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Chair

Mr. John Aldag

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● (1605)

[*English*]

The Chair (Mr. John Aldag (Cloverdale—Langley City, Lib.)): We're back and in public.

The purpose of this next portion of the meeting is to look at the IPCC report that was recently produced and shared.

Thank you to the witnesses for being here. We have set aside an hour for testimony and discussion, and at that point, we'll see where we're at.

I want to welcome Mr. Lloyd and Mr. Shipley to our meeting as guests today.

I'll invite you, presenters, to take just a moment to introduce yourselves and your role, and then we'll move right into the comments. I think we have 10 minutes of opening comments that will be shared between two persons.

It is nice to see some familiar faces back at the table. Welcome.

Ms. Meltzer, would you like to start with an introduction? When we get through the introductions, we'll move to the start of the 10 minutes.

Ms. Judy Meltzer (Director General, Carbon Pricing Bureau, Department of the Environment): Thank you very much.

My name is Judy Meltzer. I'm the director general of the carbon pricing bureau at Environment and Climate Change Canada.

Ms. Nancy Hamzawi (Assistant Deputy Minister, Science and Technology Branch, Department of the Environment): Hi. My name is Nancy Hamzawi. I am the assistant deputy minister of science and technology at Environment and Climate Change Canada.

The Chair: You have a bit more time behind you from when we last saw you. Hadn't you just started in your position?

Ms. Nancy Hamzawi: Not to be precise, but there's the scientist in me, it's 39 days and a half.

Mr. Matt Jones (Assistant Deputy Minister, Pan-Canadian Framework Implementation Office, Department of the Environment): Hi. I'm Matt Jones. I'm an assistant deputy minister at Environment and Climate Change Canada and responsible for climate policy.

Dr. Greg Flato (Senior Scientist, Canadian Centre for Climate Modelling and Analysis, Science and Technology Branch, Department of the Environment): I'm Greg Flato. I'm a senior research scientist in the climate research division under the science and technology branch at Environment and Climate Change Canada.

The Chair: Thanks to the four of you for joining us today.

With that, we'll start the 10 minutes of opening comments.

Ms. Nancy Hamzawi: Good afternoon. Thank you for the opportunity to be here with you.

In addition to my responsibilities as the ADM of the science and technology branch, I am also the Canadian focal point for the Intergovernmental Panel on Climate Change, the IPCC. You have met my colleagues, so I will begin with an overview of the Intergovernmental Panel on Climate Change.

It's an international body that undertakes comprehensive assessments of the state of knowledge on climate change. Currently, 195 countries are part of the IPCC, and thousands of scientists worldwide participate in its work. The main outputs of the IPCC are their assessment reports. These span several disciplines—scientific, technical and socio-economic—and explore the causes, impacts, mitigation and adaptation approaches for climate change.

[*Translation*]

The assessment reports are internationally recognized as the most comprehensive and authoritative scientific assessments of climate change. They provide policy-relevant scientific information to inform national and international policy discussions.

Canada has been an active participant in the Intergovernmental Panel on Climate Change, or the IPCC, since it was created in 1988. Canadian scientists from both the government and academic sectors have contributed to the authorship of IPCC reports and the body of peer-reviewed literature that the IPCC considers when preparing its reports.

[*English*]

As Canada's focal point to the IPCC, I am committed to engaging broadly to ensure Canada's leading climate science experts, other levels of government and stakeholders are actively involved in IPCC processes.

In particular, I am committed to engagement with indigenous peoples. Most recently, three representatives of national indigenous organizations joined us as active members of the Canadian delegation in Incheon, South Korea, at the plenary where the special report on warming of 1.5°C was accepted.

IPCC assessment reports are multi-year endeavours. Work on assessment report number six is currently under way. It will be finalized in 2022, just before the first global stock-take under the Paris Agreement. The IPCC also undertakes special reports, and we will hear more about the most recent one of these very shortly.

[*Translation*]

The IPCC released its fifth assessment report in 2014, which provided critical scientific information to inform the development of the Paris Agreement. It offered definitive evidence that global warming is unequivocal and has affected all continents and oceans, and that observed warming is primarily caused by humans. We're continuing to build partnerships in the key area of research on climate change to support evidence-based decision-making.

Environment and Climate Change Canada undertakes a wide range of scientific research on climate change to understand the effects of climate change on the environment and wildlife and to inventory GHG emissions. In addition, we're a world leader in modelling and prediction to understand the physical basis of climate change.

[*English*]

We are fortunate to have one of our top and world-renowned experts with us today, Dr. Greg Flato, who I will turn to now to tell you more about his work and the IPCC “Special Report on Global Warming of 1.5°C”.

● (1610)

Dr. Greg Flato: Thank you, Nancy.

As they said, I'm a senior research scientist and manager of the Canadian centre for climate modelling and analysis, located in Victoria. I was also elected vice-chair of working group I of the Intergovernmental Panel on Climate Change, the IPCC, in 2015. I'm the only Canadian on the IPCC bureau.

My research over the past 25 years has been in the area of development and application of global earth system models. These are physically based computer simulations of the global climate, which include representations of the atmosphere, ocean, ice and land surface, as well as interactions between the biosphere and carbon cycle. We use these models to understand how the climate system operates, why it has changed in the past, and how it will change in the future.

In my capacity as an IPCC vice-chair, I was involved in the selection of authors and served as review editor of chapter 2 of the “Special Report on Global Warming of 1.5°C”. This particular chapter was the one that assessed mitigation pathways compatible with 1.5°C warming. By way of background, this special report was initiated as part of the Paris Agreement, wherein the IPCC was invited to prepare a special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways.

The IPCC released this report in early October 2018 at an approval plenary in Incheon, South Korea. The IPCC report preparation process is very rigorous, involving the selection of an international author team, four lead author meetings, and three rounds of reviews that involve international experts and governments. The report itself draws upon peer-reviewed scientific publications, some 6,000 of which are cited in this report.

This special report provides quantitative information about the greenhouse gas emission pathways that would be consistent with limiting warming to 1.5°C and to 2°C, as well as an assessment of the difference in climate-related impacts between these two levels of warming.

It's important to understand that, in order to stabilize global temperature at any level, global net carbon dioxide emissions must reach net zero. That is, the global sum of emissions and removals must equal zero. As long as emissions are positive, temperature will continue to increase. Global mean temperature is currently at 1°C above pre-industrial levels.

The analysis provided in this special report shows that limiting warming to 1.5°C would require rapid reductions in global greenhouse gas emissions with a decline of about 45% relative to 2010 levels by 2030 and reaching net zero around 2050.

I'll now pass it back to Nancy.

[*Translation*]

Ms. Nancy Hamzawi: Thank you, Mr. Flato.

The Government of Canada recognizes the real impact of climate change on our environment, as highlighted by the IPCC. That’s why the government worked with the provinces and territories, and with input from Indigenous peoples, to develop and adopt the pan-Canadian framework on clean growth and climate change. This framework is Canada's plan to reduce greenhouse gas emissions, pursuant to the commitments in the Paris Agreement.

The pan-Canadian framework outlines over 50 concrete measures to reduce carbon pollution, help us adapt and become more resilient to a changing climate, promote clean technology solutions, and create good jobs that contribute to a stronger economy.

[*English*]

We've made significant progress implementing the pan-Canadian framework. We can point to several successes, such as new regulations to reduce methane reductions, establishing the Canadian centre for climate services to improve access to climate science and information, and making historic investments to support clean growth and address climate change.

A price on carbon pollution is a key part of Canada's plan to fight climate change and to grow the economy. Pricing carbon pollution is the most efficient way to reduce greenhouse gas emissions and stimulate investments in clean innovation. It creates incentives for individuals, households and businesses to choose cleaner options.

The federal government worked with provinces and territories giving them the flexibility to design their own climate plans that included putting a price on carbon pollution. Many provinces and territories took action and are either developing their own carbon pollution pricing systems or have accepted the federal system. As announced by the Prime Minister on October 23, the Government of Canada will put the federal carbon pollution pricing system in place in these provinces that do not take action. All direct proceeds from the federal system will be returned to the jurisdiction of origin.

Much work remains. The government will continue to work with provinces and territories, indigenous peoples, businesses, academia, youth and international government to inform the transition to a low-carbon and resilient economy.

Thank you.

● (1615)

The Chair: Excellent. Thank you.

For anyone who is new today, we're going to get into our rounds of questioning. We have six minutes per person as we go through it.

We're going to start with the government side.

Ms. Dzerowicz, you have the floor for six minutes.

Ms. Julie Dzerowicz (Davenport, Lib.): I'm going to be sharing my time with my colleague Mr. Peschisolido.

I want to say thank you so much for being here. It's an important discussion, and I'm definitely learning a lot, because I'm one of the newer members of the committee.

I'm delighted to hear that we are a global leader in modelling impacts. I think it's wonderful to hear. The IPCC has come out and said that what we had agreed to a few years ago in Paris we need to step up, to really put the pedal to the metal and actually go much faster. In terms of the modelling we do, have we also seen that, or is that not something your model would actually show?

Dr. Greg Flato: The kind of modelling we do does provide information about emission pathways that would lead to certain temperature consequences and other changes in climate.

The pathways that were used in the last IPCC assessment, which was published in 2014, did have a low-emission pathway that did limit warming to between 1.5°C and 2°C. The emission pathways that were associated with that are contained in that report.

This special report, the new one, provided even more information, more details about the contributions to those emissions and the more detailed pathways that would lead to 1.5°C and 2°C and also talked more about the difference in impacts that would be associated with limiting warming to 1.5°C versus letting warming go to 2°C or exceeding that.

Ms. Julie Dzerowicz: What would be the impact on our overall pan-Canadian framework? We talk a lot here about the price on pollution, but there are so many different aspects under the pan-Canadian framework. Would any of these adjustments or changes in modelling actually have an impact on our pan-Canadian framework? That's not to say it's not relevant, but maybe there are some additional aspects we need to start looking at that we haven't yet.

Mr. Matt Jones: I think one of the most useful aspects of the new IPCC report is that it paints a clearer image of the impacts associated with 1.5°C versus 2°C. For many years, we have been trying to avoid 2°C, and while we were very aware that there were plenty of climate change impacts at 2°C, I think it was chosen as a rough benchmark for a point beyond which the risks of much more significant, even catastrophic, impacts were much more probable.

I think in terms of our efforts to reduce emissions, we're one player in the global scene to reduce emissions and do our part to get to a situation in which we're reducing the risks of very significant impacts on climate change. I think even before the report was completed, we were very much aware that there are plenty of impacts—and very costly and dangerous impacts—at 2°C. In fact, we're feeling impacts now at only 1°C and even more so in the north.

I think when it comes to our policy response, we're striving to reduce our emissions, in line with the Paris Agreement target of 30%, but we're very aware that that's only one step in the process and that we need to continue in order to drive down our emissions more fully.

Ms. Julie Dzerowicz: I'm going to pass it to my colleague, but I'll just make one comment. My perspective is that I want to just get to implementing these aspects. My sense is that we're going to be adjusting as we go along, as we get new information, as we see what the impacts are. I'm just anxious to get started.

Mr. Joe Peschisolido (Steveston—Richmond East, Lib.): I come from the great municipality of Richmond. We're at sea level. We have a very ample farming industry and fishing industry. I'd like to follow up on Ms. Dzerowicz's point about the impact of climate change with the difference of 0.5°C. What would happen to a place like Steveston or Richmond, which is at sea level, if we do have that change of 0.5°C?

● (1620)

Dr. Greg Flato: Perhaps most relevant to that region, which is not far from where I live in Victoria, is sea level rise. Sea level rise is in part directly associated with warming of the ocean. As the climate warms, the ocean takes up a lot of the excess energy that is associated with increasing greenhouse gases. That increasing energy leads to warming of the ocean, which leads to an increase in the volume of the ocean. As you heat up—

Mr. Joe Peschisolido: What direct impact would that have on fishing and farming?

Dr. Greg Flato: It has a direct impact on sea level in that sea level rises. It has a direct impact on other aspects of the ocean ecosystem. One thing that's highlighted in this report is the consequence for corals in the tropics. I realize that is not really an issue for coastal British Columbia, but it is part of the global ocean ecosystem. There are lots of implications there.

In terms of sea level rise, what's shown in this report is that the difference between 2°C and 1.5°C is about 10 centimetres in global sea level rise by the year 2100. That's on a background of about 30 centimetres to 60 centimetres. It is a consequential difference, but sea level is still rising.

Mr. Joe Peschisolido: Thank you for your comments.

The Chair: Mr. Lloyd.

Mr. Dane Lloyd (Sturgeon River—Parkland, CPC): Thank you.

As a preamble on what we want here on this side, we want to know the most effective system to achieve what we want to achieve here, which is lowering greenhouse gas emissions. I come from an area that has a lot of reliance on the coal industry for electricity. I want to suss out some of the secondary impacts that a lot of people don't think about. With regard to shutting down coal power, obviously coal has a lot of greenhouse gas emissions per unit. However, a secondary production from coal plants is fly ash, which is actually a critical ingredient in cement and road production.

Ms. Meltzer, has the government done any impact modelling on the increased cost to infrastructure programs in Canada from losing our capacity to produce fly ash in Canada? Is there a plan on how we can get fly ash for these essential products?

Ms. Judy Meltzer: Colleagues at the table may want to add something as well.

I think you're referring to beyond just pricing pollution. You're referring to the broader efforts and regulations that will aim to phase out coal by 2030.

To speak to it from the carbon pollution pricing side, yes, there is economic analysis under way. In terms of the analysis that my team and I are part of, we're looking at the impact of a price on pollution on those sectors and at some of the economic and competitiveness impacts. That analysis is still ongoing. There are three phases to it. It cuts across all the major industrial sectors. In particular, we're looking at it in the context of developing the output-based pricing regulations. It includes cement.

Mr. Dane Lloyd: I'm sorry to interrupt, but I have only six minutes of time. Thank you for helping me home in on this.

Specifically related to the coal phase-out in 2030, if we have no coal in this country, we have no fly ash production. If we have no fly ash production, then cement production becomes cost-prohibitive, because we'll have to import fly ash from the United States. Have there been any impact studies on the cost of increases in infrastructure specifically with regard to the phase-out of coal and the loss of fly ash production?

Mr. Matt Jones: We could probably get back to you with additional details, but in our consultations with the Cement Association, this is not something that has come up. I have a university friend who works for the Cement Association. We have lots of discussions about the industry and environmental impacts and their efforts to improve their environmental performance. My understanding from him is that there are a number of alternatives to fly ash and that cement is produced around the world, including in jurisdictions where there is no coal and where they use alternatives to fly ash.

Mr. Dane Lloyd: Will it raise the cost because these alternatives are more expensive? Or is that not something you're aware of?

Mr. Matt Jones: I can't say off the top of my head, but I think if there were concerns, the Cement Association would have raised this over several years of discussion. Keep in mind that the efforts to phase out coal started many years ago. The initial regulation dates back several years. This has not come up from the Cement Association to date, to my knowledge.

● (1625)

Mr. Dane Lloyd: It's not just related to cement. For example, I worked in road construction for several years. When you're laying a roadbed, a tremendous amount of fly ash is used to set a base for the road. Really, there's no effective replacement when you lose that. There are more expensive alternatives.

Has there been any economic modelling done on the coal phase-out and the costs associated with it, not just from the carbon and electricity prices going up from but the secondary by-products created by that?

Mr. Matt Jones: I think we'd have to follow up with our sector experts in our regulatory branch, including those who deal with the Cement Association, the cement industry and the electricity industry. We can return to the committee and provide additional information, if that's helpful.

Mr. Dane Lloyd: Here's another thing. It's actually an interesting consequence. When you input carbon pricing, you're raising the price of carbon, and this unleashes certain innovations, which is what I think the government intended to do. One innovation, which was planned previously at the Keephills plant, near my riding, was to input carbon capture sequestration technology. The pioneer project, as it was called, was later abandoned because the company said there is no carbon tax and so there's really no reason. Then when you have a carbon tax, it creates an incentive to keep that coal plant running, with carbon capture. However, when you put a ban on coal for 2030, at a plant that can reduce emissions by a million tonnes at one plant, which is about a 30% reduction of what that one facility had, it really reduces your innovation.

Do you have any comments on that? When you have a carbon price combined with regulations, that can actually stifle innovation in some ways.

Ms. Judy Meltzer: I would just make the general point that there are different technologies that become more cost-effective at different price points. There's no singular correct or right path. It depends on the industry. As you know, there are significant coal-to-natural gas transitions in certain jurisdictions. There are different incentives that lead to different things.

Really, I would say it's the range of measures. Carbon pollution pricing creates a particular price signal, but it works in conjunction with other regulations and complementary measures. I would also just note—and maybe carbon capture and storage is one good example—that carbon pricing rewards and recognizes the investments that are made by industry to improve their performance. There's an ability to get surplus credits for clean performance, which can be traded or sold for economic benefit. There is that incentive to improve performance. It doesn't necessarily determine which trajectory a firm will take—that will be shaped by a range of factors, like business decisions that are obviously informed by a whole range of considerations—but I don't think it would be fair to frame it as a sort of disincentive for a particular kind of clean technology.

Do you want to add to that, Matt?

The Chair: We're out of time on that one, but there may be a chance to get back to it.

Mr. Stetski, you're up next.

Mr. Wayne Stetski (Kootenay—Columbia, NDP): Thank you. It's good to see a number of you again. The title of our study is “Clean growth and climate change in Canada: International leadership”. Due to logistics, we haven't really been able to talk to anybody from other parts of the globe. I'm wondering whether any of you....

Perhaps Mr. Flato, you might be the best person to comment on it. I'm really interested in best management practices around climate change and what can be done. When you look around the world, have you seen anything internationally, or any countries in particular that you think are good models, that are doing things we should be doing more of, or that are perhaps better at it?

Dr. Greg Flato: My expertise, of course, is in climate science. I can speak to the stature of Canadian climate science internationally, which is very well regarded. We have a very well regarded global climate model. We have a lot of research undertaken in Canada that is published in very high-profile journals and is cited in IPCC assessments and other places. From that perspective, Canada has a very good reputation internationally as a leader in climate science.

In terms of policy and regulation, I'm afraid it's just not my area of expertise, and I would have to defer to one of my colleagues.

Mr. Matt Jones: I'd be pleased to pick up on that point.

I think there's a lot to be learned from a number of other countries, particularly developed OECD countries. Each of them is doing something well. Japan, for example, has put a number of measures in place to maximize energy efficiency, for example, and has really greatly reduced the amount of energy consumed per unit of production, per household, per square foot of office space, and so forth. I think there are a lot of co-benefits that come with that kind of efficiency. Nordic countries have placed prices on carbon and seen subsequent emissions reductions across the entire economy. Even in the United States, in years gone by, we've seen a combination of regulatory measures targeting greenhouse gases, and even more so air pollutants from coal-fired power plants, coupled with some subsidies for renewables, and we saw some shift from coal. Older coal plants are shutting down on a fairly regular basis even now in the United States based on EPA policies around mercury, acid gases and other pollutants.

I think there's a lot to be learned, and part of the UN climate change process requires countries to report on what they're doing. Part of the motivation for that is to hold people's feet to the fire, but also so we can all learn from one another. We can go to the European Union, which has targeted both industrial and vehicle emissions, and Japan with its efficiency measures. We can talk all day about that; there are lots of great examples out there.

In developing the PCF, we have tried to look at what has worked well and what has not around the world. That's one of the reasons we did our analysis exercise, the four reports that were mandated by first ministers, and part of the Vancouver Declaration to produce a menu of options. We tried to look at every emission reduction opportunity for every greenhouse gas in every sector and every policy tool conceivable, and then drew from that menu to produce the PCF, and we tried to pick the right policy tool for the right source of emissions.

● (1630)

Mr. Wayne Stetski: Thank you.

My riding is Kootenay—Columbia, in southeastern B.C., but I was born in Churchill, Manitoba. The midwife was a polar bear. I lived in Chesterfield Inlet, which is about 500 kilometres north of Churchill, and so the Arctic is still near and dear to my heart. According to the IPCC special report, it's likely that with 2°C of warming, the Arctic Ocean will be completely free of sea ice on average once every 10 years, and with 1.5°C of warming the Arctic Ocean will be completely free of sea ice on average once every 100 years. Of course, both of those have severe impacts on everything that lives in the Arctic.

Has Canada at all looked at potential plans to deal with some of these scenarios going forward? What would they look like? If we know it's coming, what are we doing about planning for it?

Mr. Matt Jones: We're missing one key set of players at this table, which is our experts on adaptation. I think one of our concerns is that you can adapt to certain things and you can't adapt to others. The costs of trying to adapt to the impacts of climate change become prohibitive when you get past a certain threshold. Adaptation is a pillar of the pan-Canadian framework. We have a disaster mitigation fund and we have the Canadian centre for climate services, which is trying to paint a picture of what changes in temperature and precipitation have been and will be under different emissions scenarios. Step one is to understand what's coming. There's a lot of work we're trying to support around visioning and planning around adapting to the impacts, but we're trying to balance that with a desire to avoid the worst impacts certainly.

The Chair: You have half a minute.

Mr. Wayne Stetski: Being from British Columbia, of course, we have what we hope is not a new reality. I live in an area that people come to from all over the world to see: the Rocky Mountains and the Purcells and the Selkirks. By mid-summer, you can't see any of them because of the forest fires. It is estimated that over 200 megatonnes of CO2 are put into the atmosphere as a result of these fires.

How are emissions from things like forest fires and other climate-related events that result in significant emissions dealt with in reporting to the United Nations Framework Convention on Climate Change? Are they accounted for?

The Chair: Just on that, we are out of time on this question, but I'll get the answer. If the question's out before the six minutes are up, we'll take a brief answer.

Mr. Matt Jones: We are trying to account for the emissions associated with “natural events” even if climate change is human-induced. The reporting requirements for the United Nations are narrowly focused on human emissions, so emissions from tailpipes and smokestacks, but we know, of course, that we're monitoring the concentrations in the atmosphere and we know very much that a lot of emissions are coming from events like forest fires and other things like volcanic eruptions. Some of those are human-induced and there is the possibility of a bit of a negative feedback loop, where warming causes release of methane or burning of forests, which then increases concentrations, which increases warming. These are the kinds of feedback loops that we are trying to avoid by reducing our emissions in the near term.

● (1635)

The Chair: Mr. Amos.

Mr. William Amos (Pontiac, Lib.): Thank you, Mr. Chair. Thank you to our witnesses.

I'd first like to thank the entirety of the Environment Canada team who have really lifted hard, and in fact the whole Government of Canada, Natural Resources, Global Affairs, other departments. This has been a major lift since the fourth quarter of 2015. There have been some significant policy shifts and it represents a lot of work. I'd also like to compliment Mr. Flato and the modelling community in Canada. There is some incredible work that's being done. I know Canadians are helping lead the world and I commend you on your work, particularly with the IPCC.

The report says that future climate risks would be reduced by the upscaling and acceleration of far-reaching, multi-level, cross-sectoral climate mitigation and by both incremental and transformational adaptation. I'd like to learn more about the mitigation measures being undertaken that are far-reaching, multi-level and cross-sectoral, particularly as they relate to small communities.

In Pontiac, I represent a bunch of suburbs but also a large number of small towns. Sometimes I get asked the question, what are the best examples of how small-town Canada can contribute, because rural Canada wants to do its part. How can you provide them some guidance and some inspiration?

Mr. Matt Jones: It's a tough question. I think our focus has really been on the biggest sources of emissions. You start with the biggest sources of emissions and work forward in the spirit of fishing where the fish are in terms of emissions. We have focused on the largest sources of emissions, whether it's electricity generation, heavy industry, the transportation sector and the building stock.

One potentially interesting example for smaller towns is opportunities for geothermal energy and community heating and cooling. In downtown Toronto, they're pulling cold water from the bottom of Lake Ontario and cooling the banking district with that cool water. There are opportunities for district heating systems in smaller communities where you can have a combined heat and power system that generates a little bit of electricity and a lot of heat and heats the downtown core.

That's a little further afield. It's not something that's common now, although in Charlottetown I believe they're heating part of the downtown core by an incineration plant that basically runs off the methane from a landfill. We're supporting that through the low-carbon economy fund, an expansion of that program.

There are opportunities. The question is what is cost effective, and our hope is that with the implementation of policies, including a price on carbon pollution, we can get to the point where the cost of the technologies comes down and the economics work so that there are, maybe, some opportunities for district heating and cooling.

Public transit, obviously, is an important one that is more relevant for larger centres, but there are opportunities for smaller-scale public transit in smaller communities, including shuttle routes between popular destinations within towns.

I'm also from a small town and there is a small public transit system that shuttles between downtown and the suburbs. There are opportunities and there are examples that we can draw from on both the building stock side and on the transportation side, but, as I say, right now that has not been the core focus so far.

Mr. William Amos: Okay. My next question is for Mr. Flato.

What are some of the modelling challenges that your community now faces? What do you think are some of the issues around modelling that Canadians should be aware of? I know that if a member of the public asks me to what extent can we trust this kind of reporting, I know I instinctively do because I trust scientists, not just one but the hundreds and thousands of scientists who contributed to the IPCC report. Modelling is a very technical area and I'd be keen to learn more.

● (1640)

Dr. Greg Flato: We participate in a bigger community, so the model we developed in Canada is one of roughly 30 or so around the world. There are about 30 centres like ours in other countries that develop and use the kinds of models that we have. One thing we do is compare one to another and ask how well our model compares to other models. How well does our model compare to observations? We're constantly evaluating the model as we try to improve it.

In terms of the big challenges, the things we're really trying to work on now are some aspects of the feedback that Matt alluded to earlier, in the sense that as the climate changes, there are certain parts of the natural system that change along with it in ways that can enhance emissions from natural sources. These include changes in the ocean and the way the ocean takes up carbon.

Right now, the ocean takes a lot of the carbon dioxide that we put into the atmosphere; it gets into the deep ocean through circulation. As the ocean warms up, that circulation changes and the ability of the ocean to take up carbon can change, so we're doing a lot of work on that.

We're also looking at the extent to which, as the climate warms, the carbon that is currently locked in frozen form—in permafrost, for example—can be released as that permafrost thaws, and enter the atmosphere.

The role of wildfires is another area in which we're working. We're building all these capabilities into our model so that as we go forward, we can try to simulate these feedbacks and make more quantitative estimates of how they affect the climate.

Mr. William Amos: Thank you.

Chair, I have one more very quick question they could respond to in writing.

I want this to be perceived as a non-partisan report. I don't want it to be the “leadership since 2015 onwards”.

I would like to know specifically what federal leadership the Government of Canada can be shown to have demonstrated internationally, including prior to 2015. If it's a very thin list, that's fine as well, but I'd like a written response please.

Thank you.

The Chair: I just want to say welcome to Madame Laverdière. Thanks for joining us.

Mr. Lake, over to you.

Hon. Mike Lake (Edmonton—Wetaskiwin, CPC): Thank you for taking the time to come today.

I represent the biggest riding by population in the country, with some significant rural area as well: it's about fifty-fifty in Edmonton and outside of Edmonton. A pattern we noticed over the summer was that our normally clear blue sky has not been so clear and blue over the last few years. It led me to look into some figures regarding emissions from forest fires over the last few years. I'm kind of following up on Wayne's questioning.

Can you tell us, say, over the last four or five years, what the amount of emissions from forest fires would be in Canada?

Mr. Matt Jones: I'm sorry, I don't have those numbers in front of me.

We have an inventory group that keeps track of these numbers. They're not represented here today, but they are quite significant.

Hon. Mike Lake: Would it be accurate to say in the neighbourhood of a third of emissions in Canada would come from forest fires? A quarter to a third? It's a big number, isn't it?

Mr. Matt Jones: It's a very big number.

I'd be hesitant to speculate about the precise number, but it's certainly quite significant. It's not just Canada. Forest fires are an increasing source of emissions in many countries around the world.

Hon. Mike Lake: Canada probably has one of the highest percentages in the world because of our large land mass, our large forests and our smaller population. That would make sense.

It's also fair to say they're not considered at all under the Paris Agreement. Is that accurate?

Mr. Matt Jones: A number of measures are being pursued in a number of countries to address fire suppression, but in terms of the target setting it's generally not part of the commitments.

The commitments are more focused on direct emissions from tailpipes and smokestacks. It is certainly something the international community is very aware of, and there are a number of countries, including in Latin America, that are looking at fire suppression. China actually included reforestation efforts and increasing forest cover in its national commitment, so it's certainly something we're looking at.

Land-use accounting is built into our targets.

● (1645)

Hon. Mike Lake: Thinking about forests as a sink and thinking about Canada's vast forests, is there a calculation on how many emissions are absorbed by Canadian forests every year?

Mr. Matt Jones: This is something that we haven't landed on officially yet, but Canada has indicated in past communications with the UN that we do plan to, as per the rules of the Paris Agreement and other agreements that preceded it, account for the carbon sequestered in managed forests here in Canada—

Hon. Mike Lake: In a quantification of that?

Mr. Matt Jones: Yes, we're landing on a quantification methodology now and hoping to report on that very soon. That's something that has been a placeholder in our past reporting while we sort out the methodology. It's more complicated in Canada than it is in smaller countries, and it's something that we're trying to get right so that we can accurately account for it.

Hon. Mike Lake: It stands to reason that we could make a massive impact on our contribution to greenhouse gas emissions by tackling our forest fire problem, and yet we would get zero credit under the Paris Agreement for doing that, even if we did it year after year. Even if we produced some expertise around it that we could export around the world, we would get zero credit for that.

Mr. Matt Jones: Not necessarily. Land use, the carbon sequestration associated with—

Hon. Mike Lake: That's specifically on the emissions from forest fires. I'm not talking about land use. I'm talking about the emissions from forest fires.

Mr. Matt Jones: Yes, but it's a net accounting. If there are changes in the forest stock, either from logging or from forest fires, that affects the map of our accounting. This is something that we're building into our accounting, along with our direct emissions.

Hon. Mike Lake: To be clear, you're talking about the forest stock, not about the emissions that are released into the atmosphere from the burning of forest fires.

Mr. Matt Jones: It would be best to have an expert from the Canadian Forest Service here. They are working on this as a full-time job. My understanding is that there is a carbon accounting that involves both the release from logging or forest fires but also sequestration from increased forest cover.

Hon. Mike Lake: If we could cut 150 megatonnes of emissions from smoke in the atmosphere from forest fires, we would get credit for that?

Mr. Matt Jones: It's a complicated accounting where we're looking at what is considered the managed forest, which isn't the summation of the entirety of the boreal and other forests here in Canada. I'm really not the expert in this area.

Hon. Mike Lake: Okay.

I have a couple of questions with the rest of my time here.

On the expected revenues from the carbon tax, or the price on carbon, what are those expected to be year by year and, let's say, by next year, the first full year in effect?

Ms. Judy Meltzer: The Government of Canada released on the 23rd estimates of revenues from the application of the federal system in Saskatchewan, Ontario, Manitoba and New Brunswick. Those are posted online. Again, these are led by Finance, but I do have them here. The estimated revenues—I know that you probably don't want me to read tables that are available—by province—

Hon. Mike Lake: Just overall in Canada would be great.

Ms. Judy Meltzer: I'd have to do that calculation, because we have it from the fuel charge component for those four jurisdictions. The one thing I would note is that there are plans that are still under development. The total proceeds from the federal system, including the output-based pricing system—because we're in the process of developing regulations—are still to be confirmed.

The numbers of revenue estimates from the application of the federal system in Saskatchewan, Manitoba, New Brunswick and Ontario are posted online. We can follow up on that if you'd like.

Hon. Mike Lake: If you can provide that, it would be great.

Ms. Judy Meltzer: Yes, absolutely.

Hon. Mike Lake: Then, as you provide that, very apropos of the discussion in question period over the last couple of days, if you can provide an accounting for the amount of revenue the government would receive from HST and GST charged on top of that carbon price, that would be fantastic as well.

Ms. Judy Meltzer: I'm sorry, but just to clarify, you're talking just about the total amount. That's the amount that...all direct proceeds are returned, as we were referencing in the last session.

Hon. Mike Lake: I'm talking about the revenue side in this case.

Ms. Judy Meltzer: I want to clarify that the amounts we have online give estimates of how much is generated, estimated to be generated and returned, because all direct proceeds will be returned.

Hon. Mike Lake: Including the GST and HST portion?

Ms. Judy Meltzer: I can't speak to that component. That's a Finance or CRA question, but the direct proceeds from it will be returned.

Hon. Mike Lake: Okay.

The Chair: Thank you.

I just have a comment on the first part of Mr. Lake's questioning related to forests. The next study we're getting into is on forests, agriculture and waste. That will be starting two weeks from today, so we may see some of you again. Also, you've given us some suggestions for other potential witnesses to come and talk to us on some of the topics that raises.

Mr. Bossio, over to you.

● (1650)

Mr. Mike Bossio (Hastings—Lennox and Addington, Lib.): Thank you, Chair, and thank you all so much for being here again. It's always great to have your testimony. It's very informative and precise.

I want to pick up from where Mr. Lake was on forests. Is it not the case that climate change is exacerbating the problem around forest fires themselves? Correct?

Mr. Matt Jones: Certainly. Picking up on past questions about past models and what they are showing, one test for the accuracy and usefulness of models is to look at what they predicted a long time ago and see what has come to pass.

If you look at the national impact assessment from 10 years ago—I think that was the study that was done by NRCan—if you run through the list of things they predicted, you can see the very clear examples, one of which is an increased incidence of forest fires, as one would expect, coupled with an increased incidence of prolonged periods of heat and drought, and inconsistent precipitation.

Mr. Mike Bossio: And insects and bugs that will kill the trees as well, as we see with the mountain pine beetle. It's not killed off in the winters because the winters are no longer as cold as they once were.

There is an NRCan document I was able to find that talks about human activities around managed forests and the removal of 20 tonnes of CO2, but then the natural disturbance accounted for emissions of 98 tonnes and therefore an increase of 78 tonnes. Canada has 347 million hectares of forests, almost 900 million acres. Each hectare will absorb six tonnes of CO2, but every year millions of trees die. They admit that.

I think forests have never really been accounted for in the numbers because they both absorb it and then release it at the same time, so it's kind of a wash at the end of the day.

Would you agree with that statement?

Mr. Matt Jones: Do you want to fill in?

Dr. Greg Flato: It is the case that an undisturbed natural forest does achieve a balance in which the carbon that is taken up by photosynthesis is returned through the mortality of the trees. It's the difference that is relevant to the net budget in the atmosphere.

Mr. Mike Bossio: On the climate modelling side, Mr. Flato, when is the last time in history we saw temperatures increase this rapidly, accelerating in this manner?

Dr. Greg Flato: At least over what we call the Holocene, the warm period since the last ice age, the warming we see now is unprecedented. You would have to go back to previous warm intervals and ask whether this rate of warming was as large then as it is now. Unfortunately, the information we have about the detailed timing of temperature increases in these previous epochs, 100,000 or 200,000 years ago, is inferred from paleo records that don't allow for that kind of timing, but it is the case that the rate of warming we see now and over the last several decades is unprecedented over the Holocene period.

Mr. Mike Bossio: In a sense, that's why you are able to say that it's human caused. Are there other reasons why you're able to say unequivocally, as you say, that it is caused by humans?

Dr. Greg Flato: The unequivocal statement is actually that the temperature is increasing. The planet has warmed. That's unequivocal because that's an observational fact.

The attribution to human cause is a slightly more complex thing, and that involves the combination of observations we have and the models we have that allow us to dive into the reason for the change and to ask, “For the emissions we have observed in the past and the changes in concentrations of greenhouse gases we have also observed, do the models produce a temperature response that is like the temperature response that we observe?” If the answer to that question is yes, then we can attribute the change in temperature to human activities; and that is the case. The statement there is that, with very high confidence, the warming we've seen over the last 50 years is attributable to human activities.

Mr. Mike Bossio: You're now in a leadership role in this fight, on the modelling side, being a vice-chair in the IPCC. Many times you hear the statement, “Oh, Canada is so small. We have such a small footprint, and we're such a small player in the world. It really doesn't matter what we do because we're not in a leadership position anyway.” I've never felt that. I have always felt that Canada has punched above its weight.

Are there indications that Canada, through its leadership and what we're doing now, the work we're doing in the IPCC.... I know we're talking a lot about a price on pollution, but in terms of the overall measures we're taking in a multitude of different areas, is that playing a leadership role? Are you seeing indications of that?

● (1655)

Dr. Greg Flato: I guess I would just have to reiterate what I said before. In terms of climate science, I think it would be demonstrably true that we play a leadership role and that the climate science that is done in Canada is very highly regarded. That's probably as far as I could go, from a scientific perspective.

Mr. Mike Bossio: Matt.

Mr. Matt Jones: Yes, I think there are many spheres of the complex issue of climate change, and Canada is attempting to play a leadership role in each of those. Step one is to pull your weight in terms of reducing emissions, which I feel we are doing, and that's being recognized. The others are to contribute to international processes, which we're doing, and contribute to the efforts of other countries; and you've heard presentations at this committee on climate finance and other things. So we've certainly been engaged internationally, and we're doing our homework at home.

Mr. Mike Bossio: Thank you.

The Chair: Mr. Lloyd, we'll go back to you.

Mr. Dane Lloyd: Mr. Jones, earlier you mentioned coal phase-outs and things like that. The previous government had a coal phase-out plan. It had a little bit longer time horizon than the 2030 that has been set by the government.

Many of these coal facilities were actually naturally just going to shut down. The end of their lifespan, for the majority of them, I believe was in the 2020s.

How significant is the difference between the current government's coal phase-out policy and the previous government's policy in terms of megatonnes, a ballpark figure? Is there a significant difference between the two policies? Can you comment on that?

Mr. Matt Jones: I would have to come back to you on that. My colleagues John Moffet and Helen Ryan, who have testified before this committee many times, are responsible for the coal reg, and there is a regulatory impact assessment statement attached to our regulations that spells out a rather complete and rigorous analysis of the impacts of those regulations.

The two exist online. The RIAS, as it's known—regulatory impact assessment statement—for the previous regulation and the new one are both available online. I haven't gone through those for the sake of cross-comparison, but certainly we are seeing more emission reductions and sooner.

Mr. Dane Lloyd: Is that significantly more?

Mr. Matt Jones: Yes, but I don't have the figures in front of me. I'm sorry.

Mr. Dane Lloyd: Turning to my next line of questioning, as recently as 2011, I think, a Statistics Canada report said that 6% of Canadian households use wood biomass products for home heating, and in some provinces, such as P.E.I., it's as high as 33% of total home heating.

I'm wondering if Environment Canada is keeping track of the carbon emissions from home heating. I know it's almost impossible to track somebody throwing a log in the fire, but do you have any estimates of the amount of CO2 emissions that are being created by home heating?

Mr. Matt Jones: I don't have that information in front of me. Wood is, almost by definition, a carbon-neutral fuel, so while there is carbon emission from the forest, it absorbs those carbon atoms from the atmosphere. We do follow the emissions from home wood combustion more from an air pollutant perspective, because there are potential significant localized air pollutants that come from wood combustion. There had been talk at one point of some regulatory measures about more high-efficiency wood stoves, but I've lost track of the status of those air pollutant policies over the years.

So we'd have to come back to you on that, but it certainly has not been a target of our policies at this point.

Mr. Dane Lloyd: Thank you.

I have finished, unless I can pass it on to—

The Chair: Well, we had said an hour from when we started, and we started at 4:04 p.m., but if people want to end at 5 p.m., I'll do whatever is the will of the committee. We're very close to the hour that we said we would take.

Hon. Mike Lake: I can probably use a little bit more time.

The Chair: There are still three minutes on your side's clock, which will probably take us to the end of the time we have.

Hon. Mike Lake: Could you explain the process? I do want to get back to the forest fire process, because I think there is a huge potential there, but I may be missing something. I'm not a scientist.

So maybe, Greg, you'd be the guy to speak to this a little bit. You talk about it being completely neutral, but when you have these raging forest fires like we've had in the last few years in B.C., it seems there are a lot of emissions coming from those.

Could you describe the counter effect that would be neutral in that?

● (1700)

Dr. Greg Flato: When I was talking about neutral, I meant that in undisturbed forest over a very long time, as trees grow, they take carbon dioxide out of the atmosphere, and as they die or burn or otherwise are eliminated, they put that carbon dioxide back into the atmosphere.

So forest fires have always happened. They have always been part of the natural cycle of forests, but to the extent that changing climate is causing fires to be either larger or more frequent or cover a larger percentage of the forest, then that can cause a net addition of carbon to the atmosphere over and above this neutral balance of trees growing and dying and burning.

It's the difference between the kind of equilibrium state and a state that is changing as the climate is changing.

Hon. Mike Lake: It seems to me, and correct me if I'm wrong, that a burning forest is much more damaging in terms of emissions than a forest that's naturally dying. Would that be accurate?

Dr. Greg Flato: I'm not quite sure how one would measure damaging. On the long time scale, it doesn't really matter whether a tree dies and decomposes, or whether it dies a fiery death.

Hon. Mike Lake: As we're trying to rapidly make an impact on global emissions, it seems that if we could develop an expertise to stop the forests from burning and throwing 200 megatonnes of emissions into the air in a year, that would buy us some time to tackle all of the other things that we're trying to tackle from a climate change perspective.

Would that not be accurate?

Dr. Greg Flato: In general terms, anything one does to reduce the net amount of carbon dioxide that's going into the atmosphere reduces the concentration, and therefore reduces the climate change that's associated with it. So, yes, in a general way anything you do to reduce emissions is a benefit, in that sense.

Hon. Mike Lake: I think this is where I'm going: I'd love to see us tackle this question as a country. As we look at the time frame from here to 2030, it seems that there would be an enormous opportunity, and a win-win.... Obviously there's a danger associated with forest fires, there's pollution that's not emissions-related associated with forest fires, and there's certainly a quality of life.

In my province, where something like solar might be a huge opportunity, when you block out the sun to the level that we're blocking it out over the last few years because of forest fires, you're certainly having an impact there.

I am looking forward to the next study and to taking a look at some of these questions a little more.

The Chair: Our committee had agreed today that we would go one hour with you as a panel. Thank you so much for coming in.

For the committee members, for the first Tuesday back after our constituency week we're going to be moving into drafting instructions. I have asked the analysts on this current study that we've done to come up with some thoughts, a table of contents, perhaps, on what that study could look like. We'll have that available to guide the discussion.

We've made a request to the minister to see if she'd be available for the supplementary estimates on that day. We hope to know tomorrow or, if not, what her availability is in the next three or four weeks.

On the Thursday that we're back, we'll be moving into the agriculture, forestry, waste portion of our study.

Hon. Mike Lake: To that point, I know the minister's schedule is very busy, so I would suggest that as a committee we make ourselves available at basically any time the minister happens to be available.

The Chair: We put out the inquiry.

With that, everybody have a great constituency week.

The meeting is adjourned.