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Chair

Mr. Alan Tonks

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● (1535)

[*English*]

The Chair (Mr. Alan Tonks (York South—Weston, Lib.)): Welcome. This is the 26th meeting of the committee, pursuant to Standing Order 108(2), a study on Canada's implementation of the Kyoto Protocol, part II, a lower carbon energy supply.

The witnesses we have before the committee today are, from the Canadian Hydropower Association, Pierre Fortin, executive director, and Pierre Lundhal, environmental adviser; from the Canadian Renewable Fuels Association, Kory Teneycke, executive director; from Enbridge, David Teichroeb, who is with the business development division, fuel cell markets; and from the Canadian Nuclear Association, Duncan Hawthorne.

Welcome to you all. We're very pleased that you are here to draw your insights to the committee's attention. I think you'll find that the committee, when it arrives fully, will have lots of questions for you.

Unless there's any given order, I'd suggest we start with the Canadian Hydropower Association and just go through the list.

Pierre.

Mr. Pierre Fortin (Executive Director, Canadian Hydropower Association): Thank you, Mr. Chairman and members of the committee.

We're very pleased to be here to talk to you about the environmental challenges that our country and the world are facing.

I'll just make a quick presentation, if you don't mind, Mr. Chairman.

The Chair: I should have let everyone know that we allow ten minutes, give or take, and then we have ten minutes, through the parties, of asking questions.

Mr. Pierre Fortin: Thank you.

One of the biggest challenges the world will have to face in this century is how to continue supplying affordable energy, an energy that is essential to maintaining our quality of life and to developing nations and industries, while at the same time protecting the environment and fighting climate change.

We are, as I said, pleased to have been invited here today to present our vision of how Canada can effectively address climate change.

[*Translation*]

Reducing the greenhouse gas emissions that contribute to climate change is an energy issue.

The production, combustion and use of fossil fuels such as coal and natural gas for energy, including electricity, are by far the largest source of greenhouse gas emissions in Canada. To reduce these emissions, we must reduce our dependence on fossil fuels. Renewable energy and energy efficiency can help us achieve that goal.

As the number one renewable energy source in the world, hydro power is a key component of the solution and, as such, must be an integral part of any climate change strategy.

Unfortunately, since Canada signed the Kyoto Protocol in 1998, greenhouse gas emissions have continued to rise, making the goal harder to reach. Between 1990 and 2002, total emissions went up by 20 per cent; electricity sector emissions went up by 30 per cent.

How can that be when close to 60 per cent of our electricity comes from a clean, renewable and low emitting source: hydro power?

[*English*]

This alarming increase is explained by the fact that in recent years new growth in demand has in great part been met by plants fired by coal and natural gas, which are much quicker and less expensive to build than hydro power projects and face less costly and shorter environmental permitting processes.

Fully aware of the situation, Environment Canada wrote, in a publication released in August 2004 entitled *Canada's Greenhouse Gas Inventory, 1990-2002*:

> The growth in emissions from 1990 to 2002 is directly related to rising demand for power and the increasing use of fossil fuels in the generation mix. While increasing use of natural gas has helped mitigate the rate of emissions growth, the shift away from non-GHG-emitting sources (nuclear and hydro) in the latter part of the decade has resulted in large absolute increases.

If we continue on this carbon-intensive road, we can expect even greater emissions levels. Industry Canada estimates that the electricity market share of hydro power will have diminished by 15% by 2020. In new capacity, hydro power will be replaced almost entirely by fossil-fuel-generated electricity, not by wind or solar. Emerging renewables are expected to meet about 5% of electricity generation needs. To reverse the trend and fight climate change, we must make use of our hydro power advantage.

[*Translation*]

There is only one way to reverse the trend and fight climate change: we must make use of our hydro power advantage.

[*English*]

Hydro power produces 60 times less greenhouse gas than coal-fired plants and over 20 times less than the least carbon-intensive of the thermal generation options, the natural gas combined cycle. In fact, emissions produced during the life cycle of a hydro power facility are equivalent per kilowatt hour to those of solar or wind power.

Canada holds significant potential for a new development of hydro power—approximately 118,000 megawatts, twice the amount currently in use. This potential can and must be developed in an environmentally and socially sustainable manner, as should be the case for all energy projects. To ensure that the environmental, social, and economic aspects are considered in the assessment of new hydro power projects and in the operation of existing ones, the International Hydropower Association—of which the CHA is the national committee in Canada—has produced comprehensive sustainability guidelines. In fact, in Canada all hydro power producers have policies to ensure the implementation of good environmental and social practices in their facilities and projects.

The development of emerging renewable energy sources can also help reduce emissions. Wind and solar power supply less than 1% of electricity production in Canada today, but the potential for development is enormous. And you've heard, I believe, from both the Canadian Wind Energy Association and the Canadian Solar Industries Association earlier. They have stated that for wind, the technical potential is about 50,000 megawatts, and for solar power the estimated potential is 70,000 megawatts.

As the production of electricity from these intermittent sources of renewable energy increases, the need for complimentary energy storage systems will also increase. Because hydro power is low emitting, clear, renewable, and flexible, and because most hydro power facilities have the unique capacity to store energy over time, it is the best energy source to support the development of other renewables, such as wind and solar power, as well as run-of-river hydro.

● (1540)

[*Translation*]

In short, to address climate change in any serious way, the federal government must put in place incentives favouring the development of all renewable sources of electricity, including large and small hydro power facilities. In its recent review of Canada's energy policies, the international energy agency strongly recommended that Canada investigate further advancement of hydroelectricity.

[*English*]

The use of a domestic emissions trading system, combined with an equal allocation of permits to clean electricity generation on the basis of a single national emission standard, could be one of the most effective ways of ensuring the development of renewable sources of electricity, including wind, solar, and hydro power.

In the last couple of years, Natural Resources Canada developed, in consultation with various industrial sectors and other stakeholders, a domestic emissions trading plan. Unfortunately, some of the aspects of the proposed trading mechanism will hinder the creation of an effective price signal in favour of most large hydro power projects. Since these projects represent a large share of future hydro power potential, the overall effectiveness of that plan will be greatly diminished.

Facilitating interprovincial trade by expanding the electricity grid across Canada to allow the east-west export of hydro power is another way of reducing regional greenhouse gas impact, as is the export of hydro power to the United States to displace fossil-fuel-generated electricity. However, to ensure that hydro power projects are developed, regulatory obstacles must be lifted.

[*Translation*]

First, the environmental process must be streamlined; then federal and provincial-territorial environmental assessment processes and licensing procedures must be harmonized. And finally, the global impacts of greenhouse gas emissions and emissions causing air pollution, acid rain and smog must be included in the assessment of all energy projects.

To accomplish all this effectively and rapidly, Canada must develop a national long term climate change strategy. Such a strategy must include effective energy conservation and energy efficiency programs. It must also take into account economic, social and environmental aspects, look at energy needs and available potential at national and regional levels, and build on the potential synergies of different renewable energy sources.

[*English*]

A national renewable energy secretariat could be established to drive the strategy and enhance federal-provincial-territorial and interdepartmental cooperation. The development of renewable energies and the implementation of energy efficient measures would not only reduce our dependence on fossil fuels—leading to fewer greenhouse gas emissions and making for cleaner air and energy price stability—but would also generate new jobs in a wide range of sectors such as research, manufacturing, and installation. In this way Canada could continue its tradition of being a world leader in hydro power and renewable energy expertise.

Thank you.

● (1545)

The Chair: Thank you, Mr. Fortin.

We'll now go to Kory Teneycke of the Canadian Renewable Fuels Association.

Mr. Kory Teneycke (Executive Director, Canadian Renewable Fuels Association): Thank you very much.

I will just briefly share with you some remarks to leave as much time as possible for questions.

I would like to share with you the large role that ethanol, cellulose ethanol, and biodiesel can play in reducing greenhouse gas emissions in the transportation sector and in creating new jobs and economic growth in the Canadian economy.

Globally, the renewable fuels industry is sizeable and rapidly growing. Over 43 billion litres of ethanol and biodiesel are produced every year for transportation purposes. In the past year ethanol has become a trading commodity on the NYBOT, the CBOT, and the Chicago Mercantile Exchange, showing it is becoming a larger and growing part of the transportation fuel mix in the United States. Tens of thousands of jobs in rural areas and billions of dollars of value are added to economies directly through the renewable fuels industry.

Ethanol and biodiesel are a major focus for the United States, Europe, Asia, particularly China and Japan, and Brazil as a mechanism to provide the transportation fuels necessary for their markets going forward. Some of these countries are looking to ethanol and biodiesel as a way of reducing greenhouse gases and meeting their Kyoto commitments, but many of these countries are looking not for those environmental reasons, but simply for reasons of energy security and the economic value associated with this industry.

Canada has some huge advantages when it comes to the production of renewable fuels, both ethanol and biodiesel. As a leading agricultural producer, we have excellent infrastructure, rail, grain handling, etc., which are key to handling the feedstocks associated with this. We also have proximity to a large market that is very thirsty for these fuels: the United States. We also have governments and companies that understand the energy industry and the fuel industry very well, which we can draw upon. That is to say that Canada, in our opinion, should be one of the world's leading global producers of ethanol and biodiesel.

Well, where are we today if that's what we could be? We are far from the leader in terms of the amount of fuel produced. We're producing about 230 million litres of ethanol a year, mostly in Ontario, and consuming about 300 million litres. We believe that is going to grow significantly, almost threefold in the next two years. By 2007, we anticipate, consumption and production in Canada will be over a billion litres, in part due to ethanol mandates in Saskatchewan, Manitoba, and Ontario.

On the biodiesel side, we're making two million to three million litres a year, mostly in Quebec and Ontario. Feedstocks are soy, canola, recycled restaurant grease, and tallow. Consumption is about seven to ten million litres a year, mostly by transit authorities and large fleets. By 2007, it is projected, consumption will be around 130 million litres, as a result of a mandate being proposed by the Province of Ontario.

The point in this is that although we are potentially a large global producer and exporter of these fuels, right now we are not producing enough fuel to meet our own domestic needs.

Let me just share a little bit of information on the role that ethanol and biodiesel can play in reducing greenhouse gas emissions. We believe that by 2007 we'll be reducing GHGs in the transportation sector by two megatons per year. This is in excess of what the government expected or laid out in the original climate change plan for Canadians. About two-thirds of this is coming from the ethanol side, for a total of 1.44 megatons, if it's grain ethanol. If we can get Iogen and cellulose ethanol capacity on line, that will go up to 1.6 megatons. On the biodiesel side, we think it is just shy of half a megaton of reduction through having 120 million litres of biodiesel produced.

● (1550)

The federal government contemplated in the most recent budget having a national mandate for ethanol and biodiesel. If that were to happen, with a 5% ethanol mandate you would reduce greenhouse gas emissions by 3.13 megatons, and a 2% biodiesel mandate nationally would reduce GHG emissions by 1.38 megatons; that is to say, it is a significant reduction in the transportation sector.

The beauty of the reductions you get from ethanol and biodiesel is that they do not require consumers to purchase new automobiles or change their driving behaviour. It's using a new, cleaner fuel in their existing cars or, even if they're taking a bus, having that bus running on a cleaner fuel.

If we have this enormous potential both to reduce greenhouse gases and to produce these fuels domestically and it's not happening today, why not? We see two barriers to reaching our full potential. They have been the same for a long time. One is markets for the fuel. The second is a competitive incentive in the regulatory environment compared with neighbouring jurisdictions.

On the market barrier side, we are a competing product with gasoline; however, the distribution infrastructure for petroleum tends to be owned or at least indirectly controlled by the petroleum industry, so we have some market access issues. Most markets—the United States, Europe, Japan, China, and others—have overcome this issue through having renewable standards or mandates, requiring that renewables be blended in the fuel supply. This is the direction the prairie provinces of Saskatchewan and Manitoba, plus Ontario, have gone. It's also what the federal government has indicated a willingness to look at in the recent budget.

We think we have made a lot of progress there. Irrespective of mandates in Canada, there is a lot of progress being made south of the border, which in the longer term we see as a huge market for Canadian producers. In the United States, bans on MTBE, which is a competing product with ethanol, are coming in, so in order to meet the Clean Air Act requirements, more and more petroleum companies are having to blend ethanol, creating large markets. In addition, President Bush's proposed energy bill contains a renewable fuel standard. It has strong bipartisan support. It would require that ethanol be blended in all gasoline in the United States.

The second barrier is to have competitive incentives and business environments for our producers. Canada, as I mentioned, does have natural advantages in producing ethanol and biodiesel—it is a large agricultural producer, etc. However, that's not the only criterion one considers when looking at where to locate a plant. We also look at labour costs, natural gas cost, markets for co-products, and a number of other criteria, but one of the largest drivers is where the incentives for producing these fuels and blending them are the strongest. Right now there is a gap on the government incentive side between what's offered in Canada and what's offered in the United States. That's one of the reasons we are consuming more than we're producing here in Canada.

The federal government has played a role in closing that gap through the ethanol expansion program, and we are having some success with that program. We're looking at what could come on the heels of the ethanol expansion program in particular to deliver that same sort of value, to ensure that the large provincial mandates for these fuels are met with fuel produced here in Canada.

To close, I'd just like to say that we look forward to working with the government and industry to overcome these remaining barriers and to make Canada a world leader in both ethanol and biodiesel production.

● (1555)

The Chair: Good. Thank you, Mr. Teneycke.

We'll go now to the next witnesses, from Enbridge Gas Distribution.

Mr. Teichroeb.

Mr. David Teichroeb (Business Development - Fuel Cell Markets, Enbridge Gas Distribution Inc.): Thank you, Mr. Chairman, and fellow committee members.

I would like to thank you for inviting Enbridge Gas Distribution to appear before you today. By way of introduction, Enbridge Gas Distribution serves approximately 1.7 million customers throughout Ontario and Quebec. Our parent company, Enbridge Inc., is a partner in bringing natural gas to New Brunswick. Recently, Enbridge was one of six Canadian companies that received recognition at the World Economic Forum in Davos, Switzerland, where we ranked among the world's best of the global 100 most sustainable corporations in the world listing.

Enbridge's services include advancing energy conservation initiatives that benefit our customers. To this end, our energy conservation programs have assisted customers in reducing their consumption by approximately 1.8 billion cubic metres of natural gas over the last decade. This equates to approximately 3.4 million tonnes of CO_2 reduction, which is the same as removing 890,000 cars from the nation's highways.

Enbridge has a history of leading by example. Our company is increasing its focus on development of sustainability in its operations, and we're a major user of electricity in our pipelines. The company has invested in two large wind plants. In addition to its existing and planned renewable energy investments, the company is partnered with FuelCell Energy to advance energy conservation and environmental benefits of large stationary fuel cells. It's this item that I would like to talk to you about today.

Large stationary fuel cells have been in continuous operation for some time. Global installations have accumulated some 60 million kilowatt hours of electricity generation, but no existing installations are here in Canada today. I would like to outline six key areas where we believe stationary fuel cells can benefit Canada. I'll speak to four of these in more detail, but the six of them are: clean air, environment, energy conservation, infrastructure, Canadian employment, and convergence of the electricity and gas sectors. I'll also highlight immediate opportunities for early deployment of this technology.

Under the subject of clean air, today, large stationary fuel cells offer reliable electricity generation with unparalleled clean air benefits. They include near zero smog emissions and significant reductions in greenhouse gases. The value of the fuel cell is its predictable 24-hour operation, which results in more consistent emission reductions than comparable-sized wind systems.

Although large stationary fuel cells do use natural gas for the production of hydrogen and electricity, no combustion of that natural gas occurs. With no combustion you also remove the pollutants of NOx, SOx, and particulate matter up to a level of 99.9%. Policy changes that support these ultra-clean technologies can advance greenhouse gas reductions and provide simultaneous health benefits to the Canadian population.

On environment, fossil fuels, hydroelectric, and even wind power have environmental impacts. Fuel cells provide high-quality electricity where needed, lower noise, higher efficiency, and low environmental impact. The benefits are so compelling that some jurisdictions, like the State of Connecticut, have policies and regulations that support this technology as a renewable energy alternative.

A portfolio of solutions will be needed to help Canada meet its overall Kyoto goals. My colleagues on the panel today all have compelling messages. I respectfully suggest that no one solution will carry the day.

Fuel cells provide solutions for urban power needs where costly electricity transmission systems are required. Today these transmission systems are needed to bring large quantities of electricity into the cities from thermo-generating plants, nuclear plants, and some renewable energy solutions. The fuel cell is only one technology in this portfolio, but it is one that needs Canada's attention so the benefits can become a reality.

On conservation, today's large fuel cells are 40% more efficient at converting fuel into electricity. Compared to conventional power plants, that reference has been made. The adoption of the fuel cell is one way to help conserve our natural gas resources for tomorrow. The same high efficiency provides meaningful gains toward Canada's Kyoto objectives. While natural gas is used to operate the fuel cell, it uses significantly less fuel per unit of electricity generated than other technologies.

Today we know that landfill gas and methane recovered from municipal waste water treatment plants can be used to generate electricity. This is considered renewable energy, and it's supported by market incentives and policy support. The fuels do provide greenhouse gas reductions and help conserve our natural resources; however, these fuels also contribute to pollutants through increased smog emissions.

● (1600)

Today's natural gas fuel cells also help to conserve natural gas and other resources. They provide significant greenhouse gas reductions, and they do so with near zero smog emissions, but the technology is not afforded similar policy support or incentives.

Enbridge recognizes the benefits of wind, as a large investor in wind plants. The company also recognizes that wind has its limitations. When the wind resources are low, incremental generation is needed. This generation is commonly referred to as spinning reserves, which tend to be primarily made up of today's thermal plants. The efficient predictable output of the fuel cells greatly minimizes the need for spinning reserves. As a result, the fuel cell can offer more predictable emission reductions from these thermal plants.

Again, I must highlight that we believe a portfolio of solutions will be needed. Policies that drive the best technology use in the correct application will provide the greatest benefits to Canada.

On infrastructure, today Canada's electric utilities are facing the challenge of providing reliable services. It's especially true where aging municipal grids have reached capacity. Large fuel cells are the cleanest form of new urban generation capacity. Fuel cells can reinforce these electric networks precisely where needed. It can become a clean infrastructure opportunity.

New transmission systems, like the contemplated east-west transmission network, will bring more needed renewable electricity to Canada's cities. However, these transmission networks and the renewable generation have their own environmental impacts. By embracing large stationary fuel cells as clean infrastructure, an opportunity exists to provide a balanced approach to increasing electricity supplies.

Specifically related to Enbridge's demonstration project of this technology, earlier I spoke to the challenges that Canada faces with new alternative energy supplies. Enbridge has identified a market that can deliver near-term progress on our Kyoto goals, and it can also be a part of natural gas utility infrastructure. Our partners in this project include Toronto Hydro, B.C. Hydro, SatCon Power Systems Canada, QuestAir Technologies Inc., and FuelCell Energy.

Today natural gas is delivered across the country in pipelines at 600 to 1,200 psi. Boosting natural gas to these pressures requires considerable energy. Before the utility can distribute it within the city, pressure needs to be reduced. Reducing pressure is an energy loss and it also cools the gas. Today we run natural gas boilers along these pipelines to reheat the gas for safe and reliable operation. In essence, there's a consumption of natural gas to maintain operations. Large natural gas flows in a pipeline, though, are the equivalent or similar to water flowing down a river. Flow turbines can be installed to basically extract energy at the points where we reduce pressure in our system, and like other utilities across Canada, this is repeated day in and day out.

The results of this hybrid fuel cell plant will, one, recover energy lost in normal pipeline operations today and convert it into useful electricity; two, it will provide high efficiency, near zero emission electricity from the fuel cell; and three, it will conserve energy by reducing the natural gas used in boilers to operate our pipelines by recovering the waste heat from that fuel cell.

It's estimated that demonstration will produce greenhouse gas reductions equivalent to 1,000 vehicles coming off the nation's highways or, to put it in terms of our entire system opportunity, about 100,000 vehicles. This becomes more compelling if you look across Canada and see that many provinces can replicate the same type of technology adoption.

As a role for government, as mentioned earlier, a portfolio of solutions will be needed to make progress against our Kyoto targets. Encouraging natural gas conservation initiatives and new technology initiatives will be a significant part of our success.

The National Energy Board in its report, *Canada's Energy Future: Scenarios for Supply and Demand to 2025*, identified several key findings, two of which were:

> Canada will continue to satisfy the majority of its energy needs from fossil fuels until 2025.

—and—

> Overall, renewable fuels (wind, biomass and small hydro) account for almost 10% of the generation mix in 2025.

Overall, industry, society, and government need to advance a diversified mix of renewable energy and an improved use of fossil fuels. However, over the next several decades, we'll continue to be reliant on fossil fuels, and new technologies to lessen the environmental impact are required. By extension, policies that enable alternative fossil fuel technologies that reduce greenhouse gases and their pollutants will be a significant part of our strategy.

● (1605)

Some of the policy levers government can use for climate change advancement include extending the renewable power production incentives to low-impact electricity generation technologies such as natural gas fuel cells; second, ensuring that existing policies such as class 43.1s accelerated capital cost allowances truly are an enabler of these technologies, for artificially high thresholds can act as a disincentive to market adoption; third, ensuring program design works to embrace industry as a partner in delivering climate change solutions.

Technology-neutral programs can minimize risks associated with programs that support favourite technologies or too narrow a focus. Recently delegates from several Canadian ministries travelled to California to understand the proactive policies of that state. A good example of a technology-neutral program is California's self-generation incentive program. It supports solutions on the basis of actual environmental results and technology maturity.

Fourth, government can join industry in leading by example in its procurement of energy. Numerous government facilities are candidates for implementing low-impact technologies for on-site generation. Where on-site solutions are impractical, governments can purchase low-impact electricity from a variety of sources, including low-impact renewables and low-impact technologies such as natural gas fuel cells.

In conclusion, large stationary fuel cells are a reality today. They're a key stepping stone towards a sustainable hydrogen economy. Today the large, stationary fuel cells retail at a price premium; however, the technology is competitive with other low-impact electricity generation supplies if the environmental benefits are valued equitably with other alternative energy solutions.

Low-impact electricity supplies such as the fuel cell can provide significant support to Canada's climate change strategy. The federal government support, involving both incentives and regulation, can assist in moving all low-impact and electricity supplies forward on an equitable basis. Utilities can be a significant partner in assisting Canada in meeting its climate change plans.

Other jurisdictions are leading Canada in the adoption of these low-impact technologies. To maximize emission reductions, Canada needs regulations and technology-neutral incentives similar to those of California and Connecticut to ensure the cleanest and most efficient technologies are used in the appropriate applications. Again, a portfolio of technology and market-based solutions will be needed to meet our climate change objectives.

I trust I've provided some compelling ideas on how stationary fuel cells can be part of that assistance to Canada. Large stationary fuel cells need Canada's attention and support so the stated benefits can become a reality. In partnership with the federal government, Enbridge is prepared to lead by example to demonstrate the environmental economic benefits of hybrid fuel cell plants in the pipeline sector. Together we can make it happen.

I look forward to addressing your questions and comments. Thank you for your time.

The Chair: Thank you, Mr. Teichroeb.

We'll now go to the Canadian Nuclear Association.

Mr. Hawthorne.

Mr. Duncan Hawthorne (President, Canadian Nuclear Association): Good afternoon, Mr. Chairman, members of the committee.

For the record, I'm Duncan Hawthorne. I'm the chairman of the CNA. I'm also the chief executive officer of Bruce Power.

I do have a number of slides, but I can probably just speak off the top of my head about the issues that we want to make the committee aware of as it relates to nuclear power. I guess there are really three things I would want the committee to consider.

The first is that today about 17% of Canada's energy is supplied by nuclear power plants. Those 22 reactors are based in Ontario, New Brunswick, and Quebec. In Ontario that percentage is significantly greater, where 50% of Ontario's power is currently provided through nuclear power stations in operation.

One of the challenges that nuclear has, and continues to have, is any recognition for the role it currently plays as a large-scale, zero-emitting technology. It is one of only two that are available right now—the other being hydro—yet it's never really given that recognition. No one seems to want to admit that nuclear has that zero-emitting role, and it's clearly been excused from any mention at all in terms of our role in the Kyoto Protocol. Some of the nuclear industry feels somewhat aggrieved that that would be the case. It doesn't make any sense to us at all that the largest zero-emitting technology we currently have has no recognition at all for the emission-free role it plays.

Secondly, it's important to note that although there is a very significant role being played by nuclear today, the entire nuclear fleet is reaching the point in its life where it really is being challenged to continue its role. By 2009, without investment, nuclear plants start to retire from service, and by 2017 there is no nuclear power. The investment required in order to hold its market share where it is, is in the region of $20 billion.

Obviously this is an issue that Ontario is grappling with right now, as they look to deliver the government's mandate of retiring coal plants from service in 2007. As I said, in Ontario right now the simple way I explain it is that every second house, every second school, every second factory, every second hospital today is powered by nuclear power. If you don't want nuclear power, then fill in the blank.

To give you an idea of the challenge nuclear faces, consider how many times the word “nuclear” was mentioned by my fellow presenters as part of the overall supply mix in the province. It's a situation that I think needs to be seriously considered here. The options to fill the gap left by nuclear, should it not continue, are not any of the ones you've just heard, not on the scale that matches nuclear power. One of the challenges we have in our industry is having people recognize the role nuclear plays.

Canada has been in the nuclear business for 60 years, the pioneer of a nuclear industry. You can probably spot from my accent that I'm not a native of Canada, and yet I'm still, by reference, taking some pride in the fact that Canada has a long history in the technology and it should be proud of it. CANDU reactors, in my experience, stand a good comparison with any reactor design anywhere else in the world, yet we still are somewhat apologetic for their existence.

We recognize that nuclear alone is not the solution. In fact, we are probably one of the few associations that acknowledge the fact that there is a role for every type of technology. If you look at the world's growing demand for energy, it cannot be met by any single source, but rather by the combination of all. Nor are we naive enough to believe that we can actually match the scale of nuclear with some of the other options that are available to us today.

We really see ourselves being at a crossroads, particularly here in Canada as an industry, because we know that there is such a large capital investment required in order to hold the market share...but we also see things like highly volatile gas prices, concern about climate change associated with continuing to rely on fossil fuels, and the limited availability to exploit as yet untapped hydraulic sources.

Basically the message I bring to you from the CNA is that we would like this committee to recognize nuclear power for the role it plays today in meeting Kyoto targets and the emission-free commitment that comes from nuclear operations. Secondly, we see a very good synergy between nuclear power going forward and a hydrogen economy. Nuclear designs lend themselves very favourably, because of the baseload generation, to the production of hydrogen. Certainly it's a business. It has been put forward many times that baseload nuclear power, combined with electrolysis, can generate hydrogen, and in doing so, you have an emission-free cycle end to end.

● (1610)

Obviously the refurbishment project needs to be supported in some way, and there are challenges in financing such a large program of investment. But the nuclear power industry today is a $5 billion industry and employs 21,000 highly skilled, highly qualified jobs directly, with a further 15,000 indirect jobs. So it's a very significant contribution to Canada's economy as a whole.

We'd like to see this committee provide some support for that refurbishment program, and indeed lend some recognition to nuclear's ongoing role to the extent that as the demand for power continues to increase, the potential for nuclear new build to meet that growing demand be a realistic consideration.

That is the end of my remarks. Thank you very much.

● (1615)

The Chair: Thank you, Mr. Hawthorne. We'll now go to the committee.

Members of the committee, Mr. Cullen has brought to the chair's attention that he has to leave and he wants to take a few minutes to question Mr. Hawthorne in particular with respect to his presentation. Do I have consent to allow to Mr. Cullen to go ahead on that?

Some hon. members: Agreed.

The Chair: Okay, Mr. Cullen.

Mr. Nathan Cullen (Skeena—Bulkley Valley, NDP): Thank you, Mr. Chair, and thanks to the committee as well. I'll try to keep it as brief as possible.

Thanks for your presentation, Mr. Hawthorne, and all the committee members.

You're asking for recognition in terms of the reduction of greenhouses gases. There are also concerns about the nuclear industry, and I'll focus on one of those concerns with respect to the waste produced through the industry.

First of all, on a lot of the questions we have with all the people who come forward to us as a committee and propose and pitch their ideas on how to fit into this portfolio, full-cost accounting of what those energy costs really are has been a preoccupation of mine. I'm wondering what the cost of storage of nuclear waste is and how you include that in your figures.

In your documentation you refer to a clean and safe energy. I guess just from a pragmatic point of view I'm having difficulty justifying clean with nuclear waste and how that terminology is applied.

On my last question, what are the annual federal contributions to the nuclear industry right now in investment in technology development and research, and also in just direct support to the industry?

Mr. Duncan Hawthorne: If I can respond to the first question, from every kilowatt hour produced there's an allocation to support waste management costs. The nuclear industry fully accounts for its waste storage, both short term and long term, with some percentage of its overall operating costs being assigned to that. So it's sort of pay-as-you-go for our waste.

Your second issue is more of perception than reality. We are the only industry I can think of that actually captures all of its waste. I can take you to our waste today and show it to you in a very controlled manner.

The challenge the industry has is having people feel comfortable with a technology that operates today when the waste will still be an issue 1,500 years from now. It's a massive problem for public perception. It's not a technical solution to it, but you ask people to consider a closed-loop approach to waste that actually goes beyond the timetable in which they feel comfortable making any form of reasoned assumptions.

The nuclear waste management organization is out doing public opinion surveys. I was involved in our scenario planning exercises. You put a group of people in a room and ask them to consider what the world will be like 50 years from now and people can be pretty reasonable about that. You ask them about 100 years from now and people can have a reasonable gauge on that. You ask them about 1,000 years from now, and if anyone's read the scenario planning document, it also contemplates contact by alien species, because people can't deal with thinking about 1,000 years out. That's the problem with the industry.

It can actually explain how it manages its waste today. It can take people to its waste, show it to them, and give them a degree of comfort that it's being controlled today. But the challenge is, how can you actually give people a feeling of comfort that the duty of care that's very obvious today will continue into the long term? It has been financially provisioned for, and because it is such a long time in the future, the discounted allocation is so small. So it's not a financing issue; it's more of a perception issue that it leaves a long-term liability and a duty of care. That's the concern.

Mr. Nathan Cullen: I want to get to the federal contributions and not use too much of my time, but is this percentage allocation you're setting aside over 1,500 years? Is 1,500 years an accurate assessment of how long nuclear waste is—

Mr. Duncan Hawthorne: Yes. Some of the half lives of various isotopes I'm giving you are ballpark figures, but that's close, yes.

If you think about it, I can put 0.92 of a dollar aside today to meet a $50 billion commitment a long time out. Because it's such a long-term liability, it is funded today and the fund grows to meet the commitment over time.

The other thing that's important to note is that as part of a pay-as-you-go thing, nuclear plants also set aside for the decommissioning and removal of their facility in its entirety from service. So as well as paying for our spent fuel from now until the end of time, we're also paying as we go for the decommissioning of the facility and returning the site to a brownfield site at the end of the process. That's part of the accounting; it's part of the overall operating costs today of nuclear power.

● (1620)

Mr. Nathan Cullen: For the last question—I want to return it to the committee—the current federal contributions to the industry...?

Mr. Duncan Hawthorne: The federal contribution to the industry is mostly through its own organization, AECL, but obviously the federal government is making some.... AECL is run largely as a business in its own right. They are receiving federal support towards research reactors and indeed towards a development of the new reactor design. I can't actually point to the quantum of that; I'm sorry. You'd have to ask AECL.

Actually, the industry itself is not receiving anything directly from the federal government.

Mr. Nathan Cullen: Thank you, and thanks to the committee and chair.

The Chair: Thank you, Mr. Cullen.

We'll go to the top of the order, then, with Mr. Mills, please.

Mr. Bob Mills (Red Deer, CPC): Thank you, gentlemen, for appearing.

My first question is about hydro. I apologize for being late.

I wonder what effects climate change will have, as you see them coming, on water quantity and the potential for hydro. We hear quite often, at least from the former environment minister, that there would be a dramatic reduction in hydro's potential over the next 50 to 100 years as climate change occurred.

Along with that, I wondered, when I was in Denmark and observed the tie between the wind energy and Norway's gas plants and hydro, what potential we have in Canada, particularly in Quebec, to tie wind and hydro together. They seem very compatible in terms of up and down cycles.

Mr. Pierre Fortin: On your first question, about the assumption that water would be reduced over time, I have never seen any studies about it. Water is renewable; it keeps raining. Even if the climate changes, it will still be raining, in some parts of the country, anyway.

As I said in my presentation, the hydro production at this time—the last numbers date to 2003, I believe—is about 70,000 megawatts, and there's a potential for another 118,000 megawatts. That potential is technically feasible. There's the economic aspect that you have to look at, because most of the new development projects would have to occur in the northern part of the country. But the potential is there, and I don't see how climate change would affect the development of hydro power. On the contrary, we say that hydro power would improve the situation vis-à-vis climate change.

On your second question, I think we've had over the last year at the association level, between the CHA and the Canadian Wind Energy Association, lots of discussion about the complementary theory of those two sources of energy, and within the industry, industry members are talking and getting involved in the wind development sector.

So there is a complementarity, a synergy between the two sources. One of the reasons for that, especially when you think of larger-scale hydro projects or developments, is that with the reservoirs you can store the energy. As we know, wind is an intermittent source of energy, so when the wind is not available to produce, you can use the energy that has been stored in the larger reservoirs.

Mr. Bob Mills: So our grid would have the capability of going up and down, as you suggest.

Mr. Pierre Fortin: Yes, but that's one of the problems, if you will, because at this time there's a problem of interconnection between wind development and existing hydro—

Mr. Bob Mills: Do you see that as a potential?

Mr. Pierre Fortin: Definitely, yes.

Mr. Bob Mills: On the technology to get hydrogen, ultimately, if you could find a cheap way to get hydrogen for fuel cells, that would be the solution. Do you foresee that in the future technology? What's being done in that area? Natural gas obviously isn't a good source of hydrogen because of the cost.

Mr. David Teichroeb: Certainly the technology is viewed as a stepping stone, so the fact that these large fuel cells today consume natural gas as a source of hydrogen, but do so and derive 40% more efficiency than today's other cogeneration technologies and turbine technologies...you're getting a conservation benefit. You're deriving a lot of technology enhancements that those fuel cells.... Once pure renewable hydrogen is available or other cost-effective supplies of hydrogen, a lot of your balance of plant—the technologies that connect them to the grid, the technologies that manage the systems rather than the fuel cell itself, are all achieving cost reductions and technology innovation. So as true renewable hydrogen becomes available, you've already completed a large part of the technology cost-out, and while you've done that, you've achieved a lot of conservation benefits, because even using natural gas is 40% more efficient than what you could use today in a typical cogeneration at a hospital, a university, or other types of institutional facilities.

● (1625)

Mr. Bob Mills: Obviously electrolysis is much too expensive.

Mr. David Teichroeb: It's an interesting point. When you start to look at electrolysis, there are off-peak electricity issues for a lot of technologies. How do you store energy? That might be one means to it. At the end of the day we really see this as a jigsaw puzzle where you're putting the pieces together. It may not be a complete picture right now, but as technology improvements are made on all of these fronts—the hydro, the biofuels, the nuclear, natural gas—you're going to be able to piece together a road map that really gets you much closer than trying to look at these in isolation.

Mr. Bob Mills: This is my question about nuclear. Say we went to the level of rebuilding in Ontario as we have it today. As you said, it's starting to need to be replaced. What would be the cost in dollars, roughly?

Mr. Duncan Hawthorne: Speaking for Bruce Power, we have just reached a tentative agreement with the government to restart Bruce A, units 1 and 2, and the cost of that will be in the region of $2.5 billion to $3 billion for 1,500 megawatts. If you look at the entire fleet, as I said, it's $10 billion to $15 billion to actually refurbish the existing fleet.

The Chair: Mr. Richardson, you have four minutes.

Mr. Lee Richardson (Calgary Centre, CPC): Thanks, Mr. Chairman.

I only have some quick ones because we're rotating and we have to ask quickly.

I was interested in the ethanol thing because it looks so obvious to me that it was carrying the benefits because of the transportation and agriculture out there. I understand our transportation is about 25% of our greenhouse gas emissions, but our personal ones are probably about 50%. It occurs to me that it seems so obvious, but is it economic? Why aren't we there now? Why aren't we taking greater advantage of this?

Mr. Kory Teneycke: One of the reasons we're not taking advantage of this as much in Canada is that we haven't put in place the same sorts of requirements for using these fuels, on the one side—blending them—and on the other side, until recently we've had reasonably low oil prices, so the cost differential between ethanol and petroleum has been quite high. This gap has narrowed considerably. In combination with the incentives for blending these fuels, ethanol for the consumer is now running at about 10¢ to 15¢ less per litre than petroleum. There's still a gap. We're still slightly more expensive to produce, but for the consumer it's actually a less expensive fuel option.

But that alone isn't going to mean it's going to be blended. We're a competing product with petroleum, and we're trying to sell our product through their distribution infrastructure, so there are some problems.

The potential in the longer term is as it is now for the petroleum industry in western Canada—to produce lots of ethanol and sell it south the same way we do with petroleum. We have the ability to produce far more of this fuel than we have the ability to consume here in Canada at low-level blends, and we have an extremely thirsty energy market south of the border. We should be looking at these fuels not just from a domestic consumption perspective, but as a huge potential energy source. Canada could very easily be producing $5 billion litres of ethanol a year five to ten years from now.

It's very easy to do, so I don't want to just look at it as a domestic consumption issue. This should be viewed by policy-makers in very much the same way the tar sands are, as a huge potential energy source that is being under-exploited today.

● (1630)

Mr. Lee Richardson: I don't know if one minute is going to be enough, but I'll get it on the table anyway, and maybe we can get back to it.

I was interested in this Californian self-generation incentive program you mentioned, David. You said in your remarks that "to maximize emission reductions, Canada needs regulations and technology-neutral incentives similar to those of California and Connecticut to ensure the cleanest and most efficient technologies".

Can you just give me a snapshot of what that program is? I'm not familiar with it.

Mr. David Teichroeb: Sure.

The California program in particular looks at natural gas cogeneration using technologies like microturbines, using reciprocating engines as, I'll say, their tier 3 or their entry level. They also have tier 3 renewables, those technologies operating on renewable fuels like digester gas at a waste water treatment plant, or landfill gas, but they recognize as a state that those are contributing to air criteria pollutants while they're using a renewable fuel.

Tier 2 is natural gas fuel cells, and they also list in with them as a renewable—just above them—wind, and actually incent the natural gas fuel cells at a higher level on the basis of technology maturity and also 24/7 operation, which they cannot get with the wind.

Their maximum benefits go to solar electricity because it tends to be coincident with the peak day electrical demand—and you can appreciate that California probably has much better solar opportunities than we might have—but also, then, natural gas fuel cells running on renewable gases.

So at a waste water treatment plant they're able to install that fuel cell, have zero or near zero criteria pollutants, and they're getting 40% more electricity from that finite renewable fuel stream versus using a microturbine or a reciprocating engine. They really embrace a host of technologies, including renewables and non-renewables, to try to target an overall portfolio.

The Chair: You may want to revisit that.

We'll go to Mr. Bigras, and then we'll go across to the other side.

[*Translation*]

Mr. Bernard Bigras (Rosemont—La Petite-Patrie, BQ): Thank you very much, Mr. Chair. Thank you for being here and contributing to our study of the Kyoto Protocol implementation issue. My first question is for Mr. Fortin.

I would like to ask a question about your association. What percentage of your members produce hydro power? Is it 60 per cent, 70 per cent, 80 per cent or 90 per cent?

Mr. Pierre Fortin: Presently, our association has some 40 members, about 25 of which are producers. The others are manufacturing companies that service the hydro power sector and the service sector. The producers that we represent presently produce 95 per cent of all hydroelectricity in Canada. It is an extremely important group.

Mr. Bernard Bigras: On page 6 of your brief, you focus, and with good reason, on the domestic emission trading plan. In my view, it is important for us to discuss this issue, because it is essentially the corner stone of the Canadian climate change policy.

There is something that worries me in your presentation. You are saying that the emissions trading system must be based on "clean electricity generation". You do not mention hydroelectricity. You say that this "could be one of the most effective ways of ensuring the development of renewable sources of electricity", and of course you add "including hydro power".

My fear, Mr. Fortin, is that in this whole negotiation on the development of quotas and licences leading to the emissions trading system, hydroelectricity producers could be put in the same basket as all power producers in Canada, which are not all producing hydraulic power.

If I am not mistaken, Hydro-Québec is no longer a member of your association. Do you anticipate that hydro power will occupy a distinct position in these negotiations, so that this industry will not be overlooked in favour of other sectors of the power generation industry that do not necessarily produce their power by using a renewable energy source?

● (1635)

Mr. Pierre Fortin: We certainly anticipate that it will be the case. However, I would like to clarify one point, Mr. Bigras.

You mentioned Hydro-Québec. Hydro-Québec is indeed a member of the Canadian Hydropower Association. They left the Canadian Electricity Association, but Hydro-Québec remains one of our members and is one of the great promoters of our association.

I mentioned in my presentation that renewable energy sources must be taken into account. I was referring more particularly to hydro power or to the wind sector, which should be taken into account in the implementation of an emissions trading system.

In fact, the very purpose of the association is to promote hydro power in the discussions—I would not say negotiations, because there has not really been any negotiations with the federal government—or in the consultations with Natural Resources Canada and Environment Canada.

Obviously, we stand for our position. Hydroelectricy is an energy source that is emission free or is very low emitting. It is a clean and green energy source that presently represents 60 per cent of all electricity produced in Canada. It must be recognized at such.

It is part of the solution and must be included in the federal government's plans to meet our Kyoto Protocol objectives. Hydro power must indeed have a distinct status in this debate.

Mr. Bernard Bigras: A few weeks ago, we heard Mr. Alex Manson, the Acting Director General of the Climate Change Bureau at the Department of the Environment, and we have attempted to get more details from him about the most recent budget, in particular the Clean Fund. He told us that in that fund, there was something fantastic for Quebec. It was precisely what you are recommending to us today: an east-west interconnected network, a national power grid in Canada that you are clearly advocating today.

How can you reconcile that position that you are defending today with the position that has historically been advanced by Quebec in the past 50 years and that has resulted in the energy balance of Quebec, where 95 per cent of all energy is hydro power? How can you advocate such a network when Quebec under René Lévesque, Robert Bourassa and all previous premiers of the province rejected that approach? What is your view on this?

How would Quebec be accountable in this new east-west interconnected network? Should Quebec be accountable to the National Energy Board of Canada? How should this east-west management be done, given that Quebec as always maintained that there would never be any federal encroachment in Quebec's jurisdiction?

Mr. Pierre Fortin: Negotiations are presently being held between provinces, for example between Ontario and Manitoba, as well as between Ontario and Quebec. Ontario has also indicated that it was prepared to discuss with Newfoundland and Labrador. If ever such a transmission network is developed, it will be done by the provinces themselves. For example, in the case of discussions presently being held between Ontario and Manitoba, a new distribution network would allow Manitoba to develop a large hydro power project.

Mr. Bernard Bigras: From the point of view of Quebec, how would you see this type of application, concretely?

Mr. Pierre Fortin: As has already been done, this must be discussed between the two provincial governments concerned, Ontario and Quebec. At this time, discussions between the two provinces may have slowed down, but both provinces already had discussions on potential improvements to the distribution network; this would allow Quebec hydro power to be exported to Ontario in order to replace some energy sources that are perhaps not as low emitting.

● (1640)

Mr. Bernard Bigras: In the end, is the goal not to develop the lower Churchill? Hydro-Quebec customers are not out in the west, they are in the south. This project does not really serve the interests of Quebec. Is it not due to the fact that, in the opinion of some people, the lower Churchill project must absolutely be done? I am trying to understand and I would like you to explain to me how this project serves the interests of Quebec in a context of limited supply.

Mr. Pierre Fortin: Quebec already has business relations with Ontario. Exports are not only going to northeastern United States. On a lower scale, some power is exported to the west, to Ontario. As for Churchill Falls, I hope that it will be done some day, but it would be following discussions between various provincial authorities.

[*English*]

The Chair: We're out of time on that segment now, Mr. Bigras.

Thank you, Mr. Fortin.

We'll go to Mr. Scarpaleggia.

Mr. Francis Scarpaleggia (Lac-Saint-Louis, Lib.): Thank you, Mr. Chair.

I have a number of questions. First of all, Mr. Teichroeb, when you talk about large fuel cells, what sort of capacity are we talking about here? Could these serve as power supplies for, say, a hospital?

Mr. David Teichroeb: Yes. The technology today is scalable. It starts, in its smallest configuration, at about 250 kilowatts, which would be part of a load, maybe a quarter or maybe half, of a typical-sized hospital, and it really starts to scale up into something megawatt or multi-megawatt.

When you look at that, our headquarters in Toronto is a 250,000-square-foot office complex with additional warehousing. Its peak daily demand is about 1.2 megawatts. In conjunction with the energy recovery off our pipeline system, this hybrid fuel cell plant will produce about 1.5 megawatts to 1.9 megawatts of power. So we will actually export surplus power back to the grid.

Ultimately, it scales up into something around 14 megawatts in stand-alone locations.

Mr. Francis Scarpaleggia: Thank you.

As sort of a graphic example about the importance and role of nuclear energy in Canada, Mr. Hawthorne talked about every second hospital being powered by electricity from a nuclear plant. Could your large fuel cells meet that demand in the medium term?

Mr. David Teichroeb: The large fuel cell is certainly one technology that can meet on-site power needs very efficiently and cleanly.

Mr. Francis Scarpaleggia: Thank you.

Mr. Fortin, everyone has made reference here to hydroelectric power as a zero-emission power source, but it's my understanding that large reservoirs created as a result of large hydro projects can emit greenhouse gases. Is that correct?

Mr. Pierre Fortin: I'll ask my colleague, Mr. Lundhal, to expand on that. We're not saying we're zero emitting; we're saying we're low emitting. It's virtually no emission, but there is some.

Mr. Lundhal can talk about the reservoir issue because we have to differentiate between Nordic reservoirs and—

Mr. Francis Scarpaleggia: That's fine. I just want to clarify that now.

I was speaking with people from the solar industry a while ago. They introduced me to the notion of...I don't know what the term is, it keeps slipping my mind, but it's the idea that a home that is heated with solar panels can capture and store electricity and then at night channel it into the hydro grid.

Is there a term for that? Do you know what I'm talking about? I think they're doing it in B.C. now.

● (1645)

Mr. Pierre Lundhal (Environmental Advisor, Canadian Hydropower Association): Reverse billing.

Mr. Francis Scarpaleggia: Reverse billing, that's what it is, yes. And they're starting to do it in B.C.

My understanding is that Hydro-Québec is very resistant to this idea. As an association, would you be pressuring, or lobbying, or suggesting to Hydro-Québec that it become more flexible on that point?

Mr. Pierre Fortin: It's normally the other way around, where our members decide on the direction of the association. Honestly, this is not something that has ever come up, so I couldn't give you an intelligent answer.

Mr. Francis Scarpaleggia: Well, maybe "lobbying" is too strong a term. I understand that. Has it ever come up?

Mr. Pierre Fortin: No, never.

Mr. Francis Scarpaleggia: Okay.

My third question is to Mr. Teneycke. They're still developing biomass ethanol, and basically Iogen is the world leader. Is that correct? How far away are we from a commercial product? I keep hearing that they're getting very close.

Mr. Kory Teneycke: Well, technically we're there. Iogen's technology is ready to commercialize. One of the challenges with any new technology is that it is impossible to finance through the traditional banking industry. No bank will lend you money to build the first plant for a new technology. So the question for building that first plant comes back to government. I believe Mr. Passmore was here speaking to the committee recently. There are some sorts of loans or loan guarantees. Iogen are on a two-track process right now here in Canada looking to federal and provincial governments to provide that, and they're also looking in the United States as well. But from a technical perspective, yes, they're ready to go.

Mr. Francis Scarpaleggia: I remember reading that biomass ethanol would revolutionize the world. Every farmer across the planet could basically be energy self-sufficient.

Mr. Kory Teneycke: Sure. It effectively doubles the potential to produce renewable fuels, because instead of just using starch derived from grain, you're looking at agricultural residues, the straw, the corn stover, etc. So you're really, metaphorically speaking, spinning straw into gold. You're taking something with no value that's rotting on a field and you're turning it into fuel.

Mr. Francis Scarpaleggia: When we talk about the obstacles to the distribution of ethanol—again, this is a naive question—what are the obstacles really? You can sell ethanol out of a gas station, can't you?

Mr. Kory Teneycke: But who owns the gas station, I guess is part of the problem.

Mr. Francis Scarpaleggia: So that's where the impediment is, is it?

Mr. Kory Teneycke: Yes, and you can't even sell through an independent because there are some vapour pressure issues. You have to mix ethanol with a low-volatility blend of gasolines. So you have to refine gasoline at a slightly different configuration to be able to blend ethanol with it. This is about having the major players in the petroleum refining industry agree that they're going to buy your product.

Mr. Francis Scarpaleggia: Excuse me for interrupting you, because I just don't have that much time.

Shell has bought into Iogen, has it not?

Mr. Kory Teneycke: Right.

Mr. Francis Scarpaleggia: Does that mean it's serious about letting ethanol into its distribution system?

Mr. Kory Teneycke: Not all petroleum companies are as hostile to blending ethanol.... It tends to make its way into the system in the case where companies are short of refining capacity. If your choices are buying gasoline at a rack from one of your competitors or essentially extending your refining capacity by buying ethanol and mixing it with the gasoline, well, the better of those two options is buying ethanol. But if you have sufficient refining capacity or are long in refining capacity, then you probably have very little interest, from a business perspective, in mixing in ethanol or any other product. So you're going to make a smaller margin on that volume.

The Chair: Thank you.

If anyone wants to shoehorn in on that question, we have two and a half to three minutes.

Mr. David McGuinty (Ottawa South, Lib.): Thanks, Mr. Chairman.

When I listened to the presentations, Mr. Chairman, it took me back to my years living in Africa. It's just an incredible embarrassment of riches when a country can speak about 118,000 additional megawatts of electricity from hydro power, seemingly unlimited electricity and electrons from stationary fuel cells, huge reservoirs and findings of natural gas, and obviously the nuclear.... Obviously, our problem is not an energy supply problem.

I want to go back to something Mr. Bigras raised with Mr. Fortin,

● (1650)

[*Translation*]

and that is the issue of the interconnectivity between the Manitoba, Ontario and Quebec networks. Mr. Bigras seemed to imply that the Quebec market focussed exclusively on exports to the south of Canada. That came as a great surprise to me. Mr. Pierre Marc Johnson, the former Premier of Quebec, negotiated for Quebec during two and a half years with Mr. Harris and Mr. Eves, both Ontario Premiers, in order to create a tighter link between the two provinces, and I believe that this is continuing.

[*English*]

What is the state of that negotiation, if you could just be more explicit?

The other question, I guess, is for our colleague from the nuclear association, Mr. Hawthorne. I'm not an individual who denies the existence of nuclear power. Eighty percent of France's power is derived from nuclear sources. The Chinese are going to have to do something if they don't want to build 1,400 more coal-fired plants. And the Americans are looking at 200 more coal-fired plants, which could be a huge problem for Kyoto and climate change internationally.

But I'd like to hear a little bit about the emerging market for nuclear with respect to desalination, because in most emerging economies and developing countries I've ever worked in, they don't talk about climate change as their issue or problem; it's a rich country's problem. They talk about fresh water, they talk about air quality, and they talk about basic energy supplies.

So I'd like to hear from you on both of those fronts, if I could.

The Chair: We will have to make it one minute each because we are running out of time.

Mr. Pierre Fortin: Quickly, if I understood you correctly, you asked me about the status of negotiations between Ontario and Manitoba.

Well, as far as Quebec is concerned, I'm not privy to those negotiations and discussions, but as far as the situation between Ontario and Quebec is concerned, it is my understanding that there have indeed been talks about improving the interconnection between the provinces. That's the point I was making earlier, that for export purposes indeed, Hydro-Québec, for example, is dealing *majoritairement* with the northeast states—but there is also some export connection right here between Hull and Ottawa and the Cornwall area.

As far as the Manitoba and Ontario discussions are concerned, they're still going on. As far as I know, both provinces are very optimistic that there will be some positive conclusion. One of the issues in terms of the transmission lines is their location, or where they will go, but there are ongoing discussions in that respect.

Mr. Duncan Hawthorne: With respect to the nuclear industry, there are 35 nuclear reactors being constructed right now in the world—32 of them are either in China or India, with India particularly looking at desalination. There is a whole set of issues in their area particularly. Obviously, they have taken the CANDU technology and produced a variant of their own, which they are now building in India. So there is a heavy build program there.

You're absolutely right; it's not just about electricity, particularly for India, where they're looking at the whole infrastructure they get around that.

But I think the message is also true in the U.S., where President Bush has also pointed, in his state of the union address, to the need for more nuclear plants. The Department of Energy in the U.S. has set aside significant funds in its budget to see a new nuclear build developed as an option. So it's not that people have abandoned the technology, and certainly in developing countries. Yes, a lot of coal plants have been built in China, but they also have the biggest nuclear program ever. India is very much the same, with a lot of coal plants being built, but alongside them are nuclear plants. It's certainly an issue for developing countries. Just last month, Vietnam announced the formation of their nuclear industry also. They have uranium deposits there.

So nuclear is still alive and kicking. I guess my point today is that Canada should be taking a more upfront role in that.

● (1655)

The Chair: Thank you, Mr. Hawthorne.

Mr. Richardson, do you wish to ask questions? Mr. Watson? No? Okay.

Mr. Bigras.

[*Translation*]

Mr. Bernard Bigras: I would like to come back to the domestic emissions trading systems. Do you believe, Mr. Fortin, that we should grant hydro power a specific status vis-à-vis other types of electricity for the granting of these licences and quotas? I fear the establishment of a single system for the whole power sector in Canada that would not take into account the fact that hydro power is emitting less greenhouse gases. Do you believe that the federal government should take this difference into account when putting into place such a system?

Mr. Pierre Fortin: Absolutely, and that is the position that we have been advocating ever since the beginning of the discussions on the development of a Kyoto Protocol implementation plan. Hydro power can greatly facilitate the attainment of our objectives. We could provide incentives to the various sectors with an emissions trading system. I entirely agree with your statement.

Mr. Bernard Bigras: Consequently, when allocating quotas, an hydroelectricity producer should perhaps receive a larger quota, compared with another producer that is producing thermal power, for example. Is that what you are saying?

Mr. Pierre Fortin: That's exactly it. Unfortunately, it may not be the path that the federal government would like to follow.

Mr. Bernard Bigras: We are here to make recommendations.

I would like to ask you two questions about ethanol. A number of people submit that using ethanol reduces greenhouse gas emissions, but creates on the other hand some other problems. For example, I am told that ethanol is not as energy efficient as they would like us to believe. Moreover, it creates pollution in rivers. Is there a technology that would allow us to reduce greenhouse gas emissions while reducing as well the water pollution caused by the use of fertilizers or pesticides?

[*English*]

Mr. Kory Teneycke: Thank you for the question.

The GHG emission numbers I quoted are based on a life-cycle analysis, looking not just at the manufacturing or distillation of the fuel, which is virtually identical to the making of vodka or to any other distilling process—you're just distilling alcohol—but also at the agricultural production right from the planting of the seed, any fuel used there, and any chemicals used throughout the agricultural process. All of that is taken into account, and yet you still net out with a substantial GHG reduction. So we do think we are a net contributor on a life-cycle basis.

On the energy balance issue, are you referring to mileage—like fuel efficiency, how far the car goes—or to the energy balance of the ethanol? There is some old information out there that says it takes more energy to produce ethanol than you get out of ethanol itself. The reason you've heard that is that at one point in time it was true. In the late seventies and early eighties that was indeed the case. The energy balance would have been netted out as zero.

That hasn't been the case for quite some time, and the energy balance is significantly positive. The last study from Agriculture Canada, I believe, said there was twice as much energy coming out. The number was slightly lower than that in the last study done by the USDA in the U.S., primarily because a number of their plants are less efficient. They're using some older technology. A lot of what is driving the increase in energy balance is improvement in farming technology. Yields are up 50% from the late seventies, so we have significantly less energy being used.

As for waterways, I'm not sure what you're referring to. Ethanol in itself is not a toxin; it's alcohol. It dissipates in waterways. One of the main drivers for growth of our industry is that we're displacing MTBE from the gasoline pool. The reason for MTBEs being banned is water contamination. There could be some concerns over fertilizer or something as it pertains to agricultural production. We're interested in those issues as well. Obviously, having an environmentally sound agricultural sector is important to us, but we think that great strides are being made on that side.

● (1700)

[*Translation*]

Mr. Bernard Bigras: I would like to ask a small question to Mr. Hawthorne, from the nuclear industry.

I have some difficulty understanding the last statement in your presentation. You submit that recognition by this committee of nuclear power will allow us, among other things, to meet Canada's Kyoto Protocol commitments.

Nuclear power is not an energy source that is recognized under the Kyoto Protocol. Unavoidably, Canada will need the mechanisms that are included in the Kyoto Protocol, particularly on the international level, in order to meet its commitments. How would public investments and the development of these technologies help us meet the objectives under Kyoto? We will most likely need the international emissions trading system. If we invest in this type of technology, we will not utilize these mechanisms. How would investing in your industry allow us to meet our commitments, given the fact that these are more and more dependent on the utilization of mechanisms and are less and less focussed on reducing emissions at the source?

[*English*]

Mr. Duncan Hawthorne: I think you just make my point for me; you make my argument for me. Here we are, nuclear power is meeting 17% of the world's need. It's meeting 50% of the need in Ontario. If we should close the nuclear plants today, then anything we replace it with, on a similar scale, will actually make it harder and harder to meet our Kyoto commitments. It's just simple. It's easy to see.

So the challenge before us is, why wouldn't we be arguing for nuclear's inclusion within Kyoto? Why wouldn't we? Why isn't someone doing that? That's my challenge to everyone. Because it's nonsense to have such a large power source with zero emissions and not have it recognized for the role it plays. It's very obvious that if it's not there, whatever replaces it will make it all the more difficult for us to ever achieve Kyoto.

That's a simple dilemma we face. For every other technology we've talked about today, no one has talked about the cost of the power. Right now, no one has looked at the economic impact of swapping nuclear at 4.5¢ power with 9¢ wind or 8.5¢ wind and what that does to the Canadian economy. I don't understand how you can have a meaningful discussion without considering the cost of the power to the consumer. It's a total enigma to me that we can have such a conversation and not recognize that if we ask our industries in Canada to pay 8.5¢ and 9¢ for power, then we won't have any industry in Canada.

The Chair: Thank you, Mr. Hawthorne. Thank you, Mr. Bigras.

Mr. Wilfert, and then I'll come back this way.

Hon. Bryon Wilfert (Richmond Hill, Lib.): Mr. Hawthorne, unfortunately you've left more questions than answers. I was under the impression that in fact you were recognized. I find it very hard to believe that you're not. I obviously take your word for it, but it would seem to me that you contribute, what, 12% of the total emissions. You assist with nuclear power. There's going to be an enhanced climate change document that the minister will release very shortly.

You make a statement here that if nuclear stations are not refurbished or replaced, this will obviously add to carbon increases. Why do you think the provincial governments, for example, are not taking a more proactive role? Even Sweden, which in fact had mandated that it was going to phase out nuclear power, changed its position, realizing obviously the role it does play.

Why, first of all, do you think provincial governments have taken that viewpoint?

● (1705)

Mr. Duncan Hawthorne: Let me answer three things. First, we're not on the Kyoto thing, and if you read it you will find we're not. We were until it came to signature, and someone did some kind of a deal and took it out, but nuclear is not recognized today. That's the first thing.

Second, I would not suggest for a moment that Ontario won't support the refurbishing of nuclear plants. The fact that we ourselves have reached an agreement to refurbish the plant is more about the economics of it. I can't speak for the Premier of Ontario, but I can tell you that rather obviously he has set an aggressive, challenging target to retire coal plants. He's done that for all the right environmental reasons. He looks around and he turns to all the technologies to help him meet that, and he recognizes the role that nuclear can play. Now fortunately for Ontario, there happen to be some nuclear reactors that are currently not operating, so he has an option there that's credible. But that option would have been totally disqualified had it required the construction of nuclear plants, because we're talking about eight or ten years to do that.

So the problem for nuclear in terms of it being recognized as any kind of solution is that it takes a very long time to actually put it into service—eight to ten years. You gents know as well as I that there's an ongoing conversation about whether New Brunswick should refurbish its plant or close it and replace it with a coal plant, which would be a very interesting environmental discussion they'd be having, whereas in Ontario people are looking to close coal plants and replace them with nuclear.

So it's very much the same answer as the previous person. It's a provincial matter. But I don't think there's a bias against nuclear in that respect. I think there's a recognition of its role. My only comment is that it is not recognized in Kyoto and that seems to me to be a massive oversight.

Hon. Bryon Wilfert: Let's go back to that. Why do you think it was left out?

Mr. Duncan Hawthorne: Because it's a political.... It's because, as with the question Mr. Cullen asked me earlier, the perception is we cannot acknowledge the zero-emitting nature of nuclear because it has nuclear waste. That's my view.

I've been in this industry for 30 years. I'm not apologizing to anyone for being in it. I don't know why we're seen as a shadowy technology and why no one wants to mention our name, because we play a very significant role. In the Kyoto debate, someone decided the document would somehow be subject to criticism if it included nuclear. That's how I view the world. Someone says, if you mention the “n” word, then we're going to meet more opposition than we want to take at this time, so we'll leave it off and maybe no one will notice that it's every second home, school, factory, or hospital that it's powering today.

Hon. Bryon Wilfert: There are people who believe the world is flat, and there is the Flat Earth Society, but the fact is, as I said, Sweden, which I have some familiarity with, changed their national policy. Obviously A was the issue of cost, and D for demand was there. How were they going to supply it? Well, they have these plants.

Mr. Duncan Hawthorne: If you were to look at the debate, you would find that I also provided testimony to the Swedish government at that conference. All of the pressure was derived from large industrials that got together, formed a strategic alliance, and lobbied government to tell them they could not be commercially competitive if nuclear plants were retired and replaced by higher-cost energy sources.

Hon. Bryon Wilfert: We're going to host the United Nations Framework Convention on Climate Change conference in Montreal at the end of November. The major purpose is to look beyond Kyoto, obviously. I take it the message is that in looking beyond Kyoto, one of the areas we should be clearly addressing in the international arena is the issue of nuclear—in terms of addressing our emissions issues.

Mr. Duncan Hawthorne: My message is that everything at the table needs to be given a chance to develop. Some need financial help to allow the technology to become—

● (1710)

Hon. Bryon Wilfert: The government hasn't ruled out any option.

Mr. Duncan Hawthorne: The World Energy Council passed a resolution last year that said we should not idolize or demonize any technology; we need it all.

Hon. Bryon Wilfert: In fact the minister has said exactly the same thing. I would suggest to you that everything should be, and obviously at that conference one of the major areas for discussion was—and I'll certainly take that back—the issue of how that would play.

The Chair: Thank you, Mr. Wilfert.

Mr. McGuinty has a question.

Mr. David McGuinty: I just want to pick up on this very discussion.

The Kyoto Protocol is a living, breathing document and agreement. There are annex I countries that have signed and there are annex II and annex III countries that have not. The whole notion of the protocol was to start by starting, and to get the rich countries, which built their economies on the back of the atmosphere, to begin. As the Chinese and the Indians continue to build nuclear plants in the hundreds, I don't understand how it's going to be possible in successive COP meetings and negotiations not to look at nuclear and factor in nuclear.

Monsieur Bigras is I think totally right when he talks about the fact that the international emissions trading system does not presently include the nuclear question. I don't know how it's going to remain outside the ambit of the agreement as these other big nations come into the fold.

That's more of a comment than a question, Mr. Chairman.

The Chair: I think on that question we're also going to have our research staff check into it as an issue, since it has been raised.

We appreciate your being here very much. We're going to have to adjourn—we have a vote that is pending—but I think you can see by the nature of the questions and the degree of agreement that the issues you've raised are very relevant to the Kyoto study we're involved with, in terms of some recommendations coming out of the back end of the process that will give us a very firm handle on a climate action plan that will include some of the elements you've referred to here today. We appreciate your being here. Thank you very much, on behalf of the committee, once again.

Members of the committee, we'll adjourn now and we'll reconvene tomorrow.

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