

## CARBON TRADING-A NEW MANTRA IN FINANCIAL SERVICES

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### ABSTRACT

*Droughts, Hurricanes, Rising temperatures and Melting glaciers.... the much talked about words in the present scenario, have become widespread in the universe. But countries all over the world are trying to en-cash these crazy weather happenings. Amidst all this, global warming has emerged as a major market-moving force representing a generational shift likely to influence how people invest for decades. With the continuous increase in the climatic risk, the business houses are focusing on creating returns from the same. Throughout the world, financial service firms have initiated investing massive amounts of time and brainpower trying to discover what stocks and sectors will benefit — and be hurt — by changes in Earth's weather patterns. The financial service industry, always known for coming out with innovative tools for investment, is trying to hedge this climatic risk by introducing a new innovative mechanism popularly known as Carbon Trading.*

**Keyword:** Carbon credit, Carbon trading, Green House Gas (GHG), Certified Emission Reduction (CER).

### INTRODUCTION

Climate change, one of the major concerns in today's world, is being attributed to the enhancement of the greenhouse effect. Certain naturally occurring gases such as Carbon dioxide (CO<sub>2</sub>) trap the sun's heat to keep the earth warm and habitable, called as greenhouse gases (GHG) and the process of heat entrapment is the greenhouse effect. Major green house gases are, CO<sub>2</sub>, Methane, Nitrous Oxide, Hydrofluorocarbons, Perfluorocarbons and Sulphur Hexafluoride. However, over the last 100 years, large-scale industrial development has raised the level of these gases in earth's atmosphere resulting in global warming causing dramatic climate changes such as melting of glaciers, rise in sea levels, frequent hurricane activity, and prolonged droughts, floods and like. The weather disturbance impact is so wide that not only the natural environment is disturbed resulting in impact on human's health but also industries

worldwide in terms of financial impact. Global warming is likely to be one of those forces that can change the face of economic landscape. Majority researchers believe that investors don't bother about the fact that global warming is real or if greenhouse gases are to blame, what bothered them is if consumers, regulators, governments and corporations "react to the perceived threat." This ideology creates investment opportunities with risks and the analysts worldwide are working on finding the climatic consequences in order to position profit from changing weather.

Many companies are becoming increasingly aware that climate is closely tied to profits. Investors are always looking for new asset classes and investment alternatives to diversify their portfolios. In this background, the Chicago Mercantile Exchange (CME) has come up with weather-related product lineup and plans to create new markets. These options and futures enable insurance, energy and utility companies to hedge potential losses related to weather. Similarly, the CME recently launched "hurricane contracts" that enable insurers to transfer risk to financial markets. There are various markets that trade in different financial asset classes such as, shares, debentures, loans, foreign currencies and their derivatives. There is however a new kid on the block known as "Carbon Credits."

### **CARBON TRADING: A GENESIS**

The business of carbon trading has an entrepreneurial tinge to Richard Sandor, a research professor at the Kellogg Graduate School of Management at Northwestern University, USA, is known as father of carbon trading, who pioneered the idea of market-based solution to environmental problems. He founded the Chicago Climate Exchange (CCX), which is a self-regulatory exchange that administers the world's first and North America's only multi-national and multi-sector marketplace for trading greenhouse gas emissions.

United Nations Organisation, took the initiative to practice carbon trading by signing Kyoto protocol on 11 December 1997 that came into force from 16 December 2005 and thus setting a new landmark in the financial services market. The Kyoto protocol aims to tackle global warming by setting target levels for nations to reduce greenhouse gas emission worldwide. It is an amendment to the United Nations Framework Convention on Climate Change (UNFCCC), an international treaty on global warming. Countries which ratify this protocol commit to reduce their emissions of carbon dioxide and five other greenhouse gases, or engage in emissions trading if they maintain or increase emissions of these gases. The maximum amount of emissions (measured as the equivalent in carbon dioxide) that a party country may emit over the commitment period in order to comply with its emissions target is known as a Party's assigned amount. The Protocol includes provisions for the review of its commitments, so that these can be strengthened over time. Under the protocol, initial target was to reduce greenhouse gas emission to 5.2 per cent below 1990 base level. The targets cover emissions of the six main greenhouse gases, namely: Carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous oxide (N<sub>2</sub>O), Hydrofluorocarbons (HFCs), Per fluorocarbons (PFCs) and Sulphur hexafluoride (SF<sub>6</sub>).

Carbon trading or Emission trading can be defined as a commercialised activity that originates from protecting the earth from harmful emission of gases from industries. It is the term applied to the trading of certificates representing various ways in which carbon-related emissions reduction targets might be met. Emission trading is seen as a market based system that provides companies with the flexibility to meet their environmental goals at lowest cost and encourages innovation and development of low-cost techniques to reduce emission. The

concept of carbon credit is that of providing incentives to the units which pollute less and giving disincentives to the units that pollute more.

The objective behind introducing carbon trading was to reduce pollution in the atmosphere but in the most cost effective way. Instead of governments trying to achieve this objective through fiscal measures such as taxation, it was realized that the market mechanism would achieve better results with lesser cost to the consumer. The free play of the forces of demand and supply was expected to ensure that the price to achieve the objective was just right. In effect, the industries that emit greenhouse gases pay a price and those that initiate activities that contain emissions reap incentives. Trading in carbon credits at the market price would achieve both these ends at an efficient economic price.

Carbon market can be defined as market place that involves an entity preparing a contractual agreement describing and specifying the kind of activity undertaken to reduce or offset carbon emission. An offset in principle, is created when someone takes action to reduce emission below the accepted level, and gets reduction in emissions documented in an appropriate manner. An offset is distinct from a typical emission allowance, which is usually seen as the amount of emission an entity is allowed to emit under government regulation. All types of carbon are not tradable. There is still debate on what is tradable. To deal with uncertainty, some practices are discounted. Tradable units might be achieved through the following practices:

- a. Capture methane from a waste lagoon/anaerobic digester and destroy it with a flare, for heat, or for generating electricity.
- b. Practice no-till to sequester carbon on large acreage.
- c. Reduce nitrogen application to reduce nitrous oxide emissions and energy.
- d. Practice Timber Stand Improvement in woodlands to sequester carbon in trees.
- e. Supply an energy processor with wood chips, grass for pellets, oilseeds for biodiesel, etc. to displace fossil fuels.
- f. Make significant improvements in efficiency, thus reducing energy use.
- g. Use wind, solar or geothermal energy sources to displace fossil fuel use.

The applicability of this concept is not only limited to manufacturing companies but also the services firms. Various corporations like Ford and Motorola; municipalities such as Oakland and Chicago; educational institutions such as Tufts University and the University of Minnesota; farmers and their organizations such as the National Farmers Union and the Iowa Farm Bureau are actively involved in carbon trading. The corporate behemoths like General Electric, DuPont, Johnson & Johnson and others have come together to form the United States Climate Action Partnership. Even oil companies like Shell and Conoco Phillips have joined this coalition. Number of organisations has established recently as CO<sub>2</sub> exchanges that organise and facilitate international trade like the European Climate Exchange (ECX), Nordic Power Exchange (NordPool) in Norway, the European Energy Exchange (EEX) in Germany, BlueNext in France and the Energy Exchange in Austria (EEXA). Likewise, several associations have developed master agreements for emission trading e.g., the International

Emissions Trading Association (IETA), the International Swaps and Derivatives Association (ISDA) and the European Federation of Energy Traders (EFET).

### EMISSION/CARBON TRADING MECHANISM

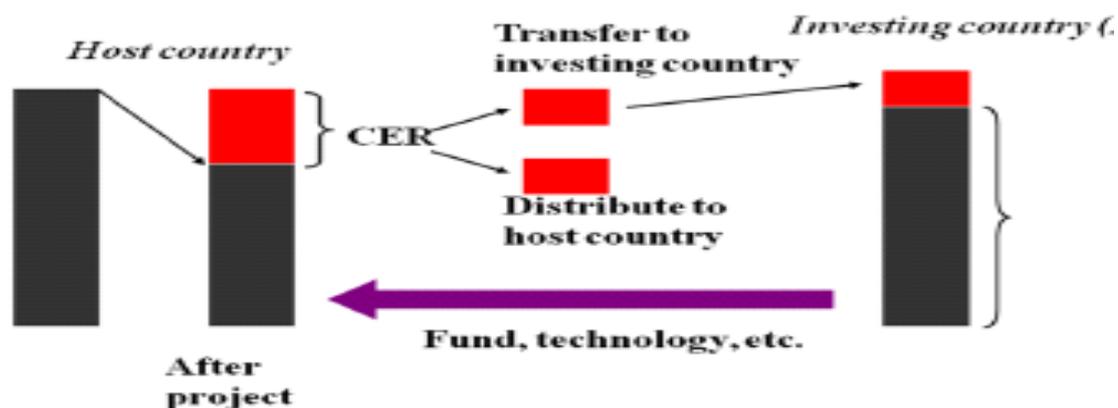
The process of carbon trading includes a central authority which fixes the limit of the amount of a pollutant that can be emitted, which becomes the permit of pollutants to be allowed into the environment. This permit is devised into several smaller units and distributed to several companies in the form of permit or credit or allowance, which gives licenses to emit a fix amount of pollutant into the environment.

Carbon credit, as defined by Kyoto protocol, is one metric tonne of carbon emitted by burning of fossil fuels. The GWP (Global Warming Potential) factors are used to convert each of the five gases (like methane) that are not CO<sub>2</sub> into tonnes of CO<sub>2</sub> equivalent (CO<sub>2</sub>E), which is the standard of trading. On this basis, participants engaged in carbon trading buy and sell contractual commitments or certificates that represent specified amounts of carbon-related emissions.

Now if a company, say, XYZ, is able to emit only eight units of greenhouse gases out of 10 units allotted to it, then XYZ will be having two units of emission as 'credit outstanding' in its 'pollution' account. On the other side, if a company say ABC emits 12 units instead of 10 units allotted to it then ABC will be having two units of 'debit balance' in its pollution account. Now XYZ will be able to transfer its two 'credit balance' to two debit balance account of ABC. So both the companies' pollution account will be matched and the environment also is able to digest a certain scientifically fixed amount of pollutants. This transfer from XYZ to ABC will be for some monetary consideration and hence it is referred as carbon trading.

To bring the buyers and sellers of carbon trading on one platform and to augment the process of carbon trading, carbon credits are traded at CO<sub>2</sub>E exchange in Britain, CDM (Clean Development Mechanism) exchange in Europe. In India recently, MCE (Multi Commodity Exchange) has announced carbon trading exchange with license agreement from Chicago Climate Exchange. Like the usual stock exchange, carbon credits have all spot transactions, forward settlement and options of trading.

**FIGURE 1: CARBON TRADING MECHANISM**



Source: [http://assets.wwfindia.org/downloads/cdp2009\\_1.pdf](http://assets.wwfindia.org/downloads/cdp2009_1.pdf)

Let us say that India decided to invest in a new power station, and has decided on a particular technology at the cost of X crore. An entity from an industrialised country (which could even be a company) offers to provide India with slightly better technology, which costs more (say Y crore), but will result in lower emissions. The industrialised country will only pay the incremental cost of the project – viz. Y minus X. In return, the investing country will get certified emission reductions (CERs), or credits, which it can use to meet its Kyoto commitments. Thus, results in good investment opportunity.

The World Bank has also purchased CERs from 10 companies. Tata Steel, HLL, Jindal Vijaynagar Steel, Essar Power and Gujarat Flurochemicals Ltd have specially designed projects to take advantage of the opportunity. Bharat Heavy Electricals Ltd is the only public sector firm which is planning to approach the ministry for approval. The projects range from cement, steel, biomass power, municipal solid waste to energy, municipal water pumping and natural gas power. Of the 15 projects approved by the UNFCCC so far, four are Indian. These four are: Gujarat Flurochemicals, Kalpataru Power Transmission Ltd, the Clarion power project in Rajasthan and the Dehar power project in Himachal Pradesh. India is the world's sixth largest emitter of carbon dioxide with its present share in global emissions estimated at 6 per cent.

Pricing in carbon market depends on the characteristics of individual markets which include the following:

- International and domestic policy
- Recognition of monitoring and verification protocols
- Recognition of early credit
- Expected versus actual allocation of carbon emission
- Project, financial and operational risk
- Sustainability issues and social impact of underlying project

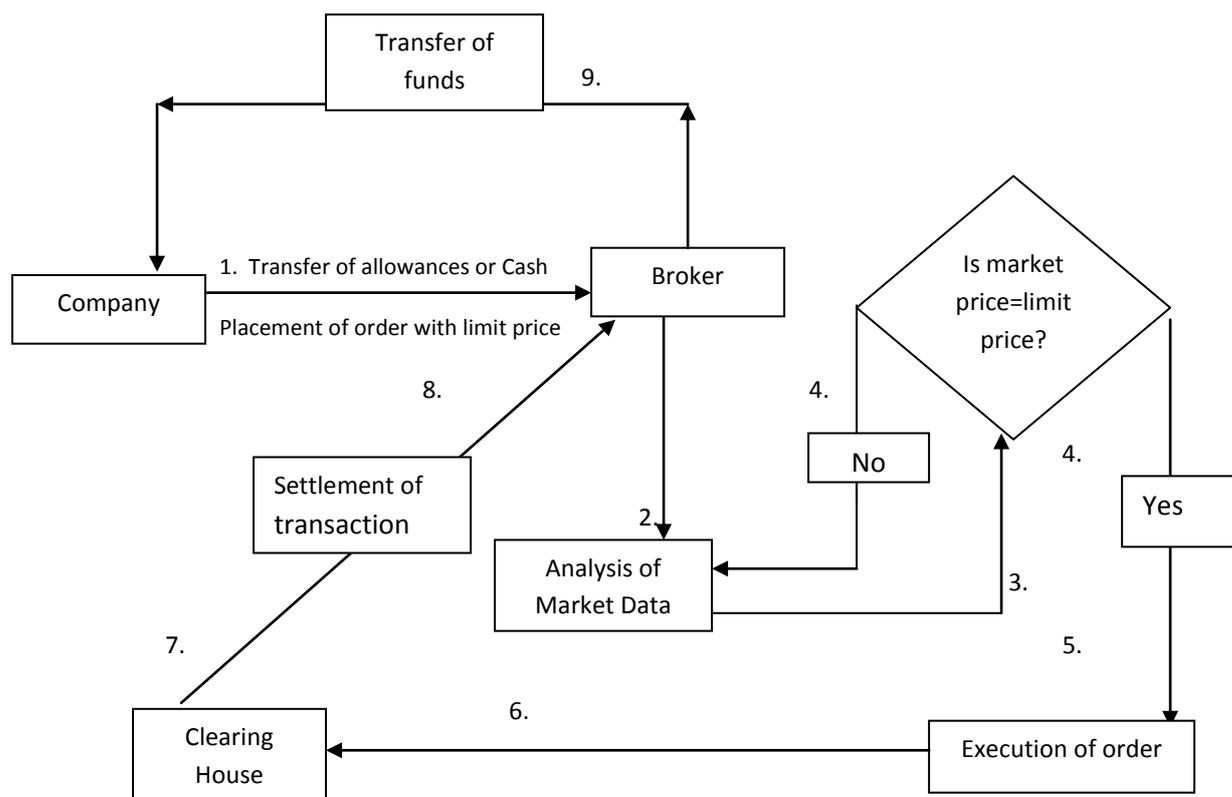
### **APPROACHES TO CARBON TRADING**

There are two approaches to carbon trading namely: baseline- and –credit approach and cap-and-trade approach. The baseline-and-credit regimes, a voluntary approach, do not set a fixed absolute cap on the emissions from the sectors covered by the regime, but the regulator has a complete target in mind when setting the relative target. The relative target is usually placed through defining a baseline, which is expressed in the emission efficiency in relation to the activity of the source, measured in weight per unit of input, output or activity. The same baseline used can be applied to a wide range of similar installations. Under this regime, installations that can reduce their emissions lower than the market price of allowances, are permitted to obtain allowances which can be traded. Conversely, installations whose emissions are more expensive than the market value can maintain or increase their emission by buying additional allowance from the market. This approach allocates allowances when a source or installation demonstrates its capabilities to perform better than its baseline. Low cost carbon emitters are not obliged to create carbon credits, and high cost carbon emitters are not compelled to purchase carbon credits. In essence, the efficiency gains created by the

tradable permit systems provide the necessary incentives for voluntary participation by firms/installations.

In a cap-and-trade scheme, the situation differs from that as described by the baseline-and-credit regime. The polluting industries, are given a certain number of allowances, Certified Emission Reductions (CERs), each representing 1 metric ton of CO<sub>2</sub> on the basis of historic data and their capacities of production,. This is the cap beyond which the respective entity cannot release pollution into the environment during a specified period. If the pollution exceeds the allowance given, the entity would be forced to either buy appropriate number of such allowance from the open market or to pay hefty fines. Offsetting activities such as planting forests that trap carbon would be entitled to credits which could also be traded. The buyers in the trade are primarily made up of entities that exceed their cap and the sellers primarily by those able to reduce their pollution below the cap and have spare allowances to sell as well as those entities that involve in activities that trap carbon. If a polluting industry find its operation unviable due to the high cost of purchasing additional credits, less polluting technology, although more expensive, might become viable for it to migrate to. Non-governmental organizations that wish to reduce pollution could also buy up the credits from the market, thus reducing the supply, to make it more expensive for the polluters. Thus the carbon trading mechanism is built to automatically reduce pollution over time. The trade in carbon credit is made through a broker:

**FIGURE 2: CAP AND TRADE MECHANISM**



1. The company transfers its allowances, (or cash if it is for purchase) to the holding account of the broker. The company places the order for purchase or sale and provides a limit price and the volume to be traded.
2. The broker collects and analyze the market and evaluate the carbon trading market condition.
3. The broker will compare the market price with the limit price.
4. If the market price reaches the limit set, the broker executes the trade. In case the price doesn't match with the limit price, the broker will again evaluate the carbon trading market. The company can change the instructions any time before the trade is matched and accepted.
5. The orders matching the decision criterion will be executed.
6. After orders are matched, the clearing house of the CO2 exchange clears the transaction.
7. The clearing house settles the transaction.
8. The purchase price (or the allowances) will be transferred to the broker's account.
9. After the receipt of funds or the allowances from the clearing house the broker will transfer the purchase price reduced by the brokerage fee (or the allowances) to the Principal's bank account (or holding account).

## **BENEFITS**

The phenomenal benefits of carbon trading is not only limited to reduction of global warming but also extends to the companies as well. Most of the beneficiaries of the carbon trading are those companies that are investing in Windmills, Biodiesel, Biogas. Companies like Torrent Power, Chennai Petroleum, Jaypee Associates, Grasim Industries, and Gujarat Fluoro Chemicals are expected to make huge profits through carbon trading.

Companies that produce clean energy will be profiting on two fronts; they'll be selling their power and the carbon credits they acquire while making it. As the demand increases for carbon credits, many companies are coming on the scene that specializes in reducing emissions. These are companies that help reduce the overall emissions of a variety of businesses like farms, factories, and utilities and also not only get premium consulting fees, but a portion of the carbon credit proceeds, as well.

Emission trading also helps the companies in achieving economical means of overall carbon reductions. Besides helping in environment protection, the companies who are able to prove themselves as environmentally concern organization in terms of lesser emission of carbon are able to generate emission reduction certificates that can be sold to the carbon emitting organizations, thus increasing the former's revenue.

## **CARBON MARKET POTENTIAL - WHAT THE FUTURE HOLDS?**

Carbon trading is one of the fastest-growing specialties in financial services. Carbon will be the world's biggest commodity market. The companies are scrambling to get a slice of market which presently, is of about 100 billion and is expected to grow to \$1 trillion within a decade. And the number will continue to grow, as developing nations demand more energy that will likely be produced by coal and other carbon heavy sources of fuel. As more international governments start to regulate their country's emissions, and as more companies start to voluntarily limit their emissions, the demand for available carbon credits will skyrocket. And so will their price.

The governments all over the world have begin to cap carbon emissions and initiate trading schemes, thus, necessitating a need for regulatory bodies that can measure and confirm reduced emissions. This scenario will further augment the need of new instruments and technologies. India is no exception in carbon market. According to World Bank estimates, India is expected to collect \$100 million annually by trading in carbon credits and greenhouse gas emissions are expected to come down by 2.5 billion tonne by 2012. Indian companies are also expected to corner at least 10 per cent of the global market in the initial years.

## **CONCLUSION**

Carbon trading though new on Indian bourses is on a roller-coaster offering huge profit potential. For the system of carbon trading to achieve its objective, highly accurate measurement and estimation methods are required - to measure emissions, to estimate the effectiveness of alternate technologies. To what extent the system would actually reduce the global warming is yet to be seen. However, we may not have the time to save ourselves from the brink of extinction if we were to wait for the perfect system. Carbon trading appears a reasonable beginning in the right direction.

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