



One of the most effective and innovative market based instruments for controlling the emission level is carbon credits. In this Article, the various aspects of carbon credits, its creation, marketability, usefulness and the procedure for trading have been discussed.

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Carbon Credits – Overall Perspective

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INTRODUCTION

Managing environment is one of the biggest issues these days and is a matter of serious concern for everyone. Environmental management is not just managing the environment but it's the management of human interaction in order to conserve the environment for the benefit of present and future generations. Initially, the environmental laws were perceived as one of the most effective tools for environmental management. However, protection of environment from degradation has not just remained a legal issue but has become a management issue as well. Different countries in the world have various environmental protection laws and the industries operating in these countries have to abide by these laws. It was thought that apart from compelling these companies to comply with these laws through Statutes, it would be appropriate if a new market based instrument, is developed, because that would further help to reduce emission of pollutants since the corporates would have to pay a price for polluting the environment. Tradable emission limits, eco-taxes, financial incentives like subsidies, taxes, price differentiation are some of the key instruments which are being effectively utilised in various countries for pollution abatement. [One of the most effective and innovative market based instruments for controlling the emission level is carbon credits.]

Need for reduction in carbon emissions

The need for reduction in carbon emissions was debated at the United Nations Conference on Environment & Development ("The Earth Summit") held at Rio de Janeiro in 1992 which resulted in the adoption of United Nations Framework Convention on Climate Change (UNFCCC), an international treaty on environment. The Kyoto Protocol, 1998, was adopted by the parties to the UNFCCC with the objective of achieving quantified emission reductions through specific policies and measures for minimising the adverse effects of climate change. India is also a party to UNFCCC.

The UNFCCC has divided countries into two broad groups. A total of 41 industrialised countries are currently listed with the convention, including the relatively wealthy industrialized countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992, plus countries whose economies are in transition (EITs) including the Russian Federation, the Baltic States and several Central and East European Countries. All other countries not listed in the Convention's Annexures, mostly the developing countries, are known as non-Annex-I countries.

Annex I countries such as USA, UK, Japan, New Zealand, Canada, Australia, Austria, Spain, France, Germany etc. have agreed to reduce their emissions (particularly carbon dioxide) to target levels below their 1990 emission levels. If they fail to do so, they are under obligation to buy carbon credits from the developing countries.

Developing countries (Non-Annex I) such as India, Sri Lanka, Afghanistan, China, Brazil, Iran, Kenya, Kuwait, Malaysia, Pakistan, Philippines, Saudi Arabia, Singapore, South Africa, UAE etc. have no immediate restrictions/ limits under the UNFCCC. This is beneficial to the

developing countries as it doesn't come in the way of growth of the developing countries. Moreover, they also get the money and advanced technologies from the developed countries to upgrade their infrastructure and industrial set up.

How the system works?

The Kyoto protocol provides for quantified reduction in emission limits and reduction commitment by the developed countries to achieve these targets. It lists six green house gases – Carbon Dioxide (CO₂), Methane(CH₄), Nitrous Oxide(N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur Hexafluoride (SF₆). India acceded to Kyoto Protocol in August, 2002. One of the objectives of the Protocol is to implement Clean Development Mechanism (CDM) projects, in accordance with national sustainable priorities, where under, a developed country can take up green house gas reduction project activities in developing countries to meet its obligations.

Further, the protocol has fixed 'caps' or 'quotas' that specify the maximum amount of green house gases that each participating country can emit. In turn these countries have set quotas on the emissions by the industrial units operating in their country, which are generically termed as 'operators'. Countries manage this through their own national 'registries', which are required to be validated and monitored for compliance by the UNFCCC. Each operator has an allowance of credits, where each credit unit gives the owner the right to emit one metric tonne of carbon dioxide or other equivalent green house gas.

Operators that have not fully used up their quotas can sell their unused allowances as carbon credits, while businesses in developed countries that are about to exceed their quotas can buy these extra allowances as credits, privately or in the open market. Thus, although the demand for energy would grow over a period of time, the total emissions would still stay within the "cap" thereby necessitating the corporates emitting more carbon dioxide etc. to buy equivalent number of carbon credits from energy efficient producers.

Thus, the system of carbon credits provides an effective way to reduce greenhouse gas emissions on an industrial scale by capping total annual emissions and letting the market assign a monetary value to any shortfall through trading. Credits can be exchanged between businesses through screen based trading in international markets.

What does 'Carbon Credit' mean?

Carbon Credits are a part of international emission trading norms. It is a permit that allows its holder to emit one tonne of carbon dioxide. The total annual emission limits are fixed and the market allocates a monetary value to any excess as well as reduction in carbon emissions. Credits are awarded to countries or groups that have reduced their Green House Gases (GHG) below their emission quota. Thus carbon credits incentivise companies or countries that emit less carbon dioxide.

The companies can exchange, buy or sell carbon credits in international markets at the prevailing market price. The rationale behind the introduction of carbon credits is to curtail the carbon dioxide emissions.

Clean Development Mechanism (CDMs)

CDM has been established pursuant to Article 12 of Kyoto Protocol as project based emission reduction activity in developing countries. CDM is designed to meet two main objectives:

- (a) to assist developed countries/parties in achieving compliance as part of their quantified emission limitation and reduction commitments under Article 3.
- (b) to assist the developing countries in achieving sustainable development thereby contributing to the ultimate objective of the Convention.

Each CDM activity project should meet the above objectives.

The project is eligible for CDM benefits if it results in net decrease in GHG emissions. For example, a company can get Carbon Credits (CERs) if it installs a waste heat recovery plant that saves energy, since usage of lesser fuel reduces the amount of carbon dioxide emitted in the atmosphere. However, if the project developer has to take up the activity because of any law, then such project is not eligible for the CDM benefits. For example, the public transport in New Delhi has been mandated by the Supreme Court to switch over from diesel to CNG. Hence, any vehicle now going in for fuel switchover is not eligible for the CDM benefit.

The predominant objective for adopting CDM is to bring about reduction in consumption of hydrocarbon fuels which leads to generation of GHGs. This reduction can be achieved by way of energy efficiency in industrial sector, energy efficiency in heat use / transportation of heat like installing efficient steam system, reducing steam leakages, fuel switch over from fossil fuels to renewable energy sources like biomass, solar energy, windmill, hydro power etc.

The CDM ensures that all investments are channeled into genuine sustainable carbon emission reduction schemes, through its internationally-agreed validation process. Genuine efforts are being made by the Western countries to reduce carbon emissions since every additional tonne of Carbon Dioxide generated by their manufacturing process is a drain on their cash flow and thus reduces profitability.

Operational Mechanism of CDM

The operational mechanism of CDM involves an investment by any entity belonging to a developed country that has adopted binding emissions targets in to the project of another country, which does not have limits of binding emissions. Such a project should result in emission reductions. The investment decision would include an agreement between the two parties and their

respective countries on the dispensation and transfer of the emission reductions resulting from the project. These emission reductions have to be certified by an appropriate authority (the CDM Executive Board, provided for under the protocol). After certification by CDM-Executive Board, these emission reductions are termed as “Certified Emission Reductions” (CERs, commonly known as “carbon credits” also). A “CER” is equal to one metric tonne of carbon dioxide. The emission reductions, which could not be a part of CDM project activities due to technical or some other constraints are known as Voluntary Emission Reductions (VERs).

1 CER or 1 VER refers to reduction in 1 tonne of CO₂, that would have been emitted in the normal scenario i.e. baseline for the project activity. The crediting period for a CDM project activity is the period for which reductions from the baseline are verified and certified by a designated operational entity for the purpose of issuance of Certified Emission Reductions (CERs). Project participants shall choose the starting date of a crediting period to be after the date the first emission reductions are generated by the CDM project activity. A crediting period shall not extend beyond the operational lifetime of the project activity.

Activities eligible for carbon credits

Some of the activities that are eligible for availing carbon credits include:-

1. Afforestation & reforestation Projects.
2. Agri-biomass based Energy Projects.
3. Bio-methanation: Power Generation route: Organic Fertilizer.
4. Energy Generation by controlled combustion.
5. Wastewater Projects: Methane Capture & Flaring: Organic Fertiliser.
6. Wastewater cum solid waste treatment; methane capture: power generation.
7. Avoidance of methane and nitrous oxide emission from paddy fields.
8. Household level biogas plants treating organic farmyard, Kitchen, and bio wastes.
9. Solar Energy.

The above list of activities is only an indicative list for the purpose of understanding the concept of carbon credits and not an exhaustive list.

CDM Methodology

A project has to pass through various stages as detailed below in order to become eligible for Certified Emission Reductions (CERs):-

Stage I: Preparation of Project Design Document (PDD) and Monitoring Plan :

The project Sponsor is required to develop a CDM Project Design Document (PDD) for the identified opportunities in the format approved by CDM Executive Board. This will also *inter alia* address the requirements of the Kyoto Protocol.

Stage II: Host country approval

The project proponents are required to submit a soft copy of the Project Concept Note (PCN) and Project Design Document (PDD) through online form and 20 hardcopies each of PCN and PDD along with two CDs containing all the information to:

The National CDM Authority [Designated National Authority (DNA)] Ministry of Environment and Forests Room No. 115, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi - 110 003.

The National CDM Authority examines the documents and if there are any preliminary queries the same are asked from the project proponents. The National CDM Authority then puts up the project proposals for consideration. The project proponent and his consultants are normally given about 10-15 times to give a brief presentation regarding their project. Once the members of Authority are satisfied, the Member-Secretary of the National CDM Authority issues the Host Country Approval (HCA).

Stage III: Validation

Validation is the process of independent evaluation of a project activity by a Designated Operational Entity (DOE) against the requirements of the CDM on the basis of the project design document. The project sponsor is required to appoint an independent third party for validation of the project. CDM-EB has approved certain entities e.g. DNV, TUV, SGS etc. as Designated Operating Entity (DOE) for undertaking validation of projects. The validation process also involves a public disclosure of the project for 30 days at the UNFCCC website. This is also organized by the validator.

Stage IV: Approval of Baseline Methodology by CDM-EB Panel

The project proposal must clearly and transparently describe the methodology for determination of baseline. It should fulfill the following criteria:

- Baseline should be precise, transparent, comparable and workable;
- It should avoid over-estimation;
- It should be homogeneous and reliable;
- Potential errors should be indicated;
- System boundaries should be clearly established;
- Intervals between updates of baselines should be clearly described;
- Role of externalities, (social, economic and environmental) should be brought out.
- Should include historic emission data-sets wherever available;
- Lifetime of project cycle should be clearly stated.

The project proponent could develop a new methodology for its project activity or could use one of the approved methodologies by the CDM Executive Board. For small-scale CDM projects, the project proponent can use simplified procedures. The project proposal should indicate the formulae used for calculating GHG offsets in the project and baseline scenario. Determination of

alternative project, which would have come up in absence of proposed CDM project activity should also be described.

In case a new baseline methodology is developed, the DOE shall submit the same to CDM-EB for review.

Stage V: Project Registration:

A validated project is required to be registered with CDM-EB of UNFCCC. Registration is the formal acceptance by the Executive Board of a validated project as a CDM project activity. Registration is a prerequisite for the verification, certification and issuance of CERs related to that project activity. This is usually the responsibility of the Designated Operating Entity. The project sponsor is required to pay the prescribed registration fee.

Stage VI: Monitoring and verification:

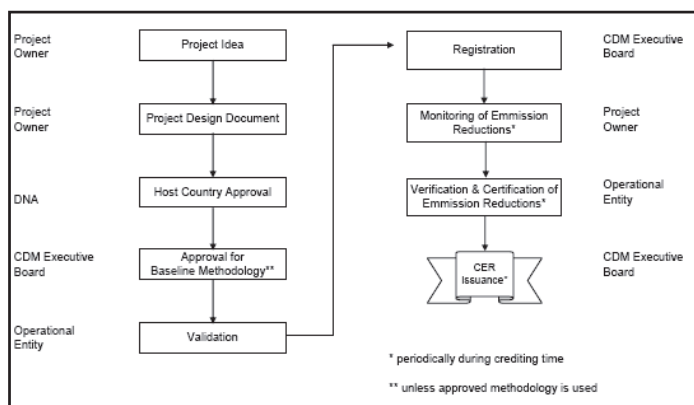
DOE conducts an audit of the project activity after its commissioning and its becoming operational, as per the approved monitoring and verification protocol (included in the PDD registered with CDM-EB) to estimate and certify the actual volume of Emission Reductions generated by the project activity. The sponsor may appropriately select a verification cycle i.e. annual, half yearly, quarterly etc.

Stage VII: Issuance of CERs:

After verification, the DOE has to submit a Certification Report to CDM-EB/Registrar, thereby requesting the Executive Board for issuance of CERs. The CERs are issued as per the allocation plan outlined to the CDM-EB at the time of Project Registration.

The chart below shows at a glance the process to be adopted under CDM Methodology in order to obtain CERs.

CDM Process



Costs involved in a CDM Project

The transaction costs while implementing CDM, generally comprise the following:-

- Consultancy fee of consultants for developing the CDM projects and preparation of necessary documents.
- Hiring Designated Operational Entity for Validation & Verification.
- Registration of the project with CDM-EB.

Apart from the CDM costs, 2% of the CERs issued are deducted towards adaptation fund by CDM-EB.

Trading of Carbon Credits

The CERs or carbon credits can be easily traded at the prevailing market price at international exchanges viz., Chicago Climate Exchange (CCX), CO₂ e Exchange, UK and the European Climate Exchange. Carbon credits trading can also take place in the open market. For trading purposes, one credit is considered equivalent to one tonne of emission of carbon dioxide.

Trading of Carbon Credits at MCX

It is glad to note that India has come at the centre stage of the Carbon Credit Trading market as Multi Commodity Exchange of India Ltd (MCX) entered into an alliance with the Chicago Climate Exchange in 2005 to introduce carbon credit trading in India. MCX launched futures trading in carbon credits w.e.f. 21st January, 2008. MCX has become the first commodity exchange in Asia to trade in carbon credit futures.


The lot size for trading in CER at MCX is 250 CERs and the closing price of each unit of CER as on 8th October, 2009 was Rs. 943. Thus it can be seen that the price of CER at MCX is more or less at par with the International price, which hovers between Euro 13 to 14 per CER.

The basic advantage of electronic trading of CERs is that price is more likely to be perceived as true and fair by those paying it, as the price of carbon credit is determined by the market forces.

Indian Scenario

India has emerged as world leader in reduction of greenhouse gases by adopting Clean Development Mechanism (CDMs) over the past few years. Indian companies have successfully encashed the opportunity thrown open by the Kyoto Protocol. SRF Limited has emerged as the largest earner of carbon credits. The Chemicals and Polymers Business of SRF Ltd derives substantial revenue from the sale of CERs generated by destruction of the green house gas, Hydrofluorocarbon-23 (HFC-23). Other companies like Jindal Stainless Ltd., Essar Steel Ltd., Hyderabad Chemicals Ltd., Paschim Hydro Energy Pvt. Ltd., The Andhra Pradesh Paper Mills Ltd have also availed the benefits from carbon credits.

Further, companies in Cement sector have also started availing the benefit of carbon credits. The CDM-EB has issued 103382 CERs in July, 2008 to HeidelbergCement India Limited for its cement unit situated at Ammasandra (Karnataka) for the period from 1st January, 2001 to 31st December, 2006. In the instant case, the CDM project resulted from the increase in use of "Slag" (which is a by-product of Steel). The use of Slag leads to reduction in usage of clinker in manufacture of each tonne of cement. Accordingly, the coal burnt to convert limestone into clinker was considerably reduced resulting in reduction in carbon emissions.



The company earned revenue of Rs. 1175.62 lakhs through sale of these CERs. Similarly, the Annual Report of India Cements Ltd (ICL) for the financial year ended 31st March, 2008, states that the Waste Heat Recovery System at its cement plant of ICL at Vishnupuram, (Andhra Pradesh) is an approved CDM project. During the said year, the company sold 106300 Verified Emission Reductions (VERs) relating to the period prior to the registration with UNFCCC earning a revenue of Rs. 264 lakhs. The company has also earned 47550 Certified Emission Reductions (CERs) relating to the operations of the said plant.

The Indian market is extremely receptive to CDM. Having cornered more than one half of the total global trade in Certified Emission Reductions (CERs), India's dominance in carbon trading is beginning to influence business dynamics in the country. According to the statistics, out of the total projects sanctioned, UNFCCC has registered highest number of projects from India. More than half of the total CERs issued globally so far by CDM-EB have been issued to the Indian companies. At the global level, Asia is the largest generator and supplier of CERs, followed by Latin America. Five countries (India, Brazil, China, Indonesia and Romania) represent two-thirds of the total supply of CERs.

Small and medium enterprises (SMEs) in India have huge potential to tap carbon credit market. Even without getting carbon credits, SMEs stand to gain from implementation of CDM as it would considerably reduce their costs towards consumption of fuels through energy efficient methods. Some of the sectors where SMEs could benefit by applying CDM are Hand tools, Textiles, Foundry & Forging, Steel Re-rolling, Brick Manufacturing, Lime Industry, Ceramics, Biomass co-generation and wind energy.

Conclusion

Carbon Dioxide, which is produced by combustion of fuels, has become a cause of global panic as its concentration in the earth's atmosphere has been rising alarmingly leading to green house effect and global warming. Thus, it has become utmost necessary to reduce carbon emissions by whatever means possible. In view of this the steps taken under Kyoto Protocol are laudable. On the one hand such measures are helping in reduction of carbon emissions thereby making the world a better and safe place to live in and on the other hand these measures are bridging the gap between the developed and developing countries as the developed economies have to purchase CERs from the developing economies. □