PRESS CONFERENCE WITH
PRESIDENTIAL ECONOMIC ADVISER ANDREI ILLARIONOV
MOSCOW WORLD CLIMATE CHANGE CONFERENCE
[ALEXANDER HOUSE, 14:12, Friday, OCTOBER 3, 2003]

TEXT

Moderator: Good day, ladies and gentlemen. Today we -- by we I mean the Kremlin.org network -- are holding a press conference with Andrei Nikolayevich Illarionov, an economic adviser to the President. The topic of our press conference is "Russia and the Kyoto Protocol: What Is to Be Done?"

This question interests us very much because, and I am afraid I will express almost everybody's view, everything we read about this, that has been said or written by supporters and opponents, and especially by supporters, because with opponents everything is simply they only have to maintain the status quo, so all this offers very vague arguments.

Usually we are offered different explanations of why we should sign the Kyoto Protocol. And all these explanations are so enticing, one can't help asking why there are so many of them. Just yesterday a very respected person who works in a very respected energy company tried to explain to me why it was so important for Russia to join the Kyoto Protocol, that it was an international club of very important countries. Is it a club, is it a way to save mankind, or is it a way for Russia to earn? What it is? I hope we will find this out today.

Illarionov: Thank you, Gleb Olegovich for your introduction. Before we start talking about the content of our meeting, I would like to make a few introductory remarks. First of all, as it turned out, the topic of the Kyoto Protocol, the topic of ratification by Russia of the Kyoto Protocol or the topic of non-ratification of the Kyoto Protocol or the topic of postponement by Russia of the Kyoto Protocol ratification has become so politicized lately that frankly speaking I can't think of any other topic recently that would have stirred such intensive and emotional debates.

Just two days ago I was at one of the press conferences devoted to the ratification of the protocol and I witnessed so much emotion on the part of the people who attended that I hadn't seen since the end of the 1980s or at least since October 1993. It's not quite usual for such a calm life, political and economic and intellectual, we have had over the last few years. Relatively calm, of course, at least compared to the emotions that I could see several days ago.

So my first wish in our meeting today is that this meeting should not have a nature of political statements. We do not pursue any goals here. The only task we are facing is to have a calm and balanced discussion of problems that are confronting the country, the choice that has been offered to the country, the choice that has been the subject of very intensive intellectual and political fighting. Despite all this, I will try to have as calm and balanced a discussion as possible in order to try to figure out what is happening.

Just a few very general words about the Kyoto Protocol, although I am sure the people in this room know this. The Kyoto Protocol was prepared and signed in December 1997 in the city of Kyoto. This is why it is called the Kyoto Protocol. I have here this small book called "The Kyoto Protocol: the Convention on Climate Change." The Convention on Climate Change was adopted by the United Nations.

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But it is not the convention that is a legally binding document but the Kyoto Protocol. The essence of the protocol is that -- of course, it's a legal document that is based on a certain theory, on a certain concept.

According to this concept, the global climate warming that has been happening over the last few decades and maybe even centuries is caused primarily, if not entirely, by human activities, mainly by industrial and agricultural activities, as a result of which a considerable amount of carbon dioxide is discharged into the atmosphere. Carbon dioxide accumulates in the atmosphere and increases the greenhouse effect that has always existed or at least it has existed for the last several hundred million years, but carbon dioxide has increased this effect. As a result, the temperature rises, the climate changes. This leads to serious cataclysms, both short-lived and long-lasting, such as the melting of snow, ice, the rise of the Ocean, severe draughts in one place and devastating floods in another place, and so on.

In order to prevent such scenarios, it was proposed to restrict the discharge of carbon dioxide obtained through human activities. Certain quotas were introduced for countries that are members of the so-called Appendix 1 to the Convention on Climate Change. Here is the text of the Convention both in English and Russian. And there is Annex 1 that lists these countries. As a result of different negotiations, these countries arrived at a decision that, using the year 1990 as the basis, the emission of carbon dioxide and several other gases that are called greenhouse gases and that account for a relatively small share of all greenhouse gases, including methane, lower nitrogen oxide, should be reduced for about 5 percent for all Kyoto Protocol member-states as a whole. These quotas differed for other members of Appendix 1.

The European community countries and the European community as a whole decided to reduce greenhouse emissions by 8 percent. Japan, if I am not mistaken, decided to reduce them by 6 percent, Russia by about 100 percent of the 1990 level, Iceland by 101 percent, Australia by 110 percent. That is, the quota for each country was negotiated separately. This list included most but not all industrialized countries and several, but not all, countries that used to be called and are still called economies in transition. The overwhelming majority of countries in the world are not parties to Appendix 1 and therefore they have not undertaken to reduce greenhouse gas emissions or to reduce carbon dioxide emissions.

In accordance with the provisions of the protocol, the protocol may enter into force only after it has been signed by not less than 55 countries that are jointly responsible for the emission of not less than 55 percent of greenhouse gases, the countries that are included in Appendix 1. Such a provision can be found in many international documents. By now if the information is correct that I have received on September 29, naturally the protocol was signed or rather was opened for signature in 1998, it was signed in 1997 and it was opened for ratification in 1998.

Since then, I think on September 29, the treaty was ratified by 105 states and it follows from this that not all countries have ratified the instrument and correspondingly, out of those have ratified the agreement, there are countries that assume certain commitments to restrict and limit the emissions of carbon dioxide, there are also countries that do not pledge themselves to such

restrictions and which remain without any restriction, without any ceilings. They can increase their emission of hothouse gases in whatever way they please to.

Now about ten countries or maybe more have yet to ratify the agreement. 2.5 years ago, in March 2001, the United States through the lips of President Bush declared that the United States would not ratify the protocol and they go out of it. A little later a similar statement was released by the government of Australia. And considering that the share of the United States in the aggregate emission of hothouse gases according to data of 1990 was quite substantial, over 36 percent, then correspondingly, the US exit from the protocol put the entire construction into question -- can the agreement take effect?

A situation developed as a result of which the protocol could take effect only if, considering the countries that have already ratified and those who have not ratified and quit it, the agreement may enter into force, rather the protocol may enter into force only when it is ratified by Russia. And only Russia and no other country --even if all other countries which would like to ratify the protocol have done it, but it is not done by Russia, then under this document the agreement may not be able to enter into force.

The fact that Russia from March 2001 has found itself in such a role, the role of the keeper of the key to the Kyoto Protocol, in the past 2.5 years a big part of the discussion devoted to the Kyoto Protocol has this way or the other been related to Russia. Will Russia ratify the agreement? Won't Russia ratify the agreement? When will it ratify? And so on.

Considering that the discussion about the Kyoto Protocol and its ratification was extremely acute, was acute between, on the one hand, the Europeans, Japanese and Canadians and, on the other, the United States, as a result of that discussion which among other things was happening in the city of Genoa at the meeting of the heads of state of the Eight in June 2001, the Russian President Putin who was present at that meeting submitted a proposal after two hours of intensive discussion on these issues when the parties were exchanging opinions about the pluses and minuses, the pros and cons of ratifying the protocol -- after that Vladimir Putin made a proposal to try to resolve the outstanding issues that existed at a special conference, a world conference on climate change.

The proposal was supported by all the participants of the Eight and this position was registered in the final document. And now 2.5 years later, in September this year, there began in Moscow and is now into its fifth day to be closed today -- the world conference on climate change. Without Articles of Association doubt it is quite an outstanding phenomenon. It is just a third world conference on climate change. The previous ones were held as follows: the first one took place 24 years ago, the second – 13 years ago and now the third. And it is naturally the first that the conference is being held in Moscow.

Also for the first time, and also on a proposal of our President, the conference is attended not only by scientists but also by officials from governments, statesmen, businessmen, representatives of informal or nongovernmental entities. This was done on purpose, so that everybody has the opportunity to hear out any viewpoints and that everybody would have an

opportunity to express one's own point of view to see which position is considered to be the most reasonable.

So, in the course of five days such a conference is happening and today it is being completed. As you know, on Monday, at the opening of the conference our President addressed the conference and although the conference is devoted to questions of climate change, this topic is much more broader than the topic of the Kyoto Protocol, nevertheless, as was to be expected, but not to that extent, very many among the conference participants for some reason waited for the opening statement of the President to announce that Russia will ratify the Kyoto Protocol or this has already been done or is being done, something like that.

[Putin Announcement]

As you know, the President decided not to do this. He did not do it and he said a different thing. He said that we are being urged to ratify the Kyoto Protocol and it is already not the first day they do it and they insistently urge us to do it, we are hearing the arguments in favor of ratifying the Kyoto Protocol. We also hear other arguments. We would like to attentively analyze all information. The Russian government is engaged in analyzing the protocol and the possible consequences of the ratification. And when the analysis is completed, then the decision will be taken in accordance with Russia's national interests.

One must say that among a part of the participants in the conference the statement caused a sense of regret, to put it mildly, and several delegates intervened in the sense that a magnificent opportunity was lost to ratify the Kyoto Protocol. Why wasn't the opportunity used? To tell you honestly, this is a somewhat strange approach.

It is necessary to make such a preface because I think over the past two months our mass media and in the public area there was an intensive and heated discussion of the question related to ratifying the Kyoto Protocol.

I would also like to make my small contribution to this discussion and to formulate several questions and several positions which in my opinion represent a broad public interest. I will say more: two days ago, at the same world conference on climate change I had been given the floor and I intervened and some of these questions were asked there. **Ten questions were asked concerning the scientific foundation of the Kyoto Protocol.**

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Questions posed to Bert Bolin by Andrei Illarionov
Moscow World Climate Change Conference
October 1, 2003

1. What was the actual level of carbon dioxide concentration in the atmosphere in 1980-2000?
* The forecast is alarming. What is the basis for it?

2. What are the parameters of the model of temperature anomalies? And how are they derived? Why are there such fluctuations in anthropogenic forcing observations?

3. Can we explain the temperature variation by CO2 concentration in the atmosphere in the past 1000 years?

4. Can we explain the temperature variation by CO2 concentration in the atmosphere in the past 140 years?

5. Can we explain the temperature variation by CO2 emissions of anthropogenic character?

6. Other factors explaining temperature variation: Volcanic activity? Whether to include in the model?

7. Other factors explaining temperature variation: Long-term cycles? Whether to include in the model?

8. Is the modern "global warming" unique in the last 5,000 years?

9. Can we achieve the Kyoto Protocol targets, providing the share of Annex 1 countries (including Russia, not including USA and Australia) in the world's CO2 emissions is rapidly falling?

10. And finally: How much does it cost?

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Colleagues from the international panel of experts on climate change -- the English abbreviation is IPCC -- well known to specialists, got together and jointly they drafted answers to those ten questions and this morning one of the IPCC leaders, Professor Bolin from Sweden acquainted the participants of the conference with answers to those ten questions.

I just want to show you a book. It's a sort of a synthesis report that was prepared by the Intergovernmental Panel on Climate Change, which is the intergovernmental group of experts on climate change. The book summarizes the main conclusions on climate change made by scientists. The research makes three volumes of special studies. This is just a brief overview. And there is a special chapter for those who do not understand complex calculations, that is for those who make political decisions. It explains why the problem of global warming exists, what role human activities play in this process. And I would say it makes an attempt to provide a scientific basis for the Kyoto Protocol.

[Ten Questions to Bolin: No Answers]

Professor Bolin is one of the leaders in this team of authors, he also spoke and gave answers to these questions. I can tell you that unfortunately none of the formulated questions was answered. One of the reasons for that may be that there was not enough time and there was not enough information at hand. However the questions that were formulated were not raised yesterday. They have been on the agenda for at least the last 20 years at all such conferences, meetings and seminars of climate scientists and economists who discussed global warming and the role of human activities in this warming and climate changes.

The fact that there are no answers to these questions does not mean that these questions will not be answered tomorrow or the day after tomorrow.

We hope, and we reached such an agreement, that our honorable colleagues will try to prepare appropriate answers and make them known not only to us but to the world and the international scientific community to make this knowledge public domain so that everyone could study and analyze it and make his own conclusions.

What I am going to offer you after such a long introduction is only part of the questions that were formulated one more time in the last 20 years two days ago, some of the questions and observations that were formulated today, and some additional information. In order to draw a picture, and I think that climate experts will find it extremely simplified, and they may be true, but for those who do not deal with climate changes every day, it will give them a rough idea of how the mechanism of climate changes works.

In the last several years when the attention of the people was riveted mainly to the human impact on climate, but the problem of climate changes is much broader and much bigger. ***Roughly speaking, if we focus on climate changes, by which we mean the change of temperature and mainly precipitation, we can single out a group of factors that affect climate and that can be divided into two big groups. These are natural factors, of which the most important are solar***

radiation and changes in solar radiation, the reflecting ability of the surface of Earth, for which there is this serious scientific word albedo and which changes depending on the nature of the surface, whether it is covered with woods or it is ploughland, or it is barren rocks , ice or ocean.

Each of these surfaces has its own reflecting capability. The change of the surface changes the reflecting ability, the albedo, and therefore the amount of solar radiation that Earth received from the Sun and then reflects back into the outer space. And the third, very important, element is the concentration of carbon dioxide in the atmosphere, which serves as a cushion that causes the greenhouse effect. There are several sources of carbon dioxide emissions. Carbon dioxide is generated by Earth's mantle regularly and constantly. This is the main source. Carbon dioxide is discharged by volcanoes and oceans. Carbon dioxide is produced by decomposing organic substances and by animals when they breathe. People also contribute to the concentration of carbon dioxide especially by burning fossil fuel for the generation of electricity and heat, and in industry. Cement production produces a lot of carbon dioxide. And of course, carbon dioxide is produced by breathing. So, these are human factors. All these factors cause climate changes. Climate changes affect the lithosphere, the cryosphere, the atmosphere, the hydrosphere and the biosphere and everything that is called human society: economy, social relations, politics. There is a well-known example when riots, revolutions, uprisings occurred in lean years, people died and so on.

There is a lot to discuss, and very much has been written about this. In the discussion on the Kyoto Protocol, -- ***the Kyoto Protocol addresses only one group of factors that are called human factors. It does not deal with the breathing of people yet but it deals with restrictions on the emission of carbon dioxide generated by burning of fossil fuel and industrial activities, and how this affects the climate. It is a general approach. The impact of other factors is left outside, on the periphery. And I think it shouldn't be because the study of relevant literature showed that the share of carbon dioxide emissions caused by human activities in the overall carbon dioxide emission caused by both natural and human factors is growing and reached 8 percent at the end of the 20th century. In other words, this means that if we take a step back, we will see that these two factors account for 8 percent. Carbon dioxide emissions caused by natural factors make up 92 percent of the total. But these are not addressed by the Kyoto Protocol. But natural factors also play a role in this process -- among these three key factors: solar radiation, the reflecting ability of Earth, or albedo, and -- so, if we try to build a climate model and assign a certain share to a certain factor, human factors should get their share. Bit they cannot account for more than 8 percent. They will be actually smaller than that because each of these factors has its share. You may ask me, what are the shares of other factors? I addressed this question many times to climate scientists, and different people gave me different answers. This is a subject of a broad discussion. But I did not get a single answer although such an answer probably exists.***

But I would like to draw your attention to the following. At least we must have in mind that although the emission of carbon dioxide of antropogenic nature exists, and is growing, it indeed increases the concentration of carbon dioxide in the atmosphere and its contribution is roughly like this.

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Further on, we area passing over to the basic essence of the concept, the theory under which the temperature in the recent period, especially falling on the 20th century, I mean the rise in temperature, cannot be explained by anything else except man-made activities. Strictly speaking, this is the basis of the theory and all these data are taken from this book and there are indications as to where the data were taken.

Like any person who looks at this picture, one immediately gets to ask several questions: these changes in the temperature or even the basic changes on the planet, and mind you, in Northern Hemisphere -- it is not coincidental that here we have the Northern Hemisphere and if we trace here such a trend, more or less constant, here we will get a big growth.

If we take a look at data on the Northern and the Southern hemispheres, we don't get such a picture, and there is also a trend of rising temperature, but it is much less expressed. If you take a look at the data about the trend of temperature of the ocean that have been obtained in recent time, the trend shows a strictly horizontal straight line, there is not even a hint of an increase. If one analyzes data on temperature measurements in the near-Earth atmosphere at the level of 1.5-2 kilometers – received from satellites -- they indicate a weak tendency toward lower temperature.

Now we kind of leave this side with different measurements, and we take only one part -- the part used in this report -- a certain increase in temperature in Northern Hemisphere. But if it is there, then the question arises: so they say this is connected with human activity. Then naturally, this question arises: the other temperature fluctuations over the past thousand years have also been connected with anthropogenic activity the bulk of which is the burning of organic fuel -- meaning coal, oil, gas and so on. And we have discovered quite a number of examples over the past thousand years which, by the angle inclination and by scale are comparable with the period we had in the 20th century. But honestly, it is quite difficult to say how the active anthropogenic activity of burning organic fuel was noted.

Moreover, it is not difficult to see that after a period of higher temperature there were observed quite notable sharp reductions in temperature. It was apparently assumed that at that period the anthropogenic factory ceased to operate and then for 30, 40, 50 and sometimes even 100 years mankind ceased to burn organic fuel.

This is obviously causing very big doubts, I mean such an interpretation, and this interpretation gets more profound if another graph is super imposed on this one, taken again from that book. It is shown by dots here.

It is a graph showing concentration of carbon dioxide in the atmosphere obtained with different methods also over the past 1,000 years. So when the graphs are examined separately and incidentally they are given in this and in other books, then the question of the extent to which they match each other just does not arise.

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If however, one still tries to super impose one graph on the other, then naturally the question arises as to what extent these two graphs are correlated. To what extent it is possible to say that the changes of this indicator are to some extent the functions of the change of this factor.

Anyone who engaged in correlations or regression analysis, even in their simplest form, will naturally express some minor doubts about whether it is possible to draw such a conclusion. Naturally, quite a number of scientists in climatology are also expressing doubts over the possibility of this kind of interpretation of the data.

We can take a shorter period -- 140 years. This is how this was done in this book which also says that over the past hundred years, namely during the 20th century, the temperature on the planet increased by 0.6 degrees and then it is added in brackets -- plus- minus 0.2 degrees. Considering that the accuracy of measurement may change. And they say that 0.6 degrees rise in temperature in a hundred years is so colossal, so dramatic that there can be only one explanation -- the impact of anthropogenic activity, the impact of carbon dioxide which is man-made. If you take this period of the 20th century and try to analyze it not from 1990 to 2000 but try to divide it into three sections that differ by their trends. Actually we can do it a little later. And let us put on this graph the same line of concentration of carbon dioxide in the atmosphere and let us take a look at the extent to which these lines correlate with one another and what can one say about the strength of such a statistical link.

[IPCC Hockey Stick]

An additional problem is one that is shown here in the appearance of a trend line, indicated in blue here. The fact is that in this book there are no data on carbon dioxide concentrations over the past 20 years -- from 1980 to 2000. Instead of such dots that indicate the actual observations, instead of the dots there is the traced line of the trend, relying on about the last 10-12 points and it plays a role sort of representing the existing observations of the concentrations of carbon-dioxide in the atmosphere.

This question appears to be all the more strange because on all other gases, methane, nitrogen-oxide, there are some detailed actual data of observations over the past 20 years. However, for some reason there are no data concerning carbon dioxide. All participants in these discussions, the authors of the report asset that there are such data and in general it is hard to imagine that such data do not exist. But for some reason the data were not included in the book and instead of the data by traced the a line of the trend, a straight line of the trend, thanks to which it is possible to say that at this section between the end of the 1960s and the end of 1970s and 1980s there exists a certain likeness between this trend line and the temperature line.

However, there is no confidence that everything has been accurately done from the viewpoint of science and many scientists asked questions. Finally, we can take the same graph make out trends by individual sections of the 20th century. Let us take the section of 1970s; from mid-1970s to 2000; from the mid-1940s to the mid-1970s and say from the 1910s of the 20th century to the middle of the 1940s.

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It is not hard to see that in principle these three lines of the trend reflect three different types of behavior, or three different characters and if on this same graph we super impose a graph of the emission of anthropogenic carbon-dioxide, then the question of how much these lines correlate emerges with special acuity.

While up to this period of time -- from the mid-1970s to 2000 -- it was possible speak about some link between the emission of anthropogenic carbon-dioxide with a rise in temperature; here there seems to be a certain similarity observed although one cannot say whether there is a link or not, if there is a cause-effect connection or not. At least we can't say what causes what.

As for the period from the middle of the 1940s to the middle of the 1970s, it remains a big mystery because anyone who knows the history of mankind since the middle of the 20th century knows that it was a period, that it was a golden period, a golden era of economic growth, when the highest rate of economic growth was achieved by most countries and it was a period of the highest economic growth of the world economy, it was an era of cheap oil, when oil, coal and gas were extracted and burned at an incredible rate. During these 30 years the extraction and consumption of oil increased six-fold. And we can only imagine how much carbon dioxide emissions increased.

But what is happening to the atmosphere? The temperature of the atmosphere is not rising. Moreover, there is a clear trend, which has been around for 30 years, and over these 30 years the temperature at the surface of Earth dropped by 0.2 degrees, which is quite a lot. Therefore, not for a year or two, but for 30 years diametrically opposite tendencies developed: carbon dioxide emissions caused by human factors continued to increase considerably, as we can see on this curve, and at the same time the climate was cooling off and the temperature was decreasing. How can this be explained? No explanations have been produced in the last 20 years in any discussion or at the latest conference.

And finally, this period. We see a rather considerable increase in temperature that is comparable in terms of speed and angle of inclination with what we have been seeing in the last 25 years. At the same time, in the period from 1913 to 1944-1945, a period when two world wars, the Great Depression, several global economic crises occurred, a period when the biggest portion of the world economy was stagnating, carbon dioxide emissions caused by human factors increased very slowly. At the same time, now the temperature is growing as fast as it did in the last 25 years. How can it be explained that carbon dioxide emissions grow rapidly in the period of slow economic development and economic stagnation, and decrease in the period of rapid economic development and growth? Unfortunately, we have so far not got any answer to this question.

And this raises several more questions. For example, climatology has come up with a rather decent connection between volcano activities and the concentration of carbon dioxide. It's quite decent for our level of knowledge and for our limited scope of knowledge and measurements. In fact, when volcanoes erupt, they discharge a large amount of carbon dioxide into the atmosphere, its concentration increases, and this results in an increase in the temperature of the air. These curves are based on data covering a period of more than 100 million years. It's a rather long period of monitoring. It's not 20 or 25 years, as we saw in the previous charts. And here, too, we

see a rough semblance. **There is a number of studies that show that volcanoes are one of the main source of carbon dioxide emissions into the atmosphere.**

[Concerns about Models]

However, this factor was not included in the climate model that was represented here. As a result, one of the most important factors, which has been recognized by all climatologists, was not incorporated into the model which provides the basis for the Kyoto Protocol. The question is why? Unfortunately, no answer was given to this question either.

[Historical Data]

Now, there are even more interesting factors. For example, this chart represents changes in temperature at the surface of Earth over a rather long period of time. Not millions of years but for more than 400,000 years. What is so good about this period of time? It is good because it is a period of time when people were already around. According to the latest studies, people appeared about four million years ago, at least the first signs of human presence date back to that time, and 400,000 years ago people existed in large groups, and there already began to appear the first signs of human society. By the end of this period the first protohuman societies came into existence.

So, what do we see here? We see that temperature changed considerably during this period from the peak of minus 8 and minus 10 and even minus 12 degrees, the relative average for the period, to plus 2 and plus 3. In other words, the fluctuation amounted to 12- 15 degrees. Over what period did this occur? It's a period of about 1,000 years. If we extrapolate these numbers into our times, we will see that -- the amplitude of fluctuations shows that they by far exceed the fluctuations we have seen in recent years. As far as the rate of temperature increase or decrease is concerned, they considerably -- they certainly don't differ from what has been happening in recent years. Moreover, the climate has never been constant either and will never be constant. It changes all the time.

It is obvious that during this period of time fossil fuel was not burnt in more or less considerable amounts. And this means that these fluctuations were caused by other factors that are not related to human activities. The question is what are these factors? And if there are any cycles, whether they are connected with solar radiation or something else, it is necessary to understand which factors affect the situation and why, and can't they be included in the model. ***Unfortunately, this book, The Climate Model, on which the Kyoto Protocol is based, does not include these factors either.***

And the last thing. It is necessary to say that at the moment we are in the upward part of this curve. This may to some extent explain why the temperature on the planet is rather high or is said to be rather high. And yet, the temperature is lower than the peaks registered in the previous era. It needs to be said that people already existed during this entire period, they survived at high temperatures and they surely survived at the temperatures that are marked here as peaks. This is

interesting information for discussion on whether humankind will be able to survive an increase in temperature by one degree or several degrees.

We gradually reduce the period. At first we had 100 million years, then we reduced it to 400,000 years, and now let's see what happened in the last 5,000 years. This point here represents the year 2000 A.D. And this point here is the year 3000 B.C. It's easy to see that the current increase in temperature, it is marked here, does not really differ much from increases that occurred around 800th or 900th years A.D., or 200th and 100th years B.C., around the year 1300 B.C. It's easy to see that these peaks were much higher than the ones we have now. And this is a period when people not just existed but when rather developed human societies existed.

Suffice it to say that this is a period when the Ancient World had reached its highest point. Everything we know about that period happened then, when the temperature of air at the surface of Earth was higher than it is now.

Reports say that grapes were harvested in England in ancient times, and then around 800th or 900th years B.C. when Eric the Red discovered Greenland, it was all green and that is why it was called that way and there is nothing of this kind today.

This is fertile ground for reflections, food for thought. And the question is: what factors, evidently no longer anthropogenic in nature because in this time nothing was observed similar to what is emitted by mankind into the atmosphere today. Nevertheless, the temperature was much higher.

These questions were also perennially put, but so far there are no answers. Further on, there emerge a number of questions related to a not so distant history or rather the current history: it is what is happening today or maybe over the past 40 years. These are data of the World Bank and we see that in absolute volume the emission of carbon dioxide at least from the middle of the 1990s is stabilizing and probably shows a weak tendency toward reduction. Now it is difficult to say but at least the data related to highly developed countries or countries of average development -- register a weak indication of reduction.

If we take a look at the indicator of the emission of carbon dioxide per capita we will see that on the whole in the world the indicator has stabilized roughly from the middle of the 1970s. In highly developed countries it begins to diminish from the mid-1990s. I beg your pardon, I find it a little difficult to speak ... In the weakly- and average-developed countries the tendency also indicates a certain reduction.

If one talks about the specific "load" of carbon dioxide per one dollar GDP produced, at least over the entire period of observation for which there are the appropriate rows of statistical data based on the information of the World Bank, one observes a sufficiently sustainable tendency of reduced emission of carbon dioxide for the entire world economy. And even steeper tendency is for highly developed countries.

As regards the weak- and average- developed countries, there was a rising tendency which continued roughly from the middle of the 1980s, and from the mid-1980s the tendency attested already to a drop.

We then pass over directly to the document for which we have gathered here, namely the Kyoto Protocol. It transpires that the document is not universal, it does not embrace all the countries of the world, it imposes no restrictions on the emission of carbon dioxide for all countries of the world. And we see how a change occurred between the two groups of countries. The countries of Annex 1, which undertook the commitments and ratified the agreement, took the commitment and abide by them, and the rest of the world.

In 1990s the countries of Annex 1 produced 7.5 billion tons of carbon dioxide while the rest of the world -- 12.8. In 1999 the Annex 1 countries produced less carbon dioxide and indeed they are doing some work to reduce the discharges of carbon dioxide while other countries, not committed to the obligations of the Kyoto Protocol, are increasing it. As a result the gap between those who undertook the commitment and those who did not take commitments, has notably increased.

This can be seen, among other things, also on the graph here that shows the specific weight in emission of carbon dioxide of Annex 1 countries in the world emission. In 1968 those countries were responsible roughly for half of the world emission of carbon dioxide; in 1990 -- on the order of 37 percent; and finally, in late 1990s it was slightly less than 31 percent of the world emission of gas -- this is if you count it with Russia; and if you count it without Russia then the indicators will be slightly lower, of the order of 24 percent at the present time.

It is clear that this has nothing in common with 55 percent and naturally the question arises to what extent such a protocol and such international law can be effective in attaining even the goals that were proclaimed. If countries which are responsible only for less than one-third of world emission do everything possible and even impossible to cut on the emission, while the countries responsible for 70 percent of discharges will not do it and will continue to increase the emission, it is not hard to see that in this case the goals of the Kyoto Protocol in principle cannot be attained because these countries are not bound by anything and one must say that they do not intend to be bound by these restrictions.

[Long Term Reductions Required to Meet True Kyoto Agenda]

The next question that was also actively discussed -- related to the price of the activities in order to meet the demands stemming from the Kyoto Protocol at later stages of development -- for the economies of different countries of the world and for the entire world economy. This graph is somewhat complicated but I will try to explain it. You can see here slightly pale posts -- this is the cumulative emission of carbon dioxide between the years 1990 and 2100, which means for 110 years. On condition that the carbon dioxide concentration in the first case will not exceed 450 ppm -- meaning 450 particles per one million in a molecule, or molecule per million molecules of atmospheric air. Here it is 550 ppm, which means 550 particles of carbon dioxide per million of molecules of atmospheric air, correspondingly 650 ppm and 750 ppm.

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And here we have different variants of reducing the emission, different variants of technological decision. And I would like to draw your attention not so much to that vertical axis indicating maximum volumes of carbon dioxide emission, measured in gigatons of carbon and more for that vertical axis which contains the indication of the price of activities, measured in trillions -- and for those who might make mistakes with zeros, we have a "crutch" -- ten to the power of 12 -- dollars in prices of 1990.

If we take a look at this scale, we will see that this variant is near the figure of 1,800 which means one quadrillion 800 trillions of dollars in 1990 prices. For those who deal with such figures not quite regularly, I will simply give you one figure for comparison. The figure is the world gross domestic product of 2002, i.e., of last year measured in 1990 prices. The whole world, including the US, China, Germany, Japan -- generally the whole world, all those six billion odd people produced the GDP worth 32 trillion dollars per year. This is to say that if we put this post here, it would be a very small post. This is what produced by the entire world economy during the year. And here -- marked with a pole --is the spending to take measures under the Kyoto Protocol on this particular project with these conditions. Of course, with other conditions and on other variants, the expenditure may be even less. ***But even in the most conservative estimate, it is a figure on the order of 100 trillion dollars. This is to say that it is three times more than the current world gross domestic product. Each can make a conclusion as to whether or not such activities are expensive or cheap and to what extent such measures are practicable and realistic.***

There is one more aspect which as a rule is not discussed intensively because it is regarded not to be quite decent to discuss. And not all of us engage in the studies of climate and we don't have any restraining factors and we can engage in discussing this part which may be regarded as not quite correct in political terms. And this part is called Emission of Carbon Dioxide -- it is an inevitable product of civilization at the current stage of development. We will not say that carbon dioxide is a product of human life. But it we stop producing carbon dioxide, we will simply cease to exist. But the present economic civilization is based on hydrocarbons. Like it or not, effective or ineffective, but humankind burned and is burning wood, coal, oil, gas, fossil fuel, people are generating energy which they use in their life.

This chart here shows a connection between average annual increase in carbon dioxide emissions in the last 40 years and the average annual increase in GDP over the same period. It's easy to see that there is a rather high correlation between the two in about 150 countries. It's easy to see that all countries that had high economic growth rates are in the right-hand upper corner of the chart. This means that these countries had rather large average emissions of carbon dioxides. At the same time, the countries that had no increase in carbon dioxide emissions during this period had either low or negative economic growth rates. ***Since our country has been busy the last six months discussing how to double GDP, we couldn't help looking at this picture from this point of view.***

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[Impact on Russia; Plan to Double GDP by 2010]

If we are to double GDP within the next 10 years, this will require an average economic growth rate of 7.2 percent. It's a horizontal line here. We see the first point on this line or above it, draw a vertical line through this point and this tells us that these countries that had sufficient economic growth rates for doubling GDP within 10 years or even higher rates, these countries increased their carbon dioxide emissions by 7 percent or even more every year. No country in the world can double its GDP with a lower increase in carbon dioxide emissions or with no increase at all.

If we apply to this picture the requirements that the Kyoto Protocol applies to Russia, we will see the following: since the Kyoto Protocol says that the 1990s levels may not be changed, in other words, it sets the limit, we may actually say the zero point -- we use this zero point to draw a vertical line until it meets the last point here and continue it to the left toward axis Y. And this leads us to the point of 4.5 percent. This means that the best rate that has ever been achieved in the world economic history in the last 40 years, that this is the best one can achieve without increasing the emission of carbon dioxide and with the maximum economic growth rate of 4.5 percent. All other observations are below that. At least 4.5 percent is the maximum that one can achieve. There has been nothing higher. This is the highest rate that one can achieve. If we take the average, the growth rate will be lower.

[Impact of Kyoto: Reduce Emissions to 58% below 1990 by 2050!]

Lastly, if we look at the criterion that simply does not exist in official documents, but that has been actively discussed, for Russia it is 42 percent of the 1998 level, which the country is supposed to achieve by 2050. And this means that we will have to reduce greenhouse gas emissions every year by about 3.5 percent. So, we take this rate of 3.5 percent and go up every year until we meet the last point that is consistent with this criterion. And this takes us to about 2.5 percent.

In other words, the maximum rate of economic growth that may be possible if this criterion is to be met and that has been achieved in the last 40 years is 2.5 percent of GDP growth a year. Everything else will be below that. This chart may not be politically correct. But it shows the nature of connections between carbon dioxide emissions and economic development at the present stage of human civilization. Like it or not, people will survive because they have to inhale oxygen and exhale carbon dioxide. The economy is a living creature and it has to consume energy. In the 1930s there was a motto that read "Coal is the bread of industry." So, we can say that oil is the blood of industry and so on. But there is logic to this because this is something that gives us energy that powers our industrial and economic development. ***Since there is such a strong connection between carbon dioxide emissions and economic growth, the implementation of the Kyoto Protocol or even preparations for its implementation, which will be more correct to say, will curb economic growth considerably.***

This column here includes all countries listed in Appendix 1, that is the countries that are parties to the Convention on Climate Change and that have ratified the Kyoto Protocol. Some of them

have worked to reduce carbon dioxide emissions with more success, others with less success in order to meet the criteria established for them in 2008-2012. It turned out that the average increase in GDP in 1997-2002 was chosen because the Kyoto Protocol was signed in 1997. These are the years when authorities had to meet the criteria determined by the Kyoto Protocol. And the rate of growth was 2.1 percent a year.

The rest of the world that was not bound by any obligations, irrespective of whether a country has ratified the Kyoto Protocol or not and whether it is a party to the Kyoto Protocol or not, they did not assume any obligations. And they developed almost twice as fast as the countries that had assumed such obligations and fulfilled them. As we can see, some of the countries, especially EU countries and Japan, took their obligations very seriously and have reduced emissions. For these countries and regions of the world that have undertaken to reduce emissions, the rate of growth was negative in the last 1990s. Other countries did not reduce emissions and actually increased them. How did this affect economic growth in these countries? While the European Union still had economic growth, although quite modest in the last few years, Japan was basically stagnating, but the countries that did not reduce emissions showed very impressive economic growth rates. This allowed them to obtain additional financial resources to improve the life of their citizens, including the poor part of the population, particularly in such a country as India where more than one billion people live, as well as Iran and Mexico.

If we further narrow down the topic, we will approach the relationship between Russia and the Kyoto Protocol and we will see a rather noticeable phenomenon which can hardly be described in any other way but discrimination against Russia. In fact, if we take the absolute volumes of carbon dioxide emissions, these are the latest data that have been available for a whole number of countries, Russia has produced 1.7 billion tons of carbon dioxide. But there are countries that produce more carbon dioxide than Russia. The biggest of them are the US and China.

However, these countries have not imposed any restrictions on emissions and they have no plans to assume any obligations. If we taka a look at the per capita figure of carbon dioxide emission in Russia, it is quite a big indicator -- about 10 tons per one person. But it turns out that there are tens of countries in the world where the emission is higher than in Russia. And in some countries the emission is tens of times higher than it is in Russia and those countries do not commit themselves to any restrictions. If we take a look at the specific GDP "load" in regard to carbon dioxide emission, it is quite big -- 1.6 kilograms per one dollar of the GDP produced in accordance with purchasing power parity in prices of 1999. However, it turns out that tens of countries in the world where carbon dioxide emission per one Dollar of GDP produced is higher than in Russia but they are not restricted in any way. Our country possesses a certain amount of financial resources, conditioned by the size of the GDP but nevertheless, we are not the largest economy in the world. There are economies that have not smaller but much bigger financial resources, including for the pursuit of different activities in order to meet the requirements of the Kyoto Protocol but emission is not limited in those countries. Finally, per capita GDP in this country is about 7.5 thousand dollars per capita -- it is a country with an average development but we can see that there is quite a number of countries which have much higher indicators of per capita GDP incomes and they undertake no restrictions on carbon dioxide emission.

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[Sale of Russian "Hot Air"]

Finally, one of the most hotly debated questions is the following: given all the deficiencies and unclear points of the Kyoto Protocol, it has one substantial advantage -- the Kyoto Protocol enables Russia to trade in its quotas per superfluous ones, say pure air. Russia can sell the air to countries that need it. It is because those other countries will exceed the limits of hothouse gas emission.

Alas, regrettably, this statement does not square with reality, it is illusory. It has its roots in the reflections of those who established the Kyoto Protocol in 1990s. Then indeed there were three major potential buyers of free quotas in the world -- the United States of America, the European Union and Japan. Based on the projections of economic growth in those countries it was expected that they will be net buyers of available quotas. However, quite a lot of interesting things happened over the period. The United States left the Kyoto Protocol and is not going to ratify it while the European Union and Japan, on the one hand, carry out large programs to introduce technologies reducing the discharges of hothouse gases; and on the other they have lower rates of economic growth, actually being in a stage of stagnation.

As a result of this, one can say with a high degree of probability that the European Union and Japan will on the whole reach the required levels of hothouse gas emission in 2008-2012. And that is why no demand will appear on their side for free and clear air. Essentially, there is no buyer for European quotas. At least there is no high degree of probability.

But let us also say that the European Union will most likely meet those criteria. But different countries meet the criteria in different ways and it is likely that some countries may not be able to reach that level -- that is true. But then these countries will not be able to buy free quotas from other EU countries -- which is attested to by the appropriate EU directive approved two months ago.

Finally, if the number of such countries turns out to be slightly bigger and it will not be possible to reduce the carbon dioxide emission to the degree one would like to over the period, ***then there are 10 countries of Eastern Europe which in the spring of 2004 will become EU members and thus they will be the first natural participants in that line. They will become the sellers of the quotas that they have. Russia will in any case be the last in that list.***

Finally, even if you imagine a hypothetical situation that buyers will still be found for some Russian quotas, that situation will exist for a very brief period. Between the year 2008 when the appropriate market mechanism may begin to operate, and up to 2012, 2014, 2016 the dependence on the rates of growth of the Russian economy ***when we will reach those restrictions on discharges that are established either under the first stage of the Kyoto Protocol or under the next one which is now beginning to be discussed.***

And then after crossing that point Russia finds itself not as a seller but a buyer of pure air quotas. And if we are not going to restrict ourselves in economic growth, in economic development in 2012, 2014 or 2016, that in principle they are not of great importance, we will

then be forced to buy additional technologies and equipment in order to better meet the stringent standards and on the other hand, to buy additional quotas in order to be able to improve our production.

One can imagine this tradeoff -- this matching of pluses and minuses of the solution. In principle, the situation in regard to the Kyoto Protocol may be illustrated with us a slightly simplified picture compared with man. Considering that human organism in this sense differs little from the economy. Let us say we can imagine the US economy as a grown up person, with 180 centimeters in stature, weighing 80 kilograms, aged 20 and such a man exhales bout 249 kilograms of carbon dioxide a year. We take the average parameters of man, not an athlete, not big, not small, about an average man.

Compared with such a man, we Russia, as an economy would look like a child aged five and a half years, weighing 20 kilograms, being 110 centimeters in stature and the results of our life and work would be exhaled as roughly 88 kilograms of carbon dioxide a year. If we ratify the Kyoto Protocol, then we will at most reach the level that corresponds to what we had in 1990 -- it is about 159 kilograms of carbon dioxide. Such volume, a mass of carbon dioxide corresponds to a teenager aged 12 and weighing 40 kilograms. We simply cannot develop any further. Of course we would like to grow and inhale more oxygen and eat more of something, but we have that boundary in the form of a red plank, beyond which we cannot grow.

Moreover, there enters into force the second phase of the Kyoto Protocol under which the emission permitted to us must not exceed 48 percent from the 1998 level when, in terms of emission per man per year will reach 30 kilograms which roughly corresponds to an infant aged two and a half months and weighing about 6 kilograms.

Of course, this is clearly a simplification. Nevertheless, this simplification gives one an idea of the challenges and problems we may face if we decide to go down that road. At least if we take that road we have to clearly see what tasks we will have to resolve in addition to other problems we are also grappling with.

And finally, naturally, one more argument arises which can repeatedly be heard and you surely heard it -- the argument to the effect that with such an economy, with such an energy effective economy, with an economy that consumes so much carbon dioxide, such goals cannot be accomplished. It is necessary to switch to new technologies. We need to move on to a higher level of development. And we can only agree with this. There is no doubt that this must be done. But the big question is when and how we can move on to these new technologies.

In order to get some idea about other technologies, let's take a look at this picture. Global power generation looks as follows: 6.8 percent of energy, and not only energy, is generated by nuclear power plants, 2.3 percent by hydropower plants, 0.5 percent by geothermal power plants, and 90.4 percent by hydrocarbons that are burnt to heat our houses, to cook food, to power our cars, planes and ships.

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This is why when some say that it is necessary to move on to another stage of technological development, there are no objections to that. But the question is what exactly is meant. If you stop using hydrocarbons, what stage are you going to move on to? Geothermal? And then the question is where are the sources and when can you do this? Or, are you going to move on to the stage of hydropower generation. But most of the world's hydropower resources have already been used and what is left is located in a few localities in different parts of the world, and this will not solve global problems. And this leaves the last option -- nuclear power engineering. Therefore, we must understand that those who say that –- after all, we are people and we are not fantasizing here. And this means that if we give up fossil fuel as the main source of energy and the main element of our civilization and modern economy, we will have to move on to nuclear power engineering and to replace fossil fuel with nuclear power generation.

The supporters, those who call themselves environmentalists, the supporters of the Green movement who support the Kyoto protocol and who object to the development of nuclear power engineering, they may find it interesting to know that there is a discovery many of them are not even aware of when they call for the ratification of the Kyoto Protocol. It is quite possible that nuclear power engineering is the safest way to generate energy, as those who work in this field say. I may not know this.

But even if there is a certain period of time during which humankind may change one energy generation technology for another, the ratio would be 4.9 to 6.8. It's not hard to figure out how much time and investment we will need, what structural changes will have to occur in our life and society and safety in order to do this. And whether this can be done by 2008, 2012, 2014 or 2016.

So, from this point of view, it is very interesting how justified is a seemingly illusory belief in such technological operations. Basically, this allows us to formulate 10 conclusions. Sometimes they may be formulated in a somewhat harsh or categorical way.

[Conclusions]

Nevertheless, we don't have answers to the questions that were formulated and to the many other questions that were not expressed today but which are constantly heard over the past 20 years. They may be formulated as follows. So far the Kyoto Protocol does not have a scientific substantiation. That model of climate which is proposed, has many deficiencies and fails to accommodate many factors, and what has been presented so far lacks conviction. The Kyoto Protocol has significantly exaggerated the speed of the real increase in carbon dioxide emission especially in recent years. The Kyoto Protocol is not universal. It does not include all the countries of the world and it does not impose limitations on all countries of the world.

By its mechanism, the Kyoto Protocol is not effective, it cannot attain even the goals that it proclaims. The Kyoto Protocol is unacceptably expensive. The costs given in the calculations in this book are of course beyond the boundary of the reality.

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The Kyoto Protocol or rather compliance with the Kyoto Protocol conditions is obviously holding up economic growth and today this was again admitted at the world conference on climate change, in the statement by IPCC co-chairman Professor Bolin who clearly said in his statement that yes, indeed, meeting the Kyoto Protocol provisions reduces the pace of economic growth by one percent a year according to his estimate.

One can argue whether it's one or two percent, this is immaterial. The important thing is that nobody, including the supporters of Kyoto Protocol ratification, takes issue with the fact that the pursuit of the Kyoto Protocol requirements and the economic growth are opposed directions. They are incompatible.

[Kyoto Protocol would cripple Russian Economy]

The concrete text of the Kyoto Protocol and the requirements that Russia is expected to meet, are discriminatory. The Kyoto Protocol is dooming Russia not to the role of the seller, but to the role of a buyer of quotas for hothouse gas emission. Considering that the Kyoto Protocol is restricting economic growth, we must say it straight that it means dooming the country to poverty, backwardness and weakness.

And finally and lastly, this concerns not only Russia but also the entire world and in this case we can speak about the interests of not only and not solely of Russia but rather of the interests of the world. The Kyoto Protocol relies of course on technological illusions. Replacing the technological base of hydrocarbon energy sector, which took 1,000 years to establish and which is now in a state of development in which it has been during several years, is a great illusion.

That would be it. Now I am prepared to answer your questions.

(Further Mr. Illarionov answered journalists' questions.)