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## *Carbon Credits: A New Currency*

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*Abstract: With the progress of mankind there has been an increasing adverse effect on the global environment due to hazardous emissions including carbon. This has caused what we know of as global warming. To address this issue of global warming, the United Nations Framework Convention on Climate change (UNFCCC) was adopted in 1992, with the objective of limiting the concentration of green house gases in the atmosphere. The concept of carbon credit came into existence as a result of increasing awareness of the need for controlling emissions. Carbon credits are units that can offset a company's carbon footprint. Carbon credits are a tradable permit scheme. It is a simple, non-compulsory way to counteract the greenhouse gasses that contribute to climate change and global warming. Carbon credits create a market for reducing greenhouse emissions by giving a monetary value to the cost of polluting the air. The Carbon Credit is the new currency and each carbon credit represents one tonne of carbon dioxide either removed from the atmosphere or saved from being emitted. Carbon credits are also called emission permit. Thus the idea behind this study is to know the concept of Carbon Credit, its mechanism and how it works to reduce the emissions. This paper focuses on Carbon credit meaning, its history, and mechanism.*

**Key words:** Carbon Credit, New Currency, Climate Change, Emission

### I. INTRODUCTION

The burning of fossil fuels is a major source of greenhouse gas emissions, especially for power, cement, steel, textile, fertilizer and many other industries which rely on fossil fuels (coal, electricity derived from coal, natural gas and oil). The major greenhouse gases emitted by these industries are carbon dioxide, methane, nitrous oxide, hydro fluorocarbons (HFCs), etc., all of which increase the atmosphere's ability to trap infrared energy and thus affect the climate.

The concept of carbon credits came into existence as a result of increasing awareness of the need for controlling emissions. 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. What was introduced by John Dales, economist from Canada, as tradable rights to control pollution, in 1968, is seemingly lucrative venture and is in vogue for some time now; with carbon credits, green projects, carbon footprints, sustainability reports being off-springs of the initiatives. Industries are projecting to be taking initiatives to fulfill their social responsibility and are also making profits in the offing. It is like being an emblem of being a meritorious entity showing responsible behaviour towards the environment.

**WHAT IS CARBON CREDIT?**

As nations have progressed we have been emitting carbon, or gases which result in warming of the globe. Some decades ago a debate started on how to reduce the emission of harmful gases that contributes to the greenhouse effect that causes global warming. So, countries came together and signed an agreement named the Kyoto Protocol. The concept of carbon credit came into existence as a result of increasing awareness for controlling emissions. The mechanism was formalized in Kyoto protocol, an international agreement between more than 170 countries. Carbon credits are key component of national and international emission trading schemes implemented to mitigate global warming. They provide an incentive to reduce GHGs [Carbon dioxide (CO<sub>2</sub>) - Methane (CH<sub>4</sub>) - Nitrous oxide (N<sub>2</sub>O) - Hydrofluorocarbons (HFCs) - Perfluorocarbons (PFCs) - Sulphur hexafluoride (SF<sub>6</sub>)] effect emissions on an industrial scale by capping total annual emissions and letting the market assign a monetary value to any shortfall through trading. Thus,

- » Carbon Credits have emerged as an important financial instrument in the financial markets.
- » One carbon credit is equal to one metric tonne of carbon dioxide, or in some markets, carbon dioxide equivalent gases.  
**1 credit = 1 tonne of CO<sub>2</sub>**
- » Carbon credits, defined as "**a value assigned to a reduction or offset of greenhouse gas emissions**".
- » "**Tradable Rights to control Pollution**" by John Dales, Economist from Canada, 1968.
- » In a nutshell, a carbon credit is a generic term for any tradable certificate or permit representing emissions reductions equaling **one ton of carbon dioxide or carbon dioxide equivalent**.
- » Global Warming Potential for GHGs.

Greenhouse Gas	Global Warming Potential
Carbon-dioxide	1
Methane	21
Nitrous Oxide	310
Hydrofluorocarbons	140-11,700
Perfluorocarbons	7000-9200
Sulphur Hexafluoride	23,900

**WHEN WAS THE CARBON CREDIT CREATED?**

The term "carbon credit" was created in **1992** during the **United Nations Framework Convention on Climate Change (UNFCCC)**. The term was further refined during the "Kyoto Protocol", a set of guidelines adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh in 2001, and are called the 'Marrakesh Accords.'

**Kyoto PROTOCOL**

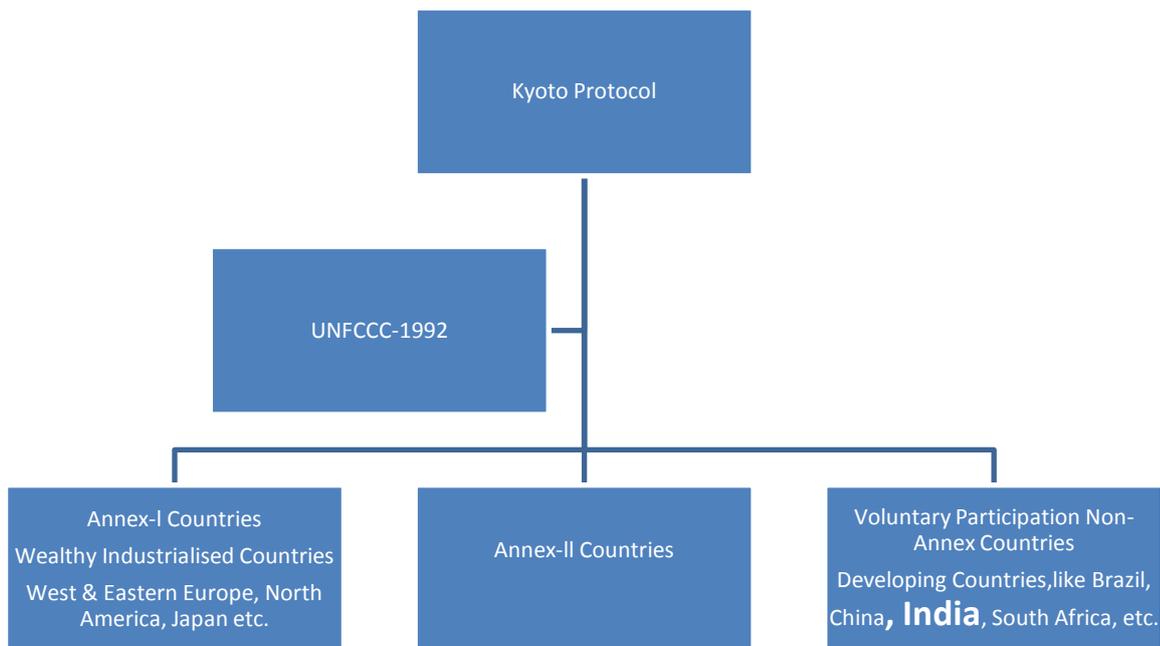
The Kyoto Protocol has created a mechanism under which countries that have been emitting more carbon and other gases (greenhouse gases include ozone, carbon dioxide, methane, nitrous oxide and even water vapour) have voluntarily decided that they will bring down the level of carbon they are emitting to the levels of early 1990s.

Developed countries, mostly European, had said that they will bring down the level in the period from 2008 to 2012. In 2008, these developed countries have decided on different norms to bring down the level of emission fixed for their companies and factories.

On **Wednesday 16th February 2005**, some 8 years after the world's nations came together in Kyoto in Japan in 1997 to discuss Global Warming, the Kyoto Protocol finally came into force. The very phrase 'Kyoto Protocol' has become synonymous with the idea of saving the planet from global meltdown, and yet in truth quite what we should be expecting to happen next remains something of a mystery. The Kyoto Protocol aims to tackle global warming by setting target levels for nations to reduce greenhouse gas emissions worldwide. These targets vary between countries and regions, the focus of the Kyoto Protocol, however, is on the reduction in the levels of the following six gases: Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O), Hydro-fluorocarbons (HFCs), Perfluorocarbons.

Kyoto Protocol (UNFCCC- 1992), In Three Phases

1. Phase I – 2005-2007
2. Phase-II 2008-2012
3. Phase –III 2013-2020



Kyoto Protocol provides three market-based mechanisms, they are,

1. Joint Implementation (JI),
2. Clean Development Mechanism (CDM),
3. International Emission Trading (IET).

Under **JI**, a developed country with a relatively high cost of domestic GHG reduction can set up a project in another developed country that has a relatively low cost and earn carbon credits that may be applied to their emission targets. (Projects between Annex-I Countries)

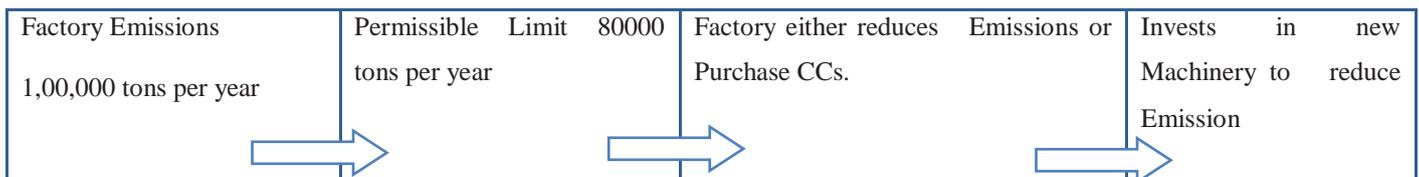
Under the **CDM**, a developed country can 'sponsor' a greenhouse gas reduction project in a developing country where the cost of greenhouse gas reduction project activities is usually much lower, but the atmospheric effect is globally equivalent. The developed country would be given credits for meeting its emission reduction targets, while the developing country would receive the capital investment and clean technology or beneficial change in land use. (Non- Annex with participation of Annex-I)

Under **IET**, countries can trade in the international carbon credit market to cover their shortfall in Assigned amount units. Countries with surplus units can sell them to countries that are exceeding their emission targets under Annex B of the Kyoto Protocol.

## II. CARBON CREDIT MECHANISM

Carbon credits are certificates issued to countries that reduce their GHG emission that causes global warming. Carbon credits are measured in units of Certified Emission Reductions (CERs). Each CER is equivalent to **one tonne of carbon dioxide** reduction. Under IET (International Emissions Trading) mechanism, countries can trade in the international carbon credit market. Countries with surplus credits can sell the same to countries with quantified emission limitation and reduction commitments under the Kyoto Protocol. Developed countries that have exceeded the levels can either cut down emissions, or borrow or buy carbon credits from developing countries. When the companies are listed, the administration decides on the total amount of gas emissions they can emit as a group. Normally the total amount is lower than the one emitted the previous year. The main idea here is to reduce this level every year. Let us simplify it by one of the examples.

How Buying CCs. (Carbon Credits) can reduce Emissions?



### CARBON CREDITS ADVANTAGES

1. Better technologies for the company which is benefiting from generation of CERs.
2. Technology transfer from developed to developing countries (Due to low cost structure in developing countries).
3. Additional source of foreign investment in developing countries which act as a catalyst in developing cleaner technologies.
4. Channel CDM funds to investment priorities – The CDM funds can be channelized into building or improving projects, thus reinvesting it for higher growth.
5. Development of cleaner technologies leading to sustainable development where countries have a strategic advantage from now in terms of pollution.
6. Environmental benefits due to lesser GHG emissions.

### CARBON CREDITS DISADVANTAGES

1. Provision of cheapest way of purchasing climate destroying right.
2. Due to nature and process of complexity involved, foreign players may dominate domestic industries for the incentive if CERs.
3. CDM investment could affect national development strategies, possibly adversely affecting national decision-making processes. Until future commitment periods are agreed, the CDM may not provide incentives for financing long-term development projects and strategies.
4. CDM timeframe may not assist long-term development strategies as the timeframe is foreseeable till 2012 only. (Most projects - developed with short term perspective).

5. No opportunity for less developed countries under this framework. • Still the mechanism leads to developed countries emitting more GHG in spite of their KYOTO caps. Historically they are the culprits for GHG emissions. The developed countries purchase CERs rather than finding new ways of reducing emissions by technological development.
6. Pressure to accept technologies which have adverse local impacts - CDM may attract unfavorable or unwanted technologies which adversely impact local people.

### **Carbon Credits and India**

India is ranked as the second largest seller of carbon credits in the global market last year as per World Bank. Its share is only 6%, as compared with China's gigantic 73%, but it is expected to reach 15-35% by 2012. By 2012, India's earnings are estimated to jump to USD 3.6 billion. The price of an Indian carbon credit works out to about 14 -16 Euros and the price is expected to rise if new international regulations come into play. India now has 930 carbon credit projects in the pipeline, which promises to increase India's share in CDM market. Out of a total of 1,047 projects registered by the CDM Executive Board till May 2008, about 32 percent are registered in India alone - highest among all other "green" conscious nations.

India is suppliers of CERs. As it belongs to developing nation. Whereas other developed countries are the buyers of the CERs. India is not obliged to cut emissions, as its energy consumption is relatively low. Also, India has an advantage in the global carbon market because the investments required are relatively small due to lower input costs. The biggest buyers of Indian carbon credits are European countries followed by Japan, Australia and Canada. The main sources of carbon credits in India are biomass projects, small hydro projects (less than 15 MW in size) and wind power projects along with some energy efficiency improvement projects. These comprise nearly 55% of Indian carbon credits. Some of the projects are Torrent Power (which switched to natural gas recently), Suzlon's land bank projects, Suryachakra Group's four biomass projects, Godavari Power and Ispat gas projects. The main sources of Carbon Credit in India are, Biomass Projects, Small Hydro Projects, Wind Power Projects, etc.

### **III. CASE STUDY- TATA POWER COMPANY LTD.**

Tata Power is India's largest integrated power company with a significant international presence. From Fuel and Logistics to Generation and Transmission to Distribution and Trading-exploring various renewable sources of energy in India and globally, we now have a significant presence in wind, solar, hydro and geothermal energy space.

Our technology leadership is legendary and we have demonstrated successful public-private partnerships in Generation, Transmission and Distribution - "Tata Power Delhi Distribution Limited" with Delhi Vidyut Board for distribution in North Delhi, 'Powerlinks Transmission Ltd.' with Power Grid Corporation of India Ltd. for evacuation of Power from Tala hydro plant in Bhutan to Delhi and 'Maithon Power Ltd.' with Damodar Valley Corporation for a Mega Power Project at Jharkhand.

Today, it is poised for multifold growth. It is one of the largest renewable energy players in India and have developed the country's first 4000 MW Ultra Mega Power Project at Mundra (Gujarat) based on super-critical technology. Tata Power said its 25 MW solar project in Gujarat has been registered under the United Nations Clean Development Mechanism, a move that would allow the company to trade carbon credits from the plant. This allows the company to trade Certified Emission Reductions (CERs) it would earn from the renewable energy project. It is the company's second project, after the 50.4MW Khandke wind farm in Maharashtra, to get registered under the Clean Development Mechanism (CDM). The Mithapur plant would help in reducing an annual average of 37,696 tonnes of carbon dioxide, by producing 39,597 MW per year (average) equivalent amount of clean energy. Tata Power Trading is currently handling MSW, Biomass, Sol-air and Cogeneration projects under CDM services.

#### **IV. CONCLUSION**

Carbon offset and carbon credit still needs to find its place in layman's vocabulary. Thus, mass awareness on the issue through widespread education is required, to provide our future generations the better cleaner environment. But still the increased demand flowing to carbon credits and the introduction of newer financial instruments for emission trading are all signs of heightened activity. It can also be concluded that India is an emerging leader for the developing countries in designing innovative strategies and portfolios for carbon trading. India has much more wider scope to earn Carbon Credits by implementing various projects. Even other Indian Companies are also in tune with this, like Shree Pandurang Co-operative Sugar Factory Ltd., SAIL, Adani Power, etc.

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