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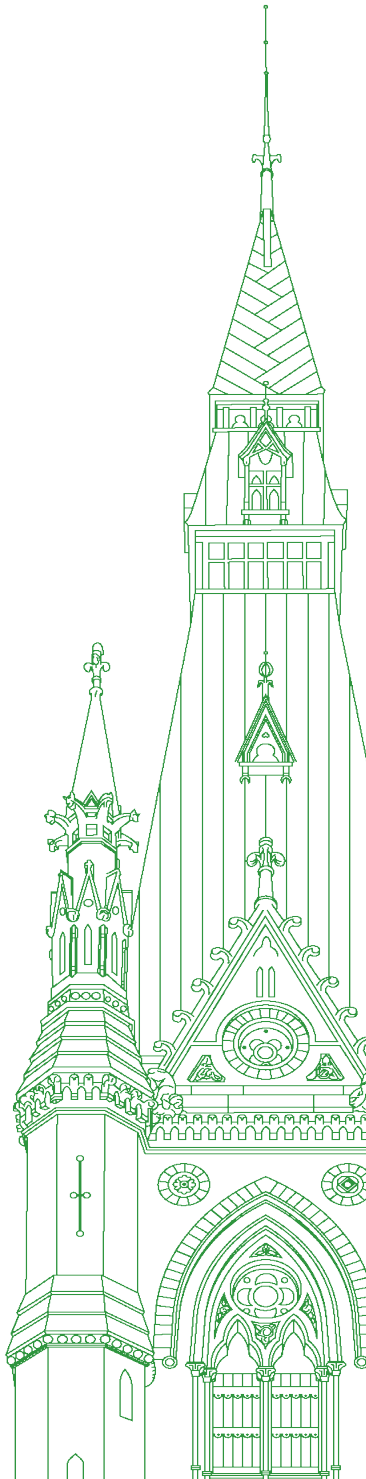

Chair: Mr. Joël Lightbound

Standing Committee on Industry and Technology

Friday, February 11, 2022

● (1300)

[*Translation*]

The Chair (Mr. Joël Lightbound (Louis-Hébert, Lib.)): I call this meeting to order.

Welcome to the eighth meeting of the House of Commons Standing Committee on Industry and Technology.

Pursuant to Standing Order 108(2) and the motion adopted by the committee on Wednesday, January 26, 2022, the committee is meeting to study the draft report on critical minerals.

Today's meeting is taking place in a hybrid format, pursuant to the House order of November 25, 2021. Members are attending in person in the room and remotely, using the Zoom application. I encourage everyone present in Ottawa to be aware of the health measures in place and to follow them.

I would like to take a moment to thank the many witnesses who are with us today.

Dr. Charles Burton, Senior Fellow, Centre for Advancing Canada's Interests Abroad, Macdonald-Laurier Institute, and Dr. Karim Zaghib, Professor, Concordia University and Professor of Practice, McGill University, are appearing as individuals. In addition, we have Matthew Fortier, President of Canada's ZEV Supply Chain Alliance, with ZEV meaning zero-emission vehicles; Daniel Breton, President and Chief Executive Officer of Electric Mobility Canada; and Lisa McDonald, Executive Director, and Jeff Killeen, Director, Policy and Programs, both from the Prospectors and Developers Association of Canada.

[*English*]

Thank you all for being here today.

My colleagues, members of Parliament, know the system, but for our witnesses, when I present this yellow card, it means there is one minute left. This red card means time is up.

We first have to hear from the witnesses. We'll begin with Mr. Burton, for five minutes.

Dr. Charles Burton (Senior Fellow, Centre for Advancing Canada's Interests Abroad, Macdonald-Laurier Institute, As an Individual): Thank you, Mr. Chair.

Mike MacPherson, the clerk of the committee, has emailed me the five points that comprise the committee's study on critical minerals under Standing Order 108(2).

This afternoon I would like to address points one and three. Point one is how can we best protect Canada's national security by preventing the sale of critical mineral assets to hostile foreign interests? Point three is how can Canada reduce its reliance on and vulnerability to foreign supply chains when it comes to sourcing and processing of critical minerals?

It's pretty clear that the hostile foreign interest, as has been affirmed by several of the people who have given evidence to this committee earlier, is overwhelmingly the People's Republic of China.

I can appreciate the ideal that Canada should be a country agnostic to a national security threat assessment, but the fact is that the People's Republic of China regime is an integrated party-state-military-security-industrial complex unlike any other country in the world today. As China's president, party general secretary, and chairman of the military commission has put it, party, government, military, civilian, academic, east, west, south, north, and centre, the party leads everything.

There are no industrial enterprises in China existing independently from China's party-state. If we impose a distinction between China's state enterprises and ostensibly private enterprises.... For example, Huawei describes itself as a private enterprise. It serves China's strategic interest for us to perceive these enterprises as private, by giving Canada the misimpression that a company like Huawei, for example, as a non-state actor, would not be subject to direction by Chinese military intelligence, as all Chinese enterprises, state or non-state, would be under Chinese law.

China's business enterprises are all state-related. The serving of the overall interests of the Chinese Communist Party at home and China's geostrategic interests abroad takes priority in the business decisions of these business enterprises over maximizing profits to shareholders or whatever.

As earlier witnesses to this study have observed, it's very difficult, well-nigh impossible, to distinguish between commercial and geostrategic factors in Chinese regime acquisitions.

We see evidence of this in Canada. For example, China's acquisition of Nexen, the attempt to purchase Aecon, or Shandong Gold's bid for the Tmac Resources gold mine in Nunavut, all involved bids that are well established to have been well over market value.

Why does China pay more than the market rate for things? It's because these acquisitions would enable the potential for Chinese state agencies to use them for espionage through privileged access to knowledge of Canadian infrastructure and digital databases. These enterprises are heavily subsidized, because they serve both geostrategic and commercial interests.

The Huawei software and hardware is priced well below that of its Scandinavian and South Korean competitors. This makes it attractive to our telecommunications companies, which have a mandate to maximize profit for their shareholders, but Canadian telecommunications companies do not have a defined mandate to protect Canada's national security from a foreign threat.

Insofar as critical minerals go, the same principles apply. China does a lot of these belt and road development projects in resource-rich countries such as Angola, Djibouti, Ethiopia, Kenya and Zambia. The potential for China to attain geostrategic leverage over minerals that are central to high-tech sectors is rightly of very deep concern.

● (1305)

We already have the example, in 2010, of a dispute over Japan's detention of a Chinese fishing trawler captain. To coerce his release, the Chinese government blocked exports to Japan of a critical category of minerals used in products like hybrid cars, wind turbines and guided missiles for a period of two months in 2010. China denied that it had imposed any embargo on Japan, against great evidence to the contrary.

We know only too well, with our experience of hostage diplomacy and the imposition of unjustified tariff barriers on our canola seeds and meat, violating contractual terms for the Chinese import of those Canadian commodities, that China does apply economic coercion, and did so to force our government's hand over an extradition matter.

● (1310)

We cannot rely on China to fulfill its treaty obligations to the WTO. It's important for us to collaborate with our allies to protect foreign supply chains as increasing tensions occur between China and Russia and the western alliance.

Thank you.

The Chair: Thank you very much.

[*Translation*]

I now give Professor Zaghib the floor.

Dr. Karim Zaghib (Professor, Concordia University and Professor of Practice, McGill University, As an Individual): Good afternoon, Mr. Chair, ladies and gentlemen.

My experience with critical minerals and with processing them into active materials for batteries spans more than 36 years. My team and I are responsible for many publications, book chapters and patents in this field, a number of which have had commercial success. For example, lithium salt, iron phosphate, graphite and titanium oxide are used today in many types of battery technology for electronics, energy storage and electric vehicles.

From June 2020 to December 2021, I acted as a strategic advisor for Investissement Québec and the Government of Quebec. Because of my international network and 36 years of experience in the lithium-ion battery field, I was able to open doors around the world for Investissement Québec and Quebec's department of economy, science and innovation to promote opportunities, to achieve greater recognition of Quebec's mining industry—from its mines to its recycling facilities—and to attract to Quebec international players in various industries, including ores, precursors, cathodes, anodes and cells.

The Quebec government is working on several fronts to create a green circular economy for batteries, with a focus on the traceablity of greenhouse gases, GHGs, emissions and on a stable and secure supply chain in Canada.

Developing batteries requires two steps from the mine to the cell. There is the processing of rock into ores at the mine, and then the processing of the ores into the active materials, such as cathodes or anodes.

The first step, which involves opening and operating a mine, takes a number of years, sometimes more than 10. The second step, to produce a known material at industrial scale, takes anywhere from two to three to seven years. For a new material, it can take many years.

[*English*]

In order to reduce the time for the first transformation, mining, I suggest that the federal government creates a committee, including the Minister of Finance, the Minister of Innovation, Science and Industry, the Minister of Natural Resources and the Minister of Environment and Climate Change, with first nations leadership, to facilitate the reduction of time for environmental assessments and the permits required to open mines, in particular for critical minerals. Of course, we should include constant monitoring of environmental impact audits to these projects. This committee should help finance mining projects with multi-billion-dollar budgets, as these projects are very expensive by their nature.

As for the second transformation, I recommend the creation of special federal funding of and programs in critical minerals to support the local transformation of the minerals into active materials for applications. Some critical minerals, such as rare earth elements, should be considered national security elements. For example, we find 16 or 17 rare elements in one iPhone. It is critical for the country and for the local transformation of critical minerals to protect them from foreign interests.

Canada must also invest in bringing back the national industry of microelectronic chips manufactured using local silicon, which is essential for several electronic components in electric vehicles and batteries. Moreover, the programs should include the funding of research and innovation, universities, colleges, research institutes and industry. This would reduce the time of production. Through the technology transfer for local companies, an international company would establish manufacturers in Canada as well, putting Canada at the forefront.

[*Translation*]

In addition, I suggest that the Government of Canada establish three industry centres for mining and engineering in different regions of the country to design machine prototypes for mineral processing with full technology transfer. The objective is to build a new manufacturing industry in Canada. This strategy would create many jobs and strengthen Canada's industrial independence.

Thank you very much.

● (1315)

Mr. Joël Lightbound: Thank you very much, Professor Zaghib.

I now give the floor to Mr. Fortier, from Canada's ZEV Supply Chain Alliance.

Mr. Fortier, you have the floor.

Mr. Matthew Fortier (President, Accelerate: Canada's ZEV Supply Chain Alliance): Thank you, Mr. Chair.

[*English*]

Vice-chairs and members of the committee, thank you for inviting me here today.

I am the president of Accelerate, an alliance of companies and organizations that have come together to advance the development of a national zero-emission vehicle supply chain.

Our members are private sector companies and organizations from across Canada's zero-emission and electric vehicle ecosystem, from mining companies to battery research and development organizations to parts manufacturers, vehicle assemblers, EV battery recyclers and EV charging companies.

The transition to zero-emission transportation is happening quickly—probably more quickly than most of us ever imagined. Paradoxically, this presents both an enormous opportunity and a threat for Canada.

[*Translation*]

I will first talk about the threat.

A large part of our economy relies on the success of the automotive industry. It accounts for 10% of our manufacturing GDP and is Canada's second largest export industry.

While there have been some announcements of electric vehicle, EV, assembly mandates for southern Ontario, it is not at all clear that the industry's footprint will remain as large as it has been for the past 60 years. Without a comprehensive strategy to attract and retain EV manufacturers, the long-term commitments of manufacturers to Canada will remain uncertain.

[*English*]

Let's talk about the opportunity. This is an opportunity, not only to retain our auto sector footprint, but to grow it and move further up the global value chain. It's an opportunity to develop and execute against a comprehensive EV strategy, and to take advantage of Canada's enviable position to be a leader in the entire electric vehicle production chain.

As members know, we have the critical and rare earth minerals needed to build the next generations of batteries and motors. We have world-class battery and vehicle R and D. We have parts manufacturers that supply global OEMs and, of course, those OEMs have a history with and investment in Canada. By virtue of those investments, we have tens of thousands of skilled men and women who work in this industry and are vested in its success.

The window is open for Canada, but it won't stay open forever. This committee has already heard a lot about the dominance of China in mineral, battery and EV production. It's not only China. It's the EU, Australia, South Korea, Japan, the U.K. and the United States. Every jurisdiction that believes it can benefit from the world's transition to clean mobility is making a move. They're developing comprehensive EV and battery supply chain strategies and making significant investments.

Canada has an enormous opportunity, but we can't simply assume things will work out. While having parts manufacturing and vehicle assembly capacity will remain critical, it can't be the only part of our auto sector's future. It certainly doesn't assure our success. Simply put, what got us here is not what's going to get us there.

What will? Canada needs an integrated strategy to ensure that our EV supply chain flourishes here. We need our mining sector to be a part of our auto sector. We also need our software, AI and financial services sectors to be a part of our auto sector.

This will attract the world's interest and investment, but it won't happen by accident. It needs to be done purposefully and with intent.

[*Translation*]

The good news is that the federal government has already begun to focus on this opportunity, including through the release of the report entitled “From Mines to Mobility: Seizing Opportunities for Canada in the Global Battery Value Chain”. It has also provided funding for a centre of excellence on critical minerals and encouraged direct foreign investment in battery cell manufacturing. However, it needs to do more.

[*English*]

Critical minerals are a foundational part of this industrial future. The sector requires much more development and investment to ensure Canada’s future EV supply chain success.

Accelerate has already been supporting work in this area. We are collaborating with one of our members, Clean Energy Canada, which is leading our joint battery task force to work in consultation with various industry stakeholders, including parts manufacturers and OEMs, to advance Canada’s domestic battery industry.

Another of our members, the Battery Metals Association of Canada, has initiated a study of the opportunities in our critical minerals and metals sector to feed into an integrated and competitive EV supply chain.

This work will identify ways in which Canada can maximize critical mineral production and foster the production of battery active materials. Reports from these projects are forthcoming and will inform policy-makers on the opportunities in the upstream and midstream segments of Canada’s EV supply chain.

[*Translation*]

The Chair: Mr. Fortier's screen has frozen. Let's move on to our next witness while we wait for the problem to be resolved.

I see that you are back, Mr. Fortier. Please excuse me, your screen froze for a moment.

Could you repeat the last 15 to 20 seconds of your remarks?

● (1320)

Mr. Matthew Fortier: All right.

[*English*]

I think I was talking about some of the work we're doing. We're working with a couple of our members to really develop Canada's battery sector.

For example, with Clean Energy Canada, one of our members, we're leading a joint battery task force that works in consultation with various stakeholders, including OEMs and parts manufacturers, to advance our domestic battery industry. Further upstream, we're working with the Battery Metals Association of Canada and have initiated a study on the opportunities in our critical minerals and metals sector to feed into an integrated EV supply chain.

Reports on these products are forthcoming and they'll inform policy-makers such as yourselves on the opportunities in the upstream and midstream segments of Canada's EV supply chain.

I'll pause there. I look forward to our conversation.

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

We'll now move to

[*Translation*]

Daniel Breton, President and Chief Executive Officer of Electric Mobility Canada.

The floor is yours, Mr. Breton.

Mr. Daniel Breton (President and Chief Executive Officer, Electric Mobility Canada): Thank you, Mr. Chair.

We would like to thank the members of the Standing Committee on Industry and Technology for taking the time to study our recommendations on the sourcing and processing of critical minerals.

Electric Mobility Canada was founded in 2006 and is one of the world's leading organizations in electrifying transportation. Our members include manufacturers of light-, medium- and heavy-duty vehicles, off-road vehicles, suppliers of electricity and charging infrastructure, mining companies, technology companies, research centres, cities, universities, fleet managers, unions, environmental non-governmental organizations, or NGOs, and so on.

In a word, Electric Mobility Canada is the national voice for the electrification of transportation.

[*English*]

One year ago, EMC fully supported the agreement of the Canadian and U.S. governments on the importance of the development of a zero-emission vehicle future and a battery strategy, as agreed to at the first bilateral meeting held virtually between Canadian Prime Minister Justin Trudeau and U.S. President Joe Biden and their senior teams.

As noted in their official statement:

> The leaders...agreed to work together to build the necessary supply chains to make Canada and the U.S. global leaders in all aspects of battery development and production. To that end, the leaders agreed to strengthen the Canada-U.S. Critical Minerals Action Plan to target a net-zero industrial transformation, batteries for zero-emissions vehicles, and renewable energy storage.

Although Canada is not yet a critical mineral superpower, the potential is clearly there, with 31 critical minerals identified in Canada, experienced research teams such as Jeff Dahn and Karim Zaghib, and a qualified workforce. According to Natural Resources Canada, rare earth elements are used in many industrial applications, including electronics, energy, aerospace, automotive—for EVs—and defence.

The largest use of rare earths is in permanent magnets that are a component of our cellphones, televisions, computers, automobiles, etc. The second-largest use of rare earths is in petroleum-cracking catalysts. In 2020, 90% of rare earths used for these products were produced and used in China. For strategic reasons, China rationed its exports of rare earths in 2013.

According to a 2020 report from Bloomberg New Energy Finance, China controls 80% of the refining of critical minerals, such as rare earth element materials and other critical minerals, and 77% of the world's battery cell manufacturing capacity. Having control is not necessarily having the mines in one's own country, but having invested in the mines of other countries as well. It has to be said that China has been far-sighted in its long-term investments.

In 2021, Chinese companies produced more than 40% of the world's EV batteries. South Korea produced more than 30% of them, and Japan produced close to 15%, but the situation is evolving rapidly. For example, the European Battery Alliance was launched in October 2017 to create a competitive and sustainable battery cell manufacturing value chain in Europe.

That's why, as identified in our 2030 EV action plan, EMC recommends that the federal government focus its effort on the following.

First, it should attract more investment to accelerate EV manufacturing and related industries in Canada—including assembly, parts, machinery, charging equipment and battery materials extraction and processing—with a Canadian EV economic development and investment attraction strategy.

Second, the government should be accelerating technologies, research, development and manufacturing associated with reducing the cost of vehicle batteries and thus vehicle costs per unit of range, thereby achieving economies of scale in vehicle, battery and charging infrastructure production that will also help to reduce costs for consumers and fleets in Canada.

Third, it should work with the U.S. administration to ensure that any buy America policies reflect the North American automobile market and do not negatively impact Canadian EV businesses and suppliers.

Fourth, it must help Canadian EV battery recycling companies through financial incentives and a regulatory framework that will support innovation.

Fifth, the government should be supporting the Accelerate alliance—my friend Matt and his group, Canada's zero-emission vehicle supply chain alliance—to help key players in the country develop a thriving EV industry.

● (1325)

[*Translation*]

We need to encourage the development of our own zero-emission vehicle supply chain, from mining to mobility, in order to ensure that Canada is not left behind in the electric vehicle revolution.

For economic, environmental and, as Mr. Burton aptly put it, geostrategic and national security reasons, Canada can and must develop a critical minerals strategy that will ensure enough supply. Canada's electric vehicle industry should not simply be about sending critical minerals overseas, where value-added jobs will be created. We should instead be creating those jobs here. If we do not, we will be missing out on a historic, once-in-a-generation opportunity.

Thank you.

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

Lisa Macdonald, of the Prospectors and Developers Association of Canada, you have the floor.

[*English*]

Mr. Jeff Killeen (Director, Policy and Programs, Prospectors and Developers Association of Canada): I will actually be addressing the committee today.

The Chair: No worries, Mr. Killeen. The floor is yours.

Mr. Jeff Killeen: Thank you very much. Good afternoon, Chair and committee members.

I want to first acknowledge that I come to you from the traditional lands of the Huron, the Chippewa, the Haudenosaunee, Wendat and Oneida peoples, the Anishinabe and the Mississaugas of the Credit, and all the indigenous first nations who lived on these lands over the centuries.

My name, as you mentioned, is Jeff Killeen, and I am the policy and program director for the Prospectors and Developers Association of Canada. Thank you for inviting me to appear today on behalf of Canada's mineral exploration industry.

As you know, or I hope you know, PDAC represents thousands of members, both corporations and individuals, that work in mineral exploration and mining in Canada and around the world.

PDAC operates through a committee structure. Industry professionals and stakeholders with real on-the-ground experience in industry collaborate to inform our recommendations and the points of advocacy that we bring to governments.

In recent years, PDAC has engaged with the government in developing the Canadian minerals and metals plan and Canada's critical minerals list, and in efforts to improve the efficiency of targeted programs and incentives that can accelerate critical mineral discoveries within Canadian borders.

We are certainly encouraged to see the Government of Canada recognize our potential to become a supplier of choice for the minerals needed to transition to a low-carbon future, and we support a number of the commitments noted in the Prime Minister's recent mandate letters to cabinet.

We share this committee's enthusiasm towards critical minerals, and I offer recommendations that aim to both spur exploration for critical minerals in Canada and bolster our capabilities to conduct science- and evidence-based processes for infrastructure and development, land management and conservation decision-making.

From previous testimony, I understand this committee has had some questions about the efficacy of the mineral exploration tax credit, or METC, which combines with flow-through shares to incentivize early-stage mineral exploration within Canadian borders.

I can tell you definitively that this mechanism is a foundational reason that Canadian mineral exploration companies and projects attract more capital than any other country. In 2021 alone, flow-through and the METC were the source of more than $1 billion of investment into Canadian projects.

The impact of this economic activity is magnified in rural and remote regions of the country, where our sector typically operates, and places the mineral industry in a unique position to help accelerate economic recovery in parts of Canada where few alternatives exist.

While record-high gold prices and base metal prices trending higher have boosted exploration activity in Canada over the last two to three years, the amount of exploration spending directed towards critical minerals such as cobalt, lithium, graphite or rare earths represents less than 3% of domestic activity in 2021. That's based on NRCan estimates.

For Canada to be successful in efficiently transitioning to a low-carbon future and becoming a supplier of choice for the minerals and metals needed by the world to effect such a change, we must increase our inventory of economic and socially viable critical mineral deposits here in Canada.

That's why PDAC has called for an expansion of the mineral exploration tax credit. This is to help spur grassroots exploration activity in Canada, and we support the call by government to double the METC for critical minerals exploration.

We're certainly keen to offer ways to implement and administer this expansion effectively. Furthermore, we recommend permanent adoption of the METC incentive, rather than letting that incentive expire in 2024, as it is currently set to do. We feel that a permanent adoption is essential in order to provide long-term certainty for investors and a competitive advantage to generating viable critical mineral discoveries here in Canada.

This step is crucial, particularly given the low odds of exploration success. Typically, only one in 10,000 prospects turns into a mine, and, as mentioned, there is a decade or sometimes a multi-decade path that a project will undergo from first discovery to an operating mine.

We also support the government's call for the use of science and evidence-based decision-making. This dovetails directly with our recommendation to increase public geoscience funding and establish a mechanism to assist provinces and territories in undertaking comprehensive mineral assessment models.

This is evidence that's necessary to inform decision-making in future infrastructure development, energy production, conservation, and advancing indigenous reconciliation, both at the regional and national levels.

Enhancing our geoscientific knowledge base will support effective policy development. It will attract stable industry investment and drive long-term exploration and the infrastructure required to fill the upstream gaps that currently exist in Canada's mineral supply chain.

These are the necessary steps to identify future domestic sources of critical minerals, expand our processing capacity to reduce our reliance on foreign sources, and capture more value-added activities within the Canadian economy.

● (1330)

These strategic choices can also ensure that Canada has greater self-determination in our future carbon footprint and our ability to export sustainable practices and minerals to the rest of the world.

Thank you very much for your consideration and time today.

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

We'll now move to our first round of questions, with MP Tracy Gray.

Mrs. Tracy Gray (Kelowna—Lake Country, CPC): Thank you, Mr. Chair.

Thank you to all the witnesses for being here today. I'd first like to go to Dr. Burton from Macdonald-Laurier Institute.

You were in the middle of making a comment regarding the Chinese regime's economic coercion. I'm wondering if you could just finish your thoughts on that. Then I have some questions for you.

Dr. Charles Burton: My message really is that there is a lot of urgency here. I read the statement by Mr. Putin and Mr. Xi after their bilateral meeting at the Olympics. Clearly, they're getting much closer together and much more interested in creating the lines of what could be an intensified sort of cold war dynamic.

The idea that China could use its control of critical minerals to coerce nations is something that is pretty much a no-brainer. In other words, they're going to do it if they can. This is part of their modus operandi to expand their influence in the world and their overall plan to displace the United States as the dominant global power by 2050, as articulated by Mr. Xi.

Australia, for example, sends a lot, or most, of its lithium production to China for processing. We really have to get together with our allies and try to figure out ways to establish supply chains that will not be running through countries with whom we may have very hostile relations in the future and who may use their control of critical minerals to further their geostrategic purposes.

Mrs. Tracy Gray: On that note, with this debt trap diplomacy, what actions do you think the Canadian government should be taking right now so that we're not stuck in a place when it comes to critical mineral access?

Dr. Charles Burton: This is a question that really can't be resolved by Canada alone. Certainly, the Chinese use of its belt and road initiative—which involves facilitating corruption and bribery of autocratic dictators in third world countries that have something in China's interest, particularly mineral resources—is something we want to challenge, to provide alternative streams for development funding to those nations.

Up to now, in the global community, the like-minded nations have been unable to successfully coordinate, largely due to differences among ourselves. The French and the Germans are not happy about coordinating with the Americans in an international alliance to contain China's malign activities. The result is that we haven't seen the allocation of funding or the coordination necessary to try to protect the international rules-based order against China's malign activities, including stuff like hostage diplomacy and unjustified imposition of tariff barriers to try to engage in the economic coercion of nations to comply with China's political agendas in their countries.

● (1335)

Mrs. Tracy Gray: The Canadian government says it's working on a critical minerals strategy. Are you satisfied with the speed at which the strategy is being developed? What is Canada losing out on right now, while we still don't have a strategy?

Dr. Charles Burton: I'm definitely very concerned about our lack of effective action on this. I was completely flummoxed when we had an opportunity to stop the Chinese acquisition of a Canadian-controlled mine in Argentina.

A lot of this seems to have to do with persons who were involved in the policy process who may have a conflict of interest because they are the recipients of benefits from a foreign regime. I'd really like to see us follow through with an act like Australia's Foreign Influence Transparency Scheme Act, or a foreign agents registry act, just so that the people who are in this conflict of interest will have to declare it. That could clear up some mysterious decisions by government that seem to favour the Chinese regime and that I believe act against the overall interests of Canada and the international rules-based order.

Mrs. Tracy Gray: I guess to add to that, under the Investment Canada Act, should takeovers of Canadian companies by foreign state-owned enterprises be subject to more stringent review than what is currently undertaken?

Dr. Charles Burton: Absolutely. As I said in my presentation, I think that.... When you look at Chinese enterprises, they're all under the control of the Chinese Communist Party. They all have Chinese Communist Party branches at the top of their hierarchical structure, and it's the party secretary who coordinates their activities at the direction of Beijing, if Beijing wants to see that.

We should be going down to zero in terms of assessing the value of these investments if it does involve anything out of China or other state actors.

Mrs. Tracy Gray: Based on the regime's previous actions, is there a potential for Canada to be shut off from some of these critical mineral supply chains, in your view?

Dr. Charles Burton: I think it's almost certain that China would do that if it wanted to get something from Canada, such as more access to our high tech or a greater capacity for the Chinese state to invest in Canadian mining and other critical infrastructure.

Mrs. Tracy Gray: Where in this strategic mineral supply chain do you see Canada being the weakest right now?

Dr. Charles Burton: That's not really a question I have the expertise to answer. There are a lot of people here who have more.

Obviously, we should be pulling the stuff out of the ground ourselves and processing it here. Experts may have a better take on that than me, but that just strikes me as a no-brainer in terms of maintaining the integrity of our ability to avoid being subject to coercion by autocratic states. They might have things we need for our development, and they would be prepared to withdraw them—as they did with Japan in 2010, as I said—to coerce us into giving concessions in other areas.

The Chair: Thank you, Mr. Burton.

Madame Gray, that is all the time you have.

We'll now move to Madame Lapointe for six minutes.

[*Translation*]

Ms. Viviane Lapointe (Sudbury, Lib.): Thank you, Mr. Chair.

[*English*]

My first question is for the members from PDAC.

I'd like to ask about domestic supply chains. Is Canada ready to not only mine the critical minerals and metals needed to shift to a zero-emissions economy, but also develop the raw materials into the products needed for electric vehicle batteries and other things? I'm looking at this from an A to Z perspective—from mined production to infrastructure and technology, along that domestic supply chain. Where are we in Canada on that front?

Mr. Jeff Killeen: I would start by suggesting that the Canadian mining and mineral exploration industry is almost unparalleled in terms of its quality, its capabilities and the best practices that this industry brings to its operations, both in Canada and abroad. When we think about Canada's capability to discover more minerals and metals within our own borders and bring those metals to market, it's almost unequalled compared to any other country. Our ecosystem is very robust, from the exploration end of things all the way through to mineral processing.

When we think of where the shortfalls are.... At PDAC, we think of our members as largely being the junior exploration and developers within Canada, and we think about what can be pulled out of the ground, as you pointed to. Our recommendations are centred around the concept that we need to build up a larger inventory of known resources and reserves within Canada. It would be in our best interest to understand where those are located, so quality infrastructure decisions can be made, so we can understand what our energy balance will be in the future, and so we can ensure that we can actually access those prospective lands with a social licence to operate well in mind.

That's really where our minds are focused at this point—to build up that resource capacity within Canada. With that in mind, the lion's share of what we have seen over many years with respect to exploration in Canada has been focused on precious metals and more traditional base metals. The amount of attention devoted to—as this committee has considered before—lithium or different types of lithium species, or graphite, cobalt or other metals, has been relatively immaterial in Canada's history.

What I can say is that we are the second-largest country on earth in terms of geography. We have every geological terrain and potential for discovery—in virtually every region in this country—for rare earths, lithium, cobalt and the things this committee is talking about and considering. I would say there's unparalleled exploration upside and vast exploration potential here in Canada that we need to maximize to ensure that all of those downstream issues that we're considering are put in focus, as opposed to the upstream portions that are maybe lacking right now.

● (1340)

Ms. Viviane Lapointe: Between the different levels of government and the private sector, what needs to be implemented or changed to ensure that we are expanding and maintaining that supply chain?

Mr. Jeff Killeen: It's a great question.

I'll come back to our recommendations, and for good reason. Knowledge is key, and what we've seen in recent mandate letters around reliance on science and evidence-based decision-making is the right way to go. With that in mind, there is information we still need to have in hand to be able to make quality decisions that are thinking 10 and 20 years down the road, as has been indicated by some of the other panellists here today.

Public geoscience is very important in terms of its value to the Canadian public. We also see the government starting to take steps, like forming a pan-Canadian geoscience strategy. These are the types of interactions between the federal and provincial governments, all the way down to municipal governments, that need to be taken into consideration, so that when we think about access to land, energy demands and the impacts on potential local communities, these are thought out well in advance. That way, we don't have to make decisions in the short term that will put us behind our competitors with respect to participating in these opportunities.

Ms. Viviane Lapointe: Thank you, Mr. Killeen.

[*Translation*]

Dr. Zaghib, given your 36 years of experience, I would like to ask you a question about research and development in the process of transition to the electrification of transportation and the needs for rechargeable batteries.

Can something be done everywhere in Canada?

Are there any region-specific challenges that might relate to, for example, infrastructure or weather conditions, which would mean that electric vehicles could not be used everywhere?

[*English*]

Dr. Karim Zaghib: I'll be very quick.

[*Translation*]

Canada has the necessary technology to develop the mine, to do the first transformation of the active materials, from the battery cell to the battery module and then to the battery pack. Since the 1970s, Hydro-Québec, the company Moli Energy and the Jeff Dahn laboratory have been developing this technology.

Let’s take the Tesla car as an example. The nickel-manganese-cobalt lithium technology, or NMC, developed by the Jeff Dahn laboratory was used. As for the lithium iron phosphate, or LFP, technology, it was developed by Hydro-Québec and its partners.

The technology was born in Canada and we have the human capital. If the car can’t run at low temperatures, we can find solutions using our human capital, our very good Canadian universities, our institutions and the Canadian ecosystem.

Ms. Viviane Lapointe: Thank you.

The Chair: Thank you, Ms. Lapointe and Dr. Zaghib.

Mr. Lemire, you now have the floor for six minutes.

Mr. Sébastien Lemire (Abitibi—Témiscamingue, BQ): Thank you, Mr. Chair.

First of all, I would like to say to Ms. McDonald and Mr. Killeen that I did attend the last two Prospectors and Developers Association of Canada, or PDAC, meetings, and that I'm looking forward to attending the one in June if I can't attend the one in March.

My question is for Mr. Breton.

Mr. Breton, I would like to hear your comments on the urgency of legislating now in order to keep pace with future development and to support the industry by offering it more predictability.

Should we recommend that Environment and Climate Change Canada step up to the plate and introduce a zero-emission vehicle bill this spring in order to meet electric vehicle sales targets?

When a state legislates to improve a citizen's access to electric vehicles, does this have an impact on the market and on the number of vehicles available?

● (1345)

Mr. Daniel Breton: If you look at the way things are unfolding around the world, the main markets for electric vehicle sales are regulated markets.

Canada is unregulated, and in the third quarter of 2021, the percentage of sales of fully electric or plug-in hybrid vehicles was 5.4%.

Let's look at the sales of electric vehicles in November or December in Europe and China. In China, the percentage was about 20%, in Germany it was over 30% and in Norway, it was 90%.

A federal zero-emission vehicle law will certainly accelerate the sale of electric vehicles. For now, manufacturers are prioritizing electric vehicles in markets that are better regulated and that give incentives for infrastructure installation or electric vehicle production, that offer purchase rebates, or that run awareness campaigns.

Ms. Lapointe asked if it was possible to travel by electric vehicle in certain regions of Canada. Last week, I left the countryside in Quebec and drove to Toronto in an electric vehicle with four people on board. Everything went well. The temperature was 20 degrees Celsius below zero. People often think that an electric vehicle in a country like Canada can be problematic. It's not really a problem.

In fact, Norway leads the world in the purchase of electric vehicles, yet it is not a tropical country. There are opportunities to develop the electrification of transportation in all regions of Canada. In the northern regions where electricity generation is off grid, it is more complicated. We are working on energy storage with people like Dr. Karim Zaghib.

I can tell you that it is quite possible to travel by electric vehicle anywhere in Canada, whether it is a light or heavy vehicle. It's getting better and better.

Mr. Sébastien Lemire: I can attest to this, as I myself own an electric vehicle. I must admit that, in Abitibi-Témiscamingue, we still need to improve the supply of charging stations, especially for crossing the La Vérendrye wildlife reserve. In fact, we had the opportunity to discuss this a few times in the committee.

Mr. Breton, from 2017 to today, there have been several meetings between the United States and Canada to discuss, among other things, critical minerals and oil sands. In addition, the United States is leading a battle against Canada regarding the protectionist Build Back Better Act. In defence of the electric vehicle industry, particularly in Ontario, and all that we have to build in this sector, Ministers Ng and Freeland have sent a letter to Washington. However, this process seems to be very long and tedious, and relations with the Americans remain strained. What are your fears in this regard?

Mr. Daniel Breton: As far as the Build Back Better Act is concerned, there is certainly a concern for the Canadian auto industry. After all, the reason we're here discussing critical minerals is to ensure that the electric vehicle industry—cars, trucks, buses and even snowmobiles—can develop in Canada, but it's also to make sure that the transition happens without job losses. We want to fight climate change and air pollution, while creating jobs. Right now, the concern we have with the Build Back Better Act is that the tax credit that will be offered to consumers who purchase an electric vehicle manufactured in the United States will jeopardize the manufacturing of light, medium, and heavy-duty vehicles in Canada.

In an integrated market, such as the one between Canada and the United States, this goes against the so-called collaboration between Canada and the United States. As I mentioned earlier, we have heard and read that in February 2021, President Biden and Prime Minister Trudeau signed an agreement to collaborate on batteries and critical minerals. It would really be a loss and a mistake to send raw materials to the United States to have value-added products and vehicles manufactured there. We would be replicating the model that we have too often followed in the past, with our oil, our wood, our aluminum, our electricity. We want to create quality jobs in Canada, from mining to mobility.

Mr. Sébastien Lemire: I think all the witnesses agree that there are problems with the supply of raw materials.

Do you think the committee should invite the Deputy Minister of Natural Resources to testify in order to better understand the leadership and timeline of the Critical Minerals Working Group, which aims to advance collaboration between the United States and Canada?

Mr. Daniel Breton: I think it would be worthwhile, because we have talked about it, and several people here are talking about it.

In terms of critical minerals, it is said that Canada is behind the rest of the world. In fact, it's not that Canada is behind, it's that most of the western world has fallen behind China. We need to catch up for economic reasons, but also for geopolitical reasons, as Mr. Burton rightly mentioned.

● (1350)

Mr. Sébastien Lemire: In closing, I would like to know if you have any concerns about federal-provincial relations in this dynamic between Quebec, Ontario and the federal government. Is there a favourable context for acting now? What would be the right time? How can this be done while respecting the provinces?

Mr. Daniel Breton: We shouldn't wait, because Europe has really woken up. Since 2017, Europe has been developing a battery manufacturing ecosystem for electric vehicles. For this reason, we cannot discuss this issue for five or ten years, because other countries will have taken an insurmountable lead, and Canada will lose a historic opportunity.

Mr. Sébastien Lemire: Thank you very much.

Mr. Daniel Breton: It was a pleasure.

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

I will give the floor to Mr. Masse for six minutes.

[*English*]

Mr. Brian Masse (Windsor West, NDP): Thank you. Mr. Chair, I can't help but feel that I'm part of the fiddling that's going on as Rome is burning. Right now, about two kilometres away from me, we actually have a blockage at the Ambassador Bridge that is the lifeline for the auto industry in this country. There are MPs I'm working with who have been encouraging some of this activity.

At the same time, we're discussing how we could rescue investment for electric vehicles. The Stellantis plant in Windsor, which produces the Chrysler Pacifica, an electric vehicle, is currently shut down right now because of that activity. I still can't get any help, including from the Minister of Transport, who claims that it's a municipal issue to connect the roadway to the international crossing 17 kilometres away, to the 401 system.

The mayor is bringing an injunction right now, as I speak, to deal with this. We have right now the only electric vehicle production in our country shut down because of this. Even if we create more battery plants and more investment in this industry—even if we take, as Mr. Breton has proposed, some of these really good ideas about how we use transferable technology to other types of industries—it's all for naught. Just yesterday, the president and CEO of Stellantis was in Windsor to help decide about the new future, because the Pacifica needs a new product in the area later on. That's probably the most successful manufacturing plant since the Second World War. It has run until just recently on three shifts.

I have Ford right now actually airlifting products and pieces to its engine plants here in desperation, and those workers are done. I'm sorry I'm going on, but I'm using my opportunity as an MP to emphasize this. Down on the border, where these people have come, most of them aren't from the neighbourhood. Adjacent to it, Mr. Chair, is one of the most impoverished areas in Canada. It's called Sandwich Town, and that area right now is not only losing its quality of life but on top of that already has people who are unemployed, as well as students and others who have been disenfranchised. Ironically, they're the full victims of what's taking place.

I guess, Mr. Chair, I'm hoping that we can take advantage of this. I will propose at least a question to Mr. Breton, really quickly, though my time is evaporating through my obvious frustration with what's taking place here. I still see hope and opportunity for this, and I would ask him this. With our universities and with our assets, outside of the current problems we're facing right now, can we turn this around and also use, as he's noted, snowmobiles and other types of electric vehicles, so it's not just the car industry, as a wedge for us to be different and prosperous in our future?

Thank you, Mr. Chair. I thank the indulgence of the members on this meeting.

Mr. Daniel Breton: Yes, we absolutely can. The time is pressing. I don't know if you remember back in 2009, when we had a financial crisis, there was an opportunity there to develop EV research and development, like the U.S. did. We did not do that in 2009.

Now it's our second and last chance. We have amazing companies in Canada developing electric cars, electric buses, school buses, electric trucks and electric snowmobiles. I've mentioned to you in the past Lion Electric, based in Saint-Jérôme, which has 300 suppliers in Canada only.

Companies like that can be spearheading the transition towards electric mobility. If we don't do that now, if we don't accelerate the transition, what will happen is a few years from now all we will do is import technologies, batteries and vehicles from abroad. That's why it is pressing and we have to act on it now.

Mr. Brian Masse: Again, aside from my current situation, it's actually really exciting.

Mr. Burton, you mentioned a rules-based order with regard to the United States, and obviously that's ironic with what's taking place now in my constituency, but I am hopeful. Can we work within our current trade agreement's context to smooth out some of these things, to have a North America trading bloc that's effective among Mexico, Canada and the United States, that's beneficial in enabling us to push back against some of the eastern imports that we are getting, not just from Europe but also from Asia.

Can you comment on that, please?

● (1355)

Dr. Charles Burton: We certainly want to have our own capacity to be independent of other nations, including the United States. What's most important is that the supply chains be implemented among like-minded countries that respect the rules and the spirit of the WTO and the international rules-based order. They will not arbitrarily cancel contracts when there's a political dispute, or try to menace Canada if we started to crack down on Chinese state espionage or the harassment of people in Canada on some sort of flimsy pretext, and not allow us to get things that we desperately need because China's the only viable source for those components.

We should tighten up with our allies and be conscious that we need to have reliable supply chains that will not be subject to disruption and interference from countries that have geostrategic and political reasons for doing that.

[*Translation*]

The Chair: Thank you, Mr. Masse and Mr. Burton.

Mr. Généreux, you have five minutes.

[*English*]

Mr. Bernard Généreux (Montmagny—L'Islet—Kamouraska—Rivière-du-Loup, CPC): Merci, monsieur le président.

Je remercie tous les témoins.

[*Translation*]

Monsieur Burton, à mon sens, la vente de Neo Lithium au gouvernement chinois était une erreur. Quelle était l'importance de cette erreur pour le gouvernement?

[*English*]

Dr. Charles Burton: In general, when we have.... For example, when there was a reversal of a cabinet decision with regard to the sale of technologies from a Montreal company that was applicable to directed energy weaponry, or when we decided to allow China to acquire a large satellite company that had satellites that were used by the Pentagon and the Government of Taiwan, I really wonder who has been convincing our government that these things are a good idea.

When the matter of Neo Lithium came up, I just saw it as one of a sequence of decisions made at the most senior levels of government that mystify me, because they don't seem to be serving the Canadian interest and seem to be allowing China to consolidate greater and greater control over geostrategic matters and military matters, which could, in years to come, come back to haunt us very badly.

[*Translation*]

Mr. Bernard Généreux: Thank you.

Mr. Breton, I imagine that the sale of Neo Lithium troubled you, given that all of its products are necessary for the production of batteries.

When you see Canadian companies selling their mines, wherever they are in the world, I can't imagine that it makes you happy.

Mr. Daniel Breton: As I said earlier, I think most western countries did not see the speed at which the transition to renewable energy and electrification of transportation would occur, nor the scale of the need for critical minerals.

For geostrategic and military reasons, we need critical minerals and rare earths for these products. A few years ago, the Pentagon pointed this out and it is important to say so.

In my opinion, Canada has not acted quickly enough, and neither has the United States. In the last few years, some countries have let China buy up mines around the world. We closed down mines that were exploiting these critical minerals, because we said that the market was not there and we were looking at things from a too short-term perspective. Now we are starting to see the long-term implications.

China is really ahead of the rest of the world. Everyone is waking up right now and it's a rude awakening, but we need to wake up because it's urgent.

Mr. Bernard Généreux: Thank you, Mr. Breton.

Mr. Zaghib, you mentioned the possible establishment of three centres of excellence in Canada.

Do you already have an idea of the nature and location of these centres of excellence? What do you think the timeframe should be for the establishment of these centres?

● (1400)

Dr. Karim Zaghib: These engineering industrialization centres, as I call them, could manufacture graphite. For the furnaces, the processing with the machines is done in Japan or China. For graphite solidification, the machine is made in Korea, Japan or China. For the purification of all these materials and all the industrialization, we let our industries go.

It is very important to go back to the silicon industry. We need these centres to build a machine for the mines. There are many centres, but the ones being considered are specialized. We need to work with the industries so that these centres are built, for example, in Quebec, in central Canada and at one end of the country.

We need to work together, in collaboration with the universities. It is very important for industrialization that our mines are in Canada and that the machines, anodes, cathodes, cells and batteries are made in Canada.

Mr. Bernard Généreux: Thank you.

Mr. Fortier, you were talking earlier about a threat, because 6% of our GDP comes from the automotive sector. When you talk about opportunities—and I understand that we have them in Canada—what is the timeframe for setting up all the centres that Dr. Zaghib and Mr. Breton are talking about?

The Chair: Mr. Fortier, please give a short answer.

Mr. Matthew Fortier: Thank you.

As Mr. Breton said, other countries are far ahead of Canada. So it's going to take some time. Our friends at the Prospectors and Developers Association of Canada, or PDAC, have told us that it will take five, seven, or ten years to open mines.

Of course, it will take time, but we also have many advantages. In Canada, we have an automotive industry, human resources, and natural resources. There will be opportunities for Canada, but it will take some time.

The Chair: Thank you very much, Mr. Fortier and Mr. Généreux.

Mr. Gaheer, you have the floor.

[*English*]

Mr. Iqwinder Gaheer (Mississauga—Malton, Lib.): Thank you, Chair.

My questions are for Mr. Fortier. We've heard testimony that may suggest that Canada's perhaps falling behind in the critical minerals race. I'd like to ask how far along Canada is, as compared with other western nations specifically.

Mr. Matthew Fortier: That's a great question.

We've talked about that a little already today. China, obviously, was well ahead of the rest of the world, and a lot of Asia has been able to catch up to China. I think the rest of the world, including Canada, is playing catch-up.

The good news for Canada is that we have these critical minerals. We're one of the very few countries in the western hemisphere that has most of these minerals, and, as we've heard today too, we have one of the best mining sectors in the world.

This is a possibility for Canada. Can we get these things out of the ground and get them into the products that the world needs? Absolutely, we can. There's a lot of work to do. We also need to process these things. We need to have a processing industry that can ensure that the minerals and metals that are mined are processed and then put into batteries and other important products for the transition that's to come.

We are playing catch-up, but the rest of the world is playing catch-up too. It's a reality, and I think one of my counterparts on this panel has said Europe has been really focused on this. Australia's been focused on this as well. They both have terrific battery strategies, and the U.S., as we all know, is playing offence now as well.

Mr. Iqwinder Gaheer: That partly answers my next question as well, but are there other western nations that have the right mix to get this right, in terms of the critical mineral resources, the R and D and the skilled workforce? Who are our competitors?

Mr. Matthew Fortier: The EU has developed a really interesting battery strategy, as has Australia. Here's the really interesting thing for me. Canada has the opportunity to have a battery strategy. We have an opportunity to have a zero-emissions vehicle strategy, because we have an auto sector here that is decades old and we have thousands of people who know how to put these things together and design really advanced auto parts. We've got an AI and technology sector in Canada. We're one of the very few jurisdictions in the world that can do all of this.

The question is, are we willing to do it? Are we willing to make the investments to do it? Are we willing to put political capital into this as well? I think we can and we should. This is part of Canada's industrial future, so it's not just minerals and batteries. It's heavy industry. It's advanced manufacturing. It's battery recycling. We are world leaders in a lot of this, so let's put it together. I think, frankly, Canada has a great opportunity to do that.

Mr. Iqwinder Gaheer: For lithium in particular, what are the critical next steps that we need to take to get the supply chain right? Is it the mines? Is it the roads to the mines? Is it the facilities to turn the lithium into something else? What's the next step?

● (1405)

Mr. Matthew Fortier: It's all of that. It is infrastructure. It is the mines. It's the processing and the R and D as well. I know there are others on this panel who have deeper expertise in the actual mining part of this, but you've identified the key components that need to be invested in. The reality that we are experiencing is that it needs to be invested in [*Technical difficulty—Editor*]

[*Translation*]

The Chair: The image seems frozen.

[*English*]

Mr. Gaheer, move to another witness because we've lost him.

Mr. Matthew Fortier: My Internet was unstable. I'm back though. I'm sorry I couldn't finish the last question.

Mr. Iqwinder Gaheer: We just missed the end of your answer.

Mr. Matthew Fortier: I was just saying that it's everything you've highlighted. It is the infrastructure. It is development of new mines and new technologies as well. You look at Alberta and there's a lot of interest in looking at oil wells and working with the brines to extract lithium. There's an opportunity not just for traditional mining here. The interesting thing for me is that there's an opportunity across Canada. The auto sector doesn't have to just be southern Ontario. That's an incredibly important part of the future of our auto sector, but it can be British Columbia, it can be Alberta, it can be Saskatchewan, Quebec obviously, and the Maritimes.

It's an exciting time, but we need to knit this stuff together.

Mr. Iqwinder Gaheer: What are the trade obligations with CUSMA? I wonder how that plays into this.

Mr. Matthew Fortier: Is that in terms of just auto parts in general?

Mr. Iqwinder Gaheer: Yes.

Mr. Matthew Fortier: There may be people who are better placed than me to talk about the trade elements of this, to be honest. Obviously, we have a trade deal with the U.S. that allows for Canadian content in vehicles, but the vehicles are changing.

These trade deals are predicated on technologies that exist when they're signed, so the car of the future, or the automobile or vehicle of the future, is not reflected in trade deals today.

The Chair: Thank you.

We'll now move to MP Sébastien Lemire for two and a half minutes.

[*Translation*]

Mr. Sébastien Lemire: Thank you, Mr. Chair.

Mr. Fortier, I won't let you catch your breath.

Most car manufacturers have committed to building electric vehicles, or at least vehicles with an electric component. However, the stock markets do not seem to believe that they will be able to deliver on their promise, largely because of problems in the supply chain and dependence on parties such as China or the Congo for essential minerals or other basic inputs. This could threaten the government's plan to move everyone to electric vehicles.

At Accelerate, you are committed to building a Canadian supply chain.

Tell us about the importance of having an autonomous and sufficient domestic market.

Mr. Matthew Fortier: Thank you.

I think it shows that the world needs more critical minerals and processing capacity, not just in Canada. Canada needs an integrated strategy and supply chain that works in the North American context to bring more vehicles to market. Where Canada can distinguish itself is in the way its minerals are mined. Our mines are among the cleanest in the world and we have one of the cleanest sources of energy to power that extraction.

Mr. Sébastien Lemire: Is it too late to act?

In concrete terms, what needs to happen for Canada and Quebec to become major players in North American and global supply chains?

Mr. Matthew Fortier: No, it is not too late at all.

We know that other countries are ahead of the curve, but it is not too late for Canada. We need the provinces and the federal government to work as a team to identify opportunities in the mining, furniture, and manufacturing sectors and make the necessary investments.

It is not too late. It’s going to take a lot of effort and investment, it’s ambitious, but we can do it, as a country. In fact, we have to do it, because we are talking about the industrial future of Canada.

Mr. Sébastien Lemire: Finally, tell us about the importance of processing and building these cells close to the resource.

Is this problematic, in your opinion?

● (1410)

Mr. Matthew Fortier: This is very important for us. It is one of the main elements of this project. Exploring and exploiting the mining sector is an advantage for Canada.

Today it was pointed out that Canada's mining sector is very advanced, more so than most countries in the world. So we have to ask ourselves whether we can exploit our natural resources for this project so that Canada can be a leader in the electric vehicle sector.

We can do it, but, as I said, it will require significant investment and a lot of effort.

Mr. Sébastien Lemire: Thank you.

The Chair: Thank you, Mr. Fortier.

Before I go to Mr. Masse, Mr. Lemire, could you speak a little more slowly? I thought I was talking fast, but you're talking very fast, and it's difficult for the interpreters. Even for Mr. Fortier's connection, it seems to be too fast. So I would just ask you to slow it down a little bit. Thank you.

Mr. Masse has the floor for two and a half minutes.

Is Mr. Masse with us? I don't see him on the screen. At the beginning of the meeting, he informed me that he was having connection problems.

While we wait for Mr. Masse to come back, we'll go to Mr. Kram for five minutes.

[*English*]

Mr. Michael Kram (Regina—Wascana, CPC): Thank you very much, Mr. Chair, and thank you to the witnesses for joining us today.

My questions will mostly be for Jeff Killeen and Lisa McDonald of the Prospectors and Developers Association of Canada.

The mining sector is extremely important to my home province of Saskatchewan. There is broad public support for the mining sector. There is considerably less public support for the government's Bill C-69, brought in a few years ago. The Saskatchewan Mining Association has said that a majority of its members did not support the extra regulatory process brought in by Bill C-69.

I'd be curious to hear how the member organizations of PDAC feel about the additional regulations brought in a few years ago by Bill C-69.

Mr. Jeff Killeen: In thinking about who our membership predominantly represents, we typically have junior mineral exploration somewhat up to development companies as the primary cohort at PDAC.

The impacts of what has happened over the last number of years, from the development and implementation of the Environmental Assessment Act, are still not fully understood. I don't believe there's been enough of a case history from projects that have gone through that process to understand what impacts it may have on future project development.

The pace of permits for land access and the ability to bring new products to market is certainly a concern that we have. The ability for our members to be able to access prospective lands, conduct work on a consistent basis, and have that clarity for their investors and stakeholders is still a bit of a challenge in parts of Canada, whether that's as a result of federal legislation, provincial legislation, or the interaction of the two. There are a number of different reasons.

It goes back to some of the recommendations we've made. At the heart of our recommendation around public geoscience is trying to increase the support for provinces, municipalities and regions to be able to understand what's underneath them. It's only through that function that like minds can be brought together. The forethought can be put this way: Where are we going to need energy? Where are we going to need to develop roads? Where can we actually have economic development and do it in an engaged and collaborative way?

I really come back to the concept that public geoscience and the funding around that are super important. As I say, with respect to the Environmental Assessment Act, it was well thought out to a degree. We certainly, as an association, worked in collaboration with the Mining Association of Canada to provide feedback through its development.

We'll continue to engage with government as companies go through that process, to understand where the challenges may exist.

Mr. Michael Kram: [*Technical difficulty—Editor*] assessed only through the robust provincial environmental assessment process in Saskatchewan.

Does PDAC agree with this position for Saskatchewan, and the other provinces as well, that the assessment process should be limited to provincial governments?

● (1415)

Mr. Jeff Killeen: We understand quite clearly that resources are predominantly within the purview of the provincial governments. It's really up to the provinces to find what they think is appropriate within those regions, whether it's an economic development related to mineral exploration or otherwise.

With respect to issues of broader national concern, we respect the fact that the federal government has purview in those issues. In such a case, where a mineral project may reach that type of importance, there may be voracity around taking those additional steps.

We certainly do, by and large, agree with the idea that the provinces understand their resources quite well and are able to administer the regulations around this industry as well as possible.

Mr. Michael Kram: This has to be quick, because I'm almost out of time.

Three years ago, PDAC made a submission to the Senate committee on energy, the environment and natural resources about Bill C-69, indicating that the numerous costly studies earlier in the process would be a significant burden.

Is that still the position and experience of PDAC?

Mr. Jeff Killeen: I would say, definitively, that we were focused on a social licence to operate as an industry and as an association, as well as on how we could assist our members in being able to get to that point with their projects in asset development.

When we consider where we are today, in 2022, with respect to generating that social licence to operate, it often means that companies and proponents will have to consider additional steps, and rightfully so, in order to ensure that the ideas and concepts they're hoping to bring to their projects are well understood.

With that in mind, I certainly appreciate where companies today are going above and beyond what is often the regulatory framework and what is required of them in terms of being able to engage with their stakeholders. They are ensuring that the public understands their projects and that their investors understand their intent.

At PDAC, we're thinking more about what companies should do to grasp and maintain that social licence to operate. Often, that angles activities well above the requirements from the regulatory process.

The Chair: Thank you, Mr. Killeen.

We'll move to Mr. Dong, for five minutes.

Mr. Han Dong (Don Valley North, Lib.): Thank you very much, Chair.

I don't know if MP Masse has come back yet, but I want to be on record saying that I will convey his message to the government. At the same time, I admire his effort to speak on behalf of his constituency—certainly I took notes—using every opportunity to speak up on behalf of his constituents and local businesses.

With that, I just want to make an observation.

Twenty years ago in China, the traditional combustion engine vehicle industry had just started. They were a very small player. Very quickly they realized that they couldn't play catch-up, so they found a very niche area at the time, we think, to strategically invest in, by purchasing mines and whatnot and looking at the future of electric vehicles and batteries.

That lesson made me realize that playing catch-up is never the best solution. I know it's a necessary thing to do, but we have many industry experts here. I would challenge them to give more advice to the government on where Canada should really invest and focus—it could be a very small but very important part of the supply chain—to make sure our future is secure.

My first question is for Mr. Killeen from PDAC.

Can you confirm that Canada has a large deposit of hard rock lithium? Is that the case?

Mr. Jeff Killeen: I wouldn't speak to any one single deposit in terms of what its capacity and capability is, but there is most certainly hard rock potential across virtually every province and territory in Canada. I think there are known showings or prospects for lithium of various species all across those regions as well, whether we're looking at northern Quebec, Newfoundland, Ontario or all the way through the territories.

The central point we're trying to convey to this committee is that the potential is vast. Our industry has, by and large, been focused on other things for over a century, if you think of copper and nickel, certainly as components in batteries and electric vehicles and technology. In terms of those peripheral things we've been speaking about, very little attention has been wrought from Canadian industry or from provincial and federal government programs in terms of public geoscience. It is a bit of a nuance, but it's really refocusing strategies we've had in the past in terms of their intensity and in terms of their intent to understand where critical mineral potential lies in Canada.

You'll see our members active all across the country in various forms in terms of exploration for critical minerals, but, as I mentioned at the start, we understand that less than 3% of domestic activity last year went towards things like rare earths, lithium or cobalt. We see a need to incentivize that end of our industry to try to draw more attention.

Back to the question that was asked earlier, apologies about our capacity: there are over 950 companies listed on the venture exchange today that operate in the mineral exploration industry. That represents over 50% of the venture exchange companies that are listed in Canada. When we think of the TSX overall, 35% of all listings are in the mineral industry, so the capacity we have as an industry to be able to ramp up, whether it's exploration or extractive capacity, is truly there in terms of knowledge. It's really adding in some of those little pieces that can help us accelerate the pace that we can take on.

● (1420)

Mr. Han Dong: That's quite an answer, and I appreciate the additional information you gave us. In comparison to lithium brine mining, would you say that hard rock lithium mining is more environmentally friendly and easier, and therefore perhaps costs less and is more cost-efficient?

Mr. Jeff Killeen: I wouldn't want to speak to the very specifics of a cost comparison, but I would say there is a huge amount of hard rock potential in Canada. We have a huge amount of experience with respect to hard rock mining. The majority of mining that's conducted in Canada is hard rock, whether that's open pit or underground, and we are seeing new technologies brought to bear. In Ontario, the Borden mine is going to become the first all-electric vehicle underground mine in Canada. Steps are being taken by hard rock miners in Canada today to reduce the footprint, become more efficient and produce fewer emissions.

From that standpoint, yes, there's real potential to ramp up hard rock mining and the potential to bring more lithium products to market. We understand, though, that there's the potential for lithium deposits to be smaller and potentially more distantly located, so we may have to consider how infrastructure and processing capacity can really accelerate and leapfrog where we may reach short ends or gas in the supply chain. Small mines may not work on their own, but banding together as a collective through central processing hubs or infrastructure hubs is what can really help accelerate development in Canada and in the north.

Mr. Han Dong: In your experience—

The Chair: I'm sorry, Mr. Dong. That's all the time you have.

We have to move to Mr. Fast now for five minutes.

Hon. Ed Fast (Abbotsford, CPC): Thank you very much, Mr. Chair.

I'm going to direct my questions primarily to Dr. Burton and Dr. Zaghib.

Dr. Zaghib, you mentioned the time it takes to get mines into production, and the long approval process. You have to establish processing facilities, etc. I'm curious to know whether there are any operating lithium mines in Canada today.

Dr. Karim Zaghib: I believe that there is a project right now called Nemaska Lithium, and there was Canada Lithium. Today, they're at the stage of finalizing the process in order to produce it, which may be in one or two years.

As I mentioned, right now I cannot understand why it's taking a long time. I have worked in mining all my life. This makes no sense. If we want Canada to put up mining establishments, we should reduce the time. We should help. We should, as I said, form an inter-ministerial committee to help make the times shorter.

The process and the technology are mature. It's not difficult. From—

Hon. Ed Fast: Doctor, I'm sorry. My time is short.

So that I understand, what is the time frame for a mine to be prospected and then start the approval process or come into production? What is that total time frame today, under current regulatory processes?

● (1425)

Dr. Karim Zaghib: From what I know, it's more than five years.

Hon. Ed Fast: It's more than five years.

Dr. Burton, as we strive to develop EVs and an EV battery industry in Canada in the short to medium term, we're going to have to secure our lithium from outside of Canada, because we don't yet have a reliable or functioning supply within Canada.

Your testimony indicates that it is critical that Canada work with its allies to protect the security of our critical minerals supply chain. Our largest trading partner is the U.S. We have challenges with buy America. We also collaborate, supposedly, on critical minerals.

What is the state of the collaboration that presently takes place between Canada and the U.S. when it comes to the security of critical minerals?

Dr. Charles Burton: I don't have expertise in this area, but it seems to me that if you're looking for a reliable partner, the United States is a much better bet than the People's Republic of China.

We have to diversify our sources to the extent that we can. The main thing is that when this committee issues a report, we need to see some vigorous action on the part of government to implement what I anticipate will be the recommendations, judging by the consensus of all the people here.

Maybe after the end of the pandemic, there will be renewed energy in government processes. This clearly requires a terrific amount of attention. There's the change to facilitate getting action on these long delay terms that Dr. Zaghib has mentioned, and investment by the government, as a matter of national priority, to ensure that when push comes to shove, Canada will not find itself in a difficult situation.

Hon. Ed Fast: You mentioned earlier the Neo Lithium sale to a Chinese state-owned enterprise. My question to you is, having looked at that transaction and the fact that no enhanced security review was conducted—the minister said that a full security review was conducted, but certainly not the enhanced review that can be triggered—do you believe that the current standard that is set for conducting security reviews is sufficient?

Dr. Charles Burton: No, I don't. Particularly with China and their highly coordinated process, they can be inclined to make multiple investments that are just under the threshold areas to try to achieve their.... It's like playing a game of go; they eventually surround you and then you're stuck. No, I don't think it's sufficient.

We ought to really be looking at this in a way that is much more responsive to the reality on the ground. My concern is that there are elements within Canada that represent the interests of the People's Republic of China, consciously or unconsciously, which will probably dampen down the enthusiasm of the government for responding to this committee's report.

Hon. Ed Fast: I have one last question for Mr. Fortier.

How far away are we from having a full EV ecosystem in Canada?

Mr. Matthew Fortier: For a full ecosystem, we talked about the time frames for mining. That's a big part of it.

The great news is that we actually have a lot of that ecosystem. We have manufacturers. We mentioned Lion Electric. We have electric heavy-duty manufacturers and mining manufacturers. We obviously have a mature auto sector here.

The full ecosystem is going to take some time, for sure. That is on the upstream side. It's the mining, refining and processing. The great news is we've heard a lot about this. We have the capacity to do this, but it is going to take some time. That doesn't mean it's not worth doing.

The great news is that people are going to be driving electric vehicles for many years. We don't need to be doing this next year, but that doesn't mean we shouldn't be starting to ramp up capacity towards the end of the decade.

The Chair: Thank you, Mr. Fortier and Mr. Fast.

We'll move now to Mr. Erskine-Smith, for five minutes.

Mr. Nathaniel Erskine-Smith (Beaches—East York, Lib.): I want to ask Mr. Zaghib and Mr. Killeen questions around the timelines for these development projects.

Mr. Zaghib, you indicated that we need to speed up the timelines. With greater specificity, what does that look like?

Dr. Karim Zaghib: I believe, if we can make the mine in less than four years, that would make sense. The transformation is about two years for existing materials.

I can give one example. If we mine graphite, it could take less than four years. If we have the raw material—the graphite—it would take one and a half to two years to bring graphite to the market, with the transformation, purification and so on. If you are going to develop new materials with the technology that's here, it usually takes 10 years. Then, if we have the programs supporting EI, we could shorten it to five years.

It could be four years, one and a half to two years, and then less than five years for new materials.

● (1430)

Mr. Nathaniel Erskine-Smith: That's very helpful insofar as the government could well set targets for approvals and moving things forward quickly.

To that point, Mr. Killeen, other than timelines, are there specific recommendations around regulation that could move things quickly?

Mr. Jeff Killeen: I'll step back and just talk about the timelines for a moment as well.

In bringing something from exploration to an extracted mine, exploration is certainly onerous. As I talked about earlier, the odds of success are pretty low. It's very capital intensive. Most of the exploration companies that exist today are pre-revenue. They don't have earnings from an operating mine somewhere, so they're reliant on going to capital markets, raising new equity and putting that equity in the ground in hopes of finding something.

The exploration process itself can be very onerous. It could take five to 10 years to actually define an economically viable deposit through typical exploration processes. That's just the time and effort it takes to get through that.

If we were going to start to activate our industry today, take them to a particular place in the country and start doing those exploration activities to bring new production, we might be looking at a decade before we have that inventory we've been speaking about. That is why it's so critical, in our minds, to expand incentives, get those drills turning and do that type of proper groundwork.

Mr. Nathaniel Erskine-Smith: It always seems there are two ways for the government to intervene here to speed things up. One's on the regulatory side. If you can follow up with a brief on specific changes on that, I'd welcome that, because we just don't have the time.

On the dollar and cents side, given the increasing value of critical minerals, I have to say I'm a bit skeptical that expanding tax credits is the best use of public money at the moment in this space. Convince me otherwise.

Mr. Jeff Killeen: I appreciate that sentiment. Let me give you a sense of the return on investment for somebody who's looking at this sector, because it's very relevant. We think about the concept of critical minerals and the industries they're going to feed into.

A gold deposit could exist, theoretically, in northern Ontario or the Northwest Territories. You could have a process facility on site. You could produce the material on site. You could fly the revenue-generating material off site. The amount of infrastructure that's required to go into that and the timeline it'll take to develop the infrastructure to bring that product to market is extremely short compared to what we're talking about here with respect to rare earths or things that may not have current processing capacity in Canada.

When we think about where the next dollar of investment is going to go into the ground in terms of Canadian exploration, it's inherently attracted to those things that have a shorter timeline for investor return, like a gold deposit or, potentially, a copper deposit that's in a known area with processing capacity.

That's why we're really focused on this idea of expanding an incentive for a part of the sector where very few funds actually go, and for something that requires a significant amount of exploration effort to start to understand where these production centres and this capacity could be.

Mr. Nathaniel Erskine-Smith: That's a helpful answer.

Mr. Breton, in relation to moving away from the critical minerals mining piece and exploration piece towards the battery supply chain piece, I heard from Mr. Fortier that we want to do everything all at once. It occurs to me that Canada also might take a step back and ask where we can strategically add value in a global supply chain.

Where can Canada add strategic value in a global supply chain?

Mr. Daniel Breton: Actually, right now some companies in Canada are already working on battery packs. Some companies want to invest in battery cells right now. We're moving forward in that direction. We have electric vehicles being built right now in Canada. As Brian Masse mentioned, whether it's cars or trucks or school buses or snowmobiles or boats, we don't have to wait for the mines to keep moving forward. However, to have the whole supply chain, the mining part is very important.

We have to think about the fact that when we're talking about critical minerals, if we want to talk to our American friends, we have to say to them that it's not just about the environment; it's also about national security. When we talk national security, the Americans listen. These issues regarding critical minerals also have to do with defence. To me, this has to be part of the conversation as well.

● (1435)

[*Translation*]

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

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

Mr. Sébastien Lemire: Thank you, Mr. Chair.

My question is for Dr. Zaghib.

Dr. Zaghib, first of all, I want to thank you for your testimony and for the expertise you are sharing with us.

I remember that you were an advisor to the Quebec minister during the development of his strategy. I would like you to tell me to what extent Quebec has what it takes to create a complete lithium value chain and become a leader in this field.

Do you have any concerns about the federal government?

I would also like to know if the famous centre of excellence that the government has announced could be located near the resource, in a place where there is university expertise. For example, would you be prepared to collaborate on a centre that could be located in Abitibi-Témiscamingue?

Dr. Karim Zaghib: Quebec is an excellent example of the circular economy, from the mine to the cell to the recycling of the urban mine. There is complementarity. We should work together and develop this complementarity between Quebec, Ontario, and the federal government.

Today, for example, Mr. Breton talked about the specificity of Quebec in terms of trucks and snowmobiles, in particular. The same is true for the specificity of Ford and GM in Ontario. We should work together to establish common intellectual property, a strategy to establish cross-licensing, a strategy to change technology, and so on.

As I said about the centres, in a global way, we should take care of our industry, which was abandoned a long time ago. It should be re-established and developed in a complementary way. The federal government should have no choice but to support the provinces. For example, if a company is brought in that can provide 25% of the funding for a cell, the government should match that. I think this is in the national interest.

We should quickly position ourselves with regard to the manufacture of active materials for the anode or cathode and the cells. This is what is most important for the electrification of transportation.

Mr. Sébastien Lemire: Thank you very much, Dr. Zaghib.

Mr. Breton, we are now talking about catching up, but is it too late?

Mr. Daniel Breton: It's important to talk about catching up. When I was young, in the 1970s, many Americans made fun of Japanese cars. In the 1980s, people made fun of Korean cars. Today, no one makes fun of Japanese or Korean cars, because they are good vehicles. We can play catch-up in Canada in terms of electric vehicles, whether they are light, medium or heavy vehicles.

We say that we want to make a rapid shift towards the electrification of transportation in order to create jobs, but we also say that we want to make a rapid shift in the fight against climate change. We have set ourselves an objective for 2030, which is to significantly reduce our greenhouse gas emissions. These two intentions must come together.

For our part, we launched the EV 2030 Action Plan precisely to ensure that jobs are created while we fight climate change. We can't do one without doing the other. Otherwise, we will be at a crossroads, which will not be good for the climate or for jobs.

Mr. Sébastien Lemire: I hope you are not telling us that people are making fun of the Canadian industry.

Thank you for your answer.

The Chair: Thank you, Mr. Lemire.

As Mr. Masse had to leave, I will give you the floor, Mrs. Gray, for five minutes.

[*English*]

Mrs. Tracy Gray: Thank you, Mr. Chair.

My questions right now will be for Mr. Breton at Electric Mobility.

You were before the trade committee last year on our clean-tech study. It's good to see you again.

You're concerned by the dominance of one country that we're seeing right now with critical mineral supply chains. Would you say it's a fair comment that this is a concern of yours?

Mr. Daniel Breton: It is a fair comment. I would not want Canada and the U.S. to be in the same position that we were in with geopolitical tensions in the 20th century because of our dependence on foreign oil.

What we are seeing right now in working in energy transition is that we want to make sure we have diversified sources of supply for critical minerals. Canada can be a reliable source for critical minerals for friendly countries like the U.S., and for Europe as well.

Mrs. Tracy Gray: Are there other ways in which your industries are being impacted right now by Canada's not having a critical mineral strategy?

● (1440)

Mr. Daniel Breton: As I mentioned earlier, it is not just Canada. None of the western countries have been listening enough to what I and other specialists like Karim have been saying for decades regarding the transition towards electric mobility. This is not something new. It's just that countries are now realizing that we are in the middle of a shift towards electric mobility. Now, all of a sudden, everybody is waking up to that fact, and we really have to move a lot faster than we would have had to do if we had started this shift 10, 15 or 20 years ago.

Mrs. Tracy Gray: Are you seeing with respect to critical minerals a lot of red tape right now that might be impeding your industry?

Mr. Daniel Breton: That's a good question. We all say that we find the process quite long and the time is pressing. Yes, I would say that we need to accelerate the process. While we're saying we want to reduce our climate change GHG emissions, we have to accelerate exploration in critical minerals to make sure we produce cleaner vehicles, not in 20 years but in five to 10 years.

Mrs. Tracy Gray: Can you provide any examples that might be top of mind?

Mr. Daniel Breton: Yes. Right now, what we are seeing is that we have some companies making electric vehicles in Canada that have to get their batteries from China, because the processes to get the critical minerals and the cells have not yet been developed in Canada. When we talk to the CEOs of the different companies who are members of EMC, they are looking at this and saying, “Well, we want to make the switch, but right now it's taking too long, and we need to have those batteries now.”

Mrs. Tracy Gray: Can you just clarify? When you say, “It's taking too long,” is there something from a government regulation standpoint?

Mr. Daniel Breton: Well, like Karim said, we're talking five to seven or eight years to open a mine and to start having the minerals and getting them processed. Right now, 99% of the lithium that's being extracted from Canada goes to China to be transformed. This is not the way to go, we think. We have to make sure for national security reasons that we have enough of a supply of critical minerals to be able to make those cells and those batteries in Canada. It is not happening right now.

I could get back to you on that with more details if you want, after this panel, but yes, there are some issues with the amount of time it takes to open a mine, and not only that, but to look at processing and what can be done in Canada. We don't process much of anything in Canada at the moment.

Mrs. Tracy Gray: Also, we've already seen shortages in products like microchips and semiconductors, due to growing demand. If the Chinese regime were to choose to retaliate against Canada by shutting out or reducing access to these critical mineral supply chains, what effect would that have on your sector?

Mr. Daniel Breton: It would be devastating, because obviously electric vehicles need more microchips than gas vehicles do, so the more technology we put into cars, the more we need microchips. Relying on microchips that come from China, for instance, can be a real issue.

I know some plants are going to be opening in the next few months, because we've seen what happens when the supply chain comes from very far away, not just for electric cars, but for everything. We've seen that with masks. That's something we have to look into as well, not just for the critical minerals but for the microchips as well, because we are seeing that to get them made close by brings safety, which we haven't had in the past two years because of microchip issues and COVID.

Mrs. Tracy Gray: If you don't mind providing that information to the committee, that would be very beneficial.

The Chair: Thank you, Madam Gray.

We'll turn now to Mr. Fillmore for five minutes.

Members, we'll have 10 more minutes, so if others want to have questions just let me or the clerk know.

Mr. Andy Fillmore (Halifax, Lib.): I want to start just by leaving a thought with Mr. Breton.

Mr. Breton, you heard Mr. Masse mention diversifying the use of electric batteries in Canada, and he mentioned snowmobiles. I just want to surface electric bikes. I'm a planner, and I was the parliamentary secretary to the Minister of Infrastructure in the last Parliament, leading the development of Canada's first national active transportation strategy and fund. I can tell you, from the nationwide consultation that we undertook to develop that, that there's a tremendous and growing appetite for e-bikes in Canada, so I hope to see that come into the narrative. I'll leave that with you. Thank you.

I want to ask the same question to both Dr. Zaghib and Mr. Fortier, although through a different lens for each.

For Canada's aspirations in this space, should we be focusing on the hard rock variety of lithium or the brine lithium? I want to get answers from both of you.

Dr. Zaghib, could you focus your answer on the lens of the raw material processing and the electric chemistry perspective? Which one should we be focusing on? Is there a better one?

● (1445)

Dr. Karim Zaghib: Yes, if we focus on active materials—coming from water, you make active cathode materials and active anode materials—it means we will become very competitive. We need a lot of energy, and we have low-cost energy and green energy. It's not very difficult and not very intensive on the finances.

[*Translation*]

In French, this is called the “composants d'électrode pour les batteries lithium-ion“—the electrode components for lithium-ion batteries.

[*English*]

Mr. Andy Fillmore: You mentioned energy in your answer. Did you mean the energy required to process?

Dr. Karim Zaghib: Yes, because to heat cathode materials we need 900 degrees Celsius, and for a heat treatment of artificial graphite we need 3,000 degrees Celsius, so it's really intensive energy. Also, CO2 emissions need to have active cathode materials with almost no CO2 emissions, and you have good traceability for raw materials. If we keep it inside Canada, we can export it.

Mr. Andy Fillmore: I'll turn to Mr. Fortier now, and I think Dr. Zaghib got into it a bit.

When we think about the processing in Canada that can be done in a green way, resulting in green lithium through hydro power with no global transport, we're producing the lithium in Canada, and that's a good thing. We're keeping Canadian jobs and Canadian dollars in Canada, adjacent to vehicle construction and all that.

Could you just share with me, Mr. Fortier, whether or not your group has any perspective on hard rock or brine? Which should we really be producing to be smart in the years ahead?

Mr. Matthew Fortier: I'll answer that directly and say that it's both, and the reason is that we need a lot of this stuff.

We've talked a lot about dependency on foreign powers for these materials, and that's a real issue, but a longer-term issue is that actually the world is going to need a lot more of all this stuff. If we want people to be driving electric cars, for example, by 2035 or 2030, then we need to have the capacity to put these batteries together.

The reality is that as a country we should be supporting companies that are prospecting and developing hard rock. We should also be supporting companies that are developing innovative solutions around brines. They exist in different parts of our country, and that's the good news. Different regions of this country can be involved in this, and that's a great news story. This can create economic activity across the country.

One more thing I'd say is that if we think about the electric vehicle sector as being from mining all the way through to mobility and recycling, it's economically multiplying. If you have an OEM that's set up to build an EV, and that OEM sources materials within Canada, that means we're creating jobs throughout the supply chain and the value chain. That's great news.

To answer your question, it's both, and graphite and cobalt and manganese—and we can do it.

Mr. Andy Fillmore: Thank you for that.

It seemed Mr. Breton had something he wanted to say about e-bikes, so maybe I can give him the last 45 seconds.

Mr. Daniel Breton: You're absolutely right. When we're talking about electric mobility, we have to look at the broad spectrum of mobility, because within Electric Mobility Canada we have members, actually, who build and sell e-bikes.

It's e-bikes, it's cars, it's buses, it's trucks, it's boats, it's snowmobiles, it's waterskis. You'd be surprised. Now we have mining trucks that are fully electric. That's how far we're going.

● (1450)

Mr. Andy Fillmore: That's fantastic. Thank you.

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

We have about 10 more minutes. I'll give each party—the Bloc, the Conservatives and the Liberals—three minutes each.

For the Conservatives, I think we have Mr. Fast.

Hon. Ed Fast: I'll just ask a brief question of Mr. Killeen. I've taken note of your request that the METC be increased, and we'll take that back for consideration.

You mentioned that you'd like to see an increase in public geoscience funding to inform future decisions on things like infrastructure, but you also talked about increasing our understanding of what our inventory of critical minerals might be.

Do you have any rough idea of what our potential as a country might be in terms of rare earths and critical minerals, and what the future might hold for us in terms of leveraging those assets to greater prosperity and developing a robust EV system?

Mr. Jeff Killeen: I would suggest that the government does a pretty good job of tracking some of this information. We use Natural Resources Canada as a good resource ourselves to understand where opportunities may lie.

If we look to the current list that NRCan has in terms of the top 100 exploration projects in Canada, there might be only one project on that list that is a lithium project. There are some uranium projects, but by and large you will see those projects earmarked as more traditional—for instance, copper, nickel or gold.

When we think about what our current inventory is in Canada, it's not very extensive when it comes to some of the lithium products that we've been speaking about, or rare earths. However, from the potential aspect, we're certainly confident that it is very high. It's not just notionally so, because we enjoy a big geography; it's factual, because of the results that companies have had over years in terms of exploration in different terrains around Canada. I'd say the ability to build up our inventory is extreme. There's huge potential there. Now it's just a matter of directing the investment dollars and the attention towards those ends of industry.

When we think about how we can accelerate that, we think public geoscience is important, because we understand there are bigger questions at play in front of Canadians right now. We are attempting to conserve 30% of our lands and oceans by 2030. We are attempting to become a net-zero producer of carbon emissions by 2050. These are huge challenges all at the same time while we're looking to expand this industry and create more opportunities for our supply chain to feed into the global marketplace.

When we think of those things in concert, it really brings us back to the central question. We need to know where things are and how we want to develop them, so that there can be those proper conversations; we can generate those social licences to operate, and we can really get all Canadians behind the concept.

The Chair: Thank you, Mr. Fast.

We'll now go to Mr. Lemire for a couple of minutes.

Mr. Lemire, I took you by surprise.

[*Translation*]

Mr. Sébastien Lemire: Thank you, Mr. Chair.

I thought a Liberal member would speak before me.

Dr. Zaghib, I would like to take advantage of your presence and expertise.

Can you talk a little bit more about the dynamics between Ottawa and the provinces? What is the federal-provincial relationship, whether it's Quebec or Ontario, right now? What are you afraid of?

Is the context favourable for the government to act now?

Can you give us the parameters of the opportunity that is being presented to us in terms of strategic critical minerals?

Dr. Karim Zaghib: In my opinion, we should not be afraid. Personally, I am very optimistic. Universities in Ontario and Quebec are working hard to develop an initiative on a common research and development platform.

I will give an example. Nickel is found in Quebec and Ontario. There is an opportunity for collaboration.

I think we should do more to have a secure and stable supply chain in Canada. In my opinion, we should join hands to create a win-win situation for everyone. In this way, we will be able to position ourselves together on the Canadian market and on the international market, particularly in the United States and Europe.

Mr. Sébastien Lemire: There is, however, a challenge in terms of processing the resources to create the famous cells.

Do you believe that Quebec is ready to engage in this processing activity?

Do we have all the tools to do this and to supply the market for electric vehicles in particular, but also that for heavy vehicles, among others?

● (1455)

Dr. Karim Zaghib: To make the battery cells, you have to go through the process of making the anode and cathode from the processed minerals. This all makes sense. You should create an ecosystem to avoid transporting the minerals, which would reduce CO2 emissions. The cells can be made in Quebec. Ontario can make the modules and battery packs.

Let's not forget that Quebec has Hydro-Québec and a lot of electrical energy. With this inexpensive green energy, Quebec could manufacture the cells and ship them to Ontario for the module and battery pack assembly.

I believe that this complementarity would be the best solution for both provinces.

Mr. Sébastien Lemire: I have one last question about full authority in Quebec for environmental standards.

Do you think there might be some friction in the application of Canadian standards and Quebec standards?

Who should have primary jurisdiction in this area between the federal and provincial governments?

Dr. Karim Zaghib: I would like the province to have priority. This is important, because the traceability of minerals is done mostly at the provincial level.

I think the federal government can be there and work with the provinces. So I would give priority to provincial standards.

Mr. Sébastien Lemire: Thank you very much, Dr. Zaghib.

Thank you, Mr. Chair.

The Chair: We have one last round of questions.

Mr. Fillmore, you have the floor for a few minutes.

[*English*]

Mr. Andy Fillmore: We may have heard pieces of the answer to this question throughout the meeting, but I would like to sweep them all together into one place.

We've heard a number of witnesses talk about how things aren't moving quickly enough in terms of extraction in Canada. I know that Minister Champagne, Mr. Lemire and I are very eager to get products coming out of the ground in Nemaska, for example, but also across the country, and there are other possibilities that have been mentioned. I think it would be very helpful to identify in very clear terms for the committee what the roadblocks are that keep us from moving more quickly.

Perhaps I could start with Monsieur Fortier or anyone else who has an opinion on that, but really it's open to anyone who'd like to jump in. What are the roadblocks, and what can we do differently?

Mr. Matthew Fortier: I'll start, and I'll be very brief because I'd like to hear others.

We've heard some of the roadblocks in terms of it taking a long time from developing a deposit to getting it out of the ground. That's a huge roadblock. There are regulatory challenges there. We know that, but there are also capital challenges, so we need investment, both from government and foreign direct investment. We need to attract private investment. We need to double down on processing. We need project demonstrations, and we need to see this as a bigger opportunity than just getting stuff out of the ground and shipping it overseas. That's a roadblock, and it's also kind of a cultural one, too.

Mr. Andy Fillmore: Thank you.

Go ahead, Mr. Killeen.

Mr. Jeff Killeen: Yes, I'd certainly like to pick up on that to take it further.

Social awareness, the underlying evidence we've been talking about, trying to generate that so we understand where these steps need to be taken.... We talk about timelines for development, and that's regulatory and technical, but there are also social aspects we need to be aware of. For new mines to be developed and for new processing facilities to be built, people have to understand where these things are going to occur, and we need to ensure there's a really firm understanding of what the benefits are going to be.

Mr. Andy Fillmore: Thank you.

I saw Mr. Breton's hand.

Mr. Daniel Breton: I'll say two things. First, as a former environment minister, I think it's very important that we work in a thorough way regarding the environmental impact of mines, and that we make sure that this process goes faster than it's going right now.

We haven't talked much about this, but one very important key part of the future of electric mobility is going to be recycling—what we're calling the second mining of electric vehicles—because, unlike oil, these critical minerals are recyclable indefinitely, so we have to make sure we develop an industry for recycling those battery components so that we can reuse them a second, third and fourth time.

Mr. Andy Fillmore: Following up on that, are there implications in standards for manufacturers that would ensure that the ability to extract the components into their fundamental pieces is as easy and accessible as possible? Is there anything we should be focusing on there?

Mr. Daniel Breton: Absolutely.

Presently, the Government of Quebec is looking into this. The European Union is looking into this right now to come up with advanced regulations and battery passports, so that we know where the batteries go during their life cycle. We can then recycle them. There's a responsibility on the producer of this battery, called extended producer responsibility.

Yes, we have to look into this. Right now in Quebec, the discussion is ongoing, but people from NRCan are looking into it so that we can come up with a possible federal regulation on the best ways to incentivize battery regulation and battery recycling in a responsible way that will promote innovation.

● (1500)

Mr. Andy Fillmore: Thank you.

Do I have any time remaining, Mr. Chair?

The Chair: I'm afraid not, Mr. Fillmore, but that was a good try.

Thank you to all of our witnesses for being here today. It's been a great conversation to inform the work of the committee going forward, so many thanks to all of you for taking the time this afternoon.

I wish all members and all witnesses, our analysts, the clerk and the interpreters a very good weekend.

This meeting is adjourned.