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Chair

Mr. Laurie Hawn

Legislative Committee on Bill C-30

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● (1740)

[*English*]

The Chair (Mr. Laurie Hawn (Edmonton Centre, CPC)): Ladies and gentlemen, we have quorum. I'd like to call the meeting to order.

Welcome to meeting number 11 of the Legislative Committee on Bill C-30.

We have two witnesses with us today in person and one via teleconference. In person today we have Professor Richard Peltier,

[*Translation*]

from the Physics Department of the University of Toronto, and Mr. John Stone, Adjunct Professor at Carleton University and member of the UN Intergovernmental Panel on Climate Change.

Welcome to you both.

[*English*]

And from the University of Victoria we have Professor Andrew Weaver, from the School of Earth and Ocean Sciences.

Welcome, all.

We'll start off with the usual for witnesses: we give each witness about 10 minutes and try to keep it to 10 minutes, if we can, so that we get maximum questioning in. We'll go through all three presentations and then we'll open it up to questioning from members of the committee.

We'll start in a little different order than that showing on your agenda. We'll start off with Adjunct Professor John Stone from the UN Intergovernmental Panel on Climate Change.

Professor Stone, the floor is yours.

Prof. John Stone (Member, Adjunct Professor at Carleton University, UN Intergovernmental Panel on Climate Change): Thank you very much, Mr. Chairman.

Chairman and members of this legislative committee, I'm grateful for the opportunity to appear before you today to share with you some of the main conclusions of the recently completed report of the Intergovernmental Panel on Climate Change's Working Group I on the physical science basis of climate change.

First, I have some general comments.

With this report, the debate on the science of climate change is effectively over. There can no longer be any question that the climate is changing. According to this report, warming of the climate system is now unequivocal. According to the Oxford English Dictionary definition, this implies that the science is now unambiguous.

Furthermore, most of the observed increase in globally averaged temperatures since the 1950s is, it is now very likely, due to human activities that have given rise to increases in atmospheric greenhouse gas concentrations. “Very likely”, in the words of the IPCC, means at least a 90% certainty. Scientific results don't often get as clear as that.

The IPCC report is authoritative and well balanced and reflects peer-reviewed work of thousands of scientists around the world. As an assessment, however, it treats new results with caution and is therefore somewhat conservative.

My own reading of the literature suggests that the climate change is actually speeding up and that the trends are no longer simply linear. In my view, this suggests an urgency to addressing the issue of climate change. There is, indeed, a growing body of literature that suggests that the longer we delay tackling the threat of climate change, the greater will be the risks and the greater will be the potential costs.

Let me talk a little bit about what we have observed, and first about the root cause of the threat; that is, the changes we have made to the composition of the atmosphere mainly by the burning of fossil fuels.

The atmospheric concentration of carbon dioxide in 2005 exceeds by far the natural range over the last 650,000 years. That is over some six or seven ice ages. In short, we have taken the atmosphere into unknown territory.

More worrying is that the annual growth rate of carbon dioxide concentration is now larger than it has been since continuous records were begun in about 1960, and that is consistent with the continued growth in emissions. We are clearly far from stabilizing, let alone reversing, the root cause of the problem.

We know from well-established physics that increasing the concentrations of greenhouse gases in the atmosphere will affect the climate, and indeed, that is what has been observed. Eleven of the last twelve years are among the warmest in the instrumental record, roughly since 1850, and the linear trend in warming continues to increase.

Global average temperatures have increased by almost three-quarters of a degree over the past 100 years. We now have evidence that the oceans also have warmed and in fact have taken up almost 80% of the heat added to the climate system, which has resulted in temperature increases down as far as three kilometres. This heat in the oceans will take centuries to work itself through the climate system.

Global average temperatures are now higher than at any time in the last 1,300 years, and projected patterns of warming would continue these recent trends. It is extremely unlikely that observed changes over the past 50 years can be explained without invoking the increases in greenhouse gas concentrations in the atmosphere.

In addition, average Arctic temperatures have increased at twice the global average rate over the last 100 years, and Arctic sea ice extent has declined by almost 3% per decade, with much larger decreases in the summer, and there are signs that these rates of decline are in fact increasing.

More intense and longer droughts have been observed over wider areas since the 1970s. At the same time, the frequency of heavy precipitation events has increased. There is observational evidence for an increase in the most intense hurricanes in the North Atlantic since about 1970. Outside the Tropics, mid-latitude westerly winds —the sorts of winds that hit the west coast in December—have strengthened in both hemispheres since the 1960s. That's what we've observed.

As for the future, over the next two decades, at least, further global temperature increases of 0.1 degrees Celsius per decade are in fact inevitable because of what we've already done to the atmosphere. All scenarios of future emissions project that the warming could in fact be twice as large as that. Best estimates of temperature increases by the end of the century range from 1.8 degrees to 4 degrees Celsius, with a forecast sea level rise from roughly 0.2 to 0.6 metres. In addition, snow cover and sea ice are expected to contract, with the possibility that arctic sea ice will be almost entirely absent in summer. Hence, there will no longer be multi-year ice by the latter half of the century. Weather and climate extremes, including heat waves, droughts, heavy precipitation, and winds will continue to become more severe and frequent.

Recent observations of unexpected acceleration in the flow speeds of out-lake glaciers from Greenland and Antarctica, from the ice sheets there, have led scientists to recalibrate their understanding of glacier physics. Contraction of the Greenland ice sheet is projected to indeed continue to contribute to sea level rise.

Current models suggest that ice mass losses increase faster than gains due to more precipitation if the global average temperatures are greater than 1.9 degrees Celsius above pre-industrial levels. I may note that we're almost halfway there. If sustained for several millennia, the ice sheet would completely disappear, with a sea level rise in the order of seven metres. We haven't seen such sea level rise since the last interglacial period some 125,000 years ago.

To conclude, as I suggested, with this report, the debate on the science of climate change is effectively over. We now have to focus on solutions before it's too late. This will be the subject of the next two IPCC working group reports.

Thank you, Mr. Chairman.

● (1745)

The Chair: Thank you very much, Professor Stone.

We'll turn now to Professor Peltier, from the University of Toronto, for ten minutes.

Prof. Richard Peltier (Department of Physics, University of Toronto): Thank you, Mr. Chairman.

Members of the committee, John has covered almost every single point that's contained in the *Summary for Policymakers* of the AR4, and I'm not going to go through the process of repeating them once again.

What I thought I would do is focus on the high latitudes of this hemisphere and the comments the report makes about the situation northern Canada can expect to experience, if not in the next one or two decades, then certainly within the next century.

One of the primary fingerprints of the model predictions and surface observations of the process of global warming is that it is characterized by extremely high amplification at high northern latitudes. I think John has mentioned that we are observing, and models are correctly predicting, a difference by about a factor of two in the increase in mean surface temperature between the globe as a whole and the polar cap.

This has enormous ramifications for our country. For example, two years ago, in the *Arctic Climate Impact Assessment* report, which was precursory to the present AR4, there were detailed analyses performed of expectations about what the coverage of the Arctic Ocean by sea ice is liable to become before the end of this century.

It's very clear that by 2050—perhaps a little later, but about the middle of this century—there will exist for a significant period of time in the Arctic Ocean a continuous seaway. This has enormous implications for Canadian sovereignty. It has become much discussed in the popular press over the past month or so.

But it is just one of the issues we have to face in our most northern regions. We're beginning to observe very significant areas of permafrost degradation, and the ice cover in the Queen Elizabeth Islands and the Canadian archipelago is also experiencing a very significant decline.

I want to point especially to something that is not covered in the AR4, because these are results that have really come into the scientific literature only in the past six months or so. These results have to do with an experiment that is presently flying in space. It's an experiment called the gravity recovery and climate experiment. It's a two-satellite NASA–American–German collaboration that is flying a tandem of satellites over the pole, which are used to measure the time-dependence in the planet's gravitational field. This system has been focused very strongly on Greenland. One thing that has been very clearly established, based upon only four years of GRACE gravity field observations, is that the Greenland ice sheet is beginning to lose mass at an accelerating rate. Over the past four years, the rate of mass loss has increased by about a factor of four. This reinforces the comments in the AR4 to the effect that outlet glaciers on Greenland have begun to speed up.

This is an extremely important fact of the ongoing change in global climate: high-latitude amplification; increasing rates of mass loss in both alpine glaciers and the Greenland ice sheet.

And the report draws attention to a very important piece of observational evidence from the earth's past, specifically to a time in the past about 120,000 years ago, which is the so-called Eemian interglacial. This is the last time in Earth's history when the northern regions of the planet experienced a degree of warmth similar to the present. In fact, during the Eemian interglacial, the temperature within the polar cap was about five degrees warmer than it is at present. Our AR4 projection is that we should hit that increase in temperature in the polar cap again by about the middle of this century.

In the Eemian interglacial, when temperatures in the polar cap reached this level, the Greenland ice sheet was significantly smaller than it is today. And there was a very significant rise in mean sea level associated with that time, somewhere between four and six metres of sea level rise; we think about four metres associated with the loss of Greenland ice and as many as two metres associated with the loss of west Antarctic ice.

● (1750)

The interest here is a consequence of the fact that during the Eemian interglacial era, these changes, this shift in the temperature in the polar cap, took place on a very long time scale. The system moved very slowly into this new state of a relatively large diminution of polar ice. The experiment we're performing today is an experiment that's being performed on a very much shorter time scale. Our system is way out of radiative equilibrium, we call it. It's never been in a state like this before. The changes in greenhouse gas concentrations have occurred so rapidly that heat is being trapped out of radiative equilibrium primarily in the earth's oceans.

What this means in terms of the ability of Greenland and the west Antarctic ice sheet to maintain stability is an open question. Our climate models have no skill at all in predicting how ice sheets should respond to this out-of-equilibrium radiative regime. This really reinforces the fact that we are performing an experiment on the planet on which we have no way of predicting the outcome. And it should be a cause of great caution in terms of how we approach this from a policy perspective.

Thank you, Chairman.

● (1755)

The Chair: Thank you very much, Professor.

We'd like to welcome again Professor Andrew Weaver from the University of Victoria's School of Earth and Ocean Sciences.

Professor Weaver, the floor is yours for about 10 minutes.

Prof. Andrew Weaver (School of Earth and Ocean Sciences, University of Victoria): Thank you very much, Mr. Chairman and members of the committee.

I'd like to echo what Dr. Peltier said regarding the very wonderful summary that Dr. Stone made about the IPCC *Summary for Policymakers*.

Let me say I've been involved in the last three IPCC assessments: the second one, which appeared in 1995-96; the third that was published in 2001; and the last one that appeared, at least the *Summary for Policymakers*, in 2007.

I would rather not be prescriptive as to the type of things the government should do, so I'm going to make myself available for questions on the science.

But I want to raise one small issue that was touched upon by John Stone, and that issue is the commitment to warming that is already in the cards for change that has occurred. If you look at the report, what you'll find is that even if we were to maintain and stabilize emissions immediately—and it's not even emissions, but levels of carbon dioxide immediately—we're still committed to a 0.1-degree-per-decade warming, up to a total of about half a degree warming in the centuries ahead.

Every policy option that's on the table, that is, all of the various scenarios put forward by the various working groups of IPCC, leads us to about a 0.2-degree-per-decade warming over the next couple of decades. The difference between the scenarios lies after that point, so the decisions we make today are really coming to effect on time scales greater than two decades.

We have decisions that lead us to paths where atmospheric carbon dioxide levels can stabilize, or those business-as-usual type scenarios where it doesn't stabilize. The time scale over which this occurs.... And if you ask the question, what levels of carbon dioxide or emissions do we need to get to as a globe, the working number is that if we get below 60% to 90% global emissions reductions, then we will stabilize carbon dioxide levels at greater than the level that is above a two-degree warming, and that's not necessarily an acceptable level.

So the types of targets that people are looking at are the targets greater than 60%, of the order up to 90% by the year 2050, in order to stabilize levels of greenhouse gases at a level that is not deemed to be “dangerous”. That level of dangerous is often defined to be two degrees or so, and the reason why it is defined to be that is because our estimates of when Greenland ice sheets, for example, past the point of no return, are shortly above a two-degree warming, about a 2.5- to three-degree warming.

I'll stop there and be ready for any questions on any aspect.

The Chair: Thank you, Professor Weaver. That'll give us a bit more time for questions, and we appreciate that.

We will start our questioning with Mr. McGuinty for seven minutes.

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

My thanks to all three of you, Professors. Is that right? All three of you are certainly doctors. Anyway, thank you very much for coming.

I'd like to go back, revisit with you, and get your advice on two separate matters, the first of which is what appears to have been put to bed.

The pro-science and anti-science factions have been battling each other internationally and domestically in this country for decades. This is the first point to which I'd ask all of you to respond. Isn't it clear that the Kyoto Protocol itself calls for all signatories to invest heavily in the science of climate change, and that the notion of the science being certain or uncertain is in fact a mug's game? Science ought to be seen instead in terms of being complete or incomplete. For average Canadians who are watching, when is science ever complete?

As point number two, can you help both us and Canadians who are watching to understand what the linkage is between the scientific work of the Intergovernmental Panel on Climate Change and the work that has been ongoing on the United Nations Framework Convention on Climate Change, and particularly the Kyoto Protocol, which sprang forth from the Framework Convention on Climate Change?

I'd like to remind everyone here that it was our government that created the Canadian Foundation for Climate and Atmospheric Sciences, in response to our Kyoto obligations. It's headed up by Dr. Gordon McBean and is just a stone's throw from here, on Sparks Street.

Can you help us to understand those two things. Someone opened by saying the debate over the science is dead, but from elected officials, unelected officials, and industry representatives, we're still hearing doubts and aspersions being cast upon the science. In the past, it has come more principally from the oil and gas sector, the energy world. It's less so from there today, but it's still emanating from that sector and other sectors.

So can you help us to understand those two questions: one, the completeness and incompleteness of science; and two, linkage to the IPCC and the Kyoto Protocol.

● (1800)

Prof. Richard Peltier: I'll try to respond to the first of these questions concerning the completeness of science.

I very strongly agree with you that science is an ongoing enterprise. I commented at the end of my presentation, for example, that we are unable to predict what may be one of the most important impacts of global climate change, namely the stability of the cryosphere. The implication of that is that our scientific understanding is incomplete. We're unable to embody sufficient understanding in our models to make credible predictions.

What we can say on the basis of the AR4—and I don't think I would go further than this, and I don't think my colleague intended to go further than this—is that the science is unequivocal. I think what he meant to say was that it is unequivocal in the sense of the conclusion reached. With a high level of confidence, humankind is responsible for the majority of the warming that has occurred over the past four decades.

I think that's the guts of the comment in the AR4 report, but that doesn't mean the science is over. There is still a great deal that we have to understand if we're able to make credible predictions of very important aspects of the climate system.

Mr. David McGuinty: I'd like to hear specifically about the linkage between the IPCC process, the UNFCCC, and the Kyoto Protocol.

Prof. John Stone: I'll try to answer that, if I may.

Both are creatures of the United Nations. The IPCC was created by governments in about 1988 in order to provide them with authoritative information assessments on the state of knowledge of the science—and I use that word very broadly—of climate change.

Its first assessment was completed in about 1990, and this coincided with a large intergovernmental meeting in Geneva called the Second World Climate Conference. The results of the IPCC's first assessment were presented there and led to the desire to create a negotiating body. This led to the UN Framework Convention on Climate Change.

The second IPCC report was completed in about 1995, and it is probably no exaggeration to suggest that in fact this led and gave a considerable impetus to the completion of the negotiations on the Kyoto Protocol.

The third assessment was completed in 2001, and to some extent it's still a little too soon to understand exactly what the implications of that report will be on the UN framework convention process.

Now we've come to the fourth assessment that will be completed this year, in 2007.

Mr. David McGuinty: Dr. Weaver.

Prof. Andrew Weaver: May I add to that? Thank you.

I wouldn't want the impression to be left that there is any political interference in the actual writing of the IPCC documents. In the three assessment reports, which I've been part of, the actual writing was left up to the authors. What must be discussed was not dictated; what was done was a review of the various aspects of the climate system under broad chapter headings. Everything from the beginning to the end of a chapter was up to the authors of the chapter, who are practising scientists in the field.

IPCC does not do research. It assesses existing research, and that's very important to get across. IPCC is not conducting studies; it's not going out and running models. IPCC is like a massive attempt at writing a review article that assesses our current understanding of the science of climate change, which is then passed to policy-makers.

The people doing it are not the policy-makers; they pass the best science available to the policy-makers, so they can make the best policy decisions that they deem should be made.

● (1805)

The Chair: Thank you, Professor Weaver.

We'll move on to Monsieur Bigras *pour sept minutes, s'il vous plaît*.

[*Translation*]

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

Welcome to the committee, and thank you for the information you've given us. We're read it, but it's always pleasant to hear it in person.

Since we've been studying Bill C-30, we have focused more — and will continue to focus a great deal — on reducing greenhouse gas emissions at source. How can we achieve our Kyoto targets? What technologies can we put into effect? What tax or regulatory instruments should we use to combat climate change?

We talk a lot about reducing emissions at source, but your presentations lead me to talk to you more about adaptation to climate change. Government policy, whether it be that of the current government or that of the previous government, contains no policy on adaptation to climate change.

You spoke about a risk of rising sea levels and impact on populations farther north. What aspects should a policy on adaptation to climate change address? Should the maritime regions be included in such a policy? Should more vulnerable Aboriginal populations located in northern Quebec, where the permafrost will be melting, be given special attention? In a Canadian perspective, what fundamental aspects should a policy on adaptation to climate change include?

[*English*]

Prof. Andrew Weaver: I could address some of that, if you wish.

First off, I'm loath as a scientist to discuss which policy options should be taken. We're here as scientists to give you the best available science, so that you can make the best-informed decisions as to a policy.

What is it that the science is saying? The science says, for example, that if we cut emissions of carbon dioxide by 50% globally towards the end of this century and stabilize it, we end up equilibrating at a level with atmospheric carbon dioxide that is four times pre-industrial levels. That's a level that has not been seen since the Jurassic, the Cretaceous, the Triassic, when the dinosaurs roamed. That's not acceptable.

That's one extreme that is not acceptable. Emissions must be cut much more than that and on a time scale of the middle of this century for us to move to a climate that will not have major catastrophic effects on large ecosystems both here and abroad.

The question, then, is what we do. That's up to you. We need to cut emissions. We know what the problem is; the problem is carbon dioxide. We know where it's coming from; it's coming from emissions in the combustion of fossil fuels. It's now up to the engineers, the policy-makers, the economists to put forward the ways by which we can eliminate those carbon emissions into the atmosphere.

Prof. John Stone: Thank you very much. Permit me to *répondre en anglais*.

One of the things the IPCC Working Group I report is saying is that indeed there is inertia in the climate system. We are seeing impacts now and we can expect to see impacts continue for the next two, three, or possibly four decades. What that says is that in fact the history is already written, and therefore we have some obligation to respond to those potential impacts. An adaptation no longer is simply a policy option; in my view, it now becomes a policy imperative.

Having said that, however, I think we have to be careful not to use adaptation as an excuse not to reduce our emissions. We have to understand that the root cause of the problem, as Professor Weaver was saying, is human emissions that are changing the balance of the climate. It is important to recognize that emissions have to be reduced not by 6% but possibly by as much as 60% if we're going to stabilize the concentrations and stabilize the climate at a level that is not dangerous to our livelihoods.

● (1810)

[*Translation*]

Mr. Bernard Bigras: We agree on that. We have to reduce greenhouse gas emissions at source, but that reduction must also be accompanied by a policy on adaptation to climate change.

The Ouranos Consortium in Quebec told us that the impact of climate change can be estimated at $1.5 billion for the St. Lawrence corridor alone. I don't want us to believe that adaptation is a pretext for inaction. It's quite the contrary: we have to take action to reduce greenhouse gas emissions. But if we disregard the fact that those emissions will continue to increase despite concrete action, we risk incurring enormous economic costs. There could be an impact on infrastructures in the north and on the Aboriginal populations living there.

What aspects should Canada focus on in order to reduce greenhouse gas emissions at source and to be able to adapt in future?

[*English*]

The Chair: Who would you like to see answer in 45 seconds?

Prof. Richard Peltier: Forty-five seconds?

Clearly there is a problem here that requires adaptation to the inevitable effects over the next two to three decades. As John and my other colleague have said, there's nothing we can do about this. This is inertia that's built into the system. The differences, however, beyond two to three decades are huge, depending upon the greenhouse gas path we choose to travel.

But there are steps we have to take as well to try to protect ourselves in the short term against the impact we'll undoubtedly feel during these first few decades.

So I agree with you; it's a two-stage process that we have to follow.

The Chair: Thank you very much.

We'll move on to Mr. Cullen for seven minutes, please.

Mr. Nathan Cullen (Skeena—Bulkley Valley, NDP): Thank you, Chair, and thanks to the witnesses.

This is a quick question for Dr. Weaver. Having been involved with these reports before and having seen the UN at work, if I can put the term that way, is there not a consensus required with the authors who are present before anything gets printed?

I know there are authors from over 113 countries in this last report. Does this report represent, if there were a spectrum, the more alarmist end of interpretation of the science or the more conservative end of the interpretation?

Prof. Andrew Weaver: Thank you for that question.

Yes, in every individual chapter you must have agreement. Some people will make a big deal that there's no such thing as consensus in science, but in fact there is. There's consensus that we're going to use words such as “likely” and “very likely”, which have a probability attached to them. You'll find that when you come to consensus, the extremes are not there. This is a very conservative report.

In fact, people have actually studied the results and the predictions, projections, from the IPCC, since its first report in 1990. They looked at what has actually happened over the last two decades, since IPCC started issuing their projections. You'll find that what happened was within the bounds projected by IPCC, but at the upper end of those bounds.

So you should view the IPCC projections as being very conservative, although not in the political sense. It's conservative in that it's not alarmist; it's very middle of the road and good science by the world's best scientists.

Mr. Nathan Cullen: Thank you.

I have a question for Professor Stone. I know that you folks are not here today to debate policy options, but when policy options are discussed, costs are attributed to options on a gradient.

Do you know of any studies in this country that have assessed the costs of mitigation, as Mr. Bigras mentioned, with a one, two, three, or more, just on the sea level rise? Do we know of any research that's been done to figure out how much this costs our economy?

● (1815)

Prof. John Stone: Thank you very much.

Generally speaking, it's been very difficult to engage economists in the climate change debate. Some work has been done by several academics in Canada on the costs of reducing emissions and also of responding to the impacts.

The problem for both of them is the baseline. What would happen if you did nothing? That's the challenge that many of them face.

But at the moment, if this is the intent of your question, I'm not aware of any report of the magnitude and extent of the one produced recently by Nicholas Stern.

Mr. Nathan Cullen: I think that advocating for something for us to grapple with in this country might be important.

Dr. Weaver, I have to say that many of the members around this table have listened to a lot of testimony on the effects of climate change and the predictions. Tonight I'm struck even more profoundly by the types of impacts we're talking about.

As Professor Peltier mentioned, ice is being lost at an accelerated rate in Greenland and at four times the background rate.

From a scientific view, how critical is it that we wrestle these emission rates back down to some level of normalcy? You've talked about some extremely large numbers, from 60% to 90% of 1990 levels. That's an awful lot.

Prof. Andrew Weaver: Again, we have models out there that look at the carbon cycle and what stabilization scenarios you must reach, in order to get levels of atmospheric carbon dioxide to prescribed levels. For example, you can look at emissions pathways into the future, and you'll see that if you cut emissions by about 50% and stabilize them, you'll stabilize the atmosphere with a carbon dioxide level of about three to four times the pre-industrial level, which is not good. This is very high, and there's a warming that the earth has not seen since humans have been on it, or in fact any time since mammals have been the dominant species. This is not the type of warming we want.

There's a huge amount of data—paleo-environmental as well as model data and basic physics—calling for these changes.

I don't know if I've answered the question. We know how the climate system responds to carbon dioxide.

Even Bill Nigh, the science guy, has a wonderful little experiment in which you put carbon dioxide in one and pure air in another and then look at the effect.

We know what will happen in terms of the broad effects. We don't know exactly which policy paths will take us where we'll be, but this is why we have to make decisions now.

Mr. Nathan Cullen: I know you're wary of the policy commentary, but I'm looking at an article and some of the articles in some of your comments about what happened recently in British Columbia.

Prof. Andrew Weaver: I was stunned.

Mr. Nathan Cullen: Yes, I hear you were stunned, almost speechless.

Prof. Andrew Weaver: I know. It's true.

I say it again: if you want leadership, look to B.C. That throne speech is truly one of the most progressive throne speeches I've seen.

Mr. Nathan Cullen: But why?

Prof. Andrew Weaver: It's not only about dealing with emissions, but it's dealing with them using the marketplace, which is the reality. We can't ask people to start living in tree huts; we can't ask people to stop watching television. It's not going to happen.

I wasn't consulted on this. I and many other people I know just got shocked. This is a very progressive policy calling for—

Mr. Nathan Cullen: Let me ask a question specific to this, though. You talk about the business and about the market being able to respond. How critical is it that the market is given clear signals, and, when we talk about climate change and its impacts, that we talk about absolute reductions in emissions in a viable plan in a viable government document?

Prof. Andrew Weaver: I'm going to say that the key thing is not necessarily the path by which you get it, but the path you end up at. As has been mentioned by Dr. Stone, over the next couple of decades, regardless of which policy path we take, we'll have a certain degree of warming in store of about 0.2 degrees per decade. What really matters is where we want to end up. That is why any decision must lead to cuts on the order of 60% to 90% reductions by the middle part of this century in order for us to stabilize at acceptable levels of greenhouse gases.

So it is important to have it, but it's not necessary to say that the reduction must come tomorrow, the next day, or the day after. It's important that we reach a target that's realistic and lasts more than one or two political cycles and that will set the stage for major, dramatic reductions in emissions.

● (1820)

The Chair: Okay, we'll have to move on.

Thank you very much.

Mr. Warawa, you have seven minutes.

Mr. Mark Warawa (Langley, CPC): Thank you so much to the witnesses for being here.

Professor Weaver, I'm going to start with you. I was wondering if you could elaborate on your comments. Your presentation was short.

You were talking about the importance of stabilizing the CO_2 concentrations in the atmosphere and saying that the impacts we see on climate change—and I think we all agree around this table that the debate is over, that climate change is occurring, and that it's being caused by human activity—of the carbon we put into the atmosphere now are going to accelerate for...how many years?

Prof. Andrew Weaver: If we today, immediately, stabilize our level of greenhouse gases, we still have half a degree of warming in store. We've had one degree of warming—it's actually slightly less—and it's half of that again. It's committed, no matter what, even if we immediately stabilized emissions.

We've looked at these experiments. Some have argued that the time scale for carbon dioxide is 50 to 200 years in the atmosphere. It turns out, actually, that as you saturate more and more in the atmosphere, that time scale becomes longer and longer. So if we were to ask the question what happens if we burn our existing known resources of carbon—where does the atmosphere stabilize, and can we draw it down, if we burn our known reserves of carbon, 5,000 petagrams of carbon—we're going to end up with CO_2 levels stabilizing at 700 to 800 parts per million, and the drawn-down time from that is on the time scale of tens of thousands of years; that is, the system becomes saturated.

So the answer to your question is, we have warming in store for centuries no matter what we do. The question becomes, what do we want the path of society to end up in? Do we want to end up in an Easter Island type of scenario, or do we want to end up in one that's more sustainable?

Mr. Mark Warawa: Well, I would think it would be sustainable. At least, I hope that's the direction we're heading in. That's the commitment of this government.

The 1990s were the warmest decade in the past century, 1998 being the warmest year. I'm also from British Columbia. We've seen the devastation in Stanley Park. Some have suggested that some of these storms are one-offs. I would suggest that it's part of a pattern in climate change.

My question is, as we see more and more severe storms, are we likely to see that pattern also accelerate, so that storms will be more common, more frequent, and more severe?

Prof. Andrew Weaver: I can address that.

John Fyfe and Steve Lambert at the Canadian Centre for Climate Modelling and Analysis in Victoria have looked at that. They found that there is evidence that over the last few decades there has been an actual decrease in the total number of mid-latitude storms, but an increase in the stronger ones. When they analyzed the models and what they say will happen in the future, every single model from every single country done by every single group said that more of the same will happen; that is, while there may be a decrease in the total number of storms at mid-latitudes, those stronger storms actually increase.

Mr. Mark Warawa: You are aware of the situation Canada finds itself in, in that we're one of the worst among the OECD countries for our environmental record. Unfortunately, for the last 10 years not much was done, but we're committed with Bill C-30, the piece of legislation that this legislative committee is mandated to deal with.

I'm hoping I can hear from each of the witnesses recommendations on how we can strengthen this piece of legislation to truly have that end result. Bill C-30 includes short-, medium-, and long-term targets. You mentioned, Dr. Weaver, the target of 60% to 80% or 90% reduction. Our long-term target is a reduction of 45% to 65% by 2050, and heading for that goal.

You're encouraging the larger the better. Is that correct?

Prof. Andrew Weaver: That's correct. I'm not an economist, so I'm loath to comment on the economics of it, but a path that would lead to 60% to 80% reductions by 2050 using a framework such as exists in Bill C-30 may be a kind of path that is workable; I'm not sure. But the right numbers are there, 60% to 80%. And 45% to 60% I think is a little on the light side, in light of the fact that we're already substantially above 1990 levels; 60% to 80% would be more in line with what I would hope.

● (1825)

Mr. Mark Warawa: Just for clarification, are you talking about the benchmark as being 1990 levels? The suggested target for the long term was set by the National Round Table on the Environment here in Canada using the benchmark of 2003. You're suggesting 60% to 80% below the 1990 levels. Is that correct?

Prof. Andrew Weaver: That's correct, and it has to happen not only in Canada but everywhere in the world.

Mr. Mark Warawa: Right.

May I have a comment from Mr. Stone also, please.

Prof. John Stone: Sir, I'll try to answer your question. The first point I'd like to make is that the issue is climate change. This is a long-term issue. You need, as you rightly mentioned, short-, medium-, and long-term goals or targets. To strengthen this bill, you need such instruments as targets and regulations. They must be progressive. You can't suddenly change everything overnight.

That's part of the reason why you can expect the climate to continue to change. There's not only inertia in the climate system; there's inertia in our technological system. You're not going to overnight change all the coal-fired power plants into something else; you're not going to get everybody to change to driving a Prius within the next week or so. So there's a time element to this.

My feeling is that the one commodity we need above all others, short of political will, is imagination. It's the imagination to imagine the new technologies; it's the imagination to imagine other lifestyles, to have other aspirations; the imagination to actually strive. I think, more than anything else, what we have to have to tackle this is imagination, and you can't legislate that, of course.

The Chair: Thank you very much.

The time is up. I'm sorry.

Mr. Godfrey, you have seven minutes, please.

Hon. John Godfrey (Don Valley West, Lib.): Oh, seven?

The Chair: Let me rephrase that: five.

Hon. John Godfrey: You're the soul of generosity.

The Chair: Thank you for bringing that to my attention.

Hon. John Godfrey: Well, if I had just shut up, I would have been better off.

Voices: Oh, oh!

Hon. John Godfrey: I want to pursue something Professor Stone referred to, and actually Dr. Weaver did as well: the conservative nature of the exercise. One of the elements people have commented on since the fourth report came out was the fact that it has not incorporated—because of its nature, there had to be a cutoff point for information to be analyzed—information that has come in subsequent to the cutoff point, which would give us an even more dramatic picture.

Would anyone care to comment? Is that true? Would you like to give us some examples?

Prof. Andrew Weaver: I think Dr. Peltier mentioned some of the Greenland ice treatment, so perhaps—

Prof. Richard Peltier: I'll comment on that again. Subsequent to the information that was reported in the AR4, we began to receive data from the GRACE satellite system, which is now in space and which is focused on both Antarctica and Greenland.

What we're seeing in Antarctica is basically what we would anticipate, based on the global warming projections; i.e., that the Antarctic is more or less stable. When global warming occurs, according to observations and the models, we see high northern latitude amplification. The action is in the northern hemisphere at high northern latitudes.

When GRACE looks at Greenland, it sees a rapidly accelerating rate of mass loss. That's one of the main new things that have appeared since the AR4 was put to bed.

Hon. John Godfrey: Another comment has been made about the short summary document, the advice to policy-makers. Whereas the science is not negotiated, at that stage of the document, it was suggested, for example, that with the various ways in which you express likelihood or certainty—you know, "We are almost positive that..." or "It is very highly probably that..."—there was the possibility for national governments to have some degree of say. There was some suggestion that China had come in on that particular document to soften something from 100% to 90%. It's just one of those stories that gets out there and needs to be dealt with.

● (1830)

Prof. John Stone: I can try to answer part of that, sir.

The language on uncertainty on levels of competence was determined by the scientists. It's not a matter of taste; it's a matter of statistics, more than anything else, and of scientific judgment.

I was in Paris, because I'm a member of the IPCC bureau. I don't recall any instances when governments were able to change those statements of uncertainty. What the Chinese did try to do was modify some text that had to do with the relative contributions of human factors and solar variability to the radiative forcing that we've seen. They were successful in actually removing a piece of text; nevertheless, the information is there in the graphs very clearly for anybody to read.

Hon. John Godfrey: Thank you very much.

Prof. Andrew Weaver: Can I add to that?

I was involved in chapter 10, which is the chapter that looks at what will happen in the future, at global climate projections. Not a single one of our statements was changed.

The only differences between the *Summary for Policymakers* as put forward by the scientists and the one that was finally approved is that there's a bit more addition. I think that tells you.

I don't know how many of you have actually passed the *Summary for Policymakers* to policy-makers, but it's clearly written by scientists. Most policy-makers view this as gobbledygook.

In terms of what was added, for example, we put forward a figure that had a probability distribution function in it, showing how the probability distribution function evolved with time through the 21st century. What came out of plenary in the recent assessment in Paris was that they wanted SPM-7 to be added. That's a stick chart that is easier to understand, so that figure was added to our chapter in order to expand upon the more complicated figure. We also had a table added from some of the results that were in our chapter, but there was no substantial change.

So there was no change at all in the text in terms of anything of any scientific merit. The scientists wouldn't allow it. They would be up in arms if this were to happen.

The Chair: Thank you very much, Mr. Weaver.

Mr. Jean, for five minutes, please.

Mr. Brian Jean (Fort McMurray—Athabasca, CPC): Thank you, Mr. Chair, and thank you, witnesses, for appearing today.

I've found this quite depressing. In fact, for the last several years, I have to comment, being on the environment committee and being from northern Alberta and seeing the changes, there's no question that I believe in climate change. Something is taking place.

I want to read some information and I want comments about Canada being a global leader and about how we can make sure that as a global leader somebody actually follows us so that our lead makes a difference.

I read an article from the *Ottawa Sun* on the top 10 reasons why Kyoto is doomed to fail. I'm just going to go through them very quickly, and I'd like your comments.

The first was that the United States, which produces over 20% of global emissions, doesn't participate.

The second is that China, the second-greatest emitter, at 14.8%, is exempt from reducing greenhouse gases.

The third is that the European Union, which is the third-biggest emitter at 14%, is reaping the benefits of East Germany's financial and economic collapse, so it really doesn't have to meet any emission targets.

Russia, the fourth biggest, at 5.7%, had economic collapse, so they're more or less in the same position.

India, the fifth, is exempt for many targets because it's a developing country.

Australia is not involved in it. It has the highest per capita emissions of carbon dioxide on the planet, due to its reliance on coal. But still, it would be able to actually increase its emissions.

The most disturbing was that 850 coal-fired energy plants are planned over the next few years: 562 in China, 213 in India, 72 in the United States. None of these is covered by Kyoto. In essence, just these 850 coal-fired plants are estimated to pump five times more carbon dioxide into the air than Kyoto would remove, even if every other country hit its 2012 emissions.

The eighth reason is that.... Canada, of course, is only 2% of global emissions, so even if we hit our targets, to do which this article suggests the only way we could is to buy hot air....

In essence, gentlemen, they're saying Kyoto is mainly about transferring wealth from first-world countries to third-world countries. And this seems to be the only effective mechanism that's out there, except maybe for APAC 6.

I'm wondering what your comments are in relation to Kyoto and Canada's being a global leader instead of a follower.

● (1835)

The Chair: Who would you like to answer that?

Mr. Brian Jean: All of them.

Prof. Richard Peltier: Could I comment on this point? I think it's a very important one.

All of the points you've listed are fair enough. But what we're talking about here, and what I think is required, is a major change in the way our economic system operates. In my view, we are challenged by global climate change to basically reinvent the way we operate.

Current legislative circumstances mitigate, in my view, against innovation. Our companies, our corporations, because of the regulatory environment they do not face, feel no incentive to innovate. We have allowed them, because of the lack of legislative drive, to become Luddites, to live in the past. We've given them no incentive to create.

As my colleague John Stone has said, what we're after here, and what we should be trying to do in our legislative regime, is to have our country lead. And we're not going to do this without producing the incentives that only legislation can deliver. We don't want Luddites; we want creative companies that are world leaders, leading a society that also aspires to world leadership.

It's your job, in my view, as legislative people to produce the kind of legislative regime that will lead the country forward and have our companies create and innovate, rather than rest on their laurels, which is what many of our companies have been doing for far too long.

Mr. Brian Jean: Mr. Stone?

The Chair: Make it a very short answer, please.

Prof. John Stone: First, as I've already said, the issue is climate change; it's not Kyoto. Kyoto is certainly a challenge for Canada, but it's a first step. I look at Kyoto as a direction, as an experiment to allow us to try different policy measures, an experiment to put in place certain incentives, to put in place new technologies. And I believe we should aim to meet our Kyoto commitment.

The thing I'm always reminded of is Pascal's Wager, which in this context would go a little like this. If we try hard to meet the challenge of climate change and it turns out that it's not so severe, we have lost nothing. We will have a stronger economy; we'll have greater energy security; we will have cleaner air. If we do not try to meet the challenges of climate change and it turns out to be a reality, then we may have lost everything.

The Chair: Thank you very much.

We'll move on to *Monsieur Lussier pour cinq minutes, s'il vous plaît.*

[*Translation*]

Mr. Marcel Lussier (Brossard—La Prairie, BQ): Thank you, Mr. Chair.

Mr. Peltier, you're a physicist by profession, and you belong to the university world.

Of the following three urgent situations, I'd like to know which one the university world thinks should be resolved first. Is urgent action first required to discover and master technical solutions for capturing CO2, to reduce our dependence on fossil energies, or should we focus first on adaptation, that is changing all our building codes as regards engineering and architecture?

In your view, what is the current thinking among academics?

Prof. Richard Peltier: Pardon me if I speak in English, but that's my mother tongue.

● (1840)

Mr. Marcel Lussier: I don't see any problem with that.

[*English*]

Prof. Richard Peltier: From my perspective as an academic, I live in the world of physics, and particularly in the world of climate change. First, I would be very hard-pressed to find any of my colleagues who did not feel very strongly about the critical situation we're facing now.

We all believe very strongly in the predictions that our best models are making, and we believe that on all the issues you've raised, we have to move forward simultaneously. There is no one issue that can be singled out as more important than the others.

[*Translation*]

Mr. Marcel Lussier: Mr. Stone.

[*English*]

Prof. John Stone: I'll add one small thing.

About two or three years ago, Robert Socolow, a Princeton academic, wrote a paper arguing that we have the moment, that all the technologies we need to stabilize our emissions at today's levels to the middle of the century are at hand. What's required is putting those technologies into place. We don't necessarily need any new technologies; we should implement the ones that are available.

[*Translation*]

Mr. Marcel Lussier: Thank you.

Do you have a comment to make, Mr. Weaver?

[*English*]

Prof. Andrew Weaver: I do believe that the accommodation of all three is necessary. I look at technology as an example. As a society, can we not do any better than the internal combustion engine? We put people on the moon, we put satellites in space, we build computers, we can replace hearts, but can't we do better than the internal combustion engine? There must be other reasons why we haven't moved beyond it.

There is technology that's necessary; adaptation is absolutely necessary; and mitigation is necessary, as Dr. Peltier said.

[*Translation*]

Mr. Marcel Lussier: Mr. Stone, do you share Mr. Stern's view that an investment of one percent of GDP would make it possible to reduce the impact of the catastrophe anticipated in the 2050s by five percent?

[*English*]

Prof. John Stone: I'm sorry, but I'm going to have to duck that question, since I'm not an economist. The Stern report is 750 pages long, and I haven't been able to obtain a copy yet.

I've read the report's executive summaries. Basically he says that it will probably be more costly to do nothing, than if in fact we tackle the issue and the threat of climate change.

There is already a debate among economists. I saw some of it in the *Financial Times* last week in an article by Martin Wolf. The conclusion of many of these economists is that it's folly to ignore the issue and not do anything, simply because we can't do the economics perfectly.

[*Translation*]

Mr. Marcel Lussier: In your projection of the rise in sea levels, which may be up to 0.6 metre, what portion is attributable to melting glaciers, as compared to expanding warm water in the oceans?

Do you or Mr. Peltier have any ideas on the subject?

[*English*]

Prof. Richard Peltier: The question of sea levels rising is a very interesting and important one, but it requires some subtlety of thought. For example, Canada, which was covered by ice until around 12,000 years ago up to a thickness of four kilometres through most regions, is experiencing a very strong rebound of its crust out of the sea. For example, in the Hudson Bay region, the land is rising out of the sea at a rate of around 1.5 centimetres per year.

In many of the regions in eastern Canada and the western Cordillera, the land is still rebounding out of the sea. So sea level rising is not so much of a problem for these regions, because of the post-glacial crust rebound.

However, in the high Arctic, there are regions that were not covered so heavily by ice, where sea level rise could have a substantial impact, especially along the coast of Russia, but not so much the coast of Canada, which mostly was covered heavily by ice.

The issue of global sea level rise is of enormous importance in many parts of the world, but each region can expect to experience different impacts.

The Chair: Thank you very much.

We'll move on to Mr. Paradis for five minutes.

[*Translation*]

Hon. Christian Paradis (Mégantic—L'Érable, CPC): Mr. Stone, earlier you were asked a few questions about adaptation to climate change. We're definitely not going to ask you to look into a crystal ball. However, you raised an interesting point. You said that we would need imagination to address that situation. Can you clarify your thinking?

Currently, under suggested policies and approaches — they were mentioned earlier — we're trying to limit our dependence on fossil fuels by turning to renewable energies; we're examining energy efficiency options and looking for new technologies such as carbon capture, and so on.

You don't think that's enough. Does that mean we have to do more? Should we invest in research? How do you see the challenge, not in order to make the transition, but in order to really turn the page on upcoming challenges?

● (1845)

[*English*]

Prof. John Stone: Thank you. I'll do my best. It's a very good question.

As my colleagues have said, there's no getting away from the fact that over time we are going to have to reduce our emissions of greenhouse gases, perhaps by as much as 60% and maybe even more. That depends very much on our carbon-cycle models and lots of other things. Because of the inertia in the climate system, because of the inertia in our socio-economic systems, the fact is that certain impacts are going to happen anyway, and we can't ignore those.

Those impacts will differ depending on who you are, where you live, and what you do with living. There are certain regions—for example, in the Arctic—where, as Dr. Peltier was saying, climate change is exacerbated and where the impacts can already be seen. The people who live in the Arctic are very aware of climate change and what they've seen, and of the threat to their health and their livelihoods. In some such places it makes some sense that one needs to think about adaptation.

Other places, because they may be rich or because of other factors, are perhaps not so vulnerable. Africa, for example, is argued to be very vulnerable. I have the pleasure of being associated with the program run by the International Development Research Council, with funding from Canada and the U.K., that looks at adaptation in Africa, because it's understood that Africa is one of the most vulnerable places. I would argue that if they're vulnerable, then their security is our security, and that Canada has a vested interest in actually trying to help those vulnerable countries to cope with climate change, because if we don't, I think there will inevitably be repercussions for Canada.

Thank you.

[*Translation*]

Hon. Christian Paradis: Would Mr. Peltier or Mr. Weaver have any comments on that point? Otherwise I can ask my second question.

You discuss the various regions of the world from a scientific standpoint. What would your advice be for setting viable international targets for viewing the situation as a whole? From a scientific standpoint, what do you think would be viable?

[*English*]

Prof. Richard Peltier: I think the new regime into which we have to be moving is going to stress all of us—not only our corporations, but also us as individuals. I think Canada cannot afford to hold back on this problem and do nothing and wait for the rest of the world to solve our problem for us, because what's at stake here, as I commented before, is not only the problem of climate change; it's also the problem of innovation; it's the problem of leadership; it's the problem of creativity. We need to create a regime in this country that will foster those things. That's what we're lacking on this issue at present, and many of us are hoping that this committee and this country's governments going forward will help to lead us in the right direction.

I think we have to show leadership on this issue, and we have to show it in the short term, not the long term.

The Chair: Thank you very much.

We will go to Mr. Scarpaleggia for five minutes.

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

Dr. Stone, you mentioned something was progressing in a linear way and something was progressing in an exponential way. Was it the melting of the Greenland ice sheet that was progressing in an exponential way? Could you clarify that, please?

Prof. John Stone: There are several indicators we have that if plotted on a graph over time do not give a linear slope. Dr. Peltier and Dr. Weaver mentioned the acceleration of the Greenland and Arctic ice shields. I talked about the decline of the Arctic sea ice. If you look even at something as simple as temperatures, the rate of increase of temperature is actually faster than it has been. That is not linear. If you look at sea level rise, that again is not linear. In many places you look, it seems as though climate change is actually accelerating and that the impacts we're seeing are happening at a faster rate than we had anticipated in the IPCC's third assessment report.

● (1850)

Mr. Francis Scarpaleggia: I misunderstood, then. Nothing is linear; it's all exponential.

Prof. John Stone: That's my view.

Mr. Francis Scarpaleggia: I have a theoretical question. With the last report it became crystal clear that the debate over science is—well, it's not over, but basically the conclusion is clear that there is a major human component to creating global warming and climate change. At what point over the years would a moderate individual—not someone on the left or totally on the right, but a moderate, open-minded individual—conclude that the evidence that we had a problem was clear enough?

It seems to me that many politicians waited until two weeks ago to say that the science was in and they agreed. As a matter of fact, many MPs in the House were apparently not allowed to comment on the science until three weeks ago. Given your experience, at what point would an enlightened, moderate political leader say that we had a problem and we had to do something about it?

Prof. Andrew Weaver: May I address that?

I would like to point out that politically one of the most outspoken and visionary leaders in the world on the issue of climate change was Margaret Thatcher, when she was Conservative Prime Minister in Britain. She's the one who set up the Hadley Centre in Britain, the leading climate research group. She's the one who argued internationally that there was an urgent need, and this was back in the 1980s. She's fundamentally a chemist by training.

We've known about the greenhouse effect for 200 years. We've known about the specific role of carbon dioxide for over 100 years. In fact, Arrhenius and his colleagues and others have been making the calculations about a warming world for over a century. It's not new science; it's been around for a long time. International leaders have been speaking out on this for a long time. It's true there's more action being taken recently, at least in some countries, because of the latest report, but the scientific community has been pretty strong on this and has been saying the same thing for a very long time.

Mr. Francis Scarpaleggia: A good moderate leader would have known in the late 1980s or early 1990s that this was a problem.

Prof. Andrew Weaver: Lucien Bouchard, under the Mulroney government, knew it was a problem and set up Canada's Green Plan, which was a progressive action at the time, on the issue of climate change. It has been going on for a very long time in Canada.

Mr. Francis Scarpaleggia: Yes, except that our Prime Minister, as far back as only a few years ago, said while he was leader of the opposition that the science was tentative and contradictory—

Prof. Andrew Weaver: Well, I agree with that too.

Mr. Francis Scarpaleggia: He was late in coming to the realization.

Thank you very much.

The Chair: Thank you very much.

We'll move on to Mr. Manning for five minutes.

Mr. Fabian Manning (Avalon, CPC): Thank you, Mr. Chair.

I'd certainly like to welcome our guests and thank them for their presentations here today.

Dr. Stone, in your presentation you made a comment about striving to meet the levels, but levels that are not dangerous to our livelihood, if I took you correctly. Because greenhouse gases remain in the atmosphere for decades, as you have said, we are already committed to additional climate change even after emissions have been reduced. It's there and it's facing us, and we have to develop the necessary measures to adapt to those changes.

I wonder if you would care to comment on what you believe—and anybody can answer—are the keys to creating an environmentally sustainable economy, trying to mix the concerns we have with the environment and the concerns we have with being able to live and work in this country.

It seems that most of the people who have made presentations to us are either on one side of this or the other. But in listening to you people this evening, I've found that you're in the middle of it. You're concerned about climate change, but at least you can elaborate on that somewhat. It seems to be a major concern for Canadians.

I'll just close, if I could, with the fact that when you ask Canadians today, the number one concern they have is the environment. Right behind that, though, they're very concerned about their livelihood.

● (1855)

Prof. John Stone: Let me just make a few comments.

It's my own personal feeling that we won't be able to successfully tackle the issue of climate change if we regard it simply as an environmental issue. There is no doubt that it's an environmental issue, but it's a matter of how it's framed. I think this is key to what was asked earlier about how we get other countries involved.

We have to frame it in ways in which we can build a certain mutuality, in which we can build a certain cohesion, a certain grouping of interests, so that we look at climate change in many ways: as a matter of technological competitiveness; in terms of health; in terms of development; in terms of energy security; and in many other ways.

If we look at it in those terms and frame it in those terms as well, we'll be able to get more people to the table. We'll be able to get this agreement among countries, for whatever reasons they want to look at the issue, to tackle the issue of climate change.

Mr. Fabian Manning: Dr. Peltier.

Prof. Richard Peltier: Yes, I'd like to comment on this point too, and really go back to several of the comments I made before.

On this problem of climate change, we have to get the economy working for us rather than against us. It seems to me that this is really the job of the legislative regime, right?

Clearly, no single company wants to take a leadership position on this issue. It's a matter of competitive disadvantage. That's why a legislative regime that encourages mandatory efforts to work toward a less carbon-rich development regime is absolutely crucial.

We can't expect our companies, as individual companies, to take a leadership position in this, because they'll see themselves to be at an enormous competitive disadvantage. We have to make a regime that levels the playing field and makes it possible for them to compete on that playing field, to our collective advantage.

Mr. Fabian Manning: Dr. Weaver, would you like to comment on that?

Prof. Andrew Weaver: Yes, I agree.

There are a couple of things. First of all, why would you not want to develop alternate clean energy sources when the entire world is a marketplace and a consumer of energy? The people with the widgets out first in front of everyone else are the people who are going to stand to benefit, because there's no reason not to have some clean, sustainable energy when it's available, rather than burning something that provides all sorts of other negative effects in terms of health, air quality, etc.

The second thing is that it seems to me that it's not a level playing field. The reason why is the way we cost energy. When we cost something, what is the environmental cost associated with the combustion of fossil fuels? Is there one built into the cost?

If you have a nuclear power plant and you build it, my understanding is that you have the decommissioning cost built in right up front in the commissioning of the plant. If you build a coal plant, all you have to do is find a coal field, build a burner on top of it, and burn it. Who is paying the cost of the emissions from that coal plant? I don't know. Probably nobody. Therein lies where I don't think the playing field is level.

I would defer to economists on this, because I think we really need to reconsider this. They know much better how these things are dealt with economically.

The Chair: Thank you.

We'll move to the final Liberal round and Mr. McGuinty.

Mr. David McGuinty: Thanks, Mr. Chair.

Gentlemen, based on the testimony we've heard so far this evening, I would just ask something about the Intergovernmental Panel on Climate Change process. Have the United States, China, India, Australia, and all the non-annex I countries, for example, been participating actively in the science of global warming and climate change as a hand-in-glove process along with the Kyoto Protocol negotiation process?

● (1900)

Prof. Richard Peltier: Absolutely. The scientists from these countries are full participants in the IPCC process, in many cases in important leadership positions. Susan Solomon, for example, is the co-chair of Working Group I. She is an American scientist working out of Boulder, in one of the NOAA laboratories.

So, yes, these countries all have scientists working actively in the process.

Mr. David McGuinty: So it's fair to say that scientists from pretty much all 184 nation-states are closely following the reality.

Prof. Richard Peltier: I wouldn't want to make that claim, but it's close to it, I would say, yes.

Mr. David McGuinty: I would suspect most of them are, right?

The Kyoto Protocol has been signed by 168 countries, so I guess we would be right in concluding that 168 nation-states have science experts who are following the IPCC process.

Prof. Andrew Weaver: I would be very careful there. Scientists do not like to stray into the prescription of policy. The scientists writing it are not those who are writing the policy.

Mr. David McGuinty: You're not hearing me, Doctor. I'm not talking about policy. I'm asking this question: Do 168 countries that have their name on the Kyoto Protocol, either as annex I, non-annex I, or beyond countries, have science people who are following the work of the IPCC?

Prof. Andrew Weaver: Absolutely.

Prof. John Stone: Let me try to answer that and make a couple of points.

First, the co-chairs of the IPCC Working Group I were Susan Solomon, who is an American, and Dahe Qin, who is Chinese and is actually the head of the China Meteorological Administration. Both of them are impeccably well-qualified scientists. You couldn't find better scientists. It was because they are so good that they were able to get all the rest of the scientists to work together.

What's interesting about the IPCC process, as Andrew Weaver said at the beginning, is that it's actually drafted by scientists and it's based on peer-reviewed literature, which is literature that's in the journals and has gone through a very rigorous process.

What happens in the plenaries—for example, in Paris—is that governments negotiate the *Summary for Policymakers*. The *Summary for Policymakers* is the short version. It's again drafted by scientists, and governments' role is to ensure that it's understandable, accessible, and balanced. Of course, different governments have different views of what defines “balance”. In the end, though, they are not allowed to write anything there that the scientists do not agree with.

In the end, what this means is that the final time the gavel comes down, all the governments present there agree that the *Summary for Policymakers* is an adequate, proper, and balanced assessment of the current state of knowledge.

Mr. David McGuinty: Let me put a final question to you gentlemen, if I could.

In the *Summary for Policymakers*, which I have here in front of me, you're right that there's absolutely nothing here in terms of policy. It's pure science. But is your work in this report predicated on a fundamental understanding that if we're going to deal with climate change, we have to first understand that there may be 184 nation-states, but there's only one atmosphere; and that perhaps the greater the proximity of cooperation between those 184 nation-states, the better the chance we're going to have in dealing with the reality of global warming with one atmosphere? Is that a fair assessment of what you have come to, as scientists, in terms of conclusions?

Prof. Richard Peltier: Sure.

The Chair: I think we have “yes, yes, and yes”.

Mr. David McGuinty: Is that a yes, a yes, and a yes?

Professor Weaver.

Prof. Andrew Weaver: I'm not going to say yes to something when I'm not quite sure what the question is. I'll say yes, maybe, because I'm not quite sure what the question is.

There is one atmosphere and carbon is well mixed, yes, that's true. But I don't think the IPCC concluded anything about all countries having to work together. I truly believe that this issue, which is the single-biggest issue facing humanity, will unify all countries, because it has to. It will have to if it hasn't already, but I don't think we've prescribed that in the IPCC process.

The Chair: Your time is now up.

Mr. Watson for five minutes, please.

Mr. Jeff Watson (Essex, CPC): Thank you, Mr. Chair.

Based on the round of questioning from Mr. Scarpaleggia, I'm almost tempted to hand my time over to him, just for drawing out that great information that it was Conservatives like Thatcher and Mulroney who were acting early on climate change. Coupled with this government's proposals to begin tackling this issue, that leaves us wondering where the Liberals were for over a decade.

An hon. member: Hear, hear!

Mr. Jeff Watson: I actually want to pick up from where Mr. Manning was beginning to point the direction. There are a couple of areas that I want to probe. One is on the international target side, but I'll get to that in a moment.

I want to talk about the challenge to imagine, as Mr. Stone put it, the keys to creating the environmentally sustainable economy. Can you enlighten us a little bit in that direction?

In terms of the science, you've certainly painted some of the realities we could be facing over the next few decades. Can you point us in the direction of some of the ways that we need to change? What are those keys to the environmentally sustainable economy, in your opinion?

● (1905)

Prof. John Stone: One could give a very long answer to that, but let me just tell you a small anecdote to help answer it.

I gave a lecture on climate change to the final graduating class of humanists at Carleton University. At the end of it, one of the students said that, yes, this is a threat and we need to take it seriously, but they wouldn't give up their lifestyle. I felt very sorry for that person, because that person wasn't able to imagine any other lifestyle than the one he or she had then—a lifestyle that, to some extent, has actually been sold to them.

There are people in different countries in this world who have very different lifestyles from those of the students at Carleton University. There are people of my generation who had a very different lifestyle when they were growing up, when compared to the lifestyle of the young people today. There is nothing absolute in the lifestyles we have. There is nothing absolute in our aspirations. We can have lifestyles and aspirations that I believe are a lot more sustainable than the ones we have today.

Mr. Jeff Watson: Does anyone else want to take a stab at that?

Mr. Weaver.

Prof. Andrew Weaver: I would like to take a stab at your earlier comment, now that you've given me the floor.

I'm not trying to say the Conservatives are any better than the Liberals, because the fact of the matter is that nothing has been done under any government. The fact of the matter is that the Conservatives, in opposition until very recently, were not helping the Liberals try to do anything.

I don't care about the politics. We need action. We need action down the road. We need action along the lines of this environmentally sustainable economy. Perhaps we should start talking about things like a carbon tax and replacement of things like the GST by things like a carbon tax, rethinking the way we do our taxation. You'd have to involve economists in that, but we need to at least talk about these things.

Mr. Jeff Watson: Fair enough.

How much time do I have, Mr. Chair?

The Chair: You have two minutes.

Mr. Jeff Watson: On the importance of science in building political consensus and political will, the fourth report is certainly stronger than your third report. Are we at a stage where we can expect China, India, and the United States to take on the kinds of tough targets that you talked about for the mid-21st century? Can we expect them to go from the U.S. being out of Kyoto and China and others from simply being signatories without targets? Is the science compelling enough for them now that we can expect them to take on the kinds of significant targets that are necessary?

Prof. Richard Peltier: Maybe I could step in here to try to comment on that.

Most of you here will understand that at the level of the states in the United States today, California's Pavley bill has now been passed into law and is looking for a 30% reduction in greenhouse gas emissions over a fairly short time scale. At the level of the states, both on the west coast of the United States and in the northeast, individual states are taking strong action, just as individual provinces in Canada are attempting to take strong action.

I think it's about time that in the United States at the federal level and in Canada at the federal level we begin to follow where the grassroots are taking us. There are major steps being taken in the United States and equivalent major steps attempted here in Canada. What we need to have happen is for the federal level to follow the grassroots in this country, as is beginning to happen in others.

The Chair: Okay, our time is up.

Mr. Watson, thank you very much.

We've gone through the normal rounds. We have a little less than 25 minutes left, but we have a couple of items to deal with.

Is it the consensus of the committee that we finish there? Okay. I appreciate that.

I want to thank the witnesses.

Professor Stone, Professor Peltier, and, Professor Weaver, thank you very much for the time you spent with us and the dialogue back and forth. I'm sure it's been helpful to the committee.

I hope you enjoyed dinner, and, Dr. Weaver, I hope you enjoy yours, wherever it is.

● (1910)

Prof. Andrew Weaver: Thank you very much.

The Chair: The briefs that we received will be translated and distributed to committee members.

Thank you all, again.

We have a motion to deal with.

Mr. Cullen, I believe the motion is yours.

Mr. Nathan Cullen: Thanks, Chair.

I'll wait until our other committee members are aware. That's all right, we'll just pass the motion while they're busy.

Some hon. members: Oh, oh!

Mr. Nathan Cullen: The main thing concerns the February 26 meeting. If committee members will look at it, we have FCM. From the clerk, I believe *Équiterre* is almost certain, but we can't get a hold of Camco. Then on March 1 we have only two witnesses again.

The motion essentially puts the March 1 meeting up to the February 26 meeting. Similar to tonight, I suspect that we'll be able to get through both of those, but even faster.

The Chair: Okay. I'll just point out that for the March 1 meeting, there are two confirmed and three unconfirmed—

Mr. Nathan Cullen: Correct.

The Chair: —but there's a good possibility that we will have at least one or more of those.

Mr. Nathan Cullen: The underlying intention is that as we've been asking witnesses to bring their clause-by-clause recommendations—I'm not sure how many the committee members have been seeing, but I haven't seen tons—I'm quite eager to move to the amendments of this issue, rather than discussing it further.

As valuable as tonight's testimony was, I want to get to the solutions. I want to get to changing this bill.

The Chair: We need a motion on the floor to discuss.

Mr. Nathan Cullen: Yes, I move the motion:

> That the witnesses scheduled to be heard on Thursday, March 1, 2007 be heard from 7:30 to 9:30 p.m. on Monday, February 26, 2007.

The Chair: Okay.

Monsieur Bigras.

[*Translation*]

Mr. Bernard Bigras: First of all, I'm not opposed to the motion, except that you have to consider the fact that some witnesses haven't yet been confirmed for the 26th. Is that in fact the case? Are we to understand that at least two witnesses haven't confirmed?

The Clerk of the Committee (Mr. Chad Mariage): Yes, that's the case, Mr. Bigras.

For the moment, Équiterre has more or less confirmed that it's coming. As I explained earlier, only the confirmation form remains to be completed.

We had trouble contacting the Camco people. We tried to get an answer; we contacted them, but they didn't answer us. That makes things a bit more difficult.

Right now, we're missing confirmation for one witness; the other witness has more or less confirmed. Confirmation only has to be made official.

Mr. Bernard Bigras: So that would mean that, if we agreed to Mr. Cullen's motion, we might have more than five witnesses around the table.

The Clerk: I believe Mr. Cullen's motion will result in two separate meetings being held. We'll have one meeting from 5:30 to 7:30 p.m. to hear the witnesses whose names are on the list. Then we'll hear the witnesses on tax initiatives from 7:30 to 9:30 p.m.

Mr. Bernard Bigras: All right.

The Clerk: I believe that's the gist of the motion.

[*English*]

The Chair: Do we have other discussion on that?

Mr. David McGuinty: I'm just looking at the 27th. We have seven witnesses confirmed?

The Chair: No. The Canadian Nuclear Association is off. I'll talk about that when we're done.

● (1915)

Mr. David McGuinty: But it's linked to this question of—

The Chair: Well, Vicki Arroyo has confirmed that she can come on the 27th. She is the one who has the mother with the health problem. She has to leave at 5 o'clock, so we may have to ask each witness to speak for a shorter period of time. We won't give them 10 minutes.

The Canadian Nuclear Association should be off.

Mr. David McGuinty: So we'll have six witnesses.

The Chair: It's because Ms. Arroyo's situation allowed her to come on that day. The consensus, as I recall, was that this was a fairly important organization to hear from.

Anyway, we can deal with that at that meeting by shortening up the witness statements. That would be my suggestion.

So are we back to calling the question on this?

Again, the motion is:

> That the witnesses scheduled to be heard on Thursday, March 1, 2007 be heard from 7:30 to 9:30 p.m. on Monday, February 26, 2007.

(Motion negatived)

The Chair: The motion is defeated, so we'll stay with the schedule as laid out.

If there is no other business, we'll see you all tomorrow morning.

This meeting is adjourned.

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