

# **KYOTO PROTOCOL- THE SOLUTION TO THE CLIMATE CHANGE PROBLEM**

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**Abstract:** The United Nations Framework Convention on Climate Change is the subject to a particularly important Protocol: Kyoto Protocol from 1997 entered into force on 15 February 2005. It aims to limit emissions of six greenhouse gases.

In short, the Kyoto Protocol *commits* industrialized countries to stabilize greenhouse gas emissions based on the principles of the Convention. The Convention itself only *encourages* countries to do so. Under the Protocol, the European Community has committed to reduce by 8% in greenhouse gas emissions in the period 2008-2012, compared to 1990 levels.

Protocol contains two annexes grouping developed countries in Annex I and those with economies in transition in Annex nr.II.

In december 2012, the Doha Amendment to the Kyoto Protocol was adopted. This launched a second commitment period, starting on 1 January 2013 until 2020. Russia, Japan and New Zealand are the only countries that will not take binding commitments to reduce emissions. On the other hand, Canada has withdrawn from the Protocol in 2011.

**JEL classification: Q01, Q54, Q58**

**Key words: greenhouse gases, climate change, protocol, joint implementation mechanism, emissions trading**

## **1. INTRODUCTION**

The international scientific community believes that humans are responsible for global warming (according to the Intergovernmental Forum Panel on Climate Change ) which is due to the elimination of greenhouse gases. Numerous studies have shown that the temperature is increasing, on average by 0,6°C per hundred years.

Current concentration of greenhouse gases appears to be highest in the last 160,000 years. Based on the chosen simulation model were provided particularly increases of temperatures between 1.4°C- 5.8°C until year 2100. The large margin of variation between the two figures is due to lack of information about physical phenomena and environmental policies that could be adopted. The heating process will not be uniform, being more intense in the case of polar and tropical latitudes and more pronounced on the continents than the oceans. This phenomenon will increase melting the glaciers and drought in areas that already have a high degree of aridity.

## **2. THE NEAR FUTURE**

By 2030 global emissions of carbon dioxide will increase by over 39 % , unless they will be established new rules and will not be signed other protocols to stop the global warming. Without a new agreement the worldwide emissions could reach 40.4 billion metric tons in 2030, compared to 29 billion metric tons in 2006.

Most researchers believe that emissions should be reduced by 80% by 2050 to avoid dangerous heat waves and droughts. It is expected that the largest amount of emissions of greenhouse gases come from developing countries such as China and India, where large amounts of coal are burnt. By 2030, the carbon dioxide emissions from developing countries will reach 25.8 billion metric tons, while the pollution from rich countries will reach 14.6 billion metric tons.

In December 2008, EU member states have adopted a series of ambitious targets as part of a package of concrete measures to fight climate change. These include a commitment to reduce, by 2020, global emissions of greenhouse gas emissions in the EU by 20% compared to 1990 levels and increase the share of renewable energy in energy consumption by 20% in the EU. Each member state has an individual target which reflects the potential or produce renewable energy. EU objective of reducing emissions will increase by 30% if other developed countries agree to do the same through a global agreement .

A common goal of all member states was that by 2010 the EU to achieve 10% use of biofuels in transport, with a clear set of rules that ensure that this is done in a sustainable manner. There are also individual targets for each member by 2020 to reduce emissions from buildings, transport, agriculture and waste by an average of 10% below 2005 levels.

To avoid an environmental catastrophe is required the cooperation of all countries in the world, but especially those that pollute the most ( the U.S. is the largest producer of greenhouse gas per capita and, China surpasses U.S. in the total emissions of greenhouse gas, although not in chapter quantity of greenhouse gas per capita).

## **3. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE AND THE KYOTO PROTOCOL**

International Treaty provides basic commitment aimed at halting emissions to a level that does not adversely affect global climate is the United Nations Convention on Climate Change (signed at the 1992 UN Summit in Rio de Janeiro). The Convention adopted the principle that all countries have a "common but differentiated responsibility" to stop global warming. The parties agreed that:

I. Developed countries have historically had and now have the largest emissions of greenhouse gases ( GHG );

II. Quantities of GHG emissions per capita in developing countries are still small;

III. Amount of GHG emissions will increase in developing countries to meet the social needs of these countries.

China (currently the largest producer of GHG), India and other developing countries were not included on the list of numerical limitations regarding GHG because

it had a major contribution to global warming in the period preceding their Kyoto Treaty. However, even if the treaty does not require to the signatory states measures to take, this document requires further guidelines protocols for reducing GHG emissions, most notably the Kyoto Protocol in 1997.

One of the main features of the Convention is to make an inventory for each country GHG emissions and CO<sub>2</sub> removal from the atmosphere. This is essential as it provides the necessary data to world nations negotiating agreements on CO<sub>2</sub> reduction. It also has the task of drawing a grid of equivalence of greenhouse gases other than CO<sub>2</sub> values . This can form a single market for the output common unit is CO<sub>2</sub>) . Signatories are divided into three groups:

I. Annex I countries (industrialized countries): Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, United States of America. (40 countries and separately the European Union) .

II. Annex II countries (Annex I countries minus developing countries in 1992, developed countries which pay for costs of developing countries): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States. (23 countries and separately the European Union, Turkey has been removed from this list because he asked to be recognized as a transition).

III. Developing countries. Convention requires that Annex I countries to assign to operators from their borders (companies, organizations etc.) permission of greenhouse gases for certain quantities. Exceeding the allowed amount may be done only through a mechanism that is acceptable to all parties to the Convention. Developing countries are not participating in the effort to reduce GHG emissions than if developed countries help them with financing and technology. Over time, these countries may choose to join Annex I countries.

The Kyoto Protocol is an international agreement on the environment, whose purpose is to reduce the greenhouse effect. Protocol was negotiated in December 1997 by 160 countries. One of the goals of the protocol is that the signatory states to get together to 2014, at a level of 5.2% GHG emissions lower than 1990. Discounts negotiated for each state varies from 8 % for the EU, 7% for the U.S., 6% for Japan and 0 % for Russia. The treaty allows an increase of 8% for Australia and emissions by 10% for Iceland. To enter into force, the Protocol had to be ratified by at least 55 nations (condition already met) and to produce 55 % of global emissions of carbon dioxide .

In October 2004, Russia, responsible for 17.4% of greenhouse gas emissions, ratified the agreement, which led to meeting the quorum required for the entry into force of the Protocol. In November 2004 the participating countries were in number 127 including Canada, China, India, Japan, New Zealand, Russia the 25 members of the EU together with Romania and Bulgaria and Moldova.

Among the countries that have not ratified the protocol is the United States, responsible for more than 40 % of total greenhouse gas emissions. The Protocol was signed by 183 countries in 2009.

The Protocol provides for the creation of "flexible mechanisms" to lower emissions, such as emissions trading, clean development mechanism and joint implementation. The purpose of these arrangements is to ensure that parties to the treaty that reduction can be achieved in a manner that is economically efficient. The main problem that occurs in the absence of these mechanisms is that emission reductions have different costs in different regions. In some regions are more cheap because fossil fuels as oil or coal resources are easily accessible. Also, in these regions the alternative energy may not be an efficient economic option. As such, there is strong reason to accept emission reductions. But yet flexible mechanisms allow achieving an indirect emissions by funding to increase the capacity to absorb carbon dioxide. To use the flexible mechanisms, participating countries must ratify the Protocol they should calculate the maximum amount of emissions (CO<sub>2</sub> or CO<sub>2</sub> equivalent) that can eliminate the need to have a national system for estimating emissions and removals CO<sub>2</sub>.

*The emissions trading* involves the buying and selling large quantities of CO<sub>2</sub> emissions attributed to anyone but unused. As such, CO<sub>2</sub> becomes a natural resource like other resources (oil, gold, coal etc.) and it creates a carbon market where you can buy and sell the right to emit ( tons ) carbon into the atmosphere.

*Joint Implementation Mechanism (JI)* any Annex I country can invest in emission reduction projects taking place in any other country in Annex I. For example, in Russia and Ukraine there are implementing projects that provide the replacement of coal power plants (in the heat used for electricity production is eliminated then directly into the environment ) with electric and thermal coal plants ( in which heat is used to heat water for residential installations). As such, the countries that finance such projects receive from countries in which the draft is held the project of Emission Reduction Units (1ERUs = reduce emissions by 1 ton of carbon dioxide). These units are part of a fund of CO<sub>2</sub> emissions permits allocated to each country, fund which is calculated based on emissions from 1990. If the units would not be distributed from this fund of emissions, then there might not achieve emission reductions established in the Protocol.

Romania signed (until 2007) 10 such memorandums with the governments of Switzerland, the Netherlands, Austria, Denmark, Norway, Sweden, France, Italy and Finland as well as the Prototype Carbon Fund set up by the World Bank .

So far 21 JI projects are in various stages of implementation. The vast majority of projects approved are within the local: heating systems (using renewables - sawdust, geothermal), closure of landfills. Projects undertaken under this mechanism favors revamping the areas that carry

Regarding the JI projects it can be distinguished two modes: Mode II and I. So far all JI projects approved in Romania were developed as draft mode II.

*Clean Development Mechanism* provides the possibility to purchase cardboard credits through the development of projects in developing countries leading to a reduction in CO<sub>2</sub> emissions. Loans are granted not by the country where the project is but a special organization ( operational organization design) approving the project. For the project to be approved it must demonstrate that it has an "additional" character, it

would not be conducted in the absence of country initiative that seeks to acquire loans. You also need to estimate the emissions that would be achieved in the absence of the project and an estimate of the reductions that will result from the project.

Each country listed in Annex I agreed to limit emissions to the values specified in the protocol. There are countries that currently do not reach those values . The difference can be sold to other countries that exceed quota. For example, on April 18, 2001, the Netherlands has bought four megatonnes of carbon dioxide emissions in Poland, Romania and the Czech Republic.

#### **4. ROMANIA AND KYOTO PROTOCOL**

Romania is the first country from the Annex I which ratified the treaty in March 2001 by the Law no. 3/2001. Our country has pledged to reduce by 8 % reduction in greenhouse gas emissions compared to year 1989.

The purpose of the EU trading scheme emissions of greenhouse gases (EU ETS) is to promote a mechanism for reducing emissions of greenhouse gases by economic agents such emissions -generating activities, so that the fulfillment of EU commitments under the Kyoto Protocol to be less expensive.

Operation of the scheme is based on emission allowances trading greenhouse gas emissions. A certificate of emissions of greenhouse gases is the title that confers an installation right to emit one tonne of carbon dioxide equivalent in a defined period . Eight sectors have been defined ( allocation of) ETS: energy sector, refinery sector , the production and processing of ferrous metals, cement industry, lime industry, glass industry, ceramic industry, pulp and paper sector. Once the number of allowances to each of its eight sectors, they are allocated to installations within the sector.

According to the law 780/2006, Romania allocates emission allowances for greenhouse gas free. The reserve for new entries unused at the end of 2008 - 2012 was valued by auction. The number of allowances were allocated in 2007 was 74,836,235. The number of allowances to be allocated in the second period (2008-2012) was 379 721 760 (the whole period) , with a mean value of 75,944,352 annually.

In the South West Region of the pollutants covered by the Kyoto Protocol, the emissions inventories following: carbon dioxide , methane and nitrous oxide.

In Mehedinti county has been implemented the JI project "Improvement of efficiency Heating System in Drobeta Turnu Severin . "

JI project "Improving the efficiency of district heating systems in Drobeta Turnu Severin" is mainly heat exchangers heating points and secondary network distribution of heat and hot water. Thus it is considered secondary distribution network redesign and replacement of approx. 190 km of pipelines for the distribution of heat and hot water with new pipes pre-insulated. In addition the project includes the replacement of approx. 114 heat exchangers 38 substations. Meters will be installed for heat and hot water out of points both thermal and final consumers.

The project will reduce heat loss both in the secondary distribution network and the substations . This will reduce fuel consumption and thus emissions of greenhouse gases in the CET - ROMAG THERMO. During the project (2006 - 2012) was estimated 371 667 tonnes of CO2 reduction.

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