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Chair

Mr. Leon Benoit

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● (1530)

[*English*]

The Chair (Mr. Leon Benoit (Vegreville—Wainwright, CPC)): Good afternoon, everyone, and welcome. We're here today continuing our study of innovation in the energy sector.

We have three witnesses with us today.

We have, first, from Encana Corporation, Richard Dunn, vice-president, Canadian division, regulatory and government relations. Welcome to you, Mr. Dunn.

From the Canadian Energy Research Institute, we have Peter Howard, president and chief executive officer. Welcome to you, Mr. Howard.

We have by video conference from Toronto, from Bullfrog Power, Tom Heintzman, co-founder and director. Welcome to you, Mr. Heintzman.

Today we'll just go through the presentations in the order that you're listed on the notice of the meeting, starting with Mr. Dunn from Encana Corporation.

Go ahead, please, sir, for up to 10 minutes.

Mr. Richard Dunn (Vice-President, Canadian Division, Regulatory and Government Relations, Encana Corporation): Good afternoon. I'm Richard Dunn, vice-president of government relations for Encana. I appreciate the opportunity to be here and talk to you on what innovation means to the natural gas industry in Canada. As you know, this is a significant industry that accounts for some 500,000 jobs.

Today I'll outline how innovation continues to change our business, not only from technical perspectives but also how innovation has brought industry-wide changes, structural changes, the likes of which are unprecedented in North American industry.

Innovation in the sector takes many forms, from incremental operating improvements to cutting-edge R and D efforts focused on improving both technological efficiencies and ensuring the resource is developed as responsibly as possible.

Encana, the largest natural gas producer in Canada, has been at the forefront of industry advancements such as pad drilling and multi-stage hydraulic fracturing. These huge technological leaps have allowed us to unlock natural gas from formerly inaccessible unconventional reservoirs, such as shale and tight rock formations. Innovative production methods, and development and deployment of cutting-edge technology, such as polycrystalline diamond bits, mean we've been able to access a wealth of natural gas resource in Canada, certainly estimated at well over hundreds of years of supply at current production rates—current production rates being some six trillion cubic feet a year, and recent estimates placed the western Canada resource at 4,600 trillion cubic feet, so a vast amount when compared to current production rates.

In addition to our own internal focus on innovation, we support external R and D efforts through third-party partnerships with academia. Recently, for example, Encana made a five-year pledge of $1 million to support research activity at the University of Calgary's Institute for Sustainable Energy, partnering with Alberta Innovates—Technology Futures, which is a Government of Alberta-sponsored organization dedicated to helping industries find solutions and move technologies to market. A portion of this investment was directed toward an endowed chair dedicated toward research in unconventional natural gas.

Backed up by cutting-edge core analysis facilities, the chair, along with associated grad students, focuses on unlocking the technical challenges of Canada's unconventional reservoirs, thereby further enhancing Canada's energy supplies.

The industry puts a high value on collaboration as it applies to innovation. At Encana, for example, we have an environmental innovation fund that has invested over $40 million over the last three years to economically improve the industry's environmental performance and to provide capital for projects that focus on implementing innovative technology.

A significant portion of these investments is directed to early stage start-up companies and industry projects. An example of this is the funding of Seal Well Inc.'s development and testing of ultra high-integrity well sealing plugs made of a fusible metal alloy. Targeted for use in the abandonment of wells at the end of their producing life, this product is being developed as a secure, long-life, and cost-effective alternative to conventional cement abandonment plugs.

Producers certainly recognize the importance of collaboration and innovating together on areas of responsible development. A good example of this is the B.C. implementation plan for the management of boreal caribou, established through the collaboration of industry partners along with the B.C. oil and gas commission and the B.C. ministry of the environment.

This plan manages access to land for development during the critical calving period and includes such items as promoting the use of meandering seismic lines, which limit the line of sight between predators and prey. Industry has committed to provide up to $10 million in funding over the next five years for boreal and mountain caribou research. In fact, just before coming here we were on a conference call approving the program for this year's research, a large part of which is collaring and tracking caribou and the calves.

Another item promoted in the boreal caribou plan is the use of pad drilling. Pad drilling means multiple horizontal wells are drilled from a single pad of about 250 metres by 250 metres on the surface. These wells tap into about 15 square kilometres of reservoir buried thousands of metres deep, accessing tens of billions of cubic feet of natural gas.

● (1535)

This innovation of the single pad eliminates the need for hundreds of vertical wells and well sites, along with associated roads and pipelines. It's a case where technological innovation has produced a win-win of cost-effective operations while minimizing the environmental footprint on the land.

As producers, we recognize that shale gas production is certainly a water-intensive process through the hydraulic fracturing, and we supported R and D efforts to ensure sound water stewardship. For example, in 2009 a collaboration of companies operating up in the Horn River Basin up in northeast British Columbia worked with the province of B.C. to examine non-potable water alternatives for our operations. This was accomplished through Geoscience BC, a provincially funded government organization that has launched a number of projects to identify and map subsurface aquifers suitable for water sources in the basin.

The Debolt source water treatment plant, a partnership between Encana and Apache, highlights the results of these efforts and provides a tangible example of companies working together to minimize surface water impacts. Supplying essentially all the water needed for both companies' hydraulic fracturing operations in the Two Island Lake area, the facility produces water from the Debolt formation, which is a deep subsurface aquifer containing saline water unfit for agricultural or human use.

Finding alternative water sources is just one way the industry, principally through the Canadian Association of Petroleum Producers, CAPP, has taken a proactive approach to address concerns regarding hydraulic fracturing. The industry has developed a series of industry-wide hydraulic fracturing operating practices, which are designed to protect the quality and quantity of groundwater. Companies are implementing these practices in real and meaningful ways. For example, all producers have committed to disclosure of chemicals used in hydraulic fracturing and have collaborated with provincial regulators to implement mandatory reporting systems of same.

Additionally, in Encana's case as well, we have worked closely with our fluid suppliers to implement the practice called the fluid additive risk assessment, with the result of moving to the use of greener hydraulic fracturing fluids. At Encana we're proud—having implemented this practice—of taking the step to eliminate the use of diesel, benzene, and heavy metals, such as cadmium, arsenic, chromium, lead, and mercury in our hydraulic fracturing fluids. Further, we have shared this work with both regulators and other companies operating in the industry.

Innovation is also apparent in the way industry is working to find new markets for our products. The advancements in unconventional natural gas have created a new supply and demand dynamic of sustained low commodity prices due to the great abundance of unconventional natural gas we've unlocked in the past few years. At the same time, our traditional customer, the United States, does not need us to the extent it once did, due to the prolific shale plays being developed south of the border as well. The U.S. market is shrinking dramatically for Canada, as is the level of U.S. investment in the Canadian natural gas sector.

In response, industry and Encana have embarked on a number of initiatives to boost domestic consumption, such as providing liquefied natural gas for a recently announced pilot by CN Rail that runs locomotives on liquefied natural gas. The environmental benefits of natural gas in transportation are clear, up to 30% fewer CO_2 emissions and up to 90% less smog-causing particulate matter. Continued government support and commitment to implementing the natural gas road map, which includes a commitment to research and development, will help hasten the transport sector's option of increased natural gas use.

However, increasing domestic consumption is clearly not enough; we also need to find new markets, with the U.S. market shrinking. Through Encana's partnerships with global investors such as China National Petroleum Corporation and Mitsubishi, we know that Canadian producers' technological sophistication and commitment to responsible development, along with Canada's supportive political and regulatory climate, are major enablers in attracting foreign direct investment.

This is important because we are witnessing a paradigm shift as we move from a model of U.S.-based investment and export to Asian-based investment and export.

● (1540)

Asian investors are seeking a reliable long-term supply to meet the needs of their growing economies. At the same time, Canadian producers need to diversify markets. This has resulted in industry applying its innovative focus to LNG export, with a number of terminals planned for the west coast.

The LNG market is rapidly evolving as these proposed facilities continue to advance to both project and regulatory approvals. Canada is very well positioned to supply feedstock to world markets, particularly Asia, where energy demand is robust and increasing.

Canada has a long, proud history as an export nation, and a political will exists both federally and provincially to diversify our markets for natural gas. This is crucial for the industry's continued success; however, Canada is certainly not alone in recognizing the export opportunity. We must all continue to implement policies that will provide us with a competitive and level playing field in order to compete with LNG projects in the United States and Australia.

The adoption of measures such as CAPP's proposed tax reclassification for LNG facilities will positively influence investment decisions still to be made for these west coast facilities and will ultimately help us realize the commercial potential of these new markets.

In closing, whether exemplified through operational improvements, support for research and academia, collaborative efforts by industry players to address stakeholder concerns and minimize the environmental impact, or by seeking new markets and end uses for our projects, innovation has been and continues to be fundamental to the success of the Canadian natural gas industry. That same spirit of innovation that has radically changed the industry in recent years will be just as pivotal in years to come as we capitalize on the new market opportunities before us while leading the way in responsible development of the world-class resource we're endowed with.

Thank you very much.

The Chair: Thank you.

We go now to Peter Howard, president and chief executive officer of the Canadian Energy Research Institute.

Go ahead, please, with your presentation, sir.

Mr. Peter Howard (President and Chief Executive Officer, Canadian Energy Research Institute): Thank you, and good afternoon, everyone.

My name is Peter Howard, and I am the president and CEO of the Canadian Energy Research Institute.

Founded in 1975, the Canadian Energy Research Institute, commonly referred to as CERI, is an independent, not-for-profit research institute specializing in the analysis of energy economics and related environmental issues in the energy production, transportation, and consumption sectors. Our mission is to provide relevant, independent, and objective economic research.

CERI is a fully funded institute, with funding coming from the Government of Canada, the Government of the Province of Alberta, the Canadian Association of Petroleum Producers, and the Small Explorers and Producers Association of Canada. In addition, in-kind funding by the Energy Resources Conservation Board of Alberta and by the University of Calgary is well accepted.

Concerning the gas industry in Canada, my comments today will be focused on the gas industry in western Canada and on how innovation has contributed to the competitiveness of that industry.

The natural gas industry in western Canada is currently under pressure due to low commodity prices, resulting in economic challenges for many exploration and development companies. Low commodity prices are a direct result of an oversupply situation in the market, coupled with a flat- to low-growth demand profile for natural gas within the North American market.

Surprisingly, this oversupply situation is a direct result of an innovative process developed by the oil and gas industry. I am referring to the advent of the horizontal drilling and hydraulic fracturing process. Low commodity prices are not new to the industry, but current research suggests that today's prices are here to stay for the medium to long term. This fact, when coupled with higher operating costs, weather issues, remote locations, and higher pipeline transportation costs, results in a situation in which the economics of gas development are severely challenged.

Research carried out by CERI is or will be available on CERI's website as a result of our mandate and is available to government, industry, and the general public at large. Specifically, the following reports will offer a background for my comments today. The North American natural gas demand pathways study is one we have been involved in for the last eight months; it is due to be released in March of this year. *Global LNG: Now, Never , or Later* is a report that we just published in January of this year. Thirdly, *Improved Productivity in the Development of Unconventional Gas* is a report that we published in May 2012 as a joint report with CSUR, the Canadian Society of Unconventional Resources, and PSAC, the Petroleum Service Alliance of Canada.

The development and widespread application of horizontal drilling coupled with multi-stage hydraulic fracturing has revolutionized the industry. Utilizing these innovative technologies has allowed development of hydrocarbon-bearing formations that in the past has not been deemed to be economic. The rapid development of shale and tight gas resources in the United States and Canada has created an environment in which natural gas supplies are projected to last many hundreds of years.

Unfortunately, this rapid development within the United States has added close to 15 billion cubic feet per day since 2005, creating an oversupply position. Of more concern, it is starting to back Canadian gas out of historic markets within the U.S. mid-continent, the U.S. east coast, and Ontario and Quebec.

CERI's report on natural gas pathways starts with the assumption of a continuing robust supply within the United States and explores four plausible narratives for future gas demand within North America. This report suggests that the term “robust supply” can be loosely translated into a supply swing of plus 45 billion cubic feet a day by the year 2030.

Two issues that are identified as potentially having the largest effect on gas demand are LNG exports, whether off British Columbia or from the Gulf Mexico, and the transition of coal-fired power generation to natural gas-fired power generation.

The future viability of the western Canadian gas industry is dependent on access to markets, whether North American or outside North America's shores, coupled with a resource that can be developed and be price-competitive.

● (1545)

The four narratives that were examined in this particular study indicated that the Henry Hub price will, on a low case, remain within the $2.50 to $3.50 per mcf for the next 15 years, and on a high case climb back to the $6 level by 2020 and the $7.50 level by 2030. The low case is the most concerning because it suggests that AECO C pricing, which is the benchmark price for western Canada development, will stay at or below the $3 per mcf for the foreseeable future.

The four narratives also indicated that the level of net gas exports to the United States will decline from the current level of 4.5 billion cubic feet per day to a sustained level of 3 billion cubic feet per day in the high case, to a negative position in the low case. In other words, following the low case of our four scenarios, Canada could become a net gas importer of natural gas within the coming years if the low case becomes reality.

In drilling terms, this could be considered weak, if not devastating, as activity will remain below 1,000 wells per year for several years to come. Even though a current horizontal well with 6 to 12 frack storages effectively replaces 6 to 8 vertical wells, the activity is still small when compared to the 18,200 wells that were drilled in 2006.

CERI's LNG report concluded that the proposed British Columbia LNG terminals are faced with increasing competition for access to the Asian Pacific markets, coupled with the potential of a changing price regime. Australia has seven liquefaction projects under construction, while the United States has thirteen liquefaction projects in various phases of development. This, coupled with East Africa developments and the B.C. projects, results in 25 billion cubic feet per day of new LNG supply potential all vying for the island economies of Japan and Korea and the mainland economies of China and India within the 2015 to 2020 timeframe.

Japan, from a security of supply position, will purchase LNG based on an oil-linked contract, whereas Korea is looking to buy LNG at the point of liquefaction, as in the recently announced Sabine Pass contract. China, on the other hand, is using its size to negotiate down LNG prices, still oil linked, but potentially to the point of delinking from oil will be a reality. The development of an LNG trading hub is a potential for the Asian Pacific market.

With respect to western Canadian gas producers, the above suggests that the LNG game has significant risks, and as in the case of a low-priced North American market, being a low-cost producer is paramount.

Prior to the advent of the horizontal well, gas producers drilled one well per section of land and per geological formation. In rare cases, multiple production strings were used to access multiple segregated geological structures, all within one casing. In addition, some geological structures were allowed to be commingled in a single casing but under strict guidelines from the regulator. The development of the horizontal well, against constant pressure to reduce costs, resulted in the innovative approach of multi-well pads.

The practice of grouping wells tightly on a single land location has been driven by environmental, economic, and practical logistics around materials and land footprints, but in the end it is all about reducing costs so that the unit cost of production can compete in the marketplace, which currently is approximately $3 per mcf.

The practice of placing multiple wells on one pad results in the following benefits: it reduces the impact on developable land; it reduces the need and extent of access roads and gathering pipelines; and it allows for continuous drilling over a longer period of time, including winter and summer conditions. A single rig could drill up to 30 wells without the cost of mobilizing and demobilizing that rig. It allows for continuous fracking operations without the need to reposition the pumps, trucks, and pipes; it allows for central storage of materials, including drilling pipe, fracking fluids, sand and water; it allows for improved supply chain management by having full loads of materials travelling from the warehouse to a single location; and finally, it reduces travel time for crews and supervisors to one site as opposed to multiple sites.

● (1550)

In very simple terms, by applying the economies of scale—multi-well paths—across the elements that contribute to the total drilling costs, the per-well costs drop by more than 25%. In concert with multiple well-drilling operations, the cost advantage of moving from a three-stage frack process up towards a 12-stage frack process decreases the supply cost to a range of $3 to $4 per mcf, depending on the responsiveness of the resource location.

In 2011, in the province of Alberta 2,059 gas-directed well licences were issued; 92% of all the licences that were classified as horizontal licences were located within the west-central part of Alberta. Within this area, 25 companies licensed 20 wells or more, and it is strange to note that only 24% of the horizontal well licences involved two or more wells. In fact, there was only one location—and I have to give credit to Encana—with 12 wells on that site, one location with six wells, and 25 locations with four or five wells. Please note that I'm talking about Alberta here. British Columbia is slightly different.

While the industry embraces the application of multi-well pads in pursuit of unconventional resources, the development appears to remain focused on one to two wells per section. Possible reasons for this include budget constraints for some exploration and development companies, a condition that will worsen as gas prices remain low; single wells being drilled to continue the land tenure while waiting for a price improvement to fully exploit the reservoir; and some unconventional resources still being considered exploratory resources, for which the potential and the risk have not yet been evaluated. Low market prices weigh heavily on that type of decision.

Having fragmented land holdings reduces the desire for multi-well pads. Large development companies will only use multi-well pads if they have land control in offsetting sections. In Alberta, the nature of the beast is that we have a fragmented land system.

Western Canada will continue to face challenges relating to competing for space in North America or the Asian market, and in order for the industry to achieve success in this game, continued improvements in productivity through innovation are an absolute requirement.

Thank you for your time and attention.

● (1555)

The Chair: Thank you very much, Mr. Howard, for your presentation.

We go now by video conference to Toronto, to Tom Heintzman from Bullfrog Power.

Go ahead, please, sir, with your presentation.

Mr. Tom Heintzman (Co-founder and Director, Bullfrog Power): Hello there. My name is Tom Heintzman. I'm the director and one of the co-founders of Bullfrog Power.

Bullfrog Power is Canada's renewable energy choice. We provide a renewable energy choice to Canadians coast to coast.

The premise behind Bullfrog Power is relatively straightforward. In all of the other products and services that Canadians buy, they have environmental choices, whether that's transportation, clothing, articles for their house, or food. However, historically they have not had an environmental choice in energy. It's always been "one size fits all", and you get what you get when you plug in, despite the fact that energy is the biggest contributor to an individual's environmental footprint. So the simple proposition is to give people a choice, just as they have choices in all these other products and service categories, to pay a premium to purchase a green, renewable product.

We inject onto the electricity grid or the natural gas pipeline system as much renewable electricity or renewable natural gas as our consumers use. They pay a bit of a premium, and that premium goes to helping make new renewable projects economical.

New renewable projects across Canada require a bit of a premium. Typically, that premium is paid by a government entity or a utility on behalf of ratepayers. Bullfrog is a voluntary initiative that is additional to and supplemental to these government initiatives. Government initiatives will increase the amount of renewable power by a certain amount through procurement, and the voluntary consumers, who are choosing to pay more, can increase it even further.

This model has been quite successful in the United States. It's estimated that as much as a third of the new renewable power in the United States was funded by voluntary consumers.

Bullfrog currently gives consumers both a renewable electricity choice and a green or renewable natural gas choice. Renewable natural gas is very new in Canada. It's methane that's produced by compost, by your organic waste. We clean up that gas and inject it into the natural gas pipeline to displace conventional natural gas. It's called biomethane, and the facility that is providing it for our customers is the first of its type in Canada. But we expect many more of these over the years to come.

Thousands of Canadians are making the choice to pay a premium and purchase renewable electricity. These include homes from British Columbia to P.E.I., as well as businesses, such as RBC, TD, Unilever, Walmart, and about 1,500 other businesses. These entities pay a little more to buy renewable electricity. They reduce their environmental footprint as a result and they support the development of renewable energy in the country.

That's the background in terms of Bullfrog. I would not be doing my company a service if I didn't give some recommendations as to where we would hope that policy could move. Some of these levers will be next to impossible to move; others are more changeable.

First of all, we're very fortunate to have been able to create a business model that can work coast to coast, but there are a number of impediments to innovation in our space, in the downstream electricity and natural gas markets.

First, provincial regulation of energy leads to a patchwork of regulations and makes scaling a business across the country very challenging. This is a constitutional matter, so obviously quite difficult to deal with.

Second, the turnover in ministries and bureaucracies results in shifting policy that's not conducive to long-term energy planning and investments. Here in Ontario we're on our eighth minister of energy over the course of the last eight years.

Third, utilities, which tend to control both natural gas and electricity markets in Canada, tend to be very change-resistant. Even their economic incentives are not always aligned with innovation.

● (1600)

Fourth, markets in which innovation tends to flourish are not common in the downstream energy space in Canada.

Fifth—and here is a policy recommendation, and I'm certainly not the first to make it—putting a price on carbon would certainly help drive innovation in the renewable energy space as well as in conservation.

Last, our business model is so small that this concept of citizens voluntarily paying to take environmental action is still so unusual that it is not taken account of by regulatory or administrative bodies when they make policy decisions.

As a very small example of this, because of the small size of the voluntary renewable energy market, Environment Canada and Stats Canada will not separate, for the purposes of national reporting, the electricity purchased by voluntary green customers from the electricity purchased by the other customers. As a result, there is a fundamental difficulty in separating those two pools of energy, which makes for double-counting and complicates the reporting, the claims, and ultimately the development of a voluntary renewable power market in Canada.

Those would be five policy observations and comments that I have.

The Chair: Thank you very much, Mr. Heintzman, for your presentation from Bullfrog Power.

We go now to questions and comments, starting with Mr. Calkins for up to seven minutes.

Mr. Blaine Calkins (Wetaskiwin, CPC): Thank you, Chair.

I'm going to start by getting some clarity. Mr. Dunn, last week we had the Environment Commissioner before this committee. In his report he talked a little bit about hydraulic fracturing and some of the disconnects. I was a little bit critical of him, being a rig worker myself. I've been out on the rigs when the fracturing trucks show up. I had to take all my courses, whether it was transportation of dangerous goods, workplace hazardous materials, information systems, or material safety data sheets. So I know about all of these chemicals, all the safety measures, and all the information on these safety sheets. They said there was a big disconnect between departments and agencies about what's actually going into the ground, yet your testimony seems to be clear about what the companies have to disclose and about the knowledge of the fracturing chemicals that are going down the well.

For the sake of clarity, can you tell us whether hydraulic fracturing operations in British Columbia and Alberta are required to disclose the chemicals that are used?

● (1605)

Mr. Richard Dunn: The short answer to that is yes. Disclosure is mandatory in both British Columbia and Alberta. British Columbia was brought in, in 2012, and Alberta was brought in, I believe, on January 1 of this year. So in all cases, the answer is yes.

Mr. Blaine Calkins: Before that, it was an optional thing for a company to go down that road, right? I'm not going to ask specific questions. You can volunteer the information if you want. Some companies would and some companies wouldn't. But there have also been a lot of technological advances in hydraulic fracturing that have allowed a complete change in the economic environment in North America. For example, the United States is moving towards energy independence, because changes in technology have enabled them to get at what was previously unattainable through the technology of the day. There are some trade secrets that needed to be there. But in the interest of environmental considerations, I think companies looking for what is deemed to be the social licence have been proactive, have they not, in disclosing their business practices in respect of what's been going down the hole?

Mr. Richard Dunn: Absolutely. Certainly, public awareness of hydraulic fracturing operations has in part led to industry's commitment to disclose. The websites that enable us to disclose were pulled together, I would say, roughly about a year before the reporting was made mandatory. Industry adopted disclosure at that time on a voluntary basis and, as I say, worked with regulators to recommend that the regulations be put in place to reinforce that and give the public assurance.

To your point about technological advancements and trade secrets, certainly the chemicals are protected under intellectual property. We can only give what the material is. We can't get into the details of that. That's reflected on the disclosure where there are intellectual property restrictions. That is on the disclosure. Other than that, all chemicals and materials are fully disclosed.

Interestingly, more and more of the materials—not to elaborate on it too much—or the chemicals that have intellectual property restrictions are the green chemicals. That's what the suppliers are.... As I mentioned, we looked at the risk, and as a company we moved towards saying that we would not accept the risk of benzine and certain heavy metals included in our fracturing. As a company we looked at that. It's still legal to use. There are operating practices that can safely manage them, as you mentioned, but we just felt that's not where we were going to go—hopefully leading the industry in some way, shape, or form.

Those newer, greener chemicals are often the ones that have the intellectual property issues associated with them, so when you see that you've got some restrictions in terms of disclosure, those are actually in many cases the greener chemicals that industry is moving towards.

Mr. Blaine Calkins: That's quite interesting. In terms of managing the chemicals being used for the wells being drilled at your particular company, then, how do you go about that disclosure?

We did some research on the frackfocus.ca website, and the hydraulic fracturing fluid product component information disclosure form is there. Are you familiar with that? It explains the chemicals used in fracking operations. Do you have any examples that would benefit this committee of what kind of information is on that form? If it's public information, what could the public, and for that matter the environment commissioner, have access to, or what should they have had access to?

● (1610)

Mr. Richard Dunn: Certainly you would see the types of chemicals we use and the purpose. We're pumping large volumes of water and sand, principally, in fracturing operations. In doing so, you want to minimize the energy required to do that. So you put in, for example, trace amounts of chemicals that are friction reducers that will slick up the water. That will be mentioned on there.

As well there might be.... Oftentimes the water comes from subsurface, as I mentioned in my talk, but when you're just starting out a development, you'll oftentimes get water from surface water supplies, assuming the capacity is there. This water tends to have bacteria in it that could foul your formation, so you'll add in a biocide to take care of the bacteria.

The chemicals would be listed on that form, and the purpose, as I mentioned, as gelling agent or biocide. Furthermore, it would have information that.... It's all transparent and available to the public on a location-by-location basis in terms of the actual chemical names, the company, the supplier, the components, and the chemical abstract number. So it's very detailed information.

Mr. Blaine Calkins: There's complete traceability of everything that's being used.

The Chair: Mr. Calkins, your time is up.

We go to Mr. Julian for up to seven minutes.

Mr. Peter Julian (Burnaby—New Westminster, NDP): Thank you, Mr. Chair.

Thanks to our witnesses. It's very interesting testimony.

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

It's very interesting that you referenced putting a price on carbon. It's certainly what the CEOs and presidents, even in companies in the oil and gas industry, such as Total and Cenovus, have been saying, and recently Shell Canada as well. Very clearly, this is part of an ongoing debate that has to take place in a mature framework, and we're certainly hoping they continue to bring that mature discussion on this important issue.

I'm very interested in your reference to procurement process. I'd like you to give us a little more detail about that. Are you talking about governments in Canada or governments in the United States that have included renewable energy as part of their procurement plans?

Mr. Tom Heintzman: Typically, when I'm talking about that, it's not the government entity itself that is procuring, but a government agency on behalf of ratepayers. For instance, in Ontario, the Ontario Power Authority is procuring renewable energy and then passing that cost on to the ratepayers. It's trying to increase the amount of renewable energy by something less than 10%.

In British Columbia, it's BC Hydro, typically, that procures it. In Nova Scotia, it's NSPI. Most jurisdictions in Canada have a goal for increasing the amount of renewable power in the province and there's some entity within that province that's in charge of contracting for that.

That's separate from governments purchasing, on their own behalf, renewable power. But you do see that on occasion, so we have a number of cities and municipalities that would be buying renewable power. The Ministry of the Environment in Ontario is buying it for its own operations. In the past, various entities of the federal government have bought renewable power for their own operations. In fact, Transport Canada is currently a customer of Bullfrog Power.

In addition, in the United States, both those things occur, so you have on one hand governments procuring for ratepayers and governments procuring on their own behalf for their own consumption.

Mr. Peter Julian: You said in the past that the federal government has looked at renewable power. Has that amount increased or decreased over the past few years?

Mr. Tom Heintzman: It would have decreased over the last several years. I don't have the numbers at my fingertips, but there was a green power procurement program that would have ramped up in the late 1990s, early 2000s, and that would be diminishing now.

Mr. Peter Julian: That's helpful to know. Basically, we've gone backwards in terms of procurement with the federal government.

Going to the voluntary purchases, you particularly referenced in the United States that you have consumers going out and paying a margin for renewable green power. What's that differential right now, if you can give us a couple of examples, and how much do you generate across the country and in the United States?

● (1615)

Mr. Tom Heintzman: Bullfrog Power only operates in Canada. In the United States the average residential.... They sell to homes or the residential market and then the business market. Just for the sake of reference, there are about 860 green power programs in the United States, so 860 utilities selling green power to consumers, giving them a choice.

The average price mark-up there would be in the 1.5¢ to 2¢ range. Say the average power price is something in excess of 10¢, 12¢, so you know it's a 10% to 15% mark-up. In Canada, we're in the 2¢ to 3¢ range in terms of the premium consumers would pay. Again, that's on a landed cost of 11¢ or 12¢, so something less than 20% to 30%, call it 15% to 25%. I think that answers your questions.

Mr. Peter Julian: What it doesn't answer is the issue of how many consumers roughly have been willing to pay that differential and how much you're able to sell.

Mr. Tom Heintzman: Right. Bullfrog Power would sell in the order of 500,000 megawatt hours a year, approximately, which is a very small amount in the grand scheme of things in Canada.

In the United States the average program—and these are programs that are run by utilities and are not particularly well marketed—has a 2% penetration rate. The most successful programs have a penetration rate of over 25%. Bullfrog Power would be a fraction of 1%.

One of the big levers to increase the penetration.... Where you see the highest penetration is where a company like ours is able to cooperate with the utility to market the green power. So imagine getting your bill—whether you get it from Ottawa Hydro...I'm not sure who you get it from—and having a choice at the bottom that allows you to pay a premium for renewable power. That's what really drives the take-up in the United States.

Mr. Peter Julian: Thank you. That is all very helpful.

We're clearly hearing from you that government policies do make a difference. Certainly in Manitoba the NDP government has brought forward a very innovative energy efficiency program that has helped to bolster the energy efficiency of that province. Those are the kinds of innovative programs we have to look at.

I'm going to move on to Mr. Howard. Thank you for being here.

You referenced a number of studies that the institute is currently working on. Because of the increasing debate around value-added, of course, I'm interested as to whether or not the energy institute is looking at value-added and its potential in Canada. I'm citing Jeff Rubin, a former chief economist for CIBC World Markets, who has said very clearly that part of the problem that we have with the glut right now is that we're not doing the type of value-added transformation we need to. He cited Suncor as a company that isn't subject to the same price differential, because of course it does value-added and reaps the profit, rather than sending it down to another market in another country to get that value-added increase.

Are you currently doing any studies on that? Is that something that interests the institute?

The Chair: Mr. Julian is out of time, Mr. Howard, so we'll have to have a short answer. Go ahead, please.

Mr. Peter Howard: Very simply, we are not currently looking, nor do we have anything on our agenda, at the economics of actual upgrading to refined products or anything like that. We have a project under way right now that is looking at what we call North America in 2022. We are taking the reserve base as far as oil is concerned and extrapolating it and trying to come up with a supply projection of how big the United States could get as far as domestic production is concerned, and by implication what that means for Canadian oil sands and Canadian conventional oil. The fallout of that is the change in flows on pipelines, using rail as an offset and stuff like that. What we hope to get out of that is a better understanding of how the differential is going to change in the future. The differential is what is driving whether refining should or should not take place.

● (1620)

The Chair: Thank you, Mr. Julian.

Mr. Hsu, you have up to seven minutes.

Go ahead, please.

Mr. Ted Hsu (Kingston and the Islands, Lib.): Thank you.

Thanks for coming today.

I want to start with Mr. Heintzman. First of all, I want to get a sense of Bullfrog Power. What sort of customer growth have you had in the last five years or so? Can you give me some numbers?

Mr. Tom Heintzman: Sure. Bullfrog Power launched about seven years ago. In that time, somewhere between 8,000 and 9,000 homes and roughly 1,500 businesses signed up.

Mr. Ted Hsu: Is that growth accelerating?

Mr. Tom Heintzman: It was quite strong until the recession hit, and it would have diminished almost at the same time, but it's still a growing, healthy market. The United States has a longer history in this than we do, and it's shown quite impressive growth over a 15-year timeframe.

Mr. Ted Hsu: Okay. Any idea of overall numbers of people in Canada who are willing to pay a premium for renewable energy?

Mr. Tom Heintzman: It's difficult, because you can only tell a propensity to pay, rather than actual people putting down the money. The polling would suggest that in the neighbourhood of 15% of consumers are prepared to pay a premium for environmental products, and sometimes that manifests itself as organic food, hybrid vehicles, etc. You would expect that type of penetration is possible, and certainly we do see in excess of that in the most successful U.S. programs.

Mr. Ted Hsu: Okay, thank you.

Mr. Howard, as I understand it, your institute does some work in projecting future prices for both producers and consumers. Has there been any innovation in producing a forward curve for natural gas prices in the last 10 years? The futures trade out to five years or something. I know that in certain markets, if you can develop the market for longer-term forward contracts, it helps reduce business risk.

Mr. Peter Howard: I'd have to say no. I'm not sure I absolutely understand your question. On the long-term forecasts, even on price, that we come out with, it's a process of putting a whole bunch of information into a computer model and coming out with that forecast. The answer coming out is only as good as the information going in.

Am I going down the right road here on that?

Mr. Ted Hsu: I think so. I'm just curious as to whether things have changed since I last looked at it about 10 years ago.

Mr. Peter Howard: There are several ways of doing price forecasting. Some people absolutely look at the long-run price of gas and then do an extrapolation of that. There are other people who use, basically, just a rule of thumb: gas is going to go up at 2%, following GDP.

The method we use is a very involved method of the interaction between the supply costs of the upstream supply, transportation tolls, and the change in those tolls based on flow volume, and of more importance is the demand side of the spectrum. How big is the market, or how big could the market go?

When I mentioned converting coal-fired plants to gas-fired plants, there's a huge variability in there in the sense that when you get somewhere above $4.50 per mcf, coal becomes another player, and it's very difficult to get them out of there and not have them come back on you.

LNG exports have a huge implication on the North American price, because if you can get it off, if you can bleed the supply off the basin, then the price will move upwards, which will enhance supply and all that kind of thing. We're not secure in our LNG markets yet. We have, as I mentioned, something around 22 projects that are on the books in North America. We only have one project under construction right now.

● (1625)

Mr. Ted Hsu: Thanks.

A question for Mr. Dunn is about fugitive emissions. I'm wondering whether there is third-party monitoring of fugitive emissions in Canada, generally. Or how is that monitoring done?

Mr. Richard Dunn: That's a good question.

By regulation, the provincial regulator requires that you have a fugitive emissions monitoring program. What this program requires is that on some sort of a regular schedule you go around with fugitive monitoring detection equipment to detect, let's say, leaky valve stems or connections in pipe. Where you find any issues, you will fix them. That's by provincial regulation.

Mr. Ted Hsu: Has there been an innovation in that area?

Mr. Richard Dunn: Certainly. The detection equipment we use is very, very cool. It's infrared cameras, effectively, so you can see plumes of methane emissions. You can readily detect any kinds of very small amounts of emissions and work them into your maintenance schedule.

Yes, some really neat work has been done to minimize emissions.

Mr. Ted Hsu: You're using their greenhouse gas properties to detect them, I guess. Is that right?

Mr. Richard Dunn: Yes, I guess they would have some sort of—

Mr. Ted Hsu: The infrared radiation is bouncing off the fugitive.... Okay, thank you.

Have there been innovations in technology to control fugitive emissions? Has Canada been involved in that?

Mr. Richard Dunn: That's a good question.

I would say certainly in terms of what you measure, you manage. I would say it's certainly there, that aspect of measuring fugitives.

Also, on the regulatory front, more and more attention has been paid to ensuring that, for example, the amount of gas that's flared is minimized and that best practices are built around managing flared volumes. That's a good example there of innovation and collaboration with the regulators.

The Chair: Thank you, Mr. Hsu.

We go now, starting the five-minute round, to Mr. Trost.

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

As much as I've tried to get witnesses away from always asking for money, it seems money makes the world go round.

I'm going to start with a question to Mr. Howard about general economic growth. If energy companies have money, apparently they can do more innovative energy developments.

Does the Canadian Energy Research Institute have any estimates of what Canada could forego in economic growth, tax revenue, etc., if some of the pipelines that are currently in the news are just blocked off and they don't go? Canada West Foundation did a bit of a report the other day. I was wondering if you have any data or information or have approached that subject.

Mr. Peter Howard: Are you talking oil?

Mr. Brad Trost: We're talking oil for now.

Mr. Peter Howard: CERI published a report in the springtime as it related to what we call the Pacific access, where we are looking at the Trans Mountain and Northern Gateway pipelines. Within that report we drew out of that the economic spinoff effects of the existing operations, both conventional and oil sands. Then we highlighted the GDP growth, employment, taxation, royalty growth, as a result of each one of the three primary pipelines that are being proposed.

You could take any one of those pipelines and say, those numbers there, if that pipeline doesn't go...then that is lost to the Canadian economy. In its very simplest form, what I can suggest to you is that we are about 40% along the full development curve. That's primarily led by oil sands, but it also includes—this is on the liquid side. That would mean there's 60% of the development that's out there. If the pipelines aren't built, it's not going to get to market.

● (1630)

Mr. Brad Trost: Would you be okay forwarding that information, I guess I'll ask through the chair, to our offices?

Mr. Peter Howard: Absolutely. Actually, it's available on our website. I can pass—

Mr. Brad Trost: But is it in French as well?

Mr. Peter Howard: No.

Mr. Brad Trost: We may need to work on that, Mr. Chair.

Mr. Peter Howard: Yes, I can.

Mr. Brad Trost: It's interesting listening to all these discussions in the news about fracking. Unlike my colleague here, I didn't work in the oil and gas industry, but I almost did. I was a mining geophysicist. Didn't quite make it there.

A voice: It's like being a bit of an accountant.

Voices: Oh, oh!

Mr. Brad Trost: I was almost over there, Blaine; I just about made the good country. Mining didn't pay as well as oil and gas, unfortunately.

It's interesting to see how the developments have come in the industry. A lot of it has not been the major oil players who have been technologically pushing the edge on this thing.

So to Mr. Dunn and Mr. Howard, if you could answer, why has it been that it often is the smaller players, relatively speaking, that have been the innovators? What can we learn from how fracking has developed? This is effectively a World War II era type of idea that has expanded greatly. Why is it that it's been the smaller players, in places like western Canada, that have driven the innovation on this and not the bigger guys?

Mr. Richard Dunn: Certainly I'd support your comment that small companies have played a significant role in advancing hydraulic fracturing technology. Principally, maybe not so much on the operating side, I'd suggest, but certainly on the.... Where Canada has a real niche is in the downhole tools, which take a well bore that's 3,000 metres deep and extend it out laterally another 3,000 metres and put the tools in place so that you can put some 25 stimulations along the course of that well bore. It's amazing technology, each stimulation involving the placement of two railcars full of sand—

Mr. Brad Trost: But what caused the small guys to have that innovation? We're looking for ideas to drive innovation here. What drove their innovation?

Mr. Richard Dunn: I think they saw a market. Some of the small service companies have seen a market, and I guess it's that willingness to take a risk.

I would suggest as well that the major companies that are willing to use this technology have, given the chance.... And I guess finally it's a program that I run at our company, the SR and ED, the scientific research and experimental development program. It does definitely make the use of research and development. It promotes our use of research and development in our corporation, the tax advantage, that nature of it, and I think it's driven some very innovative technological practices.

The Chair: Thank you, Mr. Trost.

Go ahead, Mr. Allen, for up to five minutes.

Mr. Mike Allen (Tobique—Mactaquac, CPC): Thank you, Mr. Chair. And I thank Mr. Trost for his comments about being a bit of a natural gas person. I remember one time he told me about being a bit of an accountant, so right back at you.

Mr. Dunn, I'd like to start with you. You were talking about the fluids used in the fracking and about some of these "greener" fluids, if you will. I would just like to ask you a little bit about that. In one of the environment commissioner's reports, he talks about the analysis it takes to get these chemicals approved and reviewed.

How much development have you seen in these, I guess you call them greener chemicals, in the last five to ten years, and have there been delays in getting some of these licensed for use by the firms?

Mr. Richard Dunn: I would suggest that a lot of the greening of the chemicals is probably in the last one to two years, as public awareness has really come to the fore. I would suggest that our suppliers, either the major companies like Haliburton or the smaller, Canadian-based suppliers, Calfrac, Trican, the pumping companies —they are very keen. They recognize the need and the public imperative of going to greener chemicals. And I would say the cooperation we've had with those firms has been tremendous. They see where the market is going and they want to participate in that market effectively.

● (1635)

Mr. Mike Allen: Can you give me an example of a greener chemical?

Mr. Richard Dunn: Yes. I mentioned the chemicals that we won't use, and really the greener chemicals have seen the elimination of the ones with benzene and certain heavy metals. In the majority of our situations—well, all of our situations company-wide—we've been able to take what we consider unacceptable chemicals and replace them with chemicals that have less difficult or toxic properties.

Mr. Mike Allen: You talked a little bit about innovation in that area. Obviously you talked about multiple wells from single pads, and that should increase your capabilities to manage your fracking fluids and things coming back up.

Can you talk a little bit about what advances you've made in the last four or five years with respect to recoverable fluids and groundwater contamination?

Mr. Richard Dunn: Certainly part of the practice that we've committed to as an industry is to work with the regulators to put programs in place to monitor baseline water in the area around our fracturing operations, so in the unlikely event that there is some contamination of groundwater and near-surface groundwater, we'd be able to understand that right away, recognizing that this has not been an issue experienced in the industry to date.

Mr. Mike Allen: One of the challenges that we see—and in New Brunswick we're in this dialogue now, and significant numbers around my riding in that area are involved in this debate right now.

I appreciate your comments about reducing the environmental footprint because of these multi-site.... But what about what you're doing around casing management and that type of thing? There always seems to be the concern about the fracking fluids seeping into the groundwater. What developments and improvements have you made with respect to drill casing work and that type of thing to ensure the safety of the fracking fluids coming back up?

Mr. Richard Dunn: So much of the protection of groundwater depends on the quality of well-bore construction, which includes both the casing and the cement that's placed behind the casing, or multiple strings of casing, to isolate your production zone and the fluids you're putting in from fracturing, from near-surface groundwater. To that end, the regulations that are being put in place.... Industry practices are extremely strong in Canada. It's world leading, and I believe our regulations are world leading as well. That's the first line of defence—proper practices, proper regulations, in terms of protecting groundwater.

Furthermore, as we continue the dialogue...they're getting better as we speak. For example, in Alberta, we're starting to look at putting in place regulations that manage the interaction between wells that are placed in reasonably close proximity. As Mr. Howard mentioned, we've moved from a model of one well per square mile to a model that involves multiple wells, and the regulator today is working with industry on regulations that manage that interaction and that make sure you can't have any inadvertent communication from one well-bore situation to another while you're stimulating it. So regulations are being put in place to address the new reality.

The Chair: Thank you, Mr. Allen.

Go ahead, Mr. Nicholls, for up to five minutes.

Mr. Jamie Nicholls (Vaudreuil-Soulanges, NDP): Thank you, Mr. Chair.

Mr. Dunn, I am going to follow up on questions posed by my colleagues on the other side regarding fracking technology now.

Disclosure of chemicals is great. Was the chemical list that was used for fracking disclosed after it was regulated, so that you had to disclose it, or were you doing that before regulation?

Mr. Richard Dunn: It was done before. In fact, in British Columbia it was done voluntarily, I believe, two or three months in advance of the regulator mandating that. In Alberta it was done some year and a half before.

● (1640)

Mr. Jamie Nicholls: Okay. Disclosure is great, but when accidents happen, traceability and liability are pieces that are necessary to complete social licence.

The National Farmers Union in Alberta, at its last AGM, made some recommendations to the federal and provincial levels of government. One of those was to require companies to include non-toxic tracers in their fracking fluids so that potential groundwater contamination could be easily linked to a specific fracking operation.

Would you agree with that recommendation?

Mr. Richard Dunn: No. I believe we have significant understanding of the fluids we pump, so that in the event there was ever any groundwater contamination we would be able to tell, especially with the practices we've committed to in terms of baseline groundwater monitoring, in which we go in and take a sample of regional waters before there is any activity.

I must say, though, with all the wells that have been stimulated, there hasn't been a proven case in Canada of groundwater contamination, so that is an unlikely event.

Mr. Jamie Nicholls: Is Encana not currently in a lawsuit with Ms. Ernst of Rosebud, Alberta, regarding exactly this, the fact that there is groundwater contamination? Ms. Ernst is not an environmentalist, I should mention. She's a 55-year-old oil and gas industry consultant, so not exactly somebody who butts heads with the industry a lot, but someone who actually works with it.

I find it kind of puzzling that here we have this technology, and it's innovative.... Scientists at Rice University are looking at non-toxic tracers to clear this up for the public. Say you have two companies that are drilling in the same place and there is groundwater contamination. Wouldn't it be useful to know which company the contamination is coming from through the use of tracers?

Mr. Richard Dunn: It could be done. In my opinion, it would not be required, given that there has never been a proven instance in all the situations.... I believe the effort should be put into proper well-bore construction practices and baseline monitoring, and those will provide the public assurance.

To comment on Ms. Ernst, you're right, she has been raising concerns about contamination in the coal-bed methane realm for a number of years. She sued us and the Energy Resources Conservation Board, the regulator in Alberta. The Department of Environment in Alberta has come out definitively saying that there has been no groundwater contamination as a result of our operations in the Rosebud area.

Mr. Jamie Nicholls: Wouldn't a tracer in the fracking fluids clear up any frivolous claims made by people complaining about groundwater contamination, if indeed they were frivolous? If you had a tracer, it would make certain that it wasn't from a fracking operation. Wouldn't you agree?

Mr. Richard Dunn: It would be one other piece of information, but, as I noted, there are a number of pieces of information already there, which is the point of our reporting, why we've gone to disclosure.

Mr. Jamie Nicholls: Right. I noted before that you talked about partnerships with academia in terms of innovative technology, and I know there are researchers at the University of Alberta who are working on tracers. If your industry is not interested in adopting them, isn't it a waste of time for these researchers to look into tracing technology for fracking fluids?

Wouldn't it be more constructive to work in partnership with researchers at the University of Alberta to sort of advance this technology?

Mr. Richard Dunn: It would certainly be something to consider and to look into. I'd certainly agree with you there.

Mr. Jamie Nicholls: Thank you.

How much time do I have, Mr. Chair?

The Chair: You are out of time, Mr. Nicholls. Thank you.

We go now to Ms. Crockatt for up to five minutes.

Go ahead, please.

Ms. Joan Crockatt (Calgary Centre, CPC): Mr. Heintzman, I was really interested in your statement that energy is a person's biggest environmental footprint. We've heard from a lot of sources, Mackenzie Valley Aboriginal Pipeline LP being one of them, that actually this is a personal decision: the two biggest things you can do, if you want to decrease that energy footprint, are to turn off your lights and insulate your home.

I'm wondering whether you have thoughts about why more Canadians are not making the decision to purchase renewable energy.

● (1645)

Mr. Tom Heintzman: I think it's a phenomenon that is not isolated to renewable energy but to environmental products generally. It's very difficult to ask people to pay a premium for a social good, but I believe you have to start somewhere.

There is a meaningful percentage of people who are prepared to do it today. If you roll the clock forward for 10 or 20 years, I think it will become increasingly the norm to make environmental decisions. I think what you're seeing is just the early phases of a curve that will continue to grow.

Ms. Joan Crockatt: Given that no form of energy is perfect—there are some things to be overcome with all of them—and that natural gas power is much superior to coal, I wonder whether you would consider using natural gas as a cleaner and cheaper form. We have a glut of it right now in Canada.

How would you respond to that?

Mr. Tom Heintzman: When you say "you", do you mean Bullfrog Power?

Ms. Joan Crockatt: Yes. It's a much cleaner source of energy; we've heard that we have a glut of it; the prices are low. Would you consider using it at Bullfrog?

Mr. Tom Heintzman: No, not for Bullfrog Power. The entire company is focused on renewable fuels.

Ms. Joan Crockatt: Okay.

I'll switch over to Mr. Dunn, please.

You have talked about the U.S. market shrinking dramatically and have said that Canada needs to find new markets. What happens if we don't? What happens to Canada's resource, as far as getting value from it is concerned?

Mr. Richard Dunn: Well, effectively we'll stagnate. The industry will continue to shrink, as it has over the last three or four years. It has probably shrunk in terms of production by some 25% to 30%, and in terms of investment probably by 50% to 70%.

This is probably more a question for Mr. Howard, as he is working towards these narratives, but I believe there is a very likely chance that the Canadian natural gas industry will shrink to a very regional market in western Canada, supplying a certain amount of the U.S. northwest and the western Canada market, including the industrial market for the oil sands. By and large, the Canadian eastern markets would be taken up by U.S. gas. That's the likely outcome.

Ms. Joan Crockatt: Mr. Howard, to follow up on that, you have said that 60% of our resource is still in the ground. Do you think Canada is at risk, especially with the development not only of shale gas but of shale oil, of seeing our oil and gas resource unused, left in the ground?

Mr. Peter Howard: First of all, let me just clarify this 60%. That's 60% of established or announced projects in the oil sands plus conventional resources—stuff like that. The actual oil sands resource is ten times that size.

The question I think you're asking is, if we can't build pipes and can't build LNG terminals, what happens to our energy?

Some of it definitely will continue to flow to the oil sands. There's a unique opportunity to possibly transition Canada's transportation fleet of long-haul diesel trucks over to natural gas.

Ms. Joan Crockatt: So we would transport it, instead of by pipelines, which are underground and safe, above ground on trucks?

Mr. Peter Howard: No, no. What I'm getting at is converting diesel trucks over to LNG fuels, railways over to LNG or CNG, and small-use trucks—stuff like that.

In essence, if we don't have access to markets, that energy will stay here in Canada, and rather than having several hundred years of energy supply we're going to have several thousand years of energy supply. Meanwhile, Alberta's royalty system would be where it is today, which is in trouble. Canada's GDP growth probably would pull back significantly.

Personally, I think it's not a good situation. I think it's something we need to pay attention to, to see whether we can access other markets.

● (1650)

The Chair: Thank you, Ms. Crockatt. Your time is up. It goes by fast, doesn't it?

Ms. Joan Crockatt: Thank you.

The Chair: Ms. Liu, you have up to five minutes. Go ahead, please.

[*Translation*]

Ms. Laurin Liu (Rivière-des-Mille-Îles, NDP): Thank you, Mr. Chair.

I would like to thank the witnesses for being here.

My first questions are for Mr. Howard.

Your presentation focused a lot on the obligation to export oil from the oil sands so it can leave Alberta. You also think developing pipelines to the United States and eastern Canada is a priority.

Have you looked at possibilities other than exportation, such as the possibility of developing these resources here, in Canada?

[*English*]

Mr. Peter Howard: The simple answer is no, we haven't analyzed that at all, but currently our focus is more on what the implication is to Canada if the U.S. becomes self-sufficient in oil. In other words, how much of our oil sands and our conventional oil would get backed out of that market?

With that process of becoming partially or fully sustainable in oil production, or whatever they get to, there's an implication as to the differential to Canada. In other words, if we don't build new pipes, and our pipes are jammed full and there's no more capacity left, the differential will stay open. The move towards upgrading to refined petroleum products—the door opens, and that might be the only way to get our resources out of North America: basically sending diesel and gas to the coast and onto ships to foreign markets.

Let me just add that we are looking at the possibility, along with others, of converting one of TransCanada's mainline pipes over to oil so that we can connect western crude to our eastern refineries.

[*Translation*]

Ms. Laurin Liu: It is the Irving pipeline.

[*English*]

Mr. Peter Howard: Yes, the pipeline to Irving.

[*Translation*]

Ms. Laurin Liu: If you ever study resource development—we know that job creation is a priority for Canadians—this committee will be most interested in receiving your study. Thank you.

I also have questions for Mr. Heintzman, from Bullfrog Power.

You mentioned biogas. Where are your main suppliers located?

[*English*]

Mr. Tom Heintzman: It's just outside of Montreal. The next two projects were built in British Columbia, and we're starting to look at projects in Ontario and elsewhere across the country.

[*Translation*]

Ms. Laurin Liu: Okay.

Who are your main green energy suppliers in Quebec?

[*English*]

Mr. Tom Heintzman: We work with this one facility, EBI, in Quebec, in the green natural gas. In terms of renewable electricity, we've worked with a number of suppliers in the past, including Brookfield. I'm trying to think whether there are any.... Anyway, those would be the principal players.

[*Translation*]

Ms. Laurin Liu: Your publications indicate that your hydroelectricity is greener than Hydro-Québec's.

Can you tell us more about that?

[*English*]

Mr. Tom Heintzman: I'm sorry. Can you say that again?

Ms. Laurin Liu: I found in your publications that the hydroelectricity you produce is greener than that of Hydro-Québec. Could you explain?

Mr. Tom Heintzman: I think what you're referring to is that there's an EcoLogo certification, which is a federal government certification done through the EcoLogo program. EcoLogo typically certifies small hydro but not large hydro. I think that's what you're referring to.

[*Translation*]

Ms. Laurin Liu: Last week, one witness told us about smart grids.

Could you tell us about the impact this technology might have on your sector?

[*English*]

Mr. Tom Heintzman: My personal belief is that smart grids will revolutionize electricity in our society, and to some extent heat as well. They will incorporate intelligence end to end, from generation all the way through to consumption, and will provide greater efficiency, greater effectiveness of the system, cheaper supply, and a more reliable supply. It's a revolution being applied to energy similar to the revolution that the web has brought us in telecommunications.

My only concern, which relates to some of the issues that I raised in my presentation, is whether our systems, be they the division of powers and regulatory and economic consensus, will allow Canada to be a leader in the smart grid or not.

● (1655)

Ms. Laurin Liu: Thank you.

The Chair: Thank you, Ms. Liu.

Mr. Leef, you have up to five minutes. Go ahead, please.

Mr. Ryan Leef (Yukon, CPC): Thank you very much, gentlemen.

Mr. Calkins and Mr. Trost talked a little about the hydraulic fracturing and the testing that is done before it comes out. Then Mr. Nicholls was talking a little bit about tracing and maybe clearing up some of the misinformation about it. That's the one thing I hear in the Yukon. We've explored LNG projects in the Yukon, and fracturing particularly up in the Eagle Plains country.

Generally, the public is weighing in, but when you really corner people on the specific issues and the facts, you hear examples they raise about wells being poisoned and things. But they just don't understand the issue generally—don't understand the science behind it, the lack of science behind it, the fact from fiction in terms of the truth behind the stories that tend to be out there.

This sways government, political, and public opinion on how these projects move forward. I think you articulated clearly what not moving ahead with some of these projects can do to stagnate the GDP growth of a region and our country.

Maybe I'll just give you an opportunity to go on the record a little more to provide the committee and Canadians listening with some additional information on the science of fracturing and the realities behind some of the stories that tend to make the headlines, in contrast with the good news or the success stories that you may be aware of.

Mr. Richard Dunn: Thank you.

As mentioned, we put an awful lot of time and effort into the hydraulic fracturing principles and operating practices, the principles being that the industry across Canada.... I think this is quite commendable for industry. I haven't seen another oil and gas industry worldwide that is committed to these principles and practices for protecting the quality and quantity of groundwater.

The practices are exactly the right practices to do the right things. Whether it's disclosure, whether it's baseline groundwater monitoring, whether it's monitoring seismicity, for example, these are all cutting-edge practices, which Canadians should all be proud of. It's from a responsible development perspective.

But you were asking the question.... Clearly I believe that what we do is done responsibly and in the right manner, but the need for energy literacy is paramount in Canada—to have the dialogue both ways, but to increase the energy literacy of Canadians is, I think for all areas, important.

To that end, there are a number of organizations, such as CAPP and the Canadian Society for Unconventional Resources. But what we've joined in recently and are just testing is this. Pollution Probe is working on a sort of industry.... At this point I don't believe government is involved, but Pollution Probe, being the NGO, is working at a project that is aimed at increasing Canadian energy literacy. I think this is an area that offers an awful lot of opportunity for increasing the level of comfort.

Mr. Ryan Leef: I'm glad you brought it back to that. We are talking about innovation, and I think maybe you just touched on it. Some of the aspects of innovation belong in the education and literacy format.

Are other companies invested in that project to create greater literacy in the energy field?

● (1700)

Mr. Richard Dunn: Definitely. It's just kicking off, but I've seen other companies in the oil and gas sphere; Suncor and Canadian Natural Resources come to mind.

It comes back to one of the points I was trying to bring forward in my remarks: that by and large, in dealing with issues around social licence and providing a level of assurance for the stakeholders and for the public, industry does an extremely good job of collaboration.

Mr. Ryan Leef: Thank you, Mr. Dunn.

Do I have a couple of minutes left?

The Chair: You have time for just a short question.

Mr. Ryan Leef: Mr. Heintzman, you talked about being in B.C. and then going east from there. Do you see any application in northern climates, and if so, are you turning your mind to that?

Mr. Tom Heintzman: Absolutely. In fact, we're one of the sponsors of the next remote renewable power conference. It's being held in Canada in partnership with the Pembina Institute, which is an Alberta-based energy think tank. It's going to be taking place in June. The entire focus will be on northern communities, off-grid communities, and the development of renewable power in those communities. I absolutely believe there's an opportunity there and that a similar business model can work, whereby individuals could choose to pay a premium and that premium could be used to help develop those types of projects.

Mr. Ryan Leef: Thank you.

The Chair: Thank you, Mr. Leef.

We'll go now to Mr. Gravelle for up to five minutes.

Mr. Claude Gravelle (Nickel Belt, NDP): Thank you, Mr. Chair.

My questions are going to be for Mr. Heintzman. First, though, my colleague Mrs. Crockatt, I believe, mentioned that turning off the lights and insulating a house are good ways to reduce carbon footprints. Maybe she can talk to the Prime Minister and bring back the ecoENERGY program. It certainly would benefit Canadians from coast to coast to coast.

My question for you, Mr. Heintzman, is on biomethane. If the federal government, the provincial governments, and the municipal governments were to get behind the production of biomethane gas from all of the municipal dumps from coast to coast to coast, how much natural gas or methane would that produce, and how much money would that save?

Mr. Tom Heintzman: I don't know the figure for Canada, but in the U.K., their National Grid, which is their gas utility, has estimated that biomethane could account for approximately, I believe, 40% of residential natural gas demand in the United Kingdom. One would expect it's a similar proportion in Canada. In terms of the dollars involved, it would take me some work to figure that out.

Mr. Claude Gravelle: Could you figure that out and send it to the committee? Is that possible?

Mr. Tom Heintzman: Sure, I'd be happy to do a back-of-an-envelope calculation.

Mr. Claude Gravelle: You said that if we compare it to the U.K., there is about 40% methane gas. In Canada, we don't know what that is. But if we were to start developing biodiesel, it would save a lot of money. I know there's an upfront cost to build the plants, but at the end of the day, are there some substantial savings for the consumer?

Mr. Tom Heintzman: Not as the economics are currently configured. First of all, this is biomethane, which is different from biodiesel, just as a point of clarification. Currently, biomethane is more expensive than conventional natural gas. If, however, we start taking account of the environmental impact and that's priced in, whether through a carbon tax or some other form, then they start getting more cost competitive. But currently it is a premium product and is more expensive.

Mr. Claude Gravelle: In your statement, you said some consumers were willing to pay a little bit more for green energy. Are there some savings for the province, for municipalities, and for individuals if they go to green energy? If you pay that extra $1 on your bill, are there extra savings down the road?

● (1705)

Mr. Tom Heintzman: There are no savings for the person who actually pays the bill, but there are savings to society as a whole in increasing the amount of renewable power, and therefore there are fewer hospitalizations, fewer adverse health effects, a more diversified electricity mix, less dependence on fossil fuels. There are a number of societal benefits, but no, it doesn't save the individuals paying the bill any money.

Mr. Claude Gravelle: But it does save society a lot of money through health care.

Mr. Tom Heintzman: Yes, and it's building an economy in the country, it's diversifying a portfolio.... I could give you a long list of benefits from it.

Mr. Claude Gravelle: Does it also create jobs?

Mr. Tom Heintzman: Absolutely. I fundamentally believe that a clean economy will be one of the big economic drivers globally over the next two decades. It's just a question of how much of that Canada is able to benefit from.

Mr. Claude Gravelle: Do you have any idea how many jobs we could create with that?

Mr. Tom Heintzman: There have been a number of studies. I don't have that data at my fingertips either, but there was a study by a woman named Céline Bak, who says already the clean tech industry in Canada is approximately the size of the aerospace industry, and is growing much more rapidly. I could send you that information as well.

Mr. Claude Gravelle: Could you send that to the committee? It would be appreciated.

The Chair: Thank you, Mr. Gravelle.

Mr. Anderson, for up to five minutes.

Mr. David Anderson (Cypress Hills—Grasslands, CPC): Thank you, Mr. Chair.

I'd like to thank our witnesses for coming today.

Mr. Howard, you mentioned this 60% loss of development. Do you have any numbers on that? Did you have numbers on what that 60% figure worked out to be, or is that contained in your report that we could perhaps look at later?

I'm wondering what the scope is of that missed opportunity.

Mr. Peter Howard: It's contained in the report. It is a volume or a daily production level. We are currently sitting at—if you add conventional in—about 2.8 million barrels per day. With all the projects that have been announced and all the conventional drilling that is deemed to go forward, we will peak out between 5.5 million and 6 million barrels per day. That's kind of where that number comes from.

Mr. David Anderson: Do you know what the number is then?

Mr. Peter Howard: In a dollar sense? I could multiply it out and send it to you, but I don't have it.

Mr. David Anderson: It would probably be as big as our differential pricing, I would think. Do you think so—or more?

Mr. Peter Howard: In a GDP sense, it would be well into the trillions of dollars.

Mr. David Anderson: Thank you.

You mentioned a little bit earlier that if things didn't turn out well, there might be some opportunity for refining and moving product offshore.

We did a study on refining and pipelines, and what we heard was a bit contrary to what you said, which is that our refineries are not operating at capacity. Typically now, countries or markets want the refining done locally because that final product is often tailored to the local situation.

Do you have any comment on that? Are you suggesting we would need to look at refining to try to find some opportunity, or that you actually think that would work? The testimony we had previously would kind of indicate that that would be a problem, not a real opportunity.

Mr. Peter Howard: Asia is going to be an interesting situation. From the information I have, they would like to get the crude because they want to refine it and get the jobs.

If you're looking at Europe as an example, Europe's refining is geared towards the diesel side of the spectrum because that's where... sorry, I have that wrong. Their refining is geared towards the gasoline side of the spectrum, but their demand, their fleet, is on the diesel side of the spectrum. The net result is they are exporting gasoline to North America. North America is exporting diesel to Europe, to get that all balanced.

If we actually manage to get a pipeline to the east coast, products above the demand within that area could actually go to Europe. It could compete in that market. It could compete because it's buying crude at a differential out of Alberta, and the transportation cost makes it below the brand price, so it can enter that market quite easily.

● (1710)

Mr. David Anderson: We were told there was a real opportunity for upgrading but not so much for refining. Would you say there may be an opportunity at the refining level as well?

Mr. Peter Howard: The answer I can give you is the differential itself. If you go back a year ago, when we were talking about a differential of $20 plus, refining to product level doesn't make a lot of sense from simple economics. When that opens up to $40, it starts to make a lot of sense.

Access to other markets is just another part of the game you have to....

Mr. David Anderson: Mr. Dunn, you look like you might want to enter the discussion.

Mr. Richard Dunn: No. I think what he's saying is that when a Canadian product is severely discounted, the less we get for it the better the opportunity is to do something else, but that's not where we want to be.

Mr. David Anderson: No. The idea would be to access the world market price.

Can you talk a little bit more about abandonment innovation? You talked about technology in plugs and those kinds of things. I'm interested because we have lots of wells that have been drilled, lots that will be drilled, but tell us a little bit about innovation in abandonment technology.

Mr. Richard Dunn: It's certainly an area that again I think we have good solid regulations for in terms of managing the liability. Currently, the focus is on addressing more of the problem sites, those defined as older sites that are proximal to residences and such. Again, the industry and the regulator are working together to make sure that those sites are well managed and the wells are put to bed in a very effective manner. There are regulations that way.

From a technology standpoint, as I mentioned, it's looking at innovation that will provide a greater level of assurance of sealing the well off for perpetuity.

Mr. David Anderson: Where do you think technology is going to go in the next 10 years? You talked about pad drilling, about horizontal technology. What do you see as the potentially big technological innovations in the next decade?

Mr. Richard Dunn: I think as we continue to push the horizontal legs out further, so you can access more reservoir from the same surface location, that's really the innovation. It's a combination of being able to drill out further, but it's also the innovation on the completion side of the technology, to be able to place the sand and fracturing fluids out further as well.

As well, I think going to the greener fluids will be quite innovative. I guess the final bit would be less reliance on surface water, by recycling non-freshwater sources.

Mr. David Anderson: Mr. Howard, you talked earlier about how the price may remain in that less-than-$3 range for a while. We've talked a bit here about financial innovations in terms of the industry and that. Do you have any suggestions or ideas about what types of financial innovations might be made in order to handle revenue like that?

Second, if other product is lower than we can produce it, why shouldn't we access it?

Mr. Peter Howard: Sorry, I don't understand that.

Mr. David Anderson: If other product from other places is lower than we can produce it, why shouldn't we access it?

Mr. Peter Howard: Again, I don't understand the question. Other products?

Mr. David Anderson: You're talking about how we may end up becoming uncompetitive because of our prices here, our costing here. My question is, if we are uncompetitive, why should we not be accessing the cheaper product?

Mr. Peter Howard: That's a very good point. As a matter of fact, that's what's actually going on in Ontario, and potentially Quebec tomorrow. We're bringing Marcellus gas across through Niagara into that market. Our forecast suggests that within the next three to four years, western Canada gas is going to be backed out of Ontario. So in effect the market is looking after that situation right there.

I don't think, with my Alberta hat on, that's a good idea.

● (1715)

Mr. David Anderson: What's the impact of that?

Mr. Peter Howard: In dollars and cents, I can't tell you that, but what I can suggest is what I indicated in my testimony. The number of wells that we're going to drill on an annualized basis is just going to go down, down, down. That has a direct effect on employment, on steel in casing and stuff like that—

Mr. David Anderson: And the solution is what?

Mr. Peter Howard: If you cannot get access to an LNG market or the U.S. market doesn't recover where it needs Canadian gas, as I indicated, I think it's a unique opportunity for Canada to start looking at changing out the long-haul trucking fleet into CNG fuels and LNG fuels, and the municipal trucks could be included in that too. The possibility exists that we could be running electric cars here, and the electricity is going to be coming from gas-fired power generation. All of that is out there.

Mr. David Anderson: But the foreign markets are the critical thing.

Mr. Peter Howard: Yes.

The Chair: Thank you, Mr. Anderson.

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

Ms. Laurin Liu: Thanks, Mr. Chair.

My questions are directed once again towards Mr. Heintzman.

You mentioned in your observations that markets aren't currently present that are favourable to innovation. Could you just elaborate on what you meant by that?

Mr. Tom Heintzman: In my experience, markets tend to breed innovation because many companies are competing over the same space and being forced to provide new products that better meet their customers' needs. Where there's a monopoly, as is the case in most electrical and natural gas distribution or downstream in Canada, there's less of a market. There are effectively no competitors and less of a demand or a need to innovate. In addition, very frequently the return on the economic incentive is based on a return on capital or a return on assets, not on some measure that would incent innovation.

Ms. Laurin Liu: Thanks.

Mr. Dunn, you mentioned the SR and ED tax credit. Have you looked into the impact that changes to SR and ED in the last budget will have on your R and D activities?

Mr. Richard Dunn: Certainly we looked at the impact of the changes, but we felt they were manageable, by and large, and wouldn't have too great an impact.

Ms. Laurin Liu: Has CAPP adopted a position concerning these changes?

Mr. Richard Dunn: I'm not sure. I'm not aware.

Ms. Laurin Liu: Great. Thanks.

I'll pass my time to Mr. Julian.

Mr. Peter Julian: Thank you very much, Mr. Chair. Thank you to Ms. Liu for sharing her time with me.

Mr. Dunn, I want to come back to the overall funds that Encana allocates to the environmental innovation fund. What percentage of your operating revenues goes to that environmental fund?

Mr. Richard Dunn: Probably somewhat less than 1%.

Mr. Peter Julian: Is that an industry standard, when you look at your competitors?

Mr. Richard Dunn: No. I would say that all companies have an innovative focus, and you'll fund items in a number of different ways, apart from distinct funds. I believe this innovation fund is, if not unique to Encana...there are probably a very limited number of companies that would target environmental innovation funds.

Mr. Peter Julian: Do you think the federal government could put any policies in place that would increase your investment in a fund like that?

Mr. Richard Dunn: As mentioned, I believe the SR and ED... giving these things tax advantages. Especially in times when dollars are tight, we're looking critically at all expenditures. Tax advantage expenditures would get that benefit.

Mr. Peter Julian: That's a real concern to us on this committee because Canada is a laggard around the world in terms of R and D investment, last in the industrialized world in terms of public investment, second to last in terms of the number of patents developed, and last in terms of the number of doctorates. We have to turn that around.

Mr. Heintzman, I want to clarify. You talked about less than 1% penetration in terms of consumers for the 500,000 megawatt hours that you supply. How many consumers are paying that preferential tariff of 2¢ or 3¢ for your green power?

● (1720)

Mr. Tom Heintzman: The penetration is a fraction of 1%. The number would be 8,000 to 9,000 homes and roughly 1,500 businesses.

Mr. Peter Julian: Thank you for that.

What are your projections over the next five to ten years in terms of growing that market?

Mr. Tom Heintzman: Roughly speaking, we would hope to be able to double that over the course of the next three to five years. I should emphasize that that is business as status quo. A number of different levers have been pulled in the United States, any one of which could dramatically increase the penetration.

The Chair: Thank you, Mr. Julian.

We go now to Mr. Hsu for up to five minutes. Go ahead, please.

Mr. Ted Hsu: Thank you.

Mr. Dunn, can you tell us a little of the history of innovation in fracking fluids? What does “green” mean? What changes have occurred?

Mr. Richard Dunn: We have developed what we call a responsible products program, and we have shared this with the industry. We sat down with a toxicologist and looked at the accepted toxicological types of rankings of various fluids. As well, we worked with our suppliers, and even where there was confidentiality information we went in and signed non-disclosure agreements, on a company-to-company basis, so we had all the information that's in there.

We looked at the various components of fluids and decided, based upon their toxicological properties, that certain chemicals, principally due to their properties and their pervasiveness, presented a certain degree of risk, and that risk could be managed through operating practices or through avoidance.

We've decided, as a company, to avoid those certain chemicals that I mentioned.

Mr. Ted Hsu: I'm just wondering, in terms of the chemistry, what chemicals were there and what is there now? There always has to be a surfactant in there. There used to be heavy metals and now there are not. Chemically, what changes have occurred?

Mr. Richard Dunn: The intent of the chemical packages that we use would be the same, whether it be a surfactant or a biocide or some sort of corrosion control. What we've been able to do within those packages is substitute less harmful chemicals, if you will, to meet that same intent. To be honest with you, I don't understand what we swapped in, but I do understand what we swapped out, and that's really the beauty of it all.

Mr. Ted Hsu: Just going back even a little further, to the original development of hydraulic fracturing technology, can you tell us a little bit about what role Canadian researchers played in that?

I don't mean to put you on the spot, if that's not something you feel comfortable—

Mr. Richard Dunn: Canada is an innovative place. It's not the easiest place to do business in at times, with the environment and such. If you look at pumping large volumes of water and keeping it from freezing in the dead of winter, Canadians have come up with incredibly innovative methods.

Mr. Ted Hsu: Would you say that Canadian companies, or Canadian researchers, have played a pretty big role in developing the technology that's now used around the world?

Mr. Richard Dunn: Certainly, if you look at hydraulic fracturing in the service companies I mentioned.... One area, with regard to the development of the oil sands and the SAGD technology, for example, was all developed out of the University of Calgary with a professor named Roger Butler. There was some incredibly innovative work done to work on Canadian resources.

Mr. Ted Hsu: That's all I have.

● (1725)

The Chair: Thank you, Mr. Hsu.

Mr. Allen.

Mr. Mike Allen: Thank you, Mr. Chair.

I just want to pick up very quickly, Mr. Howard, on one of the comments you made from the questioning by Mr. Anderson. Did I correctly hear you say that Marcellus shale is coming into Quebec?

Mr. Peter Howard: Yes. Actually, if you count the molecules, it's probably not.... The Marcellus molecule doesn't make it to Quebec, but by displacement you could say that in fact within a couple of years Marcellus gas will be occupying that demand space.

Mr. Mike Allen: Just like transmission lines and electrons; it's the same kind of thing. I find that interesting.

If that's the case, and presumably if the same thing happens in New Brunswick, for example, two jurisdictions.... I'm hopeful we won't put a moratorium on that in New Brunswick, but you never know. With that in mind, have you done any numbers with respect to what the economic development would be and the cost to the economy if Canada were not pursuing that, as opposed to taking Marcellus shale?

Mr. Peter Howard: I would have to say we haven't looked at it in that context, although we do have a report out there that looks at the economic impact of shale gas development within Quebec. Basically this report says that we fully recognize that there's a moratorium in place, but if that moratorium was lifted, there's this level of activity, this level of GDP growth, employment, and all that kind of stuff, that goes along with hydrocarbon development within the province of Quebec.

You could make the same statement in New Brunswick, if shale gas development took place there. We haven't worked on those numbers, but in Quebec we have.

Mr. Mike Allen: Mr. Dunn.

Mr. Richard Dunn: Yes, thank you. I'd appreciate adding to it because we've been working on the LNG side.

The market works, and United States gas is closer to the eastern Canadian market and is displacing western Canadian gas. So the market works, and the market is what it is.

At this point, United States imports into Canada are some three or so billion cubic feet a day. We've been considering the impact of LNG. When we lose those markets, it's critical that we access the Asian markets offshore with LNG. This is really where the growth is going to come, and that potential. And as I mentioned, we have that proposal through CAPP to get some three to four bcf a day, roughly equivalent to what has been displaced in the east. That would provide some $500 billion of GDP, and the jobs you're looking at, ongoing jobs, are in the range of 100,000. This would be Canadian jobs across the breadth of Canada, direct, indirect, and induced. LNG is critical.

Mr. Mike Allen: Like oil, is there a price differential issue between the two countries on natural gas?

Mr. Richard Dunn: It's not to the same extent. There is somewhat of a differential. Gas is probably selling for, let's say, around the $3 to $3.50 per 1,000 cubic feet—mcf. At this point there would probably be a differential of 25¢, principally due to transportation distance from western Canada, and that's part of the advantage that the Marcellus gas would have in eastern Canada. They avoid that transportation differential.

Mr. Mike Allen: The short answer, then, is that if you think you're not getting shale gas and you make that decision, well, it's too bad, you probably are.

Thank you.

The Chair: I just want to thank all the witnesses....

Sorry?

Mr. David Anderson: Does he have a minute left?

The Chair: Yes, there actually is a little over a minute.

Go ahead, Mr. Anderson.

Mr. David Anderson: Can I ask one question? I don't think we understood until today the importance of the access to the world markets. I wish more Canadians could hear this conversation, because they would understand the importance of it.

Have you done anything on how much R and D investment in new technology and innovation would be lost if we lose the opportunity we have? If we can't move ahead, and if we lose that 60% and we can't get our LNG offshore, do you have an idea of what will happen to R and D? We keep talking about research and development being important as well.

● (1730)

Mr. Richard Dunn: It's a good question. I'll take a quick stab at this.

For our company, each year we submit, I think, somewhere in the range of $50 million to $60 million worth of activity that would qualify for SR and ED, so it meets the stringent tests of the research and development. Absolutely, that's in the upstream side.

That's certainly development that's going to go away. I mentioned a number of different areas, and it definitely would lose that. To your point before, it would strand an incredible amount of resource unless we access that world market.

The Chair: We are out of time.

Thank you very much. Thank you to all the witnesses today for the information you have given and for answering the questions. It's very much appreciated. It will help us with our report.

The meeting is adjourned.