CARBON CREDIT-CURRENCY OF 21ST CENTURY

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Abstract

In 1997, Kyoto Protocol, a voluntary treaty was signed by 141 countries to reduce the emissions of Global House Gases by 5.2% below 1990 levels by 2012. Certified Emissions Reductions (CER) or Carbon credits are certificates issued certifying reduction in emissions. The developing countries have been exempted from any such restrictions. These certificates can be traded in the market and purchased by firms which find purchasing emission credits to offset its emissions lower in cost. Thus an opportunity has emerged for firms in developing countries like India, Brazil and China to boost their earnings by complying with norms. However not all projects are eligible for registration under the Clean Development Mechanism (CDM) under the Kyoto Protocol. As a result a large number of advisory firms have spawned. In addition an entire market has been developed around the same. The key participants apart from the project developers are, including not limited to, verification, certification and financing institutions. In India this opportunity has manifold implications affecting not only industry but also government, financial institutions and civil society at large. Most importantly this has opened up a new source of cash flow in project financing making unviable projects viable by exceeding the hurdle rate for investment returns. Industry will need to adapt to the changing opportunity that it brings along i.e. higher return on investments along with risks that are inherent in carbon credit project financing. In my opinion, it will be pragmatic on part of firms to consider this mode of cash flows in project financing. Further this provides a strategic role for the countries to benefit from the cash flows that can be invested in cleaner technologies for sustainable development.

Keywords: *Carbon credits, Emission, Certified Emissions Reductions (CER), Clean Development Mechanism (CDM)*

Carbon credits have emerged as an important instrument in the financial markets. The primary goal is to reduce emission of green house gases. By permitting allowances to be bought and sold, an operator can seek out the most cost-effective way of reducing its emissions, either by investing in cleaner machinery and practices or by purchasing emissions from another operator who already has excess capacity. Carbon credits are a key component of national and international emissions trading schemes that have been implemented to mitigate global warming. They provide a way to reduce greenhouse effect emissions on an industrial scale by capping total annual emissions and letting the market assign a monetary value to any shortfall through trading. Credits can be exchanged between businesses or bought and sold in international markets at the prevailing market price. Credits can be used to finance carbon reduction schemes between trading partners and around the world. There are also many companies that sell carbon credits to commercial and individual customers who are interested in lowering their carbon footprint on a voluntary basis. These carbons off setters purchase the credits from an investment fund or a carbon development company that has aggregated the credits from individual projects. The quality of the credits is based in part on the validation process and sophistication of the fund or development company that acted as the sponsor to the carbon project. This is reflected in their price; voluntary units typically have less value than the units sold through the rigorously-validated Clean Development Mechanism.

History of carbon credit

Kyoto Protocol, the issue of climate change and global warming became the topic of International concern in the 1980s and since then has been subject to debate and several agreements on scientific issues, voluntary actions, legally binding greenhouse gas emission targets, rules for implementation and mechanisms. At the 1997 Climate Change Convention in Kyoto, the primary topic of discussion was the reduction of greenhouse gases (GHG), which are believed to be the principal cause of global warming. Kyoto Protocol is a voluntary treaty signed by 141 countries, including the European Union, Japan and Canada for reducing GHG emission by 5.2% below 1990 levels by 2012. However US who accounts for one-third of the total GHG emission, is yet to sign the treaty. The preliminary phase of the Kyoto Protocol ends in 2007 while the second phase starts from 2008. The penalty for non-compliance in the first phase is Euro 40 per ton of carbon dioxide (CO2) equivalent. In the second phase, the penalty is hiked to Euro 100 per ton of CO2.

Carbon credits are certificates issued to countries that reduce their emission of GHG (greenhouse gases) which causes global warming. Carbon credits or Certified Emissions Reductions (CER) are a “certificate” just like a stock. A CER is given by the CDM Executive Board to projects in developing countries to certify they have reduced green house gas emissions by one ton of carbon dioxide per year. For example, if a project generates energy

using wind power instead of burning coal, it can save 50 tons of carbon dioxide per year. There it can claim 50 CERs (one CER is equivalent to one ton of carbon dioxide reduced).

Ideally, Carbon credits can essentially be viewed as a means of empowering the market to care for the environment. The legislations can set inflexible environmental targets for the industry with the flexibility to meet the objectives in any manner, it chooses to. The industry must find the lowest cost solutions to meet these objectives with all the flexibility at their disposal. The emissions cap is decided under the Kyoto Protocol and the level of reductions by time frames has been specified. The emissions are easily tradable and thus results in lower abatement costs. All this allows permanent reduction in emissions from a certain decided baseline. However, a certainindustry can purchase emission credits to offset its emissions from somewhere else at a lower cost.

Implementation road map

In 1990 UNO (United Nations Organization) feeling an immediate need to decrease the emission of greenhouse gases into the atmosphere released the Kyoto Protocol. As a result under the UNFCC (United Nations Framework Convention on Climatic Change) industrialized nations entered into a legally binding agreement to reduce the collective emissions of greenhouse gases (GHG) by 5.2% compared to the 1990 level; calculated at an average over the five year period of 2008-12. Separate national targets have been given to US (7%), European Union (8%), Japan (6%) and Russia (0%). The reduction is to be done on six greenhouse gases– carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, HFCs and PFCs. Further the protocol reaffirms the principle that industrialized countries have to pay and supply technology to other countries for climate related studies and projects. The Protocol came into force in February 2005 giving GHG emission limits for each developed (Annex I) country included in the protocol. In order to facilitate reaching emission limits, three additional mechanisms were agreed upon in the Marrakesh Accords in 2001. These are the Clean Development Mechanism (CDM), Joint Implementation (JI) and Emission Trading (ET).

JI (Joint Implementation): Developed countries can implement projects that reduce emissions or remove carbon from the atmosphere in other developed countries in lieu of ERUs (Emission Reduction Units). These ERUs can be used to meet the emission reduction targets. JI projects must have the approval of all parties involved and must lead to emission reductions or removals that are additional to any that would have occurred without the project. ERUs can only be issued from periods onwards of year 2008 although JI projects can be started from year 2000 onwards.

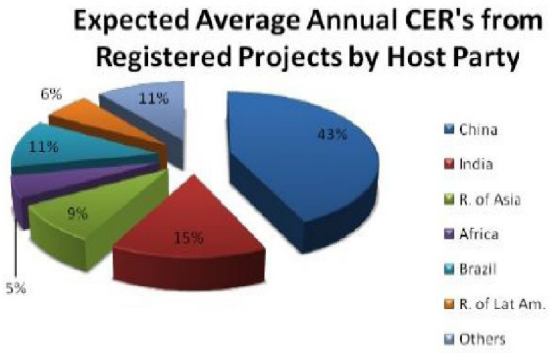
Emissions Trading: The protocol provides that developed countries can acquire units from other developing parties and use them towards meeting their emissions targets, but must be prepared to transfer the units when they do not require them for compliance. This enables developed countries to make use of low cost opportunities to reduce emissions. Only some developed countries with emission limitation and reduction commitments specified in the protocol can engage in such an activity.

CDM mechanism in india

The CDM was created to give a cost effective option for developed (Annex I) countries to achieve their emission reduction targets. In the CDM, an organization from a developed country (Annex I country) can obtain Certified Emission Reductions (CERs) by reducing emissions in a developing (non-Annex I) country where a comparable reduction requires substantially smaller investments. The country and the organization receiving the CERs from the CDM project are allowed to add the corresponding amount of CO2 emissions to its emission quota.

India qualifies to be a host country for the CDM projects only. India is considered as one of the most potential countries in the world for CDM projects. This is due to its large power sector that depends on fossil fuels, and to the proactive policies of the Indian government towards CDM. The power sector alone is estimated to emit 433 million tones of CO2 per annum. The total CO2 reduction potential through CDM projects in India is estimated to be around 300 million tones. The largest potential is in the renewable energy sector with 90 million tones CO2 equivalents. The total expected average annual CER's from registered projects by India are about 22 million having a 15% world share

Graph-1 - Expected CER'S from registered projects



(Source: IGES Database http://www.iges.or.jp/en/cdm/report_cdm.html)

CDM Methodology in India

In India the Designated National Authority (DNA) is hosted by the Ministry of Environment and Forests (MoEF). In addition to the DNA, India has many state-level nodal agencies promoting and facilitating CDM-

projects in their area. These organizations can be of assistance in setting up contacts with public organizations to arrange CDM projects, or in approaching a larger number of small-scale possible project proponents. They can act also as bundling agencies, i.e. combine a number of small-scale CDM projects and handle financial management for bundled projects.

The CDM also allows an industrial actor in the non-Annex I country to reduce its Green House Gas emissions and to sell the reduction units to a party in the Annex I countries. The GHG reductions and the way to reduce them have to be approved by the CDM EB. The GHG reduction achieved though a CDM project is quantified as a Certified Emission Reduction (CER), one CER corresponding to one ton of CO2 equivalent.

An industrial actor in a non-Annex I country can execute the project activity all by itself, in which case the project activity is called unilateral. If a party from an Annex I country takes part in the project through funding, a project is called bilateral. The technical way to reduce Green House Gas emissions is called a methodology. A methodology is a description detailing the new way of operating with the result of generating less GHG emissions than in a business-as-usual case. The business-as-usual case is referred to as the baseline in the methodology description. The comparison between emissions of the new and the baseline case yields CERs, provided that the project activity is judged as additional.

Review of literature

A survey conducted by the Global Reporting Initiative and KPMG's Global Sustainability Services , it was found that relatively few examples of companies that reported on carbon neutral activities or activities to offset emissions from part or all of their operations. Of the companies surveyed, 4 reports were found where companies specifically referred to the term "carbon neutral". Companies also reported different approaches to achieving carbon neutrality, for example planting trees, buying Kyoto compliant carbon credits or investing in improvements in energy efficiency. Companies' exposure and response to climate change can be used by the financial services sector as a differentiator in investment decisions and asset allocations. In general, the reporting on new products identified the type of product, but provided little further detail on revenues, role in the product portfolio, or importance for further business development. The reporting was generally useful for indicating that innovations were taking place, but offered little insight into the financial implications of such new opportunities. A surprising two thirds of companies reported new business opportunities from climate change, mostly in the area of emissions trading and carbon credits.

Negotiating the transfer and acquisition of project-based carbon credits under the Kyoto Protocol by, United Nations Industrial Development Organization, opined that naturally, in line with the mandate of the United Nations Industrial Development Organization (UNIDO).This mandate is to assist developing countries and countries with economies in transition in their industrialization efforts, to enable them to enhance their capacities for promoting sustainable industrial development for growth and for the alleviation of poverty. With this mandate as the paramount guiding principle, the areas that UNIDO has been addressing with its expertise encompass the promotion of investment and technology transfer, the enhancement of accessibility to reliable and affordable energy, the facilitation of cleaner and more sustainable production and the protection of environmental resources, to name a few.

Parvathamma, presently working for the Deutsche Bank account of Tata Consultancy Services(TCS) "Carbon Credits Trading- Young and Emerging Market" opined in his research that India's biggest Nationalized Bank –State Bank of India says that analysts peg the global carbon trading market at $100 billion by 2010 and the Indian carbon market has the potential to supply 30-50 per cent of the projected global market of 700 million CERs by 2012. SBI proposes to provide a single point delivery of services such as implementation of CDM projects, advisory services and value added products like securitization of carbon credit receivables, carbon credit delivery guarantees, and escrow mechanism for carbon credits, besides finance related to carbon credits/Clean Development Mechanism (CDM) under the Kyoto Protocol to its customers. Due to India's vast forest and agricultural land, a significant opportunity lies ahead for India to earn carbon credits when energy saving and environment protecting methods are adopted. But this may be short lived as India is progressing towards being a developed country and these benefits will not be applicable forever. When India joins the league as a developed country, it has to strictly adopt the Kyoto protocol and it may turn out to be a potential buyer instead of a seller as it presently is. Experts say that global carbon credit markets will have an established impact in the next 10 years and is expected to grow from $ 10 billion to $1 Trillion by 2010. Carbon traders across the world say that emission permits could become the world's largest market if all the developed economies agree to take part in the final phase of Kyoto Protocol implementation. Considering the effects of economic value and environmental threats, we need to observe how these changes affect the IT Industry and financial market as a whole.

Monika Bhardwaj and Anand Wadadekar , had undertaken research on "Carbon Credit For Environmental Management" concluded, "According to industry estimates, Indian companies are expected to generate at least $8.5 billion at the going rate of $10 per ton of CER. Tata Sponge Iron Ltd got a CDM certificate from the UN for its waste heat recovery project in Orissa. Reliance Energy already has energy efficiency and process development CDM projects. It's the need of the hour to think very seriously on reducing environment loss by religiously following & implementing and innovating techniques & ways to contain the same. This is a high time to call a revolution for reducing carbon footprint in order to preserve what's left of the ozone layer, which is a protective layer between sun's harsh ultra violet rays and the living beings. Otherwise, the day is not far when the world will be full of hunger; sun burnt, blind people, scary sounds and many more incurable diseases".

Objectives of the study

To find out the areas in which carbon credit can be applicable.

To find out the reasons why the firm should take carbon credit into consideration

To describe how the firm can generate the cash flow by using carbon credit

Hypotheses

There is no significant difference between IRR without CER and IRR with CER of the state.

There is no correlation between IRR without CER and IRR with CER of the state.

Data Source

The study is a descriptive research based on statistical phenomenon, mainly on secondary data which have been sourced from Government publications, research journals, bulletins and websites.

Data Analysis

By comparing various companies' issued Certified Emission Reduction (CER) and its effect on Internal Rate of Return (IRR) of the company.

Limitations of the study

It is found that administering transactions with Carbon Credits becomes very difficult as it is on a wide global scale. Hence chances of fraudulence go up.

On a market level, capped companies are at a competitive disadvantage against those uncapped because firstly they are giving off deadly emissions at a much higher rate than what is allowed and secondly they have to pay uncapped countries and buy their extra credits from them.

Also there is only ONE internationally agreed mechanism- The Kyoto Protocol. If the UNFCCC comes up with a few more mechanisms then certain parts of the world can be looked after by any one such mechanism. Hence fraudulence chances can be reduced to a great extent.

Table - 1 State-wise companies' internal rate of return (irr) without & with certified emission reduction (cer)

Sr. No.	State Name	IRR Without CER	IRR With CER
1	Andhra Pradesh	10.67%	15.04%
2	Arunachal Pradesh	11.69%	27.29%
3	Assam	10.01%	15.34%
4	Chandigarh	10.91%	15.12%
5	Delhi	9.27%	16.23%
6	Gujarat	10.31%	15.18%
7	Haryana	0.00%	32.52%
8	Himachal Pradesh	10.32%	15.24%
9	Karnataka	10.21%	15.33%
10	Tamilnadu	20.96%	29.16%
11	Maharashtra	23.21%	30.89%
12	Madhya Pradesh	10.53%	15.74%
13	Kerala	10.06%	15.19%
14	Orissa	12.01%	15.43%
15	Punjab	11.54%	33.42%
16	Rajasthan	10.47%	15.26%
17	Sikkim	9.62%	12.92%
18	Uttar Pradesh	10.48%	15.21%
19	Uttarakhnad	7.18%	14.02%
20	West Bengal	7.40%	17.87%

(Source : IGES Database -http://www.iges.or.jp/en/cdm/report_cdm.html)

Table-1 IRR without CER ranged between 0 (zero) percent to 23.21percent in Haryana and Maharashtra state respectively while IRR with CER ranged between 12.92percent to 33.42percent in Sikkim and Punjab state respectively. It indicates IRR with CER is higher than IRR without CER and CER improves the IRR of the company.

Table – 2 Mean and standard deviation

		Mean	N	Std. Deviation
Pair 1	IRR without CER	10.8425	20	4.63024
	IRR with CER	19.1200	20	6.98513

Table-2 exhibits that Mean value of IRR with CER is 19.12 which is higher than that of IRR without CER of 10.8425. It indicates that IRR of the company is affected by CER. Standard Deviation is 6.98513 in case of IRR with CER which indicates value of IRR with CER of the states spread out over a large range amongst the states.

Table – 3 Paired sample t-test

		Paired Differences				t	df	Sig. 2-tailed
		Mean	Std. Deviation	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	IRR without CER IRR with CER	-8.27750	7.25878	-11.67471	-4.88029	-5.100	19	0.000

(Calculated using SPSS v 17.0)

Table-3 exhibits value of paired sample t-test (19) = (-5.1) at 95percent confidence interval and concludes that **null hypothesis is rejected** which shows that there is some significant effect of carbon credit on company's IRR.

Table - 4 Correlations

		IRR without CER	IRR with CER
IRR without CER	Pearson Correlation	1	.271
	Sig. (2-tailed)		.247
	N	20	20
IRR with CER	Pearson Correlation	.271	1
	Sig. (2-tailed)	.247	
	N	20	20

(Calculated using SPSS v 17.0)

Table-4 exhibits the value of Pearson Correlation 0.271. It concludes that null hypothesis is rejected which indicates there is positive correlation between IRR without CER and IRR with CER.

Table - 5 Revenue generated by indian companies through carbon credit

No.	Company Name	Revenue generated (In Cr.)
1	Aditya Birla Nuvo	4.92
2	AndhraPradesh paper Mill	2.11
3	Binani Cement	4.03
4	CESE	11.42
5	Deepak Spinner	1.12
6	DLF	3.00
7	Everest Kanto Cylinder	1.26
8	Gujarat Flouro chemicals	6.29
9	Gujarat Minerals Development	118.00
10	HPCL	265.00
11	ITC	90.00
12	Jindal Steel & power	163.00
13	JSW Steel	48.58
14	Kalptaru power	4.73
15	Kalyani Steel	60.45
16	Navin Fluorine Industries	235.83
17	Nippo Batteries	9.26
18	Orient Paper and industries	7.68
19	Orient sponge Iron and steel	7.48
20	Rajratan Global Wire	0.52
21	Sesa Goa	2.76
22	Sesa industries	41.00
23	Shasun Chemicals & Drugs	3.31
24	Shree Bhavani paper mills	3.85
25	Shree Cement	17.83
26	Souther Online Bio Tech	9.00
27	Lahari power and steel	1.18
28	South Asia Agro Industries	40.1
29	MSM Energy	11.57
30	Shri Panjanya Power	5.18
31	Triveni Engg. & Industries	13.1
32	Usha Marting	4.12
33	United Phosphor	5.62

(Source: IGES Database -http://www.iges.or.jp/en/cdm/report_cdm.html)

Table – 5 shows that highest of the revenue generated through carbon credit is HPCL followed by Navin Fluorine Industries and Jindal Steel & Power with Rs. 265 crore and Rs. 235.83 crore respectively.

Conclusion

Carbon credits emanating from CDM projects can be considered as enhancers of equity returns rather than as a reliable long term source of cash flows for projects. As soon as the future trends for carbon credits are frozen after year 2012, they would be viewed as source for long term cash flows as well. Projects ought to be developed so that they are CDM compatible. Due to OTC markets, the market is illiquid and non transparent, firms need to negotiate deals with knowledge of the market trends and potential problems arising after year 2012 deadline for current round of emissions reduction. The CERs are also heterogeneous in nature depending on origin and quality of CERs and quality of project. The CDM cycle is perceived to be long and the complexity of rules and regulations is a barrier to usage of this opportunity. With the expectation of the maturity of the carbon market, carbon credits will become an important consideration in project financing in developing countries especially India.

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