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Chair

Mr. James Bezan

Standing Committee on Environment and Sustainable Development

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● (1105)

[*English*]

The Chair (Mr. James Bezan (Selkirk—Interlake, CPC)): Order. We're ready to go.

We're going to kick off our meeting, which is meeting number 32, resuming the study of Bill C-311, An Act to ensure Canada assumes its responsibilities in preventing dangerous climate change. This is pursuant to the order of reference that was given on Wednesday, April 1, 2009.

I want to welcome those who are joining us today at committee.

John Stone is an adjunct research professor in the department of geography and environmental studies at Carleton University.

We also have Francis Zwiers. He is with the climate research division at the Department of the Environment.

We have Louis Fortier, who is scientific director with the Network of Centres of Excellence ArcticNet at Laval University.

Joining us by video conference from Regina is David Sauchyn, research professor at Prairie Adaptation Research Collaborative, University of Regina.

Welcome, all. It's great having all of you here.

I ask that all of you keep your opening presentations to under ten minutes. I will signal to you when we're getting close to ten minutes, if you're pushing it. But to be fair to the committee, we want to have a fulsome discussion in the two hours we have slated.

With that, I'm going to turn it over to Dr. Stone.

Please go ahead.

Professor John Stone (Adjunct Research Professor, Department of Geography and Environmental Studies, Carleton University, As an Individual): Good morning.

Thank you for the opportunity to appear before you. Much of what I have to say is based on the fourth assessment report of the Intergovernmental Panel on Climate Change, the IPCC, although I will provide some updated information where it suggests that the need to act is becoming more urgent. My remarks focus on the long term and the immediate future.

Emissions of greenhouse gases continue to rise and are now growing at 3.5% per year. In fact, emissions for the last few years have been larger than the worst-case scenario developed by the IPCC in their *Special Report on Emissions Scenarios* in 2000. This worst-case scenario projects carbon dioxide concentrations in 2100 of almost four times pre-industrial levels with global temperatures around 4°C. We certainly don't want to go there. The impacts could be catastrophic.

Atmospheric concentrations of greenhouse gases are indeed continuing to grow. Currently, the concentration of carbon dioxide —the most important greenhouse gas—is almost 390 parts per million, which is a 38% increase since pre-industrial times and the highest it has been in almost one million years. The annual rate in increase in the 1990s was about 1.5% per year; it is now close to 2.5%. This carbon dioxide will stay in the atmosphere for many centuries. As it does, it will continue to trap heat and warm the planet.

As a result of these changes, global average temperatures have risen. Global average temperatures are now outside the range observed over the last 1,300 years. The last time the polar regions were significantly warmer than at present for an extended period, there was little ice at the poles, and sea levels were four to six metres higher. What is more troubling is that the linear warming trend over the last 50 years is nearly twice that for the last 100 years. In other words, the closer one comes to the present, the more the rate of increase of global temperatures increases.

There are other indications that climate change may be accelerating. Closer to home—I'm sure Louis Fortier will elaborate —the Arctic sea ice is declining faster than any of our models has been projecting. The reduction in 2007 was unprecedented in the period for which we have reliable, comprehensive measurements. In some estimations, late summer Arctic sea ice could disappear almost entirely within the next few decades rather than by the end of the century, as was previously thought. The ice sheets in Greenland and Antarctica are melting faster than we have seen before, and we have been forced to entirely rethink our understanding of glacier physics. As a result, current projections of sea level rise are as much as twice that reported in the IPCC's fourth assessment report.

All of this suggests to me that we have to act, and act urgently, to address the threat of climate change. Time is not on our side. An explicit long-term goal is regarded as being absolutely essential. Without such a goal, none of us—individuals, businesses, and other levels of government—will have a clear direction for policy and action. Such a goal must be strong enough to stimulate the necessary ambition.

But this is not enough. We also need short- and medium-term objectives. Once each short-term objective is achieved, decisions on subsequent steps can be made in the light of new knowledge and reduced uncertainties.

Ideally, the choice of a long-term goal is the product of solid science and wise political decision-making. Science can inform the process, but in the end it depends on what we value, and this is best determined through a political process.

It is estimated that if we stabilized concentrations of all greenhouse gases in the atmosphere at roughly the equivalent of 450 parts per million of carbon dioxide, we could limit global mean temperature increases to about 2°C above pre-industrial levels.

● (1110)

Such a stabilization level, however, implies concentrations of carbon dioxide alone of 350 to 400 parts per million, which has to be compared with today's level of 390 parts per million. Clearly it's going to be difficult now to meet this goal without some overshoot from which we will have to recover.

There is a growing consensus that indeed we should try to avoid such an increase of 2°C above pre-industrial levels, in order to avoid what the framework convention refers to as "dangerous interference with the climate". We have already seen an increase of 0.7°C, and in order to achieve this goal it is estimated that global greenhouse gas emissions will have to peak before 2015 and be at least at 50% of current levels by 2050.

These are global numbers, and achieving these low-emission scenarios requires a comprehensive global mitigation effort. The IPCC's Fourth Assessment Report contains some estimates of what this would possibly mean for industrialized countries. Countries like Canada will need to reduce their emissions in 2020 by 25% to 40% below 1990 levels and in 2050 by approximately 80% to 95%. These ranges cover the levels suggested in Bill C-311. Emissions in developing countries, on the other hand, would need to start to be below their current business-as-usual emissions pathways by 2020 and be substantially below these pathways by 2050. Such a commitment was made recently by the Chinese premier, at the United Nations meeting on climate change in New York.

Now let me switch briefly to the other end of the spectrum and talk about what we have to do now.

Very simply, time is running out. What we do in the next decade or so will be critical to tackling the long-term threat of climate change. Decisions to delay emission reductions will likely be more costly and riskier. Delaying decisions will seriously constrain opportunities to achieve future low stabilization levels and raise the risk of progressively more severe climate change impacts.

It's been estimated that each 10-year delay in mitigation implies an additional 0.2°C to 0.3°C of warming over the next 100 to 400 years. Because of the inertia of the climate system, there is at present already approximately 0.6°C of additional warming, as it were, in the bank. Together with the warming we've already experienced of 0.7°C, this gets us perilously close already to the 2°C target.

As the IPCC has stated, evidence of climate change is unequivocal. The scientific community has issued a warning, a warning that may now be underestimated. Addressing climate change will be a long-term challenge, but one we must start addressing now. There is no excuse for inaction. The climate has a memory, and it will not let us forget.

To conclude, let me quote from the *World Development Report 2010* issued recently by the World Bank, which says we need to "act now, act together, and act differently".

Thank you.

The Chair: Thank you, Dr. Stone. We appreciate your opening comments.

With that, we will go to Mr. Zwiers for comments.

Dr. Francis Zwiers (Director, Climate Research Division, Department of the Environment): Thank you very much.

Thank you for the opportunity to be a witness.

I'll start by describing a little bit about the IPCC assessment process. I have a heavy involvement in the IPCC. I'm a vice-chair of the IPCC bureau, as Professor Stone has been in the past.

The principal products of the IPCC are sets of comprehensive reports, issued roughly every six years, on the science of climate change, impacts, adaptation and vulnerability, and the mitigation of climate change, together with a synthesis report.

The process is one that engages governments and in which governments take ownership. The scientific community, together with input from the governments, develops a proposed outline for the report and that outline is then approved by the member countries. There are currently 194 member countries of the IPCC.

The governments commission a particular type of report. The world's top scientists then assess the available literature. The IPCC does not do research, but produces draft reports that are reviewed extensively.

In the case of Working Group 1, in which I was involved, there were more than 30,000 comments from scientists and government analysts of all stripes. Authors are required to respond to each and every one of those comments. There are review editors who track how those responses are produced to ensure that responses are provided in a fulsome manner.

Ultimately, the governments accept the reports that are produced and give line-by-line approval of the summaries for policy-makers, again making the reports theirs. These are 194 governments of all stripes, from all over the world.

Canada makes important contributions to the IPCC, providing both leadership and expertise for the assessment process. As I mentioned, Canada sits on the IPCC bureau. We provide expertise from government labs, universities, and the private sector and we undertake substantial amounts of science in this country.

On the key findings from the IPCC, there are two, in essence. The first is that the IPCC concluded in its fourth assessment report that the world is warming, that human activities are largely responsible for this warming, and that additional warming is inevitable.

That means, of course, that there is warming that will take place, as Dr. Stone has already mentioned, to which we will have to adapt. But IPCC findings also show that the choice of emissions path over this century will ultimately determine the climate that our grandchildren experience at the end of this century.

IPCC has reported on a number of observed changes. It reports that a warming of the climate system is unequivocal, as is evident from observations of increases in global air temperature and ocean temperatures, widespread melting of ice and snow, and so on. The total temperature increase from the late 19th century to the beginning of the 21st century is about three-quarters of a degree.

There are many other aspects of the climate system that are changing, and changing in a sense that is consistent with the warming that is taking place. There are changes in wind patterns, in the hydrological cycle, including precipitation and some aspects of extremes, and so on.

We have a great deal of information about the causes of these changes, and the IPCC has been making increasingly strong assessments in that regard. Each of those assessments is very conservative relative to the science that was available at the time.

For the second assessment report, the assessment was that there were slightly better than even odds of a human influence on climate.

For the third assessment report, the assessment was that it was "likely"—a term that has a specific IPCC meaning, which is that it has at least two chances in three of being correct—that most of the observed warming during the past 50 years at that time was due to human influence on the climate system.

For the fourth assessment report, that assessment is now very likely, so there is less than one chance in ten of the statement being incorrect, and likely substantially fewer chances than one in ten that most of the warming over the past 50 years is due to human influence on the climate system.

Also, there are assessments of many other changes in the climate system that have similarly been quantified, including changes in extremes, ocean interior temperatures, sea level, glaciers, atmospheric circulation, wind patterns, precipitation extremes, and droughts.

Projections for the next few decades are continued warming at about two-tenths of a degree Centigrade per decade, with about one-tenth of a degree Centigrade per decade already built into the system—committed warming. If we manage to stabilize atmospheric compositions at today's level, the climate would continue to warm and sea level would continue to rise for long periods of time.

● (1115)

The IPCC shows that there are substantial impacts from this warming. Some sectors and regions may initially benefit from warming that is taking place, but ultimately almost everybody suffers impacts, with increasing severity in number. Some sectors and regions that are likely to be impacted—again, more than two chances out of three—are the tundra, boreal forest, and mountain regions; snow and ice biomes, with sea ice biomes involving seals, polar bears, and so on; water resources in dry regions; low-lying coastal systems; and so on.

There are many implications for Canada. We have observed in Canada a rise in average temperature of 1.2°C since 1950. That's about twice the global rate. Warming that has been observed in Canada is attributable to increasing concentrations of greenhouse gases. There have been changes in precipitation over this period. Stream flow in rivers flowing into the Arctic has increased. The hydrological regime on many river systems has changed, with earlier peak flows and changes in the magnitude of peak flows.

Projections indicate that there will be continued warming over Canada at roughly double the global rate, with amplified changes in the north and greater vulnerability to drought despite increased precipitation over our land mass. Water levels in the Great Lakes and in the St. Lawrence River are likely to decline. There will be a continued loss of sea ice, permafrost, snow cover, and so on.

Professor Stone discussed the mitigation pathways that were assessed in the IPCC, indicating that emissions should peak by 2050 and be reduced by 20% to 85% below year 2000 levels to limit warming to somewhere below 2.4°C, or in the range of 2°C to 2.4°C. The risk of exceeding 2.4°C is substantial nonetheless, because the IPCC assessments do not account for uncertainties due to climate sensitivity—the amount that climate responds to the release of a fixed amount of greenhouse gas—or carbon cycle feedbacks, the possibility that carbon that is currently stored in soils, in ecosystems, and in oceans may be released to the climate system as the climate system warms, further driving the climate system to additional warming.

This has been an area of very active research recently. This research indicates that the key determinant of future stabilized warming is the total amount of global emissions of carbon dioxide accumulated over time—that is, the total amount ever to be released from pre-industrial to the present and on into the future.

This research indicates that warming can likely—meaning a 66% probability or more—be kept below 2°C if the post-2000 cumulative emissions do not exceed a number of about 560 petagrams of carbon. We're currently emitting about 10 petagrams of carbon per year. At current rates, that means 59 years of emissions.

Warming can very likely—meaning with greater than 90% certainty—be kept below 2°C if post-2000 cumulative emissions do not exceed 170 petagrams of carbon. But note that we're already 44% along the road to using up that 90%, since 74 petagrams of carbon were emitted between 2001 and 2008, cumulative.

Emissions pathways that peak earlier may allow more gradual subsequent emissions reductions, although there is also research that indicates that the probability of exceeding 2°C increases if mid-21st century, or 2050, emission rates remain high.

A further uncertainty that needs to be taken into account is that as emissions are reduced, the cooling effects of aerosols that currently offset the warming of non-CO_2 greenhouse gases begin to diminish, and therefore the effects of those non-CO_2 greenhouse gases start to become more apparent.

Ultimately, the degree of risk that is tolerable is a societal choice. It's not one that scientists can inform. We can only help to provide the factual information with which you will make those decisions.

● (1120)

So it's a societal choice as to whether we want to risk a warming in excess of 2°C at a level of 66%, a one-third chance of exceeding that level of warming, or a level with greater certainty, allowing ourselves perhaps only one chance in ten of exceeding that level. If the choice is to take a conservative approach and to minimize the risk, then we need to begin to curtail emissions very rapidly on a global scale.

Thank you.

● (1125)

The Chair: Thank you, Dr. Zwiers.

Dr. Fortier, the floor is yours.

Professor Louis Fortier (Scientific Director, Network of Centres of Excellence ArcticNet, Laval University, As an Individual): Mr. Chairman, committee members,

[*Translation*]

thank you for hearing me on Bill C-311.

I would like to raise three points which, I hope, will demonstrate the political and socio-economic importance of the bill, as well as its excellent timing given what is happening in the world today.

[*English*]

For the first point, allow me to be somewhat blunt. In recent years, Canada's abysmal record in the fight against greenhouse gas emissions has had terrible impacts on our international stature as a country. We plummeted from the enviable position of world leader on environmental issues in the early 1990s to a reputation of a foot-dragging crony of the U.S.A.

Now that the U.S.A. and Australia have made a clear about-face, Canada is left in the cold, collecting fossil prizes at each international meeting.

Based on many conferences presented to the general public, let me assure you that this resistance and the resulting international disapproval are insufferable to many Canadians who are genuinely concerned with climate change. Bill C-311 would certainly help rebuild Canada's international stature in the stewardship of the global environment.

Second and perhaps more important, the 80% reduction of greenhouse gas emissions by 2050, which would be imposed by Bill C-311, would necessarily require a complete and crucial transformation of the Canadian economy. We will have to either buy at great cost or develop ourselves the technology and the infrastructure to shift from an economy rooted in cheap petrol and the gas engine to an economy based on renewable energies and the electric car.

This is the direction that the modern world is taking now. Canada is already losing ground to several countries, such as the United Kingdom, France, Germany, Sweden, and Denmark, which are taking aggressive measures to wean themselves off fossil fuels. These are countries that will soon dominate the world's economy, thanks to immensely more efficient and competitive industries. For example, it is forecasted that 30% of the one billion vehicles that will roam the planet by 2030 will be hybrid or fully electric cars and will be charged from electric grids powered primarily by solar energy.

Based on the fact that it took about 10 years to replace the horse with the automobile, I personally think and hope that this transformation will take place even faster. How will Canada position itself in this new electro-solar economy? We have the engineering skills and the industrial basis to take some leadership.

For example, researchers at the Institut de recherches en électricité du Québec have just developed a lithium battery that can be recharged at unprecedented rates, thus making possible a wide-autonomy all-electric car.

Are we going to wait for the Americans and the Japanese to develop these new technologies for us, or are we going to encourage the development of our own capacity to wean our society from fossil fuels, thereby fulfilling at the same time our climate responsibilities and making Canada an exporter rather than an importer of this new technology?

The alternative of fossilizing Canada in the fossil fuel-based economy will be suicidal as the era of cheap oil comes to an end. It would lead to the degradation of the Canadian economy that would parallel the decline of the Soviet economies in the second half of the last century. Bill C-311 would certainly force Canada to make the right choice between competitiveness and fossilization.

Third, I would like to stress that the fate of Bill C-311 will hinge to some extent on whether or not at the time of the vote MPs are convinced of the reality of dangerous climate change. Now, like the severed heads of the mythological Hydra, the unbalanced debate on the reality of climate change is perpetually growing back in the media.

For example, just last Friday in his very popular editorial, Mr. Rex Murphy again steered the debate by referring to a BBC report that pointed out that despite rising carbon dioxide levels, global temperatures have not risen over the past 10 years. Mr. Murphy's prose smacked of contempt when assimilating scientists to the zealots of some climate change religion.

It is important to point out that for scientists, the reality of climate warming is not an issue of fate. It's an issue of hard data, hard fact. Like any other citizens, scientists all wish climate change would go away and would no longer threaten our future and that of our children. However, the hard scientific facts are that despite some expected decadal fluctuations, global temperatures are definitely on the rise.

Decadal interludes in rising global temperatures and in the declining trend in Arctic sea ice cover have occurred before, but except for those who crave to disillusion themselves, there is absolutely no basis in the recent data to feel confident that global warming is over with.

● (1130)

While Mr. Murphy puts much confidence in the BBC report written by a journalist, what does he make of the recent warning by U.K. climate scientists that the 2°C warming over the next 40 years —on which the Copenhagen discussions will be based—is overly optimistic and that a 4°C increase must be envisaged instead?

This is what I mean by an unbalanced debate, in which a journalist has more weight than several dozen climate specialists.

My point here is that while the debate on climate change is certainly healthy, Bill C-311 is utterly crucial for Canada's international stature and our economic future—as I tried to explain in my first two points. Hence, MPs ought to base their work on the bill and vote on it based on verified scientific consensus rather than on the flavour of the day in the never-ending debate over climate warming.

Thank you.

The Chair: Thank you, Dr. Fortier.

That leaves us with Dr. Sauchyn.

The floor is yours. You have 10 minutes.

Dr. David Sauchyn (Research Professor, Prairie Adaptation Research Collaborative, University of Regina, As an Individual): Thank you, Mr. Chairman, and members of the committee, for this opportunity to speak to you.

The preamble to Bill C-311 accurately describes climate change as a serious threat to Canada. In fact, it is also a threat to people in environments worldwide; and Canada, with its high per capita emissions, contributes to that threat.

My remarks today will be based largely on our work at the Prairie Adaptation Research Collaborative in Regina, where we study climate change and its impacts on western Canada and the adaptation that's required to avoid the most adverse impacts. This work makes a strong case for efforts to prevent further global warming, and thus supports the intent of Bill C-311.

Our work clearly demonstrates that current climate change and most of the impacts are largely caused by human activities, that the impacts in the near future are potentially serious and costly, and that the degree of adaptation required, and therefore its cost and feasibility, will depend on the amount of global warming that we allow to occur.

I have some information about the IPCC fourth assessment report, but given that you've heard from two experts who are involved in that process, I will skip that information and keep our remarks to well under 10 minutes. I will add only that the fourth assessment report, which was published in 2007, synthesized the state of knowledge of global climate change up to the year 2006. Since then, various updates of climate science have concluded that not only are the impacts of climate change occurring as predicted by the IPCC, but also that they are occurring at a faster rate than was forecast in 2007.

That's the extent of my remarks about the IPCC. I want to move instead to the Canadian assessment, to this big, thick report that you all should have read, or at least you should have read the thin synthesis for decision-makers. This is in both official languages...and this is only one language.

This report was released in March 2008. Over 3,000 studies that pertain to Canada were synthesized by 145 authors. Our chapters were reviewed by 110 scientific experts and government officials.

I will mention only four of our conclusions: first, that the impacts of a changing climate are already evident in every region of Canada; second, that climate change presents new risks and opportunities to Canada; third, that climate change impacts elsewhere in the world will affect Canadians; and fourth, that the impacts of recent extreme weather events highlight the vulnerability of Canadian communities and critical infrastructure.

Canada is a major contributor to the problem in terms of our per capita emissions, but we also have more capacity and incentive to respond to climate change than most nations, if not all. Our capacity is a function of our great natural, social, and intellectual wealth. The many incentives for responding include new economic and technological opportunities on the path to sustainable communities, sustainable ecosystems, and a sustainable economy.

Another major incentive is avoiding cost and risk. All of Canada is at risk.

The highest rates of observed and projected warming in the world are in the northern hemisphere at high latitudes, high altitudes, and in the continental interiors. Thus, Canada's north and the western interior are among the most vulnerable regions on earth. Of course, these regions have Canada's largest indigenous populations, and thus our most vulnerable communities.

By our very human nature, we would prefer a simple world that doesn't change. As Dr. Fortier said, for the sake of our children and grandchildren, we would prefer a predictable and stable world. The climate change deniers capitalize on these basic human instincts by telling us what we'd like to believe—that things are fine and that we don't have to do anything. However, they tend to grossly oversimplify the science and diminish the problem, while exaggerating the costs of reducing our carbon footprint.

There are a few complexities to the science that are important to understand, so please bear with me. Dr. Zwiers has already mentioned the carbon cycle feedbacks whereby a warmer climate tends to release more carbon from natural sources, but I want to mention a couple of other feedbacks.

First of all, the extra greenhouse gases that we are producing are triggering global warming, but they account for only a part, and in some cases only a small part, of the projected warming. That's because a warmer atmosphere and warmer oceans trigger a web of interactions and feedbacks that mostly amplify the warming. Probably the best example anywhere is in the Arctic, where the so-called ice-albedo feedback can increase the rate of global warming up to threefold. That's the process by which permanent snow and ice cover are rapidly diminishing, so that less radiation is reflected back into space and more is absorbed to warm the land, the Arctic Ocean, and the overlying air.

● (1135)

When you consider that some climate change scenarios project global warming of up to 4.5°C, three times that, or 12.5°C, would be catastrophic for the Arctic.

The other major feedback I want to mention affects Canada's other vast vulnerable region, which is out here, the western interior, where we have more than 80% of Canada's agricultural land. With global warming, there is increased evaporation from the oceans and higher humidity in the atmosphere. As Dr. Zwiers mentions, this increase in water vapour accounts for more precipitation over land, but it also traps more heat. You just have to think about the difference in early morning temperatures between a cloudy and a clear night.

This humidity feedback accounts for the forecast of more rain in the west, but in fact we also expect more drought. That's because most of the extra heat and water is occurring in winter, but we grow things during the warm, dry part of the year, in summer. So it's an important scientific detail to understand that the influence of this humidity feedback is to amplify the warming in western Canada in particular, but also to intensify the natural variability.

Canada already has one of the world's most variable climates, especially in the west. Therefore, the threat from climate change is not so much a change in the average climate but an increase in the variability.

About this new average and the more extreme weather—and in particular, in the west, drought—drought is Canada's most costly climate hazard. For example, the most recent drought of 2001-02 caused crop losses of $3.6 billion and a drop in GDP in western Canada of $4.5 billion. This kind of volatility can never be managed away. It challenges our capacity to adapt. Therefore, the best strategy is to simply avoid it, to simply prevent the global warming that is projected to cause an increase in the severity and frequency of drought.

I thank you for indulging in this simple science lesson. I think it's important, because I want you to appreciate how, by supporting policy that limits greenhouse gas emissions, you are taking your finger off the trigger of a cascade of processes and feedbacks that have some potentially unfortunate consequences.

Thank you.

● (1140)

The Chair: Thank you, Doctor.

We're going to go into our seven-minute rounds.

To kick us off, Mr. McGuinty, you have the floor.

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

Hello, everybody. Thank you for being here today.

I'd like to begin by simply asking all four of you if you could quickly comment yes or no on this, and, if there a yes, whether you could share the documentation.

You're all research scientists, or, in the case of our colleague here, Mr. Zwiers, from the Department of the Environment.

Do any of you have in your possession *A Climate Change Plan for Canada*?

Have you seen *A Climate Change Plan for Canada*, the science-based *Climate Change Plan for Canada*?

Do you have a plan for domestic climate change action in Canada?

Do any of you, any four of you, have a plan? Have you seen a plan or can you share a plan, please?

The Chair: We'll start with Dr. Zwiers.

Dr. Francis Zwiers: I think this is a policy question that's being posed as opposed to a scientific question, so I'll defer.

Thank you.

The Chair: Dr. Sauchyn in Regina.

Dr. David Sauchyn: I think this is a rhetorical question, because, no, I haven't seen a plan, but I've seen the science. This assessment was done by scientists but not for the scientific community. It was done for decision-makers. So they have the scientific support for such a plan.

The Chair: Dr. Fortier.

Prof. Louis Fortier: Actually, you can find several plans in Canada. There is one for each of the provinces.

For example, in Quebec we have a plan to reduce emissions and try to mitigate the impacts that will have on society and everything. You can also consult the plans that each of the American states are producing.

So there are a lot of plans. The common denominator to all those plans is a reduction of greenhouse gas emissions, like the one proposed in Bill C-311.

The Chair: Dr. Stone.

Prof. John Stone: I presume you're talking about a federal plan.

Mr. David McGuinty: Correct.

Prof. John Stone: No, I have not seen a complete federal plan. I have read about some elements of what it might contain, but this seems to be a continuous work-in-progress.

I shall stop there.

Mr. David McGuinty: So no one has seen a plan.

I appreciate Mr. Fortier's comments about provinces having to go it alone. That's what they're doing across the country. Quebec has gone it alone. Ontario has its own climate change secretariat—it is negotiating directly with Washington and bypassing the federal government. All kinds of provinces are doing it in the absence of a federal plan. Thank you for confirming that.

Are any of you tracking the work of your colleagues in science and the extent to which science is factoring into the debates on Capitol Hill in Washington? How is the science you are producing—IPCC and otherwise—being used in the Obama administration's efforts to get a bill from the Senate or the House of Representatives? The Obama administration announced 10 days ago that in the absence of a bill it was going to move to regulate greenhouse gases under the EPA. Can you please help Canadians understand where that is?

Dr. Francis Zwiers: I'm a scientist working for Environment Canada. I don't think I can comment on work that policy analysts in our department or in other departments might be doing.

Thank you.

The Chair: To support Dr. Zwiers, public servants—

Mr. David McGuinty: We don't need an explanation, Mr. Chair.

The Chair: —don't need to provide confidential advice that they give to their minister.

Dr. Stone.

Prof. John Stone: I think what's most significant in Washington is that science has been returned to its rightful position. The administration has appointed top-rate, internationally recognized scientists to its administration. This has been an enormous encouragement to scientists, not just in the U.S. but also in Canada and elsewhere.

● (1145)

Prof. Louis Fortier: What we're hearing in Washington is exactly what the scientists would like to hear. It's a discussion based on scientific facts. There is no more systematic rejection of the scientific facts. The scientific consensus is recognized by the politicians. The situation is much healthier than it used to be, and things will move extremely fast in the United States. Already, the Obama administration sees all the difficulties of imposing a reduction in greenhouse gas emissions, but it also sees the solutions.

I believe that Mr. Obama will soon be able to convince the coal unions to change their position. Instead of burning coal, if they use solar energy and develop new technologies and everything, they can bring richness to the United States. The day he is able to convince those constituencies, things will move extremely fast. The problem is that in Canada we're going to be waiting to do the same thing.

Mr. David McGuinty: Dr. Sauchyn.

Dr. David Sauchyn: I have nothing to add.

Mr. David McGuinty: Have we seen the concomitant or corollary investment, and perhaps respect, in Canada in the past several years in terms of placing scientific evidence over ideology?

Dr. Stone.

Prof. John Stone: That's a pretty leading question.

My sense is that we have been ignoring the scientific evidence on climate change for too long.

Mr. David McGuinty: Do we feel in Canada that there is the same sort of respect now being accorded scientists; senior scientists are in senior positions in the administration; the government is listening to science; the government is calling on scientists; the government is asking scientists to help inform a non-existing plan?

I mean, as scientists, you're completely capable of commenting on that, I presume.

Mr. Zwiers, have you seen an uptake in respect accorded to scientific work in terms of formulating a plan somewhere, sometime?

Dr. Francis Zwiers: I can relate to you that the kinds of requests that come to me from up the management stream are requests that are designed to inform our negotiating position, for example. Within Environment Canada, we have a science working group that briefs up to our international negotiating team, our COP 15 negotiating team, on current developments in science, at the request of that negotiating team. Certainly we receive a fair number of requests from them.

The Chair: Your time has expired, Mr. McGuinty. Thank you.

Monsieur Bigras, s'il vous plaît, sept minutes.

[*Translation*]

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

First, I would like to thank our witnesses for their presentations. As regards Bill C-311, it is important to have a good scientific basis before we begin our in-depth study of the measures contained in the bill.

I have two questions. The first is for Mr. Fortier. It seems that nobody answered Mr. McGuinty's question.

In an environmental magazine of the spring of 2008, you stated, and I quote:

> Under the Liberals, there were lots of good intentions but very little action. The Conservatives have valid arguments for not endorsing the Kyoto Protocol because Kyoto is not THE solution. It is a step in the right direction, but we must go further. The Conservatives could develop a plan which goes further than Kyoto. If they don't, it will be up to voters to let them know..."

Given that Kyoto is indeed part of the solution—you may not have a plan for us today—would you concede that we may not have a plan before us, but we do have a bill whose aim is to find a solution in light of the scientific evidence you presented to us today?

If you want to go further than Kyoto, as you said you did in the spring of 2008, would the quick adoption of Bill C-311 not be a step in that direction?

● (1150)

Prof. Louis Fortier: Absolutely, Mr. Bigras. I did not realize I was engaging in politics when I wrote that magazine piece. That's the point: Kyoto does not go far enough. This is what scientists have been saying from the outset. We have to do much more.

Bill C-31 is music to my ears, no doubt about it. I feel great when I read it. The bill points us in exactly the right direction. It is ambitious, given the numbers and values which it contains, but it is completely realistic.

Further, a little earlier, I wanted to explain that if Canada does not embark on this transformation, this metamorphosis of its economy towards an economy which is based on alternative energy, we will be lagging far behind other countries in 20 years. We will end up riding on the coattails of the United States and Europe. We must act now and as quickly as possible.

Mr. Bernard Bigras: Excellent.

My second question is for Mr. Stone.

A few weeks ago, I was reading an article in *The National Post*'s October 2, 2009 issue about a man named Ross McKitrick, whom you probably know and who is a professor of environmental economy at the University of Guelph. I believe he is one of those scientists who call themselves negationists—I don't know if that is the correct term—and who are trying to invalidate the work of the IPCC, and who question the theory developed by Professor Mann, the one which uses a hockey stick as an analogy, and which you are probably familiar with.

I was reading his article last week. He said that the IPCC fabricated evidence in its 2007 report to hide the problem. In his opinion, there is a significant gap between climate models and what has been observed, and the controversy grows year after year.

I cannot lend Mr. McKitrick's piece any credibility. However, what do you say to scientists who question the work of the IPCC?

Prof. John Stone: Thank you, Mr. Bigras.

Please allow me to respond in English.

[*English*]

The climate skeptics, as I like to call them, have been remarkably effective in delaying action on climate change for almost 20 years. The tactic they have used is to emphasize uncertainty. Unfortunately, most of them are not scientists, certainly not climate scientists, and their approach is to attack rather than to resort to research, as other scientists do, and to published papers, papers in peer review journals. It surprises me that newspapers still give these people space on their sheets when the IPCC and many, many other scientific institutions have made it absolutely clear that climate change is real, it's happening now, it's caused by us, and if we don't get off the present track the consequences could be quite damaging.

I trust that provides at least some of the answer to your question.

[*Translation*]

Prof. Louis Fortier: To just add to what my colleague said, how could 1,200 scientists from around the world, who have 6,000 other scientists looking over their shoulders, possibly be part of a conspiracy to falsify data and to announce to politicians, and to the entire world for that matter, that a catastrophe is imminent? Scientists just aren't like that, they just aren't in the same category of human or animals as are the deniers, the skeptics. The skeptics are people who have to be part of a crusade, or part of a religion, or something, and who are governed by instinct, whereas scientists study data and have no choice in the answers they give.

● (1155)

Mr. Bernard Bigras: I don't have much time left.

The Kyoto Protocol contained a provision relating to carbon sinks which would see the sinks, or forests, used to offset greenhouse gas emissions.

However, this type of measure is not included in Bill C-311. Based on scientific studies, do you think we should include this option, namely carbon sinks, in a Canadian plan to fight climate change? The Kyoto Protocol sets limits on the extent to which carbon sinks can be used to offset a country's greenhouse gas emissions. So what role should carbon sinks play in Bill C-311 and in a future Canadian plan?

Prof. Louis Fortier: To briefly respond, there are at least 15 proven technical ways to reduce greenhouse gas emissions. Each country does not have to use all of these methods. If in Canada, from a technological point of view or because of our environment, it is better to focus on certain sectors, then we don't need all of the other methods. If Canada adopted carbon capture and storage as a way to mitigate the Athabasca oil sands refinery emissions, and if we made better use of existing types of energy, if we slowly but surely got rid of fossil fuels, we could reach our objectives, such as those contained in the bill, even if we did not use carbon sinks—our forests—or other types of sinks.

[*English*]

The Chair: Time has expired. We have to keep on moving.

Ms. Duncan, it's your turn.

Ms. Linda Duncan (Edmonton—Strathcona, NDP): Thank you, Mr. Chair.

First, I want to thank all four gentlemen for testifying. I know that you're very busy scientists. I appreciate your taking time away from the important work you're doing on documenting and bringing forward the issues that are being attached to climate change to testify to us and try to influence our opinion. I consider your testimony extremely valuable.

My first question I would put to Dr. Fortier and Dr. Stone, but Dr. Sauchyn and Dr. Zwiers can feel free to elaborate as well.

I think it was you, Dr. Fortier, who mentioned that the failure of Canada to commit to the science-based targets as laid out in Bill C-311 and as put forward by the IPCC has impacted our international reputation and competitiveness. Based on what I've read and the international conferences I've appeared at, that opinion seems to be backed up by a wide range of groups, including the International Energy Agency, UNEP, and the Copenhagen Climate Council. So that certainly seems to be a growing common view.

If Canada committed to these targets in Bill C-311, would that help to begin to restore our international stature at those tables?

Prof. Louis Fortier: Absolutely, and very quickly.

In fact, not only the political but also the scientific international community is somewhat taken aback and surprised by the recent attitude of Canada toward those major global issues. Canada has always been seen as the country that can actually influence the U.S.A., having the high ground environmentally over the U.S.A., and having some clout, some impact, some effect on the U.S.A. We don't see that any more.

The comment that this is surprising comes from all horizons. I've had the King of Sweden ask me how come Canada is like that now; how come you cannot use what you see in the Arctic to convince the present government that it's important to move along with the rest of the international community in this domain?

Ms. Linda Duncan: Dr. Stone.

Prof. John Stone: In a word, absolutely. Absolutely it would do enormous good to Canada's credibility.

More than that, it could help immeasurably in the international process and getting a satisfactory outcome of the negotiations in Copenhagen.

Ms. Linda Duncan: Thank you.

Would either of the other two like to reply?

Dr. Sauchyn.

● (1200)

Dr. David Sauchyn: I can add, Ms. Duncan, that not only does Canada's reputation suffer internationally, but there's a great deal of frustration with the federal government within industry, amongst your constituents.

We consult with these groups, and I can cite hundreds of examples of measures being taken by individual constituents, by farmers, by people in the forestry sector, by industry. They require some kind of leadership by the federal government, because right now they're making adjustments, mitigative and adaptation efforts, at their own cost and on their own behalf.

Ms. Linda Duncan: Thank you.

Gentlemen, there's been some suggestion from some quarters that we don't need to commit to the Canadian targets until after Copenhagen. I'd like your opinion on whether you think that there's any value in that suggestion, or does it make more sense, as I and others in my party have been suggesting, that in order to get a good agreement at Copenhagen, we should be committing—we should have already committed—now to the science-based targets leading into Copenhagen?

Prof. John Stone: The question I ask myself is what is Canada going to say in Copenhagen? It would seem to me that if we're going to be taken seriously, we're going to have to say something, and that has to be developed ahead of that conference in Copenhagen.

It seems to be a logical way of doing things.

Prof. Louis Fortier: My opinion is exactly the same. What are we going to say in Copenhagen? We have absolutely no power, no clout, no.... We're not in the game in Copenhagen, as long as we haven't ratified or developed a bill like that to force Canada to take some action.

It's impossible, but suppose we adopted Bill C-311 before Copenhagen. We could then walk into the meetings with something to say: Yes, we caved. We are going to participate. We are going to move ahead with that. This is what we think should be done.

Then we would have a voice. Until then, we don't have a voice in those meetings.

Ms. Linda Duncan: Thank you.

I have a couple of specific questions for Dr. Sauchyn.

I want to advise you that I have taken the time to read the report you led.

Dr. David Sauchyn: Thank you.

Ms. Linda Duncan: It's an excellent report. It's an invaluable resource for government decision-makers. I very much want to thank you for that.

I have noted your testimony today, saying that there seem to be even stronger indicators. I, being from the prairies, paid particular attention to the chapter that, as I understand, you led yourself, which is the impact of climate change on the prairies.

I would like to get your impression of some things that have occurred in Alberta only this past summer. The Agricultural Financial Services Corporation, which is the agency that assesses crop insurance, has stated that they faced 1,400 claims by early August, when they normally only receive a dozen, for extreme drought for zero-yield crops. They've declared entire areas of Alberta so dry that they don't even send out the adjusters. They're saying that they anticipate several decades of similar drought based on the science studies. I'm presuming that some of those studies are the ones you've done yourself. Researchers at the University of Alberta, in the area of health, have expressed extreme concern about the impact on the health of the farm community by the drought on the prairies, and the high evidence of stress and even suicide.

Dr. Klaver-Kibria has expressed frustration at the failure of the government agencies to recognize and consider the health implications, in addition to the other science impacts, and is calling for more investment and bringing together.

I'm wondering if you could comment on whether or not you think we have actually fully assessed the cost of not acting early on addressing climate change. In fact, are there potential additional costs, as those two avenues have identified this past summer?

Dr. David Sauchyn: I'd like to say that if you think responding to climate change is costly, try the alternative. Try doing nothing and discover what the cost will be like.

I'm glad you mentioned the work of Justine Klaver-Kibria. We had her write a chapter for a book on climate change in western Canada that we just sent to the publisher. She documents suicides during periods of drought when, according to the Government of Canada, drought is not a natural hazard because it doesn't kill people. But if you're a prairie person, you know that it does.

You identified some specific weather events and their impacts from this summer, but we can't attribute those to global warming, simply because global warming is a change in the climate and you've described weather. However, the weather events of this past year in Alberta are very much consistent with the expected climate with global warming. That is, we had the most serious drought on record in the spring. There were also some extreme rainstorms. And then in mid-September, temperatures reached 36°C in Alberta and Saskatchewan. That's not only the warmest September ever, it's the warmest temperature ever recorded for Edmonton.

Those kinds of extreme weather events are weather, as I said, and not climate. But they are consistent with the type of weather we expect with global warming.

● (1205)

The Chair: Thank you.

Your time has expired, Ms. Duncan.

Mr. Warawa, the floor is yours.

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

I also want to thank each of the witnesses for being here.

It's important to have good input on Bill C-311. I have concerns about the bill in that it sets aggressive targets but there are no mechanisms built in to help us achieve reductions in greenhouse gas emissions. That's going to be the focus of my questioning—namely, how effective Bill C-311 will be, if it becomes legislation, at actually reducing greenhouse gas emissions globally.

I'd like to start with you, Mr. Zwiers. How are global climate change scenarios prepared, and how does the consensus process work?

Dr. Francis Zwiers: The word "scenarios" refers to a number of different things. It could refer to emission scenarios; it could refer to resulting estimations of how the climate will change in response to those scenarios. Emission scenarios are developed to cover a range of possibilities. They start with current atmospheric concentration and rates of emission and build from there, proposing a range of possibilities.

The new IPCC report will use a new set of emission scenarios rather than the so-called SRES emission scenarios, where concentration pathways will be specified starting with today's concentrations, either increasing or eventually decreasing concentrations, and stabilizing at some level. These span a large range of possible atmospheric concentrations of carbon dioxide, eventually stabilizing at very low levels or at levels that are much above today's levels.

These are specified to climate models. Climate models are then run to translate these changes in atmospheric composition into changes in climate. Very often when you hear of a projection of a 4° C rise in global mean temperature by 2100 that's an estimated response to a change in greenhouse gas concentrations built up over a period of time. This kind of information is then used to conduct impacts and adaptation research to understand what the impacts will be.

I hope that goes part of the way toward answering your question.

Mr. Mark Warawa: It does.

What is the scientific consensus on the potential impacts for the 2° C global temperature warming?

Dr. Francis Zwiers: The impacts research community is a very large community. It's multidisciplinary and includes biologists, physical scientists, and people undertaking social science. So it's a community where consensus is not the easiest thing to obtain. But there is, by and large, a broad understanding that as temperatures rise, the impacts will become more widespread and more severe, and that these will then start to be felt increasingly as you go from 1.5°C to 2.5°C to 3.5°C. These impacts tend to become quite broad at about 2°C.

Take, for the example, species extinctions linked to climate change. It's estimated that 20% to 30% of species will become susceptible to extinction with an increase in temperature of 2°C above pre-industrial levels.

Also, if temperatures are sustained at that level for a very long period of time, then we risk substantially increasing sea levels. That's not just by centimetres or fractions of a metre, as had been projected by the IPCC for the year 2100, but by many metres—perhaps 10 metres—as a result of the melting of large parts of large ice sheets.

● (1210)

Mr. Mark Warawa: Thank you.

I'd like to focus specifically on Bill C-311. My question would be for all of you.

Mr. Fortier, I like Rex Murphy. I don't agree with him on everything, but I think we....

Voices: Oh, oh!

Mr. Mark Warawa: Anyway, with regard to Bill C-311, in our consideration of this bill, which the Liberals call a "twiddlywink" bill—

Mr. David McGuinty: Tiddlywink.

Mr. Mark Warawa: Yes, tiddlywink bill, thank you, Mr. McGuinty.

So we know that the previous Liberal government set random targets and then did nothing, and we ended up with the environmental mess.

It's very easy for the NDP to come up with unrealistic targets that may not achieve anything.

What Canada right now...is we've set tough targets: 20% reduction by 2020, and 60% to 70% reduction by 2050. We are on the pathway toward that. But Canada by itself cannot achieve a global reduction in greenhouse gas emissions. We are taking a continental approach with the United States through the clean energy dialogue to reduce greenhouse gas emissions, and a North American commitment, as we head toward Copenhagen.

First, is it important that Canada be part of a continental approach, again, looking at the practical? Also, should there be a balance where you are protecting the environment but also providing economic prosperity?

We need these practical considerations: North American, and a balance between economic and environment.

I'll start with Mr. Zwiers, please.

Dr. Francis Zwiers: I think these are questions that I'll defer to others. These are questions that consider policy choices as opposed to questions that are purely scientific.

Mr. Mark Warawa: Thank you.

Prof. Louis Fortier: If one wanted to be cynical, since Canada is emitting less than 3% of overall global emissions we could do nothing about it and it wouldn't have much impact globally. But that would be extremely cynical. It would also be a huge mistake economically.

If we don't do anything now, if we don't transform or metamorphose our economy towards a renewable energy economy, then we'll be the poor cousin of the world. We hardly are part of the G7 or G8. We wish we were at the top of the G20, but we won't even be part of G20 if we don't make that revolution that is needed in our economy and our industry in the way we do things.

Mr. Mark Warawa: Is it important to do it in a continental—

The Chair: Mr. Warawa, unfortunately, we are out of time. I think Mr. Fortier answered the question, so we'll continue on.

We're going to start the five-minute round.

Mr. Trudeau, you're going to kick us off.

Mr. Justin Trudeau (Papineau, Lib.): Thank you.

Dr. Stone, you brought forward the comments that the target we're looking at for 2020, according to the international climate change panel, is 25% to 40% below 1990 levels. That's a reasonable target, according to you.

I'm not asking for a policy opinion, and I would like a response from everyone else as well.

In your scientific assessment, if that is the kind of target that I think universally we're talking about, at a minimum about 20% with as much as 40% below 1990 levels by 2020, is it your assessment, as scientists, that, to quote Mr. Warawa, 20% below 2020 from 2006 levels would consist of a “tough” target? Is 20% below 2006 levels by 2020 qualifiable, in your scientific opinion, as a “tough” target?

● (1215)

Prof. John Stone: Thank you very much.

There are lots of elements to your question, but let me take the last part. The current government's target, which as you say is a 20% reduction by 2020 based on 2006 levels, translates into roughly a 2% to 3% increase from 1990 levels. That is not even what we proposed to do under Kyoto. So my assessment of that target is that it's not very ambitious at all.

The numbers that are referred to were taken from this BRIC that the IPCC Working Group III put together. They're based clearly on some assumptions. One may debate some of those assumptions, but we have said in the IPCC for several years that if we are going to avoid dangerous interference with the climate and stabilize emissions at a level that achieves that, then emissions are going to have to decline significantly from what they are now, to perhaps as much as 10% of what they are now.

Mr. Justin Trudeau: Thank you.

I'd like to hear comments from the others on whether or not you consider the 2006 baseline to be adequate.

Monsieur Fortier.

[*Translation*]

Prof. Louis Fortier: No, it's not adequate at all. Certainly, it would be hard to hit that target, but it is actually the wrong target. We should have a target which is much more ambitious. That is why we need a very tough bill.

[*English*]

Mr. Justin Trudeau: Okay.

Dr. Sauchyn, do you consider it a tough target to reduce below 2006 levels by 20% by 2020?

Dr. David Sauchyn: Well, from a purely scientific perspective, the only solution to the anthropogenic global warming is to completely eliminate greenhouse gas emissions. The residence time of carbon dioxide is so long that at some point we have to stop using fossil fuels, but of course that's not feasible at all.

So in terms of the targets we set, it's not a scientific question. It's really a social-technological-political question. They need to be as aggressive as possible, as aggressive as our technologies and our infrastructure and our political will.

Mr. Justin Trudeau: Do you think, then, that 3% above 1990 levels is as aggressive as we are capable of reaching for?

Dr. David Sauchyn: I can't say, because I'm not an expert in terms of the technology or the economics of the problem, but to me it doesn't seem very aggressive at all.

Mr. Justin Trudeau: Thank you.

Now, Dr. Zwiers, I know you're in a difficult position, but if you'd like to comment on the 2006 level baseline, I'd be open to hearing about it.

Dr. Francis Zwiers: I won't pass judgment on what is a tough target or what is not a tough target.

Recent research that has looked at this question of what total cumulative emissions are consistent with a limit of 2°, or a limit of whatever you would choose to set—that again is a policy question, not a scientific question—indicates that the choice of baseline is actually not that important. So a 1990 baseline allows you to construct emissions pathways that would get you to 2°C with reasonable likelihood. A 2006 baseline also lets you construct pathways that allow you to get to 2°C with reasonable likelihood.

All emissions scenarios are constrained by the emissions that we have already produced and the fact that we cannot go back in time and reduce emissions or the pathway we have been on in the past. That is really what constrains what these pathways would look like. All of them would require peaking relatively soon and then substantial reductions in greenhouse gas concentrations and emissions in the atmosphere.

● (1220)

The Chair: Thank you. Your time has expired.

Mr. Braid, you have four minutes.

Mr. Peter Braid (Kitchener—Waterloo, CPC): Thank you, Mr. Chair.

Thank you very much to all of our witnesses appearing before us this afternoon.

I'll start with Mr. Zwiers, if I could.

Mr. Zwiers, is the Department of the Environment preparing for negotiations at Copenhagen?

Dr. Francis Zwiers: We have a negotiating team. I'm not privy to the work of that negotiating team. I work in a different part of the Department of the Environment.

Mr. Peter Braid: Do you have any reason to doubt that officials at the Department of the Environment are focused on negotiations and working very hard preparing for them?

Dr. Francis Zwiers: I'm sure they are working very hard on their preparations. The only evidence I can provide you is that I am a member of the science working group that briefs the negotiating team at their request, and we do get requests from them.

Mr. Peter Braid: Thank you.

Professor Stone, which countries currently are most responsible for total global greenhouse gas emissions?

Prof. John Stone: There is a basket of countries in the industrialized world.

Mr. Peter Braid: Which are the top two or three?

Prof. John Stone: The United States...but it depends how far back you actually go. If you go back to the Industrial Revolution times, the United States and United Kingdom certainly are among the top two. They're now being followed by some developing countries—for example, China and the like.

I'm not sure one should focus on the totals. I think more interesting is the per capita contributions to emissions. If you look at it that way, then the average North American is responsible for twice as much emissions as the typical European and about ten times as much as the typical Indian.

If you try to split out algebraically the various components, it is more important to focus on the per capita emissions rather than the total.

Mr. Peter Braid: What is the current American target for reduction of greenhouse gas emissions by 2020?

Prof. John Stone: I think it depends upon who you ask. President Obama has one, the House bill has one, and the Senate has one. These are different. They have yet to be resolved. In the view of many, they aren't ambitious enough.

Certainly there has been an enormous sea change in Washington, and that has been reflected in the negotiations that have been going on almost continuously and have led many to believe that indeed we are going to go into an era in which the United States will take an appropriate role in the global solution.

Mr. Peter Braid: Very good.

Professor Stone, how would you describe the current state or status of international discussions and negotiations moving into Copenhagen?

Prof. John Stone: This is a very personal opinion: I'm not encouraged.

I have been following it very closely. You can do that without spending the jet fuel and going there. There is enough on the web. I feel for some of these people, because they've been in almost continuous negotiations now for two years. I used to be part of that process, and I know how quickly you become almost brain dead from it. You don't eat properly or sleep properly or drink properly.

If you look at the status of the negotiations at the moment, you'll see they're certainly not that encouraging. There have been some interventions recently that have been encouraging. I mentioned the one by the Chinese premier in New York a couple of weeks ago. Japan has increased its level of ambition. Norway has done likewise, and so have many of the European countries. So you're actually seeing some countries now raising their level of ambition. But there are still some very tough issues that need to be agreed upon, and as they say in the U.S., for the negotiators, it's way outside their pay bracket. These are issues that can be resolved only by national leaders. They are such things as the level of ambition of the industrialized world, and the level of financing for developing countries to address climate change.

● (1225)

The Chair: Thank you. Your time has expired.

Monsieur Ouellet, s'il vous plaît.

[*Translation*]

Mr. Christian Ouellet (Brome—Missisquoi, BQ): I would like to thank our witnesses. It is very important that we hear from you today. You are all independent people. Even though Mr. Fortier sang the praises of renewable energy, I am sure that you don't own a factory and that you will not be making profits when you're home again. However, I am astonished that your witness from the Department of the Environment is not on the team of negotiators who will be in Denmark next month. It affects the credibility of the testimony.

Mr. Fortier, I would like to revisit the economic aspect of this situation because you talked about it the most. These days, the government is always telling us that we are prosperous, and that if we begin to reduce greenhouse gas emissions, we will become less prosperous. In fact, the government says that the consequences of reducing greenhouse gases would be disastrous. Perhaps what the government is trying to say is that the traditional economy will change. You seem to leave the door open when you said that we would still be prosperous and that we would develop a new economy.

I trust you: as a scientist, your job is to stay abreast of developments in renewable energies and their potential. Could you expound on that? To what extent could renewable energy influence or replace our economy while ensuring that we indeed remain prosperous?

Prof. Louis Fortier: That's an excellent question. Please don't think that scientists are calling for an immediate halt to the production of fossil fuels. We have to begin by decreasing the use of fossil fuels. A country as rich and prosperous as Canada can make that transition. It would not be an abrupt change, but a slow transition towards an economy which is increasingly unreliant on fossil fuels. This might mean that for a period of time, people will have two cars, one of which runs on gas and the other being electric. People have to change their attitude and the government has to encourage that.

That's how we will get through this. There are some fabulous examples of this in Europe, in the Scandinavian countries in particular, where this kind of thing is actually happening. The Europeans have realized that making these changes has been extremely profitable. What I meant to say in my presentation is that those countries which develop these new technologies first will become economic leaders in 20 or 30 years, and not in 100 years.

Mr. Christian Ouellet: As Mr. Stone was saying, do you think that we need to look at per person greenhouse gas emissions? If we choose to go ahead with renewable energy, would it be easier to decrease greenhouse gas emissions on a per person basis?

Prof. Louis Fortier: Absolutely. Take Quebec, where 97% of power comes from hydroelectricity. As in most of the rest of Canada, most emissions come from cars, gas and jet fuel. We have made progress with respect to reducing greenhouse gas emissions in every sector, except for transportation. That's really where we have to make progress. We have technologies which we sell to other countries rather than using them ourselves. I cannot understand why Canada has not developed an electric car. India is doing it. Such a development would really help us reduce our greenhouse gas emissions.

Why can't we develop a technology, which we, in fact, already have, to help us process the oil sands in a manner which is clean and less polluting? Emission levels are the same for refining as they are for driving a vehicle. Finding a way to extract oil from the Athabasca oil sands using clean technology would be a wonderful challenge for society. The development of the oil sands represent 47% of our greenhouse gas emissions since 2000. What are we waiting for to use our technological capacity, our engineering knowledge and our know-how? The idea is not to get rid of everything from one day to the next, but to transit towards a much cleaner and more efficient economy.

● (1230)

Mr. Christian Ouellet: Could the fact that the largest emitter is based in western Canada be the reason why the government is not taking quick and strong decisions with regard to greenhouse gas emissions?

Prof. Louis Fortier: There is no doubt a connection. The problem is political; let's not pretend otherwise. What I want the current government and any Canadian government to understand is that it is extremely profitable to make this transition. We will not be losing jobs or become less prosperous. However, if we do not go ahead, we will become poorer and head towards a Soviet-era economy which will not be competitive.

[*English*]

The Chair: *Merci.*

Mr. Woodworth, the floor is yours.

Mr. Stephen Woodworth (Kitchener Centre, CPC): Thank you very much.

I want to thank all of the witnesses who have come to appear before us today. I want to say at the outset that I appreciate the sincerity with which each of you has made your case. I would never for a moment question that sincerity, although, in all honesty, I have to tell you that I find your presentations to be lacking in a singular respect. I accept for myself, at least, that you have raised the alarm well and truly. There's no doubt in my mind about the problem of global warming and the fact that we have to do something about it. And I am on the search and on the lookout for practical and achievable solutions.

Once again, today, I've heard very little about achievable solutions. Simply setting targets, as Bill C-311 does, achieves absolutely nothing in itself. There's evidence of the awful cost of not taking some steps, but there's virtually no evidence on the cost of competing solutions. In one respect I find that rather odd, but I think I understand it.

When I ask the government for what solutions it proposes, I hear about progress in tailpipe emissions, extending hydroelectric grids, investments in renewable energy programs, research in carbon capture and sequestration, literally billions of dollars in green energy investments, improvements in resource extraction techniques, money to the provinces to close down coal-fired generators, biofuel incentives, automotive innovation grants, home retrofit incentives, and persuading international emitters like the U.S.A. that it's economically feasible.

Bill C-311 contains absolutely no plan whatsoever.

I would like to begin by asking Dr. Stone, what specific scientific measures would you put in a bill that would have the effect of actually reducing greenhouse gases in Canada? And could you tell me, for each of those measures, how many dollars would be required to devote to that particular solution?

Prof. John Stone: Thank you.

I'm afraid that I'm only going to be able to give you a partial solution, limited by my own expertise.

I think you're right in your implication that Bill C-311, in itself, will not achieve what we want to achieve. But to my view it is an essential first ingredient, that if we are going to set this country on a path to addressing climate change, then the first place to start is by setting an ambitious goal, an ambitious target, a target that will galvanize Canadians as individuals, Canadian industry, and Canadian governments at all levels.

● (1235)

Mr. Stephen Woodworth: Dr. Stone, it didn't work with Kyoto. So what I really need to hear from you and from other scientists are measures that we can implement. If you have something specific to tell me, now's your chance, please.

Prof. John Stone: What did not work with Kyoto was that we did not have the legislation in place that, for example, would cap emissions of the big emitters and allow them to enter the global carbon market. We didn't have the legislation that would allow us to achieve what we committed to under Kyoto.

Now, there are, as Professor Fortier has mentioned, several technologies that we can take advantage of. My concern is that if we do not take advantage of these soon, Canada is going to be left on the wrong side of history.

As just one example, China now is the second-largest producer of photovoltaic cells. I don't want to look at a future in which I'm going to go to Wal-Mart to buy the photoelectric cell to put on my roof. I would prefer that it was engineered and developed in Canada. I think we have the expertise and the ability to do it. But unless you start with an ambitious target and then put in place the legislation, put a price on carbon, then I think all of those technologies, which are there and we know we can harness, simply will not be realized in this country.

Mr. Stephen Woodworth: Dr. Stone, if this bill put a price on carbon, at least we'd have something to talk about, but the reality is this bill doesn't do anything, like Kyoto.

I'm interested in your idea about photovoltaic cells, but I need to know what kind of investment you're proposing the government make in the production of photovoltaic cells.

Prof. John Stone: Let me give a very short but more direct answer.

We know we have done the calculations. They are in a recent report produced by the National Round Table on the Environment and the Economy. They have analyzed what it would take for Canada to reach such ambitious targets, and their bottom line is, yes, it is possible.

Mr. Stephen Woodworth: Actually, I—

The Chair: Unfortunately, time has expired. I know it goes by fast when you're in an in-depth discussion.

Mr. Scarpaleggia, you have the floor.

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

I think whenever we talk about the severity of the problem of climate change and the impact of climate change, we're really preaching to the converted. I think everyone at this table understands that it's a real problem and that it's having ravaging consequences—drought, declining water levels, and so on and so forth.

I think that discussion is a bit of a red herring, to be honest. We're here more to establish whether the targets in the bill that we're studying are realistic for Canada to achieve, given the constraints that we have presently.

I would like to ask the scientists here a political question. And you may say, well, that's off-base, but you are scientists *engagés*. You're involved in the political process, and you've made political statements about the dynamics of the Copenhagen process.

Dr. Stone, you said we need ambitious targets above all to galvanize the Canadian public. That's a political statement. Those are the kinds of statements that politicians make. So I think this is a fair question.

Do you believe, if this bill were to be passed on December 11 by the House of Commons, that this government, especially a government that has a fairly stubborn reputation when it comes to environmental issues, in fact all issues, would change its negotiating position at Copenhagen because a day prior or a week prior or a month prior the House of Commons passed Bill C-311?

The Chair: Gentlemen, who wants to respond?

Dr. Stone, do you want to start off?

Prof. John Stone: You've noted that I made some statements that you regard as political.

Mr. Francis Scarpaleggia: I have no problem with that, by the way.

Prof. John Stone: But they are more personal. They're derived from having been engaged in this topic for 20 years and being convinced of the seriousness of it and the urgency of taking action. I think scientists do have a responsibility to warn. It's on that basis that I made my comments.

If this bill were passed before Copenhagen, then undoubtedly it should change Canada's approach to the negotiations. That would seem a no-brainer, as I think they say.

● (1240)

Mr. Francis Scarpaleggia: My next question is for Dr. Fortier.

You spoke about carbon capture and storage as being a solution to the problem of greenhouse gas emissions in Canada, as a tool that would help us achieve the ambitious targets in this bill. But what I hear about carbon capture and storage is that it's scientifically unproven. Even the government, in its press releases.... Jeffrey Simpson this morning says that in the press releases of the government, which are touting carbon capture and storage as a panacea, the language is always hedged with words like “could” achieve, or “as much as” in terms of reduction.

You know, the science is not there on carbon capture and storage. I don't know how we can say we should pass this bill with these particular targets—maybe we should, and that's why we're debating it—because we have carbon capture and storage, which is like a magic bullet.

Another statement you made, Dr. Fortier, which I found interesting, was that it's better to have ambitious targets like 80% reduction by 2050 than 50%, because when you put everything else aside—the moral reasons for aiming high and so on—you said it's good for the economy.

But I have not seen any scientific evidence, or economic analysis, to show that if you choose a target of 80% versus 50%, the economy would grow by *Y*%. We talk about science and we all buy into the science, but we're here to discuss whether the targets are realistic.

I'd like to read something from this month's *Foreign Affairs* magazine, which you've probably read. It's an article by Michael Levi, called “Copenhagen's Inconvenient Truth”. It says here:

> There is an emerging consensus among negotiators that the world's governments should aim to cut emissions in half, ideally from 1990 levels, by 2050. This basic goal, endorsed by the G-8 (the group of highly industrialized states) at its 2008 summit, should frame U.S. calculations.

Maybe 80% is the best target. Maybe this is the kind of target we should adopt in the House of Commons. But we're here to debate whether it's the right target. We can't simply say let's choose the most ambitious target because it makes better headlines or motivates the population. We have responsibilities as legislators, and that's why we want to take our time to really examine this bill, not because we doubt the science or because we don't think we should be taking aggressive action.

The other thing that I think we have to keep in mind is that, yes, with proper investments we can achieve some very drastic reductions, but the government has tied our hands with a $60-billion deficit. It's making investments in carbon capture and storage that amounts to a price on carbon of $760 per tonne of reduction. What we're trying to answer here is given our context, are these the right targets we should be going ahead with? That's what I'm saying. If you have any comments—

The Chair: Mr. Scarpaleggia's time has expired, so I'll ask that you respond very briefly to this question.

Dr. Sauchyn.

Dr. David Sauchyn: Thank you.

I want to comment on the remark about unproven technologies. From the boardroom here, I'm looking directly at the International Test Centre for Carbon Dioxide Research. This is a world-class research facility where researchers have developed that technology. It's proven. It exists. It's been operational in southern Saskatchewan for more than a decade. They have an extreme sense of frustration here in that it's not required. These innovations and this new economy will not exist until the targets are established, because who's going to invest in these technologies, and what small business is going to pursue this kind of research and development, unless it's legislated?

I've spoken to engineers in the energy sector in western Canada. They have told me that they have developed technologies to make energy use and production much more efficient, but it's not required. Therefore, they will use the status quo. They will use the least efficient but cheapest approach until it's required, until it's legislated that they implement these new technologies.

● (1245)

The Chair: Thank you.

Time has expired. We have to move on.

Mr. Watson, the floor is yours.

Mr. Jeffrey Watson (Essex, CPC): Thank you, Mr. Chair, and my thanks to our witnesses for appearing.

The orders of the day suggest that we're looking at a science panel. First, when it comes to emissions reductions, we hear the warning not to look at it from an intensity perspective but from an absolute perspective. Yet, when quantifying global emissions, we're told not to look at major emitters for the absolute emissions that they give off, but rather, to look at the issue by intensity. I think that's illogical.

Secondly, I think it's illogical to argue that this is a global problem that affects everyone, but then, when it comes to apportioning targets, to hear that the problem is, globally, more the responsibility of some than of others. This is a values judgment, and I don't find that logical.

Mr. Stone, you said something to the effect that science is back in Washington, D.C. The Obama administration has adopted a target that is virtually identical to Canada's for the reduction of greenhouse gas emissions. Is the U.S. target, in your opinion, scientific or not scientific?

Prof. John Stone: It depends where you look. There are three numbers at least.

Mr. Jeffrey Watson: I've asked for your comment on the Obama administration.

Prof. John Stone: My feeling is that it is not ambitious enough but has been sufficient to change the tone of the negotiations on the Framework Convention on Climate Change.

Mr. Jeffrey Watson: I have a question on the IPCC's fourth assessment report targets. We've heard a lot in discussion, both on Bill C-311 and Bill C-377, its prior incarnation in the debate. Particularly the New Democrats will call them scientific targets. Greenhouse gases know no political boundaries. Science has been able to quantify the aggregate problem. It's global in nature. But in proportioning the targets, a choice was made to divide target responsibilities between developed and developing countries using something called, I think, an equity interpretation.

First, to the panel, are you familiar with what an equity interpretation is? Secondly, is that a standard scientific judgment, or is that a values or policy judgment?

I'll start with Mr. Zwiers.

Dr. Francis Zwiers: I do not know what an equity allocation is, but if we are talking about equity, this would seem to be a political policy judgment rather than a scientific one. The climate cares about the total amount of carbon dioxide that's in the atmosphere.

Dr. David Sauchyn: I agree entirely with Dr. Zwiers.

Mr. Jeffrey Watson: Mr. Fortier.

Prof. Louis Fortier: I wouldn't be able to answer that question.

Mr. Jeffrey Watson: Okay.

The thrust of the question, of course, is that I find what gets a bit distorted—blurred, at the very least, if not obliterated—in the discussion around the science of this is having climate scientists commenting on things that are not scientific, or certainly not within the realm of climate science.

For example, Mr. Fortier, I was reading your submission to the committee. You made a lot of judgments about what the economy will look like.

First of all, what is your relevant economic expertise in making those kinds of forecasts about what will happen? You've stated that countries like Sweden, for example, are going to be world economy leaders. You've accepted forecasts about how many vehicles will be hybrid. You've made a lot of assertions about the economy of the future.

I want to know what your relevant expertise is to do so, or to assess the claims of others that those are accurate.

● (1250)

Prof. Louis Fortier: I'm not an economist, that's for sure, but I have followed the debate very closely. I've read the Stern report and other reports and everything, and we are projecting one billion cars by 2030 and two billion cars by 2050.

You can also see the example of European countries. Take Germany; the German environment minister is trying to push this idea that we will be able to power Europe as a whole, in 20 years, from solar power, which will come from somewhere in the Sahara desert or whatever—

Mr. Jeffrey Watson: Is that what scientists are saying or what you think economists are saying?

Prof. Louis Fortier: That is how economists are seeing the future.

Mr. Jeffrey Watson: Okay. And what's your relevant expertise to assess whether that's true or not?

Prof. Louis Fortier: I'm not an economist. If you—

Mr. Jeffrey Watson: That's the thrust of my....

The Chair: Order!

Mr. Jeffrey Watson: You know what, Mr. Chair? I hear Ms. Duncan over there, interrupting continually on this.

The Chair: Yes.

Mr. Jeffrey Watson: But I have a very relevant question here....

I hear her heckling across the way. She doesn't like the thrust of the questions. But this is the reality: it's my assertion that scientists should stick to synthesizing the science and let the economists synthesize the economic data. Let those who are relevant in their jurisdictions synthesize it, because they have the expertise to do so. At the end of the day, it is the realm of policy-makers to try to synthesize all the relevant facts in making policy decisions.

I think Mr. Zwiers has been respectful of that line today. I'm not sure some of our other witnesses have done so.

Mr. Sauchyn, I should say that you have as well; I think there was a particular question about this.

Mr. Chair, that question is entirely relevant to the discussion.

The Chair: Okay. I appreciate those comments. At the same time, your time has expired, so we're going to continue on.

I do ask that the sidebar conversations and the comments across the table be minimized. It is distracting to our witnesses and it's not very respectful.

Mr. Warkentin, the floor is yours.

Mr. Chris Warkentin (Peace River, CPC): I'm going to pass my time over to Mr. Woodworth.

The Chair: Mr. Woodworth.

Mr. Stephen Woodworth: Thank you very much, Mr. Chair and Mr. Warkentin.

I want to pick up on the point that was made earlier about incentives to industry to adopt the technologies that are out there. I think that's a valid point as far as it goes, but I think it's misplaced.

If anyone says that just because we pass Bill C-311, which has targets, it will give any incentive to industry.... I think what we're really talking about is in some fashion putting a price on carbon and in some fashion adopting a cap and trade system.

I would like to ask the witnesses whether they think a heavy-duty cap and price on carbon in Canada, without the participation of the United States, will incent Canadian industries to adopt new technologies or instead encourage them to move to the United States. Have the witnesses taken into account the scientific features of market reaction in the proposals they're putting before us?

Dr. David Sauchyn: We were just criticized for responding to questions like this. We were just told not to respond to questions—

Mr. Stephen Woodworth: Well, I'm not criticizing you for it. If anything, Dr. Sauchyn, I'm criticizing you for *not* taking into account the consequences of the policies that are being proposed.

The Chair: Order.

Mr. Stephen Woodworth: I certainly don't mind you telling me whether you think that a cap and trade system in Canada alone, without participation of the United States, or one that's seriously more onerous in Canada than in the United States, will encourage any industry to adopt new technologies or will just encourage them to move south of the border.

Dr. David Sauchyn: I appreciate the question. It's a very good one. But it requires an expertise in economics, and I'm a physical scientist. We were just criticized—

The Chair: Do any of the other witnesses wish to comment on that?

Dr. Stone.

Prof. John Stone: Let me just try to be helpful. I am not an economist, but I know how important it is, as are many of the other social sciences. So I have read a lot about it. I have read what the IPCC said in its fourth assessment on the costs. I have read what Nicholas Stern said in his report for the U.K. government. I have read what the World Bank said.

All of them seem to suggest that in the tackling of this issue, first of all, it will be more expensive if we don't tackle it; and secondly, the costs are manageable.

One estimate—it comes from the IPCC, which I'm simply reporting—is that if we adopted a target that was roughly maintaining the temperature below 2°C, then that would mean globally the GDP in 2050 would be what it would otherwise have been in 2049. In other words, we would have missed one year of global economic growth.

● (1255)

Mr. Stephen Woodworth: Could I interject for a moment, Dr. Stone? Do you understand that my question is about whether you feel there is a benefit to harmonizing the North American approach to greenhouse gas emissions?

Prof. John Stone: Let me come to that now. From the way things are going, I think it is now inevitable that there will be a price on carbon, and there will be a North American market. I say that because we already see states and some Canadian provinces entering into carbon markets. It is the experience in the U.S. that their federal legislation is very often based on experiments that are carried out at the state level. I think it's inevitable that we will see a price on carbon in North America.

Mr. Stephen Woodworth: Thank you.

There was a question earlier about whether Bill C-311 would make a difference to our negotiating position in Copenhagen. I'd like to ask the witnesses whether they think that arriving at a harmonized North American approach to greenhouse gases might also strengthen our position in Copenhagen.

Perhaps Dr. Fortier could respond to that.

Prof. Louis Fortier: Yes, I think it would obviously help if we came as a North American bloc to the discussions in Copenhagen. Personally, I'm very encouraged by the recent developments with the President of the United States taking steps to actually reduce emissions. I think that to achieve this reduction in emissions we need a mobilization similar to what we had for the Second World War. Those who mobilized the world in 1939 were the President of the United States and the Prime Minister of the United Kingdom.

This is what we're seeing at this time. Mr. Brown and Mr. Obama are really trying to move the agenda forward. I think if we came with our position aligned with that of the United States, it would be excellent for Canada.

The Chair: Thank you. Time has expired.

We have some business at hand that we need to deal with quickly.

I want to thank all the witnesses for your testimony today, and for your discussion in our debate. It was really appreciated. It will help us with our study on Bill C-311.

You are now dismissed.

The committee does have a couple of orders of business.

Ms. Linda Duncan: I have a meeting at one o'clock, Mr. Chair.

The Chair: Okay. This will be very quick.

We have to approve an operational budget for the study of this bill. There is a motion drafted that the committee approve the operational budget for the amount of $39,650 for the study of Bill C-311, An Act to ensure Canada assumes its responsibility in preventing dangerous climate change.

Can I have someone move that?

Thank you, Mr. Warawa.

(Motion agreed to)

The Chair: We circulated the proposed schedule that we have so far for the witnesses who have confirmed. It is there for your information. We'll take a look at this again, depending on the outcome of the vote tomorrow night.

Is there any other business?

Go ahead, Mr. Trudeau.

Mr. Justin Trudeau: We've spoken about this a number of times, but I'm moving a motion—we can discuss it on Thursday morning—that the meetings in relation to Bill C-311 be televised.

I will be depositing this with the clerk. Unless we get unanimous consent now, we can discuss it on Thursday morning.

That's just a notice of motion.

The Chair: It's a notice of motion for Thursday.

Okay. It's tabled.

Is there a motion to adjourn?

Mr. Woodworth so moves.

We're out of here.

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