# CARBON TRADING SCENARIO IN INDIA

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**Abstract**

Presence of Green House Gases in our environment is becoming serious issue these days. Not only developed country but also developing countries are working towards reducing gases in presence of environment. To deal with same Kyoto Protocol was signed among various Annex I, Annex II and Non Annex countries which aimed at reducing GHGs emission in the environment. A new method was devised to deal with gases reduction esp. for carbon dioxide which is called as carbon trading. Carbon trading helps countries which are not able to achieve emission targets helping both developing and non-developing countries. Our paper also shows the increasing pattern of carbon dioxide in the environment which is serious concern. This increase presence of GHGs is a serious concern for human life so the overall aim of carbon trading is achieve zero net increase in GHG emissions because each tone of increase in GHG is off setted by project which is based on GHG emissions leading to more ecological way of doing business thereby leading to sustainable environment.

**Keywords**: Carbon credits, certified Emission, Green house producer, environmental carbon trading.

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## SECTION 1: INTRODUCTION

In 1990 the intergovernmental panel on climate change reported that Green House Gas concentration in atmosphere is rising at faster rate. It has been reported that four major greenhouse gases being emitted are carbon dioxide (co2), methane (cH4), nitrous oxide (n2o) and chlorofluorocarbons (CFCs). Because of increasing presence of these green house gases earth's temperature is constantly changing. Increasing GHG is responsible for adverse impact on water bodies, environment, ecology, humans, plants and animal's health. It has also lead to changing rainfall patterns, disruption in hydrological cycles, melting of glaciers, rise in sea level etc. In 1992 in Rio deo Janeiro of Brazil, in U.N conference on Environmental and Development concept of Sustainable Development was raised. To answer the same a United Nations Framework Convention on Climate Change (UNFCC) was set up which aimed to take control of greenhouse gas emissions. In 1997, conference of Parties (C.O.P) was held under UNFCC in Kyoto of Japan which aimed at reducing Carbon emissions in developed countries which lead to agreement called Kyoto Protocol, which was an internally binding and enforceable agreement which aimed at reducing Green house emissions. Kyoto Protocol introduced concept on carbon credit, carbon footprints and emission trading. Kyoto Protocol which came into force on 2005, that *binds* most of developed nations to cap and trade system. Emission quotas were agreed by each participating company. According to the treaty, nations that emit less than their quotas will be able to sell emission credits to nations that exceed their quota. Overall it aimed at reducing green house gases emission to an average of 5% against the levels f 1990 over the time period of 2008-2012.

**KYOTO PROTOCOL**: Kyoto Protocol which came into force on 16 Feb2005 is a main international agreement which is amended to reduce emission of CO2 of member countries and to enter into emission trading if ther increase their emission levels or if ther are able to save few credits also called carbon credits which are earned when countries emit less of CO2 than their limits. Kyoto Protocol is implemented through 3 mechanisms, namely:

I. Clean Development Mechanism (CDM)
II. Joint Implementation (JI) Projects.

**III.** Emission Trading (E.T)

**I. Clean Development Mechanism:**

According to U.N.F.C.C, company from developed countries can tie up with developing country who has signed Kyoto Protocol. Developed country has to invest in developing coun

tries in form of new technology that will emit less gases and will save energy. This way developing country will earn carbon credit. Under C.D.M developing country can transfer a fixed quota of carbon credits it earns to developed countries. This will help developing country to gain in form of new technology which will emit less and is environment friendly and also will help developed country by way of earning carbon credits.

**II. Joint implementation:**

According to Article 6 of Kyoto Protocol, under J.I mechanisms a country in Annex 2 is allowed to emission reduction in order to earn Emission Reduction Units from Emission Reduction projects in another party in Annex 2, which can be counted towards meeting Kyoto Targets. J.I provides investing country a flexible and cost efficient means of fulfilling Kyoto Commitment and host country gets benefit in form of foreign investment and technology transfer.

**III. Emissions trading (E.T):**

Annex B parties that have commitment under Kyoto Protocol for emission reduction is allowed to sell their spare and unused unit to sell these units to country that are over their targets.

Annex 1 Countries include developed countries like U.S.A, Japan, Canada, New Zealand, Spain, France, Germany etc. They are in all 41 industrialized countries that agreed to reduce CO2 emissions below their 1990 emission levels .Annex 2 Countries include sub-group of Annex 1 countries like U.S.A., U.K, New Zealand who cannot reduce their emission targets level and therefore buy emission credits from developing countries. Non Annex A countries include developing countries like India, Sri Lanka, Afghanistan, China, Iran, Pakistan,

Malaysia, Saudi Arabia etc. they have no pressure from U.N.F.C.C to reduce their emissions immediately.

**The main objective of the paper is to deeply gather insights of environmental issues, Kyoto protocol and carbon trading in India. To achieve the objectives, the paper is divided into following sections, section I i.e. the present section gives the basic concept of environmental changes, Kyoto protocols, followed by section II which gives the details of carbon credits**

**SECTION II: CARBON CREDITS:**

Main aim of Protocol was that developed countries should pay more for their emissions and rewarding those countries who behave well in this regard. Carbon Emission Reductions (C.E.R) also called carbon credits can be defined as unit which firm earns when they reduce 1tonne of Co2 less than their project activity. They can also be defined as tradable units which provide a way of reducing G.H.Gs emission by giving them a monetary value. One carbon credit gives the owner right to emit one tone of CO2. The Collins English Dictionary defines a carbon credit as "a certificate showing that a government or company has paid to have a certain amount of carbon dioxide removed from the environment". Carbon credits are the units which one earns where they emit less of carbon dioxide than otherwise allowed to them. Main burden of reducing Green House Gases was on developed countries that were basically responsible for huge emission of green house gases. So those countries that emit above their permitted level of CO2 are required to either cut down their emission levels or if they cannot cut them down to the level allowed they can buy carbon credits from other countries.

**SECTION III: CARBON TRADING**

Emission trading can be defined as "market where for specific pollutants, parties can buy or sell allowances or permits for emissions or credits for reductions in emissions". (Canada national round table 2001) .Carbon trading refers to the market where carbon credits are traded. Trading in carbon market takes place in form of cap and trade system also called emission trading and through offset-trading. Cap and trade system is basically a system which allows certain amount of carbon to be emitted by participating company. When they

emit less than what is allowed to them they earn carbon credit which they can sell to countries that emit more than what is allowed to them. One carbon credit is equal to one metric ton of Co2. This helps both the countries. As the firm which sell carbon credit is saving their environment as well as earning money on it while the other the country who is purchasing them gets the benefit in form of purchasing them from other countries which otherwise wouldn't have been possible. Carbon Dioxide being a major greenhouse gas was tracked and is now traded in form of Carbon Trading.

The overall aim of carbon trading is achieve zero net increase in GHG emissions because each tone of increase in GHG is off setted by project which is based on GHG emissions leading to more ecological way of doing business thereby leading to sustainable environment. These carbon credits are set below the usual baseline and are decided by governing bodies like United Nations. Carbon credits are traded in international markets like Chicago climate exchange, European climate exchange. And in India they are traded at multi-commodity exchange (MCX), N.C.D.E.X.

**SECTION IV: INDIAN SCENARIO**

As per Dr kirit Parikh chairman of Expert Group on Low Carbon Strategies for Inclusive Growth of Planning Commission of Government Of India "India is one of the lowest G.H.G emitters in the world. "It emitted 1.1.8tonnes of CO2 in 2008 which was one-fourth globally. According to latest reports issued by PBL Netherlands Environmental Assessment Agency in 2012 there is 1.1% increase in global emission over the 2011 levels. Now the total emission has increased to 34.5 billion tones in 2012. Countries are now becoming more careful and are taking steps to reduce emission levels and become sustainable. According to the reports of Planning Commission India will reduce its emission intensity of GDP by 20-25% by 2020 over its 2005 levels which will be done by using efficient appliances in [power sector, promoting goods transport by railways, mass transport for passenger movement in transport sector, through Green India Mission in Forestry Sector. Though C02 emission for India is increasing because of growth of economy as well as energy consumption but India is still in mid-range given for developed countries. India being a developing country has no emission targets to follow but India itself is taking initiatives by entering into various projects that will

help to reduce CO2 and will in earning Carbon Credits which will lead to sustainable environment as well as additional income.

## SECTION V: RECENT STATISTICS OF CDM PROJECTS ININDIA AND ACROSS GLOBE

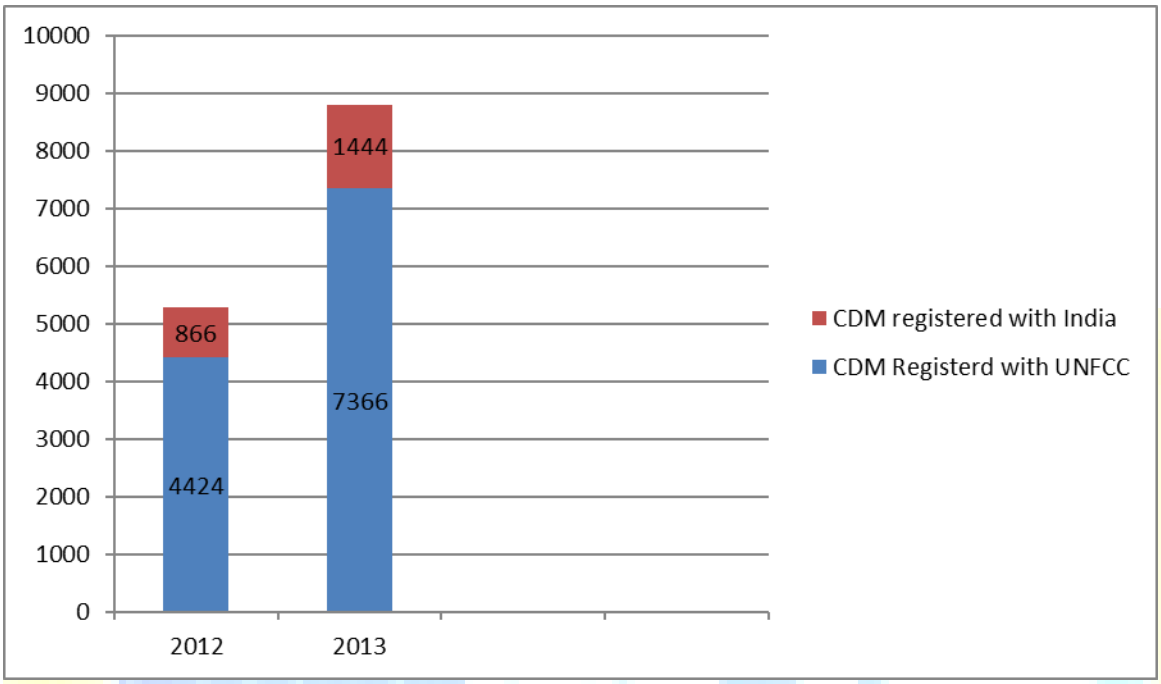
TABLE 1 given below shows total CDM projects registered with U.N.F.C.C. as well as registered with India. It also states C.E.R i.e. certified Emission Reduction Certificates which in India are 187.5Mn out of total 1400.38Mn

**TABLE1: CDM STATISTICS (AS ON 31 OCT 2013)**

| | |
|---|---|
| **TOTAL NUMBER OF REGISTERED CDM PROJECTS WITH UNFCC** | **7366** |
| **TOTAL NUMBER OF REGISTERED CDM PROJECTS WITH INDIA** | **1444** |
| **TOTAL NUMBER OF C.E.R ISSUED** | **1400.38Mn** |
| **TOTAL NUMBER OF C.E.R ISSUED TO INDIAN PROJECTS** | **187.5Mn** |

China leads with 3727 registered CDM projects followed by India 1444 projects and Brazil 314 projects. Indian CDM projects have 187.5Mn i.e. 19.6% CER out of total 1400.38Mn.Out of total CER issued to Indian CDM projects 1.71 million CERs are newly issued.

**FIGURE2:**




From the above chart we can see that total number of CDM registered with UNFCC has increased from 4424 to 7366.India's share in that has also increased from 866 to 1444.

It has increased because India is now shifting to renewable energy like solar energy, wind energy etc which is helping country to earn carbon credits and is also now one of the biggest player in carbon market.

**SECTION VI: CARBON EMISSION IN 2013: GLOBALLY WITH SPECIAL REFRENCE TO INDIA**

In 2012 global emissions have increased by 1.1% over 2011 level which now totals to 34.5 billion tones in 2012. It has been seen that China, U.S.A and European Union are three major CO2 emitters. China increased its emission by 3% which now represents 29% total emission in 2012. U.S.A though has decreased the emission level by 4% but still has 16% share in CO2 emission. European Union has 11% share in CO2 emission though it has actually decreased its emission by 1.6%

Following table (table 2) shows percentage emission by top six countries amounting to around 70% emission level of CO2.

**TABLE 2**

| COUNTRY | CO2 EMISSION (%) |
|---|---|
| CHINA | 29 |
| U.S.A | 15 |
| EUROPEAN UNION | 11 |
| INDIA | 6 |
| RUSSIAN FEDERATION | 5 |
| JAPAN | 4 |

China, U.S.A and European Union are the three top CO2 emitters which account for 55% of total global CO2 emissions.

**INDIAN CASE STUDY:**

With increase in urbanization and globalization there has been adverse impact on environment. India stands second in population in world with its energy consumption being 4$^{th}$ largest in world. And as far as green house gases emission is concerned India is 4$^{rd}$ largest GHG producer in world. India has experienced growth rate of 4% in its GDP which is lowest in a decade but India's emission of CO2 has increased by 6.8% emitting around 2 billion tones in 2012. This makes India fourth largest C02 emitting country. This increase is mainly due to population size, economy, increase in coal consumption.

Comparison can be made among emission level among various countries and in various years.

**Trends in CO2 emissions among country2000-2012(unit: billion tones of CO2)**

| Country | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| United States | 5.87 | 5.75 | 5.83 | 5.87 | 5.94 | 5.94 | 5.84 | 5.91 | 5.74 | 5.32 | 5.50 | 5.39 | 5.19 |
| EU27 | 4.06 | 4.13 | 4.11 | 4.22 | 4.23 | 4.19 | 4.21 | 4.15 | 4.09 | 3.82 | 3.91 | 3.79 | 3.74 |
| Japan | 1.28 | 1.26 | 1.30 | 1.31 | 1.31 | 1.32 | 1.30 | 1.33 | 1.25 | 1.18 | 1.24 | 1.24 | 1.32 |
| China | 3.56 | 3.64 | 3.90 | 4.50 | 5.28 | 5.85 | 6.51 | 7.01 | 7.79 | 8.26 | 8.74 | 9.55 | 9.86 |
| India | 1.06 | 1.08 | 1.12 | 1.15 | 1.24 | 1.29 | 1.38 | 1.48 | 1.56 | 1.69 | 1.78 | 1.84 | 1.97 |

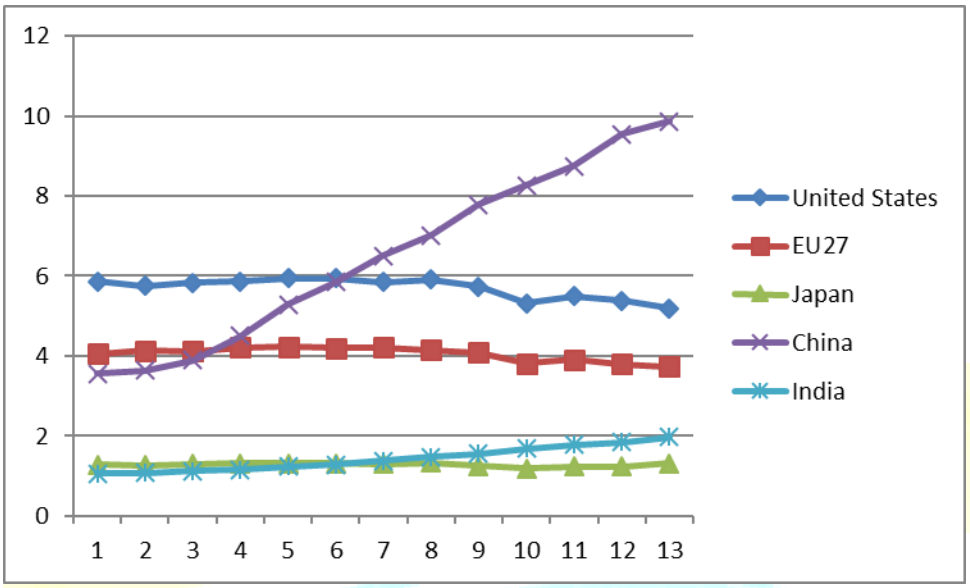
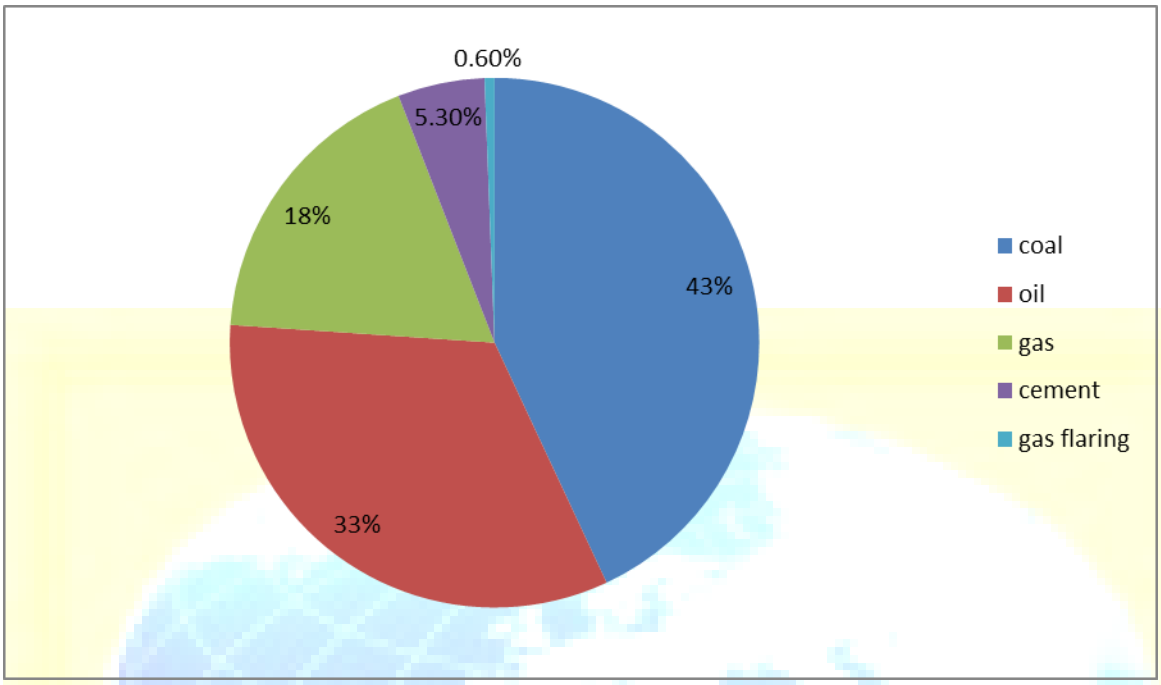



**Figure 3: CO2 emissions from fossil –fuel combustion in 2010 among various sectors: Unit: billion tones CO2**

| | Total | Coal | Oil | Natural gas | Other |
|---|---|---|---|---|---|
| Sector total | 30.3 | 13 | 10.9 | 6.2 | 0.2 |
| Power generation | 11.4 | 8.4 | .7 | 2.2 | .1 |
| Fuel production and transformation | 2.8 | .8 | .9 | 1.0 | .1 |
| Manufacturing industry | 6.1 | 3.3 | 1.5 | 1.3 | 0 |
| Road transport | 5.0 | | 4.9 | .1 | |
| Other transport | 1.7 | | 1.6 | .1 | |
| Residential sector | 1.9 | .3 | .6 | 1.0 | |
| Other sectors | 1.4 | .2 | .7 | .5 | |

**FIGURE3:**




It can be seen that coal burning is the major factor responsible for CO2 emissions. Oil being the next factor followed by gas and cement production. Emissions are projected to increase by 61% level above the emission level of 1990 level in 2013 which in 2012 is 58% above 1990 emission levels.

## SECTION VII: CARBON CREDITS IN INDIA:

Current scenario in India is that there are huge carbon emissions partly because of incomplete as well as inefficient fuel combustion of biomass like cattle dung, crop waste etc and partly because of growing economy of India but never the less Indian companies have huge potential to earn carbon credits. And India being a developing country has no emission targets to be followed but she can enter into various projects to reduce GHG thereby earning CER. There are various companies like ACC, Tata Steel and Asian Paints which are on their way to reduce carbon emissions thereby earning huge carbon credits. U.N has awarded Delhi Metro as 1st Metro Rail in world to earn carbon credit for reducing emission of GHGs. Delhi Metro has removed around 18lakh people or 91 thousand vehicles on road that travel by metro. It has earned credits worth 47crore annually for next 7years.It is using regenerative braking system which saves 30% of electricity usage. SRF Ltd and Shell Trading International are among actively traded countries in

India.SRF Ltd has announced that they have signed four new contracts for sale of further 2.5 million carbon credits from its HFC-23 thermal oxidation CDM projects activity. Suzlon Energy is also using wind energy to create a better environment. Companies using renewable energy are going to earn hug from the carbon credits in years to come. Shriram EPC and Gujarat Flouro chemicals are also on their path to earn carbon credits in India. So to conclude we can say that with increased desirability among countries to keep their environment clean and also with introduction of various financial instructions for emission trading there is huge scope carbon trading.

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