking to someone in the hydrogen sector a couple of days ago. First, she pointed out that Canada has a tremendous amount of technical know-how when it comes to hydrogen in the world. We're one of the leading technical hydrogen countries around. However, to build out that innovation, we need real infrastructure, infrastructure to move the hydrogen and so on. She likened it to the government building the infrastructure for roads or building the infrastructure for electric transmission lines.

This is something that these hydrogen companies can't afford to do on their own. This is something the government could really help with.

I wonder if you could comment on where you think the federal government could really help in terms of taking on some of the actual infrastructure problems faced by a lot of the new clean energy projects, specifically with hydrogen.

• (1235)

Mr. Sean Cleary: It's a good question, and it's a tough one.

We have utilities that deliver natural gas and we have reforming technologies that allow us to take natural gas to produce hydrogen. That's where I think we should start in terms of a plan, which is to focus on those industries that are willing and able to take and produce great hydrogen as a first step and then backfill to either incent those companies to do carbon capture, so that we're using effective-

ly blue hydrogen, and then finally to work with the electrical utilities. For example, in Quebec, Hydro-Québec has now created a hydrogen unit.

This has been slow going and it's only in the last year or two that it's really gotten under way. We need more emphasis on this, because if we can show that we're going to deliver commercial levels of hydrogen to industry, then the rest of the hydrogen strategy can follow that because you'll have volumes of hydrogen being used. That's where we have to get to. It starts with industry. It starts with the existing infrastructure, the natural gas. Then it's utilizing carbon capture, moving to electrolysis and electricity generated. A lot of the same infrastructure can be used in terms of the gas utilities.

The Chair: Thank you, Mr. Cannings.

It's over to Mr. McLean for three minutes.

Mr. Greg McLean: Thank you. I thought we were going to finish that round, Mr. Chair.

The Chair: This is the same round. I just wanted to make sure we got the full round in.

Mr. Greg McLean: Thank you very much.

I'll go back to Mr. Blondal at Nano One.

Mr. Blondal, I understand that you are creating a process or a material that will do away with cobalt as a cathode for batteries. Is this correct?

Mr. Dan Blondal: We actually work on a variety of different cathode materials, and one of them does have no cobalt in it. That is correct.

Mr. Greg McLean: How close to market is that?

Mr. Dan Blondal: I would say it's probably two to four years away, depending on commercial adoption in various regions around the world.

Mr. Greg McLean: As an ESG alternative, lower cobalt would be a huge step forward. I thank you very much for pursuing that. Congratulations on your recent financing. It went very well, I understand.

I'll move back to Mr. Breton.

Mr. Breton, we talked about the electricity system and how we're going to have to build it going forward. I didn't hear your choice about how that actually has to be built and where we are going to get that power, given the fact that we're going to have to consume about twice as much power in a static scenario in the next 30 years with all the applications coming online here.

As we replace power, what do we replace that with?

Mr. Daniel Breton: As I said before, since electric mobility takes a lot less energy than gas or diesel vehicles, we won't have to double the amount of energy that we have to use now for electricity. Because of vehicle-to-grid and vehicle-to-home, what we'll be able to do is be a lot more efficient with our energy.

As I mentioned earlier—I don't know if you heard that—the electric grid right now is not as smart as it could be. With those systems, because most of the people are charging at night—

Mr. Greg McLean: I did hear this. I understand this. Nevertheless, we're going to need more power at the end of the day. You're telling me we won't need more hydroelectricity and we won't need more uranium. We're just going to fumble through with a more efficient system.

Mr. Daniel Breton: It's both. We will need more energy, but not that much more energy to compensate. Since electric mobility is so much more efficient than gas mobility—

Mr. Greg McLean: Thank you.

We do need more energy. Can you tell me where it's going to come from?

• (1240)

Mr. Daniel Breton: As I said, more wind power, more water power, more solar power. The price of that energy is going down really quickly. I don't know if you heard that there was a wind power project accepted in Alberta that was just over 3.4¢ per kilowatt hour. With these new projects linked with geothermal energy, vehicle-to-grid, vehicle-to-home and more hydro power, we'll be able to have affordable energy, cleaner energy, and it will be more than sufficient to meet the demand.

The Chair: Thank you, Mr. Breton, and thank you, Mr. McLean.

Last up is Mr. Sidhu for three minutes or less, if he feels so disposed.

Mr. Maninder Sidhu (Brampton East, Lib.): Thank you, Mr. Chair, and thank you to our witnesses for being here today.

I want to give everybody the opportunity to chime in here. I know that some of the answers were cut off due to a lack of time. If anybody wants to add anything else, we're talking about a very interesting topic here, and I just wanted to give the witnesses an opportunity to add to their answers.

Go ahead, Mr. Breton.

Mr. Daniel Breton: As other people have mentioned, I think we need a national electric mobility strategy going from mining, materials, metals, supply chains and the whole supply chain, so that we can have a clear vision of where we are going for the future of Canada. Right now, we don't have that strategy. We have a hydrogen strategy, which makes total sense, but we need an electric mobility strategy so that we have a national vision for the creation of jobs, for the transition in jobs and obviously for a good transition to lower greenhouse gas emissions and air pollution in Canada.

Mr. Maninder Sidhu: Thank you for that, Mr. Breton.

The Chair: Mr. Thibault has his hand up, I believe.

Mr. Simon Thibault: Yes, just to add to what Mr. Breton said, and also to follow up on what Mr. Blondal and Mr. Cleary said, the

importance here is to do some kind of SWOT analysis—strengths, weaknesses, opportunities and threats—map the whole supply chain and then say, okay, for those weaknesses we have, we need to build and work on R and D projects. As well, for those threats and opportunities, we need to focus investment there and stimulate those areas where we have the most potential to develop our supply chain.

As Mr. Blondal was saying, doing so is most likely to be focused on CAM production—cathode active materials—and also on cell making. By doing that, you will be providing clients to those upstream and facilitating market access to upstream projects such as mining projects. This is how Europe has been developing its supply chain and, in my view, that's how we should be developing it.

Thank you.

The Chair: Thank you.

Mr. Blondal had his hand up. Then we can move over to Ms. Houde.

Mr. Dan Blondal: Yes. Maybe I'll just echo that same thing.

We believe that integrating the supply chain is going to create the kind of demand we need for the critical minerals within Canada. Certainly by integrating we can also make it more efficient, clean it up, green it up and make ourselves a very competitive clean technology supply chain throughout the world. Integration is really required there. In our mind, piloting that integration is really key. That goes from mining to refining to conversion to cathode, all the way through to the cell production. That's where we look to the government for support.

Thank you.

The Chair: Thank you.

Ms. Houde, please be very quick. Then we'll stop there.

Ms. Sarah Houde: I just wanted to piggyback on Mr. Thibault's idea to say that Europe is doing exactly what he said they are doing, but we still have the natural resources, and this is really the key item here. We're lucky enough to have this combination of natural resources. Other regions do not necessarily have this chance, and we should seize this opportunity.

The Chair: Thank you.

Thank you to all our witnesses. Unfortunately, that's all the time we have. As you can see, there's a lot of ground to cover here, and there would be a lot more questions if we had the time, but unfortunately we don't.

We do want to say thank you. You're the last panel on the study. It was a very interesting group. We're incredibly grateful for your time and for the effort you put into coming here today and for informing us as you did and bringing this to a conclusion on a very positive note. Thanks very much, all of you. You are free to go.

As for everybody else, please log off and then log back in so that we can move into the in camera session. Thank you.

[Proceedings continue in camera]

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