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# Carbon trading: A tool to control global warming

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**Abstract**--In current scenario Global Warming has given rise to a new form of commerce i.e. the carbon trade. Carbon trading is advance format where firms or countries buy and sell carbon permits as part of a program to trim out carbon emission. It is a widespread method countries utilize in order to meet their obligations specified by international Kyoto Protocol (1997) of United Nations Framework Convention on Climate Change; namely the reduction of carbon emissions in order to mitigate future climate changes. It specifically targets carbon dioxide calculated in terms of CO<sub>2</sub> equivalent or CO<sub>2</sub>. India signed and ratified the Kyoto Protocol in August 2002. Since India is exempted from framework of the treaty, it is expected to gain from the protocol in terms of transfer of technology and related foreign investments. India was an early player in the market and was doing well, but after the entry of China in 2005, it gradually out performed Indian the carbon market. The objective of the paper is to discuss the regulatory mechanism of carbon trading in international market with special reference to opportunities for the emissions market in Indian context. The author has also made an attempt to throw some light on the future prospects of carbon trading business.

**Keywords**---Carbon trading, global warming, control.

## Introduction

Global warming has spawned a new form of commerce: the carbon trade. This new economic activity involves the buying and selling of “environmental services,” including the elimination of greenhouse gases from the atmosphere, which are identified and purchased by eco-consulting firms and then sold to individual or corporate clients to “offset” their polluting emissions. While some NGOs and “green” businesses support the carbon trade and view it as a winning solution that reconciles environmental protection with economic prosperity, and other environmentalists and grassroots organizations claim that it is not the solution to environmental problems such as global warming.

Carbon is the universal denominator in all-polluting gases that cause global warming. Carbon dioxide is the gas most commonly thought of as a greenhouse gas; it is responsible for about half of the atmospheric heat retained by trace gasses. It is produced primarily by burning of fossil fuels and deforestation accompanied by burning and biodegradation of biomass. Analyses of gas trapped in polar ice samples indicate that pre-industrial levels of CO<sub>2</sub> in the atmosphere was approximately 260 parts per million. Over the last 300 years, this level has increased to current value of around 375 ppm; most of the increase by far has taken place at an accelerating pace over the last 100 years. About half of the increase in carbon dioxide in the last 300 years can be attributed to deforestation, which still accounts for approximately 20% of the annual increase in this gas. It is estimated that if the carbon increases in the atmosphere at the present rate and no positive efforts are pursued, the level of carbon in the atmosphere would go up to 800–1000 ppm by the end of current century, which may create havoc for all living creatures on earth.<sup>1</sup>

Various firms scour the world in search of environmental services that could offset its client's emissions. These services are usually forests and tree-planting projects and are known in the business as carbon assets or carbon sinks, because trees remove carbon from the atmosphere and sequesters it in their wood. The activity of these sinks is often called carbon sequestration.

The carbon trade is an initiative that came about in response to the Kyoto Protocol. The Kyoto Protocol is an agreement under which industrialized countries will reduce their greenhouse gas emissions between the years 2008 to 2012 to levels that are 5.2% lower than those of 1990. The idea behind carbon trading is quite similar to the trading of securities or commodities in a marketplace. Carbon would be given an economic value, allowing people, companies or nations to trade it. If a nation bought carbon, it would be buying the rights to burn it, and a nation selling carbon would be giving up its rights to burn it. The value of the carbon would be based on the capability of the country owning the carbon to store it or to prevent it from being released into the atmosphere. A market would be created to make easy buying and selling of the rights to emit greenhouse gases. The industrialized nations for which reducing emissions is a daunting task could buy the emission rights from another nation whose industries do not produce as much of these gases. The market for carbon is possible because the goal of the Kyoto Protocol is to reduce emissions as a collective.

On the one hand, the idea of carbon trade seems like a win-win situation: greenhouse gas emissions may be reduced while some countries reap economic benefit. On the other hand, critics of the idea suspect that some countries will try exploit the trading system and the consequences will be negative. While the proposal of carbon trade does have its merits, debate over this type of market is inevitable since it involves finding a compromise between profit, equality and ecological concerns.<sup>2</sup>

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<sup>1</sup> Current science, vol 91, No. 7,10 October 2006.

<sup>2</sup> [www.investopedia.com](http://www.investopedia.com)

## **UNFCC and Kyoto Protocol**

### **UNFCC**

The United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) established the Intergovernmental Panel on Climate Change (IPCC) in the year 1988. Its role is to assess a range of information relevant for the understanding of the risk of human-induced climate change.

The UN Framework Convention on Climate Change (UNFCCC) is one of a series of international agreements and treaties on global environmental issues that were adopted at the 1992 Earth Summit at Rio. The Convention provides the overall policy framework for addressing the climate change issue and so forms the foundation of global efforts to fight global warming. The ultimate goal of the UNFCCC is: 'Stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic human induced interference with the climate system.' (UNFCCC, 1992).

The UNFCCC does not yet identify what the stabilization level should be, with another 10 years probably needed before the uncertainties can be largely removed and an ideal target GHG level decided upon. The treaty promotes action against global warming in spite of the current uncertainty on the basis that it's better to be precautionary than wait until irreversible damage is done.

The UNFCCC entered into force in March 1994 following ratification by 50 of its signatory parties. In 1995 the UNFCCC set out some guiding principles and general commitments for the international response to climate change. This was the first Conference of the Parties (COP).

### **Kyoto Protocol**

The Kyoto Protocol broke new ground by defining three innovative "flexibility mechanisms" to lower the overall costs of achieving its emissions targets. These mechanisms enable Parties to access cost-effective opportunities to reduce emissions, or to remove carbon from the atmosphere, in other countries. While the cost of limiting emissions varies considerably from region to region, the effect for the atmosphere of limiting emissions is the same, irrespective of where the action is taken.

All these three mechanisms under the Kyoto Protocol are based on the Protocol's system for the accounting of targets. Under this system, the amount to which an Annex I Party (with a commitment inscribed in Annex B of the Kyoto Protocol) must reduce its emissions over the five year commitment period (known as its "assigned amount") is divided into units each equal to one ton of carbon dioxide equivalent. These assigned amount units (AAUs)\*, and other units defined by the Protocol, contribute the basis for the Kyoto mechanisms by providing for a Party to gain credit from action taken in other Parties that may be counted towards its own emissions target.<sup>3</sup>

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<sup>3</sup> [www.unfccc.int](http://www.unfccc.int)

## **Regulatory instruments for flexibility under Kyoto Protocol**

The three Kyoto mechanisms are:

1. Joint Implementation,
2. Clean Development Mechanism and
3. Emissions Trading.

### **Joint implementation**

This is one of the so called 'flexibility mechanisms' are defined in Article 6 of the Kyoto Protocol designed to help rich (annex 1) countries meet their Kyoto commitment using methods other than directly via cuts in their own emissions. Under Joint Implementation, an Annex I Party (with a commitment inscribed in Annex B of the Kyoto Protocol) may implement an emission-reducing project or a project that enhances removals by sinks in the territory of another Annex I Party (with a commitment inscribed in Annex B of the Kyoto Protocol) and count the resulting emission reduction units (ERUs) towards meeting its own Kyoto target.

### **Clean development mechanism**

The clean development mechanism allows governments or private entities in rich countries to set up emission reduction projects in developing countries. They get credit for these reductions as 'certified emission reductions (CER's)\*. This system is different from the Joint Implementation as it promotes sustainable development on developing countries. The Clean Development Mechanism (CDM) is the entry point for developing countries (non-Annex I) into the Kyoto Protocol on Climate Change. The mechanism was established under Article 12 of the Kyoto Protocol adopted by the Third Conference of the Parties to the Framework Convention on Climate Change on December 11, 1997.

The purpose of the CDM was defined under Article 12 of the Kyoto Protocol. The CDM is meant to benefit both industrial and developing countries. For industrial countries, the CDM will provide access to emission reduction credits based on GHG abatement projects undertaken in developing countries where the costs of reducing emissions might be considerably lower than the costs of comparable reductions at home. The CDM provides developing countries with opportunities to become active participants in international efforts to curb GHG emissions. The CDM will provide a vehicle through which investment flows and the transfer of climate-friendly technologies can take place. The CDM will also set aside a portion of the proceeds from qualifying projects to pay administrative costs and help those developing countries that are the most vulnerable to the adverse impacts of climate change cope with the costs of adaptation.

The dual goals of the CDM are to promote sustainable development in developing countries, and to allow industrialized countries to earn emissions credits from their investments in emission-reducing projects in developing countries. To earn credits under the CDM, the project proponent must prove and have verified that the greenhouse gas emissions reductions are real, measurable and additional to what would have occurred in the absence of the project.

To prevent industrialized countries from making unlimited use of CDM, Article 6.1 d) has a provision that use of CDM be 'supplemental' to domestic actions to reduce emissions.

### **National CDM Authority**

The Ministry of Environment and Forests (MoEF) deals with climate change and CDM issues in India. It established the Designated National Authority (DNA) in December 2003 as the National CDM Authority (NCDMA). The NCDMA is chaired by the Secretary of MoEF. The other members are from the Ministry of External Affairs Secretary, the Ministry of Finance Secretary, the Secretary, Department of Industrial Policy and Promotion, the Ministry of Non-conventional Energy Sources Secretary, the Ministry of Power Secretary, the Planning Commission Secretary and the MoEF Joint Secretary of Climate Change. The Member-Secretary of the NCDMA is the Climate Change Director of MoEF.

The project developers first submit the Project Concept Note (PCN) and the Project Design Document (PDD). These documents are circulated for review by the NCDMA members, who then call the project developers for a presentation at a regularly scheduled once-a-month meeting. Any clarifications/additional information from the project developers are sought when required by the NCDMA members. If all the requirements are met, India gives host country approval. The entire process for host country approval takes 60 days. No fees are charged by the National CDM Authority. The project developers then present their documents to the CDM Executive Board for approval and registration.

### **Emission Trading**

Article 17 of the Kyoto Protocol authorizes Annex B countries to engage in international emissions trading. This means that the Annex B countries will have the option of buying or selling some portion of their emission allowances. These allowances are called "assigned amount units" (AAUs) in the Kyoto Protocol. Emissions' trading is one of the flexibility mechanisms allowed under the Kyoto Protocol to enable countries to meet their emissions reduction target. Countries/companies with high internal emission reduction costs would be expected to buy certificates from countries/companies with low internal emission reduction costs. The latter entities would also be expected to maximize their production of low cost emission reduction so as to maximize their ability to sell certificates to high cost entities. The overall outcome is that the emission reduction target is met, but at a much lower cost than would be incurred by requiring each entity to achieve the emission reduction target on their own.

### **Principles of Kyoto Protocols**

At its heart, Kyoto establishes the following principles:

- Kyoto is underwritten by governments and is governed by global legislation enacted under the UN's aegis.
- Governments are separated into two general categories: developed countries, referred to as Annex 1 countries (who have accepted GHG

emission reduction obligations); and developing countries, referred to as Non-Annex 1 countries (who have no GHG emission reduction obligations).

- Any Annex 1 country that fails to meet its Kyoto target will be penalized by having its reduction targets decreased by 30% in the next period.
- By 2008-2012, Annex 1 countries have to reduce their GHG emissions by around 5% below their 1990 levels (for many countries, such as the EU member states, this corresponds to some 15% below their expected GHG emissions in 2008). Reduction targets expire in 2013.
- Kyoto includes "flexible mechanisms" which allow Annex 1 economies to meet their GHG targets by purchasing GHG emission reductions from elsewhere. These can be bought either from financial exchanges (such as the new EU Emissions Trading Scheme) or from projects which reduce emissions in non-Annex 1 economies under the Clean Development Mechanism (CDM), or in other Annex-1 countries under the JI.
- Only CDM Executive Board-accredited Certified Emission Reductions (CER) can be bought and sold in this manner. Under the aegis of the UN, Kyoto established this Bonn-based Clean Development Mechanism Executive Board to assess and approve projects ("CDM Projects") in Non-Annex 1 economies prior to awarding CERs. (A similar scheme called "Joint Implementation" or "JI" applies in transitional economies mainly covering the former Soviet Union and Eastern Europe).

### **Carbon Trading**

It is a system whereby countries or individual companies are set emission targets. Those that cannot meet their targets can buy credit from countries or companies that bear theirs. In economics, carbon trading is a form of emissions trading that allows a country to meet its carbon dioxide emissions reduction commitments, often to meet Kyoto Treaty requirements, in as low a cost as possible by utilizing the free market. It is a means of privatizing the public cost or societal cost of pollution by carbon dioxide.

Carbon trading is the term used for the trading of certificates representing various ways in which carbon-related emissions reduction targets might be met. Participants in carbon trading buy and sell contractual commitments or certificates that represent specified amounts of carbon-related emissions that either:

- are allowed to be emitted;
- comprise reductions in emissions (new technology, energy efficiency, renewable energy); or
- comprise offsets against emissions, such as carbon sequestration (capture of carbon in biomass).

People buy and sell such products because it is the most cost-effective way to achieve an overall reduction in the level of emissions, assuming that transaction costs involved in market participation are kept at reasonable levels. It is cost-effective because the entities that have achieved their own emission reduction target easily will be able to create emission reduction certificates "surplus" to their own requirements. These entities can sell those surpluses to other entities that would incur very high costs by seeking to achieve their emission reduction

requirement within their own business. Similarly, sellers of carbon sequestration provide entities with another alternative, namely offsetting their emissions against carbon sequestered in biomass.<sup>4</sup>

### **Legal aspect of carbon trading in India**

The Multi Commodity exchange started future trading in the year 2008 after Government of India recognized carbon credit as commodities on 4<sup>th</sup> of January. The National Commodity and Derivative Exchange by a notification and with due approval from Forward Market Commission (FMC) launched Carbon Credit future contract whose aim was to provide transparency to markets and help the producers to earn remuneration out of the environment projects.

Carbon credit in India is traded on NCDEX only as a future contract. Futures contract is a standardized contract between two parties to buy or sell a specified asset of standardized quantity and quality at a specified future date at a price agreed today (the futures price). The contracts are traded on a future exchange. These types of contracts are only applicable to goods which are in the form of movable property other than actionable claims, money and securities. Forward contracts in India are governed by the Indian Contract Act, of 1872.

Under the present provision of the Forward Contracts Regulation Act, the trading of forward contracts will be considered as void if no physical delivery is issued against these contracts. To rectify this The Forward Contracts (Regulation) Amendment Bill 2006 was introduced in the Indian Parliament. The Union Cabinet on January 25, 2008 approved the ordinance for amending the Forward Contracts (Regulation) Act, 1952. This ordinance has to be passed by the Parliament and is expected to come up for consideration this year. This Bill also amends the definition of 'forward contract' to include 'commodity derivatives'. Currently the definition only covers 'goods' that are physically deliverable. However a government notification on January 4<sup>th</sup> paved the way for future trading in CER by bringing carbon credit under the tradable commodities.

### **Benefits of carbon trading**

The benefits to the general public of trading emission reduction/offset certificates in a market include:

1. The reduction in overall cost of meeting emission reduction targets, as mentioned above;
2. The progressively improved definition of a "price" for carbon, particularly as the market becomes more liquid and active, and assuming that all carbon certificate products are fungible, meaning that they are equivalent ways of addressing emission reduction;
3. The opportunity to generate more income from activities that previously attracted no additional revenue, such as investment in emission reduction, renewable energy generation, greenhouse friendly fuels and carbon

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<sup>4</sup>. The Carbon Trade, BBC News, Thursday 20 April 2006.

sequestration.

4. The ability to use revenue from carbon sequestration to help fund additional planting of trees and other vegetation, for benefits such as salinity amelioration, biodiversity enhancement, conversion to greenhouse gas friendly fuels and energy, and employment and wealth creation in rural areas.

### **Carbon market: the regulatory instruments**

The emerging global carbon market is growing exponentially as states and countries around the world use the power of the “market’ to control greenhouse gas emissions. In the US, a voluntary market has sprung up to help provide a method to track these emission reductions for concerned individuals and businesses. Carbon offset and renewable energy credits typically represent investments in alternative energy enterprises, energy efficiency technology development and forestry- or agricultural-related (carbon sequestration) projects. Evolution Sage has made an organizational decision to only support projects that cut emissions directly, such as energy efficiency and renewable energy efforts.

Carbon Market refers to the buying and selling of emissions permits that have been either distributed by a regulatory body or generated by greenhouse gas emission reductions projects. Six greenhouse gases are generally included in “carbon: markets: carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydro fluorocarbons and perfluorocarbons. Carbon markets enable units of pollution to be converted into units of property, making it possible to exchange pollution from one place in the world with somewhere else. This leads to polluters having to decide between accepting the cost of added pollution, changing of fuel mixes or conserving of energy.

### **Examples of carbon trading in India**

#### **Jindal Vijaynagar Steel**

The Jindal Vijaynagar Steel has recently declared that by the next ten years it will be ready to sell \$225 million worth of saved carbon. This was made possible because their steel plant uses the Corex furnace technology which prevents 15 million tons of carbon from being discharged into the atmosphere.

#### **Powerguda in Andhra Pradesh**

The village in Andhra Pradesh was selling 147 tonnes equivalent of saved carbon dioxide credits. The company has made a claim of having saved 147 MT of CO<sub>2</sub>. This was done by extracting bio-diesel from 4500 Pongamia trees in their village.

#### **Handia Forest in Madhya Pradesh**

In Madhya Pradesh, it is estimated that 95 very poor rural villages would jointly earn at least US\$300,000 every year from carbon payments by restoring 10,000 hectares of degraded community forests.



## Conclusion

Carbon trading is an emerging concept which is strong tool for mitigating risks the globe is facing. Though some major pollutants are signatories to the Kyoto protocol, it would take efforts of other nations in building up a mechanism that ensures the temperature rise due to the GHG emissions being restricted to the envisaged 2 degree level. The flow of investments/ technology from develops countries to developing ones is aided by the unprecedented economic growth as witnessed in Asia. Such rapid growth at the cost of environment would put the future generations in jeopardy. Hence, developing nations like ours are better off accepting Voluntary Emission cut which would ensure their readiness to face compulsory cuts as and when they are imposed on them.

Carbon emission trading has been steadily increasing in recent years. According to World Bank's Carbon Finance Unit, a 374 million metric tons of carbon dioxide were exchanged through projects in 2005, a 240% increase relative to 2004 which was itself 41% increase relative to 2003.

Thus, Carbon Emission Trading can be seen as powerful tools in the hands of powerful nations to maintain economic superiority and make poor countries accountable for their inefficiencies which lead to a disparity in the concept of Carbon Emission Trading.

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