

УДК 339.5:551.588.74:631.152

FORMATION AND DEVELOPMENT OF INTERNATIONAL QUOTA TRADE FOR GREENHOUSE GAS EMISSIONS IN THE CONTEXT OF AGRICULTURE MANAGEMENT IMPROVEMENT

K. Pogorila

*postgraduate student,
researcher at the laboratory of agricultural landscapes management
and forest ecosystems*

*The Institute of Agroecology and Environmental Management of National Academy
of Agrarian Sciences of Ukraine*

Проаналізовано процес і причини становлення та розвитку міжнародної торгівлі квотами на викиди парникових газів. Розглянуто сучасний стан скорочення викидів парникових газів в Україні.

Ключові слова: міжнародна торгівля, квоти, парникові гази, парниковий ефект, проекти спільного впровадження.

In the XIX century, scientists have found that carbon dioxide retards infrared radiation in the atmosphere, and this affects the surface temperature of the Earth. Since the beginning of the industrial revolution and scientific progress (XVIII–XIX centuries) global consumption of fossil fuels increases, causing the greenhouse effect (GE) by enhancing concentration of carbon dioxide, methane, nitrous oxide and other greenhouse gases (GHGs) in the atmosphere. However, for many years, scientists did not take into account this issue, as it was assumed that the carbon dioxide «excess», one of the GHGs in the atmosphere, are absorbed by the oceans. But, according to NASA, the oceans absorb about 30%, biomass – 25%, and the remaining 45% enter the atmosphere [1].

1. Studying the causes of global warming. Discussion issue.

General concentrations of carbon dioxide, methane and nitrous oxide in the atmosphere have increased markedly resulting from human activity since the mid XVIII century and are far superior before industrial labels, defined on the thousands of years old ice cores content. Ukraine Agricultural activity causes the GHG emissions both in the Plant Growing Sector (from soil related to agricultural cultivation by introducing nitrogen fertilizer, lime, and fuel combustion of agricultural machinery engines and spare parts), and in the Livestock

Sector (the processes of intestinal fermentation and animals manure management).

In 1827, French explorer Jean-Baptiste Fourier first considered a «greenhouse effect» as a phenomenon of solar energy capturing by atmospheric gases. After him in 1896 the Swedish chemist S. Arrhenius has investigated the link between combustion of fossil fuels (coal, oil, gas) and the CO₂ formation.

In 1957–1958, the International Geophysical Year scientists have conducted a series of studies on top of Mauna Loa the Hawaii volcano. The data showed that the concentration of carbon dioxide increases uniformly. The global political instability during the Cold War was a barrier to international cooperation on GHG emissions reduction to mid 80's. Measures for environmental policy of most countries do not go beyond the national level. When in September 1987 the Montreal Protocol has been signed, aimed at halting the production and use of certain chemical substances that deplete the ozone layer, the state positions began to change because of the considerable efforts by scientists to solve the problem of ozone depletion. The success of this Protocol has propelled prospects of international cooperation with other global environmental problems. [2]

Statement concerning the direct connection between the anthropogenic component of GE and warming by scientist James Hansen in 1988, has caused a storm of criticism. A lot

of climatologists have not been agree with him at that time and believed that the recent hot years were normal deviation from the mean. However, in 1989 A. Strong at National Administration of Air & Ocean Research had reported: «*Measurement of ocean surface temperature made by satellite during the years 1982–1988 indicate that world's oceans are heated gradually but significantly by about 0,10°C per year*» [3]. Later R. Houghton and J. Vudvell also claimed that the physical manifestations of human GE is no longer in doubt. They referred to a report of increased distance to the zone of permafrost in Alaska and the Canadian Arctic, an increase in the average temperature of lakes in Canada a decrease in the annual maximum extent of ice cover in the Arctic and Antarctica, as well as reducing number of icebergs in Europe and other regions. Climatic disasters in recent years reinforce the hypothesis of GE and are a realization of scientific forecasts of the Intergovernmental Panel on Climate Change [4].

2. Study of the formation peculiarities of the international GHG emission quota trading.

Gradual changes in the atmosphere surface layers temperature increasing associated with the synergistic effects of various factors, including: cyclical temperature changes in the surface layers of the atmosphere in geological time (warming and cooling phases), changes in solar activity, the Earth's magnetic poles drift and so on. But, without a doubt, a marginal factor in today's climate changes, so to speak – «the last straw» that breaks the delicate balance of the system – is the anthropogenic factor, which is realized not only through growth in revenues GHG into the atmosphere as a result of anthropogenic activities, but also in creating conditions conducive to their accumulation, eg by deforestation. Link between the presence of GHG in the atmosphere and dynamics of temperature regimes, primarily carbon dioxide (CO₂) is shown in Fig. 1.

Therefore, it was imperative to reduce GHG emissions. One of the tools to solve this problem is the market mechanism – such as an emissions trading. Its basic idea was introduced

in 1968 by Canadian economist John Dales in his book «*Pollution, Property and Prices*» and was a continuation of the Coase Theorem (Ronald Harry Coase). [6] Revolutionary new in this idea was that the government could set a specific amount of total pollution as an environmental purpose. With free trade in these certificates quota price depends on the demand. Emissions that exceed the established limits (quotas) are subject to a fine. In the English language this practice is called «*cap-and-trade*» (limit and trade) [7].

Jan-Peter Voss proposed to divide the history of GHG emission quota trading into four stages: «Origin», «The proof of principle», «Prototype», «Mode of formation» [8].

The first big success of environmental emissions trading concept was demonstrated in the 1980 program of the U.S. phase out lead from motor fuel. This was followed by very successful program management of the environment from sulfur dioxide emission quota trading.

In December 1988, reviewing strategy on climate change policy, the UN General Assembly approved the establishment of Intergovernmental Panel on Climate Change. Then in 1989, at the annual meeting, the heads of seven major democratic states have recognized the need for the adoption of the World convention on global climate change to reduce emissions of anthropogenic emissions.

Realizing the danger of GE for humanity, a series of measures aimed at sustainable

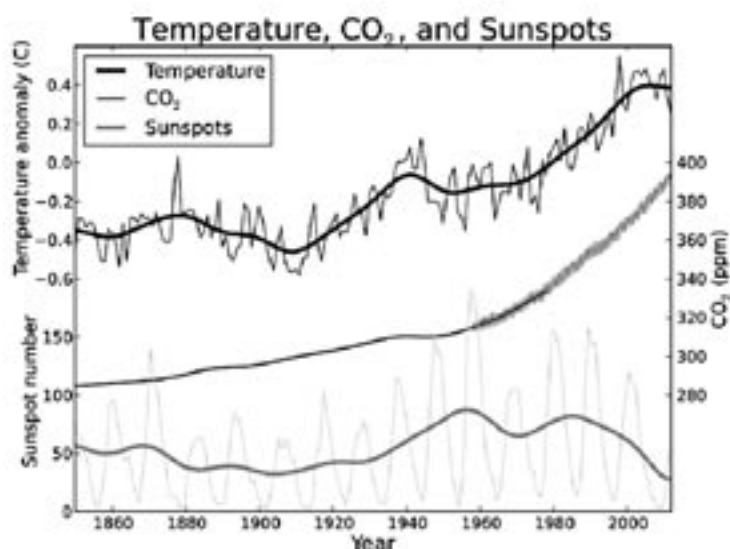


Fig. 1. Changes in air temperature, CO₂ concentration and solar activity by 1850–2010 (by L. McInnes, 2009) [5]

economic development, have been adopted at the international level. Declaration of Rio de Janeiro on Environment and Development in 1992 – is the final document adopted by the United Nations Conference on Problems of the Environment and Development held in Rio de Janeiro (1992). This document has secured 27 major principles of environmental protection in the context of sustainable development.

Sharing the international community concern about increasing concentration of GHGs in the atmosphere, Ukraine became a full-fledged party to the Convention on Climate Change in August 1997 and has committed to implement national policies and measures to mitigate climate change by limiting its anthropogenic GHGs emissions, protecting and improving the quality of GHG sinks, regularly provide detailed information on policies and measures for reduction of anthropogenic emissions by sources and removals by sinks of GHGs.

Since the Convention contains no quantitative commitments and calls only to voluntary emission reduction, more powerful step was the signing of the Kyoto Protocol (KP) 11 December 1997 (became operational Feb. 16, 2005) – supporting documentation to the UN Framework Convention on Climate Change – under which member countries that are Parties to the KP and listed in Annex I, pledged in 2012 to reduce GHG emissions, which they had in 1990. The volume commitments range from 1% to 8%, and in countries with economies in transition, to a group such as Ukraine, obligations are not to exceed the emissions reductions that were recorded in 1990. This document governs the preparation and submission of reports to the KP Parties as well as imposes a number of requirements for the operation of the national GHG inventory, which aims to provide an acceptable level of quality reporting.

Kyoto Protocol provides for certain kinds of economic activity, so-called «*flexible mechanisms*» to reduce GHG emissions, namely: the Clean Development Mechanism (CDM, Article 12 CP) – provides for cooperation between countries of Annex I and developing countries, technology transfer aimed at emissions reduction and/or increase the absorption of GHGs; the mechanism of Joint Implementation (Article 6 CP) – provides for cooperation, similar to CDM, but between countries in An-

nex I; mechanism for sale of emission quotas for GHGs (Article 17 CP) – provides for direct marketing authorizations for emissions from one country to another in Annex I.

According to the State Environmental Investment Agency of Ukraine, almost 300 joint implementation projects (JI) are implemented at various stages in Ukraine as of 2012. With implementing of JI projects specific companies in Ukraine had an opportunity to attract additional foreign investments in environmental projects in the same business, purchasing the latest technologies etc. The implementation of JI project in Ukraine is interesting for investors because the price of GHG emission reductions in developed countries is much higher than in Ukraine.

Ukraine and Japan are interested in continuing cooperation under the Green Investment Scheme, and therefore have signed a joint action plan for green investment projects on 21 March, 2013. Cooperation between Japan and Ukraine in the field of green investments can not only affect the contribution to the improvement of Ukraine social infrastructure and welfare of Ukrainian citizens, but also can be a stimulus to the arrival of Japanese advanced technology in the field of energy conservation and ecology.

Kyoto agreement was prolonged for 5 years. Representatives from nearly 200 countries have attended the conference of the UN Member States supported the extension of the Kyoto Protocol in 2020. However, the U.S., China, India, Japan and Russia as well as Canada, which officially withdrew from the agreement in 2011, do not intend to participate in the new commitment period under the contract. Decision to create in June 2003 the EU directives on emissions trading has made Europe a pioneer in the field of large-scale application of market-based instruments in climate policy.

Ukraine commits itself to reduce emissions by 20%, which until 2020 do not exceed 80% of the baseline in 1990 on condition that the international design and market mechanisms to function. It is known that Ukraine occupies 22nd place (after China, USA, India, etc.) in the world for air GHGs emissions (which is 2% of global emissions). Experts of carbon market called Ukraine a largest seller of emission reduction units (ERU) in Europe.

SUMMARY

The implementation of sustainable agricultural management can reduce net GHG emissions. Efficiency of this practice, for example, for land use will depend on promoting the preservation of humus in the soil. Great potential for climate protection measures is caused by the fact that the forest cover of the country is among the lowest in Europe – 15,9% (while the average forest cover in Eastern Europe exceeds 43%) [9].

Thus, we can conclude that the introduction of an international GHGs emissions trading and other flexible mechanisms will become the new eco-economic tool for countries that focus on achieving sustainable development in activities such as agriculture and forestry, afforestation, reforestation that contributes to enhance the GHGs absorption. For Ukraine it is one of the tools in achieving sustainable economic development, including agriculture. Ways to apply capacity of flexible mechanisms (emissions trading, JI project) in the management of agriculture require to be studied. Quotas for GHGs emissions as a new product in the international market of natural resources is a lever in solving of modern environmental challenges.

REFERENCES

1. Effects of Changing the Carbon Cycle [Електронний ресурс]. / Earth Observatory and climate and environmental science at NASA. – Режим доступу: <http://earthobservatory.nasa.gov/Features/CarbonCycle/page5.php>.
2. Robert, Walter Orr. «It is Time to Prepare for Global Climate Changes», Conservation Foundation Letter, April 1983.
3. Philip Shabecoff. Global Warming Has Begun, Expert Tells Senate: The New York Times. – 1998. – 2 p.
4. [Електронний ресурс]. – Режим доступу: <http://www.ipcc.ch/>. – Назва з екрану
5. [Електронний ресурс]. – Режим доступу: <http://commons.wikimedia.org/wiki/File:Temp-sunspot-co2.svg> – Назва з екрану
6. Coase, Ronald H. The Problem of Social Cost: Journal of Law and Economics. – 1960. – 3 (1): 1–44.
7. Burton, Ellison, Sanjour, William. An Economic Analysis of the Control of Sulphur Oxides Air Pollution // DHEW Program Analysis Report. Ernst and Ernst. Washington, DC. – 1967. – № 69.
8. Voss, Jan-Peter. Innovation processes in governance: the development of emissions trading as a new policy instrument // Science and Public Policy. 5 (Ingentaconnect). – 2007-06. – № 34 (5) – P. 329–343.
9. Букша І.Ф. Проблеми наукового та інформаційного забезпечення лісівничих досліджень у контексті зміни клімату / Букша І.Ф., Пастернак В.П. – Х.: УкрНДІЛГА ім. Г.М. Висоцького, 2010. – 7 с.

Новини

Новини

Новини • Новини • Новини

МІЖНАРОДНИЙ УКРАЇНСЬКО-ЯПОНСЬКИЙ ПРОЕКТ “ЗБЕРЕЖЕМО КЛІМАТ РАЗОМ”

Важливим кроком у низці заходів в рамках реалізації проектів за схемою зелених інвестицій в Україні стала реалізація міжнародного українсько-японського проекту «Збережемо клімат разом», який полягає у проведенні серії регіональних семінарів (тренінгів) із запрошенням японських фахівців для технічних консультацій, діагностування місцевого енергозбереження та іншого, що стосується захисту навколишнього природного середовища за підтримки японської компанії НЕДО, Українсько-Японського Центру НТУУ «КПІ».