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Chair

Mr. Bob Mills

Standing Committee on Environment and Sustainable Development

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● (0900)

[*English*]

The Chair (Mr. Bob Mills (Red Deer, CPC)): I would like to call the meeting to order and start off by welcoming Mr. Scarpaleggia as a permanent member of the environment committee.

Some hon. members: Hear, hear!

The Chair: I'd certainly like to welcome our guests.

Mr. Villeneuve is on the telephone and will be broadcast. In fact, it will be in translation. He's in Chicoutimi, but he will be on the phone.

Welcome, Mr. Villeneuve.

Mr. Claude Villeneuve (Biologist, University of Quebec at Chicoutimi): Bonjour.

The Chair: He's there. Welcome.

We will begin with Mr. John Stone, a professor at Carleton University.

Mr. John Stone (Adjunct Research Professor, Carleton University): Thank you very much, Mr. Chairman.

Let me introduce myself. I was for thirty years of my life a public servant. I retired eighteen months ago and have been on the Bureau of the Intergovernmental Panel on Climate Change, first for Working Group I, which is on science, and now for Working Group II, which is on impacts and adaptation. I hang my hat part of the time at Carleton University and some of the time with the International Development Research Centre.

Thank you very much, sir, and thank you very much, members of the committee, for the opportunity to appear before you to tell you some of the science that underlies the threat of climate change.

I would like to make four points.

First, we have, mainly through the burning of fossil fuels, taken the atmospheric concentration of carbon dioxide—one of the main greenhouse gases—to levels that the earth has not experienced for almost a million years. We are in unknown territory.

Second, recent global temperatures are higher than we have been able to determine over the last millennium. We have in fact detected global warming.

Third, the only way we can satisfactorily understand this change is by invoking the known characteristics and physics of the influence of greenhouse gases on the climate.

Fourth, we are now seeing some impacts occurring at a faster rate than we had previously anticipated, and the longer we delay action, the greater will be the risks and the more expensive will be the costs. In my view, there is an urgent need for action.

We can explain the threat of climate change either in simple terms or in terms of extraordinary technical detail. The climate system itself is extremely complex, containing many interacting and mostly non-linear processes. Nevertheless, our understanding is sufficient to tell us that increasing the concentrations of greenhouse gases in the atmosphere, as we have been doing by our burning of fossil fuels, will affect the radiative balance and hence the climate. This is a fundamental fact, based on well-accepted physics, that we cannot avoid. It's the reason I used the term “threat”.

The scientific understanding is not new. As long ago as 1824, the French mathematician, Fourier, discussed the link between the climate and the atmospheric concentration of certain gases. These gases, collectively known as greenhouse gases, act like a blanket around the earth. They're responsible for making this planet of ours inhabitable. Without them the world would be 32 degrees cooler. This hypothesis was taken up some 70 years later by a Swedish chemist, Arrhenius, who did some back-of-the-envelope calculations of how the earth's temperature would change with the doubling of the concentration of these greenhouses gases, a situation we are rapidly approaching.

Scientists put this issue of climate change on the international political agenda in the mid-1980s precisely because of their concern with the observed increases in the atmosphere of concentrations of carbon dioxide that were measured very carefully on Mauna Loa by Dr. Charles Keeling. The scientific concern was such that it dominated the Conference on the Changing Atmosphere that was held in Toronto in 1988. It also led the United Nations to take the initiative to establish the Intergovernmental Panel on Climate Change, the IPCC, to provide governments with authoritative policy-relevant—but not policy-prescripted—assessments of the current state of our knowledge of climate change.

Now to my first point. Recently, scientists have extracted a three-kilometre-long core from the ice in the Antarctic. The snow that falls there each year captures within its crystals samples of the ambient air at the time it was deposited. Layers have built up one year at a time. By examining the air trapped in each layer, the scientists have been able to determine a record of past temperatures and concentrations of key greenhouse gases. They have now been able to take the record back some 630,000 years, covering several ice ages. These ice ages occur every 120,000 years or so and are forced by the orbital variations of the earth around the sun. The concentration has varied over time. It's been lowest during an ice age and highest during an interglacial period.

● (0905)

The important point to register is that the atmospheric concentrations of carbon dioxide have stayed between two bounds, never going above 280 parts per million. This was even so up until the mid 18th century when the Industrial Revolution began. Today we are at 380 parts per million, a 30% increase over the past 150 years. Those concentrations are still increasing.

By looking at the isotopic ratios of the carbon dioxide, we were able to establish that most of it originates from the burning of fossil fuels. We are clearly taking the atmosphere into uncharted territory. We know from basic physics that this will affect the climate. I won't claim that I can tell you exactly how the climate will change, but I can assert with very little doubt that change it will.

Let's turn to what we've observed already has happened to the climate and focus on the temperature, since it's the easiest parameter to understand. For the most recent period, we use direct thermometer readings. There's been a considerable amount of work to make sure this temperature record is homogenous and devoid of spurious effects such as enhanced warming in the cities. For earlier periods, before we had the thermometer, we have to rely on carefully calibrated proxy data such as tree rings and ice cores. Several groups of scientists have used this data to reconstruct the temperature record of the past 1,000 years. The general characteristics of these several reconstructions are all similar. Although some have greater variability—for example, at century time scales—than others, these reconstructions clearly show that there has been significant warming over the last 50 to 100 years, and, more importantly, that this warming is outside the range of the variability over the past 1,000 years.

As the IPCC reports have concluded, it is very likely that the recent warming is outside of the natural variability of the climate. It is for this reason that we believe we have indeed detected climate change. Now, attributing climate change to human activities is quite different and requires not only the use of such data but also climate models and looking for fingerprints in the past climate.

Our understanding and ability to model the climate has improved significantly over the last 10 to 15 years. We also know what have been the changes in the concentrations of greenhouse gases and aerosols in the atmosphere over the last 100 years. We also know what have been the changes in natural forcing, such as the sun's output and volcanic activity. We can feed this information into climate models and compare the results with the observed record. If we take natural forcing alone, the fit for the first half of this century is not bad, but it begins to deviate afterwards.

● (0910)

If instead we use both natural forcing and that due to greenhouse gases and aerosols, the fit is remarkably good. Indeed, the only way to reproduce the observed temperature change of the last 150 years is by introducing greenhouse gases from burning fossil fuels and from land use change.

The Chair: Excuse me, Mr. Stone. You are over ten minutes. Could you try to wrap up as quickly as you can, please?

Mr. John Stone: Let me just say a few words about the urgency of addressing climate change.

Last year, in preparation for the chairmanship of the G-8, the United Kingdom government organized a conference on dangerous climate change. The reference to "dangerous" is from article 2 of the framework convention, what some refer to as the ultimate objective—that is, to avoid dangerous interference with the climate system. One of the conclusions of that conference was that we are experiencing some impacts at a faster rate than was anticipated. We can see it in some ecosystems, but perhaps the clearest evidence comes from the acceleration of coastal glaciers in Antarctica and Greenland. In part, this is because we don't fully understand glacier physics, but it does underline that surprises are possible, and some of these surprises may take us past the point where the changes are reversible.

The longer we delay in taking action, the greater becomes the risk to ecosystems, to humans, to our societies and economies. In addition, the costs are likely to be greater. One reason for this is that the longer we delay action, the higher will be the concentrations from which we will have to make the reductions. Some scientists are now arguing that we may have as little as a decade to get on the right track to reduce our emissions and avoid dangerous climate change.

I do not wish to be an alarmist, but I do believe it is a scientist's duty to warn.

Thank you, sir.

The Chair: Thank you.

I would remind our witnesses, and of course members, that I do have this little grey box here that times you, so I do know how long you've gone.

I would like to introduce Mr. Ian Rutherford from the Canadian Meteorological and Oceanographic Society.

Mr. Ian Rutherford (Executive Director, Canadian Meteorological and Oceanographic Society, Partnership Group for Science and Engineering): Thank you, Mr. Chairman, and thank you, members of the committee, for the opportunity to make a presentation to this group on what I think is a very important subject, certainly very important for our society.

The Canadian Meteorological and Oceanographic Society is a major non-governmental organization and it is the national society of individuals and organizations dedicated to advancing atmospheric and oceanic sciences and the related environmental disciplines in this country. We serve the interests of meteorologists, climatologists, oceanographers, limnologists, hydrologists, and cryospheric scientists throughout Canada, and indeed we have members internationally as well. We represent Canadian scientists carrying out research on the atmosphere, the oceans, and related environmental issues, including, of course, climate change. We have more than 800 members from Canada's major research centres, universities, private corporations, and government institutes. We think we're uniquely positioned to provide expert advice on the issue of climate change science.

We had a major scientific conference in Toronto last year at the beginning of June, and as a result of that conference we issued a position statement on climate change. The points I'm going to make this morning are essentially based on that statement, with a few additional wrinkles added to deal with developments since then. I'm going to talk about the state of the climate and climate science, I'll talk a bit about the link to air pollution, and I'll talk about the urgency of dealing with the greenhouse gas issue.

Climate change is happening now, both in Canada and around the world. As you've just heard, most of this change is attributable to human activities that have released greenhouse gases, notably carbon dioxide, but there are others, into the atmosphere in increasing amounts since the beginning of the Industrial Revolution. The effect of these additional greenhouse gases on the global heat balance is well known, it's basic physics, and it's now clearly detectable on continental and global scales.

The removal processes for carbon dioxide are relatively slow, and it eventually becomes fairly evenly mixed throughout the atmosphere. The mean lifetime for carbon dioxide is measured in decades to centuries. Once you put it into the atmosphere, it doesn't go away. This means that it takes a long time for the atmospheric burden of excess carbon dioxide to respond to changes in emissions. It takes a long time to build up and a long time to decline. It also means that the effects of carbon dioxide emissions are not local, but inevitably they will be felt globally. So it's quite different from other forms of so-called air pollution.

Another characteristic of the climate system is that the ocean component, because the earth is roughly 70% ocean, dominates climate processes, and it's the time scale of the oceans that dominates the time scale of climate change. The ocean has a very long response time to changes in the energy balance, because of its enormous heat capacity. So the climate system takes even longer to respond to changes in emissions than the CO_2 content of the atmosphere. There are lags and lags. The changes in global temperature that are apparent today are the result of the accumulating burden of anthropogenic carbon dioxide in the atmosphere over many previous decades. It's not the result of what we're doing today, it's the accumulated burden. That's why there's an urgency to do something about it.

I want to say a few words about the link to air pollution. Human activities that release carbon dioxide, mostly the combustion of fossil fuels, also release other substances such as oxides of nitrogen and sulphur that lead to air pollution, with both direct and indirect effects on the health of ecosystems and human beings and other animals. These substances have a much shorter lifetime in the atmosphere; you can measure it in hours to days. Their effects are mostly local and are quickly reversed if you reduce emissions. They're relatively easy to deal with on a short time scale. Carbon dioxide is not.

Measures to reduce the emissions of substances that lead to this kind of air pollution will not result in the reduction of emissions of carbon dioxide unless they involve reducing the combustion of fossil fuels. Carbon dioxide is the inevitable chemical product of the combustion of carbon-containing fuels. You can't get away from it. Unless you capture it before release to the atmosphere, such combustion inevitably leads to an increase in atmospheric levels of carbon dioxide. If emissions of carbon dioxide continue to increase, they will lead to an increasing rate of buildup of carbon dioxide levels in the global atmosphere.

● (0915)

Even if emissions were to stabilize at current levels, carbon dioxide would continue to increase in the atmosphere and it would result in an increasing effect on global climate. We can't just stabilize and say we're okay. The climate is going to continue to react with past emissions, and current emissions are sufficient to keep the content rising. So even if emissions were to suddenly decrease to pre-industrial levels, the carbon dioxide content of the atmosphere, and hence the climate, would take decades to centuries to return to pre-industrial conditions. Again, there's a long time lag in these things. That's why we think we need to take immediate action to reduce emissions of greenhouse gases, to mitigate future climate change, and we must prepare for adapting to the climate change that has already been set in place by past emissions.

As just a few words on the climate convention and Kyoto Protocol, we advocate a coordinated global response to climate change. We urge all governments to work together toward a single international agreement to address it, as was recognized in the 1992 UN Framework Convention on Climate Change.

The convention's Kyoto Protocol is an important first step towards reducing the release of greenhouse gases into the atmosphere. However, the scientific evidence dictates that in order to stabilize the climate, global reductions in greenhouse gas emissions need to go far beyond those mandated under the Kyoto Protocol. We recognize the challenge of implementing the current agreement. Nonetheless, we urge Canada to contribute effectively.

It is to be noted as well that Canada has other obligations under articles 4, 5, and 6 of the climate convention and article 10 of the Kyoto Protocol regarding research on climate and systematic observations related to the climate system. We're not holding up our end of that either.

Canada has no choice but to adapt to present and future climate change, and we need a national adaptation strategy in order to do that. Further research is critical for making more accurate predictions of future climate on seasonal, decadal, and century time scales, for defining our options, for reducing the effects of climate change, and for understanding and dealing with its impacts specifically on Canada. Although it is a global problem, it affects different parts of the world unequally. Canada, and Canada's north, is one of the areas of the globe most affected by climate change, and we need to understand that better. We need more research, we need more data, and we need to support those activities.

That ends my presentation, Mr. Chair.

● (0920)

The Chair: Thank you very much—and under time, thank you.

From the Canadian Chemical Producers' Association, we have Richard Paton.

Mr. Richard Paton (President and Chief Executive Officer, Canadian Chemical Producers' Association): My name is Richard Paton and I'm the president of the Canadian Chemical Producers' Association. With me is Gordon Lloyd, our vice-president of technical affairs, who I understand seems to very often appear in front of your committee.

Thank you for the opportunity for CCPA to appear in front of the committee to review Bill C-288 on the important issue of climate change.

CCPA is not here to speak for the industry in general, but we will talk a little about the overall issues facing our sector, in particular, and focus on the challenges and experiences of the chemical sector, which is Canada's second largest value-added manufacturer. This will perhaps provide members of the committee with an insight into how industry is trying to deal with this issue.

Our association recognized the concerns about climate change after the Rio de Janeiro convention around 1992, and as a result, we started to report and monitor our emissions of greenhouse gases starting in 1992. In 1995 we also developed a policy on climate change to help our companies address this issue and to reduce emissions. We've been involved in this issue for a long time.

Because we take this issue seriously, we believe governments must develop policy approaches that are sound, realistic, and effective. This will require a significant change in how Canadians live and will require a significant economic intervention as well as provincial coordination.

Since our government agreed to the stabilization target in the mid-1990s, we have yet to see any program to meet this commitment that is either workable or effective at achieving the environmental priorities for Canadians. These programs all had the potential to create grave problems for the economy and, had they been implemented, probably would not have helped achieve environmental priorities either.

We thus have serious concerns about a bill that proposes that the federal government adopt the Kyoto targets without a clear idea of how this could be accomplished and the impact this would have on the Canadian economy or society.

On a note about our association, if our association was given credit for the early action we took as an association since 1992, we would meet the Kyoto targets for our sector. However, no proposed program has recognized this contribution.

As you can see from the charts that I believe you have, the top chart shows that Kyoto called for a 6% reduction in greenhouse gases from 1990 to 2010. On a CO_2 equivalent basis, CCPA members will achieve a 56% reduction by 2010.

By 2000, CCPA members had already reduced GHG emissions by 43%. While CCPA members' GHG emissions will have declined 56% by 2010, our output will have increased 26% from 1992. We're creating a high-intensity improvement basis of around 65% improvement.

We've been reducing emissions for over a decade and will continue to make improvements. I think how we have done that is instructive for how you deal with this issue. It's been done gradually. We've been making improvements of about 1% to 1.3% a year in greenhouse gas performance. We've been making those improvements linked to our economic objectives, as well as reducing other pollutants linked to clean air. We've continued to make that kind of progress. These investments were aimed at reducing energy costs, which have economic benefits for companies and a return on investment.

We also had one huge technological breakthrough at DuPont that is limited to one plant and is a “once in a generation” kind of improvement. It illustrates that these can happen, but they happen very rarely.

Our environmental performance is not unusual for large manufacturers. As the third chart illustrates, you'll see a chart that was developed by the Canadian Manufacturers and Exporters association showing general manufacturing progress on greenhouse gases.

I know in our parliamentary day, many parliamentarians were quite surprised to find that manufacturers are generally 7% below the 1990 levels, and large manufacturers as a whole, steel, aluminum, and others, will be 20% below the Kyoto targets by 2003.

There's a lesson to be learned here. The lesson is that capital investment is the key to reducing emission intensity in manufacturing and, in the longer run, the key to absolute emissions. Over a long period of time, investment works to reduce pollutants and greenhouse gases, it works to reduce energy costs, and it helps productivity. This has all been done without regulation and without targets.

● (0925)

Recognition of this fact is a critical foundation to build climate change policy. As you can see from the second chart in your package, also done by the Canadian Manufacturers and Exporters association, there is a very strong link. The chart shows that as the investment goes up the top curve, the emissions intensity performance showed by the bars that go down improves substantially. On average, every billion dollars manufacturers invest in new technology and structures between 1990 and 2003 resulted in a 0.2% annual reduction in their emissions intensity.

Unfortunately, as you can see in this chart, something happened around 2000. Improvements in emissions intensity slowed as manufacturers cut back on capital spending, and this reflects the impact of the high-dollar energy costs and Asian competition, which reduced available capital for investments.

Targets for greenhouse gases can be set if they fit with the performance of our industry and with natural investment cycles. This is a win-win for industry and for the environment, but it takes time to make these technological changes and it takes money.

An important contribution this committee could make to Canadian climate change policy would be to recognize the link between new capital investment and improved environmental performance on greenhouse gases and other pollutants generally. It's extremely important to understand the realities and restraints on how companies invest capital and the technological realities of reducing greenhouse gases.

Why are we concerned about this bill if we've had all that great performance? At this point in time, no one can seriously believe that Canada can meet its Kyoto targets by reducing emissions. It's basically just too late. Potential for action that would meet these Kyoto targets by actual reduction is now long past. It's a long-term problem; it's going to take a longer-term solution. Ensuring that the Kyoto targets are met would require Canada to purchase credits abroad. To look back at the Liberal platform, that's the plan that was basically going to have to happen, at a cost of around $5 billion a year over the Kyoto commitment period of 2008 to 2012.

The math is very simple. According to the previous government's projections, Canada was about 270 million tonnes short of our target in 2005. That number is increasing as the economy grows. The Environment Commissioner used a $20 tonne as a base price for purchasing carbon. You just multiply 270 times $20 and you get $5.7 billion. Maybe we can do better than that; maybe we'll do worse. The number is going to be $4 billion or it's going to be $6 billion, but it's a big number, and we're going to have to deal with that number in order to be talking about meeting the Kyoto targets.

The industry committee's work has noted that the manufacturing sector is in trouble right now. We've seen that with pulp and paper plants closing, which I know many members have commented on in the House. The huge cost of buying foreign credits, even when our performance in the manufacturing area is remarkably good—in fact, it's probably going to be below Kyoto—would have significant impact economically and reduce our ability to attract further investment. It may also reduce our capacity to meet other environmental objectives relating to clean air and water.

I'm sure some of you will debate the economic impact in trying to meet the Kyoto targets. CCPA is not the group proposing this bill. The onus is on the proponents to demonstrate that it will not have serious consequences for the economy and on individual Canadians. As far as I know, no substantial analysis has been done that would give me any comfort that the bill has taken into account these potential consequences. In fact, I've not seen a legitimate and credible analysis by government to date of the potential impact of meeting Kyoto targets. Until that analysis has been completed, our association cannot support this approach or this bill.

My final point is that addressing climate change in a serious way, as is needed, means looking at what can be done realistically in the short, medium, and long term and recognizing that we are committed to this issue in the long term. The government's notice of intent with respect to the clean air bill does set out a framework that could be used to do just that if it's implemented effectively. It recognizes that we need an integrated approach to clean air and climate change, to working with the provinces, and this needs to be an approach that recognizes the critical role of investment and business cycles.

In conclusion, we believe that to make progress there has to be a carefully developed path to achieve reduction targets. We have not seen a workable plan yet. Until it is clear how Canada can meet such targets and at what cost to economic, fiscal, and environmental priorities, we cannot support this bill. After ten years of discussion on Kyoto, I have not yet seen a government do this kind of assessment. Without any target, it's going to be unrealistic and probably counterproductive.

● (0930)

The evidence illustrates that technological change and capital investment are the key drivers to greenhouse gas reductions. This is something that takes time and cannot be legislated into existence by the government. Right now the technology is simply not available to economically capture greenhouse gases, particularly in a short timeframe. There is no program that adequately addresses this fact, and to that end the alternative is to bear the huge cost of purchasing foreign credits that have no environmental benefit for Canada or Canadians in terms of absolute reduction of greenhouse gases.

Thank you very much for your time.

The Chair: Thank you very much.

We'll go to the Institute for Catastrophic Loss Reduction, Paul Kovacs, please.

Mr. Paul Kovacs (Founder and Executive Director, Institute for Catastrophic Loss Reduction): Thank you, Mr. Chair.

This is the first time I've been invited to appear before the committee, and I thank you very much for this opportunity to share my views and the institute's views on these important issues.

I just want to take a brief moment to introduce myself and the institute. I'm an economist. For the last 15 years, my research has focused on extreme events—tornadoes, hurricanes, floods, and those sorts of risks. Our focus is on trying to promote loss prevention. What actions can reduce the adverse impact of these kinds of extreme events?

Our institute has had support from, and we were founded by, the Canadian insurance companies. We're based at the University of Western Ontario, and we have a large team of researchers—and a laboratory—trying to understand how to minimize the risks of extreme climatic events.

Today I wanted to share two key messages with the committee. First, there's growing evidence of the benefits of early action by Canada and Canadians to address change in the climate. In particular, our research has focused on the increasing frequency and severity of large storms—they're already increasing in Canada—and action is urgently required to protect Canadian lives and our property from these extreme events.

Second, a comprehensive climate strategy should include participation in international efforts to mitigate the adverse impacts on future generations, but it should also be combined with a domestic plan to adapt to the local impacts.

Bill C-288 and the federal government's green plan focus on managing future emissions, but both fail to have a comprehensive strategy that includes adaptation.

For the past decade, I've been part of the Intergovernmental Panel on Climate Change. This is the United Nations' process, which John Stone talked about earlier, that is monitoring and evaluating the emerging climate research.

The IPCC has been warning that in a warmer world there would be more weather extremes. For Canadians, these are some of the risks we should anticipate. There will be more large Atlantic hurricanes, hurricanes like Hurricane Juan, which went through downtown Halifax and became Canada's most costly hurricane. There will be more wildfires that could grow out of control and get into urban areas, wildfires like the wildfire in Kelowna that destroyed more than 200 homes and became Canada's most costly wildfire. There could be more heavy downbursts, the kinds of events that led to record flood damage in Alberta recently and also to Ontario's most costly storm last year. There will be growing threats to human health from summer heat waves, and there were record heat health alerts in Ontario in 2005 and in Alberta this year. There will be more drought events. We've had several billion-dollar drought events in Alberta recently. There will be more landslides and avalanches in particular areas, and recently there have been deadly landslides and avalanches in British Columbia, Alberta, and Quebec. And there will be more disruption of our transportation networks.

The short message is that this is happening now, and the research is saying that we will see more in the next period of time in a warming world.

The insurance industry has been on the front lines dealing with the increase in extreme climatic events evident across Canada and around the world. Some of the actions taken by the insurance industry may illustrate some of the important efforts that Canada and Canadians can take to deal with the change that is happening to our climate.

Something is happening in the insurance industry. First, the insurance industry is paying a lot more in disaster claims. There's been a twenty-fold increase in payments by insurance companies over the last thirty years worldwide. In Canada, last year was the highest payout year ever. Several billion dollars were paid by insurance companies to Canadian homeowners and businesses because of damage that had occurred.

Second, insurance companies are changing their practices. They're adapting. In some areas, like Florida, where there's been a significant surprise, or unanticipated, increase in activity, insurance prices are going up. There are various other ways that insurance companies have changed their practices to reflect what they're learning about the new climate.

In addition, the insurance industry is investing in research. They're supporting our institute. They've been active for more than a decade in our work, trying to understand what's happened to the climate and what can be done to reduce the negative impacts.

The insurance industry has also been fairly outspoken about public policy actions that can be taken to minimize the adverse impact of extreme events. They've been fairly outspoken in terms of their praise of those governments in Canada that are taking positive action. Good examples of enlightened policy have recently been introduced in Quebec, Ontario, Alberta, and British Columbia. A number of provinces are showing some real leadership here, but the federal government could play a bigger role.

● (0935)

Because actions needed to bring about meaningful reductions in greenhouse gas emissions will take many years to realize, it is critical that the international mitigative actions are supported by local adaptive actions, actions that will deal with the adverse impacts that are happening now. Near-term investments to build resilient communities are crucial over the next twenty to fifty years, while we wait for the international mitigative efforts to have an impact.

Examples of adaptive actions are taking place not necessarily because of support from the federal government. The insurance industry, for example, has taken action not because the government encouraged them or told them what to do, but because they just got on with business. And while some are adapting without help and guidance from government, there still is a very important role for government—in particular, I believe, a role for the federal government—to play to support adaptive actions.

Here are some illustrations of what the federal government could do. The first thing is to provide climate information, local climate predictions, and other risk management tools that would help decision-making by individuals, by business, by others, to better cope with the change that's taking place.

In addition, the government is investing billions of dollars in public infrastructure. It's modernizing building codes in a way that influences private investment decisions. It's important that public infrastructure building codes and other standards not only reflect historic climate, but future climate, and that we spend the money appropriately so that there will be long-standing positive benefits for all Canadians.

The government has an important role to play in protecting climate-sensitive public goods. Here we're talking about coastal regions that are vulnerable all around the country, and the federal government should be more aggressively supporting embedding this protection role in emergency management efforts.

The government has a role to play in making sure the adverse impact of these changes is shared and is not disproportionately on those who are most disadvantaged. And the government has a potential role to support research in these areas.

To conclude, again, I thank you very much for the opportunity to participate. There were two key messages that I was looking to share with you today. The first is growing evidence that early action is important. There are more extremes already occurring in Canada and we need to take action. The second is a comprehensive strategy that not only would deal with Canada participating in international efforts to reduce emissions, but also include an adaptive strategy. Adaptation is the only response available to reduce the adverse impacts of climate change over the next several decades before the mitigative measures take effect.

Thank you.

● (0940)

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

I'll now call on Claude Villeneuve.

Welcome to our committee, sir.

[*Translation*]

Mr. Claude Villeneuve: Good morning, and thank you for virtually welcoming me to your committee. I'm going to address the committee in French. However, I can answer any questions in English.

Allow me to introduce myself: my name is Claude Villeneuve, and I am a professor at the Université du Québec à Chicoutimi. I've been interested in climate change since 1979. My first research interest was fish, but as acid rain destroyed the fish, I developed an interest in the causes of acid rain and, from the causes of acid rain, in air pollution in general and climate change in particular.

I published my first book in 1990, in which I adopted a skeptical position. In 2001, I published a second, in which I concluded that it was necessary to adapt to climate change because we were already living with it, as the first speaker showed. In 2005, I published a third, to which I'll refer a number of times in support of my remarks.

So I've been asked to discuss Kyoto, the urgency to act. The first reason why it is urgent that we act is the scope of the challenge. The challenge was very well illustrated at Exeter in February 2005: on a global scale, we must reduce global emissions by 25 billion tonnes a year, relative to the reference scenario, until 2054 in order to limit global temperature increases to two degrees in the twenty-first century. With all the uncertainty associated with that and with the thermal system, to which the previous speakers referred, this is an immense challenge, particularly in a situation in which the global population at that time will be approximately nine billion inhabitants. So we still have three billion new greenhouse gas producers to welcome to the world.

Kyoto is a small part of the challenge. In fact, it's a part that represents so little that, even if we manage to achieve the Kyoto objective in full, with the participation of the countries that have ratified the protocol, we won't affect the rate of increase of greenhouse gas emissions. It represents a reduction of 5.2 percent of 35 percent of global emissions.

Canada, as everyone knows, is a poor player in this new part, under global governance, with, according to the latest figures, 270 million tonnes a year to recover relative to its objective and likely 300 million tonnes in 2008, since it was the 2004 figures that were released a little earlier this year. So from 2008 to 2012, we in Canada will have to find a minimum of between 1.35 billion and 1.5 billion tonnes of CO2, assuming we can level off our emissions immediately.

The plan that the government published two or three weeks ago contains no short-term measures that would suggest to us that we can achieve this objective. It's clear that Kyoto 2 is the first of a very long series that won't necessarily be spread over five-year reference periods, but by the 2050 horizon, we would have to do at least 30 times Kyoto in order to be able to meet the challenge. So that's my first observation: the scope of the challenge is very great.

The second reason why Kyoto is urgent is Canada's inability to meet its commitments between 2008 and 2012. I mentioned the extent of the challenge of 1.5 billion tonnes. How are we equipped? Very poorly.

● (0945)

The report of the Commissioner of the Environment and Sustainable Development, Johanne Gélinas, which was tabled in the House of Commons this fall, provides a list of policies that have failed since 1997 in an effort by the Canadian government to put in place an effective system of measures and greenhouse gas reductions.

Paragraph 1.10 states that the six percent reduction objective was set without a preliminary study — you could say it was set “one evening at a party” — to limit the objectives of the United States and Europe. For example, that same evening, Australia was a little wiser and set its objective at 10 percent. It must be understood that the government had no obligation to set a reduction objective at that time. If it had conducted serious studies, it would have set a much more realistic objective.

Second, government intervention since 1998 has been characterized by procrastination. The plans that were published in 2002 and 2005 were hastily put together, and that's quite clear in the report of the Commissioner of Sustainable Development. The government refused to take effective action for political reasons. Reference was made to pan-Canadian policies. For example, it wanted to apply the same rules to Quebec on electricity reduction, whereas electricity in Quebec produces very little greenhouse gas, and those investments were therefore ineffective. The government should have been much more flexible much sooner. I remind you that Quebec already had a strategy in 1998 to which the Canadian government could have contributed, which would definitely have yielded more interesting results.

The government indulged in a lot of wishful thinking, in saying in Mr. Dion's last plan, for example, that Canadians would provide significant quantities of emissions reductions to the Climate Fund Agency. The current objective is to reduce greenhouse gas emissions by 10 tonnes a year for every Canadian, if we want to achieve the Kyoto objectives. However, that's a mathematical impossibility.

The Kyoto Protocol must not be viewed as a goal in itself. Kyoto is a training session for the real game. Earlier I referred to global governance for horizon 2050. Kyoto is the reference period for putting tools in place and showing that they can be usable and effective. We have to think that a thermal power station built today, like the Bécancour plant which was built in Quebec last year, will still be emitting one million tonnes a year in 2050. If we don't show any good will today in implementing greenhouse gas reduction measures, it will be impossible for us to be credible to the international community in negotiating a better position in the subsequent stages.

By the horizon of 2050, the federal government's last plan stated that Canada would have to reduce its emissions by 65 percent. That's extremely hard to believe, if we consider that Canada is an exporter country and that it is considered an empty country. If we use the Radanne classification, which was used and explained in my book, Canada has much too small a domestic market for its citizens to offset the greenhouse gases caused by its exports, whether it be exports of aluminum, metals, paper or oil.

● (0950)

The fourth reason why it's extremely important to act immediately is adaptation issues.

Mr. Kovacs mentioned adaptation before disasters occur. We have populations at risk. It is necessary to rebuild and repair infrastructures. Erosion problems, flooding problems which are already very much present, freeze-thaw cycles, low water levels and drinking water problems anticipated in the next 10 years call for major investments.

The question of energy production is also extremely important.

There are research problems. I sit on the scientific committee of Ouranos Consortium. Last week, we had a symposium of the status of research on adaptation to climate change. I invite committee members to take a look at that work. There is an enormous amount of work to do in this area, and there are very major issues.

One subject that is more similar to my work is biodiversity across Canada, which is changing and which will undergo very great change along with climate change.

The fact that we have not yet seriously addressed the Kyoto issues has made us miss absolutely important opportunities. Some businesses and industrial sectors have been very proactive, as the chemical sector has shown us. Unfortunately, we are not equipped to recognize the progress achieved in that area.

Some companies are conducting research and development on CO2 sequestration, enzymatic capture of CO2 and development of more efficient engines, and do not receive research grants, despite the fact they are experiencing financial difficulties and have trouble being globally competitive.

We're working on the development of methodologies to offset greenhouse gases, and, without a defined framework, those methodologies must be recognized internationally because we in Canada are unable to have those methodologies recognized.

For example, we have doubly offset the emissions from the Conference of the Parties last year, and Environment Canada wasn't equipped to validate what we did.

[*English*]

The Chair: Mr. Villeneuve, I would remind you that you're at about eleven and three-quarters minutes. Could you start to wrap up, please?

[*Translation*]

Mr. Claude Villeneuve: Thank you, sir.

So these are missed opportunities, not to mention the carbon market.

I'd like to close by saying that uncertainty kills the economy. Clear rules make it possible to integrate costs. I would especially like to call on committee members to consider one thing: I've been a grandfather for two months, and you're playing with my granddaughter's life.

Thank you.

[*English*]

The Chair: Thank you very much.

We'll begin with Mr. Godfrey and Mr. Silva.

● (0955)

Hon. John Godfrey (Don Valley West, Lib.): Thank you very much, everybody. It was a most helpful session.

I have two questions, and these are addressed to Messrs. Stone, Rutherford, Kovacs, or Villeneuve, whoever wishes to answer.

My first question relates to Mr. Paton's presentation in terms of the difficulties he sees in moving in a way that responds to the urgency you describe. I would like to know what your reaction is to his difficulties or the case he made, in terms of how the two balance off —the urgency you describe and the problems he describes.

The second question relates to the bill we're studying, Bill C-288, which is simply an attempt to increase accountability in terms of our obligations under Kyoto. Imperfect though Kyoto may be, do you think this is a helpful way of increasing the urgency of our response to the urgency of the problem you describe?

I'll turn it over to whoever would like to respond from among the four I asked.

Mr. John Stone: I will try, with some trepidation. I am not an economist.

The issue, in my view, is climate change. As Dr. Villeneuve said, Kyoto is a first small step. Tackling climate change requires long-term, medium-term, and short-term targets and actions. As Professor Villeneuve mentioned, if we want to stabilize the climate, it's going to take a reduction of between 60% to 80%.

Kyoto can be interpreted as giving guidance to short-term actions. It provides us with the chance to experiment, to learn. It gives a signal, and with the right amount of will and political instruments, it allows us to attempt to in fact meet those commitments.

Finally, just to conclude, I will mention the example of British Petroleum. A year or so ago, I was invited to visit them to talk about climate change and the science of it. John Browne is the chief executive officer of British Petroleum, and in the mid-1990s he committed British Petroleum to return their emissions to 1990 levels by 2010. They achieved it in 2001, and they added $600 million to the value of the company.

Thank you.

The Chair: I would ask our panel to keep the answers as short as they can, just so we get the maximum number of questions.

Dr. Rutherford.

Mr. Ian Rutherford: I really do not have a lot to add. Like Dr. Stone, I'm not an economist; I'm a meteorologist. I'm quite willing to comment on the science, but I would not really want to comment on the economics of trying to do this, that, or the other thing. I would leave that to the economists.

The point is, though, that there is an urgency to act, and to act quickly, unless you're willing to accept the consequences of longer-term, built-in climate change going on for centuries. That may be a decision that society would want to take, but that's not for me to say. All I can say is that the science tells us that if we continue on the path we're on, there will be certain consequences.

I'm fully cognizant of the difficulty of shifting a human economy that is so energy-dependent to other sources of energy or becoming less energy-dependent. On the other hand, I'm struck by the fact that Mr. Paton mentioned that some industries have already met or exceeded the Kyoto targets. In fact, they're distressed that they're not getting credit for doing so. They're not that difficult to meet, at least in certain sectors. It's understandably difficult for Canada, as a country with a highly energy-intensive economy that is growing, to meet them. But our energy sector is not only growing, it's producing increasing amounts of greenhouse gases, and that is a major problem that has to be dealt with in this country.

Whether meeting Kyoto is a good first step or not, I'm not sure. I think we have to do far more and we have to do it more quickly. I'll leave it to others to figure out how we do it.

Thank you.

● (1000)

The Chair: We'll go to Mr. Kovacs.

Mr. Paul Kovacs: If I can speak very briefly to the second question, I am an economist. I guess economists speak on most issues or something. I'm not quite certain what the reference to the profession is about.

I believe very much that it's good economics to set targets and measure performance against targets. I think it's good politics as well. The spirit of Bill C-288 to do that is a very positive thing. I only remind the committee that in addition to Canada ratifying Kyoto, Canada also ratified earlier the Framework Convention on Climate Change. I think that's actually a more important document, and that was much of what Professor Villeneuve talked about.

The bigger goal is the climate change convention. It deals with issues like adaptation and another set of issues, including informing the public about progress. To measure progress against the climate change convention would actually contribute more to this issue.

Thank you.

The Chair: Mr. Villeneuve, we'll go to you right after I ask Mr. Silva to pose his question, please.

Mr. Mario Silva (Davenport, Lib.): The issue of math and the costs and economics have certainly been raised by Mr. Paton, but also by others. Mr. Kovacs was talking about the insurance industry and others who are also quite alarmed about where we're going if we don't act.

It's not that we're not concerned about manufacturing; of course, we are. But at the same time, we realize that if we don't have an economically sustainable environmental policy at work that is also in partnership with world economies and world leadership—the first step is the Kyoto Protocol—then we will not have an economy in the future.

I was speaking just yesterday with a member of Parliament from Tanzania who was talking about the problems with a light shortage in her country. I was a bit confused, because I was talking about the melting of the glaciers on Mount Kilimanjaro, but she was talking about the fact that the hydro power they use for their electricity is drying up. There is no more water in their lakes, no more water in their rivers, and it's having a dramatic impact on Africa.

So the actions we take in Canada have an impact around the globe, and that's what we're not seeing, the devastating cost, not just to our environment but to economies throughout the world. If we, the rich countries of the world, are not prepared to start living up to our obligations, how are these other countries, who are receiving the negative impacts of our lack of decisiveness, going to be able to manage this?

There is a cost, but the question is, where do you measure the cost? You can measure the cost right now, just one specific sector, or you can measure the cost in terms of the impact it will have on the whole country within the next ten years, or what impact it already has around the world. There's a huge financial cost, in the billions of dollars, maybe the trillions of dollars, and we have to look at it. It's not just the immediate costs we have to be focused on.

It's a comment, but maybe somebody else would like to add to it.

The Chair: Professor Villeneuve, we'll give you a chance to start.

[*Translation*]

Mr. Claude Villeneuve: Thank you very much.

There are a number of factors. The first concerns costs. I'm not an economist either, but the life cycle approach absolutely has to be put forward.

The life cycle approach enables us to establish, from the cradle to the grave, the costs incurred by production or for an activity, not only economic costs, but environmental costs as well.

In the field of climate change, the guilty parties are rarely the first victims, which is an enormous problem as regards responsibility. That's why elements were put in place with regard to responsibility and fairness in the UN Framework Convention on Climate Change, and in which an attempt is being made to apply the precautionary principle.

The second comment I'd like to make concerns the carbon market. That market makes it possible to make adjustments within countries and between countries, and within industrial sectors and between industries, so that we can change reductions, make lower cost reductions available to everyone in a single market. So this market is one of a number of very powerful instruments and absolutely must be put in place so that we can hope to achieve Kyoto Protocol targets and go even beyond Kyoto, if we want to control the problem.

In closing, I'd like to comment on the bill. This bill would have been excellent if it had been introduced in 1998.

Some hon. members: Oh, oh!

Mr. Claude Villeneuve: Today the bill can't be valid if the tools to achieve the desired ends aren't available. So an enormous effort has to be made upstream from the bill to provide the accountability and audit tools.

Environment Canada only began to train auditors last summer. In Canada, there may be perhaps 200 to 250 trained auditors, which is clearly inadequate at present.

The bill must also contain a vision that goes far beyond the Kyoto Protocol and does not stop at the 2008-2012 reference period.

The bill must also separate export-related emissions from domestic consumption-related emissions.

Lastly, the bill must make reference to the life cycle approach. Let's take ethanol as an example. Everyone wants ethanol put into gasoline, but if you attribute emissions reductions to the ethanol that you put in your engine and the production of that ethanol causes more emissions, you won't be improving your national performance.

● (1005)

[*English*]

The Chair: Thank you, Professor Villeneuve.

Again, I remind our witnesses to please try to keep your answers as short as possible.

Mr. Bigras.

[*Translation*]

Mr. Bernard Bigras (Rosemont—La Petite-Patrie, BQ): Thank you, Mr. Chair.

This morning, it's not the presentations and statements of the scientists and meteorologists that surprise me, but rather those of the industry. During his presentation this morning, Mr. Paton told us that we needed a long-term strategy that takes economic analyses into account; that the Kyoto Protocol objective can't be achieved without purchasing international credits; that the entire strategy regarding the Kyoto Protocol must take into account a cost evaluation in order to achieve objectives.

I'm a bit surprised to hear that. We could conduct an economic analysis of the effects of achieving the Kyoto Protocol objectives, but I think we should also do an evaluation of the costs associated with not complying with the Kyoto Protocol. I think the British study released last week, which puts the cost of climate change at $7 billion, must be weighed as well. When we talk about a nearly 20 percent reduction of global GDP, I think these are also economic analyses that have to be taken into consideration when public administrations are required to make decisions.

I put the question to the industry because its record is good. A 7.4 percent reduction in greenhouse gas emissions is similar to that of Quebec's industrial sectors. Wouldn't it be in your interests to promote the Kyoto Protocol and for the progress that you've made to be recognized in the form of offset credits in the approach that should be presented to Canada? As Mr. Villeneuve said, in a domestic carbon market, I think you'd have every interest in selling the credits you've achieved to other industrial sectors, probably the oil sector, which doesn't have the same footprint as you. Wouldn't you have an economic interest in the Kyoto Protocol being reinforced?

[*English*]

Mr. Gordon Lloyd (Vice-President, Technical Affairs, Canadian Chemical Producers' Association): I'll respond to that.

One of the concerns is, what will be the impact on the economy as a whole? There are two ways to meet Kyoto. One is by actually reducing emissions, and that's what our sector and manufacturing have done. We've done even better than the minus 7% that manufacturing did; we've done over 50%.

As a whole, Canada won't be able to do that. As a number of the speakers have said, it's just too late. Using the figures of the previous government from their green report, our emissions gap was estimated at 240 megatonnes in 2002. Then they talk about how the economy has increased. The emissions gap is more likely in the range of 270 megatonnes and could be greater. It probably has increased since then.

So it's not really economics; it's just simple mathematics. We have at least a 270-megatonne gap. The cost is $20 a tonne. In the short time still available, we aren't going to be able to address this, other than by going to credits.

There will be some sectors, such as ours and manufacturing, and some provinces, such as Quebec, that will achieve the Kyoto targets. But as an economy, as a country as a whole, we won't. We will have to send billions of dollars abroad, and that's not good for the economy.

What we're arguing for is the recognition that we're going to do a lot better, if we can recognize that our improvement in environmental performance is tied to new investment. I think the chart, which we tabled, shows that.

There aren't that many things the Canadian government can do to attract investment here instead of elsewhere. We can't do too much about the dollar, and certainly we can't do too much about what's happening in the Middle East, China, or India. But one thing the government could do, which we hope all parties would support, would be to improve capital cost allowance provisions. This would be something that money could be used to invest in, that would be returned later in taxes, and that would get us the kind of new investment that would help improve our performance.

Over the medium and long term, this will drive intensity improvements that can probably reach reductions and absolute reductions. Our sector's experience shows this.

But as a lot of the people have said, it's short, medium, and long term. In the short term, it's just too late, unless we send all this money abroad, which doesn't make sense.

● (1010)

[*Translation*]

Mr. Bernard Bigras: I'd like to know what the industry thinks of a carbon market in Canada. In view of your present strategic position, with the figures you've presented to us today, wouldn't there be an economic interest, from a sustainable development perspective, in taking part in this type of carbon market? You'd also be enabling Canada to move toward its Kyoto Protocol objective, while making economic gains. You seem to be telling us that the environment and the economy don't go together, whereas the carbon market aims precisely to make environmental gains in a regulated free market.

Mr. Claude Villeneuve: I'd like to speak on that point.

[*English*]

The Chair: We'll go to Mr. Paton first. Then we'll go to Mr. Villeneuve.

Mr. Richard Paton: I know a carbon market is a very innovative idea, but let me make two points about it.

First of all, it can't be domestic; it has to be international, because with the gap we have in this country, we're all going to be buying from somewhere else.

Second, to establish a carbon market you have to understand what it would take to make it happen. It's literally the equivalent of setting up a completely new economic system in this country. It is an absolutely huge and very complex endeavour that has been understated tremendously by people arguing that this is the magic bullet.

You literally have to decide on numbers for every plant in this country. That means the federal government—and it will be the federal government, Mr. Bigras, so this is going to be a little bit of an issue for you people—will have to go into a plant, Patrimoine Québec, and decide on the level of emissions it should have, because if you can't set a number, you have no differential with which to trade.

That means an unbelievably heavy hand of government. Some people would argue you need to do that, given all of the science. I haven't seen government do a very good job on these kinds of things. It would take literally years to even understand our sector and our companies. The chance of setting the wrong number is probably more likely than setting the right number, so that would likely result in driving investment out of the country to countries that have less environmental performance.

On the last point, Mr. Bigras, you've seen these numbers. I know you have the same arguments for Quebec. We haven't received one single bit of credit for this since the climate change discussions started, so I don't believe we'll get any credit, and I don't believe we'll have anything to sell. We'll just end up with higher numbers, and in fact that is exactly what happened. We ended up with higher numbers based on our previous performance.

● (1015)

The Chair: Mr. Villeneuve, do you have a brief comment?

[*Translation*]

Mr. Claude Villeneuve: Yes. The carbon market was based on the SO2 market model, and the difference is unfortunately very great because the SO2 market in the United States, which worked relatively well, is linked to a pollutant that is subject to the same regulation in the same area. Establishing an international carbon market currently represents a difficulty with regard to the setting of ceilings for each industry, which is possible, but which also represents all the recognition of credits that will have to be put on the market to ensure they are unique and that they are additional and so on.

An international standard has been established on this: ISO 14064-2 and 14064-3. In Europe, a carbon market is currently operational, in which each of the industrial sites concerned has received a limit. It's working there.

[*English*]

The Chair: You have about half a minute, Mr. Bigras.

[*Translation*]

Mr. Bernard Bigras: I'd like Mr. Villeneuve to tell us about the impact of climate change in Quebec. I read the report he helped produce: “Adapting to Climate Change.” Could he summarize the impact of climate change in Quebec for us? Among other things, I'm thinking of the Quebec high north and the St. Lawrence, that is all the coastal areas. Could he briefly summarize those effects?

[*English*]

The Chair: Mr. Villeneuve, you have about fifteen to thirty seconds to do that. Possibly you could provide Mr. Bigras and the committee with details, but just very briefly reply to his question, please.

[*Translation*]

Mr. Claude Villeneuve: The issues are enormous, particularly for the coastal area and northern Quebec. As regards the St. Lawrence, the river could disappear in the medium term.

[*English*]

The Chair: Thank you.

Mr. Cullen.

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

It seems that part of the elephant in the room, if we're going to take a look at the CCPA and at manufacturing in general in Canada, is that when we talk about the implications, today we're trying to understand the implications of what this bill and law would look like and what this would mean. I know in future testimony we'll have more of the economic analysis. I think this is critical. This is the joining of the environment and the economy in some fundamental way.

Why is credit for early action not being considered, Mr. Paton? What have you heard from government—this government and the previous one—as to why that's not on the table?

Mr. Richard Paton: If you take a look at these numbers, for us and for manufacturers, which are about 17% of the total of the amount the previous plan tried to reduce of industry, either 45 or 55 megatonnes, if you actually recognize this contribution, you're now 17 megatonnes short. You have to find it somewhere else, and you're going to find it from oil and gas, or you're going to find it from electricity, or you're going to find it from consumers. The target structure sets up a zero-sum game, and by recognizing anybody's performance, you penalize others. It's the same issue that Mr. Bigras has for Quebec.

It has been in the interests of government not to recognize performance, because the penalty for others would have been higher. That's why we included it in the charts, and also the graphs that were put in the Environment Canada submission. If you start looking at what consumers are as a piece of this problem, it's fairly significant, either in driving their cars, heating their homes, or using various products. That 17-megatonne burden would probably shift to either one of the other sectors or to consumers. Frankly, I don't think governments have wanted to deal with these realities. It's easier to say that industry is a problem. It has been easier to ignore the fact that manufacturers have already met Kyoto. We've always argued, "Give us the Kyoto numbers, thank you very much, for 1990. We'll take them right now." But nobody has ever given us that number. It has been 2001 and 2003, and nobody has ever given us that number.

● (1020)

Mr. Nathan Cullen: Is it not a false argument, though, to suggest that it's some sort of tug-of-war between consumers and the producers of those goods, whether it's energy or whether it's a manufactured good, in looking at this bill, because at some point what this bill calls for is that the government formulate a plan to meet our Kyoto targets? Now you've raised the spectre of international credits as being the way to do that, but it seems to me a false positive to suggest that it's either the consumers' or the manufacturers' fault.

A consumer, in consuming electricity, will consume the electricity available to them. If government has set policy that has supported dirtier pollution, why is it suddenly now between the consumer and government where the fight exists, rather than government and the industry providing that energy?

It seems to me—and I guess this is advice to the clerk and committee—that if we don't have the energy sector come before us while studying this bill, this is not a complete study. Would you agree with that?

Mr. Richard Paton: Yes.

Mr. Nathan Cullen: Mr. Villeneuve.

[*Translation*]

Mr. Claude Villeneuve: I say the same thing.

It's true, the energy sector is absolutely essential. We also have to question the limitation on energy responsibility by province. Very effective interprovincial actions could be taken. For example, in terms of greenhouse gas reductions, it would be much more effective to use wind energy produced in the Gaspé and to shut down the Belledune thermal power station than simply to add it to Quebec's stock.

There are major interprovincial difficulties to be resolved in that area, but until you've conducted a genuine analysis of the energy sector and of the energy sectors in Canada, you won't be able to take the bull by the horns.

Mr. Nathan Cullen: Thank you very much.

[*English*]

I have a question for Mr. Kovacs. You raised the case of Florida for a moment, which I think has been rather instructive, both for your industry and on the adaptation question.

A number of insurance companies have simply gone out of business or left the state, in terms of insuring certain residential properties, and they've now included some state insurance to cover off some of the higher-risk properties. It's therefore a general public subsidy of a risk taken by a private homeowner, which is an interesting scenario for a Republican governor to undertake.

But allow this. Is there not also a question of where it is that we are building these properties and what risk we are taking in the actual development of our economy? I am thinking of the Lower Mainland in Vancouver and places we know to have a certain climate risk factor to them. It's not terminology that I think we use.

Is your industry doing anything with this on the more progressive side, suggesting to homeowners and businesses—two fronts, two questions here, one to the homeowners in specific terms—that if you build a property in what we consider to be a risky area with respect to climate change, you will be penalized by higher rates? On the business front, to businesses that you believe are susceptible to climate change—the forestry sector and others who don't have a climate change strategy—do you then incorporate some of those influences in the way you set out your terms and policies?

Mr. Paul Kovacs: I have a three-part answer.

First, the insurance industry is investing heavily in research. Our institute is part of that program. At the University of Western Ontario we have a wind tunnel. We put up a model home, we blow the roof off, we put it on better, we blow it off again. It's quite exciting; it's engineers destroying things but learning from the process.

Some of the application of that is in the new building code. In Florida, the damage to new homes was half the damage to old homes. We hope with the next generation of research that we can take it to a quarter or one-tenth the damage that happened to the older homes.

We're trying to improve the building code. We're trying to give the improvements to the Government of Canada, and we're trying to give them to the American government and others to make part of the code for the next generation of buildings. So one part is research, and the insurance industry is investing in research.

The second part is that insurance practices are reflecting the new knowledge. In areas with higher risk, the price goes up. In areas with lower risk, the price goes down.

To give a Canadian example, the most costly insurance event in Canada was the 1998 ice storm. The insurance response to it was that it was a very bad storm, but there's no real evidence that there are more ice storms; we haven't had one since. There was no change in the cost of insurance because of that storm.

In Florida, the hurricanes were modelled to predict that the damage to the insurance industry could be $6 billion. The new models are saying $60 billion. They were really missing the number with their research, so the cost of insurance for people on the coast has gone up quite dramatically in Florida. Where there is new knowledge, there are big changes in insurance practices.

One of the challenges, as you've described, in the American market is that there has been quite a bit of government interference in it, and while the industry would like to say to business and to homeowners, “If you choose to live in a very risky area, we may choose to sell you our product, but we have to charge a fair price for it”, some governments weren't willing to permit that, and they intervened and didn't allow the price to get to the market level. That led to lack of availability in some markets, etc.

Finally, the industry in most parts of the world is having a very active dialogue with government: “If you want the industry to be the private market in looking after the risk of wildfires, heavy rain, strong winds”—most of the things that are in the Canadian market.... Flood is really the only climate element homeowners can't get insurance for; for most other things they can. “If you want the insurance to stay in those markets, government, have you thought about what role the insurance industry is supposed to play, or not?”

In Canada there's not really an active dialogue going on, as there is in several other countries, about what we want the insurance market to do and what we don't want it to do, and how Canada wants to handle the damage from a flood, which insurance does not cover.

● (1025)

Mr. Nathan Cullen: I'll just add a question to that. In the government's recent climate change plans, how heavily involved was the insurance industry in guiding some of the principles set out in that plan?

Mr. Paul Kovacs: Most of the efforts by the government have focused on emissions. The insurance industry is a tiny fraction of one percent of emissions. It doesn't have very much to contribute in a dialogue about emissions.

The industry is on the front lines on adaptation. It's helping Canadians clean up after these storms. The industry has regularly written to the government to talk about adaptation. There just is no dialogue going on about adaptation. The industry would love to talk to the government about adaptation.

The Chair: You have about a minute left.

Mr. Nathan Cullen: Thank you.

I have a question for Mr. Rutherford or Mr. Stone. Is not part of the impetus for a bill like this that it be a contribution to Canada's international reputation and ability to negotiate the second round? As Mr. Villeneuve says, this is a dress rehearsal.

Kyoto, as dour as industry painted it to be, was not actually what is needed. There's something quite a bit more.

Is there not some effort to re-establish Canada's battered image with respect to climate change?

[*Translation*]

Mr. Claude Villeneuve: If we go back to the example of a hockey practice, Canada is arriving at a rink where it has agreed to play, but it's six foot four and it only has size five skates. Obviously, for its first practice, it can't be very comfortable with regard to the Kyoto Protocol. However, if Canada doesn't agree to be proactive and show real effort — if it makes any — it won't make itself credible by saying that it doesn't want to play in the league.

Canada's environmental reputation has constantly declined since 1992. Canada is currently taking a very hard hit at the international level because of its performance over the past two years. Even though the last UN conference, which was held in Montreal, showed a glimmer of light, that's been very quickly forgotten. A great deal was made of the result in Montreal, even though it was a very small result.

[*English*]

The Chair: Mr. Stone, maybe you can pick up on the next answer very briefly.

Could we go to Mr. Warawa first, please?

Mr. Mark Warawa (Langley, CPC): Thank you, Mr. Chair.

I'll be sharing my ten minutes with Mr.Vellacott.

I appreciate the comments from each of the witnesses here today. Dr. Stone and Mr. Rutherford started with the science of climate change. I think we all agree we've moved beyond that. There is a sense of urgency. We are experiencing climate change, and what we're looking for are solutions.

Mr. Rutherford recommended that we have to be efficient and look for efficiencies. He also said that you'll leave it to others to figure out how to do it, but you're challenging us.

What we have today is that the Government of Canada has introduced Bill C-30, our Clean Air Act. It will likely be going to a legislative committee where it will be dealt with. Here in the environment committee we are dealing with Bill C-288, a private member's bill introduced by Mr. Rodriguez.

I find it interesting that Mr. Villeneuve made the comment that Bill C-288 would have been a good bill in 1998, but it's too late. The response to that from the Bloc and the Liberals was laughter. We do have urgency; we are looking for solutions.

On Saturday I was at a town hall meeting. There was a discussion very similar to what we are experiencing here this morning. There was a feeling of urgency within Canadians on climate change and a desire for the Government of Canada to do something immediately, mid-term, and long-term.

My questioning will be directed toward recommended actions we can take that will be effective and efficient.

Mr. Villeneuve talked about the ten tonnes of reduction per person to meet the targets being suggested here. Mr. Villeneuve, could you elaborate on the ten tonnes per person? You said it's impossible to achieve.

● (1030)

[*Translation*]

Mr. Claude Villeneuve: Yes. It's very simple. Canadians, in their everyday lives, aren't the cause of emissions of this size in the domestic market. Canadians' day-to-day activities emit between six and 10 tonnes, depending on the province, but the remaining tonnes making up the 20 tonnes that we emit are associated with exports. For example, one tonne of aluminum — in Quebec, we produce five percent of the world's aluminum — adds four tonnes of greenhouse gases to our footprint. Every time we export a tonne of aluminum, we have to offset an equivalent of four tonnes of CO2. The same is true for the oil sands. The oil that is extracted from the oil sands does not remain in Canada. If we want to impose this 10-tonne reduction on Canadians, they'll have to achieve zero tonnes. In actual fact, the burden can't be imposed solely on the public. That's why I was talking about an empty country. “Empty country” means that our position as an exporter is disadvantageous relative to the size of our domestic market, particularly since our main customer, the United States, has no emissions limits and therefore, in terms of competitiveness, can't help us offset by paying for the emissions for which it's responsible here at home.

[*English*]

The Chair: Mr. Stone.

Mr. John Stone: Thank you very much, Mr. Chairman.

I have a couple of points to help with this discussion.

As I said earlier, I was a federal civil servant for a long time. I was actually part of some of the negotiations and policy development. I can remember at least seven years ago having some discussions on the carbon market and the cap in trade. My sense is that we have a very good idea of what we need to do. There are some difficult decisions that have to be made, such as setting particular caps for certain industries or sectors, but we really have a good idea of what we need to do. The U.K. and Europe have moved ahead and actually put a carbon market in place.

Secondly, responding to Mr. Cullen's comment, yes, indeed, Canadian credibility has taken a bit of a bashing recently. It wasn't always the case. But I would put it much more positively. I believe we have the ingenuity in Canada to address this issue and tackle it successfully. Technologically, I think we have many of the technologies we already need. I was at a conference recently in Ottawa, at the Chateau Laurier, where there were a large number of industry types talking about what they were able to achieve and why it was in their interest to achieve it.

I think if you look at the national round table's recent report—

● (1035)

The Chair: Excuse me, Mr. Stone....

Mr. Mark Warawa: Mr. Stone, I'm sorry, I've run out of time.

I'll have to pass it on to Mr. Vellacott to give him adequate time.

Thank you.

Mr. Maurice Vellacott (Saskatoon—Wanuskewin, CPC): How much do I have left, Mr. Chair?

The Chair: You have four and a half minutes.

Mr. Maurice Vellacott: The interesting thing that I picked up from a comment you made, Mr. Paton, in terms of the billions of dollars required, was that every $1 billion manufacturers invested in new technologies and structures between 1990 and 2003 resulted in a 0.2% annual reduction. There's a need, obviously, for technology. I think that was the underlying point here.

So I say this kind of tongue-in-cheek here that I assume, then, that the CCPA was not making big moves in terms of converting to income trusts with the need for technology and that kind of stuff. I'll just leave that hanging out there on the record, because I do believe there needs to be capital infused into the technology if we're going to get some major gains in manufacturing, in chemical, in terms of energy, oil, and so on.

I have just a few comments, though, because I want to get to the heart of my question, which is the whole matter of setting targets and getting credible, realistic targets. I'll set you up with a few quotes here, first off by no less an individual than Michael Ignatieff.

He says, “As a practical matter of politics, nobody knows what (Kyoto) is or what it commits us to.” He also said, “Kyoto allows polluting countries like Canada to meet its objectives by buying credits from countries emitting less carbon dioxide. We'll clean up Kazakstan, but we won't clean up downtown Toronto.” And “Despite efforts by the previous Liberal government to curb emissions growth, Canada cannot now meet the Kyoto target of cutting greenhouse gas emissions to 6% below 1990 levels between 2008-2012 without spending billions of dollars buying emissions credits from other countries.”

He goes on to say at another point in the *Globe and Mail* that Canada is not on track to meet its commitments under the Kyoto Protocol.

I just want to get to something very basic here. As a father of four children, as a grandfather to five, when I make commitments and promises to my children or others within the family configuration, there is an impact in terms of what I say.

So my question is this, and I'll set it up this way. If I were to say to my children or my grandchildren—and that's more difficult to do, because they are at the other end of the country in Saskatoon. If I were to sit those four children down—two of them are married, but there are five grandchildren—and say, "I'm going to spend two hours with you every night, doing what you want to do, a family time kind of thing every night, with each one of you separately...." So we get into this, and it's obvious pretty soon that I'm not able to keep that commitment. I guess, for one, I destroy a trust and credibility. I hurt the relationship, I think, by making those kinds of promises. It's obvious that I can't keep those commitments.

Our party, the Conservative Party, is actually interested in and willing to take action on clean air in terms of greenhouse gas reductions as well.

So my question, in a philosophic sense, is to several of the presenters—Mr. Villeneuve, Mr. Paton, Mr. Rutherford. When we make commitments of the unrealistic sort that we did in Kyoto, what is the net effect in terms of our credibility, our trust relationship with other partners internationally, across the world stage, and so on, when you set those unrealistic targets, as acknowledged by Mr. Ignatieff and others? Those are the kinds of targets that are emphasized in the Kyoto Protocol and also in Mr. Rodriguez's Bill C-288.

What, philosophically, is the impact of making unrealistic commitments like that?

The Chair: Can we do a shotgun shoot on the answer, please?

Go ahead, Mr. Villeneuve.

[*Translation*]

Mr. Claude Villeneuve: Thank you.

It's the same as when the promise was made to allocate 0.7 percent of gross domestic product to aid for developing countries. The promises that come from wishful thinking at the international level come back very regularly. I refer you to the objectives of the Millennium, the Rio Convention and the Johannesburg Convention.

● (1040)

[*English*]

The Chair: Mr. Paton.

Mr. Richard Paton: I think the fatal flaw in what we've done here is that we set a target that had no basis in any kind of analysis or reality. And I really enjoyed Mr. Villeneuve's insights. His point about the export issue versus domestic issue is a very good example of how we didn't deal very well with this issue.

Basically, as everybody knows, we set a target to look better than the United States—and with no one else's. Since then, we've been trying to build a system to deal with that target. It has resulted in basically ten years of wasted effort. If we had started from figuring out what our economy is like, how we're producing greenhouse gases, what we can do in terms of technology...saying, let's encourage capital investment turnover, let's get consumers involved—because consumers are a big part of this, even though the initial plan back at ratification, as Mr. Mills would know from his hours in the House, totally ignored consumers. It basically said, "It's not your problem. You don't have to worry about it."

So starting from the very beginning, this process had a problem. We started with a target that did not make any sense for our country and had no link to action. Repeating that in this bill is not going to help.

The Chair: Mr. Rutherford or Mr. Stone.

Mr. Ian Rutherford: I just want to make a general comment. The climate science community was fully behind Canada's participation in the Kyoto Protocol in the beginning when the protocol was set up.

It never saw it as dealing with the climate problem in any substantive way. Canada only contributes 2% of greenhouse gas emissions, so if we met our target it would have made a small contribution to the overall global effort. It was always seen as more of a symbolic issue, in that if Canada cannot do its part, how can we ask other countries in the world, particularly developing countries, and in some sense Canada is a developing country because we have a rapidly developing economy.... How can we talk to them credibly if we don't do that?

Unfortunately, many of the measures that were necessary in order to meet those targets were not put in place, but it's not correct to say that there were no measures for consumers. We did have various programs to convince consumers to reduce their personal emissions of CO_2 by one tonne, which is I guess 10%. So consumers were asked to do 10% of what they should be doing. The country was asked to do 7%, or whatever the overall target was. The manufacturing industry did its part. The chemical industry did its part. Somebody else didn't, so I think it's up to you folks to figure out who didn't and get them to do it.

The Chair: Mr. Rodriguez.

[*Translation*]

Mr. Pablo Rodriguez (Honoré-Mercier, Lib.): Thank you, Mr. Chair.

Mr. Rutherford, sometimes we hear certain people say that it's hard to predict the weather for tomorrow or next week; how then can we predict the impact of climate change in 20 or 30 years? What do you have to say on that subject?

Mr. Ian Rutherford: I'm very pleased to ask that question because it's very easy to answer.

[*English*]

I'll switch to English, if you don't mind.

We're talking about two different kinds of problems in physics. There's an initial value problem and a boundary value problem. Weather prediction involves knowing accurately the initial conditions and extrapolating forward in time to impute the details of a weather forecast.

Climate is the statistics of weather where you do a lot of averaging over time. Climate predictions are made without any initial data. Data is only used in order to verify the predictions made by a climate model, which are made *ab initio* from pure physical principles. You model the earth, the atmosphere, turn on the sun, compute the physics of energy transfer, the circulation starts up, the atmosphere starts up very quickly, and the ocean takes a lot longer to start up. You actually simulate the climate from first physical principles without any data at all; data is used only to determine certain coefficients and parameterizations and to verify the results after the fact.

So people who make the statement that we can't predict the weather even, let's say, ten days in advance, so how can we possibly predict the climate a century in advance are talking about apples and oranges. Furthermore, the fact is we can predict the weather ten days in advance, and it is through the use of this numerical weather prediction model that we've been able to do that.

When I started my career as a weather forecaster, we couldn't make a prediction beyond about 36 hours. We didn't even try. Weather predictions for ten days now are as accurate as they were for a day and a half back in the sixties when I started in this business. That's all due to being able to model what's actually going on and solving the initial value problem.

Climate people solved the boundary value problem where they changed the content of the composition of the atmosphere, the energy coming in and going out, and other parameters like that. It works.

● (1045)

[*Translation*]

Mr. Pablo Rodriguez: The science of climate change works and should be trusted.

Mr. Ian Rutherford: I think so.

Mr. Pablo Rodriguez: Mr. Paton, you say that the delay in implementing the Kyoto Protocol could cost between $4 and $6 billion a year because we would mainly have to buy international credits. So you're saying we shouldn't do that, that that's way too much money.

In your view, how much money would it be appropriate to spend to preserve our children's future?

[*English*]

Mr. Richard Paton: I can't answer that question. I would say, though, that what we should be aiming for is good policy here and expenditures that improve environmental performance and that improve our economy. That's long-term sustainable improvement.

Buying credits will do neither. It will neither help our economy nor help our environment. If we did all of that and at the end of 2012 we looked at our environmental performance and said, it's not very good, why is that? We spent all our money buying credits from somewhere else.

The objective in Canada should be to get the best possible environmental technologies and economic performance at the same time. I believe it can be accomplished. We've shown that it can be accomplished.

[*Translation*]

Mr. Pablo Rodriguez: I don't understand how you can say this amount is too high if you won't say what amount would be acceptable.

Mr. Claude Villeneuve: I'd like to speak on this question.

[*English*]

The Chair: We have just one minute left for this round.

[*Translation*]

Mr. Claude Villeneuve: The question of purchasing international credits is entirely relevant, but it's forgotten that an enormous number of domestic credits have been neglected on small projects based in the communities. In fact, that money will increase our GNP because it will be used in Canada by Canadians for the local economy. This potential has been completely overlooked. But there's enormous potential here.

As regards the purchasing of international credits, there's another important factor. I'll cite, among others, the case of Biothermica, which is currently ready to negotiate on the 10-million-tonne market that comes from action that's been taken outside Canada. That 10 million tonnes is entirely acceptable, and it would be unfair for the businesses that carried out clean development projects outside Canada not to be able to have those credits recognized in the market.

[*English*]

The Chair: Go ahead, please, Mr. Harvey.

[*Translation*]

Mr. Luc Harvey (Louis-Hébert, CPC): Mr. Stone, you mentioned the increase in global warming over the past 50 or 100 years. Is that correct?

[*English*]

Mr. John Stone: Yes, you understood correctly. Being part of the IPCC and in my job in government I've actually worked with and have sat with scientists who have done these calculations and these experiments, and I've rigorously questioned them. In the end, I've been convinced that they're right. In fact, we have seen the change of the climate, in temperature particularly. It's outside of normal variability, and the only way we can understand it is by invoking the effects of greenhouse gases on the climate.

[*Translation*]

Mr. Luc Harvey: Having regard to the demographic increase — we know that the world population is several times more than what it was in 1900 — and to technological means, vehicles and our habits and so on, and if we consider that there was already a climate change 100 years ago, to what extent should our CO2 emissions be reduced in order to achieve neutral warming or even a cooling of the Earth?

● (1050)

Mr. Claude Villeneuve: If you'll allow me to speak, it's necessary, to stabilize emissions — we're not even talking about cooling — so that the climate stabilizes at a level two degrees warmer than the current climate, for another three centuries, we would need a reduction of 1.8 tonnes of carbon, that is to say the equivalent of approximately five tonnes of CO2 a year per inhabitant of the planet, until 2050-2060, in the event it would be possible to sequester carbon and to use other means to stabilize the amount of emissions. That would mean a doubling of the pre-industrial concentration. That quantity corresponds to roughly half of what is emitted by a Quebecker each year or to one-third of what is emitted by a Canadian in general. That's a relatively imprecise measurement, but that's the order of magnitude that the studies are currently giving us.

Mr. Luc Harvey: Earlier Mr. Paton talked about the technology that's not available. We can well spend billions of dollars, but do technologies for solving the problem exist?

Back home, I installed a geothermal system that cost me $20,000. I did it because I believed in it. Are there still solutions for the main industrial sectors, such as transportation? Would the idea be to put all the trucks we see on the road on a train and to transport them from one place to another?

Mr. Claude Villeneuve: No. In 2005, a professor at Princeton demonstrated that it was possible to achieve the objective with existing technologies and by blocks of one billion tonnes of carbon emissions avoided. I refer you to a publication that I surveyed on pages 314 and 315 of my book. To summarize briefly what it states, there do exist technologies that are applicable in the very short term.

[*English*]

The Chair: Mr. Villeneuve, can I just go to Mr. Paton? The time is just about up and we have another committee coming in. I know Mr. Paton is anxious to answer that.

Mr. Lloyd.

Mr. Gordon Lloyd: Some of the technology breakthroughs will come. We don't know when they'll come. Companies are always working on the type of process change DuPont did in making nylon. They make huge profits when they come through. They're great energy efficiency breakthroughs.

When will they come? It's hard to predict. That's why the issues of short-, medium-, and long-term approaches are so important to this, and why it's so important to have focused improvement on new investments in capital stock turnover. We could also do continuous improvement, and that's the kind of 1% a year we do, absent the major technology breakthroughs.

So it happens in our sector. We're looking at how we can capture carbon, as are other sectors, and that will come on board when it's ready. Maybe the technology investment fund that was part of the previous government's proposal—I understand it's also part of the current government's proposal—can be helpful in that. But it's hard to predict exactly when these things will come on board. They involve research and development, and we have to take a long-term, a medium-term, and a short-term perspective.

The Chair: Monsieur Lussier.

[*Translation*]

Mr. Marcel Lussier (Brossard—La Prairie, BQ): Mr. Villeneuve, I'd like to go back to the position you adopted earlier on the exchange between Belledune and the wind generators in the Gaspé Peninsula.

Is the question of the territorial sharing of greenhouse gas emissions part of your philosophy?

Mr. Claude Villeneuve: The problem with territorial division is simply related to the fact that Canada is responsible under the UN Framework Convention on Climate Change. The provinces have no responsibility or duty in actual fact. As a result, energy management by province is not the best way to reduce greenhouse gas. If we facilitated recognition of reductions that can be achieved from one place to another by monetary offsets, it would be much easier to achieve that type of reduction.

I'll go back to the example that you referred to. Adding wind generators in Quebec does not reduce carbon intensity. Whereas every kilowatt-hour represents 912 grams of emissions in Quebec, it represents 10 grams in Quebec. In New Brunswick, we have 912 grams because we have thermal power stations. By closing a thermal power station to replace it with the corresponding energy from Quebec, we'd achieve reductions in the order of one million tonnes without any difficulty.

● (1055)

Mr. Marcel Lussier: Mr. Villeneuve, and yet, responsibility in Europe is territorial; each country is responsible for...

Mr. Claude Villeneuve: There are two major differences between Europe and us. The first is that Europe has included under its umbrella countries from the former Soviet Union which had already achieved reductions. For example, East Germany had practically acquired half a billion tonnes, which enabled Germany passively to achieve part of its objective. The same is true of Hungary and the Baltic states.

Second, in Europe, every country has a differentiated target under that umbrella, as a result of which, overall, some countries will be able to increase, others decrease. That means that territorial responsibilities are being met and fairness is being achieved between the less developed countries of Europe and the more developed countries, that is to say those that have more trouble with renewable energies and those that have less trouble in that regard. This is an approach that Canada should have adopted from the outset, but about which the people in position at the time had political reservations. This is a subject I won't discuss here.

Mr. Marcel Lussier: You also targeted the Bécancour power station as one of the most polluting stations in Quebec, one million tonnes a year.

Mr. Claude Villeneuve: No. It's a very efficient station, but it's a station that emits one million tonnes. It's the same machine as Suroît. It was planned at the same time or roughly so, but it adds a significant share to Quebec's footprint.

Mr. Marcel Lussier: What do you think about replacing coal-fired stations with natural gas stations?

Mr. Claude Villeneuve: That's a 40 percent advantage in terms of greenhouse gas reduction. Natural gas is the cleanest way to produce electricity with fossil fuels, especially if you can add biogas to the natural gas, purifying the biogas so that it only produces methane. Electricity produced from natural gas can be entirely valid when you don't have the choice to produce it with renewable resources.

[*English*]

The Chair: Mr. Watson, if I could go to you, I'll ask you to pose your question and ask for a written answer. As you can see, another committee is coming in.

Mr. Jeff Watson (Essex, CPC): Very good, Mr. Chair.

I want an answer to the carbon market question. The carbon market is more of a medium- to long-term tool. In the short term, it takes capital away from industries that should be investing in the technology for longer-range improvements in cleaner technologies. I think that's one of the perverse effects of a carbon market, in the short term.

I want that confirmed, particularly for industries like the machine tool, die, and mould sector or the auto parts industry, which are capital poor. That will give a competitive advantage to lower-cost jurisdictions, say China, to have those jobs that are already outside the Kyoto Protocol.

I'd like some thoughts on what a carbon market means for capital-poor industries, in the short term.

The Chair: Thank you very much.

I know, Mr. Lloyd, you'd love to answer that. If you could get a written answer through the clerk, certainly Mr. Watson deserves that.

Thank you very much to our witnesses. Thank you, Mr. Villeneuve.

The meeting is adjourned.

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