



THE 9TH EDITION OF THE INTERNATIONAL CONFERENCE
**EUROPEAN INTEGRATION
REALITIES AND PERSPECTIVES**

**Progress of Fulfillment of the Kyoto
Objectives by the European Union**

Paul Calanter¹

Abstract: Climate change is one of the most important challenges that humanity faces in the 21st century, which is seriously considered by the European Union. In this context, the objective of this paper is to analyze the extent to which the EU has fulfilled its obligations in the first commitment period of the Kyoto Protocol, and also to expose the obligations stipulated for the second period (2013-2020). The approach is to display in the first part of the work the fulfillment by the European Union of the Kyoto objectives, and in the second part, to analyze the successful implementation in the EU of the flexible mechanisms provided through the Protocol.

Key words: emissions; flexible mechanisms; policies; greenhouse gases (GHG)

1. Introduction

For the European Union, combating the phenomenon of climate change is an essential element for the economic and social development. This fact is reflected both in the actions carried out by the EU in recent years, domestically and internationally, as well as in its policy on climate change. The EU adopted regulatory acts that demonstrate the importance they attach for limiting climate change, as well as for the compliance with the Kyoto objective.

2. Kyoto Protocol

The third annual Conference of Parties to the United Nations Framework Convention on Climate Change has adopted the Kyoto Protocol (KP), which sets the target for reducing GHG emissions for each Party to this Convention. The Protocol has provided a process of implementation, in the form of a comprehensive strategy for limiting and reducing GHG emissions, by establishing specific targets and flexible mechanisms.

The Kyoto Protocol provides the following flexible mechanisms that were created to help the Parties to fulfill their commitments to reduce GHG emissions:

- International Emission Trading (IET);
- Clean Development Mechanism (CDM);
- Joint Implementation (JI).

The flexible mechanisms that were agreed under the Kyoto Protocol, offered to the industrialized countries the opportunity to fund projects through the sale of emission reduction units (ERU).

¹ PhD., Romanian Academy-Institute for World Economy, Romania, Address: 13 Calea 13 Septembrie, Sector 5, Bucharest 050711, Romania, Tel.: 40-21-318.24.55; 318.24.60, Fax: 40-21-318.24.54, Corresponding author: paul.calanter@yahoo.com.

The mechanisms were “voluntary”, which means that countries had to formulate and enforce their own policy regarding the use or non-use of these mechanisms.

International emissions trading (IET) allowed that industrialized countries (Annex I), which managed to reduce their emissions below the level which they have assumed by obligation, to sell this surplus to another country listed in Annex I which is not able to abide by the commitments, by their own efforts.

Emissions trading were probably the most effective tool of all the flexible mechanisms under the Kyoto Protocol.

Clean development mechanism (CDM) allowed companies or governments from industrialized countries the introduction of emissions reduction projects in developing countries, in order to fulfill their own GHG emissions objectives. The mechanism has provided the rewarding of industrialized countries for the participation in these projects in the form of “certified emission reductions” (CER).

Joint implementation (JI) has allowed governments and companies to buy emissions reduction units (ERU), resulted from projects that reduce or avoid GHG emissions, implemented in other developed countries. ERU could be used to fulfill the obligations as regards to the commitments relating to emission reductions through the Kyoto Protocol. This mechanism could be a source of capital for environmental protection projects.

In December 2012, the countries meeting at Doha, at the 18th Conference of the Parties (COP18), agreed to extend the Kyoto Protocol until 2020.

Therefore, for the period 2013-2020, the Parties have agreed to reduce GHG emissions by at least 18% below the level recorded in 1990, given that the Convention was ratified by new Parties, but at the same time, there were Parties that withdrew from the Convention.

3. EU targets for GHG Emissions under the Kyoto Protocol

Approximately 11% of the GHG emissions generated annually worldwide come from the European Union. The share of the EU emissions drops, as Europe reduces its emissions, while emissions from other parts of the world, particularly from the emerging countries are growing steadily, while in East Asia air pollution exceeds any rational limit. Thanks to the measures taken at European level, and those adopted by the Member States at national level, the EU is able to meet the targets on reducing GHG emissions, under the Kyoto Protocol. By significantly reducing emissions over the past two decades in comparison to 1990 levels while continuing economic development, the EU has succeeded to show that emissions reductions and economic growth are not in a flagrant contradiction.

The 15 countries, Member States at the time the Kyoto Protocol was signed (1997), have undertaken a reduction by 8% compared to the reference year (1990 in most cases), during the first commitment period of the Protocol (2008-2012). In 2011, the last year for which data are available, the EU-15 emissions were 14.9% lower compared to the reference year. According to the European Environmental Agency (EEA) estimates for 2012, EU-15 emissions were on average with 12.2% below the base year levels, during the 2008-2012 period.

The 13 countries that have acceded to the EU after the entrance into force of the Kyoto Protocol, with the exception of Cyprus and Malta, had set a clear objective regarding the limitation of GHG emissions in the first commitment period of the Protocol. Hungary and Poland have set as objective the reduction by 6% of GHG emissions in the period 2008-2012, and Croatia aims at a reduction of

5% compared to 1990. The other eight Member States objectives are to reduce emissions by 8% compared to the reference year. Based on the current estimates (before the completion in April 2014 of the national GHG emissions inventories for 2012), all of the 11 Member States which have set targets under the Kyoto Protocol, have fulfilled, or have exceeded, their commitments.

Table 1. Total GHG emissions (Mt CO₂-eq.)

Country	Total GHG emissions (Mt CO ₂ -eq.)					The overall objective of the 2008-2012 period under the Kyoto Protocol (Mt CO ₂ -eq.)
	1990	2008	2009	2010	2011	
Austria	78.2	87.0	79.7	84.6	81.9	68.8
Belgium	143.3	136.7	125.2	132.5	121.3	134.8
Bulgaria	114.3	68.6	58.9	61.4	67.9	122.0
Croatia	31.5	31.0	29.1	28.6	-	29.8
Cyprus	6.5	11.4	11.1	10.8	9.4	-
Czech Rep.	195.8	143.7	134.7	139.2	141.1	178.7
Denmark	68.6	63.6	60.7	61.1	56.1	55.8
Estonia	40.9	19.7	16.4	20.5	20.9	39.2
Finland	70.4	70.2	66.1	74.6	67.3	71.1
France	559	537.3	514.6	522.4	497.5	563.9
Germany	1 246.1	976.0	911.8	936.5	917.0	973.6
Greece	105.0	131.3	124.7	118.3	118.5	133.7
Hungary	97.3	73.3	66.9	67.7	65.6	108.5
Ireland	55.2	67.6	61.7	61.3	57.3	62.8
Italy	519.2	541.6	491.5	501.3	493.7	483.3
Latvia	26.6	11.7	11.0	12.1	12.1	23.8
Lithuania	49.4	24.3	20.0	20.8	21.4	45.5
Luxembourg	12.8	12	11.5	12.1	12.3	9.5
Malta	2.0	3.1	3.0	3.0	2.9	-
Netherlands	212.0	204.6	198.9	210.1	195.8	200.3
Poland	457.4	401.3	381.8	400.9	409.3	529.6
Portugal	60.1	77.8	74.4	70.6	70	76.4
Romania	253.3	146.7	123.4	121.4	123.7	256.0
Slovakia	71.8	50.1	44.2	46.0	45.9	66.3
Slovenia	18.5	21.4	19.5	19.5	19.5	18.7
Spain	282.8	403.8	366.3	355.9	356.1	333.2
Sweden	72.8	63.6	59.7	66.2	62.8	75.0
United Kingdom	763.9	626.1	572.3	590.2	549.3	679.3

Source: European Environmental Agency

For the year 2020, the European Union has set as unilateral objective a 20% reduction of the GHG emissions of the 28 Member States, compared to 1990 levels. The EU has offered to raise the threshold for this goal to 30%, if other major economies of the world would agree to contribute with a fair share to the effort of reducing the global emissions. The European Commission has published a communication in which is considering this possibility. At the same time, the reduction commitment of 20% is provided within the “energy-climate change” package and represents an objective of the EU 2020 strategy.

The EU also pledged to reduce their emissions by 20% in the second Kyoto commitment period (2013-2020). This commitment differs in some respects, in comparison to the unilateral 2020 commitment of the European Union:

- the Kyoto objective is measured in comparison with the reference years, not with 1990;
- the EU must maintain its emissions in average by 20% below the level of the reference year over the entire period, not only as a global target for 2020;
- as field of application (for example, does not cover international aviation emissions, because they are outside the scope of application of the Protocol, but it covers emissions from land use, which the unilateral commitment does not cover).

4. Implementation of the Flexible Mechanisms under the Kyoto Protocol in the European Union

4.1. International Emissions Trading - EU Emission Trading scheme (EU ETS)

The Emission Trading Scheme (EU ETS) is an important part of EU policy for combating climate change, and is a key element for an effective reduction, in terms of cost, of the greenhouse gases emissions generated by the industry sector. EU-ETS, the first and most important GHG emissions trading system, is covering more than 11,000 industrial centers in 31 countries.

The key elements of the scheme are the following:

- the companies receive or purchase emission allowances they can sell. The limitation of the total number of certificates shall maintain their value over time;
- after every year, companies must hold sufficient allowances to cover all emissions, otherwise risking severe fines. If a company reduces its emissions, it can keep the certificates to cover future needs or it can sell them to another company;
- by putting a price on carbon and by granting a financial value to each tonne of emissions “saved”, EU-ETS scheme has put climate change on the agenda of every major European company. At the same time, a carbon sufficiently high price promotes investments in clean technologies.

Launched in 2005, the EU-ETS is now in the third phase (2013-2020). A major revision in 2009 for strengthening the scheme refers to the fact that the third phase differs significantly from previous phases, which are based on harmonized rules much more than before. The major changes are as follows:

- auctioning, and not free allocation, is now the main method for the allocation of certificates;
- for the certificates granted for free, there are applied harmonised rules on the allocation which are based on the reference values of the EU's performance in terms of emissions.
- EU-ETS covers approximately 45% of the total greenhouse gases emissions from the 28 Member States. The greenhouse gases and sectors included in the EU-ETS scheme are the following:
 - carbon dioxide (CO₂) from:
 - the electricity and heat generation;
 - industries that are energy-intensive, such as refineries, metal production (iron, aluminum etc.), cement, lime, glass, pulp, paper, paperboard;

- commercial aviation;
- nitrous oxide (N₂O) from the production of nitric or adipic acid, glyoxal;
- perfluorocarbons (PFCs) from aluminium production.

The success of the EU-ETS scheme has inspired other countries and regions to launch such projects. The European Union aims to join this scheme with other systems in the world to form the cornerstone of an international carbon market. The Commission has agreed to unite the EU-ETS scheme with the Australian system starting in mid-2015.

EU-ETS faces the challenge related to the surplus of certificates, caused by the economic crisis that has resulted in the depreciation of their value, more than anticipated. On short term, this surplus is likely to undermine the proper functioning of the carbon market, and over long term it can affect the ability of EU-ETS to effectively meet the objectives of reducing emissions from the standpoint of costs. As a first step, the Commission has taken the initiative to postpone the auctioning of a quantity of certificates. In addition, the Commission submitted a legislative proposal establishing a reserve for market stability, at the beginning of the next trading period, in 2021.

The EU-ETS scheme will help to achieve the objective of reducing GHG emissions in the EU by 40% below the 1990 level, by 2030. This goal was set by the EU 2030 framework policies for climate and energy, published in January 2014.

The European Parliament adopted Directive 2004/101/EC, known as the “Linking directive”, which revises the Directive 2003/87/EC for establishing a system for trading greenhouse gas emissions in the community, in accordance with the flexible mechanisms of the Kyoto Protocol. Directive 2003/87/EC establishes that the recognition of credits from the flexible mechanisms in order to ensure compliance with 2005 obligations will increase the cost-effectiveness of emission reductions of GHG worldwide, and that, to this end, the provisions should bind the mechanisms based on the Kyoto project, including Joint Implementation (JI) and Clean development mechanism (CDM), with the Community scheme.

Establishing a link between the Kyoto mechanisms and the Community system allows the use of emission credits generated by project-based activities eligible under articles 6 and 12 of the Kyoto Protocol to comply with the obligations of the Member States in accordance with article 12 (3) of Directive 2003/87/EC. As a result, this will increase the diversity of inexpensive options for harmonization within the Community system, and will lead to a reduction in the overall cost of harmonization with the Kyoto Protocol, at the same time enhancing the liquidity of European quotas of greenhouse gases emissions. By stimulating the demand for JI credits, the Community companies will invest in the development and transfer of cutting-edge technologies and know-how for environmental protection. The demand for CDM credits will also be stimulated, and the developing countries in which CDM projects are implemented will be assisted, in order to achieve their objectives of sustainable development.

4.2. Clean Development Mechanism (CDM)

Clean development mechanism contributes to the compliance with the commitments made by the European Union Member States through the Kyoto Protocol, allowing EU companies or Governments to introduce emissions reduction projects in developing countries, in order to fulfill their own objectives with respect to GHG emissions.

The merits of the CDM as a transferring method of the technologies with low carbon levels are mentioned in the literature as follows:

- CDM is the most important market mechanism that stimulates financing of the technology transfer to developing countries, by the private sector (Schneider and Associates, 2008).
- CDM has contributed not only to the transfer of equipment, but also to the transfer of knowledge.
- CDM has contributed indirectly to the development of local technologies, in developing countries.
- CDM has contributed to the technology diffusion, reducing the period of investment recovery and improving internal recovery rate (IRR) of the projects that use clean technology.

After an analysis of the existing literature, the following CDM limitations, as a method to encourage the transfer of technologies, have been highlighted:

- transfer of technologies through CDM is particularly prevalent in a few countries and sectors, and circumvents others.
- CDM, while contributing to the individual project level technology transfer, was unable to encourage support for policies related to technology transfer, for example for the energy sector.
- technology transfer through the CDM refers often to import equipment from other countries, a fact that does not improve the technological understanding and the capacity for innovation in developing countries.
- technology transfer in CDM is not monitored consistently due to the fact that there is no common definition of the concept of technology transfer. Data are collected on the basis of the application of the Project Design Document (PDD), and consequently, a comparison between the various projects may not always be made.

At the same time, a study on the integrity of the CDM for the European Commission, prepared by AEA Technology concludes that sectoral crediting and trading systems have advantages compared to CDM from the point of view of technology transfer in developing countries. (Chatterjee, 2011)

4.3. Joint Implementation (JI)

Although some countries and companies in the European Union fully benefited from this mechanism, its interaction with the EU-ETS scheme can create various problems.

Interaction of JI with a domestic cap-and-trade system such as the EU ETS creates the risk of double counting. Two types of double-counting must be distinguished:

- **Direct**, for example the situation in which a project is being implemented in an installation covered by the EU ETS. In this case the emission reductions would free up an equivalent amount of EUA (or would reduce the deficit) in addition to ERU, creating the risk of double counting.
- **Indirect**, in the case of a project which reduces emissions generated by an installation covered indirectly through EU ETS. For example, a project on renewable energy would provide additional electricity to the local network, reducing the demand for another installation covered by the EU ETS.

To address the problem of double counting, the Linking Directive stipulates that in the case of ERU's originated from an installation already covered by the EU ETS, the issue of new carbon credits should be reflected through cancellation of equal amounts of EUA's. In this case, there is virtually no incentive for the installations to implement JI projects within the EU, considering that the ERU's price is lower than the EUA's price. Theoretically, such JI projects would make sense only if the investor is forced to use the credits in a market where the EUA cannot be used, and ERU can be used.

In the case of the indirect double counting, the countries within the EU ETS may choose to create a "JI reserve" – a set aside amount of EUAs, which are cancelled progressively while ERUs are issued. Most countries in Eastern Europe have also created JI reserves in their NAPs, while, for example, Germany has not created such reserves, and excluded completely the double-counting by law. The difference in approach can be explained by the fact that most countries in Western Europe have a system of incentives for renewable energy, by means of other policies, such as feed-in tariffs, while Eastern Europe lacks such a framework, and the JI mechanism has to support renewable energy.

The formation of JI reserves is important for the encouragement of renewable energy projects (Mizerny, 2011). A good example about the support of renewable energy is Estonia, which has established a JI "set aside" of 0.95 million EUAs for the 2008-2012 period, for its wind and biomass energy projects (European Commission, 2011). The reserves have allowed avoiding the situation of double counting, successful registration of projects relating to renewable energy and the issuance of ERUs. It shows how a country can use the carbon credits to support certain types of projects, in the absence of other incentives.

Poland is another example of a country which has created a "set aside" for renewable energy approved JI projects, amounting to 0.75 million EUAs for the 2008-2012 period, of which two-thirds have been already used. An additional "set aside" of 2.67 million certificates per year has been created for new and planned JI projects that can cause double counting, such as projects relating to renewable energy. The changes in the law No. 35 of Poland, which came into force in June 2011 have simplified and clarified the procedures for the approval of this type of projects, offering the projects focused on renewable energy the possibility to be realized as JI.

At the same time, it may be mentioned that "set aside" creates competition for JI projects, because it establishes a limit on the quantity of ERUs that can be granted to projects in a given sector.

Projects relating to energy efficiency can also lead to double-counting, if they refer to electricity. Germany is currently hosting several activities relating to JI Programs of Activities (PoA), which offers incentives for plants and households, in order to improve their energy efficiency. One such example of PoA is the DE1000082 Project: Active Climate Protection – CO₂ Bonus natural gas (EWE, 2009). This project aims at offering financial bonuses to reduce natural gas consumption by implementing a set of measures relating to energy efficiency. The PDD of the revised project indicate explicitly that it refers only to reduce the consumption of gas and electricity; otherwise it would result in double-counting. Conversion of EUAs from a JI reserve would have been an alternative solution which would had stimulated the reduction of the consumption of electricity in accordance with the JI, if Germany would had fixed such a reserve. Other PoAs include energy efficiency measures in combination with changing the fuel used, with natural gas and/or biomass. Poland also hosts PoAs focused on energy efficiency - currently two projects are awaiting the letter of agreement. They are isolated from the EU ETS, which eliminates the risk of double counting.

In phase III of the EU ETS (2013-2020), the problem of double counting has been simplified: the revised 2009 Directive, has requested to stop the JI reserves, on December 31, 2012. After this date,

the German solution was introduced, this referring to the ban on JI projects that have a direct impact on emissions from sectors of the EU ETS. (Shishlov, Bellassen, & Leguet, 2012)

5. Conclusion

Considering the existing data, it can be estimated that the European Union has successfully fulfilled its obligations during the first commitment period of the Kyoto Protocol. The implementation of flexible mechanisms, particularly ET (emissions trading), through the European Union Emission Trading Scheme (EU ETS) has contributed substantially to attaining the Kyoto objective. EU also undertook to reduce its GHG emissions by 20% compared to the reference years in the second Kyoto period (2013-2020).

6. References

Chatterjee, B. (2011). AEA Technology, *Study on the Integrity of the Clean Development Mechanism*.

European Parliament (2003). *Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 for establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC*.

European Parliament (2009). *Decision no. 406/2009/CE on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020*.

Shishlov, I., Bellassen, V. & Leguet, B. (2012). *Climate Report no. 33 – Joint Implementation: a frontier mechanism within the borders of an emissions cap*.

UNFCCC, (1997), *Kyoto Protocol*.

European Environmental Agency, <http://www.eea.europa.eu/>.