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## **Standing Committee on Natural Resources**

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**EVIDENCE**

**Thursday, March 27, 2014**

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**Chair**

**Mr. Leon Benoit**



## Standing Committee on Natural Resources

Thursday, March 27, 2014

• (0850)

[English]

**The Chair (Mr. Leon Benoit (Vegreville—Wainwright, CPC)):** Good morning, everyone. We're still trying to connect by video conference with some of the witnesses for today, but we will start the meeting. We're here today to continue our study of the cross-country benefits of the oil and gas sectors of the Canadian economy.

Before we get started, I just want to mention that for any members of the committee who are interested in hooking up to the paperless committee system—I had it installed on my computer—we had a chat about this before. It's up to each individual whether or not they want to take part in that. All of the paper is still available for those who want it. Those who want can just chat.... We have a gentleman at the back whom you would deal with to get your iPad set up for that. Then you will have all the documents pertaining to the committee available to you at any time.

Let's get started now with the business of our meeting today. We have several witnesses with us today.

We have with us, as an individual, Pierre Desrochers, associate professor, University of Toronto, geography department. Welcome to you, sir. From Pond Biofuels, we have David Holm, chief executive officer. Welcome to you, sir. We have by video conference from Fort McMurray, Alberta, from the Athabasca Chipewyan First Nation, Chief Allan Adam. He isn't here yet by video conference. We have from Calgary, Alberta, from the Pembina Institute, Sarah Dobson, economist, Alberta and the north. We have from Ferus Natural Gas Fuels, Blaire Lancaster, director, government and public affairs. Again, she isn't connected yet. I will introduce them as they come on and as we finish with previous witnesses.

We'll have the witnesses present in the order that they're on the agenda and in the order I've just read. Witnesses, I would ask that you keep your comments to seven minutes; otherwise it drags a bit too long.

Perhaps you could go ahead, please, Mr. Desrochers, with your presentation for up to seven minutes.

**Dr. Pierre Desrochers (Associate Professor, University of Toronto, Geography Department, As an Individual):** Thanks for inviting me.

I sent you a PDF file with a few pictures and images. I intend to follow them. I'll go quickly.

The few comments I will make now are based on the two policy papers I wrote in the last couple of years. They're freely available online.

One paper covers the history of the petroleum industry and innovation throughout the history of petroleum. Why was it that petroleum was developed in the first place? Why did it create fewer problems than things that existed before? What new possibilities were created? How did the industry become spontaneously cleaner over time? I stretch that history all the way to the Alberta oil sands and discuss innovations there.

The other paper deals with the petroleum refining industry in this country, the economics, the changing markets, and where the industry stands today.

Both papers have plenty of statistics that should be of interest to this committee, but really that's not what I wanted to emphasize this morning. If you look at the second page, at the slide that follows, these are just refinery statistics. They're widely available. Again, they might be useful, but that's not what I want to do.

My sense of the document that was sent to me is that a lot of the benefits of oil and gas are taken for granted, and a lot of people tend to forget that because these resources are not renewable, they need to be developed over time. The emphasis that I want to put on this today is simply to show the environmental, economical, and social benefits that petroleum and natural gas gave us historically.

There are two slides that follow that essentially show subsistence farmers in Europe. I just showed them to you to show you how miserable people were before carbon fuels came along. The first is from Finland; the other is from Germany. By and large, at the beginning of the 19th century, these people had the standards of living of subsistence farmers in the third world today. It's about a dollar a day in terms of standard of living, a chance in three of being malnourished, a life expectancy in the early thirties, and of course when you rely on nature for everything, you take what you need. You can then scroll down to an image that I like a lot, of Dutch whalers going north of Norway to kill everything that they see, charismatic species like polar bears, whales, and stuff. When you don't have carbon fuel products, you take what you need from nature. I like this image so much that I have it in my office.

Then in the early 19th century, something wonderful happened for humanity. Carbon fuels came along. In the next image you'll see that life expectancy in advanced economies in the year 1800 was about 33 years of age. Around 1900 it was about 45 to 47 years of age. Today, as you know, we're pushing on 80 years of age. It's not only that we're living longer, but there are about seven times more of us.

Our bodies have also changed more in the last 150 years than in the previous tens of thousands of years before.

These are statistics that are widely known by people who do historical demography. We're much taller, we live a lot longer, and we're less susceptible to disease than our ancestors were. That's why I use the expression super-human. I mean, our ancestors would be shocked if they were here today to see not only how fat we are, but how big we are and how healthy we are overall. Of course there were no miracles behind that.

The next slide shows you how little energy was available to human beings before carbon fuels came along. Then coal, natural gas, and petroleum came and suddenly humans could do all these things that gave us our modern standards of living.

The next image is about the fact that we're born surrounded by plastic, and we die surrounded by plastic and other petroleum products, and we're so much better off for it.

The image in the bottom right corner is an African woman carrying a big jug of water on her head. If you're not familiar with the history behind that, those big plastic jugs are viewed as nothing short of a minor miracle in less advanced economies, because of course, the alternatives were big clay pots. Plastic came along and it made life better in countless ways.

But the real emphasis, the real benefit, is long-distance transportation. On the next slide, the white lines are the trade routes that were possible in the age of sail when you had to rely on wind patterns and ocean currents. Then fossil fuels came along and globalization really began in the 19th century.

What were some of the benefits of long-distance trade for the first time in human history? We put an end to famine, because regions that had bad years could rely on regions that had good years. We could concentrate food production in the best locations, so food became a lot more abundant and lot cheaper than before. People could move out of the countryside and into cities. Once we got people off of the farm, they could become medical scientists, they could become engineers, they could become all sorts of other useful things.

And nature benefited in the process.

●(0855)

The next image is a cartoon from 1861, a bunch of whales celebrating the development of the oil industry, because kerosene is putting an end to the massacre of whales about a century and a half before Greenpeace came along.

The following slide is probably the most interesting. I'm a geographer; I like to show maps, as you saw. You see four maps of the United States. The dark areas are the extent of the forest covering the United States. The top left corner is 1620, and then people began to move in. The top right corner is 1850; people are still living along the coastlines and rivers. The low point is 1920. I don't know if you can see the transition from 1920 to 1992. People left the farm. We produced a lot more food on a lot less land than before. The forest made a huge comeback in all advanced economies. Every economy that is at the level of development of Chile and above, so about

\$5,000 a year per capita, has seen a huge extension of its forest cover, and it's largely because of fossil fuels.

In the next image you see kids playing next to a dead horse, urine, dung, but cars that are so despised were a huge benefit in terms of public health.

The most controversial point, though, is the next slide, which is climate change. We've had a lot of climate change in the last 150 years. Things warmed up from roughly 1850 to the 1940s, and then they cooled down from the 1940s to the 1970s, and then they warmed up again, until about 15 years ago. We've had basically no warming for 15 years. Throughout all of that, because of increased wealth, our capacity to deal with extreme weather has improved dramatically over time. Wealthier is not only healthier, but it's also much better in dealing with climate change. I could expand on that later on, but the statistics are pretty clear. So today climate change is not really a problem.

The last one I want to show is that there were alternatives all along. You see an image of someone advertising the fact that you could pump your water for free a century ago. Why buy gasoline? Henry Ford wanted the first Model T to run on ethanol. Electric cars were around a century ago. Fossil fuels defeated them because they were better: more energy density and they created fewer problems than those that were solved.

My final message is that a lot of people today complain about our addiction to fossil fuels, but the case I want to make is that when you look at the data in the broad historical context, fossil fuels are more like a nutritious food. Saying we're addicted to fossil fuels is like saying we're addicted to whole wheat bread, and I don't think addiction is the proper word in that context.

Thank you.

**The Chair:** Thank you very much for a very interesting perspective, which I must admit I hadn't heard before, and I thought it was fascinating.

We will go to our second witness now. From Pond Biofuels, we have David Holm, chief executive officer. Welcome to you, sir. You have up to seven minutes for your presentation.

●(0900)

**Mr. David Holm (Chief Executive Officer, Pond Biofuels Inc.):** Thank you. I'll try to hit the seven-minute mark.

My background really is in the energy industry. I've been a counsel in that industry, a banker in that industry, and I've served as an executive. I also serve on boards in the energy industry, including international companies, E and P companies, cross-border pipeline companies, power companies, and service companies within the energy industry.

That said, I am here on behalf of Pond Biofuels, which is a Markham-based company. It also has an office in Calgary, Alberta. I am headquartered in Calgary, and I think that ties the link of our company to the energy marketplace.

At Pond we've developed a technology with international application. We are a development-stage company. Our technology is to convert raw smokestack gas—the carbon dioxide, the NOx, SOx, and all the particulates in the smokestack—to organic biomass. That is a unique process historically; there's a lot of work going on in this area across the world, but people are using pure carbon rather than smokestack gas. The first thing our company successfully approved was that in fact raw smokestack gas emissions were a fine fuel for organic biomass.

We do combine patent pending control-system technology, the technology taking the gas off the smokestack and feeding it to a photo-bioreactor, to grow micro-algae biomass from smokestack emissions. The applications for our technology are clearly in the oil and gas area: power generation plants, steel mills, chemical plants, mineral plants, i.e. cement kilns, pulp and paper, and other manufacturing industries.

We do have a unique Canadian basis to our knowledge, our expertise, and our circumstances. In Canada we have a 50-year history of growing algae, and that's through the National Research Council facilities in Halifax. We also have a unique Canadian expertise in photonics, or light. That goes to the University of Toronto, and it goes to companies like JDS Uniphase and Nortel. There are a lot of light experts. A lot of the work you're seeing globally in that area comes from Canada. Part of our secret sauce is to use that unique Canadian expertise in our photo-bioreactor.

We are targeting large-scale industrial facilities with significant emissions. Our strategy is to work with the industry and government to reduce greenhouse gas emissions and carbon footprints and to create valuable organic products. We have proven the concept on a test-scale basis, and we've done that in different industrial environments. Those industrial environments are in Ontario, at St Marys Cement, and we now have a facility operating at a U.S. Steel facility. We intend to build a pilot-scale facility of 100,000 litres, which would be phase one of a commercial facility. The operations that we've considered for that facility are in the oil sands and in Ontario in the cement industry.

It is interesting to understand where we've been funded. The original funding came from typical high-tech venture capital funding, government sources, and strategic investors who understood our technology, but the recent capital has come from the energy industry, from people who typically invest in the early-stage and later-stage companies in the energy industry, together with government sources. I think it's telling that the energy investment community understands the application and the global concerns respecting greenhouse gases and companies' licences to operate. Our commercial success will depend on a variety of factors, but clearly, industry support is one of those key factors.

The energy industry is a natural target for the application of our technology. In North America, oil and gas facilities rank overall as the third highest emitters of greenhouse gases. In Canada, the oil and gas industry is the second highest emitter, and in terms of scale is

very close to power generation in terms of greenhouse gas emissions. That's a function of the large-scale processing, upgrading refinery, and petrochemical facilities we find in Canada.

We think there is a market, because we think international investors in particular, outside of government sources, expect increased greenhouse gas disclosure and that industry participants must address the risk and mitigation strategies. We've seen articles, as recently as two days ago in the *Globe and Mail*, that say that very thing.

As well, there are synergies with our product and with the products produced by the energy industry. Those include biofuels, soil nutrients, and those kinds of things that could be used in reclamation for things like oil sands operations. So there are good synergies with energy operations.

Our industry will create jobs, and it will create jobs in support of energy development.

● (0905)

Our team is a highly educated Ontario-based team. It includes photonic scientists, botanists, engineers, engineering techs, and other professionals, so we're talking about high-skilled jobs.

Ontario has provided our company with a deep talent pool of portable skills, and a lot of that comes from the auto industry.

Commercial development will have a significant multiplier effect on our ability to hire. It will increase our need for internal resources. We're already pressed for internal resources, and we will have to engage significant internal resources. Those would include engineering firms, construction firms, manufacturers to build our tanks, and professional advisers.

We do think there's a global application for our products in the energy sector.

There is global interest in Pond, and my sense of the world is that generally global interest in Pond and its technology is really coming from international companies. They do understand our technological leadership in what we're doing, and they do understand the reality of greenhouse gas mitigation, because they see it in multiple countries around the world.

Our experience in the Canadian energy sector shows us that clearly, cost pressures and cost uncertainty are major concerns. Operational concerns are significant. Adoption of the technology, which is non-core to primary operations, faces institutional challenges within the industry. I don't think that's unusual, but they are hurdles to be overcome.

We do think the government policy is something that can help balance and direct beneficial technologies such as ours. We think in terms of incentives to help industry move with technological innovation. We do think to support those types of initiatives you also need strong emissions policies, and I think there's a need to continue to support Canadian innovation. The government has been very helpful to our company.

We want to lead the industrial evolution, picking up on Pierre's theme about evolution. We do think Canadian technology can be key in reducing greenhouse gas emissions. We are in a global race to do so, and we do have unique Canadian talent and expertise to lead that global race.

Our current expectation from where we are seeing the world commercially is that international companies tend to be the early adopters of our technology.

Thank you.

**The Chair:** Thank you very much for your presentation, and thanks again for being here today.

We go now to our witnesses by video conference.

The next to present is Chief Allan Adam of the Athabasca Chipewyan First Nation.

Go ahead, please, with your presentation for up to seven minutes, Chief Adam.

**Chief Allan Adam (Chief, Athabasca Chipewyan First Nation):** What was the question that was asked before? What do you want me to talk about? I missed the first presentation about what it was about.

**The Chair:** This is about the cross-country benefits of the oil and gas sector of the Canadian economy.

**Chief Allan Adam:** I could speak on behalf of the Athabasca Chipewyan First Nation, ACFN. Basically, we're in the Athabasca region north of Fort McMurray.

Over the years, what we have experienced in regard to oil and gas operations is that we find it hard to truly maximize the benefits from the oil sands reserve here in Alberta because industry makes it complicated for first nations when making impact benefit agreements on their traditional territories. That's mainly because of the high rate of lobbying that continues to happen daily with both federal and provincial government officials, in which industry says that first nations are being a burden in regard to extraction of the natural resources in the area concerned. In more ways than one, whatever Canada has been doing in the last little while in regard to first nations becoming self-sufficient and moving on an economic platform, they tend to widen the gap in regard to how difficult it is for us to make these agreements with industry. It's mainly because industry wants to control and is lobbying both levels of government to have control over first nations traditional territories.

I don't think it's right, in more ways than one, that Canada, along with the provincial government, continues to deregulate the regulatory system to make it easy for industry to go into our traditional territories. Our traditional territories existed long before European descendants came into our traditional territories. ACFN

has always recognized that we are here to protect and to be stewards of the land.

Through our IBAs, impact and benefit agreements, we're starting to implement some of the agreements we have in place. We make sure that in the implementation there are grounds for protection of water, air, land, and animals in the area. If anything were to go wrong for any of the developers with whom we make an IBA, we have implementation clauses in the agreement whereby they are subject to penalties if anything occurs on their sites.

We need a good understanding between the first nations and government with respect to where they're going. I truly believe that industry continues to lobby at a rate such that government continues to give in to them.

We all know for a fact that economic development is a key component in building this country, but we also have to look at the other portion of this whole thing. Whatever happens in our area, the community of Fort Chipewyan, has a drastic effect on our health system. Our ecosystem is in jeopardy; our water system is in question right now because of the uncertainty regarding all of the effluent that is being pumped into the Athabasca River. With the continuous breaches with respect to how the regulatory system is failing us, this situation needs to be looked at in more ways than one.

If the Athabasca River is deemed to be one of the protected rivers in Canada, why wasn't that protection enforced when the Obed Sherritt mine had a breach up around Hinton, Alberta, when the whole coal mine tailings pond leaked into the Athabasca River? No criminal charges have been laid against the perpetrators in that area.

In our way of looking at things, we need to come up with a strategy whereby first nations people are heavily engaged in the process of developing a regulatory process for protecting the ecosystem and yet can continue to build an economic platform.

For as long as those tools are not in place, the Athabasca Chipewyan First Nation will continue to put pressure on the oil and gas industry in this region until we come to these conclusions.

● (0910)

We are using our rights and we cannot continue to allow industry to lobby government officials to let our treaty rights deteriorate. Our treaty rights are enshrined in and entrusted to the Canadian Constitution. We make this a lot easier if it becomes known that we as first nations people will work at a government-to-government level with both the feds and the provincial government. I don't think that at this point in time industry has anything to say about it.

**The Chair:** Excuse me, Chief Adam, you still have a minute left, but the scope of the study is about the benefits across the country of the oil and gas sector of the Canadian economy. Are there any benefits of the industry to you and your people that you would like to talk about?

**Chief Allan Adam:** Well, that's what I'm getting at. Some of the benefits that rely on it include economic development, but the other component is that it is those who have IBAs, the impact benefit agreements, are having a hard time because industry continues to lobby government, and government is putting pressure on industry to cut back on the IBAs that industry has given out to the first nations.

We continue to live in poor conditions. Our housing portfolio has maxed out. We can't even build any more housing in our area, because benefits are not increasing enough for the first nation to sustain itself. We are therefore having problems in that area. Social programs are also becoming an issue and are deteriorating.

But we continue to move forward and we're trying to put everything together to try to make industry understand that the benefits coming from development are not maximizing the need for the first nations in the area.

• (0915)

**The Chair:** Thank you very much, Chief Adam. I'm sure you'll have some questions later.

We go now to our next presenter. From the Pembina Institute, we have Sarah Dobson, economist to Alberta and the north.

Go ahead, please, with your presentation for up to seven minutes, Ms. Dobson.

**Dr. Sarah Dobson (Economist, Alberta and the North, Pembina Institute):** Thank you to the chair and the members of the committee for the opportunity to present here this morning.

The Pembina Institute is Canada's sustainable energy think tank. We advance energy solutions through research, education, consulting, and advocacy.

My work focuses on economic issues related to oil sands development. For that reason most of my comments today will focus on the contribution of the oil sands to Canada's economy.

While Statistics Canada does not track the oil sands specifically, GDP data shows the unconventional oil and gas sector, which consists primarily of oil sands, contributed 2% to the national GDP in 2013. So the oil sands are important, but far less important than informal polling suggests Canadians believe.

Since 2007 the oil sands have grown at an annualized rate of 8.4% per year. This is rapid growth, but from a small enough base that it remains a long stretch to argue that the oil sands are driving the rest of Canada's economy.

Looking at jobs, in 2012 the oil sands provided direct employment to 0.2% of Canada's full-time workforce. Looking at the entire oil and gas sector, direct employment increased to 1.4% of Canada's full-time workforce. For comparison, the retail sales sector provided 3.9% of Canada's full-time jobs in 2012 and the manufacturing sector provided 5.4%.

Last, turning to federal government revenues, in 2012 the oil and gas sector paid \$1.3 billion in federal corporate income taxes, representing 0.5% of total federal government revenues.

These are significant numbers, but perhaps less significant than industry advertising or government prioritization would lead one to believe.

These numbers provide an overview of what the oil and gas sector is contributing to Canada's economy today. Arguably, the more relevant question, though, is where the oil and gas sector is heading in the future, which will in large part be determined by what happens to the oil sands.

In 2011, the Canadian Energy Research Institute, CERI, published a study looking at the impact of future oil sands development on Canada's economy. In CERI's most optimistic scenario, oil sands export capacity increases to just shy of six million barrels per day by 2035. In this scenario the oil sands are expected to contribute \$4.9 trillion in GDP contributions from 2010 to 2035. Direct and indirect employment is expected to reach just over one million jobs in 2035, and total federal and provincial and municipal tax receipts are expected to average nearly \$30 billion per year.

These appear to be attractive numbers, but we need to ask some fundamental questions about them. Is that scenario achievable? Is it environmentally responsible? What risks would the pursuit of these benefits pose to Canadians and to the long-term competitiveness of Canada's economy?

Looking ahead, the Canadian Association of Petroleum Producers is forecasting 5.2 million barrels per day of oil sands production by 2030. The National Energy Board's 2013 outlook pegs oil sands production at five million barrels per day in 2035. Relative to current production levels of just over two million barrels per day, this represents a minimum 150% increase in oil sands production by 2035.

Notably missing from these forecasts are strong data to support the implicit assumption that future demand for the oil sands will be high enough to support supply increases at that scale. The reality is that laws and regulations in the energy sector are changing. Jurisdictions around the world are increasingly taking action to address climate change and the assumption that demand for a high-cost, high-carbon fuel like oil sands bitumen will remain high enough to realize industry's expansion plans is weak at best.

Along with virtually every country in the world, Canada has agreed to take action to limit the rise in global average temperatures to 2°C or less. The International Energy Agency, IEA, models a scenario every year that is designed to give the world a fair chance at staying below the 2°C threshold. Under this scenario, global demand for oil peaks in 2020 and falls thereafter. In 2010, the IEA published production estimates for the oil sands specifically under this scenario and found that while oil sands production continued to grow, it reached just 3.3 million barrels per day in 2035, far below the 5.2 million barrels per day that CAPP estimates by 2030. The IEA's finding is not the result of a specific government policy to limit oil sands growth, but a natural consequence of lower demand for oil, which in turn leads to lower oil prices and thus less production in the high-cost, high-carbon oil sands sector.

• (0920)

What does this mean? The projections of expected oil sands production are based on future market conditions that correspond to a global failure to address climate change. In a world where we take action to address climate change, oil sands production grows far more slowly than industry currently predicts.

**The Chair:** Excuse me, Ms. Dobson.

You do have about two minutes left, but again, I would like to remind you that the focus of this study is the cross-country benefits of the oil and gas sector of the Canadian economy. If you could try to get to that at some time, it would be very much appreciated.

Go ahead for another up to two minutes.

**Dr. Sarah Dobson:** Thank you.

The scenario of lower oil demand and thus lower oil prices coupled with fast-growing demand for clean energy needs to be acknowledged by the Government of Canada in its policy choices and economic planning. By shifting our focus towards investing in sectors such as clean energy, we can build the kind of diversified economy we need to be competitive in a global low-carbon economy.

In your discussions around the benefits of developing the oil and gas industry, I encourage you to consider the following policies that will help guard against the risks that I have identified and will ensure that future development is responsible and maximizes longer-term benefits for Canadians.

First, introduce regulations on greenhouse gas emissions for the oil and gas sector that are strong enough to get Canada on track to achieve its national 2020 climate target. Knowing the rules of the game would allow companies to make investments, particularly in innovative technologies, to reduce emissions with greater confidence.

Second, provide greater support for energy efficiency and the clean energy sector. A reinvestment in energy efficiency retrofits for homes and commercial spaces, for example, is win-win-win: reducing Canada's emissions, creating jobs across the country, and saving money for Canadians. Similarly, programs such as production tax credits for clean energy encourage investment in a sector of growing global importance.

Finally, complete the phase-out of all tax preferences and subsidies to the fossil fuel sector by 2020. This government has made real progress in reducing tax breaks to fossil fuel producers, but Canada's two largest subsidies, the Canadian development expense and the Canadian exploration expense, still remain on the books. These subsidies are costing the government and Canadians hundreds of millions of dollars in forgone revenue every year and are providing the wrong incentives to industry to over-invest in high-carbon fossil fuels.

Thank you for the opportunity to share these thoughts with you today and I welcome any questions.

**The Chair:** Thank you, Ms. Dobson, for your presentation. I am certain you will have questions directed to you later.

We go now to the final presenter. From Ferus Natural Gas Fuels Incorporated, we have Blaire Lancaster, director, government and public affairs.

Please go ahead with your presentation, Ms. Lancaster.

**Ms. Blaire Lancaster (Director, Government and Public Affairs, Ferus Natural Gas Fuels Inc.):** Good morning. Thank you for this opportunity to provide remarks contributing to the Standing Committee on Natural Resources' cross-Canada benefits study of the Canadian oil and gas sector.

Ferus is a North American energy services company with headquarters in Calgary. Within the Ferus portfolio are two companies delivering integrated solutions to the energy industry for well stimulation, well completion, enhanced oil recovery, and natural gas fuelling solutions. Ferus's product lines include liquid carbon dioxide, liquid nitrogen, liquefied natural gas, LNG, and compressed natural gas, CNG, as well as the related logistical services.

In terms of our Canadian operations, Ferus employs 215 people. We own and operate three nitrogen plants and three CO<sub>2</sub> plants in Alberta and British Columbia, as well as a fleet of 75 tractors and 135 specialized trailers and storage equipment to transport and store our products. Furthermore, we are about to commission the first Canadian merchant LNG liquefaction facility in northeastern Alberta in the town of Elmworth.

I will begin by briefly talking about our nitrogen and carbon dioxide business, and then move on to our natural gas fuelling business.

Nitrogen and/or carbon dioxide is injected into the well to generate better production and economics with lower environmental impact for conventional and unconventional gas and oil wells. In addition to improving well results, using N<sub>2</sub> and CO<sub>2</sub> benefits the environment through reduced water use, reduced disposal of recovered water, reduced well-pad size, reduced chemical usage and reduced CO<sub>2</sub> emissions into the atmosphere. Our CO<sub>2</sub> processing facilities recover waste CO<sub>2</sub> from natural gas processing plants that previously would have been vented to the atmosphere. In all, Ferus CO<sub>2</sub> facilities are capable of processing over 300,000 tonnes of CO<sub>2</sub> per year. When carbon dioxide is used, approximately 30% is permanently sequestered underground, thus capturing a significant amount of this greenhouse gas.

Ferus's liquid nitrogen is produced by a simple physical process whereby air is cooled to a point where it turns into a liquid. The harmless byproducts from this process, oxygen and argon, are vented back into the atmosphere.

Ferus also has an emerging natural gas fuelling business with significant potential for growth across Canada. We provide end-to-end LNG and CNG fuelling services, including production, transportation, storage, and delivery to our customers in the oil and gas, mining, marine, and trucking industries.

Ferus was the first company in Alberta to integrate natural gas powered trucks into our fleet, and, as mentioned, we are nearing completion of the first Canadian merchant LNG production facility in northeast Alberta. The first phase of this facility will produce 50,000 gallons of LNG per day, which will be used primarily to fuel drilling rigs, pressure pumpers, and heavy-duty service trucks in the area. As demand grows, we will move into phases two and three of the project, ultimately producing 250,000 gallons per day of LNG. This represents a total investment of up to \$100 million.

Ferus has also signed a joint venture agreement with ENN Canada, the Canadian subsidiary of China's ENN Group, to build two LNG liquefaction plants, one in Edmonton, Alberta, and the other in Chilliwack, British Columbia, each representing an investment of \$200 million. These will primarily service the on-road trucking market, but also other high-horsepower applications.

Also relevant to Canada is our CNG joint venture with General Electric, whereby we are capturing flare gas, compressing it, and using it to fuel the operators' drilling rigs. This reduces wasteful flaring, saves money, and cuts greenhouse gas pollution. While this is a U.S. joint venture now, we see significant opportunity to apply this technology and initiative in Canada and are working now on making that a reality.

The key benefits of fuelling with natural gas are economic and environmental in nature. The significant price difference between natural gas and crude oil translates into a savings of 20% to 40% to the end user when using LNG or CNG in place of diesel fuel.

• (0925)

As a lower carbon emitting and cleaner burning engine fuel, natural gas produces 20% to 30% fewer greenhouse gas emissions and almost zero particulate emissions, contributing to significantly improved local air quality.

Furthermore, the natural gas fuelling industry represents a promising new market for Canada's abundant natural gas resource and reduces dependency on foreign *[Technical Difficulty—Editor]*

**The Chair:** We have lost the witness, obviously, and I don't believe there would be a video connection either, so we'll have to allow her to complete the last two minutes of her presentation after.

We'll go directly now to questions and comments. Go ahead, please, Mr. Trost, for up to seven minutes.

**Mr. Brad Trost (Saskatoon—Humboldt, CPC):** Thank you.

**The Chair:** Unfortunately, if you had questions directed at the witnesses who were here by video conference, we can't make that work. It's a bit awkward. Maybe we should see if we can get reconnected in a couple of minutes. I think we'd better, otherwise the witnesses don't hear what's being said here.

I apologize for the break, we'll suspend just until we get the video back.

• (0925)

\_\_\_\_\_ (Pause) \_\_\_\_\_

• (0930)

**The Chair:** We'll reconvene the meeting.

I apologize for the loss of the video conference. We just held up the proceedings until we got you reconnected.

Ms. Lancaster, you have about two minutes left in your presentation. I apologize for the disruption. Carry on for the last two minutes, please.

**Ms. Blaire Lancaster:** Thank you. I'm trying to remember exactly where I was when we lost the connection.

Did you hear me talk about the key benefits of fuelling with natural gas being price and environmental in nature?

**The Chair:** Yes.

**Ms. Blaire Lancaster:** I think I went on to say that the main challenges to widespread adoption of natural gas vehicles and engines include conversion costs and lack of infrastructure. It's a chicken-and-egg problem, whereby potential customers are unwilling to invest the capital required to convert to natural gas engines if there's no supply or fuelling infrastructure, while potential suppliers are hesitant to build the necessary infrastructure if there is no demand.

Ferus is creatively solving this problem by entering into joint venture partnerships, whereby both parties are able to commit to the minimum demand required to get final investment decision on building LNG liquefaction facilities.

Once a secure source of supply is available, we believe widespread conversion will take place across Canada which will have significant economic and environmental impact. These investments utilize Canadian natural gas to create Canadian liquefied natural gas, which in many cases fuels engines to find and produce more Canadian natural gas. This represents the creation of a virtuous cycle and value creation within the country.

The Ferus business model is a Canadian success story. Our nitrogen and carbon dioxide business has grown significantly, and while the large west coast LNG export projects attract the bulk of media attention, our smaller-scale domestic LNG facilities are a successful model that will have real economic and environmental impacts long before the first LNG export terminal is up and running and will result in a significant new market for Canada's abundant natural gas resource.

All told, Ferus has invested over \$220 million in Canada, and as we build our businesses, that number will significantly increase.

Thank you.

**The Chair:** Thank you very much for your presentation, Ms. Lancaster. It was extremely interesting.

We'll go to Mr. Trost for questioning for up to seven minutes.

• (0935)

**Mr. Brad Trost:** Thank you, Mr. Chair.

I found your remarks pretty interesting, Dr. Desrochers, because you took a look at this issue from a macro perspective and because of the nature of who we tend to get as witnesses, most witnesses tend to look at their very specific area; they have a more localized look at this.

What I took away from what you were saying was that the use of fossil fuels has created an environmental benefit for the whole world.

Could you work it more toward a Canadian situation? Do you have Canadian data? I looked at some of the American data. How have fossil fuels helped the Canadian environment? Where specifically, as it comes to a more localized sense, do we see benefits across Canada from an environmental perspective, be it technology spreading, or be it environmental, that impacts Canadians? People get the world picture, but I'm trying to draw your macro picture to a more manageable level.

**Dr. Pierre Desrochers:** I understand perfectly.

The first thing I need to say is that, if you look at Canadian trends, they're not different from world trends, so obviously, life expectancy in Canada was something like 45 years of age in 1900, and today, as you know, we're pushing beyond 80. We have all the benefits that come from petroleum applied on a localized scale.

The one area where we perhaps differ a little bit is in the reforestation data. I was saying before that in all countries that are at the level of development of Chile and above, which rely abundantly on fossil fuel, the forest cover is either making a comeback, because people are leaving the farm because they're more productive.... This is true in Canada. The last time I checked the Quebec and Ontario data, something that people don't realize is that we're actually gaining forest in places like Ontario and Quebec, despite urban sprawl. That's because a lot of people are moving out of places like the Gaspé or south Georgian Bay. A lot of unproductive farmland is being abandoned and the kids don't want to take over. If your rural land is not very attractive for cottage types or people who want to vacation, or it's just too far from an urban centre, it tends to be reforested.

At a global level though, if you look at the FAO, the Food and Agricultural Organization of the United Nations, which looks at this data, they say that forest cover in Canada is not changing. That's because we have so much forest that even though we're gaining a little bit at the local level, it doesn't make a big difference overall.

As for Canada, I don't know the data about western Canada, but I can assure you that in Quebec and Ontario, we've actually regained forest land, or expanded our forest cover.

**Mr. Brad Trost:** Let me probe a little farther into your generalized point. You're basically arguing that we're wealthier and that makes the environment healthier. Draw for me the connection between the production and use of fossil fuels and a wealthier economy. I understand how if you're wealthier you can look after the environment more, but make the argument—

**Dr. Pierre Desrochers:** Well, fossil fuels provide roughly 85% of the energy supply in all advanced economies. There are no alternatives to fossil fuels in transportation. Yes, you have golf carts, and yes, you can have a few Chevy Volts. I don't know how

many hundreds were sold in Canada in the last few years. I don't have the data with me.

**Mr. Brad Trost:** Is there no basic alternative to replace fossil fuel?

**Dr. Pierre Desrochers:** In transportation there's currently no basic alternative to fossil fuels. Yes, you can have compressed natural gas and stuff for limited things like buses or closed-circuit types of things, but there is no substitute for petroleum products at the moment for long-distance transportation.

Again, from long-distance transportation come all these other benefits. You can specialize agricultural production in the best land, and you can produce fertilizer with natural gas. Today we produce something like eight or nine times more corn on the same piece of land than we did a century ago; so of course the more general agricultural—

**Mr. Brad Trost:** So the production of oil and natural gas may be the best thing we've done environmentally for the planet. Am I stretching it maybe a little bit?

**Dr. Pierre Desrochers:** No, you're not, and that's something people don't realize. Our planet today is much greener because of fossil fuels, because we use stuff taken from underground, instead of taking stuff from the surface as our ancestors used to do. Our ancestors were much less numerous than we are, but they were also much less productive. The point of showing you those images from Finland and Germany is to show you how much the landscape was being degraded by "renewable practices" in the past.

I'm sorry if you want me to stick to Canada, but if you ever go to the Greek islands or Turkey, sometimes when you go to Roman ruins that are five miles inland, you're told that it used to be a port. What happened? People farmed all the steep hills around it until all the land was eroded, and the lagoon was silted and so.... Our ancestors did a lot more environmental damage using renewable methods than modern methods do today.

● (0940)

**Mr. Brad Trost:** Ms. Lancaster, I'm going to pivot to you, because while Dr. Desrochers brings out the macro, you tend to talk a little bit more about the micro.

Your technologies, of course, are there to make your company more money, but talk a little bit about how environmentally it helps specifically.

You'd said that there were environmental benefits, but talk to some specific technologies and how they benefit not only your company but also the wider area across the country as technologies like yours get expanded for the environment.

How do they on a local level do what Dr. Desrochers talked about on the macro level?

**Ms. Blaire Lancaster:** Thank you for that question.

If you're talking specifically about our natural gas fuelling business, I can use a very localized case study. If we look at the LNG production facility that we are about to commission in Elmworth, Alberta, if every gallon of LNG produced at our first LNG production facility replaced an energy equivalent amount of diesel, and given that natural gas emits 30% less greenhouse gas emissions than diesel does, then our 50,000 gallon-per-day facility would translate to a reduction of 43,000 tonnes of greenhouse gas emissions per year.

That's a local example right there of how using natural gas in place of diesel will improve air quality, because of the reduction in greenhouse gas emissions. Those emission reductions will of course increase as we expand to future phases, assuming that all of the LNG we're producing is being used to displace diesel, so the numbers can be calculated similarly for the plants that we're building in Edmonton and Chilliwack, as well as for future infrastructure that we plan to build across Canada.

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

Thank you, Mr. Trost.

We have three guests at our committee today. Welcome to all of you.

The first one is Mr. Cullen. Go ahead, for up to seven minutes, please, sir.

**Mr. Nathan Cullen (Skeena—Bulkley Valley, NDP):** Thank you very much, Chair.

Thank you to our witnesses here and those who are by video conference.

Chief Adam, I'm going to turn to you in a second.

We're talking about the impacts and benefits.

I will note there is some irony in Ms. Dobson's presentation—irony, or interesting fact of the \$1.3 billion that is generated directly from oil sands is almost equivalent to the IISD and IMF studies about the subsidy given by the federal government to the oil sands sector. I'm surprised that they got it so accurately correct.

Mr. Adam, I'd like to read a quote from somebody I think you know. In reference to the oil sands in general, he said:

I'd like it slowed down [because] of quality of life.... I feel sometimes like we're racing to the end. [The oil] is not going anywhere.

That was from the radical environmentalist former member of Parliament, Brian Jean, of Fort McMurray.

The pace of development is a question that's often put to us in terms of how the oil sands is developing. From your people's perspective, how does the pace affect the potential impact and benefits that Fort Chipewyan people will see from oil sands development?

**Chief Allan Adam:** I think in more ways than one.... To try to answer that question, it's more ways striking and sad to hear the fact that former MP Brian Jean, who represented our area, came out and made those comments after he stepped down as an MP. He should have mentioned that while he was a member of Parliament, because of the fact that he knew the rapid growth in our area is so substantial

that the first nations are having a hard time trying to deal with the issues at hand.

We continue to rapidly deal with application after application after application. We have a small staff of six employees who have to deal with the number of applications that come in.

The first nations' view is that continuous development in the area will also have a drastic impact on the environmental component of it. I'm not only saying that, but it makes it a lot harder when impact benefit agreements and economic development continue to be a burden.

Everybody across Canada thinks that the first nations are benefiting from the oil sands development in this region. We have to argue, and we have to lobby hard with industry in order to obtain contracts in this region. In more ways than one, the first nations, with regard to our traditional territories, are being overlooked with respect to how economic prosperity would be moved forward.

It's hard dealing with the issues we have, and governments at both levels are not making it any easier for first nations to enter into these IBAs with industry, because industry continues to lobby governments, saying why should they have to pay both parties with regard to an impact benefit agreement.

In more ways than one, Canada and Alberta alone are depleting a non-renewable resource from the oil sector, and are not putting a penalty of a tax bracket on the oil and gas industry where Canada would benefit from it.

● (0945)

**The Chair:** I'm sorry to interrupt you, Chief, but we have a point of order.

Ms. Crockatt.

**Ms. Joan Crockatt (Calgary Centre, CPC):** Mr. Chair, I'm sure that all the members would love to hear if the chief has experienced any benefits from the oil and gas sector. I'm sure there must be some, and I'm sure that's why he's been asked to come, so I would love to hear if he can think of any benefits that he would like to discuss.

**The Chair:** The member makes a valid point, Chief Adam.

The scope of this committee is to deal with the cross-country benefits of the oil and gas sector of the Canadian economy.

On that point of order, Mr. Regan....

**Hon. Geoff Regan (Halifax West, Lib.):** Mr. Chair, I think Ms. Crockatt wants to testify on behalf of the chief, and that's not appropriate.

The fact of the matter is we are talking about how the first nation maximizes the benefits, or so far hasn't managed to maximize benefits, and why that is the case. That is very relevant to this study.

**The Chair:** I'm not going to interfere with the questions and comments here. The point was made. If we can keep on focus, you always have a more productive committee.

Chief Adam, perhaps you could continue. We stopped the clock, by the way.

Chief Adam, I don't know if you were finished, but if you'd like to finish, I apologize for the interruption. It's the way committees work.

**Chief Allan Adam:** When I say it's making it harder for us to benefit, I could honestly say that if Canada was benefiting across this country in regard to the oil and gas sector, and if the Province of Alberta was benefiting from it, what we're saying is that sure, economic growth is something that is needed, but I think we could do it a lot better than how we're doing it right now.

Not only are the first nations not benefiting from it, but I don't think Canada and Alberta are benefiting from the natural resources in the area because of the fact that we're continuing to let this non-renewable resource be extracted at a fast rate right now, and we can't comprehend the magnitude of the environmental disaster that's going to erupt from it.

I don't think any benefit agreement to the first nations or to Canada would be relevant at this time, because we're running into a crisis, and if we don't get hold of it right now, there isn't going to be any benefit for Canada in the future.

**Mr. Nathan Cullen:** Thank you.

It's interesting when asking questions about how to properly assess the benefit for first nations, whereas you put it, how to maximize the benefit of this one-time resource, government members find that line of questioning not relevant.

I'll go on to my second question. It has been established in the courts by your first nations, and many first nations across the country that rights in title are constitutionally protected: this is not an option. We often talk about capacity building and having enough capacity within first nations communities in order to assess the projects that are coming your way. Some of these projects are tens of thousands of pages of technical data.

If first nations are, in a sense, a legal gateway to resource development writ large, but in particular the oil sands, would it not be of benefit, if we're talking about benefits to the Canadian economy from oil, to better establish and better give capacity to the first nations communities in particular to assess the projects that are being presented so that we're able to not only do the projects better, but to allow the greatest benefit to the people who are most impacted, which are people like yourself who live in the territory in which the development is happening?

• (0950)

**The Chair:** You have about 30 seconds for an answer, Chief Adam. Go ahead, please.

**Chief Allan Adam:** We greatly need more capacity in dealing with the amount of development that is occurring in our area to maximize the true benefit in regard to how we will be able to move forward. I truly believe that the regulatory system is failing us in regard to that development and moving that in that area. We continue to lobby for more staff, and industry continues to lobby not to give us more staff because we'd be more of a burden to Canada and to the Alberta government in putting pressure on these regulatory systems.

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

Thank you, Mr. Cullen.

We go now to Mr. Regan, for up to seven minutes. Go ahead, please, with your questions.

**Hon. Geoff Regan:** Let me also begin with Chief Adam. In terms of benefiting from the developments in the oil and gas sector, the Government of Canada, of course, has transferred the responsibility to negotiate with first nations to industry. In your view, has the federal government abdicated its fiduciary responsibility to first nations and left them to fend for themselves?

**Chief Allan Adam:** Well, I think in more ways than one we're not benefiting in regard to how we're moving in that direction. As I said, we continue to have a hard time negotiating these benefits with industry, when industry does not want to make these benefits with the first nations because of the fact that it costs them an amount of money in regard to moving forward.

We feel we need to go in that direction because of the new regulations that are coming from the federal government in regard to the federal government meeting their fiduciary responsibilities to the first nations in regard to treaty rights.

**Hon. Geoff Regan:** Thank you very much.

This next question really is for any of the witnesses.

In terms of maximizing the benefits of this sector, there's been a lot of talk from industry leaders and from politicians, like Premier Wall, for example, about the need for the federal government to focus on the social licence that we need in order to develop our energy resources and market them and open up markets for them. It's a bit like this study.

If there's anybody listening on the radio, as can be done for these committees, they may not understand that when committees make decisions about what to study, those decisions are made in camera. Of course, they're made by a majority vote, so I think people can figure out what that means.

In this case, the fact that we don't have a broad study is a bit like the situation of going all one-sided and of not recognizing that we need to take the kind of environmental actions that would win for us internationally more support for marketing our resources. Doing that in this committee, again trying to be so narrow and so one-sided in this study, is an example of the same kind of thing.

I'd like to ask the witnesses to comment on what action they'd like to see the federal government take and give any recommendations they would have.

**The Chair:** Mr. Holm, do you have any suggestions?

**Mr. David Holm:** The issue of social licence is obviously very difficult. I run a business and we view it very much as a business. For us at Pond, clearly legislation that values carbon is going to be very helpful to our business, but we understand that the industrial complex globally is also very important for Canada to take into account as to what that means.

I personally think that the investment community is going to drive what it requires out of industry, and I think we're seeing that in a big way. I think that will help facilitate government's actions on carbon policy and emissions. I think that is becoming a fact of life. I think that is going to be driven globally. That's what we're seeing. We are seeing people in parts of the world that have much more tremendous problems with carbon emissions than we have in Canada in having to deal with them. There are areas like China with mass emission problems. We have ENN investing in Ferus facilities. I think that's a reflection of their philosophy. We have CalPERS demanding people disclose what their carbon emissions are and what they're doing about them.

I think it's governments and industry in a reflection. I think our industry is maturing and understands it has to value these things and include them in their economic modelling. I think it's a combination of forces, personally.

• (0955)

**The Chair:** Thank you.

Mr. Desrochers.

**Dr. Pierre Desrochers:** Yes, quickly.

My answer will be a bit strange to you, but if you believe, like me, that overall hydrocarbons have created more benefits than problems, then I always have a problem with people who give themselves the right to block what I see as progress. What is the social licence to block development? What is the social licence to block economic well-being? What is the social licence that gives you the right to prevent reforestation of the planet by developing fossil fuels further? What is the social licence to always focus on one problem by overlooking all the other benefits?

I think governments need to strike a balance between progress and problems. Yes, you might argue that... I'm not going to address the scope of the study that is reviewed here, but I think that this whole discourse around social licence is too one-sided for my taste.

**Hon. Geoff Regan:** On that, Mr. Desrochers, let me just ask you something.

I'm sure you're aware of the kinds of air pollution that exists in some of the major cities in China, which of course is a result of the burning of fossil fuels. Of course, once that is in the air, it goes all around the world. I guess the question is, is it conceivable to you that we could produce so much greenhouse gases on this planet, that humans can do that, seven billion of us, that it could exceed the capacity of our oceans and those forests of which you have spoken to absorb it?

**Dr. Pierre Desrochers:** What if I told you that air pollution in Toronto a century ago was actually worse than in Beijing today.

**Hon. Geoff Regan:** But my question is, can you conceive of pollution like that?

**Dr. Pierre Desrochers:** No, I'm just....

All economies tend to get dirtier as they develop. People are willing to make trade-offs in China. My wife is Japanese, but she's a China specialist. She lived there 25 years ago and she saw how poor people were and how happy they were to develop those fossil fuels. So, yes, Chinese cities today are almost but not as dirty as, let's say,

Montreal or Toronto were a century ago. People are willing to make those trade-offs to have electricity, to have running water, to have a sewage system that works.

So if the past is any indication, there will be progress. There will be innovation. We heard about the natural gas industry this morning. But the papers that I was mentioning at the beginning, this is the whole history of the energy sector turning waste into wealth, creating wealth out of what used to be a pollution problem. Let's not block things. Let's focus instead on human creativity and again creating wealth out of what are problems.

**Hon. Geoff Regan:** Don't worry, be happy.

**The Chair:** Thank you very much, Mr. Regan. Unfortunately, we're out of time for you.

We will start the five-minute round with Mr. Calkins, followed by Mr. Leef, and then Ms. Leslie.

Go ahead, please, Mr. Calkins.

**Mr. Blaine Calkins (Wetaskiwin, CPC):** Thanks, Chair.

I just want to make a quick comment to Mr. Desrochers.

I'm looking at the slide where it says that people look different now. The average adult male in 1850 was 5 feet, 7.4 inches tall. Today he's 5 feet, 9.5 inches, and 191 pounds.

I'm just wondering if you've let Air Canada or WestJet know about these size differences—

**Voices:** Oh, oh!

**Mr. Blaine Calkins:** —and about the according seating arrangements on the aircraft. If I were 5 foot 7 and 149 pounds, I could fly comfortably.

All kidding aside, I really do appreciate the insights you have.

Mr. Holm, I do have some questions very specifically for you. You talked about your photo-bioreactor, your applications, and all the aspects of refining and processing, and that it's a unique Canadian technology. We have the technology and so on here to back that up. That has all come about because of what Mr. Desrochers says: we've evolved out of the agricultural age through the industrial age. We're now in the information age. Because we have more people in our universities and colleges who are thinking, we have people who are able to do more than just get by on subsistence living, which is what we used to do hundreds of years ago.

I'm wondering if you could expand on the link that your company has had between universities and colleges and the ability to get these new technologies once they're developed and commercialized. I'm sure Mr. Desrochers could speak to that more broadly as well.

As well, can you talk about the intellectual property regime and how important that is? I believe the value in your company isn't so much in the ability to actually do what your company does. I believe the value in your company is probably based on the fact that you have some intellectual property that you've patented and you have a unique technology that will solve it. I believe that's where the real true value in this comes.

Mr. Desrochers, perhaps more broadly, you spoke about the carbon side of things, but I firmly believe that in terms of the intellectual property aspect, the development of our modern societies today has come about because of the technological advances that wouldn't have come about if we hadn't had stringent intellectual property regimes that provided for those opportunities to happen.

Perhaps you guys could comment on those aspects of your companies and in the broader context.

•(1000)

**Mr. David Holm:** To start with the more micro analysis, your point is a very good one. Our value is the fact that our founders are incredibly talented people. Their backgrounds are industry photonics and the pharmaceutical industry, and that leads definitely to processes and intellectual property processes.

Each of those two individuals also spent time at the University of Toronto and integrating businesses with University of Toronto programs. They have a unique combination of skills, and there's a direct relationship right back to the University of Toronto. A lot of the photonics expertise we have was done by people who were professors at the University of Toronto. Former members of that faculty are today on our scientific advisory committee.

Again, speaking to our focus as a development company and a technology company, it was founded on the strengths of very creative, very smart people applying technologies in a unique way to address a problem that we see in the world today, which is directly on point with what Mr. Desrochers says about people evolving and using technologies and applying them in unique ways and developing them for social good and economic good.

For us, we do have the challenge of being a small company trying to have large companies adopt and use our technologies or be prepared to spend research and development dollars to help get us to that next level. That is a challenge for a company like ours. It's also a challenge in an economy such as Canada's, which is small compared with the economies of the U.S. or China, for example, and probably a little less technologically focused given where a lot of the wealth in our country has been created.

So if that's helpful to you, or if that addresses your question—

**Mr. Blaine Calkins:** There's a pan-Canadian benefit, but there's a global benefit as well, in making sure that these.... Because of intellectual property and so on and the regimes we have, the development of these technologies obviously deals with environmental considerations. It has economic benefits, but also every new thing we discover leads to the next discovery.

Am I right, Mr. Desrochers?

**Dr. Pierre Desrochers:** You're completely right.

I would introduce a note of caution, though, about universities and intellectual property. This is an area that I actually studied a lot 15 years ago, but in the American context. The problem when universities get into the patent game is that historically they were given an exemption to steal ideas from left and right, and businesses were not bothering them. But a few American universities began patenting knowledge to try to create money out of it, and this created some side issues that are beyond the scope of this committee.

I would argue that, yes, intellectual property has a role with business, but I think the main role of universities is to produce bright students who can then work for that business, or professors who can consult with that business and leave them their property rights. I don't think universities should get involved too much with that.

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

Thank you, Mr. Calkins.

We go now to Mr. Leef, for up to five minutes.

**Mr. Ryan Leef (Yukon, CPC):** Thank you, Chair, and thank you to all our witnesses for some interesting presentations.

Chief Adam, I'm the member of Parliament for Yukon. The premise of this study of cross-country benefits for all Canadians is of course interesting from a Yukon perspective, because when we frame this discussion around development in the north, it is a question for our entire population, including our aboriginal and first nations people in Yukon.

One thing I have heard as their member of Parliament is that they want Yukon people for Yukon jobs. Of course, that centres around our first nations. Eleven of the fourteen first nations in our territory have signed final agreements.

The government has done a great job, both the territorial and the federal governments, of supporting them with financial resources to sign and secure IBAs, to develop communication plans to work with industry, to help them with the capacity development.

I appreciate the comments you made around the struggle to have the capacity, with the influx of development, to deal with the volume of applications with few staff. We have been recognizing those challenges and trying to support the capacity development of our first nations, at least in Yukon, to make sure that they have the capacity to deal with the opportunities before them.

It will be a continuing growth process, but some of the ways they have done this up north include investing in education and training, specifically around our college development with the Centre for Northern Innovation in Mining, to make sure that we meet that one real premise Yukoners have, which again is Yukon people for Yukon jobs: local people to get local opportunities, specific job training for the jobs that are available in high-demand fields, and well-paying jobs, not just underskilled jobs, but semi-skilled and highly skilled opportunities.

From that, we have seen our first nations achieve, have seen our development corporations, high-paying jobs and better-paying jobs in those fields that are available, an increase in graduates, an increase in enrolment rates at post-secondary educational institutions that focus on these.

I'm wondering three things.

First, does your first nation have a development corporation?

Do you have any of the members of your first nation working right now in oil sands and natural gas development in the area? If so, are they starting to achieve greater rates of job opportunities, better-paying jobs? Are they realizing those opportunities at all?

Are you seeing people of your first nation starting to move in that career direction? Are they asking for that? Are the colleges and institutions responding to that demand by providing greater opportunity for them to achieve that kind of training and realize local opportunities for local people?

• (1005)

**Chief Allan Adam:** In regard to our people moving in that direction, many of our people are employed in the oil and gas sector. As the chief, I always have to play a balancing act in respect to those who work in the oil and gas sector, and those who still live the traditional way of life.

In more ways than one, the Athabasca Chipewyan First Nation is heavily engaged in encouraging our young people to continue their education in order to get better trades and become better equipped to work in the workforce in this region.

We engage heavily in investing in education for our young people right now, but the fact remains that we are having difficulties in that area, because we have to send the majority of our young students out of the community of Fort Chip to better their education. The Fort Chip education level at this point is probably at one of the lowest rates for education being provided in Alberta and is probably the lowest in Canada, because the curriculum doesn't meet the needs of the first nation.

When we send our kids out of Fort Chip, the first thing they encounter is a lack of housing, the lack of resources to meet the demands of housing for them to stay in school, and second—

**Mr. Ryan Leef:** Those are definitely challenges.

I was just wondering—

**The Chair:** I'm sorry, Mr. Leef, you are out of time. We have to go on to our next questioner.

Thank you, Chief Adam.

Ms. Leslie, you have up to five minutes. Go ahead, please.

**Ms. Megan Leslie (Halifax, NDP):** Thank you to all our witnesses.

Ms. Dobson, in your written submission I read in your conclusion, "Canada runs the risk of locking itself into a high-carbon development path". Then you talk about diversifying our energy economy, which is something I love to talk about: our need to diversify our energy economy if we're to truly see benefits coming from all aspects of our energy economy.

Can you talk to us a little about this potential for lock-in and this need to diversify?

**Dr. Sarah Dobson:** Sure.

There are certainly benefits to developing the oil sands; there are short-term benefits. But there are also costs and risks associated with, as I mentioned in the statement, locking ourselves potentially into this high-carbon development path.

Increasingly we are seeing countries around the world taking action to address climate change. We're seeing policies such as the low-carbon fuel standard, for example, in California, which is potentially going to limit the market we have for high-carbon fuel, which the oil sands is and which we need to recognize.

We feel it's very important to look at where the world is going, to acknowledge that countries around the world have agreed to take action to limit global warming to 2°C as much as we can, and to recognize that this is going to mean a lower carbon economy and think about what opportunities exist for Canada, about how we can be competitive within that economy.

As I mentioned, it's a question of introducing greater support for clean energy, for renewable energy, trying to develop those sectors, and ensuring that we'll be on a better footing going forward.

• (1010)

**Ms. Megan Leslie:** Thanks. That transition to the green energy economy is interesting to me, when we think about the oil sands, because there are skills being developed in the oil sands, drilling skills, for example, that are totally transferable to the green energy economy. For geothermal energy, for example, it's the same skill that's needed. I think about the potential for using some of those skills, using some of that knowledge, to help us transition.

Is that a bit of what could happen as well?

**Dr. Sarah Dobson:** Yes, for sure. I think as much as possible we would want to leverage the skills and the technology we've been developing within the oil sands and fossil fuels sector and use them as part of the transition.

**Ms. Megan Leslie:** Thank you.

Chief Adam, welcome virtually to Algonquin territory here.

I have a question for you about the water monitoring program that has been proposed by government. Minister Kent said in 2012 that we need to match our commitment to environmentally responsible development with a world-class comprehensive and transparent monitoring program, and yet I haven't heard anything about this water monitoring program.

I can only imagine that Fort Chip is involved. Are you able to give us an update on what's going on?

**Chief Allan Adam:** Well, this first-class monitoring system that both the federal and provincial governments announced a few years back isn't in place, from either Canada or Alberta.

We, the first nations, both the Mikisew Cree First Nation and the ACFN, had to conduct our own monitoring system, which is being conducted right now and has been for the last two years.

What we've found from our monitoring system is that there is heavy selenium content in our water source, in the vegetation, in the wildlife present in our area right now. The monitoring system we have in place works for us, but we need to make sure that the information is handed out to the general public to make it aware that our monitoring system works. The federal and provincial governments need to partner with the first nations with respect to the way we see the monitoring system work, because right now their monitoring system is failing Canada in more ways than the first nations one is benefiting us.

We truly understand through this monitoring system that we don't have any influence on what is being put in there. It is being developed and the research has been conducted and is coming out, and we have presented that research at the table to make sure that everybody is aware of all the contaminants that are there.

**Ms. Megan Leslie:** It's interesting that you've resorted to monitoring in light of the government's not doing its job. That's fascinating and depressing.

**Chief Allan Adam:** Well, we're trying to meet the needs with respect to all the things we've been advocating in the last six years. We need to do what we have to do.

**Ms. Megan Leslie:** That's right. Exactly.

Thank you very much.

**The Chair:** Thank you, Ms. Leslie.

We go now to the next three members on our five-minute round: Ms. Crockatt, followed by Ms. Moore and Mr. Calkins.

Go ahead, please, Ms. Crockatt.

**Ms. Joan Crockatt:** I too want to thank all of our witnesses for being here today. It's wonderful to have you and your expertise.

Mr. Desrochers, I wonder if I could start with you. I thought it was quite an incisive observation that you made off the top when Mr. Regan was questioning you about social licence and asking what the social licence is to block development when it is increasing people's quality of life.

You also touched on human creativity and innovation. I'd like you to talk a little more about how we're seeing innovation and creativity coming from oil and gas, which helps to benefit Canadians.

**Dr. Pierre Desrochers:** Again, the Canadian oil and gas sector is part of a global industry. Canada supplies roughly 60% of its own need as far as petroleum is concerned. A lot of the things in this room were probably made with Canadian fuel at some point in time, which was probably shipped from Alberta to Ontario and then turned into something else.

We benefit from petroleum products in general in our daily lives to an extent that we don't even realize. How many of you drove in this morning? What was the seat of your car made of? The food that you ate this morning was probably produced using fertilizers that were produced with natural gas. The food was probably produced in Ontario and the fuel might have come from Alberta. The food you

bought this morning was probably packaged in plastic. Again, there's a reason we're so much better off than our ancestors.

The thing is, we must not only focus on jobs. Yes, as another witness said earlier, you might say that there are few jobs created in the energy sector, but that's irrelevant because the business is capital intensive, and it provides all of these inputs that are essential to other lines of work. Canadians benefit from this from the moment they wake up in the morning to the moment they go to bed, and even when they sleep, when they're keeping their houses warm through the type of winter that we've had.

•(1015)

**Ms. Joan Crockatt:** Thank you very much.

I'll now go to Blaire Lancaster.

Hi Blaire. How are you? Thanks for being here.

I don't know if you're aware of the McKinsey carbon abatement graph, but it shows that some of the best things we can do if we're interested in abating carbon are actually things that consumers do, not governments. They do things like turn off their lights, insulate their homes, and drive a car that is powered with natural gas.

You're working on one of those things, which is natural gas cars. Can you tell me what the horizon is for that? Do we actually have a significant number of vehicles now in Canada? Is this a cross-Canada benefit that we're seeing right now?

**Ms. Blaire Lancaster:** There is definitely momentum happening in Canada, but there's a huge opportunity for a lot more growth in this regard. There are very good numbers out there about the number of natural gas vehicles that are currently on the road and what that potential can be. I don't have those numbers available, but I could likely get them for you.

It's a relatively new market in North America. Recently we have seen this surge in natural gas production because of the technological improvements in producing in the shale formations and trying to find new markets for this natural gas, coupled with the environmental benefits associated with these natural gas engines.

As I mentioned, one of the major barriers to this market developing as quickly as it could and should is the fact that there's a lack of fuelling infrastructure. The end users, whether they're operators of big trucking companies, regular passenger vehicles, rail locomotives, or marine vessels, I think can all see the benefits of converting in terms of the cost savings and significant environmental benefits, but until there's a secure and abundant source of supply, it's very difficult for the end users to make the capital investment to switch over. Also, as I said—

**Ms. Joan Crockatt:** May I interject?

I'm interested in whether you're aware of some of the benefits. For example, Calgary's bus system has a large number of buses—a project—that are running on natural gas. Are you aware of some of the current benefits of natural gas, where we have natural gas actually being used across Canada?

**Ms. Blaire Lancaster:** Yes. I know that Calgary Transit had conducted a study on this, and I think they are piloting one or two or three buses right now to run on compressed natural gas. I believe if that goes well, then....

At Ferus, we have incorporated three natural gas trucks into our fleet. We are about to take possession of 15 more natural gas trucks, heavy-duty trucks. As the engine technology catches up, we will be converting our entire fleet of 70 trucks to natural gas.

I know in British Columbia there's a lot of work being done here. Natural gas vehicles are a pretty large focus in that province. I think that Vedder Transport has 50 natural gas trucks in its fleet. Waste Management is running on compressed natural gas. BC Ferries is looking at converting.

In the province of Quebec, Robert trucking has, I think, 100 natural gas trucks in its fleet.

It's happening. I think the more and faster the infrastructure catches up, the more end users are going to be making the commitment to switch over.

• (1020)

**Ms. Joan Crockatt:** Thank you.

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

We have Ms. Moore next, for six minutes.

[Translation]

**Ms. Christine Moore (Abitibi—Témiscamingue, NDP):** Thank you, Mr. Chair.

My first question is for Mr. Adam.

During our study on rare earth mines, we also heard from a woman who is chief of her community.

Do you receive some financial assistance from either the Department of Aboriginal Affairs or the Department of Natural Resources to hire advisers or specialists to help you analyze a project to ensure that you get the best possible benefits? If not, do you have to take funds from the budget you receive for your reserve?

[English]

**Chief Allan Adam:** We have to submit our invoices in regard to CEAA in regard to going forward with intervening on most of these projects that are coming out right now. But you have to remember that we have to inject most of our money into it before we can recoup some of it back. We don't recoup 100% of the money we've invested with regard to going into the hearing or going into a proper study of the effects and damage it has with regard to our first nation.

[Translation]

**Ms. Christine Moore:** In other words, doing that analysis can be difficult. It may put some financial pressure on the community, especially if the community needs to analyze a number of projects at the same time and it knows that the costs will not be reimbursed.

[English]

**Chief Allan Adam:** That's the case we're having right now. When we have to defer money into these areas where we have to fight against regulatory systems, we're taking money away from the community, in regard to where we could provide better programs and

better services for our people. Therefore, the government is failing us in more ways than one. You have to keep in mind that ACFN does not get any money from the CFA that we have with Canada to operate our nation at this point in time.

[Translation]

**Ms. Christine Moore:** If the government helped you more, you could enjoy even more benefits from the oil and gas subsection, is that right?

[English]

**Chief Allan Adam:** Basically, at this point in time if you were to give better support in that area, we would be able to do a comprehensive review of everything that's coming forward. Therefore, in more ways than one, I think ACFN, through our group of companies and through our joint ventures.... Canada benefits quite a bit from it, maybe about \$15 million in taxes, yet we as a first nation don't get anything back in return.

[Translation]

**Ms. Christine Moore:** Thank you for your answers, Mr. Adam.

Mr. Desrochers, you spoke at length about social benefits, so to speak, from the oil and gas industry. However, these benefits have another side. Often, what pays well when individuals are working in this sector is overtime. Labour is scarce, and workers do a lot of overtime, which can sometimes affect their health. Workers have little time to themselves and are less involved in the community.

Don't these benefits have some negative effects on the social fabric of communities?

**Dr. Pierre Desrochers:** I think that, ultimately, it is a personal choice.

When I was younger, I was the type of person who accepted all the overtime hours I was offered. It paid for my education. I may not be the most social of people, but I am pleased to have been able to work overtime in my jobs. I was able to finish school without going into debt. I even had a decent amount in the bank.

At the end of the day, people make their own choices. I would rather give young Canadians as much opportunity as possible, especially in today's economy. If we can offer them well paying jobs and overtime, I ultimately believe it's them that it concerns. The less debt they are in, the more hard working they are, the better the communities will be.

• (1025)

**Ms. Christine Moore:** What about young people who, unfortunately, have accidents at work or hurt their back at the start of their career?

**Dr. Pierre Desrochers:** Once again, it's a personal issue. I could get hit crossing the street tomorrow morning. Does that mean I should stay home and do nothing?

No employer wants his or her employees to get hurt. In any case, I haven't had much experience with that in my life.

Once again, if I may come back to my statistics from the 19<sup>th</sup> century—

**Ms. Christine Moore:** No, what I want to know is whether they are better protected than before. Do they have some sort of social safety net? Have there been improvements like this?

**Dr. Pierre Desrochers:** You will have to ask the people in the industry.

In any event, the statistics on work accidents, illnesses or the back pain that people experience show to what extent people are in better health than in the past, as shown by the figures in the image and the twenty or so other similar illustrations.

Today, to work in the resources industry, you press a button or pull a few levers. In the past, people had to use axes, shovels and picks. I honestly believe that things are better now than they were back then.

**The Chair:** Thank you.

Thank you, Ms. Moore.

[English]

We have now Mr. Calkins, Monsieur Blanchette, and Ms. Block.

Go ahead, please, Mr. Calkins, for up to five minutes.

**Mr. Blaine Calkins:** Great. Thanks, Mr. Chair.

Chief, I'd like to chat with you for a second. You mentioned in your testimony that you're under the impression that the provincial and federal governments are continually lobbied to work against the interests of first nations. Could you provide us the names of the individuals or anybody you're aware of?

I've been a member of Parliament for eight years. I've been on the environment committee, and the fisheries committee. As a matter of fact, I travelled to your community with the environment committee a few years ago. I'm a member of the natural resources committee now. Every single witness who I've heard come before here, whether they're a department official or an industry official, or whether they're from a first nations, has advised us that they want to involve and create opportunities for neighbouring or adjacent first nations communities to realize the potential benefits of the economic impacts of development in their areas.

You seem to be giving me a different story, completely different from what I'm used to hearing. You allege that there are all these lobbyists and so on down here. I don't know who they are. Could you tell me who they are?

**Chief Allan Adam:** CAPP, for instance, sent representation to Ottawa in regard to changing the regulatory system when Canada came out with Bill C-45. We know of the individual who went there, but in regard to the name, under the freedom of information act that was taken out.

CNRL sent representation to Ottawa, to the energy sector minister, I think it was, in regard to that, and lobbied them to make drastic changes to the environmental system, to make it a lot easier for the regulatory system, for them to get easy access to their what you would call approvals for their projects.

The same goes for the Canadian pipeline association that continues at this point in time to lobby government officials to push both the northern gateway pipeline and the eastern pipeline that's going through Ontario, and everything.

It's a continuous process that happens today.

**Mr. Blaine Calkins:** How do you know this, Chief?

We've had CAPP appear before this committee, the environment committee, and other committees testifying to completely the opposite. I'm just curious as to how that works because it doesn't seem to add up. I know that you've done your access to information request. I'm not sure what that tells you.

You're adjacent to the oil sands. Your community is as close as any community is to Fort McMurray, other than Fort McMurray itself. I've been up there several times, I've flown over the communities, I've looked at all of the oil sands sites, the mining sites, the in situ sites.

I've flown over the Fort McKay band and it looks like there are a lot of 2,000, 3,000, 4,000 square foot homes being built on reserve in the Fort McKay band.

I'm on the Fort McKay Group of Companies website right now and I'm following their Twitter account. It says:

We're hiring permanent full-time materials handlers, come visit us for the Alberta Works job fair.

We're hiring 90 Heavy Equipment Operators! Camp is provided on a 14 & 7 schedule.

They're providing accommodations for all of these workers. It goes on:

We're hiring a Materials Handler for our Mail Room on our Logistics team!

What has the Fort McKay band done in order for this group of companies to create all of this economic wealth?

Granted, they are more proximal, but everybody in Canada seems to be... I'm on the airlines all the time and people are flying from all corners of this country to go work in northern Alberta in order to take advantage of the opportunities there. You're as close as a community can get. It's a short flight. What are you doing to ensure that you're capitalizing on all of these opportunities for your people?

• (1030)

**Chief Allan Adam:** As I said, we're working hard in regard to trying to capitalize for our people.

Fort McKay has done great things and there are great opportunities for their first nations people because they are pretty much in the centre of, how do you say, the drop-zone in regard to how the economic resources are being developed in that area. I can't speak for Fort McKay First Nation. They have a chief and council that represent them well, and we as a nation are trying to represent our people in a similar fashion, yet we're the only nation in this region who are off the reserve and are not benefiting from the full potential we should be benefiting.

I don't think there are more ways than one that—[*Technical difficulty—Editor*]

**The Chair:** We'll suspend the meeting until we get reconnected.

We'll reconvene the meeting again. That was a quick reconnect. I apologize again, Chief, for the interruption.

You had about 15 seconds left in Mr. Calkins' questioning time.

We're you asking a question, Mr. Calkins?

**Mr. Blaine Calkins:** I think Chief Adam was going to explain the difference between the situation for his band and the situation for the Fort McKay band, insofar as economic opportunities are concerned.

**The Chair:** Okay.

Chief, you just have a few seconds left. Go ahead please, sir.

**Chief Allan Adam:** I think it's pretty ironic at this point in time that we have to play off two first nations against each other because of the fact we're known in that area.

Like I'm saying—

**Mr. Blaine Calkins:** That's not what I'm trying to do, Chief.

I want you to be every bit as successful.... I'm not trying to create any controversy between yourself and the Fort McKay band. I represent the first nations at Maskwacis, Samson Oil and Gas, and these kinds... I know you know who these people are. That's not the intent of my question.

I'm sincerely asking what barriers you may have to achieve the same kind of economic potential that Fort McKay has, just as an example. I'm not trying to drive a wedge between you and anybody else.

**The Chair:** A very quick reply.

**Chief Allan Adam:** The barrier that we're having is that we're having a hard time obtaining contracts and moving forward as a nation with industry.

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

Thank you, Mr. Calkins.

We go now to Monsieur Blanchette, for up to five minutes.

[*Translation*]

**Mr. Denis Blanchette (Louis-Hébert, NDP):** Thank you very much, Mr. Chair.

What I am hearing today is quite interesting. We are talking about the industry benefits in the energy sector, but Ms. Dobson, you had started to talk about something very interesting: the relative importance of the oil industry within the Canadian economy.

Do you have comparable figures for the other energy sectors? After all, we are basically speaking about the energy people need to live in a modern society.

Do you have that kind of information? I'm thinking of hydroelectricity, for example, which is a fixture in Quebec and Alberta.

[*English*]

**The Chair:** Who is the question directed to?

[*Translation*]

**Mr. Denis Blanchette:** It is for Ms. Dobson.

[*English*]

**Dr. Sarah Dobson:** Unfortunately, I do not have those other figures off the top of my head. We do have a branch at Pembina that does work on clean energy or clean electricity opportunities. I'd be happy to try to look into those numbers and table them at a later date.

● (1035)

[*Translation*]

**Mr. Denis Blanchette:** Thank you very much. I think it is important to know the relative importance of the various energy supply sectors. If we want to truly assess the benefits of one industry in particular, it is very important to be able to compare the other industries in the same sector.

As for the entire renewable energy sector and energy conservation sector, it would also be very interesting to have a true picture of how each group in the energy sector supports the Canadian economy.

My next question is for Chief Adam.

You spoke a lot about the difficulties the projects are currently causing you. Since the benefits are not on the table, in your opinion, you surely have a general idea of what could be done to rectify the situation or, in other words, so that your nation benefits from these projects overall.

What conditions do you think should be met so that your nation can benefit from these projects? You briefly mentioned education, but I would like you to provide more details on these aspects.

[*English*]

**Chief Allan Adam:** I think in more ways than one, the thing that continues to be a burden on our first nation when it comes to economic benefits or IBAs in the area is the fact that industry does not want to pay impact benefit agreements to the first nation. They feel it's a burden to them in regard to how they do their development in our area.

We're trying to say that impact benefit agreements are a need because they benefit the first nation. There are benefits when it comes to social, housing, and education programs, and every other aspect, and creates employment in the community where the first nations people don't want to work in the oil and gas sector. Therefore, it's a great benefit when we have those impact benefit agreements. Not all of the impact benefit agreement money that comes into the first nation is being depleted as fast as it comes in. We are developing a trust fund. We're saving it for future generations. The resource is non-renewable. Our trust fund meets the demands for future generations to come.

That's why we need to have an impact benefit agreement with industry. Industry can't continue to say that these impact benefit agreements are going to be a prime example in regard to how we are getting dollars from Canada because of our contribution agreements where we have to provide a mechanism for.... Pretty much we have to ask for the money when we're trying to put it in one area to make it as simple as possible for access of those dollars to flow through to our community.

[*Translation*]

**Mr. Denis Blanchette:** Chief Adam, you spoke a lot about the idea of preserving the benefits for your community's future generations. Could you explain to me what you mean by that, what you intend to do and what you expect in that regard for your community?

[English]

**Chief Allan Adam:** I think in more ways than one we're headed down the road to a self-sufficient first nation and how we conduct ourselves just as the people here in Canada do.

We're trying to lead by example in regard to how first nations could develop in this region through economic prosperity and through IBAs in general. Right now, what we see in our area is we're having to do heavy investment in our own business group to meet the demand of the industry. Because we're investing heavily into our business group, we're not getting the full potential of the opportunities that come from it to the first nation.

Therefore we need impact benefit agreements to maintain and sustain our nation at this point in time. We're trying to develop those impact benefit agreements that will also sustain and enable us to have a trust fund for future generations, because we know for a fact that it's a non-renewable resource and we need to capture on it because it's happening in our traditional territories.

● (1040)

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

[Translation]

Thank you, Mr. Blanchette.

[English]

We'll go now to Ms. Block, for up to five minutes, or you can take the three minutes after that, if you want to. Go ahead, please.

**Mrs. Kelly Block (Saskatoon—Rosetown—Biggar, CPC):** Mr. Chair, I'll take the five minutes and pass the three minutes on to my colleague Mr. Leef, if there's time.

I want to thank all of our witnesses for being here today. It's been a real pleasure to hear from all of you.

As we go through this study and talk about the cross-Canada benefits of developing oil and gas, it's important that we also hear about the challenges. We've also heard, though, about the resilience and resourcefulness that can be applied to those challenges to turn them into opportunities. At our meeting on Tuesday, we heard from witnesses who said they'd rather be dealing with the challenge of economic growth and prosperity than not having those opportunities at all.

I appreciate the opportunity to hear about the challenges. It's one of the reasons we introduced the responsible resource development plan, which seeks to ensure that we strike the right balance between developing our resources and protecting our environment. We continue to invest in alternatives through Sustainable Development Technology Canada.

I guess my questions would be directed to Mr. Holm and Mr. Desrochers.

When you mentioned the combination of forces, I think you were answering a question by one of my colleagues across the way. I want you to talk about the combination of forces that you were referencing, because it's my understanding that those who are working in developing our natural resources, our oil and gas, understand that it's not necessarily an either-or, but a both-and.

I'd like both of you to speak to that, please.

**Mr. David Holm:** My recollection of my own answer is that I did speak to the combination of forces that are impacting some of the social issues and the social licence and greenhouse gas emissions issues that are obviously important to our business. Those combinations of forces clearly are global.

There is a concern about air quality and what we're doing to our environment. That's coming from around the world. That's coming from social groups, but it's also coming from very traditional sources and from those would-be international investors that are putting pressure on the people in these industries to ensure that they are being good environmental stewards or are at least answering for what they're doing environmentally. I think that is going to be a very important force on the industry, and for a variety of reasons, and it's probably very helpful to our business, because by the same token, these are people who can invest in technologies that we think will help with some of these issues.

We do think government policy is important. There is a cost to using carbon. I think that should be recognized in policy, so there is going to be a government role as well, and clearly there are stakeholders that are impacted. We've heard from the chief today about his circumstances with regard to living in the region of the oil sands. Those are also voices that are very important.

It's a combination of things that's going to get us to a place that makes some good sense.

**Dr. Pierre Desrochers:** What I would add is that if you look at the history of the energy sector, or of any manufacturing sector, really, what was often driving what today we would call green behaviour was simply bottom-line considerations.

What is pollution? Well, pollution is waste that is made from inputs that you've paid for, and the stuff is there, and it's in large quantities. It's all the same thing. Whether you look at the history of Standard Oil, or at any manufacturing sector, or at what we've heard today about natural gas, waste is not lucrative. If you have the stuff and you can turn a problem into an opportunity and improve your bottom line, that is still, I believe, the main driver of greater efficiency and greener behaviour in business. In one of my papers, I document that this has been going on for a century and a half in the oil business.

● (1045)

**Mrs. Kelly Block:** Thank you.

**The Chair:** Thank you, Ms. Block.

We go now to Mr. Leef for just a couple of minutes.

**Mr. Ryan Leef:** I wanted to quickly go back to Chief Adam with something that builds on what Ms. Block was saying. It's the sense that there's an either-or discussion that goes on with development, particularly with our energy sector.

Chief, you mentioned that you strike an interesting balance between the people in your community who work in the oil and gas industry and want to find careers and opportunity there and those who want a traditional lifestyle. I would gather, without being presumptuous, that those people who work in the oil and gas sector, who find opportunities there, and who seek education and career choices, very much want to maintain their traditional lifestyle as well. For them it's not an either-or discussion either. Would it be accurate that your first nation people working in oil and gas still very much practise tradition and culture and live traditional lifestyles as well?

**Chief Allan Adam:** That's pretty much accurate in more ways than one. They work in the oil sand fields because it provides a secure resource for their family and everything, but keep in mind that we're very traditional and, you know, they see the massive destruction or displacement of lands in that area, and in more ways than one, and they can't say anything because they work in that oil and gas sector and it benefits them, but they know for a fact that we can't overweigh our health concerns in the community over economic prosperity in the region.

**The Chair:** Thank you very much, Mr. Leef. You're out of time.

I want to thank all of the witnesses today. It was a fascinating meeting indeed.

I'd like to thank Mr. Desrochers, associate professor, University of Toronto, geography department, here as an individual. Thank you.

From Pond Biofuels, David Holm, chief executive officer, thank you, sir.

By video conference from Fort McMurray, from the Athabasca Chipewyan First Nation, Chief Adam, thank you, sir.

By video conference from Calgary, from the Pembina Institute, Sarah Dobson, economist, Alberta and the north, thank you.

Ferus Natural Gas Fuels Inc., Blaire Lancaster, director, government and public affairs, thanks to you, too.

Thank you, all. This fascinating meeting will be helpful to us in doing our report.

This meeting is adjourned.

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