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POSSIBLE APPLICATIONS OF MEASURES AGAINST THE NEGATIVE EXTERNALITIES ON A GLOBAL SCALE AND THE KYOTO PROTOCOL

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Abstract. *The incorporation of the option of creating a market for greenhouse gases trading into the Kyoto Protocol is of material significance within the framework of seeking a coordinated international response to the global warming issue. This article considers various tools (taxes, subsidies, technological standards, quantitative limits and trading pollution rights) in order to limit the negative external effect and the possibilities of their application in finding solutions to environmental pollution problems on a global scale. The specific characteristics of 'flexible mechanisms' are discussed as intended under the Kyoto Protocol as well as the advantages for Bulgaria from their potential application as well as the problems which may occur with respect to the functioning of the international emissions market in the future.*

INTRODUCTION

Global warming is one of the most serious issues related to the violation of atmospheric balance and the potential danger from cataclysmic natural phenomena. The uncontrolled growth of the concentration of heat-absorbing gases causes intensification of the natural greenhouse effect, which in principle maintains temperature on Earth within the limits required for the existence of life. Warming[1] in general is hardly only due to the work of human beings although the emissions of CO_2 resulting from the burning of natural oil resources and the destruction of forests are considered the principle reasons underlying this phenomenon. Global climate warming brings along negative external effects that have international dimensions - the measures taken in any individual country, i.e. the imposition of taxes on the use of oil resources are not in a position to ensure a solution to environmental problems whilst industries continue to emit greenhouse gases.

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[1] Brown, J. Beyond Kyoto. Foreign Affairs July/August 2004, Volume 83,4.

Finding a working solution to the global warming problem will depend on the stimuli of individual countries to join in the reduction of emissions of greenhouse gases internally, the costs and benefits entailed and the development of new technologies. Implementing a coordinated policy by all countries worldwide further presupposes a selection of adequate tools allowing the implementation of such joint policy.

One of the key recommendations of the UN Framework Convention on Climate Change (UNFCCC) of 1992 is taking actions towards reduction of the greenhouse gases emissions where such actions may be taken jointly by several countries without formal imposition of quantitative restrictions on emissions. Thus the idea of joint implementation through bilateral and multilateral projects creates prerequisites for the emergence of an informal market for emissions trading but not for the development of a formal one.

In 1997 over 180 countries gathered in Kyoto seeking to formulate an international response to and equally take actions against global warming. The Kyoto Protocol contains seven key clauses providing tools of reduction of greenhouse gases emissions[2]:

(i) reduction of the emissions of greenhouse gases by 5% on average over 2008-2012 against the levels at the beginning of the early 1990 with respect to the countries listed in Annex B[3] of the Protocol (mainly industrial countries, members of the Organization for Economic Cooperation and Development (OECD), plus several countries undergoing transition to a market economy);

(ii) formal system of trading of national emissions rights between the governments of the countries listed in Annex B, the rules for the development and functioning of which have not yet been defined;

(iii) Annex B countries are only entitled to exchange emissions reduction units or receive "credits" through use of Joint Implementation and Clean Development Mechanism ;

(iv) Accumulation of emission credits for subsequent periods with respect to which no quantitative limits have been formulated. Art. 3.9 of the Protocol states that obligations with respect to subsequent periods shall be determined upon initiation of negotiations scheduled to commence no less than seven years before the end of the first quota period, meaning no later than the end of 2005;

(v) Each country guarantees complete sovereignty with respect to the local policy implementation tools in order to effect the individual quantitative restrictions;

(vi) Reduction of the levels of CO_2 in the atmosphere through planting and recovery of woods, use of new renewable energy sources, etc.;

(vii) Coming into force of the agreement under the Kyoto Protocol only in the case it is ratified by a minimum of 55 countries, including Annex B countries, accounting for 55 percent of the emissions of Annex B countries in 1990.

Despite the resolute rejection on part of the USA to join the protocol almost seven years later the Protocol is binding[4] and mandatory as a result of its ratification by Russia in Octo-

[2] Annex A to the Kyoto Protocol lists the principal branch sectors and the processes and sources of greenhouse gases (CO_2, methane, dinitrogen oxide, fluorcarbons, perfluorcarbons and sulfur hexafluoride).

[3] Currently there is no difference between the countries listed under Annex B of the Kyoto Protocol and Annex I of the Framework Convention. The fact is that only Art. 17 of the Protocol substitutes the term Annex I countries with Annex B countries, which potentially means that the developing countries may join the emissions trade if they voluntarily adopt the imposition of quantitative restrictions on their emissions of greenhouse gases.

[4] In order to fulfill the requirements applicable to the Kyoto Protocol coming into effect the latter had to be ratified either by Russia, accounting for 17.4 percent of greenhouse gases emissions, or by the USA accounting for 36.4 percent of the greenhouse gases emissions of the developed countries in 1990.

ber 2004. This article considers various existing tools (national and international) allowing for reduction of the negative external effects of pollution by highlighting the advantages of the trade with emission rights. The flexible mechanisms underlying the Kyoto protocol and the opportunities of Bulgaria to adopt and implement these are further being discussed. The theoretical justification of the need to create an international market for the trading of greenhouse gases emissions is based on the assumption of a reduction of the costs related to the control of greenhouse gas emissions and the encouragement of the implementation of environment-friendly production technologies. The development of such a market is a complex process and the existence of various circumstances may impede both its effective functioning and the achievement of the intended goals of the Kyoto Protocol.

1. National and International Policy Tools for Dealing with Negative External Effects

There are several circumstances, also called market failures, which precipitate the state intervention in the economy in several ways. One such market failure are the negative externalities (external cost), defined[5] as third party costs, which differ with respect to the buyers and sellers who participate in the commodity market exchange. Negative external effects appear when the market participants cause market welfare of third parties to deteriorate by virtue of their actions and using non-market principles, i.e. such parties are not compensated for the damages caused. These are cost related to the resources used, which are not reflected in the price of the ready product and therefore are not covered by the producer or paid by the consumer. Therefore, in a situation where negative external effects exist the market allocation of resources will not be efficient.

One of the most commonly quoted example of negative externalities caused by environmental pollution is the emissions of particular substances as a result of the industrial production processes across companies which pollute the air or cause other environmental problems thus precipitating costs that need to be covered by other people. The problem with the market is not so much that it causes pollution but rather that the companies are not held accountable for the price paid by the public for the resultant external negative effects. Thus we may reach a level of pollution that is too high.

The state is unable to totally[6] eradicate pollution and its main objective is reduced to directing the market towards seeking of a solution for the level of pollution that is effective from a public perspective by application of the respective tools. These approaches may further be applied with relation to the emissions of greenhouse gases. One of the tools applied in order to control negative external effects is the imposition of standards and direct regulation of the operations of companies and individuals (command and control tools). By the application of standards the government reduces or influences the materials or equipment used in order to induce a general reduction of emissions in the atmosphere. Traditionally, the standards can be categorized as those based on technologies used and industrial factors and those based on the quantitative dimensions of pollu-

[5] Joseph E. Stiglitz. Public Sector Economy. University Publishing House Stopanstvo, 1996

[6] This is a radical approach which entails a statutory ban on the functioning of a number of companies operating in areas intrinsically linked to everyday human life.

tion. In the first instance, the requirements are imposed on regulated activities, for example relating to the use of special equipment such as power-saving items of machinery or waste gases collection technologies. In the second instance, the admissible levels of greenhouse gases emissions are specified, for example, upper admissible limits of CO_2 emissions. Inasmuch as standards bearing to the quantitative limitations of emissions present companies with a certain degree of freedom in the selection of the respective tools, they are much more efficient than the standards based on technologies used. In addition, the concerns of companies that the use of higher technology tools would precipitate the heightening of the requirements under the applicable standards bearing to the levels of emissions themselves must not be overlooked.

Each company which by virtue of its operations causes external pollution-related effects will not directly benefit or will benefit to a very small degree from pollution reduction. Therefore, governments sometimes choose the option to subsidize company costs related to the abatement of greenhouse gases emissions since from a public point of view these costs are extremely low. However, subsidies do not lead to a socially effective allocation of resources - a number of other companies that may wish to start up a subsidized production line and level of emissions will again increase. In addition, the funds needed for the subsidies will be largely attracted through taxes imposed in other sectors of the economy. In turn, the taxation will generate economic inefficiency; whether such inefficiency will cost less than the presence of external effects[7] is often hard to tell.

Two other measures against external negative effects exist which are defined as marked-based tools - corrective taxes and emission rights to pollute. The taxes imposed on the production equal to the maximum amount of external costs cause manufacturers to achieve efficiency by decreasing the volume of production and increasing prices. In order to achieve such efficiency accurate information is needed for the sake of determining damage, i.e. external costs and their monetary evaluation[8]. Since this is often impossible and the cost of gathering such information is considerable, in reality, taxes are imposed not on production levels (the larger the volume of production, the higher the greenhouse emissions) but on production factors and technologies underlying emissions. For example, a local (in the sense of a government imposed one within the jurisdiction of any individual state) carbon tax imposed on fossil fuels is hardly a perfect substitute for a tax imposed on the emissions of CO_2 because it stimulates the decrease in the use of such fuels but not the quantity of emissions themselves. However, it is capable of providing a practical taxation basis inasmuch as external effects of CO_2 emissions may not be measured correctly and used as taxation basis.

Emissions rights are transferable permits for emitting a certain quantity of gases into the atmosphere for the duration of one year. Within the framework of such a scheme companies buy permits or rights to emit and thereafter exchange these rights between them. Emission rights trading presupposes that the initial allocation of these rights is immaterial (whether by auction or on the basis of historic emission levels) and that subse-

[7] Rosen, Harvey S. Public Finance. IRWIN, inc. 1992

[8] In principle the value of a commodity such as the atmosphere of maximum admissible concentration of greenhouse gases is determined by the amount people are willing to pay for it. Even if damages caused by emissions are precisely established the problem of their monetary evaluation remains unresolved on account of the lack of such "common resources".

quent allocation will be such as to minimize emission reduction costs. Companies investing in emission reduction technologies may trade the unused portion of their rights to other companies in order to partially fund investment. Companies will want to buy emission rights if their emission reduction costs are higher than the cost of emission rights and sell in the opposite is true. Thus trading will continue for as long as companies become indifferent to buying and selling, i.e. between the maximum reduction of emissions and additional greenhouse gases emissions. In this situation the maximum emission reduction costs of all companies will level out and total costs will be minimized. Total emission reduction will be achieved by allowing companies to sell only the unused portion of their emission rights. The larger the portion of unused rights which may be sold, the more enticing the stimuli to companies to invest in emission reduction. Commonly the state periodically interferes by reducing the available amount of emission rights. Companies with lower investment rate will be buying emission rights but over time the financial incentives available to them will decrease because emissions will grow on account of the fact that the price of emission rights will be increasing as well owing to decreased availability.

Both market-based tools - corrective taxes and emission rights are similar inasmuch as they allow companies to pay for the damages caused through their operations and put them in a situation where they have to control greenhouse gases emissions through cost incentives. One of the advantages of emission rights trading is that it allows a strict control of emissions volume at any given time through the number of permissions issued. Moreover, the imposition of a carbon tax similar to the one described above will cause an increase of the price of a number of products and reduce the volume of a number of industrial products on account of the non-availability of clean alternative energy sources which may be used as substitutes of natural fossil fuels.

The negative externalities of environmental pollution are not limited to the territory of the country on which they are generated. From an analytical perspective environmental problems may be categorized as national and international. National problems are the ones with respect to which negative external effects are contained within the jurisdiction of the country in which they are generated without being directly spread over the territory of other countries. In this case the global dimensions of the problem are not so much related to pollution per se but rather to the need for pollution generating companies to pay for the damage caused by their actions. Unless pollution generating companies pay they will have considerable advantages related to their operations in any given country, which will ultimately result in attracting more investment to such country. Thus, the low or non-existing standards for reduction of pollution in a country may be considered as an advantage and a stimulus to direct investment or "eco dumping". Faced by the possibility of losing capital or human resources on account of the attractions of countries in which standards are low, many countries will be tempted to lower their own standards thus causing considerable damage to the environment on a global scale.

International environmental problems arise when pollution generated in one country has a negative impact on the life of people in other countries and incurs expenses which are not covered by the country which has generated the problem in the first place. An example of a negative external effect on an international scale is global warming; in this case, the issue of where greenhouse gases are emitted is not of the least importance as opposed to the fact that they remain in the Earth's atmosphere for hundreds of years and the damage spreads across all countries and all people. A large part of the national in-

struments are aimed at correction of the behavior of consumers and manufacturers who are not sufficiently motivated to account for the impact of their actions on the environment. With global environmental issues the gist is that national governments are not sufficiently motivated to take consideration of the environmental impact of the actions of consumers and producers. Thus, the international treatment of external effects is largely related to correction of government failures and not so much market ones. National tools for correction of external negative impacts are applied without the prior consent of the emitting companies. The tools for correction of international negative external effects may be used only on the basis of multilateral agreements and contracts with no individual country having obligations to its respective counterparts unless such country voluntarily joins the jointly implemented policy. On the basis of the national policy tools the following international tools for reduction of greenhouse gases emissions may be formulated.

One such possibility is the imposition of a carbon tax by an international agency or the signing of a multilateral interstate agreement on the harmonization of carbon taxation. Both alternatives entail considerable tax collection costs. Within the framework of a harmonized taxation system the issue of subsidies provision by countries with developed economies to poorer countries needs to be settled and with the international tax the issue of how tax revenue will be distributed among countries. The system of sharing of tax revenue may be such that some countries receive a portion of or all revenue generated on its territory whilst others will be receiving transfers. A greater problem is posed by the issue that together with the international tax levied each country will be free to adopt and implement its own measures such as fines or subsidies thus in effect circumventing international legislation and "protecting" itself from countries generating emissions in considerable volumes. As a result, the possibility of imposing taxes to reduce emissions will be very limited.

Yet another approach is the introduction of identical technological standards to fixed national emission levels. As a result of this the maximum admissible pollution reduction costs will vary considerably from country to country and total costs will exceed effective costs. Subsidies may also be used on the international level in order to reduce the level of emissions. The problem in this situation would be that the developed countries will be subsidizing not only their own industries but will also provide budgetary financial aid to the developing countries.

The most appropriate tool[9] of international policy aimed towards finding solutions to the global warming problem is the trading of emission rights. It allows for elimination of the problems related to the application of the other tools described above and a fairer distribution of the pollution reduction related costs among individual countries. The advantages of emission trading in comparison to the other tools are:

- in emission trading individual market participants are free to choose for themselves the manner of reduction of emissions produced. Each company (regardless of the country in which it operates) is free to decide whether to buy or sell emission rights depending on the cost at which such country will be able to effect reduction of emissions below the required level;

[9] Tietenberg, Thomas, M. Grubb, 1999.BN.Swift, Z. Zhang. International Rules for Greenhouse Emissions Trading. New York: UNCTADMisc.6; Cooper Richard 1998 - Toward a Real Global Warming Treaty. Foreign Affairs 77,2; Wiener Jonathan B. 1999. On the Political Economy of Global Environmental regulation. Georgetown Law Journal 87.

- since greenhouse gases reduction costs vary considerably depending on individual emitters and advantages to the environment on a global scale occur regardless of the place where emissions are being generated the permission of any agreed level of total emission reduction effected at minimal costs will lead to minimization of total costs. The market will always be more effective than government regulation when it comes to achieving an objective at a minimal cost;
- emission trading creates a powerful incentive for technological innovation. Emission right sellers will invest the revenue in new technologies in order to achieve further greenhouse gases emissions reduction, especially if over time the quantity of trading emission rights is limited or decreases or an opportunity is created for trading of only a portion of the total quantity.

2. KYOTO PROTOCOL MECHANISMS

The Kyoto Protocol (KP) ensures the application of three market-based tools for reduction of external effects - international emission trading (Art. 17), Joint Project Implementation (Art. 6.1) and Clean Development Mechanism (Art. 12.2). The objective of these "flexible mechanisms" is to make a significant contribution to a more effective reduction of greenhouse gases emissions on a global scale at a reduced cost. Application of these mechanisms need to be seen as complementing national actions which make up a considerable part of the efforts towards emissions reduction targets under the Protocol. The main responsibility of the Annex B countries under the Protocol is to ensure that their total greenhouse gas emissions expressed as the equivalent quantity of carbon dioxide are not in excess of their national limits (overall cap)[10] with respect to the reduction of emissions in view of a reduction of the total emission by about 5 percent on average relative to 1990 levels within the first quota period from 2008 until 2012.

The application of the three mechanisms is based in measurement units which are monitored and recorded through national registers. The registers need to be set up and maintained by the countries no later than the beginning of 2005. As a result of the Joint Implementation Projects Emission Reduction Units (ERU) will be generated and as a result of the Clean Development Mechanism - Certified Emission Reduction Units (CERU). On the basis of the emission trading mechanism the countries will be able to exchange Assigned Emission Units (AEU), constituting a part of the country's emissions. All units will be equal to one metric ton of carbon dioxide equivalent.

International Emission Trading

International Emission Trading (IET) is one of the key mechanisms intended under the Kyoto Protocol. The provisions under the Protocol guarantee (and in certain cases in an apparent manner whilst indirectly in others) the existence of different schemes for emission trading.

[10] Annex B to the Kyoto Protocol lists the quantitative obligations for reduction and containment of emissions as a percentage against the basis year or period. EU countries and countries in transition to a market economy have committed to an 8 percent decrease, Japan - a six percent decrease, etc.

Art. 17 of the protocol makes it clear that IET participation will only be open to the countries listed in Annex B. This system of trading will be applied on national level and each individual country will have the right to buy greenhouse gases emission rights from other countries which are able to reduce greenhouse gases emissions under the allowable emission levels or assigned amount (assigned amount of emissions is the level of emissions which each country will be allowed to emit during the initial period 2008-1012[11]).

The Kyoto Protocol recognizes national sovereignty in policy implementation oriented towards emissions reduction and, therefore, allows the existence of an internal market of emission rights among entities and structures in the private sector. In reality national governments are not the key emitters of greenhouse gases but the Kyoto Protocol is not categorical with respect to the international exchange of emission rights between private formations. In reality such transactions are indirectly allowed under the Clean Development Mechanism (CDM) and the Joint Implementation (JI) and constitute a credit trading system. Thus, two separate emission trading markets may be distinguished - formal and informal.

The rules that apply to the development of the formal market have not yet been devised although a number of Conferences of the UNFCCC countries have been held on which agreement has been reached with respect to the key elements of the regulatory framework with respect to the implementation of the Kyoto Protocol and the assumption exists that the market will begin to function in 2008 at the earliest. Theoretically speaking, the emissions market functioning will entail the following:

The development of the official market will be preceded by an agreement on the imposition of particular restrictions on total emissions-a cap, for a given period of time and afterwards the emission permits will be allocated by the parties to the agreement within the framework of the total limits imposed. Thus each country will be entitled to emit a certain quantity of greenhouse gases. As a result of the negotiations held in December 1997 in Kyoto, the Annex B countries have agreed on a preliminary allocation of emission rights or quotas (assigned amount of emissions) to be expressed as a percentage reduction of their historical emission levels. Trading will be done if the limits on cumulative emissions are not exceeded, i.e. if a surplus exists.

In order to be able to function in practice national governments will be allocating emissions among companies emitting greenhouse gases on their respective territory within the limits imposed by the quotas. The market will be controlled by the volume of emissions within the total limit imposed through the exchange of rights between companies, i.e. companies will be buying additional emission rights if their abatement cost is high. Emission right holders will be able to keep such rights and continue production and respectively the generation of greenhouse gases or reduce emissions and sell the permits. The fact that emission rights are regarded as commodity, i.e. subject to sale or purchase, represents an additional incentive for the respective holder to reduce the level of emissions. In order to ensure the efficiency of the system at the end of each period the national emission volumes will be compared to the emission quota of each individual country (the sum of the emission rights held by each company). If greenhouse gases emission as a quantitative expression exceeds the national emission quota then the country will be pe-

[11] This is calculated by multiplying the total emissions in 1998 by 5 (for the five-year term) and then by the percentage by which the respective country has agreed to according to the record contained in Annex B of the Kyoto Protocol. For Bulgaria this percentage is 92%.

nalized by the respective non-performance penalties with respect to the obligations undertaken under international agreements (the Kyoto Protocol has postponed penalties for settlement in the future).

Tradable emission rights in the above system are entirely exchangeable – any of them is a greenhouse gas emission unit, regardless of the government from which the emission right originates. Thus, the buyers may count on the value of the emission rights without having to worry about any improper conduct on the part of the seller. Emission rights denominated by the seller government guarantee that any breach by the selling government of its obligation to observe the emission quote could depreciate the emission rights of the seller, thus stimulating the buyers to turn to sellers whose government is most likely to observe the international agreements.

On the informal market12 where both private and government organizations may participate in the establishment, acquisition to transfer of reduced units, there is no formal division of emission rights. Each government fulfills its obligations to decrease emissions by virtue of contracts for joint projects by seeking to invest in emission reducing services on or outside of its territory, or to purchase emission reduction "credits" generated in other countries, even if those are not subject to an overall emission cap. These are the project-based trade systems presented in Art. 6 – Joint Implementation by governments under Annex A, and Art. 12 – Clean Development Mechanism with credits from developing countries. All emission reduction units (ERU), or any part of any emission quote which a government has acquired from another government in compliance with the Joint Implementation Mechanism or following on the international emission market are added to the emission quote of the acquiring government. Respectively, in the case of ERU transfer they are subtracted from the emission quote of the transferring government. As regards the Clean Development Mechanism, only Certified Emission Reduction Units (CERU) may be added to the emission quote of the acquiring government. In fact, each country compliance with emissions caps is determined by comparing national allowable emissions level with actual emissions minus the abatement achieved at the specific overseas projects.

Please note that on both emission markets, all transactions are voluntary. Trading motivation is determined by the willingness to find a more profitable way of fulfilling all quantitative limitations on greenhouse gas emissions, as specified under Art. 3 of the Kyoto Protocol. The principle of operation is based on mutual benefit – both sellers and buyers will complete a transaction if they find the exchange conditions favorable.

Joint Implementation

The mechanism of joint implementation involves the cooperation of two countries, the one funding the reduction of emissions in the other so as to help the first one to perform its obligations for harmful emission reduction. Joint implementation can be illustrated by the following example: two countries, A and B, impose standards on the production of power generation companies on their territory in order to reduce the emission of greenhouse effect gases. The costs for implementation of the standards in country B are higher than those in country A. The power generation countries in country B may invest in activities for

[12] In 2001 during the Conference of the parties to the RCPCON, the rules were established and the Joint Implementation Mechanism was introduced, and in 2002 – the Clean Development Mechanism was introduced.

reduction of emissions in country A in exchange of which to be granted emission credits by which to compensate the necessary reduction of its more expensive emissions.

According to Art. 6 of The Kyoto Protocol, to perform its quantity obligations for restriction and reduction of greenhouse effect gas emissions by Art. 3, each country, listed in Annex B, may initiate the mechanism of joint implementation. This means assigning emission reduction units (ERU), resulting from projects for greenhouse gas emission reduction, to another country, listed in Annex B, or acquiring such units from it. This creates a possibility for the developed countries to participate in projects for greenhouse effect gas reduction on the territory of other countries, most probably countries whose economies are undergoing the transition and where there are better possibilities for reduction of emissions at a lower price. The conditions for exchange of units of reduced emissions are a project to be approved by the participant-countries and units of reduced emissions to be acquired in addition to the national initiatives for reduction of greenhouse effect gas emissions. Emission reduction units are also called 'credits', as the ERU buyer-country actually invests in activities for reduction of greenhouse effect gas emissions in the seller-country. The value of these 'credits' is determined by the emission reduction which has been actually initiated, and this requires from the investor, or the institution accredited for the purpose, to closely monitor the progress of project. Credits are created for each ton of emission reduction against the basis period expressed in units of reduced emissions. One unit of reduced emission is equal to one metric ton equivalent of carbon dioxide, calculated according to Art. 5 of the Kyoto Protocol.

Each country which is involved in Annex B may authorize legal persons[13] to participate in initiatives, under its liability, resulting in the establishment, transfer and acquisition of units of reduced emissions. Countries which are involved in Annex B are promoted to apply the mechanism of joint implementation basically for three reasons:

- as the first step to the introduction of an international system of emission trading;
- as a cost efficient option for funding the reduction of emissions and implementing the emission quantity restrictions, as contained in The Kyoto Protocol; and,
- as a way of determining when it is cost efficient to introduce new emission sources or technologies in the existing international system of greenhouse effect gas management.

The typical examples of Joint Implementation projects are the reduction of greenhouse effect gas emissions by: replacing coal power stations by a more efficiently combined generation of heat and electric power, improving power efficiency and hence reducing coal fuel use, improving the combustion and generation processes, using renewable power sources, as well as increasing the capacity for absorption of carbon dioxide emissions from forests and the like.

[13] Trust Funds (Prototype Carbon Fund, Carbon Fund for Municipality Development, BioCarbon Fund), managed by the World Bank, were basically set up for purchase of reduced emissions for the fund participants and for sharing the benefits from them with the seller-country. The fund participants, being primarily private companies, shall agree upon the share of reduced emissions which they shall obtain, usually in proportion with the share they hold in the fund. The verification and certification of reduced emissions as well as the monitoring on the project implementation shall be carried out by a third independent party, i.e. companies which have specialized in audit performance.

Currently, the basic mechanism by which Bulgaria (as a country included in Annex B) can carry out the Kyoto Protocol agreements is that of the joint implementation, insofar trade in emissions has not started yet. The joint implementation mechanism has already been actually operating and being implemented in Bulgaria. An example is the agreement, concerning the joint implementation of a project for emission reduction, signed in September 2003 between the World Bank Prototype Carbon Fund and the paper and cellulose mill 'Sviloza' AD in the town of Svishtov. The reduced emissions of greenhouse effect gases will be transferred to the World Bank Prototype Carbon Fund. The greenhouse effect gases will be reduced by replacement of an amount of the high carbon content power source, as were used until now, by biomass, by means of a biomass boiler installation and commissioning at the value of USD 2.5 mln. This is a way of acquiring extra purposeful investments and a high technology ecology equipment through technology transfer as well as of modernizing the power industry. It is assumed that the measures which have already been initiated and the participation in the joint implementation projects shall ensure not only the performance of obligations on the part of Bulgarian to the Kyoto Protocol, but the availability of a remainder as well which can be traded by the mechanism of emission trade in the period from 2008 to 2012.

Clean Development Mechanism (CDM)

The key objective of the Clean Development Mechanism is to promote the developing countries in the implementation of ecology projects and the countries from Annex B to achieve their quantity obligations in the reduction and restriction of greenhouse effect gas emissions. Regardless of the fact that according to the international agreements the emissions of developing countries are not, for the time being, subject to caps, they can add 'credits' or CEPE to the accounts of countries, listed in Annex B. Reduction of emissions, resulting from projects in the developing countries, is permissible, only if certified by the mechanism of clean development. Certification is carried out by operative units, nominated by the Conference of the countries which plays the role of a meeting of the countries to the Kyoto Protocol. The value of these credits will directly depend on the emission reduction which has been initiated at a given location. The reduction of emissions is measured in addition to those which would have resulted, if the activity certified by the project had not existed. The certified emission reductions to be gained by the countries from Annex B in the period 2000 – 2007 can be recognized, after their obligations have been performed during the first quota period from 2008 to 2012.

3. Problems which may Arise in the Application of Mechanisms Involved in the Kyoto Protocol

The main reason for introducing and applying the Kyoto Protocol mechanisms are their advantages, as compared with the other international tools, for restriction of negative external effects. Yet, despite these advantages, the development of emission trade market is associated with many problems such as the distribution of emission rights, the guarantied participation for all participants, the reduction of transaction costs, the compatibility with national tools, and, most of all, the general reduction of greenhouse effect gas emissions.

The atmosphere is a common resource and can procure constant benefits in the form of actions which aim at the reduction of its pollution. In view of this definition, the atmosphere can be treated as an economic asset of significant value for the existence of life on our planet. The policy which has been initiated for transforming one aspect of atmosphere – its limited possibilities for greenhouse effect gas absorption – from a common resource to a lawfully guarantied and cash assets by means of the international emissions will approximate its assessment to its actual fundamental value. Until now all had a free access to such common resource. Its distribution inevitably arises the question concerning who will get a bigger share. The emission quotas which have been determined for the countries which signed the Kyoto Protocol define and distribute the rights for emission of greenhouse effect gases in the atmosphere. Regarding the developing countries, the initial distribution of emission rights seems rather unfair because their historical levels of emissions are too low. That is why extra criteria are proposed such as GDP of the country in question, population, area and dependence on production lines which make use of fossil fuels. However, insofar the developing countries have not been determined as players on the market of international emission trade, their inclusion and distribution of initial emission rights is subject to future agreement.

Regarding the distribution of marketable emission quotas, there is one doubt more that the Kyoto Protocol provisions do not ensure the objectives involved in it well enough and in the best efficient way. It is considered that the emission rights of the countries from Eastern Europe[14] for the initial period form 2008 to 2012 shall far exceed their forecast emissions of greenhouse effect gases in this period. On the right offering market the Eastern European countries will be able to sell such surplus of emission rights to other countries. Consequently, buyers through their newly acquired rights will expand their emissions, while sellers, fitting in the restrictions, will do nothing to reduce their emissions. An alternative for overcoming this issue is to apply Art. 6 from the Kyoto Protocol on a more frequent basis. In such a way trade with emissions will be accompanied by the requirement to bind the exchanged of emission rights with projects which reduce the emission of greenhouse effect gases.

The efficiency of marketable emission right market is defined by whether an actual reduction of emissions is gained. Problems arise when the countries which generate profit by the reduction of greenhouse effect gas emissions do not contribute according to the received benefits. For each individual country there are incentives to act like a 'passenger without a ticket' in terms of the characteristics of public benefit which atmosphere possesses - it is not possible or it is very expensive to exclude the countries which do not wish to participate in the common initiatives from the benefits of reduced quantities of greenhouse effect gases. Insofar mechanisms are not involved in the Kyoto Protocol for counteraction against countries which fail to perform their obligations, there is a danger that the aggregated reduction of emissions to be lower than the optimal one. Emission rights may be traded, irrespective of whether the seller-country fits in the quantity of emissions prescribed to it. In such a case, regarding the lack of penal actions by the Protocol, such country may continue to extend its emissions and sell its quota of marketable

[14] By forecast estimations, if USA ratifies the Kyoto Protocol and joins the emission trade, it can buy the entire quantity of 'hot air' of Russia in order to perform its obligations by the prescribed emission quantities.

emission rights. Acquiring the rights, the buyer-country will also increase its emissions and will fit in the quantity of emissions prescribed.

The role of national governments on the market is not less significant. They can attempt to implement the strategy in favor of the national interest by intervention on the market, meanwhile trying to prohibit the companies to buy coal fuels with low carbon content from sources outside the country and preventing the companies which are greenhouse effect gas issues from participation in the emission right trade. The Kyoto Protocol grants full national sovereignty concerning the election of tools by which the countries could meet their quantity restrictions for the reduction of greenhouse effect gas emissions. Only if all countries develop a local market of emission rights and afford its players to get involved in international trade, the benefits from the Protocol feasible mechanisms will be implemented. However, some countries could employ only local tools such as carbon taxes or fixed quantity standards, even if they hold the corresponding quota of emission rights. As a result of this, the national top costs for reduction of pollution through inefficient local tools will increase the international top costs much more that in the case of using efficient tools. Even if just and only local carbon taxes are used which are considered to be enhancing efficiency as national tools, the reduction of greenhouse effect gases may experience a strong negative impact in the global aspect. If, for example, tax rates are defined in such a way that they are higher than the international balance price of emission rights, this means also higher top costs for reduction of pollution in the country with tax. Local companies will be encouraged to acquire emission rights by projects in foreign countries in favor of their own country and to increase its emission quota, only if their tax burden is decreased. It is most probable that the country wishes to maintain the level of its taxable income without granting tax relaxation to the issuer-companies.

The high transaction costs which are associated with the implementation of exchange of emission rights increase the total costs for emission reduction and impede trade. Transaction costs involve costs for finding trade partners, holding negotiations, monitoring the implementation of transaction, and securing it against the risk of failure. Transaction costs, concerning the initiation of the Joint Implementation or Mechanisms of Clean Development, as currently structured, are too high. Finding suitable partners is not an easy job, all negotiations are usually held for the first time, each project must be approved by the governments of the two participant countries, and each investor must alone monitor the implementation of the project concerned. Translation costs can considerably reduce, if agencies are accredited to monitor the implementation of projects or a possibility is provided to exchange information. Another problem, concerning the operation of the market may arise if the influence on quota prices or the volume of sales is concentrated in a single country. Countries such as Russia and China are very likely to become the greatest sellers of emission quotas. While there is an antimonopoly legislation on a national level, there is no such legislation for the global market of emission trade yet.

Not all nations will equally benefit from a single purposeful international policy, concerning the reduction of greenhouse gas effect emissions. For some countries costs will exceed benefits, if they earn profits by global warming, as a result of the temperature and agricultural crop rise. Moreover, there exist significant variances between the countries as to the priorities and preferences in pollution reduction. If, for example, we assume that ecological environment is a luxurious commodity, poor countries will recognize fewer priorities for its gaining than rich ones. This is the meaning of the Mechanism of Clean

Development which has been developed: to initiate projects in the developing countries by which to secure an influx of financial resource in these countries in exchange of their effort for emission reduction. The developing countries are not subject to quantity restrictions and for this reason they do not have an incentive to reduce the greenhouse effect gas emissions. Projects must result in emission reduction in addition to that which would have resulted, if there had not been a certified activity by the project. Meanwhile, the projects themselves are such that they would have existed even without any mechanism. This means that emission credits may be obtained by projects which would be implementable without any Mechanism of Clean Development. If a country from Annex B obtains credits by such a project in order to avoid the reduction of its emissions, the net effect would be to ignore the obligations of such country by the Kyoto Protocol. In such a case, it would be better to require the grant of credits by projects which are not profitable, or it is pointless to initiate them for other reasons.

An efficient system for trade in emission may cause the global policy for reduction of greenhouse effect gas emissions to advance considerably. Meanwhile, its development and introduction into operation offers new challenges in national and international aspect. The inclusion of the developing countries, the reduction of transaction costs and the comparison of the national policy of individual countries with its objectives, are all the main prerequisites for ecology efficiency as well as for economic efficiency, concerning trade in emissions.

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MOGUĆE PRIMENE MERA PROTIV SPOLJAŠNJIH DEJSTVA NA GLOBALNOM NIVOU I PROTOKOL IZ KJOTA

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Utelovljenje mogućnosti stvaranja tržišta za kontrolu proizvodnje gasova koji izazivaju efekat staklene bašte u Protokol iz Kjota je od bitnog značaja unutar okvirnog načela traženja koordiniranog međunarodnog odgovora na pitanje globalnog zagrevanja.

Ovaj članak razmatra različita sredstva (porezi, subvencije, tehnološki standardi, kvantitativna ograničenja, pravni normativi zagadjenja u poslovanju) da bi se ograničili negativni spoljašnji efekti i mogućnosti primene ovih sredstava u traženju rešenja problema zagadjenja sredine na globalnom nivou. Specifične karakteristike fleksibilnih mehanizama predvidjene Protokolom iz Kjota su ovde razmotrene kao i prednosti za Bugarsku njihovom potencijalnom primenom, a takodje i problemi koji se mogu javiti s obzirom na funkcionisanje medjunarodnog tržišta u budućnosti.