



HOUSE OF COMMONS  
CHAMBRE DES COMMUNES  
CANADA

## **Standing Committee on Natural Resources**

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RNNR • NUMBER 031 • 1st SESSION • 42nd PARLIAMENT

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**EVIDENCE**

**Thursday, November 3, 2016**

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**Chair**

**Mr. James Maloney**



## Standing Committee on Natural Resources

Thursday, November 3, 2016

• (0845)

[English]

**The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)):** Good morning, everybody. We're going to get under way here.

Thank you to our three witnesses for joining us this morning—Mr. Nolan, Ms. Flood, and Mr. Hollings—and for travelling to Ottawa to speak to us today. In terms of the format, I will give each of you up to 10 minutes to make comments, and then we'll open the floor to committee members to ask questions. There are earpieces available to you, which I encourage you to use, because you may be asked questions in French, and some of the discussion may take place in French as well.

I will open the floor to whoever volunteers to go first.

They're all looking at you, Mr. Nolan. I think that means you.

**Mr. Glenn Nolan (Vice-President, Government Affairs, Noront Resources Ltd.):** Okay. I guess it's appropriate, since my people were first here.

First of all, I'd like to say that we're meeting here on the traditional territory of the Algonquin. It's an honour to be sitting here representing the company I'm going to speak for.

Good morning ladies and gentlemen, honourable members of Parliament, the staff, and my fellow colleagues here at the table. My name is Glenn Nolan. I'm the vice-president of government affairs with Noront Resources. I'm also a former chief of the Missanabie Cree First Nation here in northern Ontario.

I'd like to discuss the experience of Noront's working in conjunction with both the province and the federal government in engaging local indigenous communities in the development of our resource projects.

Noront Resources is a junior mining company with the largest mining claim holdings in the Ring of Fire, an emerging mineral-rich region located in the James Bay lowlands of northern Ontario. It's about 500 kilometres north of Thunder Bay. The Ring of Fire is considered by many as the most important new mineral resource region in the province, if not in all of Canada. Noront's lead project is our Eagle's Nest copper-nickel-platinum-palladium deposit. It is one of the largest high-grade nickel sulphide discoveries in Canada to date.

Since discovering Eagle's Nest in 2007, Noront has made extensive efforts to engage local communities to help guide the project and maximize benefits to those communities potentially

impacted by our activities. Special efforts have been made in engaging the youth, sharing the importance of education and possibly a vocation in the industry. We also made efforts in developing skills that will prepare individuals to find jobs or business opportunities to support our projects. We are also involved in communities, going above and beyond what is required under the environmental assessment process. Of course, the last thing is the importance of infrastructure to the far north, where there virtually is a blank slate. There are no roads, no power, etc.

First of all, Noront employees have spent considerable time in the local first nation communities engaging with the youth through various programs such as youth camps, art projects, and school events. The programs in the communities have been successful in teaching the youth about continuing their education and about what mining is and what they can do to participate. A particularly successful initiative was the movie-making program called "So You Think you Know Mining", which was offered by the Ontario Mining Association. It resulted in some of the youth from the Matawa communities that are our partners winning the provincial competition and being recognized at a gala event in Toronto.

The second point I'd like to make is with training. Noront has made considerable progress to provide opportunities for training and education, employment, procurement, business development, and community investment. As an example, we established the Ring of Fire aboriginal training alliance, or RoFATA, in partnership with the Matawa First Nations employment and training services, also known as KKETS, and Confederation College, located in Thunder Bay. The program provides skills-based training and guidance for long-term career paths for the members from the Matawa communities who are interested in working in the mining sector. Over 400 individuals have participated and graduated from the RoFATA program since it began in 2013. Individuals have had training in areas such as heavy equipment operation, environmental monitoring, diamond drilling, industrial trades, underground common core, and remote mining operations, just to name a few of the skill development areas.

The third point I want to address is the importance of the natural environment to the local communities. Noront's team has effectively established relationships over many years by working closely with the local communities to understand their concerns regarding the impact of the projects. From these relationships and discussions, Noront has redesigned aspects of our Eagle's Nest project to address those specific concerns with regard to water, surface development, tailings, and local economic needs.

●(0850)

Early engagement with the local first nation communities regarding the environmental assessment process revealed a common set of environmental concerns. After extensive consultations with the communities, Noront changed its mine design to reduce the footprint of the mine infrastructure, committed to recycling processed water to limit the amount of discharge, and developed a process whereby all tailings would be returned underground, eliminating the need for a surface tailings containment dam.

The last point I want to talk about is infrastructure into the remote regions of Ontario. While this is under provincial jurisdiction, the federal government can play an important role. The more remote a mining project is, the more important the discussion about infrastructure becomes.

The basic need for roads and power are uniform across the north, whether it be for local communities to address their needs or for mining companies when they are planning their projects. Indigenous communities and mining projects will share in the benefits of new roads and power lines in the remote regions of northern Ontario. Everything from lower costs for building materials from the south year-round to economic development opportunities come from this type of development.

I want to make the following points.

Engaging youth at an early stage is vitally important in laying a foundation for building awareness of the industry and building trust within the community. It showcases the importance of continuing education for students, not just for mining jobs but for the opportunities advanced education allows.

In the case of the environmental assessment, it helped our company design a better plan to reflect the concerns and ideas that came from the local communities. The federal government needs to work more closely with the industry to ensure that the requirements of the federal environmental assessment process are also reflective of the needs of the local communities.

Early engagement in training initiatives is also very important. It provides increased awareness among community members about the industry and the opportunities arising from the project. In the past, and even today, the federal government has supported training initiatives in the RoFATA training program.

A new road and power infrastructure in remote areas will bring not only benefits to the mine but to the region and the isolated communities. It's important that in partnership with the province, the federal government can play a significant role.

In conclusion, at Noront, our team believes that it is setting a standard for future development in our operations. It will create the necessary momentum for an inclusive, mutually beneficial culture for first nations, government, and industry.

Thank you very much. *Meegwetch.*

●(0855)

**The Chair:** Thank you very much, Mr. Nolan.

Ms. Flood.

**Ms. Ginny Flood (Vice-President, Government Relations, Suncor Energy Inc.):** My name is Ginny Flood. I'm the vice-president, government relations, with Suncor Energy, and I am based in Calgary. Thank you very much for the opportunity to present today, and good morning to everyone.

I appreciate the opportunity to appear before you today on behalf of Suncor Energy. We're happy to return to the standing committee as you continue your study on the future of Canada's oil and gas, mining, and nuclear sectors.

My colleague, Steve Reynish, executive vice-president, strategy and corporate development, appeared by video conference in May when your focus was on the oil and gas sector. I'm pleased to be here to provide a perspective on the future of mining.

We have deposited the full text with the committee clerk, so I'll try to keep my remarks fairly brief so we have a lot of time for the discussion.

The mining sector in Canada is vibrant and important to the future development of Canada's natural resources. Suncor is proud to be an active member of the Mining Association of Canada, and we work to promote MAC's towards sustainable mining initiative, focused on three key elements: engaging with communities, driving world-leading environmental practices, and committing to the safety and health of employees and surrounding communities.

Since Suncor began oil sands operations in 1967, our industry has changed. It's grown and evolved significantly. We believe that Suncor is a great Canadian success story. For example, in 1992, Suncor went public with an IPO valued at \$800 million, and today our market cap is about \$65 billion. Next year, Suncor will be celebrating its 50th anniversary in the oil sands operations, the same year Canada celebrates its 150th.

With respect to mining, it's important to note that only about 20% of the oil sands resources are recoverable by traditional or open-pit mining techniques, with the remaining 80% recovered through various methods of in situ processes. Our past as well as our future success depends on being innovative.

Going forward, innovation will remain key to our ability to extract benefits from these resources for Canadians across the country for generations to come. We are keenly aware of the focus currently being placed on the transition to a low-carbon economy. We believe that Suncor has an important leadership role to play in this area.

Our vision is to be a trusted steward of the natural resources. We believe that through sustainable development focusing on economic prosperity, a healthy environment, and social well-being, we'll be able to help Canada meet its energy needs using oil derived from the lowest carbon intensity in the world. That long-term goal today means continuing to invest in various innovative technologies that improve our economics and reduce our environmental footprint, both in the oil sands specifically and across the company. On average, we invest about \$200 million annually in technology and innovation.

Analyst projections in the foreseeable future are that the worldwide demand for energy will increase and that oil will remain a very significant part of the energy mix. The view of the future also comes with a growing recognition, especially with climate change, that the energy sector will need to transform itself to succeed in an increasingly carbon-constrained and cost-competitive world.

The World Business Council for Sustainable Development said it best in framing the 2050 climate change challenge as "9 billion people living well within the limits of the planet". The goal of the energy system in this context is to deliver to nine billion people safe, affordable energy that minimizes carbon emissions.

At Suncor, we recognize the part we play. We are working hard to continue to reduce emissions. We measure our progress by the total emission intensity from the production of oil and petroleum products. We're committed to reducing our GHG intensity. We'll measure our progress against the target of reducing it by 30% by 2030. Our industry's ambition is to produce our oil with lower levels of greenhouse gas emissions than any other source of oil.

● (0900)

To reduce the GHG emission intensity, we are investing in new technologies. In mining, that includes waterless extraction processes, froth-treatment technologies, and autonomous haul systems. At in situ operations, that includes both solvent and microwave-assisted extraction processes, as well as more efficient steam-generation technology.

Of course, all of that requires collaboration across industry through organizations like Canada's Oil Sands Innovation Alliance, COSIA, and with government on public policy. We encourage governments to work with us through a robust R and D effort to reduce the carbon footprint and improve the economics of the future oil sands development.

Collaboration among energy producers, services, and technology providers, academia, indigenous groups, and the public sector is a necessary cornerstone to success. Together, we have innovative capacity and the paths to deployment to commercially implement clean technology to ensure Canada's oil remains carbon and cost-competitive. We can sell our cleaner oil worldwide, creating jobs and prosperity for Canada, while lowering global emissions.

Mining has also been an important part of Suncor's integrated model of operations. Fort Hills, our newest mine, is a reflection of that. Construction is now over 70% complete, with over 30-million construction hours safely behind us. We continue to advance the project with the aim of achieving first oil by the end of next year. The scope and scale of Fort Hills reminds us of the significant contribution that the oil and gas industry makes to Canada's

economy. It underscores the considerable contribution in terms of job creation, revenue for government, and meeting the energy needs of Canadians every day.

We also believe that aboriginal engagement, working with the aboriginal communities, is also extremely important. I won't go into any detail right now, but I'll welcome any questions regarding the equity partnerships that we've just recently announced.

Thank you. I'm looking forward to the discussion.

**The Chair:** Thank you very much, Ms. Flood.

Mr. Hollings, the floor is yours.

**Mr. Peter Hollings (Director, Centre of Excellence for Sustainable Mining and Exploration, Lakehead University):** Good morning, Chair and honourable members. Thank you for the opportunity to speak to you today.

Over the past few months, you have received numerous testimonies outlining the problems facing Canada's mining and exploration industries, and I would like to focus on the roles that academia can play in solving those problems.

To give you some background, I moved to Canada 15 years ago—probably 20 years ago now—for an opportunity to work in a country where there were close ties between the mining industry and academia. I spent years working in Australia with some of the pre-eminent ore-deposit research groups there, and I've been at Lakehead University for 15 years. I am currently the chair of the geology department and director of the centre of excellence for sustainable mining and exploration, or CESME.

I think you've been told a number of times that a healthy mining industry is essential to Canada and that the industry is not possible without exploration activities that will lead to new discoveries. Mining activity is vital for our economic development, but it must be done in an environmentally sustainable manner so that it benefits all the constituent communities. Groups like CESME, the centre of excellence for sustainable mining and exploration, with the support of government, can provide the cradle-to-grave research necessary to ensure that Canada is once again considered a leader in mineral exploration, mining development, and mining reclamation research.

There have been some amazing initiatives recently, like the Canadian Mining Innovation Council's footprints project, with 27 mining companies funding research, and the metal earth initiative at Laurentian University. These are good examples of how Canada is moving towards, and sort of following, the Australian model of focusing research in key, well-funded university research centres.

In order for mineral development to be successful, we need to consider not only those exploration features but also the full mining cycle, particularly meaningful engagement with first nations, as well as developing sustainable, green technologies for mining, exploration, and reclamation.

Mining has been one of the major pillars in the development of Canada and has contributed to its wealth and reputation as a resource-based economy. Although we have had many discoveries and scientific developments to aid in the discovery and extraction of minerals, there needs to be a change in the way that wealth from the industry is distributed if we are to make the industry socially and economically sustainable.

Too often the people of Canada have received only a small part of the value chain from mineral extraction. That is particularly evident in the indigenous communities. Research and policies that will lead to meaningful engagement with indigenous communities are long overdue. This involvement needs to be comprehensive, from business development and ownership to infrastructure development and decisions about royalties and benefit sharing.

The 2015 CESME published a policy paper called "The Role of Government Policy in Sustainable Mining Development" and we made a number of recommendations.

We suggested that regional, sustainable development frameworks that facilitate indigenous peoples' participation in decision-making are sorely needed. We see moratoriums today in a number of communities, prohibiting mining and exploration. This speaks to those communities feeling that they are not being adequately consulted at this point. All levels of government need to develop plans that balance the needs of industry with those of local indigenous communities.

There is a need for an effective consultation process that addresses the principle of free, prior, and informed consent as laid out in the UN Declaration on the Rights of Indigenous Peoples. This is necessary to provide certainty for the proponents, but also to ensure that the rights of those indigenous communities are fully met.

There needs to be effective local community involvement because this can lead to lower costs by hiring locally and providing companies with a social licence that ensures greater public acceptance of large-scale projects. The New Gold project happening up in northern Ontario right now at Rainy River is a really good example of where that's working very well.

There is a need for a regional strategic approach to environmental assessment and the establishment of an indigenous monitoring program to oversee long-term environmental impacts. There is also a need for government guidance in encouraging transparency in impact benefit agreements and other forms of agreements between the private sector and indigenous communities, so that the sector as a

whole can implement best practices and not put individual communities at a disadvantage because of lack of information.

From a green technology perspective, our research institutions must provide new materials and technologies that can increase the value chain of resource extraction and that can be easily adopted in remote settings where technology and expertise are often scarce. Canada's natural resource industries and industry service providers must have access to advanced research facilities to characterize materials and processes and to maximize the natural resource value chain.

●(0905)

If I can, I'd like to finish with a number of recommendations.

We think it's important to facilitate easier access to post-secondary education for indigenous students to ensure there is that next generation of professionals, or that new generation of professionals, who can provide their communities with unbiased advice and guidance for future mineral development. There's presently an overreliance on consultants, who may not always have the best interests of those communities at heart.

We need to raise the awareness of the importance of mining in southern Ontario and the rest of southern Canada to ensure all of Canada benefits and recognizes the benefits of the vital industry.

We need to facilitate entrepreneurship in those indigenous communities to expand economic benefits from the mineral industry. It's really important that we establish best practices for industry and community partnerships, and that we facilitate funding for research that spans both the science and the social science fields to encourage collaboration and not competition between researchers.

There are many conflicting values between resource companies and communities. Companies want to advance projects, and communities want to protect rights. It's important to fund research that focuses on how this is being accomplished to allow projects to succeed with everyone feeling their values remain intact.

Thank you very much. I look forward to the discussion.

**The Chair:** Thank you very much.

Mr. Tan, you're up first for questions.

**Mr. Geng Tan (Don Valley North, Lib.):** Thanks, Chair.

Thanks to the witness for coming to this meeting.

In your presentations, you all mentioned the words “sustainable” or “sustainability”. The word “sustainable” has different meanings, and one of them is “able to last or continue for a long time”. I know when the mining companies start their explorations or production in local areas, they bring in business, training for jobs, and money.

What can the mining companies do to encourage local businesses and stimulate local areas of the economy, so that a legacy is left once the mining company has ceased its operations or depleted the local ore deposits? How can the community sustain itself and prosper after the mining company has left the area? What is the best way companies can help the local community and local economy for the long term? What can the federal government do?

● (0910)

**Mr. Glenn Nolan:** That's a great question, because I think what it will help to identify is the opportunity to talk about a legacy that's sustainable. Any time you put people to work, you're creating a legacy, you're building skills, you're building knowledge, and you're building experience they can take elsewhere, if that's the opportunity and that's their desire in the future.

What we're seeing with more and more companies is that they're hiring more people from the local population. There are training programs that are more localized to encourage more people to find the skills and the experience through the training programs, so that they can then participate in the local projects. I think that in regard to sustainability, while the ore resource might be diminished or taken away, what you have is a group of trained individuals and companies that can then provide opportunities elsewhere, or go elsewhere for the same kind of work, or deliver the same kind of service.

**Ms. Ginny Flood:** In the case of the oil sands, they are long-term assets. Fort Hills and many of our assets are more than 50 years old. Working with communities and working with the aboriginal communities is a huge opportunity for us as well as for the communities. Reiterating the comments that Glenn just made, I think it's about creating the business climate where they prosper well into the future, and that's about the skill sets.

We've also done a fair bit of work, as I mentioned in my remarks, around looking at how we're working with the aboriginal communities. One of the things that we've just recently announced is an equity partnership with the Fort McKay First Nation and the Mikisew Cree First Nation, and a combination of 49% in our east tank farm project, which will continue to provide a sustainable revenue source over the long term. It's a business to business deal. It also helps understanding and increases the capacity within that community.

I think the other thing that we do a fair bit is a lot of work with the community. Fort McMurray is basically built around the oil sands business, and we do a lot of work within that community to ensure that it is prospering. At the moment, we're rebuilding Fort McMurray, and I would say the recovery is still under way, but it certainly shows the efforts and the work that we're all putting into that to build the capacity in that community to ensure that it's going to thrive well into the future.

**Mr. Peter Hollings:** Very quickly, I would concur. I think entrepreneurship is critical in leaving a legacy of companies, small businesses, that can thrive once the mine closes. On infrastructure, I

think it is vital to ensure that we develop these mines in a way that we leave a sustainable infrastructure that benefits the communities long after the mine is closed.

**Mr. Geng Tan:** Okay.

Another question goes to Dr. Hollings. From the notes, I can see your centre carries a very wide range of researchers and also has very good, close connections and collaboration with industry. Have you ever tried to move your knowledge, your innovation, from a bench scale to the industry, for example, running a pilot test on the industry side?

**Mr. Peter Hollings:** A number of the professors we have working on green technologies are coming very close to that stage. They're at the point where they are actively seeking industry partners to get from lab scale to the pilot study. That can be challenging. Some of the mining companies—especially when profit margins are low like they are right now—are reluctant to try new techniques or mess with a working procedure to find a way to test that thing.

We're finding that some of the newer mines coming on stream, like Rainy River or Zenyatta, are very interested because they don't have a developed infrastructure in place. They're more willing to consider pilot studies.

● (0915)

**Mr. Geng Tan:** I see there is a need to move your knowledge forward, accelerate the transfer of your knowledge into the industry, and make use of industry. I'm asking this question because when I was starting university, my professor used to lead a big consortium that was supported by more than 20 companies, U.S. and Indian companies, so we had very close relationships with industry. Even with these connections, we still had difficulties identifying an industry partner that could accept us running the test in their plants. As a matter of fact, my master's thesis was delayed because of that.

I know the reason is that, whenever the manager agrees to allow you on site to run the test, it will typically cost the company money, time, loss of productivity, and other things. But as I mentioned, this is a necessary step.

In your experience or opinion, what can we do to move these things forward better and faster, and how can the federal government assist? Maybe it could be with incentives, or maybe you'd like to share some benefits with the industry.

**Mr. Peter Hollings:** I'll give you an example, and then I'll make a suggestion.

Some of the research I've been involved with recently has been looking at ways of expanding the footprint around a mineral deposit so they're easier to find. We've had consortiums of 20 companies involved. Of those 20 companies, I'm aware of two that have actively adopted the methods we've developed and shown to be successful. There has to be a willingness in the company to see the benefits of these and go ahead and do that.

In terms of what the federal government can do to facilitate that, I think you'll hear in the next session from my colleague Doug Morrison about CEMI—the Centre for Excellence in Mining Innovation—and there is a fundamental difference between the research we do as academics and taking that to a product that companies can use. Funding organizations like CEMI and the groups that do that is probably the better way to do that.

We also need to integrate those groups, the researchers all the way through, and again, funding research that is genuinely collaborative is a good step to moving those forward.

**The Chair:** Thank you.

I'm going to have to stop that line of questioning and turn the mike over to Mr. Barlow.

**Mr. John Barlow (Foothills, CPC):** Thank you very much, Mr. Chair.

Thank you to our witnesses for being here. This continues the pretty impressive group of people we've had providing testimony to this committee. We can't do the job without people like you who are willing to give up their time to be here and share their experiences and knowledge with us. We really appreciate that.

Ms. Flood, I want to talk to you briefly. I appreciate that you brought up Fort McMurray. I think we'd be remiss if we didn't thank you, Suncor, and some of the other energy companies around Fort McMurray that operate in northern Alberta. We certainly would have had a much bigger humanitarian disaster if it weren't for companies like Suncor that stepped in immediately and helped a lot of the residents of Fort McMurray with escaping the fire but also with the recovery. I just want to put that on the record and want to thank you for all the work that Suncor has done in that regard.

My riding is Foothills, which is in southwest Alberta. I would say a large chunk of my residents work in the oil sands in one respect or another.

You were talking about your market cap being around \$65 billion, and you invest about \$200 million in technology and innovation each year. That's probably a couple of per cent of what your value is. Does that fluctuate? We know we're in a recession, a downturn, right now. Does that impact the amount of money that you're investing in innovation and technology? If your goal and your focus are to reduce GHGs and to find different ways to improve extraction technologies, are there opportunities to invest further, to commit more of Suncor's funding toward those things?

**Ms. Ginny Flood:** I would say our investment and innovation have not really changed a whole lot, even in the downturn. Part of our innovation philosophy is that we have to innovate. Our company was the founder in the oil sands. The only way we've gotten to where we are today is through innovation.

Even though \$200 million doesn't sound like a lot, we also do a lot of collaboration through COSIA and through other types of partnerships, and through research with academia and so on.

I would say we're always looking for opportunities. I would say we're also very active in a lot of different types of technology right across the full spectrum. When we're looking at innovation and investing in it, we look at how to leverage that. We don't do innovation

to keep the IP to ourselves. We look at how we can share that so it's part of an industry-wide process and we can actually make sure we're benefiting as an industry. That's part of the concept—I know Dan Wicklum was here—around COSIA.

For us, it's \$200 million. That does fluctuate a little bit depending on which projects we're proceeding with. It is certainly one of the areas that we have not cut substantially even in the downturn.

● (0920)

**Mr. John Barlow:** I'm glad you brought up COSIA. We had COSIA here last year, and Dan. Actually they were here last week speaking with many of us.

It's impressive that a group like COSIA has been formed. Certainly, to have energy companies like Suncor willing to share their intellectual capital with one another is impressive. I will share with you the same message I shared with Dan, which is that I would encourage COSIA and the companies to do a much better job of talking about COSIA and some of the successes. I know there will probably be many more in the future as this continues to grow, but having a social media presence and a public presence with regard to what COSIA can accomplish, the potential that it's reached, and what you've already done, I think, would be a great step in the right direction. I was shocked to find out that COSIA didn't even really have a communications arm until now. I know they were looking at CAPP to do a lot of that. I think that would help us on this committee as well if other Canadians, besides those on the committee, knew what COSIA was doing.

Ms. Flood, how many people has Suncor laid off in the last couple of years in the downturn, and what would it take to get you back up to full employment? Again, many of my neighbours and my friends have put their houses up for sale and are moving back to Saskatchewan to look for other opportunities, which aren't out there.

How many people has Suncor laid off and what would it take for you to get you back up and start hiring again?

**Ms. Ginny Flood:** We've decreased our workforce by about 1,000. That is pretty substantial and we don't do that lightly. We've been looking at ways of improving our productivity through a number of different mechanisms. We've been on this journey since a few years prior to the decrease of oil, but obviously, in this low-cost environment, it is quite challenging.

The other thing I would say is that we're in a low-cost environment, but we're also in an environment in which we've been adding costs as well at the same time, through different policies, through different regulations, those types of things. We're really trying to work with government to figure out what that competitive climate looks like and how we can work together so that we're not eroding some of the cost savings that we're doing internally within the company through our cost measures, our reduction measures, in order to offset that low-cost environment. I think that's a really important area.

We also work very closely with our contractors. As we move forward, I think we are looking at other opportunities. We're trying to make sure that as we move forward even through the innovation agenda, that has an opportunity to create other types of jobs, other types of economic opportunities for people who have left the oil sands companies, because there's a lot of talent out there right now. How do we actually harness that talent in a way that we can make sure that everybody's working? That is the intent.

I would say also that we continue to look at ways of reducing our costs. Unfortunately, the oil price will probably be lower for longer. We're probably not going to get to the \$100 as we did before. In that context, I think we all have to work very smart.

• (0925)

**Mr. John Barlow:** I only have a couple of seconds left, but it's interesting that you say that you have these increased costs and a lot of that is due to regulations and policy. I think that's something we need to understand here as well. Policy imposed by government is not exactly helping the sector right now.

**Ms. Ginny Flood:** Can I just add one comment on that?

**The Chair:** Very quickly.

**Ms. Ginny Flood:** I think one of the pieces around that is that governments—and I say “governments” because we operate right across Canada—and the way they operate are very siloed as well. As you develop policies, if it's not holistically looking, it accumulates cost on industry. That's what we're seeing right now.

**The Chair:** Thank you.

Mr. Cannings.

**Mr. Richard Cannings (South Okanagan—West Kootenay, NDP):** Thank you all for coming here this morning. I'm going to start with Dr. Hollings.

You talked a bit about the capacity of first nations communities and you also talked about some of the challenges with getting that social licence, if you will, with first nations and other communities. One of your recommendations was to establish best practices around community partnerships. You had a list of moratoria that were out there. You could talk about best practices, but I want you to perhaps start with this. What are the things not to do? Why are those moratoria in place? What went wrong in those communities?

**Mr. Peter Hollings:** I think there are probably different answers for each of those communities as to exactly what went wrong, but the general theme to all of them is that there was a very poorly done consultation process. The one I'm most familiar with is KI in northern Ontario.

There was confusion about what consultation meant. I think different parties had different understandings of what that meant, and at the end of the day, the companies who were involved didn't satisfy the interests or needs of the communities, so the communities just said no. That set things back a long time, and it's going to be a very hard road to change opinions and change mindsets within those communities because they've had a bad experience.

I would say that, yes, the key thing is the duty to consult, but it has to go beyond that. There has to be a meaningful engagement with communities from very early stages. One of the comments we often get is the first explorer or the junior miner may make promises, which then the community remembers, but for the company that then buys three companies up the food chain, there's a challenge in remembering those promises, or even documenting those promises.

It is that element of having some of those IBAs, or whatever we're calling those agreements now, more transparent, more available. There's sometimes an unwillingness both by communities and by companies to share that potentially sensitive information, but I think there has to be a way to encourage that process so that this stuff is better preserved.

**Mr. Richard Cannings:** You think it's those agreements that are one of the key elements of success.

**Mr. Peter Hollings:** Well, if they can get to the point where they can have an agreement with the community, then having it well documented, well recorded, becomes critical, yes.

**Mr. Richard Cannings:** You also mentioned that access to post-secondary education for indigenous students is important. I'm just wondering if you could perhaps expand on that and how the federal government might facilitate that, whether it's by removing the cap on funding for post-secondary education or other ways you know of.

**Mr. Peter Hollings:** I think the biggest challenge, again, for a lot of these kids is not getting through university; it's getting to university. It's getting through high school. It's getting them inspired. I think there are ways to improve that and recognize that.

We have a program at Lakehead called the aboriginal mentorship program, which has been running for a few years. We connect first nations high school students with, ideally, first nations students at university, and the students then mentor them. They make university a less scary place, a less frightening place, and something they can feel more comfortable in and can aspire to achieve in. I think providing good role models for community members of the benefits of going to university so they can see that they can still come back to their communities and are not going to be lost to their communities, which I think is often a fear of some of the elders, can help to improve that.

I think my president would be very upset if I didn't say remove the funding cap. Improving funding and facilitating that is critical, but I think the main challenge is getting those students through high school and into the university. We have fairly good systems to get them through university. The challenge is getting them into university.

● (0930)

**Mr. Richard Cannings:** Mr. Nolan, I wonder if you would like to comment on that aspect as well.

**Mr. Glenn Nolan:** I think the issue goes back generations. We've heard about the residential schools and the treatment or mistreatment of communities over generations. There's a serious lack of trust of any outsider coming into a community, even between communities. They cannot form a bond. It's almost like when you are constantly being hit as a kid and someone comes up and pretends to hit you and you feel as if you're being hit. There's that reflex that someone is going to come in and promise something they're not going to deliver. It's happened time and time again.

I think there are some shining lights out there that have proven that trust can be built. In Canada right now there are well over 200 agreements between indigenous communities and resource development companies. In the hard rock sector, there are a number of IBAs. I believe that is the process we would call free, prior, and informed consent. The communities feel that they've been informed of all the aspects of participation in the project—environmental risk, social risk, employment opportunities, entrepreneurial opportunities—and agree and fully commit their communities to that process. I think there are great examples out there.

We talk about legacy issues in the Ring of Fire development. Our company has about 75% of all the mining claims up there. That's going to last for generations. It's the generational aspect of building trust and building opportunities that are going to see success, not for our generation or the generation of my grandchildren but in the future, when the communities are going to be more involved, more integrated into the system, and possibly owners of the mine.

**Mr. Richard Cannings:** I wonder if you could quickly comment on the infrastructure needs and the process around that with communities.

**Mr. Glenn Nolan:** Right now the communities are isolated to the point of having only winter road access to bring their materials in. What we're seeing is that there are accelerated costs, obviously, when you have to fly in most of your materials or when the winter road season is shortened considerably. Over the last three or four years, we've seen the opportunity to bring in all their supplies diminished considerably. If we have development roads in, yes, there are some social issues that come with access to the outside. Unfettered organizations or groups may come in and not have maybe the best intentions in mind, but overall, I think if we keep communities isolated, they are going to continue to suffer from neglect.

The opportunity is there for them, once they have a road, to look not only at working as partners in projects but at other opportunities that are going to be in their backyards.

**The Chair:** Thank you, Mr. Nolan.

Mr. Harvey.

**Mr. T.J. Harvey (Tobique—Mactaquac, Lib.):** First of all, I want to thank you all for being here. I know you all have busy work schedules. It means a lot to the committee to have amazing resources such as you that we can draw on to come and testify before us to help shed some light on these issues. I really appreciate that.

I'm going to focus my time on you, Ms. Flood. I want to take the opportunity to thank you for the written submission that you gave us, and that you spoke from, of course. It really does highlight what I believe, which is that the Canadian oil sands is a sector of the Canadian economy that's vital and integral, not just to Canadians in western Alberta but also to Canadians across the country. I've always been amazed by the innovation that has occurred in the in situ oil sands and continues to occur as we speak, and hopefully will continue for years ahead.

I want to highlight a couple of things you said in your notes that really appealed to me. The first was, "Our vision is to be trusted stewards of natural resources. And, we believe that through sustainable development—focusing on economic prosperity, a healthy environment, and social well-being, we'll be able to help Canada meet its energy needs using oil derived with the lowest carbon intensity in the world." I think that's very important.

I also want to highlight where you said that the energy sector will need to transform itself in order to succeed in an increasingly carbon-constrained and cost-competitive world. You also wrote that the goal of the energy system, in this context, is to deliver to nine billion people safe, affordable energy that minimizes carbon emissions. I wanted to highlight those because they really do speak to the innovation that has occurred. I praise you for those comments.

I'm from a very rural riding that is much like Mr. Barlow's riding, but on the east coast of Canada. A lot of my friends work in the oil sands. They work in the oil and gas industry, and they work in the northern mining projects, because we are a rural economy that has faced significant challenges as well in the past 25 or 30 years. I think that speaks to the importance of these projects.

I wanted to know if you could elaborate a bit on the importance of the innovation, the \$200 million that you have been investing in innovation and technology. How do you feel the government can best contribute to that in order to see the industry move forward and continue to grow upon the successes that you've already had?

● (0935)

**Ms. Ginny Flood:** Perfect. Thank you for those remarks.

I think there are a few roles that government could play. First of all, one role is how you talk about the sector, and that the sector has a future. I think that's really important from a policy perspective. It's also important from an investor perspective, and how they look at our sector. I think that's one that's very important.

I would also say that some of the conversation happening around what the innovation agenda looks like, what kinds of clusters of innovation can happen, and how that promotes economic prosperity, is also very important. For our sector, certainly, if you look at Alberta and you look across Canada, there are logical hubs of technology that are happening through academia, through industry groups, through service providers, and through just the talent that's available, and readily available. I think that's another area.

We don't expect that government will ever have the kinds of funds that industry is putting into it, such as Suncor putting in \$200 million annually. If you take the other companies in Calgary doing the same thing, it's quite a significant amount of investment. That doesn't mean to say we don't need government to help harness and leverage some of that expertise, because what we're talking about, as a sector, is that we want to be able to be transformative. We want to be able to have some real technologies that are going to be very much leading edge and world class, which we can then export.

I think what's really interesting in the mining sector, as well as the energy sector, is that we are known for being innovative in our resource sector. That is what Canada has a huge reputation for, particularly in northern climates. I'll use the example of our autonomous haul trucks in our autonomous mine in the oil sands right now. We're in the early stages, but being successful would mean we would have the first autonomous mine in North America. Autonomous mines do exist in other parts of the world. Rio Tinto has them in Australia, but it's not a northern climate, and the conditions are very different. If we're able to create that environment and move that type of innovation, we become a world-class leader in this space.

One of the things that I didn't mention is the Xprize. We are globally looking at what other innovations are out there and really looking at ways to drive the conversation about reducing our carbon footprint. One of the ways we can do that is by looking at having another product, which would be carbon, but it would take the carbon and instead of emitting it, it would actually utilize it as a product. That prize is \$20 million. It's through COSIA and a number of COSIA companies. I think Dan Wicklum mentioned there were 27 teams that have gone through the first phase, and then we're going into the second phase.

These are the types of things that we're looking at. Where government is really helpful is in making sure that it's providing that message along with industry. We have to do a better job of providing what we're doing, but there's also this culture of innovation at a regulatory aspect. When there is new technology, one of the things that we often run into is regulators who are very prescriptive. They like to have certainty, the same way we like to have certainty. When you introduce new technologies, sometimes it can be a very rigorous process. You have to prove that it will work, and you have to have a backup plan if it doesn't work. That can get very costly and increase timelines when you're looking for permitting.

● (0940)

**Mr. T.J. Harvey:** Lastly, the reason I base my comments on that—and I thank you for your additional feedback as well—is that I really do think that the innovation that's being shown, not only in mining but also in oil and gas, especially in the in situ projects, really does speak to how Canada can position itself, not only in the next 10 years but over the next 50 years, to be a world leader in low-carbon, greener technology for extraction. I think it's that leadership that's going to allow Canada to play an integral role going forward, not only within the Canadian economy but also on a global scale.

Thank you very much.

**The Chair:** Thank you.

Mr. Strahl, you have about two minutes.

**Mr. Mark Strahl (Chilliwack—Hope, CPC):** Thank you.

Mr. Nolan, it's good to see you again. I recall you more from your role with PDAC.

I wanted to pick up on some of the comments you made. In the previous government, I was the parliamentary secretary for aboriginal affairs, and I'd say the best day of my time in that role and in government was the day we announced Bill C-33, the first nations control of first nations education act and the \$1.9 billion to transform that. The worst day was when it all fell apart due to a variety of factors, including infighting at the AFN.

I was at a Indian Resource Council meeting in Calgary where they talked about how communities are no longer looking for, I think the term was, “pick and shovel work”. They want to be partners, they want to be engineers, and they want to be fully engaged, in this case with oil and gas, but I think we've heard certainly from mining companies that this is consistent in that sector, as well.

I don't have much time, but perhaps you can give a recommendation. If you could recommend an action that government could take or that this committee could recommend to government, how can we help first nations communities get to that level of partnership with the mining sector? You have one minute probably to answer that.

**Mr. Glenn Nolan:** I think we could write a book on this and not come up with a conclusive recommendation. I'll start off with, again, it's about building that trust. This industry, or the oil and gas industry, or the resource development industry, in general, is not something that is foreign to the communities. It's something they're natural partners with because it's in their backyards, and it's just because they've been isolated and they've been neglected for such a long time that they feel they're being brought along without their participation. I think anyone would feel that way if you don't understand the process and you're being told, "This is good for you".

I think it's about creating awareness, and I know that Natural Resources Canada has published a tool kit document beginning in 2006 or 2008 for informing communities about the mining industry. I'm sure there's one for the oil and gas industry that helps communities understand, as well. Whether it's using the INAC department or using other provincial programs to deliver that in the schools with the community leaders and the various groups within the communities, or whether it's an elder group or a church group, it continues to share that information that's vital for them to make a fully informed decision on whether they want to participate.

I think Pete Hollings talked a bit about the challenges of one of the northern communities, because they didn't have all the information that was necessary for them to make a decision.

• (0945)

**The Chair:** Thank you, Mr. Nolan. Unfortunately, we're out of time.

I just want to echo the comments of my colleagues around the table thanking you for taking the time to be here today and helping us along our way. Unfortunately, we do have to stop because we have three more excellent witnesses who are waiting to take your seats, so thank you.

We'll suspend for one minute.

• \_\_\_\_\_ (Pause) \_\_\_\_\_

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• (0950)

**The Chair:** We're going to resume for our second hour.

Thank you again to all my colleagues and to the witnesses who are here. We're going to get moving quickly because we're a little behind schedule.

We have Douglas Morrison and Bora Ugurgel, from the Centre for Excellence in Mining Innovation; Michael Fox and Lesley Williams, from the Prospectors and Developers Association of Canada; and Roussos Dimitrakopoulos, a professor from McGill University.

Welcome, all of you. I appreciate your taking the time to be here. It's a great help to us.

I'm going to give each of the three entities up to 10 minutes to speak, and then we'll open the floor to questions.

I'm looking directly at you, Mr. Morrison, so why don't you start?

**Mr. Douglas Morrison (President and Chief Executive Officer, Centre for Excellence in Mining Innovation):** Yes. Thank you very much.

We're very pleased to be here and have the opportunity to present to the committee.

My name is Douglas Morrison. I'm the president and CEO of the Centre for Excellence in Mining Innovation, called CEMI, based in Sudbury, Ontario. My colleague here is Bora Ugurgel, managing director of the ultra-deep mining network, which is focused on productivity below 2.5 kilometres, or 8,000 feet below surface.

CEMI was established in 2007 by both industry and government. We help solve mining industry challenges by delivering commercially viable innovations to enhance safety, increase productivity, and improve environmental performance. The ultra-deep mining network was established three years ago and is funded by the federal BL-NCE network.

My 35-year career in the mining industry includes 15 years working in the underground mines in Sudbury in operations and mines research, then another 16 years living and working in Australia, South America, southern Africa, and other places as well, finishing as the global mining sector leader for the consulting company I worked for. The last five years at CEMI have been to build a 17-person team that focuses on innovation and commercialization of research.

CEMI's internal technical staff has over 30 years of experience working in mines, and we are the only innovation/mining research group that has that capability; 40% of our staff are senior business professionals who then negotiate commercial agreements with companies to commercialize the work we've done and move that through. No other research or innovation group has that internal capability.

Our primary focus is metal mines: gold, nickel, copper, and zinc. Those are the underground mines based in Ontario, Quebec, and Manitoba. Also the copper mines based in B.C., which are now becoming underground mines as well. All our solutions apply to the global mining business. The solutions we developed for our mines in Canada apply to all metal mines everywhere in the world.

Commercialization of mining innovation helps the mining industry to improve its operational performance and its rate of return. That's why mines are operating.

Our core advantage is the ability to bring together the best teams in the world to close the innovation gap—everybody's heard of that—but the bigger gap is the commercialization gap and our lack of ability to move things into a commercial setting. Our ability to do that gives us a huge advantage to be the leader in commercializing and implementing innovations on a global scale.

Your committee is trying to investigate how to create economic opportunities for the mining industry. We recommend that to create a strong foundation for future growth, the government should invest in developing the scale and range of the mining service and supply sector companies. We in Canada cannot influence where global corporations invest capital. We can make sure that we deliver innovations to our mines that make them globally competitive. If they're not globally competitive, they will close.

By vesting our service and supply sector companies with innovations that improve productivity in our local mines, they can expand their businesses to customers in mining jurisdictions all around the world, and by doing so, increase employment here at home.

To achieve this, government needs to invest in organizations like CEMI with an established team of experts who have experience in the industry; who focus on innovation, not research; and who have a global perspective on where the industry has to go. It is critical to distinguish between research, which gives you a technical result, and innovation, which gives a commercial result. If mining companies cannot buy or lease technology or hire expertise, the investment in research is very limited. You have to have a transmission from the research end of the spectrum to the industry part of the spectrum. We are focused on that innovation component.

To do that we need an effective innovation ecosystem, as well as investing in basic research activity.

The strength and scale of our current mining service sector is the unique advantage our industry has. Yes, we have over 37 mining centres across the country, but we only have four, perhaps five, mining clusters. A cluster has to have a critical mass of mining companies, service and supply companies, research facilities, and innovation groups that all work together to improve the performance of those operations.

• (0955)

We have over 37 centres across the country, but we don't have that many clusters, and we need to focus on them. The largest and most comprehensive of all those clusters is in Ontario, split between the small and medium-sized enterprises in Sudbury and northern Ontario, and the large, original equipment manufacturing companies, OEMs, in southern Ontario.

This is not a northern issue. This is a national issue on how we manage this business for the benefit of our economy. There are tremendous opportunities to improve the environmental performance of the mining industry, and it's essential to do that for us to get the social licence to operate in the future. We can see all around us in every country in the world how that issue is changing rapidly.

We propose that you invest \$60 million in CEMI over five years, with half based on environmental changes and environmental improvements and innovations. Because of our track record in commercializing results, we already know that with that scale of funding we can bring another \$200 million from private sector companies to collaborate in that effort to make those improvements happen.

The first one would be the clean mining program of \$13 million. That's to improve waste-water management from tailings facilities.

Another one is a remote access program, which is \$30 million to improve rapid access to remote locations, remote sites, remote communities, and make that happen much faster than you can with infrastructure. That would also bring a large amount of funds.

The lean mining program is a continuation of the ultra-deep mining network, and that focuses on productivity. We have to introduce low carbon, reduce emissions, and all those things, but we also have to make sure we move ore more efficiently and cheaply. Mines have to be productive. Our programs have a five-year horizon, with the design to have measurable impacts in earlier stages of the five years. We do address safety and we do address environmental issues, but not at the expense of productivity.

Mines close because they are insufficiently productive to provide a return on investment, not because we have safety or environmental incidents. We need to be focused on what the business is about while improving its overall performance.

Our objective is to see existing mines continue, new mines open, and to increase employment in Canada to make that happen. Most mines are focused on reducing employment in their mines. We want to see that employment shift from the mining companies themselves to the service and supply sector. The opportunities for indigenous communities to participate in middle development initiatives are increasing all the time, and the mines are already the biggest employer of aboriginal peoples.

A remote program would create several indigenous businesses to enable the delivery of services and supplies to communities and to mine sites far sooner than traditional infrastructure. New mining developments are the best chance for indigenous communities to establish a sustainable economic foundation, but only if there are new mines. New mines have to meet all the needs of local and indigenous communities, yes, but they also have to meet the needs of the global metal market. Those two things have to come together.

Several large mines in northern Ontario are scheduled to close within the next five years, and no replacements are planned. It takes five to 10 years to bring a new mine into production, and that means there's already a production gap that cannot be filled if we only continue to repeat the processes we have used successfully in the past. There will be no major base metal operations developing new ones if there's no innovation. Innovation is essential to make that happen.

We have to be smarter, faster, more cost-effective in every aspect of the mining business. Innovation is essential to the survival and growth of the industry at home and to the expansion of our service sector companies through international trade.

Investing in the commercialization of innovation is one of the best ways for government to sustain and build economically sustainable communities across Canada. Investing in organizations like CEMI means investing in Canadian ingenuity and Canadian business acumen to help us deliver our commercial advantage to the global mining industry.

Thank you.

•(1000)

**The Chair:** Thank you very much, Mr. Morrison.

Who wants to go next? Professor?

**Professor Roussos Dimitrakopoulos (Professor, Mining and Materials Engineering Department, McGill University):** Sure.

My presentation will be a little different from the previous presentations you had. I was looking at your website. It will be slightly more technical, not because I'm here to say anything else other than to discuss and present, through examples, the effect of technologies on different areas, from digitization, productivity, economic cash flows, economic issues, environmental performance and sustainability. You will be asking, of course, how do these things all connect into one?

Sustainability, and everything that you see on the list, means something slightly different from the general usage. Here sustainability simply means, can I make more out of a mine that I already have or that I am building, based on new technologies?

I thought I should also tell you what the organizational model is that we have been following. I worked for a mining company for some time, spent 10 years in Australia, where I made a lot of friends, particularly in big mining companies. I came back to Canada due to the Canada research chairs program.

In 2006 the idea was that we would set up a consortium. In the companies you see here, from AngloGold, Vale, to BHP Billiton, you probably recognize these very big names. One interesting part here is that most of these, except perhaps Kinross, which joined us last year, are totally non-Canadian. Barrick is also Canadian, of course, but the rest of them are not. I find that interesting because suddenly you see people from Chile, Brazil, Australia, South Africa, coming to fund the work we do.

The budget has been about \$1.1 million per year now for five years, so multiply \$1.1 million by five. Of course, we capitalize on government programs, particularly the research funding through NSERC, Canada research chairs, of course, and to some extent FRQNT in Quebec.

One thing I find interesting is the way we operate. One thing I found interesting from the beginning, and I appreciate it now more than ever, is the fact that what we set up is not like a professor who has a lab or sets up a lab. It isn't quite that. It is that we have a real collaboration between the companies you see here and the expertise we have in the lab that I run and the new technologies we develop. The whole thing's a partnership. I can tell you extremely clearly that all these companies are in Montreal, at least twice...from anywhere you want.

The key contribution is that they are a think tank. Okay, I'm a professor. Fine. I may know some things as a professor, maybe theoretical things, mathematical, computing, whatever you like it to be, and mining, etc. But what do I know about the large-scale, serious problems these companies have? I will show you an example of the collaboration. When we work we interact consistently, and we become friends until they move on to another position in their company or they retire.

That is, more or less, the model. If you have an interest, you can always explore this more. I say this because I find the way that we operate in Canada to be very different from the way I actually learned in Australia.

I will talk to you about mining complexes. It's not a complex thing; it's just the amalgamation of different things. We start with mines, as you see them here. We continue with the treatment of what we extract. We have, of course, our waste dumps of all sorts and kinds. Of course, the main job we have is to generate products that we sell in the markets.

•(1005)

This is what I mean by "mining complex". "Mineral value chain" is another term we use. We are having difficulty deciding which one to keep.

Before I continue, the other aspect here is that we realize that managing risk is a serious issue. By "managing risk", I don't mean anything but "technical risk". I think the example I have here will show you what I mean by technical risk. I will show you the graph on the lower left corner of the page. It comes from the late nineties, when most of this work started, at the time when I went to Australia and got into these things. What it shows you on the horizontal axis is that the deviation from the expectation of production for these mines is at about 48. Of course, we see deviations from expectations here in one and two that are at minus 60 or very negative, and you understand if that happens that there is no mine.

You also have the other end, whereby some operations may start producing double what was expected. Of course, they are lucky, in that they will not get closed, but at the same time, what very commonly happens in this case is that we set up a structure in a mine that we can not really change that much. We can get stuck with overproduction and a wrongly set-up mine, which generates very suboptimal metal production and cash generation.

An easy way to show you a starting point in all of this is that in mines we have exploration that we call "drill holes". They're about 30 to 40 metres apart. We model, as you can see in the bottom list shown here, deposits. In other words, we describe them at the scale of mining units, and we interpolate values in these blocks. The values are for metal, but they could be different elements. It could be anything you like that relates to the properties of the materials we extract. I should stress that the materials we extract are extremely heterogenous.

There are new technologies that were started some time ago; I am not the only who works on these. The petroleum industry has used them since the early 1990s. On the one shown here, you can see that we have a mine. You can see three sections. This is a vertical section of a small part of this mine. What I'm trying to show you there is a concept called the "Monte Carlo simulation", or, as we call it, "stochastics"; it doesn't make a difference to me. The only issue here is that we describe the uncertainty that we see in the deposits that we are exploring. Here, you see, for example, three different scenarios of how the deposit might look based on the information that we have. Different areas from one scenario to the next to the next have different values. Red is high-grade gold and blue is below one gram per tonne.

The key issue here is technologies that can do this. There is a devolution in these technologies from basic to complex. The second thing is that it is not exactly simple to simulate scenarios, as we call them, of mineral deposits when you have a million or two mining blocks describing whatever we'd like to describe.

That opens up, of course, the key question of computational requirements. Of course, if you asked me 15 years ago if I could do two million mining blocks, I would have said that I was not exactly sure how to do it, or I would look for shortcuts. These kinds of things are a starting point to describe technical risk, to say there is now a technical risk so how do I model the deposit and how do I describe gold content if that is the metal of interest?

To go back from that point—

• (1010)

**The Chair:** Professor, I'm going to have to interrupt you and ask you to wrap up quickly, if you could.

Thank you.

**Prof. Roussos Dimitrakopoulos:** Okay.

The answer to this mining complex is what you see here in terms of flow materials through mines and the ability to characterize the possible outputs. All the risk-based methods better do that.

The key issue one needs to bring up is that these new methods now generate bigger mines, more metal. They have a substantial increase in cash flows, as you see from the graphs here, and are a bit, more than anything else, closer to the expectations we have.

I think we'll stop here. I was planning to make comments on generalizations from the previous comments, but I guess we'll leave them for later.

**The Chair:** Thank you, Professor. I'm sure you'll have an opportunity when the question session comes.

This takes us to PDAC, our final witness for the day, actually our final witness for this portion of the study, which is probably appropriate.

The floor is yours.

**Ms. Lesley Williams (Senior Manager, Aboriginal and Regulatory Affairs, Prospectors and Developers Association of Canada):** Good morning, Mr. Chair and committee members. Thank you very much for the opportunity to speak with you today.

My name is Lesley Williams. I'm the senior manager of aboriginal and regulatory affairs at the Prospectors and Developers Association of Canada.

With me is my colleague Michael Fox. He serves as the co-chair of the PDAC's aboriginal affairs committee in a voluntary capacity. He's also the president of his own company, Indigenous and Community Engagement Inc.

The PDAC is the national voice of the mineral exploration and development community. With over 8,000 members around the world, our mission is to promote a globally responsible, vibrant, and sustainable minerals industry. We encourage leading practices in technical, operational, environmental, safety, and social performance. The annual PDAC convention is regarded as the premier

international event for the minerals industry. It has attracted more than 25,000 people from 125 countries in recent years.

Most of the association's policy efforts and initiatives are focused on ensuring Canada remains the best place in the world to explore for mineral and metal deposits. On behalf of our members in the mineral industry at large, we work on numerous issues that focus on five main priority areas, one of which is aboriginal affairs, the topic of our presentation to you today.

The aboriginal affairs program at the PDAC was established in 2004. This was largely in response to the changing legal and social landscape driven by the duty-to-consult framework and the recognition that local community support and involvement was key to project success.

The work of the PDAC's aboriginal affairs program centres on supporting co-operation and understanding between companies and communities. We focus on achieving two key goals. The first is improving efforts by our members to build positive, mutually beneficial relationships with the communities in whose traditional territories they are working. Second is to enhance the participation by aboriginal people in the minerals industry.

Turning to your study, specifically the focus on the opportunities for aboriginal people, our remarks today will cover the evolving landscape related to aboriginal communities and the mineral industry in Canada, engagement in aboriginal participation in the sector, some of the challenges that still remain, and what is next in the ever-evolving landscape.

• (1015)

**Mr. Michael Fox (President, Indigenous Community Engagement Inc., and Co-Chair, Aboriginal Affairs Committee, Prospectors and Developers Association of Canada):** In recent decades, the nexus between companies and aboriginal communities has transformed and continues to evolve, as relationships have been built and aboriginal communities have a more active role in mineral development.

These changes were accelerated by legal, political, and social shifts, including the inclusion and protection of aboriginal rights in Canada's Constitution and subsequent aboriginal rights jurisprudence, more socially minded industry actors, formalized relationships through company-community agreements, and strengthened capacity of aboriginal communities to participate in project development and the mineral sector at large.

All of these elements have paved the way toward a balanced, mutually beneficial environment. The minerals industry has a long history of building strong relationships and partnerships, and generating economic opportunities for aboriginal communities within the context of a challenging and evolving landscape, characterized by historical legacies, land tenure disputes, poor socio-economic conditions in many communities, and complex crown-aboriginal relations.

While some of industry's advancements were precipitated by legal and policy changes, the nature and scope of these actions have extended beyond meeting legal requirements. Industry recognizes that it is critical to develop and maintain robust, open, and trusting relationships with aboriginal communities affected by, or with an interest in, mineral exploration and mining activities.

Companies engage with affected communities in order to share information and work together on issues related to environmental mitigation and cultural protection, as well as those related to benefits and opportunities.

The minerals industry encourages efforts to facilitate the full participation of aboriginal people in the economic opportunities generated by mineral development. These opportunities exist throughout the mineral development sequence from exploration to mine development and closure. They differ in scope and breadth, depending on the stage of the project, the state of the market, and the type of project.

The industry supports participation through training, business development, local procurement, employment, and financial arrangements. In addition, the minerals industry often makes social investments through different initiatives and partnerships that improve quality of life in aboriginal communities and support participation in the resource economy.

As a result of its efforts, the industry has become the largest private sector employer on a proportional basis of aboriginal people in Canada. One great example is New Gold's project in British Columbia, where 25% of the employees are aboriginal. Similar numbers exist for the company's exploration project northwest of Fort Frances in northwestern Ontario. Furthermore, more than 50% of the workforce of the diamond mines in the Northwest Territories is aboriginal. Overall, aboriginal employment in the mining and mineral processing industry increased by 12% from 2007 to 2015.

A key mechanism through which economic opportunities have been created is company-community agreements. There has been a significant number of agreements signed between mineral companies and aboriginal communities, with nearly 500 agreements signed since 1974. The majority, 376, have been signed within the last decade. These agreements are generally voluntary, and they are increasingly recognized internationally as a leading practice.

Each agreement is unique. The content of agreements varies depending on a number of factors, particularly with the type and stage of a project, as well as the potential impacts of a project on communities. Company-community agreements contain provisions related to employment, preferential contracting and joint ventures, capacity funding, environmental measures and monitoring, traditional land use and knowledge provisions, training programs, shares

and warrant opportunities, infrastructure opportunities, financial provisions, confidentiality clauses, and dispute resolutions and implementation mechanisms.

Agreements have generated numerous benefits for affected communities. Goldcorp's Musselwhite project in Ontario, for example, supports training and capacity building, procures millions of dollars a year in goods and services from aboriginal businesses, such as Windigo Catering, and has a nearly 25% aboriginal workforce.

Cameco Corporation in Saskatchewan has become Canada's largest industrial employer of aboriginal people and it strongly supports business development. More than 70% of the services Cameco uses at its operations in the region are procured from aboriginal-owned companies in northern Saskatchewan, amounting to more than three billion dollars' worth of business over the past decade.

Agreements and the benefits they provide are truly a testament to the strength of commitment by the industry to developing mutually beneficial partnerships and to the interest of many communities in the economic development opportunities generated by the minerals sector.

I also want to briefly mention that governments in Canada have made a contribution to the shifting landscape. This has largely been driven by the legal framework and policy decisions, including the protection of aboriginal and treaty rights through the duty-to-consult framework, the settlement of land claims, the government resource revenue-sharing mechanisms, and the inclusion of aboriginal people in permitting procedures and environmental assessments.

• (1020)

While we may have a lot to celebrate, challenges still remain. Mineral companies in aboriginal communities in Canada continue to encounter a number of challenges in their engagement with one another but also independently as a result of other factors. These issues can impact the ability to develop successful projects and are a barrier to fully realizing and maximizing fully mutual benefits.

PDAC conducted national round tables and some of the key challenges identified include the following: awareness gaps between companies and communities; skill gaps and capacity issues in communities; crown-aboriginal legacy issues; socio-economic conditions; health, education, and social issues; land tenure uncertainties; jurisdictional issues and unsettled land claims; government resource revenue sharing; resource benefit sharing; and the duty-to-consult challenges across Canada.

As the landscape is ever-evolving, where do we go from here? Industry must continue to engage and work with communities, generate partnerships, and provide benefits to communities. It is also critical that governments refine duty-to-consult processes and address some key issues, including identifying impacted communities, consultation costs, delegation to proponents, and adequacy.

Efforts to improve crown consultation will lead to increased involvement of aboriginal communities in the decision-making process and will generate more certainty and efficiency for industry. We encourage governments to focus on improving socio-economic conditions for aboriginal communities, because a number of barriers such as poverty, poor housing conditions, and educational and essential skills gaps limit the ability for members of the community to participate in the mineral industry in a more meaningful manner. Improvements in these areas can be achieved through foundational social investments that contribute to improved health and educational outcomes for aboriginal communities, targeted funds for skilled training, and entrepreneurs to assist aboriginal people in securing employment and seizing business-development opportunities.

In addition, we recommend improved government resource revenue-sharing mechanisms through which federal-provincial-territorial governments share a portion of the revenues generated by mining with the impact that aboriginal communities can contribute to enhancing aboriginal participation in the sector.

In conclusion, PDAC is supportive of the government's commitment to renew its relationship with aboriginal people and to promote economic development and job creation. The industry strongly believes that collaborative efforts by all parties—government, industry, and aboriginal communities—will lead to stable, positive business environments for mineral exploration and development, maximize benefits for all parties, and enhance aboriginal participation in the mineral and metals industry.

Thank you, *meegwetch*, for the opportunity to speak with you today.

**The Chair:** Thank you very much.

Mr. Serré, you're up first.

**Mr. Marc Serré (Nickel Belt, Lib.):** Thank you, Mr. Chair, and my thanks to all the witnesses for coming in today.

Mr. Morrison, can you provide to the clerk, to the committee, your R and D and commercialization report on the hover barges? We've talked with Mr. Nolan about the winter roads and some of the challenges with them. Can you provide the clerk with that report?

**Mr. Douglas Morrison:** Sure, we can do that.

**Mr. Marc Serré:** Perfect. Your proposal on the clean-mining environmental, \$50 million, can you provide that to the clerk too? It would be shared, so that way we could spend more time on creating jobs and the clusters aspect.

• (1025)

**Mr. Douglas Morrison:** Sure.

**Mr. Marc Serré:** PDAC, thank you so much. Can you also provide the clerk with the best impact agreement you've seen, best

practices? Can you provide that to the clerk, the best one you have? You seem to have a good handle on that as well.

Mr. Morrison, my question is directed to you. When you talked about clusters, ecosystems, you said that for every mining job there are three or four jobs created. You mentioned four clusters in Canada. Can you name the areas of those four clusters?

**Mr. Douglas Morrison:** I said the largest of them all is in Ontario, split between the north and the south. There is another cluster in Saskatchewan, because of the specialized minerals, such as potash and uranium. In Alberta, between Edmonton and Calgary, there is the oil sands cluster that supports the whole industry. There's another cluster in Vancouver, B.C., with UBC and the other organizations there to support largely open-pit mining. We have open-pit mining elsewhere, but there are more open-pit mines in B.C. than in Ontario. There are deep underground mines in Ontario, specialized minerals in Saskatchewan, oil sands in Alberta, and open-pit mines in B.C.

**Mr. Marc Serré:** We heard earlier about the Canadian mining innovation centre looking for dollars on the innovation side. Also, we heard COSIA is playing a major role in commercialization. I want you to expand on that.

You mentioned you have a lot of R and D projects and there is the commercialization of them. Could you expand on the need in your organization and the federal role we could play in ensuring that we do more commercialization, like COSIA does, in the mining industry?

**Mr. Douglas Morrison:** Throughout my career in Sudbury and elsewhere, I've been involved in research projects, continuously in Sudbury. The fact is that we have 30 years of research in the Sudbury basin on our deep mines, and very little of that has actually moved off into industry to be commercialized. It's because we don't have the mechanisms. It's not just finishing up with the research report, and then somehow it magically becomes a product. It doesn't. You go from a bench scale, as Peter Hollings described this morning, to pilot scale, to operational scale, to full-scale field trial, then to commercialization of that field-trial result.

The money that you have to spend to make those things happen, especially in a heavy industry like mining, is getting bigger and bigger all the time. One of the issues for us is the funding ratios for government funds versus industry funds. Right now it's dollar to dollar. You can see that the cost of innovation is very much larger when you move up through building physical machines and plants to do things more efficiently. That's much more expensive than large-scale trials and academic studies, yet the ratio we have to work with is still 1:1, exactly the same as for research.

Innovation is much more costly and much more risky than research, but the funding mechanisms are the same. You're essentially smothering or strangling innovation. Once excellent research has been done, it can't then move through the system to get to industry with the current format.

**Mr. Marc Serré:** That's where we need some work like Australia's doing—

**Mr. Douglas Morrison:** Well, no, Australia has not actually done a better job. Australia has done a far better job of pouring large amounts of money into research. They're only just now beginning to recognize they actually don't, for all that money that went into research, have any more innovation. In fact, they probably have less than we do.

They're beginning to look at our model here in Ontario now, and actually they're introducing a new program called METS Ignited, which is exactly the same as CEMI. Their problem is that they're actually based at a university still, so they're still trying to funnel everything through the university system. CEMI and organizations like ours are independent of the university system, so we're working on a business footing exactly the same as the companies we're trying to work with. Our objectives are exactly the same as our client organizations'. We live or die by commercial success, not by academic government grant funding.

**Mr. Marc Serré:** We could spend a whole day, really, talking about the expertise and the world class that we have.

You mentioned exports in your presentation. What role can we play in the federal government to help increase our exports, and by doing that, increase jobs here in Canada?

**Mr. Douglas Morrison:** We already have very good relationships with EDC. We know the structures that EDC can put in place for us once we have products. The fact is that, to a large degree, our service and supply sector has been relatively complacent because more than 80% of their revenue comes from local Canadian mines. That gives us a huge opportunity to globalize the services that we currently provide, but these are oftentimes local businesses that need to have exposure to the global mining sector.

Because of the companies that work on our projects, we actually bring them in touch with Rio Tinto now in a way that they would never have approached Rio Tinto or BHP Billiton in Australia. It's the innovation component that begins to link ideas to newer business and business expansion through international trade.

• (1030)

**Mr. Bora Ugurjel (Managing Director, Ultra-Deep Mining Network, Centre for Excellence in Mining Innovation):** I will add to this. The ultra-deep mining network is a \$35-million network that is funded with \$50 million of federal funds through the networks

of centres of excellence. We are a five-year network, and we are in the third year of operations. About two months ago we found out that one of our network members started selling the results of their research projects to South Africa. One of the deepest mines in the world is now purchasing Canadian know-how. The network is around, creating the know-how, so that small to medium enterprises have the tools to be able to export in the first place. That's why you need to invest in organizations like CEMI, or through the business-led networks of centres of excellence, in creating the tools so that we can stay competitive and become competitive in the international markets.

**Mr. Marc Serré:** PDAC, just quickly—

**The Chair:** Very, very quickly.

**Mr. Marc Serré:** I know you're going to give us a best practice on the AIP agreements, but also can you elaborate on the next steps? The Ring of Fire, for example, is talking with the first nations community about villages, not just roads, not just the mining. We need to have a village and social, counselling, and housing agreements that the impact agreements haven't in the past dealt with. I'd like for you to share your best practices, what's happened in the past.

However, moving forward, we need to have it at a different level. What role can PDAC play there?

**Mr. Michael Fox:** I think there is a trend of companies looking beyond project agreements. I think the end goal is to improve the quality of life of aboriginal communities. There are different ways of doing that than just straight-up project direct agreements for jobs or contracts or even royalties. I know that when I was negotiating with an American company looking at a mining project, they were looking at, instead of a signing bonus, having a seniors' complex, and after year one of production, they would look at 10 houses. After year two they would look at maybe 20 houses, and in year three they would look at a youth recreational facility. People are thinking differently. We're probably in our third generation of impact and benefits agreements. They change over time as communities become more involved with them.

**The Chair:** Thank you. I'm going to have to stop you there.

Mr. Strahl.

**Mr. Mark Strahl:** Thank you, Mr. Chair, and thank you to all of the witnesses for your presentations.

I want to continue with the PDAC folks on the aboriginal affairs component of mining. It's difficult to have an industry-wide standard. I think some companies are very good at it, and some are learning, I would say. We've seen in British Columbia some great examples of companies that get it, that understand the key to working in the traditional territories of aboriginal communities is partnerships and relationships. We've seen for others that it's simply a line item. They have to tick a box, and they put a dollar value on how much they're willing to spend to fulfill their legal obligations. I think the challenge you have and that governments have as well is to help industry see that engagement with aboriginal communities shouldn't be seen as an obligation but as an opportunity. We're trying to figure out the best way to encourage that from the regulatory side.

We had Bob Rae here on the Ring of Fire project, and we talked about the duty to consult. We've heard from some companies that very much believe that they should be engaging directly with the proponent. We've seen from court cases in British Columbia very recently on the northern gateway pipeline, for instance, that the courts have said that the crown has the duty to consult and you can't simply delegate it.

Perhaps, Ms. Williams, Mr. Fox, you can talk about the challenges and what you believe the industry standards should be in terms of fulfilling that duty to consult. How do we get around the different approaches of different communities and different companies? I don't think it's clearly defined. The courts have introduced the duty to consult and accommodate where necessary, but governments, companies, and aboriginal communities are still trying to figure out what it actually means. You deal with this every day, so what is your recommendation to, in this case, the government? How does the government do a better job of equipping both aboriginal communities and industry to meet that duty, which the courts have continually upheld?

• (1035)

**Mr. Michael Fox:** From the PDAC's perspective, we encourage our members to engage early and often and effectively with aboriginal peoples and to respect their protected constitutional rights, and we urge governments to fulfill their obligations towards aboriginal people in Canada.

That's easy to say, and I think you're correct. You have good actors and bad actors out there. I don't know what percentage are bad actors, maybe 10%, who get the news bites, and then the rest are good performers who don't get any air time out there. I think Natural Resources Canada tracks all these agreements, and there are over 300 across Canada that demonstrate that things actually do work.

When it comes to the frameworks in Canada, they really are different because companies have different projects in different jurisdictions, and a lot of times, it's not clear. All the court cases provide some clarity but you still have this functional ambiguity, especially around two kinds of capacity.

Who has the duty to provide capacity for communities? There are two types of capacity when it comes to indigenous communities. One is the capacity to understand the project; what is the phenomenon in front of them? If I ask anyone in this room whether they can do a community impact assessment, I don't know your expertise, but I don't know anybody in this room who can do that. However, you're expecting communities to understand a project. That's exactly what's being asked of them. One is the capacity to understand the project.

The other capacity is the capacity to participate in a process and that process is the regulatory process and the environmental assessment process. I can tell you first-hand that I was a negotiator for one of the communities in the Ring of Fire, and when the Canadian Environmental Assessment Agency was to provide resources for capacity to participate in the process, it would have taken \$27,000 for two mines. Not only could Environment Canada staff not come up because they had no travel dollars to come up.... I see the challenge, going forward. You're talking about the future in any of these sectors—oil and gas, mining, and nuclear. Who is providing the capacity and also participating in the project?

Right now, if you talk to the Department of Fisheries, do they engage with communities when they're making decisions? Does Environment Canada staff go into the communities? I can tell you right now that they actually had to find rides to go up to the Ring of Fire, because there are no travel budgets.

The burden goes back onto the companies, so one issue is who has that duty to provide capacity. The other one is the duty to accommodate. That's a substantial duty and that's with the crown, but they're not the ones cutting the cheques, are they?

These two items, the capacity and the duty to accommodate, actually provide that functional ambiguity. Not only that, but the policy frameworks across Canada are all different in terms of who actually does the engagement, the consultation. In Ontario, they delegate to the industry. In Manitoba, the crown does it. Who provides capacity dollars? In Alberta, they said they'll do it and they'll decide what kind of capacity. In Quebec, they divide it but it's not clear whether what they're providing is going to meet the needs of the communities with regard to the capacity requirements.

So it's different. It's a very good question and it's a challenge for us as a national organization, which we try to keep track of in our aboriginal affairs program.

• (1040)

**The Chair:** Thank you, Mr. Fox.

Mr. Cannings.

**Mr. Richard Cannings:** Thank you, all, for being here today.

I'd like to follow up right away on what Mr. Fox was saying about capacity and the inclusion in environmental assessments, etc.

Before I got this position, I was an ecologist. I did some environmental assessments in British Columbia, not with mining projects but with other, fairly small projects. A lot of them involved indigenous communities in my region. Capacity was always a huge part of that, whether it was the capacity of the Indian band to actually, as you say, do the work in understanding the projects and reacting to them, or the capacity to provide the manpower to go out and help in the field with the assessments.

You raised a lot of questions there, and I just wanted to know your recommendations, for the short term and the long term, about what the federal government could be doing to increase that capacity, whether it has to do with education at all levels or with what they could do in the short term. Education is obviously a more long-term investment. Can you comment on that?

**Mr. Michael Fox:** Every industry is a bundle of disciplines. Mining is one of them, as well as geology, geophysics, environmental science, and mining engineering. You have to pick one stream of activities. In this case, I mention the environmental assessment, which has biophysical disciplines. In the example I gave, with the \$27,000 in what was then called a comprehensive environmental assessment, there were three phases. The \$27,000 was supposed to allow the communities to review the EIS guidelines and, I'm assuming, be part of the studies and then the peer review—the three stages.

What do you do with \$27,000? What consultant would come out and help them, in a remote community, for \$27,000? That's probably your travel budget to go north.

When I hear this new government talk about enhancing indigenous participation, I don't know how that is done without providing more resources to the communities or providing more resources around the environmental assessment. If it's business development—which is another stream of activities and a different set of skills, understanding, and capacity—then there are start-up funds and training that's tied to that particular project.

When I hear the words “enhance community engagements” or “enhance indigenous programs”.... I know, from my own experience, that we know what the needs are. Past and current programs are not meeting those needs if they want full and meaningful participation in any project across Canada.

**Mr. Douglas Morrison:** I'd like to respond to this issue, as well.

The fact is that you have to take a less myopic approach to this. This is not a Canadian issue. Canadian consulting companies and Canadian mining companies have been negotiating with local and

indigenous populations in South America, Africa, and many other parts of the world for 25 years. We have lots of experience in how to do this really well.

How can it possibly be that we cannot do it equally well here, in our own backyard? This is not an indigenous issue; it has to do with a decent approach to communicating with communities, whether indigenous or not. The communities in South America and Africa do not have a special constitutional right for consultation. Companies do that in order to gain social licence. It is not sufficient to have a permit from the government to operate your mine. You cannot operate a mine with riots at the gates. It's good business practice.

It should not be based on indigenous rights and the Supreme Court. We cannot continue to work these issues through just because the Supreme Court says so. We need to take the approach that we are doing this because it's the right and decent thing to do.

• (1045)

**Prof. Roussos Dimitrakopoulos:** Can I add something?

**The Chair:** Sure.

**Prof. Roussos Dimitrakopoulos:** There is one small thing that probably is of interest.

I showed you earlier a figure and we called it the mineral value chain. On it you will see that there are processing streams, there are customers, there are products, and there are also waste dumps, slag, and so on. The interesting part here is that technologies such as these allow us to integrate all these elements into one optimization. By optimization I mean operations research and decision support. It's interesting in these kinds of technologies. One is the waste. I can easily mix and blend materials that I've sent to different destinations to produce gold or whatever it is. There is no reason that we cannot do the same with what we call waste and produce mixtures of materials that have given characteristics that respond to the growth of certain trees and plants, etc. There are examples of that.

It's the same thing if I go to the waste, to finish up. The waste management under these kinds of concepts simply says, “How can I put what I extract from the ground and don't use back, and optimize the sequence of when to do this kind of thing?” There are also examples of that.

The interesting part with the communities in this—and no one has looked at it yet—is to add them into this real optimization I showed you. Do you know what will happen? These kinds of things capitalize massively on the synergies between the different parts when they look at them as a whole.

What do we need? First of all, with communities, funding, and all of us look for funding here, funding there, so why can't we, in our strategic planning, which would be a bigger word for this kind of stuff, have technologies that integrate funding at a time that it suits the whole thing to maximize the benefits for the community? I

showed you earlier the 15%, 20%, 30% more cash flow we can generate. This all can happen, will happen, and you realize that new technologies have a hell of a lot of contribution to make.

**The Chair:** That takes us to the end of our time.

Thank you very much, all of you, for taking the time to be here. Your contribution is immense and we are all very grateful.

On that note, the meeting is adjourned. We'll see everybody on the 15th.

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