

Life in a Carbon Constrained World and What it Means to Canada

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I don't think of myself as an exotic, in fact many years ago my daughter said to me, "Daddy, you're the epitome of everything that is wrong with this country!" by which she meant a straight, white male over fifty. (laughter)

What is it all about? You have heard a lot about climate change and these are some of the things I will go over. I have many slides but I will not really discuss all of them with you. They are there for you and they will be available to download and we can maybe skip back to some of them in the question and answer session, rather than to go all through.

We will talk a little about the international process on climate change, the institutions involved in it, the background on science impacts and responses, including the economics responses. We'll go over a little bit about politics which is, as you had guessed a rather important component of the climate issue. Emission trends including Canadian emission trends, the current state of play in the international process and some possible future scenarios. Among the many players (and you read about them) this first one got half of the Nobel Prize - the other half that Al Gore didn't get. The intergovernmental panel on climate change, which is a U.N body. There is the U.N Framework Convention on climate change, which was negotiated in 1991 and 1992 and open for signatures at the Rio Earth Summit in June of 1992. Not really a major player, the U.N General Assembly (a debating body with no power to decide anything), but they pass endless resolutions related to climate change which do affect the process indirectly. Various other U.N specialized agencies, and the Organization for Economic Cooperation and Development and International Energy Agency in Paris. The IPCC was established in 1988 and is jointly under the _____ of the U.N Environment Program which is headquartered in Nairobi, and the World Meteorological Organization, in Geneva. The two of them together support it, and its secretariat is in Geneva at WMO (World Meteorological Organization). It has three working groups, it has been re-organized a couple of times. Science, impacts and adaptation and mitigation and cross-cutting issues. I have a little history - I chaired at different times, both Working Group II and Working Group III of the IPCC, so if you have questions about the IPCC, I may be able to answer a few of them.

They have issued so far four assessment reports listed there (they are roughly about every 5-7 years). Under the convention, there is the convention itself which was negotiated in 1991-1992 and signed at the Earth Summit in Rio. The first meeting of the parties referred to as COP 1 (the "Conference of the Parties") is the supreme body of the parties to the convention. It is not a meeting, it is an entity and therefore the media, which says this is the thirteenth Conference of the Parties is wrong. There is only one Conference of the Parties – It is actually the thirteenth meeting of that body. Anyway, they agreed at their first meeting in Berlin in 1995, that the treaty needed to go farther and be extended into with a subsidiary agreement (a protocol to the treaty) which was to be completed two years later at a meeting that turned out to be in Kyoto. The Japanese were my clients at the time and I said, "Don't host it, don't do it!"..... They did it.

Anyway, the Kyoto protocol is old history - you have all heard about it. It entered into force in early 2002, when Russia finally ratified which enabled it to meet the double trigger of 55 countries accounting for at least 55% of industrialized country green house gas emissions. The thing you hear about the Kyoto Protocol which is the most important aspect of it is the targets. The industrialized countries who are listed in Annex B to the protocol agree that they would limit their emissions to certain levels relative to 1990, or in the case of some of the former essentially planned economies, other base years.

For the periods 2008 to 2012, we are now in that first commitment period. The Kyoto targets were binding as of January 1, 2008. There are a few countries that are not yet in compliance, they have five years. They have five years to reach the average for the entire five years, so every year they are behind, they have to make up. They are playing catch-up ball for the rest of the period.

The domestic actions to reduce emissions can be supplemented from credits obtained by one of the three so called Kyoto mechanisms. The joint implementation and clean development mechanism are project based mechanisms for projects that reduce emissions respectively either in other industrialized countries, or in developing countries and emission trading is also allowed, but it is unclear how that will play out because there are all of these smaller trading blocks, like EU (European Union). During the negotiations, they focus pretty much on flat-rate targets. The U.S, the EU and others all say, "all industrialized countries should reduce by x percent. Kind of like suggesting everybody in the world had to wear the same size shoe. Only in the first week when they reached Kyoto and had less than a week to go, they say "Gee, maybe we ought to differentiate the targets to take in to the account national differences." Having a week and a half to do that, they didn't do the best analysis with exactly what the right targets would be and they were basically determined politically.

The EU, having proposed a 15% ratification target below 1990, had extensively differentiated within the fifteen countries of the European Union at that time. From -30 to +28 but they wanted everybody else to take a single flat rate target. That was rejected and in the week and a half they argued about it, they came up with some targets that look sort of like this. The European Union and then a number of one of these, most of who have become, adopted a target of 8% below 1990. Not too tough for the Eastern Europeans, they were already well in the double-digits below 1990. The U.S under specific instructions from Al Gore, who came to Kyoto, basically telling the U.S negotiators in front of the whole world to cave, that they had no bottom line, went down to -7. As I describe it, Canada and Japan, which typically try to position themselves just to the left of the U.S and trusting the U.S to keep anything horrible from happening, got "the bends" at about -6.

Russia and Ukraine basically just said no and said, "we'll go back to 1990 levels, which given that they were about 30-40% below, we can live with that". Thereby creating what is called a lot of "hot air" reductions. That is reductions that happen for reasons entirely unrelated to climate change. Then there are a lot of other countries with varying target and varying base years.

We are now in essentially a Montréal Bali process. Two plus years ago, when the 11th meeting of the conference of the parties took place in Montréal, a process for addressing the post 2012 period after the current targets expire, it was set up. It was argued if it was a two track, or three track process. It's really two track. One of them are the countries

that are currently bound by Kyoto targets who ratified the Kyoto protocol, that is to say not including the U.S are negotiating to see whether they can agree to newer, tougher targets after 2012. I'll come back later on the current state of play as to how much progress they're making. There's a parallel convention process to enhance the implementation of the convention. And that covers all parties, all countries. There is this so-called third track, which is a general review under Kyoto protocol, Article 9 on whether the protocol should be improved, changed in any way. Some of the industrialized countries have said, "Ah! This is where we get the developing countries to sign up to targets". I can tell you right now that we don't have to come back to that one, that one is not going anywhere.

The Bali Action Plan agreed, in Bali in last December, agrees that all of the countries want to agree and take some action by 2009 to address this general question and then it proceeds to say among many things (inter alia) that should be considered. What follows then, is the wish list from everybody that they pledge to commit to consider what anybody wanted to put on the table - that is the action plan. Among the other players, U.N agencies. The UN economic commission for Europe, which is in Geneva, gets into it sometimes, but since most of the countries there, except for the Russians, Ukraine, U.S, and Canada - and I guess Australia and New Zealand are there, it's basically the Western Europe and other group in the U.N ("other" meaning white European decedents who happen to be somewhere else, mostly in Anglophones countries.)

The OACD and IEA get involved but not in the policy, more into policy analysis. Obviously environmental groups have meetings that are like a circus, they're running around dressed up in various costumes, carrying on various stunts to get attention. Industry groups attend all these meetings they tend to keep a low profile, they don't want to get stoned by people who think they are the evil incarnate.

Let me talk a little bit about science impacts and responses and I have a background of both science and economics and am prepared to take questions later. The most recent report last year essentially confirms that there is a global warming trend and that is not really disputed. The evidence you heard by our lunch speaker, listed a number of things that have been observed. He also listed a number of things that are "what if's" and I don't necessarily agree on him that the science is in on those. But there is a fair consensus that the earth is in a warming trend. The earth is warmed and cooled periodically for millions of years, it is not shocking that the earth might be warming. Some say we are still recovering from the little ice age around 1400-1700, others say No, it is humans. The IPCC came to a conclusion...90% confidence that humans are the main cause of the warming trend that has been observed over the last several decades. They conclude that although there are some positive aspects that the majority of impact will probably be negative and some irreversible and therefore to be avoided if at all possible. They further concluded in the working group 3 report, that there are many options for limiting emissions that flow or at least very acceptable costs. They conclude that the benefits of mitigation exceed the costs by far.

Here is some caveats that I have; the attribution to humans is based not on direct measurement, or observation, but on the fact that they have tinkered with the computer models to get them roughly to match the observations over the last several decades, back maybe 100 years or so. There are many assumptions in the models and things and I won't get into the technical stuff, unless you ask me to, but I can.

There are a number of models, more than 20. and there are many inconsistencies among the models. So they don't all agree with each other, much less on this. The models are very weak on natural climate variability and I will talk a little bit about the implications of that, and they are unable to reproduce or explain longer term climate patterns, they do not have an explanation for example, of the Medieval warming that took place about 1000 years ago when Greenland was green. They were growing crops there and England had the climate of Italy and they were growing grapes and making wine. They are very weak on their inclusion of clouds. Now this is important - water vapor accounts for roughly 97% of the green house effect and clouds are the most visible aspect of that greenhouse gas. Clouds can have either a warming or a cooling effect, depending on what cloud it is, whether they reflect incoming energy away, or they let it in and then hold it in like a blanket.

In the models the solar variability is limited to the direct affects mostly of the eleven year sunspot cycle. They can't do a lot more with solar variability because much of the variations that happen in the sun and there are some dramatic ones; flares, and things that upset radio communications and things like that, are due to things happening inside the sun with very strong magnetic currents inside the sun. They can't get inside the sun and observe and they are certainly not able to put them in the models.

There's a very high correlation that's been found in a number of studies over many thousands and some cases, hundreds of thousands of years between climate patterns based on the geological record and both solar and cosmic radiation permits spiral arms in the milky Way. The indirect effects of this radiation are not understood very well and they are not included in the models. A possible mechanism (and I have a little bit of background on this), the impact of the solar wind is modulated by counter-effect of the cosmic radiation comes in and sort of diminishes the effect of the solar wind. The combined affect of these two sources of radiation is to have major effects on the ion balance in the upper atmosphere. That is important because clouds do not generally form very well, they don't form in a vacuum, they form around condensation nuclei and they don't like neutral particles so well as ions. So if you change the ion mix in a major way, you affect cloud formation, which again is an aspect of the greenhouse gas that accounts for 97% of the greenhouse effect. Neither the radiation from the source that basically drives the climate system, nor cloud dynamics are understood or included in these computer models on the basis of which they say they are 90% confident that we are causing everything we see.

On economics, there are lots of studies – they tend to tilt. I used to do energy economics in the 70's. They tend to tilt toward the desired results by tinkering with assumptions and methodologies and indeed those of us who built models know that you can make a model do almost anything you want and you can hide the way you do it deeply in the model so nobody but a specialist could find it.

The cost-benefit trade-off on the economic models is especially sensitive to the choice of what is called the “discount rate”. That is the value of an action now, versus an action in the future. The assumptions on technologies and costs are obviously critically important and I think particularly to your industry, and depending on how people do look at that nuclear ____, it looks very good or it just is not relevant.

I'm sad to say in the international climate process, energy economics are awful... very, very poorly understood. I'm going to go quickly through what I call a series of energy myths. They help to explain why people thought the Kyoto targets were actually achievable.

One of them is that there is really no link between energy and GDP, they've been decoupled and now you can have very strong economic growth while your energy use is declining and your emissions along with it. Well, when this kind of thing has happened, it is usually due to major structural changes – the last big dip where you saw emissions go down, but the GDP, the economy go up was in the 70's when we built a lot of nuclear plants.

Basically, the bottom line is if you want to make things or move things, you have to use energy. It takes energy to make something or move something and if you're not making anything, or moving anything, (it's a good question), what kind of economy do you have? What used to be called "no regrets", or things that would be justified for a number of reasons and they say there are many free options. If we just do what's on the table now, we're already there, we already met the targets and indeed there are a large number of measures that would be economically justified (positive net return after taxes).

They have been justified, by the way, since the 70's. Maybe we need to look at why have they not happened? There are a number of reasons; I could get into that discussion, but here are some at the bottom – Capital Availability, It's not an infinite amount of capital and so on, other competing priorities and so on.

Another myth: "Strict standards are good for you" – they'll make you more efficient and therefore more competitive and you'll get rich by having strict standards on you". It is a half truth – it depends. The bottom line is it's like a prescription from a doctor, the right dose could cure you, and the wrong dose could kill you.

Technology Forcing – strict targets and other standards will force people to develop new technology and everybody will win and the people who find the technologies will get really rich. Again, it's a half truth. Technology development is a black box, there's no guarantee whether you'll get a technology and if the technology you get addresses the problem you're looking for, it might not have other side effects. Example: 100 plus years ago there was a major environmental problem in the transport sector in New York that the projection showed that Manhattan Island was going to sink under the weight of the by-products of the dominant transport source within a few decades, but they came up with the technology that saved the environment. The Internal Combustion Engine.

Here's a myth – Canada would like U.S relatively high per capita emissions, people say well that's just, yes you have high per Capita emission because you're inefficient. If you could only be like us and France, you could have low per capita emissions and you would be good, you'd be more efficient. Well, it really depends very much on things like the energy mix, the resource base, the resulting economic structure, geographical size, population density, economic growth, population growth and climate, as you know here in Canada.

By the way, lots of jobs will be created by all of this, maybe. But where will the jobs be, and will they be the same people? You're going to put a bunch of people out of work who now have jobs in order to create jobs for people who don't have them and don't know they're going to find them. This is a tough-sell politically.

Speaking of politics, the current debate is quite tilted. Back in 1989 – 1990, when I first really got involved, I described it as the “debate of the birds”...Chicken Little vs the Ostrich. The media has not been very helpful and all of this business with Al Gore and Hollywood and Nobel Prize and all of that ...don't get me started on Al Gore.... Increasing in secular societies and there I include Europe and the two U.S coasts, environment is the new religion.

Climate change is very often mixed up with other political issues, especially in Europe, but I would guess also here in Canada and Anti -U.S, particularly anti-Bush feelings, affect peoples attitudes and it plays back into the climate process. Have any of you seen any of the news coverage on the Bali meeting in December where most of the world cheered when everybody insulted the U.S? I could see that this wasn't really a debate of facts, this is politics in motion.

The media – everybody knows the bad news always gets more play than the good news. The “Man Bites Dog” effect. If a dog bites a man it's not big news but if a man bites a dog, that's news. The dog is the climate system and the fact that at least many scientists believe that humans are actually biting the climate system is big news.

Another factor is the general “dumbing down” of the public - that they will swallow anything they read in the media, even if it isn't internally consistent. Another factor is that many who are basically environmentalists, people with a real environmental agenda decided to go into work in the media where they get to cover environmental issues for the New York Times or whoever, and their reporting isn't necessarily straight - and that does affect the general public.

The public itself is split and the split to some degree but not entirely in particularly now that you see the environment from nuclear power coming in, so it's not quite that simple. But it's generally been a left versus right split in the U.S. and in the general public (the red state/blue state issue). The red states by the way, in the center of the country where a lot of the fossil fuels and a lot of the coal is consumed for power generations, as you folks down wind understand, and those are the people who would get hurt. There's not a lot of heavy industry in California and New York or New England – they don't care – it's not their jobs.

The left generally tends to support strong government intervention, to support to protect the environment. The right tends to support business, but they don't want to be against the environment either. A lot of people on the right are environmentalists in the sense of nature conservations to protect forests and other places where they can go hunting.

The real debate hasn't begun. On this ideology and religion - as people have moved away from the traditional Religions, there's been a gap in their emotional life. That the need to have a belief system of some kind and increasingly, environment has become that religion and I can tell you from having been in some debates with people, the emotional intensity is almost more like religious fervor – it's not really about logic. People who don't agree with them are denounced as “skeptics” and in fact there have been proposals in Europe that Bush and others be tried in the International Criminal Court as for crimes against humanity for failing to ratify the Kyoto protocol...no ideology there.

This is climate change is not the only issue, and here are some other ex....I won't get into the details. I did spend a number of years in government and out there as a public face of government in some connections. But I remember when Al was in the senate, he

denounced the policy of the Bush (the father) as “immoral and obscene”. Now does this sound like religion?

They say there is a consensus on the science. That the science is settled...science is never settled and those of you who are students here and i'm really happy to see the younger generation getting involved, the nature of science is that it is always an open question – it is never completed. Whatever our best understanding is today, it can be changed tomorrow by new information, new analysis.

So there was a stage in the late 19th century where they thought Newton and Clark Maxwell had pretty much said it all for mechanics and electricity and magnetism and then we've got quantum theory and relative theory. The issue about trying to close off the debate and keep the skeptics out of the process is really about politics. It's not about science and these people are raising inconvenient arguments that don't support the political agenda. Al's movie – he says are inconvenient truths he left out a lot of things that didn't support his agenda because they were inconvenient. You see references to the majority of scientists believe or agree such and such. There is actually a very small number and having been part of the IPCC, (what it is), is a majority of those scientists involved in IPCC working Group I on the science of climate change. We're talking about a couple of hundred probably. There were those who were involved in that work who didn't agree, they were a minority opinion. Their views are reduced to footnotes, at best. People working on other aspects of the IPCC, they may have a personal belief opinion, but they don't have scientific expertise on the climate science. The economists working in Working Group III, they're not really “scientist” scientists, they are “social scientists”. So, it's really not a very large number and i'm one of the people that's included because I am one of the reviewers of the reports of all three working groups.

The subject tends to attract people who are already interested and inclined to believe humans are causing a problem and that's what has got them involved in this work. Also, the research funding process tends to reward those who say there's a problem they say, but more research is needed, with more research money and promotions and recognition and so on.

There are a number of scientists involved in the issue that I refer to “scientist advocates”. That is, they are straddling the line of being scientists and being advocates for environmental measures, particularly measures to restrict energy, and the most recent IPCC reports there were some bitter fights behind the scenes where they tried to get some of the things that were listed on the slide this morning into the IPCC report unsuccessfully. The majority of the scientist said yes, it could be , but the science to say that it really is likely, is not there yet and no we're not going to put it in the IPCC report. So some of the things you saw at lunch are not in the IPCC report because they didn't pass the threshold even of the majority of scientists who are inclined to believe that humans are causing the problem.

There's something called “post-normal” science and it is an interesting idea. It is sort of a philosophy and that you go through the scientific method of collecting data and testing hypothesis and all of that. Then when you get your results, you need to check with what they say, and this is Mike Hulme in the Guardian (newspaper) in London last March. He is the founding Director of the Tindall Institute of the University of East Anglia in the U.K that they needed to be guided by politics, ethics and spirituality and that if the results of traditional science, normal science, are not in line with societal

values, then you should adjust the scientific results. As a trained scientist, I have a real problem with that.

Emission Trends: Why do emissions tend to increase in spite of the fact that everybody pledges to targets that say they are going to go down, or should go down. Well, little things like economic growth, population growth, and here in Canada, the United States, Australia, and New Zealand. Immigration really pushes the population growth. Between 1990 and 2010, the midpoint of the Kyoto targets that group of Anglophone and francophone countries, are expected to experience population growth nearly 20% or in some cases, even higher.

Rising lifestyle expectations has pushed it up and this is particularly in the developing world. Rising electricity demand, a wired global economy. Rising natural gas prices (the dash to gas has slowed to a crawl and then some parts where the prices have really gone up – retreat), and rising transport demand.

Here are some more specific factors that enter into why emissions tend to go the way they go. You can look at this and recognize a few things that are relevant here in Canada, like the economic structure.

Some recent trends (and these are based on the IEA (International Energy Agency) CO₂ data, which is taken from energy data, supplied by the governments themselves. What were the CO₂ emissions in millions of tons of CO₂ in 2005 the most recent years for which the data is available for all countries? How do they compare with 1990 – the base year for most countries for the Kyoto protocol? An interestingly, how do they compare with 2000? Because during the 1990's a number of things were going on in terms of restructuring of the economies that were moving from centrally planned market base, the restructuring of the energy sector in the U.K which was resulted in a HUGE reduction. They went from coal to gas and not only saved the CO₂ from the coal, but some methane from the coal mines that were shut.

What you see, looking at 2000, some pretty big reductions between 2000 and 1990. If you look at the last column, you see almost everybody increasing since 2000. Belgium is just slow to get into doing stuff that other people did in the 90's. They're a bit disorganized in Belgium because it is a very complicated political system. Denmark, well, they're Danish! They're doing biomass, they're doing everything else and people have an incredibly high tolerance for high taxes and high energy cost. You wouldn't even be able to get away with it for a minute in the United States.

Others? Sweden. Same as Denmark. (It's that "Nordic Thing"). You get a little bit of that up here in Canada too, only it doesn't work as well! Others are all going up and you can see Luxembourg had the strictest target ...a -30 and the burden sharing. They closed the steel mill. It's a tiny country there is less than a million people and they closed the steel mill. They got a more than 30% reduction. The only problem is, they have lower gasoline taxes than the four surrounding countries and everybody from the four surrounding countries comes into Luxembourg to "tank up". The government makes a whole lot of money from the revenue and in spite of what it has done to their CO₂ emissions, they have not been willing to raise the taxes up to the levels of the neighboring countries and you see what has happened to their emissions.

The surplus that was created in the 1990's in the eastern European countries, and here I include those that are EU members (some of them - I don't include the smaller countries, there's just too many, the slide is not big enough!). And of course the big ones

to the East of Belarus; Russia and Ukraine. The only number that comes close to being a decline is the Czech Republic had such a small increase that it didn't show up and it is .0 something less than .05, but every single one of these countries is increased since 2000, and is continuing to increase.

This is a slide that was taken from the European commission about why they think they are going to meet their target and you see they have a "Business as Usual" projection there, going straight up out of sight. They have the trends of the EU15 and EU25 which they say (they show in the red line), will basically remain about flat and then the blue there is Additional Measures and the green is what they will get from the Kyoto mechanisms.

A comment; "Business as Usual", does not include the effects of German reunification in U.K energy marketing restructuring. Those were not climate measures; they should be in the base. In other words the trend for the 90's is essentially the baseline, not that line that just goes up into the sky there, that isn't. You see the big dip in the 90's. That is part of the base line that is not climate measures, that's the effects of the two primarily those two measures in the U.K and Germany which had worn off by the end of the 90's pretty much. That's why you saw Germany and the U.K more or less gone up. The gap is actually much larger and if you take a time line, say through 2003, 2004, 2005 and then run it down, you find it not going flat out, but still rising.

When you look at the additional measures that are on the table, they are not measures that are going to make a big difference. All of the big-ticket items have already been done. What about the rest of the OECD? You folks and us folks and the Aussies and people like that, well, we don't have those two big things that they had in Europe. Here are the other Western European and other OECD countries and take a look at the numbers there, versus 1990, or versus 2000. We are all in trouble relative to the Kyoto targets. The trends, the reasons why emissions rise that I talked about are operating in all of our countries; Norway, or course – oil and gas production. Switzerland – Tourism. People drive to Switzerland, people drive through Switzerland - They are driving emissions up.

A little bit on Canadian emissions: I break down the 2000 emissions by sector here, and particular relevant for you, is electricity and heat. Generation by utilities up 31% relative to 1990, but down 5% relative to 2000. Here in Ontario I think you know the reason for that, I don't have to explain it. The nukes are back up, thank you very much, and but what you see with Coal...Coal is up overall but down since 1990. Gas, getting expensive! I mean it's not going down, but the "dash to gas" has definitely slowed. Non-utility generators – some general numbers there. Other energy, which is oil and gas production, processing the Oil Sands is in there, Petroleum refining and so on. So you see it has slowed a bit, but it is not going to go down.

Manufacturing Construction – A little bit of de-industrialization here in Canada. Some of the really heavy stuff is moving offshore.

Transport – it's going up toward 30% above 1990, and that's a problem. The options which we are addressing now in Canada are limited. One surprise there, and I'm questioning the data is the International Air Transport, which is not included in the base line. It's not included in the energy balances or in the Kyoto targets. In almost every country it's way up, Canada actually shows a decline in particularly in the first half of

this decade. I don't know why, I suspect that people are not flying internationally that much less, it is counter-intuitive.

Other Sectors (which is residential, commercial, also agriculture and some things like that). That is up and both oil and gas are up. It is not people switching from oil to gas or electricity – they are both up. Electricity – it's all up.

Here in rank order are the leading developing countries and just eyeball some of those percentages. We've got to do something about them, I mean the mission outlook. Most countries, except for the former commies who will miss their targets because there is basically inertia of infrastructure, and so on.

Current States of Play – The EU has a proposal that the global average temperature must be limited to 2 degrees Celsius above pre-industrial levels, that's of 150 years ago. According to my reading of the IPCC, that target has already been missed, but it paints them into the corner in the negotiation process. They have to go for crazy targets if they are committed to that. There is no dialogue right now concurrent monologues. The EU will push its target right to the end. The developing countries will insist on no commitments, we want more money and technology – free.

Unclear what is going to happen in the U.S. It is clear until January of next year. And after that, the crystal ball is very cloudy. So the U.S will not agree to the EU approach because it just doesn't work within our legal system, much less economically.

Bottom line is countries are not compelled to ratify treaties that are seeing to be countered to their national interest and you cannot embarrass or shame them into ratifying a treaty that doesn't work. People try that on particularly the biggest countries and here I mean the U.S, Russia, China, India and Brazil – they will not/cannot be embarrassed, shamed, or politically pressured into ratifying things that don't work, and they need to be included.

I am hopeful that when the real negotiations begin, people will actually begin to understand what is going on. The costs of the targets are not trivial, and we will see this in Europe and in California, and countries will be looking for an approach that addresses these points and gets big countries in.

The economic and political stakes are higher than any environmental agreement and actually larger than trade agreements. There is a train wreck scenario where the EU pushes to the end and the whole process crashes. A possible alternative scenario, or after they pick up the pieces, is to try to put it together from the bottom up. What can countries deliver and agree to ratify and implement?

Domestic commitments, International commitments. By the way there is literature out there that I have published. A little bit about technology and generations of technology. We have talked a lot about this and I think other presentations have covered it. This is one place you can go to find out more about what I have said. Real process has not begun, A talk-down approach will not work, Canada can play an important role in trying to bridge the gap between the U.S and EU, but only when EU begins to listen.

Question and Answer Period

Guest: “Thank you very much for probably a very brutally realistic assessment. With your knowledge and given the pessimistic panorama, (but probably realistic) panorama that you put forward, how bad are the consequences likely to be? Right now you sort of talked about, you know, countries trying to counter what seems to be happening, but that the methods are either not honest, or not effective, or both. Or it is war by diplomatic means, as opposed to violent means, but what are the consequences likely to be in terms of sea level rising, desert _____, etc. you know for small countries, and big countries and while you’re at it, what would the case be for Canada with this Northland?”

Robert Reinstein: “First of all, as I noted, it isn’t entirely clear that humans control the global thermostat. So therefore, even if we could turn it down, what our contribution, it’s not clear that the climate system would respond immediately or significantly. But in any case, there is a lag and a lot of the warming is coming from CO₂ and other gasses that are already in the atmosphere. That is to say, we have banked in the atmosphere, significant additional warming. We are going to be into adaptation in any case, even if we have a significant effect on the global thermostat simply because we’re going to get climate change anyway. If it is natural, we’d better be looking at adaptation especially because we don’t have a choice. So it’s not clear how much we can do, but it is very clear we are going to have to be looking at adaptation. As far as the discontinuously reversible effects, a lot of this is “what if” They really don’t know.”

Guest: “First, just a very quick question. For those who did ratify Kyoto, what is the penalty for not meeting targets?”

Robert Reinstein: “The penalty is that you have to pay back whatever you were over at a penalty rate. So in other words if you were 100 million tons over your target, you have to pay back 130 million tons to be taken away from your second commitment target which is to be even lower than your first commit target. Now, if you don’t agree to take on in the second commitment period...there is no consequence, except red face – you’d be embarrassed. If Canada does not agree to -15 for 2013 and later, there is no consequence of missing the target for the first, actually it s a pilot phase. It’s an experiment people hopefully will learn something useful from, the fact that most people are missing it...what did they not get right? But no, Canada will not get hurt as a result of the consequences of missing the target.”

Guest: “Many political agreements are like that, but a broader question – environmentalists have constantly pushed what is called the “pre-cautionary principal” so basically you’re saying that maybe this is not right or uncertain, but it might be right and we should therefore, move in that direction.”

Robert Reinstein: “Well, you know the precautionary principle has various formulations, some of which are reasonable and some of which are crazy. It should be applied to everything, not just the environment, so if one of the consequences of trying to avoid climate change, possible climate change caused by humans, is to destroy your

economy. That ought to be weighed even though it is not going to necessarily happen, it could go badly. I mean you should take a precautionary approach to life in general. I mean we should really be responsible for future generations, period. Not just on environment.”

Guest: “Thank you very much for an interesting and sometime caustic critique. I just wonder what your opinion is as a former diplomat and civil servant of his public policy advisor, do you think the bush administration in the United States did a prudent thing by not ratifying, or withdrawing from Kyoto?”

Robert Reinstein: “It is the way they did it. It was very obvious that there was no hope of the U.S ever meeting that target and I had done projections in the late 90’s after the targets came out, of the best case what I call the “pain threshold” of what can be achieved domestically and it got emissions from something like +20 something down to about +12-14%. The gap between that and - 7, it would have had to have been covered by emission trading and projects. Was equal, about equal to the total emissions of Japan, The United States would have had to buy Japan, close it, to meet the target. It was very obvious that the United States could not ratify. I actually tried to communicate to the administration in the first two weeks in 2001, how to address that problem. They didn’t listen, they didn’t get it. The way we did it was totally driven by domestic political concerns took no account of the international reaction. The way to have done it would have been to very carefully explain much as I have sort of eluded to here, why we couldn’t meet the target and therefore, couldn’t ratify. And to take six months or more to do that, and then, with great apologies and everything else, say “we’re really sorry, but we made a mistake in Kyoto and we couldn’t do it”. That by the way, would have given Canada, Japan, and some others, cover to come forward and say, “You know, we have a problem too”. But by doing it the way we did it, we trashed the process and the relationships with the rest of the world. Now I give them a D- to an F for the way they handled it. The result was inevitable. The way it was handled was not good.”