CARBON TRADING–THE FUTURE MONEY VENTURE FOR INDIA

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ABSTRACT

Carbon trading is a advances 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 utilise 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 CO₂ equivalent or CO₂. Currently, future contracts in carbon credits are actively traded in European Exchanges(ECX). The European Union Emission Trading Scheme(EU ETS) is the largest multinational, greenhouse emissions scheme in the world and is committed to reduce 8% 1990 levels of emission in 2008-2012. Carbon Development Mechanism(CDM) is another trading project which is administered by the CDM executive which reports and is accountable to the Conference of Parties(COP) Carbon Trading In India: Though we are potentially the largest market for carbon credits on the MCX, we still need to implement proper policies to allow trading of certified emission reductions (CERs), carbon credit. To increase the market for carbon trading Forward Contracts (Regulation) Amendment Bill has been introduced in the Parliament. Thus we see that Carbon Trading is definitely the “Greenest” pastures for business trading for the small and large scale private and governmental sectors in India with opportunities for everyone. So, in this paper we have reviewed and put forward the technologies and market standards that we can set so that the concept of carbon trading can have its roots in India too.

Keyword: Carbon Permits, Kyoto Protocol, Carbon Development Mechanism (CDM), Carbon Footprint. Carbon trading in India

I. INTRODUCTION

Increase in GHGs mostly the Carbon dioxide is the serious problem of the era. The problem with humans contributing so much carbon dioxide is that Earth's natural system is overwhelmed and can't keep up with the rate of our CO₂ release. The natural carbon cycle is disrupted and Earth's carbon 'sinks' or places that carbon can be safely absorbed are either diminishing or saturated. The terms 'Global Warming' and 'Climate Change', describes what is happening...!! Global economic growth is driving higher carbon dioxide emissions and we really must manage the tremendous amounts of carbon dioxide we are emitting.
Carbon emissions trading is a form of emissions trading that specifically targets carbon dioxide calculated in tonnes of carbon equivalent or tCO$_2$e and it currently constitutes the bulk of emissions trading.

Figure: Carbon Emission % in few important business countries

This form of permit trading is a common method countries utilize in order to meet the obligations specified by Kyoto Protocol; namely the reduction of the carbon emissions in an attempt to mitigate the future climate change. Emission trading works by setting a quantitative limit on emissions produced by emitters.

II. KYOTO PROTOCOL: United Nations Framework Convention on Climate Change

In response to the global warming crisis, in Rio de Janeiro of Brazil, the 1992 UN Conference on the Environmental and Development clearly raised the concept of “sustainable development”. Through this conference more than 150 countries had established “United Nations Framework Convention on Climate Change”, which was called UNFCCC for short. UNFCCC is the first convention to take full control of greenhouse gas emissions including Carbon dioxide discharge, and is an international convention to fight global warming which causing a lot of and adverse effect to the development of society and economy. After that, in December 1997, the third Conference of the Parties (COP) under the UNFCCC held in Kyoto of Japan, which aimed at limiting carbon emissions in developed countries. In this way, we can curb global warming. The conference ended with an agreement of “Kyoto Protocol”. The Protocol took formal effect in February 16$^{th}$2005. “Kyoto Protocol” is internationally binding and enforceable agreements that will encourage countries to reduce greenhouse gas emissions. The Kyoto Protocol has introduced ground breaking concepts on carbon credits, carbon footprint and emissions trading.
Annex - I Countries:
United States of America, United Kingdom, Japan, New Zealand, Canada, Australia, Austria, Spain, France, and Germany etc. agree to reduce their emissions (particularly carbon dioxide) to target levels below their 1990 emissions levels. A total of 41 industrialized countries are currently listed in the Convention’s Annex-1 including the relatively wealthy industrialized countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992, plus countries with economies in transition (EITs), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

Annex II Countries:
Annex II countries are a sub-group of the Annex I countries. Developed countries which pay for costs of developing countries if they cannot reduce their emissions, they must buy emission credits from developing countries or invest in conservation are included in this category. Countries like United States of America, United Kingdom, Japan, Newzealand, Canada, Australia, Austria, Spain etc are also included in Annex-II.

<table>
<thead>
<tr>
<th>GROUP CO2 EMISSIONS</th>
<th>TOTAL CO2 EMISSIONS</th>
<th>POPULATION</th>
<th>PER CAPITA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANNEX-1 COUNTRIES</td>
<td>38</td>
<td>14,183</td>
<td>1,261</td>
</tr>
<tr>
<td>NON ANNEX-1 COUNTRIES</td>
<td>99</td>
<td>11,938</td>
<td>4,952</td>
</tr>
<tr>
<td>AGA (American Go Association)</td>
<td>27</td>
<td>7,868</td>
<td>1,636</td>
</tr>
<tr>
<td>BGA (British Go Association)</td>
<td>72</td>
<td>4,070</td>
<td>3,317</td>
</tr>
<tr>
<td>GLOBAL AVERAGE</td>
<td>137</td>
<td>26,121</td>
<td>6,213</td>
</tr>
</tbody>
</table>


This serves three purposes:

a) Avoids restrictions on growth because pollution is strongly linked to industrial growth, and developing economies can potentially grow very fast.

b) It means that they cannot sell emissions credits to industrialized nations to permit those nations to over-pollute.

c) They get money and technologies from the developed countries in Annex II.

Non Annex I countries:
Developing countries such as India, Srilanka, Afghanistan, China, Brazil, Iran, Kenya, Kuwait, Malaysia, Pakistan, Phillippines, Saudi Arabia, Singapore, South Africa, UAE etc. Developing countries have no immediate restrictions under the UNFCCC.

Table: Metric Tons of Carbon Emissions in world during 2007

<table>
<thead>
<tr>
<th>Host country</th>
<th>Number of projects</th>
<th>Estimated Emission Reduction (ktCO2e/year)</th>
<th>Average project size (ktCO2e/year)</th>
<th>Technology Transfer Claims as percent of Number of projects</th>
<th>Annual Emission Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>226</td>
<td>24,491</td>
<td>108</td>
<td>32%</td>
<td>68%</td>
</tr>
<tr>
<td>China</td>
<td>671</td>
<td>203,184</td>
<td>303</td>
<td>37%</td>
<td>68%</td>
</tr>
<tr>
<td>India</td>
<td>716</td>
<td>55,248</td>
<td>77</td>
<td>14%</td>
<td>40%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>56</td>
<td>8,782</td>
<td>157</td>
<td>71%</td>
<td>87%</td>
</tr>
<tr>
<td>Mexico</td>
<td>171</td>
<td>11,878</td>
<td>69</td>
<td>91%</td>
<td>87%</td>
</tr>
<tr>
<td>South Korea</td>
<td>34</td>
<td>16,692</td>
<td>491</td>
<td>50%</td>
<td>81%</td>
</tr>
<tr>
<td>Other host country</td>
<td>419</td>
<td>55,740</td>
<td>133</td>
<td>60%</td>
<td>58%</td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>376,015</td>
<td>164</td>
<td>57%</td>
<td>64%</td>
</tr>
</tbody>
</table>

III. CARBON EMISSIONS TRADING

It is relatively a new market and has traded a bit at minor levels, in the OTC market since the 1990s. Recent developments in this
A vibrant market is due to significant global governmental involvement which has facilitated the tremendous growth for carbon emission trading since 1997 from $727 million in 2004 to over $120 billion in 2008. The carbon credit market emerged due to various regularity bodies that collaborated with governments to establish the framework for carbon emission trading in a proactive attempt to involve the world to decrease their carbon footprint. Furthermore due to the complexity of this market, carbon emission trading has attracted numerous intermediaries including brokers, exchangers, aggregators and financiers.

Opportunities for market participants are expected to continue to increase as the value of global carbon markets are forecast to grow by 68% per year to $669 billion in 2013. With the EU members taking common commitment to reduce their average greenhouse emissions by 8% in the first Kyoto commitment (2008-2012), the EU has set up a European Emissions Trading Scheme. With the Japanese and Canadian governments entering the markets, and increased pressure on US companies to comply with the carbon emission reduction, the end-user in this market has grown and will continue to do so. Further to this Britain’s Department of Energy has committed to cut carbon emission by 8% before 2050. Even Barack Obama’s new US administration is considering whether to set up its own federal carbon emissions trading scheme.

IV. CARBON CREDITS

The primary purpose of the Protocol was to make developed countries pay for their ways with emissions while at the same time monetarily rewarding countries with good behaviour in this regard. Since developing countries can start with clean technologies, they will be rewarded by those stuck with “dirty” ones. This system poises to become a big machine for partially transferring wealth from wealthy, industrialised countries to poor, undeveloped countries.

A CER or carbon Credit is defined as the unit related to reduction of 1 tonne of CO2 emission from the baseline of the project activity.

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. This is a very good deal indeed – but for the investing country. Not only do they sell developing countries their technology, but they also meet their Kyoto commitments without lifting a finger to reduce their domestic emissions. Countries like the US can continue to pollute at home, so long as it makes the reductions elsewhere.

V. MECHANISMS OF EMISSION REDUCTIONS TO EARN CARBON CREDITS

Kyoto Protocol worked out three mechanisms of the energy conservation and emission reduction;
Clean Development Mechanism (CDM)

Joint Implementation (JI)

Emissions Trade (ET)

A) Clean Development Mechanism (CDM):
Under the CDM one can cut the deal for carbon credit. Under the UNFCCC, charter any company from the developed world can tie up with a company in the developing country that is a signatory to the Kyoto Protocol. These companies in developing countries must adopt newer technologies, emitting lesser gases, and save energy. Only a portion of the total earnings of carbon credits of the company can be transferred to the company of the developed countries under CDM. There is a fixed quota on buying of credit by companies in Europe.

b) Joint Implementation (JI):
The mechanism known as “joint implementation,” defined in Article 6 of the Kyoto Protocol, allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to earn emission reduction units (ERUs) from an emission-reduction or emission removal project in another Annex B Party, each equivalent to one tonne of CO2, which can be counted towards meeting its Kyoto target.

Joint implementation offers Parties a flexible and cost-efficient means of fulfilling a part of their Kyoto commitments, while the host Party benefits from foreign investment and technology transfer.

c) Emissions Trading (ET):
Parties with commitments under the Kyoto Protocol (Annex B Parties) have accepted targets for limiting or reducing emissions. These targets are expressed as levels of allowed emissions, or “assigned amounts,” over the 2008-2012 commitment periods. The allowed emissions are divided into “assigned amount units” (AAUs). Emissions trading, as set out in Article 17 of the Kyoto Protocol, allows countries that have emission units to spare - emissions permitted them but not "used" - to sell this excess capacity to countries that are over their targets.
Thus, a new commodity was created in the form of emission reductions or removals. Since carbon dioxide is the principal greenhouse gas, people speak simply of trading in carbon. Carbon is now tracked and traded like any other commodity. This is known as the "carbon market."

VI. GREEN ECONOMY

Green economy is one in which policies and innovations enable society to generate more of value each year, while maintaining the natural systems that sustain us. Essentially, it’s a pretty simple concept. Unfortunately, translating the idea into reality is hugely more complicated. Clearly, it will require technological innovation. But it requires lots of other changes too — to the way we organize businesses; the way that we design cities; the way we move people and goods around; the way we live, essentially. Effecting changes of this sort requires the engagement of all sectors, including policymakers, businesses and individual citizens. And that in turn implies the need for a mass of information to guide and inform decision-making.

VII. INDIAN SCENARIO

India comes under the third category of signatories to UNFCCC. India signed and ratified the Protocol in August, 2002 and has emerged as a world leader in reduction of greenhouse gases by adopting Clean Development Mechanisms (CDMs) in the past few years. According to Report on National Action Plan for operationalising Clean Development Mechanism(CDM) by Planning Commission, Govt. of India, the total CO2-equivalent emissions in 1990 were 10, 01, 352 Gg (Gigagrams), which was approximately 3% of global emissions. If India can capture a 10% share of the global CDM market, annual CER revenues to the country could range from US$ 10 million to 300 million (assuming that CDM is used to meet 10-50% of the global demand for GHG emission reduction of roughly 1 billion tonnes CO2, and prices range from US$ 3.5-5.5 per tonne of CO2). As the deadline for meeting the Kyoto Protocol targets draws nearer, prices can be expected to rise, as countries/companies save carbon credits to meet strict targets in the future. India is well ahead in establishing a full-fledged system in operationalising CDM, through the Designated National Authority (DNA). Carbon dioxide, the most important greenhouse gas produced by combustion of fuels, has become a cause of global panic as its concentration in the Earth’s atmosphere has been rising alarmingly. This devil, however, is now turning into a product that helps people, countries, consultants, traders, corporations and even farmers earn billions of rupees. This was an unimaginable trading opportunity not more than a decade ago. Carbon credits are a part of international emission trading norms. They incentivize companies or countries that emit less carbon. The total annual emissions are capped and the market allocates a monetary value to any shortfall through trading. Businesses can exchange, buy or sell carbon credits in international markets at the prevailing market price.

India and China are likely to emerge as the biggest sellers and Europe is going to be the biggest buyers of carbon credits.
Last year global carbon credit trading was estimated at $5 billion, with India’s contribution at around $1 billion. India is one of the countries that have ‘credits’ for emitting less carbon. India and China have surplus credit to offer to countries that have a deficit. India has generated some 30 million carbon credits and has roughly another 140 million to push into the world market. Waste disposal units, plantation companies, chemical plants and municipal corporations can sell the carbon credits and make money. Carbon, like any other commodity, has begun to be traded on India’s Multi Commodity Exchange since last the fortnight. MCX has become first exchange in Asia to trade carbon credits.

VIII. EXAMPLES OF CARBON TRADING IN INDIA

1. Jindal Vijaynagar Steel:
   Years it will be ready to sell $225 million worth of saved carbon. This was made possible since their steel plant uses the Corex furnace technology which prevents 15 million tonnes of carbon from being discharged into the atmosphere.

2. 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 CO2. This was done by extracting bio-diesel from 4500 Pongamia trees in their village.

3. 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.

IX. CDM PROJECT TYPES

Carbon Credits are sold to entities in Annex-I countries, like power utilities, who have emission reduction targets to achieve & find it cheaper to buy „offsetting” certificate rather than do a clean-up in their backyard. Type of projects, which are being applied for CDM and which can be of valuable potential, are:

- **Energy Efficiency Projects**
  - Increasing building efficiency (Concept of Green Building/LEED Rating), e.g. Technopolis Building Kolkata
  - Increasing commercial/industrial energy efficiency (Renovation & Modernization of old power plants)
  - Fuel switching from more carbon intensive fuels to less carbon intensive fuels; and
  - Also includes re-powering, upgrading instrumentation, controls, and/or equipment

- **Transport**
  - Improvements in vehicle fuel efficiency by the introduction of new technologies
  - Changes in vehicles and/or fuel type, for example, switch to electric cars or fuel cell vehicles (CNG/Bio fuels)
  - Switch of transport mode, e.g. changing to less carbon intensive means of transport like trains (Metro in Delhi); and
  - Reducing the frequency of the transport activity

- **Methane recovery**
  - Animal waste methane recovery & utilization
  - Installing an anaerobic digester & utilizing methane to produce energy
  - Coal mine methane recovery
  - Collection & utilization of fugitive methane from coal mining;
    - Capture of biogas
  - Landfill methane recovery and utilization
  - Capture & utilization of fugitive gas from gas pipelines;
  - Methane collection and utilization from sewage/industrial waste treatment facilities
- **Industrial process changes** Any industrial process change resulting in the reduction of any category greenhouse gas emissions
- **Cogeneration** Use of waste heat from electric generation, such as exhaust from gas turbines, for industrial purposes or heating (e.g. Distillery-Molasses/bagasse)
- **Agricultural sector**
  - Energy efficiency improvements or switching to less carbon intensive energy sources for water pumps (irrigation)
  - Methane reductions in rice cultivation
  - Reducing animal waste or using produced animal waste for energy generation (see also under methane recovery) and
  - Any other changes in an agricultural practices resulting in reduction of any category of greenhouse gas emissions

**X. CARBON FOOTPRINT & STRATEGY**

As regulatory frameworks on businesses around permissible carbon emission limits and carbon trading are getting strengthened around the globe, businesses are taking proactive initiatives to record their carbon emissions and devise ways to reduce the same. While greenhouse gas inventory reporting is currently not mandatory in India, progressive companies are already identifying risks associated with GHG constraints and are voluntarily taking stock of their GHG emissions.

**XI. STRATEGIC MODEL FOR CLIMATE CHANGE**

**A Framework to Path to Transformation**

A carbon strategy would chalk out steps for the company to ensure its growth in the carbon constrained economy and maximize its carbon assets. The carbon strategy would also help companies to identify climate risks and opportunities, thereby reducing costs and enhancing revenues as well as their corporate image. Companies would also be better prepared to take on climate regulations, whether local or global.

**XII. LEGAL ASPECT OF CARBON TRADING IN INDIA**

The Multi Commodity exchange (MCX) started future trading on January 2008 after Government of India recognized carbon credit as commodities on 4th 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 & help the producers to earn remuneration out of the environment projects.

Carbon credit in India is traded on NCDEX only as a future contract.
The Forward Contracts (Regulation) Amendment Bill 2006 was introduced in the Indian Parliament by 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. 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 4th paved the way for future trading in CER by bringing carbon credit under the tradable commodities.

XIII. OPERATIONAL CONCEPT OF CARBON TRADING AT MCX IN INDIA

MCX is the futures exchange. People here are getting price signals for the carbon for the delivery in next five years. Our exchange is only for Indians and Indian companies. Every year, in the month of December, the contract expires and at that time people who have bought or sold carbon will have to give or take delivery. They can full fill the deal prior to December too, but most people will wait until December because that is the time to meet the norms in Europe.

Say, if the Indian buyer thinks that the current price is low for him he will wait before selling his credits. The Indian government has not fixed any norms nor has it made it compulsory to reduce carbon emissions to a certain level. So, people who are coming to buy from Indians are actually financial investors. They are thinking that if the Europeans are unable to meet their target of reducing the emission levels by 2009 or 2010 or 2012, then the demand for the carbon will increase and then they may make more money.

So investors are willing to buy now to sell later. There is a huge requirement of carbon credits in Europe before 2012. Only those Indian companies that meet the UNFCCC norms and take up new technologies will be entitled to sell carbon credits.

There are parameters set and detailed audit is done before you get the entitlement to sell the credit. In India, already 300 to 400 companies have carbon credits after meeting UNFCCC norms. Till MCX came along, these companies were not getting best-suited price. Some were getting Euro 15 and some were getting Euro 18 through bilateral agreements. When the contract expires in December, it is expected that prices will be firm up then.

On MCX, already power, energy and metal companies who are trading. These companies are high-energy consuming companies. They need better technology to emit less carbon.

Figure: MCX Price and Volume Traded

XIV. CDM POTENTIAL FOR INDIA

1) Indian Scenario - Favoring Points

a) India - high potential of carbon credits
b) India can capture 10% of Global CDM market
c) Annual revenue estimated range from US$10 million to 330 million
d) Wide spectrum of projects with different sizes
e) Vast technical human resource
f) Strong industrial base
g) Dynamic, transparent & speedy processing by Indian DNA (NCDMA) for host country approval
h) MoU Signed between MoP and GTZ (Oct 2006) - Indo German Energy program (IGEN)

- Baseline CO2 Emissions from Power Sector already in place- first CDM country
- CDM in Power Sector

II) Sector-Wise Break-Up:

Investment done in host country approved project as on 2nd July 2007 So far, India Concentrated mainly on renewable energy (biomass, wind power, etc.) / waste heat recovery projects which generate much less CERs compared HFC23 projects.

XV. CONCLUSION

There is a great opportunity awaiting India in carbon trading which is estimated to go up to $100 billion by 2010. In the new regime, the country could emerge as one of the largest beneficiaries accounting for 25 per cent of the total world carbon trade, says a recent World Bank report. The countries like US, Germany, Japan and China are likely to be the biggest buyers of carbon credits which are beneficial for India to a great extent. The Indian market is extremely receptive to Clean Development Mechanism (CDM). Having cornered more than half of the global total in tradable certified emission reduction (CERs), India’s dominance in carbon trading under the clean development mechanism (CDM) of the Unconventional on Climate Change (UNFCCC) is beginning to influence business dynamics in the country.

India Inc pocketed Rs 1,500 crores in the year 2005 just by selling carbon credits to developed-country clients. Various projects would create up to 306 million tradable CERs. Analysts claim if more companies absorb clean technologies, total CERs with India could touch 500 million. Of the 391 projects sanctioned, the UNFCCC has registered 114 from India, the highest for any country. India’s average annual CERs stand at 12.6% or 11.5 million. Hence, MSW dumping grounds can be a huge prospect for CDM projects in India. These types of projects would not only be beneficial for the
Government bodies and stakeholders but also for general public.

Even though India is the largest beneficiary of carbon trading and carbon credits are traded on the MCX, it still does not have a proper policy for trading of carbons in the market. As a result the Centre has been asked by The National Commodity and Derivatives Exchange Limited (NCDEX) to put in place a proper policy framework for allowing trading of certified emission reductions (CERs), carbon credit, in the market. Also, India has huge number of carbon credits sellers but under the present Indian law, the buyers based in European market are not permitted to enter the market. To increase the market for carbon trading Forward Contracts (Regulation) Amendment Bill has been introduced in the Parliament. This amendment would also help the traders and farmers to utilize NCDEX as a platform for trading of carbon credits. However, to unleash the true potential of carbon trading in India, it is important that a special statute be created for this purpose as the Indian Contracts Act is not enough to govern the contractual issues relating to carbon credits.

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