# CARBON MARKETS IN INDIA : POSSIBILITY AND SUGGESTIVE POLICY MEASURES

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**ABSTRACT**

India is one of the leading generators of CERs through CDM and has a large scope in emissions trading. Its 2008 National Action Plan on Climate Change (NAPCC) specifies eight national missions for 2017 that centre on improving: energy efficiency, solar technology, sustainable habitats, water, Himalayan ecosystems, "green India", agriculture, and strategic knowledge. The paper attempts to study the possibility of existence of a extensive carbon market in India. It further cites examples of the European Union Emission Trading Scheme, carbon markets and trading schemes in China and Japan to analyse the possible measures for the strong establishment of the market and possibility of its success and expansions.

**KEYWORDS** : CARBON MARKETS, CARBON TRADING, EUROPEAN UNION EMISSION TRADING SCHEME , CHINA CARBON EMISSION EXCHANGE, EMISSION TRADING PROGRAMME BY JAPANESE MINISTRY OF ENVIRONMENT

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## 1. INTRODUCTION - CARBON MARKET

In 1988 the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) organized the Intergovernmental Panel on Climate Change (IPCC), to study the scientific, political and economic information surrounding the risks of climate change due to anthropogenic influences. With the United Nations Framework Convention on Climate Change (UNFCCC), negotiated at the Rio Earth Summit in 1992, the need to address the problem of climate change with a political response was formally acknowledged. The convention called on countries to reduce dangerous greenhouse gas emissions with an acceptance of "common but differentiated responsibilities and respective capabilities." This idea of 'common but differentiated responsibilities' appeared to acknowledge a greater responsibility for rich countries to take action for their unequal consumption of the world's resources.

Whilst the convention encouraged these actions, it was not until the development of the Kyoto Protocol in 1997 that signatories were obliged to take action to reduce their emissions by 5.2% from 1990 levels for the commitment period of 2008-12. At this time, many of the goals of the UNFCCC also became more market-based and flexible. The Kyoto Protocol allows for countries that are unable to meet their targets through national measures, to use 'flexible' market mechanisms to gain more leverage in how they attain their reduced emission goals. These flexible mechanisms enable countries to meet their targets in the most 'cost effective' manner, and include 'Emissions Trading,' 'Joint Implementation' and the 'Clean Development Mechanism.'

Emissions Trading began to be discussed within the context of international climate change negotiations with the UN Conference on Trade and Development (UNCTAD) and the establishment of an International Emissions Trading Association (IETA). However, it was not until the mid-90s that discussions surrounding formalizing emissions trading into practice really began to occur.

### 1.1. Carbon Trading

The Kyoto Protocol creates markets for carbon trading via the Clean Development Mechanism, as well as Joint Implementation. These are global markets with India, China and Brazil leading the CDM potential, and Eastern Europe the JI potential.

In COP and Carbon Trading by Mary Thibodeau, it was highlighted that the popular approach to the problem of global warming became the "project of building a single, liquid global carbon market worth many trillions of dollars – backed by the UN, national governments, economists, environmentalists and many in the business sector." With the Kyoto Protocol in 1997, polluter countries that have agreed to emission targets are given emission credits, which are equivalent to their reduction commitments from 1990 levels. Credit quotas are then distributed nationally through 'grandfather' clauses, which allow the biggest polluters to receive the largest allocation of credits. If the polluter does not use the entire pollution credit quota, they can either 'bank' the credits for the future or sell the credits on the open market to be purchased by another polluter. In contrast, if they use up all their credits, they must purchase more from a polluting country that has not used up its full allocation, or invest in projects in other countries through either Joint Implementation (JI) or the Clean Development Mechanism (CDM).

Emission trading entails the creation of a carbon market which allows countries with emission credits to spare to sell them to countries unable to meet their targets. Credit is transferred for emission reductions accumulated through projects to form units which are equivalent to one tonne of Carbon-di-oxide.

### 1.2. Sequence Of Events And The Present

The following sequence of events highlights the initiatives at global level to suggest common goal programmes for climate change and reducing green house emissions across the globe.

**Table 1:** Sequence of Events

| | |
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| 1979 | The first World Climate Conference (WCC) takes place. |
| 1988 | Inter-governmental Panel on Climate Change is set up |
| 1990 | IPCC's first assessment report released |
| 1991 | First meeting of the inter-governmental negotiating committee (INC) takes place |
| 1992 | The INC adopts UNFCCC text. At the Earth Summit in Rio, the UNFCCC is opened for signature along with its sister Rio Conventions, UNCBD |
| 1994 | UNFCCC enters into force |
| 1995 | The first Conference of the Parties (COP 1) takes place in Berlin |

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| 1996 | The UNFCCC secretariat is set up to support action under the Convention |
| 1997 | Kyoto Protocol formally adopted in December at COP3 |
| 2001 | Release of IPCC's Third Assessment Report. Bonn Agreements adopted, based on the Buenos Aires Plan of Action of 1998 |
| 2005 | Kyoto Protocol enforced. The first meeting of the parties to the Kyoto Protocol (MOP 1) takes place in Montreal |
| 2007 | IPCC's Fourth Assessment Report released. Climate science enters popular consciousness. At COP13, parties agreed on the Bali roadmap, which charted the way towards a post-2012 outcome |
| 2009 | Copenhagen Accord drafted at COP15 in...Copenhagen. Countries later submitted emission reduction pledges or mitigation action pledges, all non-binding |
| 2010 | Cancun Agreements drafted and largely accepted at the COP16 |
| 2011 | On the road to COP17 in Durban |

Source: Author's compilation

## 2. CARBON MARKETS AND ASIA PACIFIC REGION

Asia Pacific region includes the region in or near Western Pacific Ocean. The region varies in size depending on context, but it typically includes at least much of East Asia, Southeast Asia, and Oceania.

As per Carbon Forum Asia's report, under Sustainable Development Mechanisms Programme, United Nations Framework Convention on Climate Change, presented in Bangkok, on 24 September 2013, the Director John Kilani highlighted that the CDM ( Clean Development Mechanism) is the world's only international carbon credit and accounting mechanism with more than 7,200 projects. Approximately 85 percent of these projects are in the Asia Pacific. This includes projects in 33 countries, and represents more than 790 million tons of avoided $CO_2$ emissions per year. In addition to the international carbon market, countries are exploring national markets to meet emission reduction targets.

This year, the first markets in China came online, with more in development. In the Asia Pacific region, market work is underway in South Korea, Vietnam, Thailand, India, Indonesia and Kazakhstan, just to name a few.

### 2.1 Carbon Markets and India

From the above mentioned analysis of the Carbon forum Asia's Report, India per se doesn't have a broad and a well established carbon market (MCX, India).

However, a Case Study on India : Guide to Emissions Trading conducted by Environmental Defense Front, under International Emission Trading Scheme (IETS), mentions that in order to encourage its own sustainable development, in 2011 India committed to a voluntary ***Copenhagen Accord target of 20-25% emissions intensity reduction relative to 2005 levels by 2020***. India's ***current domestic climate policies*** are expected to decrease emissions by 0.6 $GtCO_2$ by 2020. These policies include:

- ✓ Aforestation of degraded lands and an increase in forest plantation area (55-191 $MtCO_2$ reduction); and
- ✓ Increase renewable energy usage by 30 GW (60 $MtCO_2$ reduction)
- ✓ 20 GW of installed PV and solar-thermal capacity and 2 GW of off-grid power by 2020 (40 $MtCO_2$ reduction);
- ✓ A 50% target for additional efficient supercritical coal plants (40 $MtCO_2$ emissions reduction by 2020);
- ✓ Increase nuclear power usage by 40 GW (175 $MtCO_2$ reduction)
- ✓ Additional energy efficiency measures (124 $MtCO_2$ reduction);

In addition, since July 2010 there has been a nationwide carbon tax on coal for 50 rupees/ton of coal produced in and imported to India. The base of India's climate policy framework is its 2008 National Action Plan on Climate Change (NAPCC), which specifies eight national missions for 2017 that centre on improving: energy efficiency, solar technology, sustainable habitats, water, Himalayan ecosystems, "green India", agriculture, and strategic knowledge.

Therefore, India, being one of the leading generators of CERs through CDM, has a large scope in emissions trading. Analysts forecast that its trading in carbon credits would touch US$ 100 billion by 2010. The number of expected annual CERs in India is hovering around 28 million and considering that each of these CERs is sold for around 15 euros, on an average, the expected value is going to be around Rs 2,500 crore.

The sections below provide an understanding of the European Union Emission Trading Scheme, the China Carbon Emission Exchanges, Emission Trading Programme by Japanese Ministry of Environment citing an example for a strong Indian Carbon market can financially as well as environmentally be beneficial for India as well the world.

## 3. LESSONS TO BE LEARNT FROM ECONOMIES ACROSS THE GLOBE

### 3.1. European Union Emission Trading Scheme

In order to meet Kyoto Protocol obligations, the European Union set up the EU ETS (European Union Emission Trading Scheme), a domestic cap and trade system for about 15,000 installations inside the EU that were constrained in their CO2 emissions, and which could also use some KP units, Certified Emission Reduction schemes (CERs) and Emission Reduction Units (ERUs) under certain conditions, to meet their obligations.

To elaborate, the EU ETS factsheet explains its working on the basis of their 'cap and trade' principle. As per the October 2013 factsheet, the overall volume of greenhouse gases that can be emitted each year by the power plants, factories and other companies covered by the system is subject to a cap set at EU level. Within this Europe-wide cap, companies receive or buy emission allowances which they can trade if they wish. That is, the companies have to emit within the prescribed limits. In any situation, if in a year, they emit more than the limit, they have to pay a fine according to € 100 per tonne of $CO_2$ emitted or they can purchase the extra emissions from anywhere across the globe, from the power plant units or companies emitting less than the prescribed units of emissions, as per norms established by EU. However, if in case there is a surplus of allowances of emissions available, then the companies or power plants can either trade these extra units of allowances with other establishments that are in need of such units against monetary benefits or they can carry forward the surplus to next year production or forfeit the

same, as per guidelines provided in the EU ETS norms. Hence, emission allowances are the 'currency' of the EU ETS, and the limit on the total number available gives them a value. Each allowance gives the holder the right to emit one tonne of $CO_2$, the main greenhouse gas, or the equivalent amount of two more powerful greenhouse gases, nitrous oxide ($N_2O$) and perfluorocarbons (PFCs).

Furthermore, the next stage of EU ETS established that from 2013 onwards, the cap on emissions from power stations and other fixed installations is reduced by 1.74% every year, so as to reduce the emissions below the 2005 levels. This means that in 2020, greenhouse gas emissions from these sectors will be 21% lower than in 2005.

These caps and norms aim at the fact that the need to purchase or draw on their reserves of allowances and credits creates a permanent incentive for companies to reduce their emissions. But companies can also sell allowances and credits, for instance if they judge they have more than they are going to need. These flexibilities in the system allow companies to choose the most cost-effective options to address their emissions. The main options that can be considered are:

- ✓ Purchase of extra allowances or credits on the market;
- ✓ Investment in more efficient technology and/or a shift to less carbon-intensive energy sources in order to reduce emissions;
- ✓ A combination of the above.

Overall the EU ETS spans around 45% of total greenhouse gas emissions from the 28 EU countries. Earlier the vast majority of emission allowances was previously given away for free by the governments. However, from 2013 auctioning is the main method of allocating allowances. This means that business houses, power plant stations etc. have to buy an increasing proportion of their allowances at auction. As per the EU ETS factsheet, auctioning is the most transparent method of allocating allowances and puts into practice the principle that the polluter should pay for the damages caused to the resources. This process is expected to push up the demand for the allowances in the global carbon market scenario, have a positive impact on the prices of the allowances and motivate the business houses to tap the positive effects by increasing the supply and reducing their own emissions.

The above analysis highlights that the norms established by EU ETS extend to beyond 2020 and aims at long term execution of plans for CDMs and CERs. This strengthens the base of an expanding global carbon markets in terms of the size of the units of emissions traded. Post Durban analysis of carbon markets by Andrei Marcu also show similar analysis. It states that the activities of the EU and Japan in the carbon market and their use of Kyoto Protocol-recognised units were driven by their obligations stemming from the basic Kyoto Protocol. Thus, trade in Certified Emission Reduction schemes ( CERs) and Emission Reduction Units ( ERUs), representing the vast bulk of GHG market activity, was largely confined to the EU, Japan and the developing countries.

### 3.2. China Carbon Emission Exchange

By the year 2006-2011, China was in it's $11^{h}$ Five Year Plan. The market economy was at a booming stage and the Chinese Government followed a strict command and control mechanism at the managerial levels. The targets for the plan was to reduce energy intensity to the tune of 20%. However, by the year 2010, the targets were moderately achieved. The share of renewable resources had increased only by 10%. With increasing pressures from the global front to control excessive emissions and the urgency to improve energy efficiency due to increasing energy demands, the concept of trading was introduced. Market mechanisms of demand and supply for emission trading was brought into place and regulated. The pace at which the regulations had been brought into role play had been quick and sincere efforts had been made to fasten up the process. In its 12th Five Year Plan (2011–2015), the Chinese government announced its intent to establish a national carbon trading system by 2015. As a first step, the National Development and Reform Commission of China has initiated carbon trading pilots in seven provinces and cities.

China has embarked on a sincere and ambitious attempt to develop a domestic carbon trading system, However, there are considerable difficulties before the plan is brought in place in the system at a National level by 2015. Several of these difficulties are not particular to China, but rather are issues that any emission trading system would have to deal with. But there are also more profound worries about how to operate a market-based instrument given the current shortcomings of the Chinese market system in general.

As per the report, there was no functional carbon market in China, earlier, aside from activities related to the Clean Development Mechanism (CDM). China certainly did not have a regulated carbon market yet, and experiments with voluntary markets was limited, with only a handful of deals – mostly symbolic – done since the Beijing and Tianjin exchanges were founded in 2008, for example. Yet the growing consensus was that, sooner or later, carbon market development is inevitable in China.

With the seven regional carbon trading pilots, and the potential for sectoral pilots initiated under the 12th Five Year Plan, China has moved into an intensive phase of testing carbon trading, and it is believed that the success or failure of those experiments will to a large extent determine the future of carbon markets development in China.

To bring out the example of one of it's initiatives, on the 18th of July 18 2013, one month after China launched its first pilot carbon trading program in Shenzhen, Guangdong province, the city began consulting local businesses and government departments about its Draft regulations for the project. The regulations emphasize that carbon credits are corporate assets.

Chen Haiou, president of the China Emissions Exchange also said that with the setting up of the exchange system, the cities are trying to use market-oriented measures, rather than administrative and taxation measures so as to promote emissions trading and the construction of low-carbon cities. A major target for carbon trading is to push the city forward in areas such as energy saving and emissions reduction. Research conducted over recent years revealed that industrial enterprises, transport, buildings and waste disposal are responsible for most of Shenzhen's carbon dioxide emissions. In the initial stages of the carbon-trading project, the city's 635 manufacturers and 197 buildings have been put under carbon emission management, that also includes shopping malls, hotels etc.

However, since the carbon reduction process is expensive and it is difficult to reduce transport and residential emissions, the municipal government set a reduction target of 25 percent for industrial enterprises.To that end, the government has allocated the 635 busines ses more than 100 million tons of free carbon credits over the next three years, based on on their previous emissions and industrial value addition. Companies and enterprises that

exceed their emissions quotas will be fined at a rate three times the average market price of the excess emissions.

Such initiatives bring out how China is making efforts to establish a well functioning market structure for carbon emission system. This can be taken as a source of inspiration for Indian markets as well to plan out a market oriented exchange regime and tap the potential of environmental friendly production possibilities and associated monetary benefits through a well established carbon market structure.

### 3.3. Emission Trading Programmes By Japanese Ministry Of Environment

There is little doubt that Japan is the third biggest economy in the world and in 2010, its 1,208 million metric tons of carbon dioxide equivalent (MMtCO2e) placed it fifth among the world's countries. Through the July 2008 "Action Plan for Achieving a Low-carbon Society," Japan introduced Green House Gas emission reduction goals. Further, as part of the Copenhagen Accord, Japan pledged to reduce GHG emissions 25% below 1990 levels by 2020. The country's 2030 goal is to reduce $CO_2$ from fossil fuels 30% below 1990 levels. In December 2010, the Japanese Central Environmental Council confirmed that Japan would commit to reducing its GHG emissions to 80% below 1990 levels by 2050. Japan also made a commitment under the Kyoto Protocol to reduce its average annual GHG emissions 6% below 1990 levels for 2008-2012. According to Reuters (2013), however, Japan emitted 313 million tons of CO2 equivalent more than its annual target during the Kyoto Protocol. Though it is said that the country will make up the for the shortfall through purchase of emission permits from other governments or project-based offset credits from major developing countries.

Moving a little back in time, in September 2005, the Ministry of Environment Japan (MOEJ) constructed the Japanese Voluntary Emissions Trading System (JVETS) to provide government support for Japanese companies to reduce emissions through activities not supported by the Voluntary Action Plan (VAP). The Competent Authority Committee (CAC), under MOEJ, managed the JVETS. CAC drafted guidelines, approved monitoring plans and verification reports, and evaluated verifiers' achievements. JVETS participants became part of the Experimental Integrated ETS in 2008.

As per JVETS, participants with absolute emissions targets were obligated to submit a corresponding quantity of Japanese Emission Allowances (JPAs) for every ton of emissions produced. Participants that emitted beneath their caps were allowed to sell to other participants who emitted in excess of their caps. There was unlimited usage of Clean Development Mechanism (CDM) credits, known as j-CERs, as long as these credits were not the primary means for achieving pledged targets. Banking of allowances and credits was allowed, but borrowing was not. In an effort to incentivize higher participation, the Japanese government subsidized one-third of the cost of GHG reduction measures until April 2009. In the event of non-compliance, entities were forced to return this subsidy to the government.

In October 2008, the Government of Japan initiated the Experimental Introduction of an Integrated Domestic Market for Emissions Trading (EI ETS) with the goal of assisting the nation's efforts to reach its Kyoto target. Policy makers were able to use the EI ETS as a building block for the proposed nation-wide Japanese ETS that was dropped in November 2012. As mentioned above, the EI ETS incorporates JVETS. The trial period for the EI ETS ended in 2012 but the government continues to encourage firms to participate.

There have been persistent efforts from the nation's end to improve and achieve the targets of emission reductions. The lesson worth learning here is that there is no stoppage despite not being successful in achieving the results. There has been constant innovation and improvement in legislations and regulations, ultimately with the aim of achieving the goal of emission reductions in the coming years.

## 4. CONCLUSIONS AND RECOMMENDATIONS

India, being a developing nation and having an expanding multi-facet industrial sector, is on the path of contributing increasingly to the global emission levels across the world. As genuinely expected, Indian planning structure concentrates heavily on improving the social conditions of the nation. However, there has been a move towards taking up a number of CDM projects as well.

The idea reflected in the paper was to draw a parallel and substantiate a case for a strong carbon market structure in India. Either we bear the current growth process which itself is negatively

counteracted by damaged natural resources and depleting clean and green environmental conditions or we try to translate this growth process into a more environmental friendly process.

Some of the very basic, yet very simple recommendations are listed below :

To start with, the registration process of the firms and business houses require them to have a proper registration certificate specified as per the legal formalities. If the emission levels can be evaluated by the Committee with expert knowledge and experience, the concept of having caps on emission levels can be established, especially for firms and production projects that emit heavily or have huge capacity of emission generation. The involved governmental organization can set permits that these firms can purchase, which provides them with the right to generate and emit the harmful emissions. In situation of shortage of permits, these firms can buy additional rights to pollute from other industries that are emitting below the permitted norms or have additional permits available with them. This will ensure that firms keep a tab on the emission generation levels at the factory or the production level. More so, it will induce them to adopt technologies that can help them curb on the existing emission levels generated by their business and work houses. Available monetary benefits on the sale of extra carbon units can also act as a strong incentive to work on environmental friendly production scheme. The increased cost factor due to permits can be shared by the producers and consumers both as a fee to use the natural resources for the purpose of production and consumption. The additional revenue generated by the sale of permits by governmental organizations can be used for efficient functioning of the involved committees and entities, as well as for the implementation of other CDM projects.

The business houses can also be provided with adequate mechanism and channels through which the permits can be traded at the global market for emission, to provide them with additional incentive to emit less and save more permits.

The government can take additional initiative to provide environmental friendly technology for production at a cheaper cost and spread awareness about available clean and green technologies for the purpose of production.

The trading organizations, both private and public, can join hands and function together to expand the size of the emission markets by increasing the number of permits traded and at the

same time, make the trading process a simple, quick and easy process to ensure low costs involved with transactions and the buyers and sellers could interact easily with each other.

With an increasing production and industrial base, the scope of having a large carbon and emission control market is also expanding. A lot of efforts have gone into promotion of use of clean and green technologies, use of handmade and environmental friendly products and signing agreements and implementing programmes under Voluntary Emission Reduction Schemes. A little more of focussed efforts can simply accelerate the speed at which these efforts are carried out and positively contribute to the nation's growth and sustainable development process by ensuring low emissions, cleaner and greener environmental conditions and additional monetary benefits that can be reaped.

The motivational factor is also that if European Union and nations like China can do it, then why can't India also be a part of global move towards low damage and greater and secured environmental conditions.

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