Carbon Credit and Carbon Trading in India: An Overview

Ashim Paul
Research Scholar, Department of Commerce
University of Calcutta
e-mail: ashim.paul06@gmail.com

Abstract : This paper modestly tries to explore an overview of carbon credit and carbon trading in India. The advent of the Kyoto Protocol (KP) on February 16th, 2005 has instigated a worldwide awareness to reduce Green House Gas (GHG) emissions. Since then, almost all the industrially developed and developing countries throughout the world have started considering this issue seriously and engaged themselves in formulating carbon emission standards and guidelines for controlling such harmful gas emissions. Being a developing one, India was not an exception to it and hence joined the race. Accordingly, the concepts of carbon credit and carbon trading have emerged from their efforts and been accepted worldwide as a sustainable solution to the problem concerned within a very short time span since its emergence. Therefore this paper aims at sketching the present scenario of carbon credit and carbon trading in India and identifying the future prospects of the same in India.

Key-words: Kyoto protocol, green house gases, clean development mechanism, emission reductions, carbon credit, carbon trading.

1. Introduction

Rapid industrialization is the outcome of modern civilization. Industrialization is undoubtedly necessary for the socio-economic development of a country but it should not be done at the cost of the environment. Fortunately, the profit seekers now have understood the true essence of environment within which they work, compete and keep their existence going. Therefore it is their duty to save the planet and maintain industrialization to an optimum level to keep the environment green and safe to avoid their extinction. There is no denying the fact that industrialization adds value to the society at large but simultaneously it is also true that its rapidity in recent times in search of higher growth and irresistible profit has caused frequent environmental hazards and has resulted into global warming, thereby possessing a serious threat to the environment. So appropriate measures have become necessary to control the ill-effects of industrialization and the Kyoto Protocol (KP) is perhaps the right step in this regard. It was initially adopted on 11th December, 1997 in Kyoto, Japan and had come into force on 16th February, 2005. It is mainly a protocol to the United Nations Framework Convention

on Climate Change (UNFCCC) to control global warming. It is an international accord for restricting Green House Gas (GHG) emissions between the member countries. GHGs are the main factors that result in global warming and massive changes in climatic situations, sea-water levels, bio-diversity etc. The KP prescribes measures to control the harmful effects to environment by limiting the following GHGs:

- *hydro-fluorocarbons* mainly arising from the filling of and leakage from refrigeration equipments;
- *carbon dioxide* causing about 50-60% of the global warming;
- *methane gas* mainly trapping heat in the atmosphere, and
- *sulphur-hexafluoride* being produced by the magnesium production industry, electrical and electronics manufacturers.

The above mentioned gases are the main factor that causes global warming and result in destruction of the environment. The KP restricts and controls emission of such GHGs by setting emission reduction targets for its member countries. Now in this context it becomes imperative to discuss a few words about the member countries of the KP. At present there are 192 member countries in this protocol. The member countries are divided into three categories based on the volume of carbon emission viz. Annex I countries, Annex II countries, and Non-Annex I countries. Annex I group includes the industrialized countries who were previously the members of the OECD (Organization for Economic Co-operation and Development) in 1992, and countries with Economies in Transition (EIT). Annex I countries are Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and United States of America. Annex II group is a further specification of the first group and consists of the OECD members of Annex I only and not the EIT countries. They are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States of America. This group is formed with an objective to provide financial assistances to the developing countries to help them to undertake emissions reduction activities under the Convention. The Non-Annex I group represents mostly the developing countries like India, China, Malaysia, Pakistan, Philippines etc. Countries belonging to this

group do not require to reduce emissions unless developed countries supply funding and technology for such purpose. The year 1990 is considered as the base year by the member countries of the UNFCCC (*vide decision 2/CP.3*) and they are supposed to reduce their carbon emissions in comparison to 1990's emission level. Since the KP aims at establishing an international agreement between the member countries to handle issues like global warming and GHG emissions, the member countries are devoted towards an average diminution of 5.2% of GHG emissions from 1990 levels by the year 2012. According to the agreement, Annex I countries must have to fulfil their task to reduce GHG emission within 2008–2012 and developing countries like China, India and Brazil which belong to the Non-Annex group are safe as far as their GHG emission level is concerned. The KP advocates three flexibility mechanisms to help the member countries in meeting their emission reduction agreements (*Bashmakov et al.., 2001, p. 402*). The flexibility mechanisms consist of International Emissions Trading (IET), the Clean Development Mechanism (CDM), and Joint Implementation (JI) projects. The CDM and JI are together called as project-based mechanisms because they help in generating and trading emission reductions from different projects through IET. On the other hand, the IET is called an allowance based mechanism as it is based on the setting of a quantitative restriction of emissions. According to the protocol, each member country should prepare a yearly report containing information regarding its GHG emissions by a "Designated National Authority" (DNA). The three flexible mechanisms work together and help the member countries of KP to reduce GHG emissions in the following way:

- IET allows countries that have extra units of emission reductions by emitting below their maximum limits, to sell that excess capacity to the countries that cross their emission targets or limits. Emission reduction transacted through the IET is called Assigned Amount Units (AAU).
- JI allows developed countries with an emission reduction or limitation commitment under the Kyoto Protocol to earn Emission Reduction Units (ERUs) from an emission-reduction or emission removal project in another developed country. It offers developed countries a flexible and cost-efficient means of fulfilling their Kyoto commitments.
- Emission reductions produced by the CDM are called Certified Emission Reductions (CERs). The CDM allows emission-reduction projects in developing countries to earn Certified Emission Reduction (CER). These CERs can be traded and sold, and used by industrialized countries to a meet a part of their emission reduction

targets under the KP. This mechanism can stimulate sustainable development and emission reductions, and give industrialized countries some flexibility in how they meet their emission reduction limitation targets as well.

Since the CDM allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits and sell CERs to the developed countries, developing nations can take advantage of this mechanism easily. A report by the Ministry of State for Environment and Forest, India, revealed that as of August 10 2010, out of the total 2313 registered CDM projects with the UNFCCC, 520 CDM projects got registered from India, which have the potential to generate 43 million CERs per annum that amount to approximately 12% of the total annual CERs generated by registered CDM projects globally. Now India's target is to achieve greater economic development, and therefore, its present concern is to switch over from agricultural dependency to industrialization. The problem is that a major portion of its total population still depends directly or indirectly on agriculture or agriculture based activities and this scenario does not match with the economic progress of the other developed countries like the US, France, Britain, Germany, Italy, Spain etc. But even then, India has a huge possibility to share a major portion of the global CDM projects as it stays below the maximum limit of carbon emission. Therefore, initiatives are to be taken. Fortunately, India has recently shown its willingness to participate in the international mitigation process of GHGs and carbon trading to give its own economy a boost. The National Action Plan adopted by the Indian government for increasing the usage of cleaner sources of energy is surely a positive step in this regard.

Accordingly, this paper aims at examining the concepts of carbon credit and carbon trading and their effects on Indian economy, their growth, future requirements and scope in India and hence making suggestions suitable for new business opportunities. The remainder of the paper is organized as follows. *Section 2* sketches the concepts of carbon credit and carbon trading. *Section 3* outlines the present Indian scenario relating to carbon credit and carbon trading. *Section 4* deals with the future prospects of carbon trading in India, while with conclusion in *section 5*, this paper completes the study of carbon credit and carbon trading from India's perspective.

2. Carbon Credit and Carbon Trading

This section discusses the concept of carbon credit and establishes the linkage between carbon credit and carbon trading through a hypothetical example.

The concept of carbon credits has been introduced in pursuance of an international policy to control GHG emission in environment. Carbon credit refers to the legal tradable certificates that permit the right to emit one ton of carbon or carbon dioxide equivalent. Credits are awarded to countries that have reduced their green house gases below their emission quota. Carbon credits can be traded in the international market at the prevailing market price. It helps in forming a strategic mindset that can influence industrial and commercial houses towards low carbon emissions into atmosphere and take advantage of carbon trading to sell their excess credits. Thus GHG control mechanism gives birth to carbon trading that can successfully encourage carbon reduction schemes among different industries and thus the concept of emitting carbon below the emission quota certainly helps many companies who are willing to sell excess carbon credits to commercial and individual customers. Industries can exchange, buy or sell carbon credits in national and international markets at the prevailing market price. According to a recent study report, India and China seem to emerge as the biggest sellers and Europe as the biggest buyer of carbon credits in near future. A company can reduce carbon emission by following new eco-friendly technologies which in return may help them to earn carbon credits. Developing nations --- India, China and some other Asian countries are now taking advantage of this process by joining into the United Nations Framework Convention on Climate Change. But the most important thing to be kept in mind is, whatever be the industry or wherever the industry is situated, if it comes under the KP's restriction, then it should take all possible measures to control the GHG emissions within the possible limits. If unable to do so, then it can purchase carbon credits through carbon trading.

So carbon trading refers to the means of generating income through sale of carbon credits. It generally helps the countries or industries which cross its maximum limits of carbon emission and need further carbon credits. Such industry(s) or country(s) can take advantage of carbon trading to buy extra units of CERs or carbon credits from the countries or industries that have already saved carbon credits in their pocket by emitting carbon below their maximum quota of carbon emission. Thus, carbon trading offers the facility of meeting the demand and supply gap of carbon credits. A simple example in this context will make the whole process more clear and understandable. For example, if country 'U's required carbon emission limit is 10 units and at price 'R' its production of carbon emission is 5 units, then it would have extra 5 units of carbon emission to sell. Now, at the same time if country 'P's generation of carbon emission at the same price exceeds its maximum level of carbon emission by 5 units, then through carbon trading country 'P' can purchase those required extra 5 units from country 'U' in exchange of the prevailing market price. Thus, this process of carbon

trading helps to reduce the total amount of carbon emission, making it profitable for both the concerned parties involved in such trading. Thus India, being a developing nation, can benefit from carbon credit and its trading in the following way:

- firstly, money from carbon credits generated through carbon trading can profitably be used to create renewable energy projects;
- secondly, energy saving initiatives can also be taken by proper usages of carbon credits, and
- thirdly, the advantages of carbon credits can also be seen in terms of generating employment for the people by setting up of industries which will engage in manufacturing of renewable energy products.

3. Present Scenario of Carbon Credit and Carbon Trading in India

It becomes imperative at this stage to examine the carbon credit and carbon trading arrangements prevailing in India presently. For the said purpose, this section is segmented into two parts— part (a) deals with the emergence and scope of carbon credit in India while the present Indian trends in carbon trading are discussed in part (b).

(a) Emergence and Scope of Carbon Credit in India

India belongs to the third category of signatories to UNFCCC. India signed and ratified the Protocol in August, 2002. Being a developing nation, India specifically belongs to Non-Annex category of countries of the KP and hence has taken initiatives in exploring the benefits of the CDM notably. According to a report on National Action Plan for operating CDM by the Planning Commission of India, India's total CO_2-equivalent emissions in 1990 were 10,01,352 Giga grams, which was nearly 3% of total global emissions at that time. The matter of concern is that, the more the deadline for meeting the KP targets becomes nearer for the first phase i.e. (2008-2012), the more the CER prices are expected to rise, as countries/companies become more interested in saving carbon credits to meet their future targets. Therefore, to take advantage of this situation India has to think of reducing its carbon emission further to save more carbon credits so as to indulge in carbon trading business more effectively. Being a non-Annex I country, India has already become successful in operating CDM. As per the report of the Prime Minister's Council on Climate Change, India has given host-country approval for 969 CDM projects as of June, 2008 and which included projects from renewable sector mainly. The 969 projects included 553 renewable biomass projects, 303 energy efficiency projects along with 6 forestry projects and 18 municipal solid waste projects. India now has two commodity exchanges trading in carbon credits namely, the

Multi Commodity Exchange (MCX) and the National Commodity and Derivatives Exchange (NCDEX). This means that Indian Companies can now get a better trading platform and price for CERs generated. The MCX is the largest commodity exchange in India and has launched futures trading in carbon credits in January, 2008. This initiative made it to be Asia's first-ever commodity exchange to offer trades in carbon credits. The NCDEX also followed the same path and started futures contract in carbon trading on and from 11th April, 2008. All these initiatives have made carbon trading a great business opportunity for India. Foreign companies which cannot fulfil the KP norms, can buy the extra required credits from Indian companies. Many national and international companies have already started investing into this business regime. As for example, SRF Ltd, Shell Trading International, Suzlon Energy and Shriram EPC, Shree Renuka Sugars etc. are all expected to derive benefit from saving carbon credits. Many Indian companies have started finding higher incomes in carbon credits than that from their nucleus businesses. Indian companies are getting interested in making eco-friendly projects to earn carbon credits. Due to the rapid growth in renewable energy projects, India's revenue from such projects is expected to rise largely. According to a survey conducted by Crisil, Indian RE projects are estimated to receive 246 million CERs by December, 2012. This will probably ensure India's second position in the global CER market as regards the volume of CER issuance and the number of projects registered with UNFCCC.

(b) Present Scenario of Carbon Trading and its Legal Aspects

A recent report of the World Bank conveys that India can be one of the largest beneficiaries of carbon trading as it controls almost 20-25 percent of the world carbon trade presently. Many developed as well as developing countries like the US, Germany, Japan and China are likely to be the biggest buyers of carbon credits and it is likely to be beneficial for India. Data collected from the report entitled *"Future of CDM Projects"* by Amulya Charan, chief mentor of TATA Power, suggests that India's dominance in carbon trading business is increasing day by day. The report reveals that till 2012, the total number of Indian CDM projects registered with UNFCCC is 942 and out of which 141 projects have got registered in the year 2012 and the number of CDM projects got registered during 2011, 2010, 2009, 2008 were 189, 138, 92, 84 respectively. Moreover, there are 104 CDM projects in pipeline and with all these India stands 2nd in terms of registered CDM projects with the UNFCCC presently. On the other hand, India's average annual CERs are presently expected to be approximately 12.6% of the global CERs. It certainly helps Indian industries to take part in the rapid growth of the carbon market. It is expected that India's gross earnings from carbon trading will be around Rs 22,500 crore to Rs 45,000 crore in the coming

3-5 years. India's carbon trading market bagged the second highest transacted volumes in the world by generating 30 million carbon credits in recent past. The carbon trading market in India is growing faster than even IT and other service industries. In the light of the above discussions, a few carbon trading companies/centres presently operating in India are listed in Exhibit 1 below.

Exhibit 1: A Few Carbon Trading Companies in India

Name of the Companies/Centres	Special Features
Jindal Vijaynagar Steel	Expected sale in next ten years is$225 million worth of saved carbon.
Powerguda in Andhra Pradesh	Currently selling 147 tonnes equivalent of saved carbon dioxide credits.
Handia Forest in Madhya Pradesh	Earn at least US$300,000 every year from carbon payments by restoring 10,000 hectares of degraded community forests.
Torrent Power AEC	Estimated amount receivable from 'Energy Efficiency Project' is Rs. 199.9 crore.
Indian Aluminium	Estimated amount receivable from 'Gas Capture Project' is Rs. 42.9 crore.
Kalpataru Power Transmission	Estimated amount receivable from 'Renewable Project' is Rs. 5.3 crore.
Grasim Industries	Estimated amount from 'Energy Efficiency Project' is Rs. 4.1 crore.
Balrampur Chini	Estimated amount receivable from 'Renewable Project' is Rs. 15.7 crore.

With two commodity exchanges, namely MCX and NCDEX, operating in carbon trading, India can bring greater transparency in the market operations and help the producers earn revenue out of carbon credit projects easily. But the dismal picture is that India is yet to

develop a proper and standardized trading policy for carbon credits. As a result, the amount of foreign exchanges that could have been earned by selling carbon credits to foreign buyers in recent past has not materialized as expected. Moreover, foreign exchange generation through carbon trading is restricted in India in some cases as some international buyers (e.g. European market buyers) are not allowed to take part in the Indian carbon trading market. It also hinders the Indian market from earning its expected revenues. Fortunately, Indian government has understood this problem and has taken steps to widen the market for carbon trading. Accordingly, Forward Contracts (Regulation) Amendment Bill has been passed in the Parliament on 2nd October, 2010. This amendment is expected to widen and open the Indian carbon market further in the near future and help the traders utilize NCDEX as a platform for trading of carbon credits more significantly.

4. Future Prospect of Carbon Trading in India

As one of the leading generators of CERs through CDM, India has a shining future in carbon emissions trading. Corporate participation seems to be increasing in carbon emissions trading in India also. Companies like Tata, Reliance, Ambuja, Birla, Bajaj and many others, are willing to earn some returns through CDM. This sudden growth in the carbon trading market has generated interests among the international carbon credit buyers to involve in India's carbon trading market. Days are not far when "carbon" would be considered as one of the most profitable commodities to be traded nationally or internationally. Now, there are two main concerns of the Indian industries and which must be settled immediately to reap profit in future: a) how carbon emissions can be reduced to gain more carbon credits? and b) how should these be accounted for? Companies are also facing difficulties in showing earnings from carbon trading in their taxable income statement as there is no specific head of income under which it should be considered. Therefore, most Indian companies show the earnings out of carbon credit trading as 'other income'. Only if the above mentioned issues get settled, India can derive the following benefits from carbon trading in near future:

- India can gain technological improvements as the World Bank in association with the Infrastructure Development Finance Company (IDFC) is likely to handle the carbon finance projects in the country;
- carbon trading will contribute to the GHG reduction projects by enabling India to adopt alternative sources of energy, and
- Indian companies can make profits by selling the CERs to the developed countries, and for encouraging them the IDBI has set up a Carbon Credit Desk (CCD), which is responsible for providing all the necessary services to promote CDM.

5. Conclusion

With growing consciousness among nations to limit industrial GHG pollution together with positive industrial growth, the emission trading seems to be the main area of business attraction today. Because of the continuous ratifications of the KP, carbon trading business is likely to emerge as the most profitable business of the modern world. The recent rise in carbon credit and its trading activities in developing countries like China, India etc. is an indication of how this industry is going to be successful in the years to come. Carbon trading occupies the fastest growing financial market in the world economy presently. As a developing nation, India has a large potential for GHG reduction and carbon trading business. According to the World Bank review, the market for carbon trading in India is emerging strongly in spite of various economic and non-economic limitations. In 2007, India pursed carbon trade valuing at US $64 billion and stood at the second position in the CDM project by capturing 6% market share. India ranks as the fourth largest emitter of GHGs in the world today. Its per capita emission of GHG is 1.2 tons per year. Though satisfactory, yet if India wants to realize its future target of economic growth and accelerate it further through carbon trading, it has to work hard. Therefore, proper policies need to be formulated and implemented to hold GHG emission in check to save more carbon credits to increase the volume of carbon trading.

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