

An Analysis of Carbon Credit Revenue Practices in Indian Corporate Sector

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Abstract

All the developed nations which have exceeded the levels of green house gases have to cut the emission rate or borrow carbon credits from developing countries. Hence, trading in carbon credit has been started. Large number of entities in India generating carbon credits and sells them to developed countries through international market. After the implementation of Kyoto Protocol, the opportunity of revenue generation by taking up structured Clean Development Mechanism (CDM) projects has given a new source of revenue for Indian Corporate sector. India is one of the major players in the global market on the supply side of CERs after China.

In this paper attempt has been made to explore the revenue from carbon credit in Indian corporate sector. This study includes ten companies which have disclosed carbon credit revenue in their annual report. The sample units are selected from various sector of economy like chemical, power, mining, sugar, paper, steel, cement and electric equipments. On an average the sample units could be able to provide only 6.84 percentage of total revenue. If carbon credit revenue of two companies viz. Gujarat Fluorochemicals and Rana Sugar Ltd. are excluded from the sample average comes 0.776%. In order to examine the hypotheses Chi-Square test and ANOVA statistical techniques have been used. The first hypothesis is accepted while second hypothesis is rejected. It reveals that there is no significant difference among different sample companies regarding generation of revenue from carbon credit trading but there is significant difference among the average value of revenue earned from carbon credit transactions of different years of sample units.

Keywords: Kyoto Protocol, CDM projects, CERs, Carbon Credit Trading

Introduction

To address the 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 (GHG) in the atmosphere. Subsequently the Kyoto Protocol came into force in February 2005, which sets limits to the maximum amount of mission of GHG by countries. As per the Kyoto Protocol developing and least-developed countries are not bound by the amount of GHG emissions. If a developed country fails to reduce greenhouse gases at

desired level, penalty provision has been imposed in Kyoto protocol. All the developed nations which have exceeded the levels have to cut the emission rate or borrow carbon credits from developing countries. Hence, trading in carbon credit has been started. Large number of entities in India generating carbon credits and sells them to developed countries through international market.

To examine whether Indian corporate sector is earned sufficient income from sell of carbon emission reduction units or not, here, an attempt has been made to analyze the trend of revenue earned from carbon credit transactions by Indian corporate sector. The present article has been divided into five sections. The first section explains how carbon credit trading takes place. The second section covers review of literature. The third section provides a brief note on methodology adopted to prepare the present research paper. Section four highlights Carbon Credit Trading practices in Indian corporate sector and the last fifth section covers testing the hypothesis along with concluding remark.

How does carbon credit transaction take place?

Under the Kyoto Protocol, which came into force in February 2005, most industrialized nations have agreed to cut existing total greenhouse gas emissions by an average of 5.2% (compared with 1990 levels) between 2008 and 2012. Each participating government has its own national target for reducing carbon dioxide emissions.

Carbon trading is a mechanism that is intended to tackle climate change. The key concept is that, from the planet's point of view, the sources of CO₂ are far less important than the total amounts released. Rather than rigidly forcing emission reductions country by country, new carbon markets create a choice for polluters: either pay to cut the emission of their own equipment or continue releasing CO₂ and pay others- in some cases, organizations in the developing world where costs are often less- to lower their greenhouse gas output. In theory this approach lessens climate warming discharges at the minimum price tag. The Kyoto protocol's clean development mechanism allows industrialized countries to gain credits by financings low-carbon-output projects in developing countries.

Carbon credits sold through the Clean Development Mechanism are known as Certified Emissions Reduction (CERs). Only projects that have gone through the process of validation and verification may sell CERs. Carbon credits sold through a voluntary carbon trading scheme are known as Voluntary Emission Reductions (VERs). Carbon credits may either be purchased ex-post (i.e. after the carbon offset has been generated) or ex-ante (i.e. in advance of the offset being generated). In most cases VERs from forestry projects are sold ex-ante (this allows carbon income to be generated before activities are established to cover start up costs).

Developed countries can meet their GHG targets by purchasing GHG emission reduction from elsewhere. GHG emission can be purchased either from financial exchange or from project which reduce emission in Developing countries under clean development mechanism or in other developed countries under joint implementation. Carbon trading takes place with the CERs points. The trading takes place in the open market as securities through climate exchanges. The first large scale carbon trading system was the European Union Greenhouse Gas Emission Trading Scheme (EUETS) which was begun in 2005. Now-a-days Chicago Climate exchange (CCX), Asia Carbon Exchange and European Carbon Exchanges are in operation. Just like securities and commodities, derivatives are also traded in respect of CER. CERs are in the form of certificates, just like shares. A CER is given by the clean development mechanism (CDM) executive board to projects in developing countries to certify that they have reduced greenhouse gas emission by one tonne of carbon dioxide per year. For example, if a project generates energy using wind power instead of burning coal, and in the process saves 25 tonnes of carbon dioxide per year, it can claim 25CERs. According to industry reports (2008), the average size of Indian clean development mechanism (CDM) project has grown to 80000 CERs a year between January and August, as against about 55000 CERs last year. The global project average is 1, 20,000 CERs. It clearly indicates that two third of world CERs are produced by India. (Source: Thursday, Oct 16, 2008, Business line)

Review of Literature

A lot of literature is available in connection with carbon credit but a few work has been done regarding role of revenue generation in Indian corporate sector. The studies that are available in this context of carbon credit trading are briefly summarized as follows:

Kansal, Anju and Modi, Ravi (2011) analyzed the Indian Scenario and state that India is likely to emerge as the biggest sellers and Europe is going to be biggest buyers of carbon credit. India has generated some 30 million carbon credit and has roughly another 140 million to push into world market. Sharma, Shailendra (2012) suggested that Income from sale of CERs should be accounted for under the head 'Business and Profession'. However, in case of sale of Intangible, it would be taxable under the head 'Capital Gains' though most companies in India are recording earnings from carbon credit trading as Income from 'Other Sources' currently. Sood, Tulika (2012) explained the accounting, reporting and taxation aspect of carbon credit. She also investigated that there is currently no authoritative accounting literature from either the financial accounting standard board or International accounting standard board on accounting emission allowances although both U.S. and

international accounting standard setters have previously attempted to address the issue. Companies have developed their own accounting policies in the absence of explicit authoritative guidance. Gupta, Yuvika (2011) discussed the basic concept and importance of carbon credit. They emphasized on the methods used to save environment and stated that the business opportunities in the global emissions market in Indian context. Savaliya, Suresh (2009) explained the process of trading of carbon credit and showed that India has generated 70.41 million CERs/Carbon credit units as on the July 31, 2009 and has expected roughly another 145 million to push into the international market and mentioned name of some Indian company which are earned multimillions through execution of CDM Projects. Agrawal, Sanjay K. (2006) described the accounting and taxation aspect of carbon credit and raised some questions regarding accounting of carbon credit. In his opinion sale of CER should be treated as other income, not turnover.

Research Methodology

Objectives

The specific objectives of this paper are

1. To review the carbon credit trading in Indian Corporate Sector.
2. To examine the percentage of revenue from carbon credit trading to total revenue of sample units
3. To evaluate carbon credit revenue in different years of Indian corporate sector.

Hypotheses

In order to examine the above mentioned objectives the following hypotheses are formulated:

- Ho 1: There is no significant contribution of carbon credit trading revenue in total revenue in Indian corporate sector.
- Ho 2: There is no significant difference among the percentage average revenue of carbon credit trading to total revenue of different years of sample units.

Selection of Sample and Data Collection

The study is based on secondary data. These data were gathered through annual reports of respective sample units available on company's website. Ten companies which have disclosed carbon credit revenue in their annual report are selected for the purpose of present research work. The sample units are selected from various sector of economy like chemical, power, mining, sugar, paper, steel, cement and electric equipments. Nine companies which are selected listed at Bombay stock exchange and one company –RSMM is public sector undertaking.

Period of Study

Five financial years pertaining 2006-07 to 2010-11 are used for the purpose of present research work. The study of five years seems to be appropriate for establishing a trend.

Statistical Techniques

In order to carry the present research work statistical techniques like mean, standard deviation, coefficient of variation, chi square test and ANOVA are used. All the calculations are made on Microsoft excel through data analysis tool.

Review of Carbon Credit Trading Practices in Indian Corporate Sector

Indian companies sell CERs to companies in developed countries, especially in Europe, through bilateral deals or carbon exchanges. SRF Ltd, Gujarat Fluorochemicals Ltd, Oil and Natural Gas Corp. Ltd, and NTPC Ltd are some of the leading companies that use and sell carbon credits. The Aditya Birla group's flagship, Grasim Industries, has become the first cement company in the world to reimburse the carbon credits it earned. In 2007 the company has received Rs 17 crore by selling these credits in Europe. Grasim expects to earn Rs 55 crore by end of the financial year by selling more of it. (Source: TNN, July24, 2007). Indian companies are increasingly focusing on their corporate GHG emissions. Tata Motors, Tata Chemicals, Asian Paints, Infosys, Wipro, ACC, ONGC, Tata Steel, Aditya Birla Group, Ashoka Buildcon Ltd, among other have established corporate carbon accounting system and have disclosed their GHG emissions of Carbon Project Disclosure. Delhi Metro Rail Cooperation (DMRC) has become the first such railway project in the world to get carbon credit from the United Nations for helping in reduction of greenhouse emission. DMRC has in reduction in emission of harmful gases into the city's atmosphere. In the process, it has earned carbon credits worth about Rs 47 crore annually for the next seven years. According to the UN, Delhi Metro has helped in reducing pollution levels in the city by 6.3 lakh tonnes every year, thereby helping in mitigating impacts of global warming. "Today, about 18 lakh people travel by Delhi Metro that is completely non-polluting and environment-friendly. Every passenger who chooses to use Metro instead of car/bus contributes in reduction in emissions to the extent of approximately 100gm of carbon dioxide for every trip of 10km and, therefore, becomes party to the reduction in global warming. According to figures by DMRC, more than 91 thousand vehicles have been removed from Delhi's roads because of Delhi Metro. (Source: TNN Sept.26, 2011).

India and china have surplus credits to offer countries that are in deficit the major projects that aid in the issuance of CERs are hydroelectric power plants, wind energy, bio mass

and congregation projects. These credits are called “Carbon Offset Credits”; the other form is “Carbon Reduction Credits”. In total, 1.67 billion CERs will be generated from projects created in the period 2009-2012. At the current rate of 9 euro per CER, this translates to approximately 15 billion euro of opportunity for countries like china, India and Brazil. In order to achieve the second objective of the

present research paper, the percentage of carbon credit revenue to total revenue has been calculated for the sample units for five years span of periods. The relevant figures are given below:

Table 1: Percentage of Carbon Credit Revenue to Total Revenue

s.n	Sample Units	2006-07	2007-08	2008-09	2009-10	2010-11	Mean	C.V.
1	RSMM	0.61	0.66	0.45	0.09	0.25	0.41	58.65
2	Shree Cement Limited	N.A.	0.75	0.64	0.23	N.A.	0.54	50.37
3	Sesa Goa Limited	N.A.	0.08	0.06	N.A.	0.05	0.06	25.73
4	Jai Prakash Power Venture	N.A.	N.A.	2.45	5.73	4.54	4.24	39.14
5	Gujarat Fluorochemicals	62.00	53.73	58.37	44.75	17.94	47.36	37.31
6	Kalaptaru Power Transmission	0.06	0.05	0.29	0.20	0.14	0.15	69.55
7	Tamilnadu News Print & paper	0.26	0.38	0.10	0.36	N.A.	0.28	46.09
8	Rana Sugar Limited	N.A.	N.A.	N.A.	3.03	26.64	14.83	112.56
9	Aditya Birla Nuvo Limited	N.A.	0.12	0.10	0.08	0.09	0.10	17.47
10	JSW Steel Limited	N.A.	0.95	0.34	0.32	0.16	0.44	78.31
	Industrial Mean	15.73	7.09	6.98	6.09	6.23	6.84	
	C.V.	196.08	265.85	276.44	240.24	165.37		

(Source: own computed)

The Percentage of revenue from carbon credit trading to total revenue of the sample units for five years is given in above table no.1. On an average the sample units could be able to provide only 6.84 percentage of total revenue. If carbon credit revenue of two companies viz. Gujarat Fluorochemicals and Rana Sugar Ltd. are excluded from the sample average comes 0.776%. So it can be concluded from this discussion that industry earned revenue from carbon credit is less than 1% of total revenue. Although two-third units of world CER are traded by Indian corporate sector yet the Indian Corporate Sector could not able to generate sufficient percentage of revenue to total revenue during the study period. The highest average revenue (47.36%) is reported by Gujarat Fluorochemicals Limited and followed by Rana Sugar Limited (14.83) and Jai Prakash Power Venture Limited. The lowest mean value of revenue from carbon credit trading is reported by Sesa Goa Limited(0.06%) followed by Aditya Birla Nuvo Limited and Kalaptaru Power Transmission Limited. Carbon credit trading revenue is less than 1% of total income in RSMM, Shree Cement Limited, Sesa Goa Limited, Kalaptaru Power

Transmission Limited, Tamilnadu News Print & paper Limited, Aditya Birla Nuvo Limited and JSW Steel Limited. It means these sample units could not able to generate sufficient revenue from carbon credit trading during last five years.

As far as variability of carbon credit trading revenue (CCTR) is concerned Rana Sugar Ltd has reported highest variability in revenue from carbon credit trading as compared to other units of sample as it is evident by its highest C.V. (i.e. 112.56%). In contrast the uniformity in the percentage of carbon credit trading revenue during last five years as compared to other sample units has been observed in the Aditya Birla Nuvo Limited sample unit because this company reported least C.V. i.e. 17.47. It may be conclude that revenue from carbon credit trading is the highest volatile and fluctuate in the Rana Sugar Limited as compare to other units of sample while aditya birla earned revenue from carbon credit trading consistently throughout study period.

The year 2006-07 may be considered as successful year

regarding revenue from carbon credit trading of sample units because highest average revenue from carbon credit trading (15.73%) is reported by sample units in this year. Gradually declining trend has been observed in later years. The possible reason for declining in revenue could be relaxation in kyto protocol. The year 2009-10 may be considered worst year from the point of view carbon revenue because the average rate 6.09 % is noticed. It indicates that

the Indian corporate sector could not generate sufficient revenue from carbon credit. It is further a matter of investigation that what reasons are responsible for such condition. The rank of sample units on the basis of average rate of carbon credit trading revenue (CCTR) is given in the following table.

Table No. 2: Ranking of Sample units

Rank	Sample Units	Average CCTR %
1.	Gujarat Fluorochemicals Limited	47.36
2.	Rana Sugar Limited	14.83
3.	Jai Prakash power venture Limited	4.24
4.	Shree Cement Limited	0.54
5.	JSW Steel Limited	0.44
6.	RSMM	0.41
7.	Tamilnadu News Print & paper Limited	0.28
8.	Kalaptaru Power Transmission Limited	0.15
9.	Aditya Birla Nuvo Limited	0.10
10.	Sesa Goa Limited	0.06

Testing the Hypotheses

H_{01} : There is no significant contribution of carbon credit trading revenue in total revenue in Indian manufacturing industry.

To examine whether there is any significant difference among sample units of Indian corporate sector regarding percentage of revenue from carbon credit to total revenue, 'Chi- Square Test' has been applied. The results are shown in table no.3:

Table No.3: Comparison of Actual and Expected CCTR %

Sr. No.	Company Name	Actual Revenue	Expected Revenue	Surplus / Deficit
1.	RSMM	0.41	5.49	-5.08
2.	Shree Cement Limited	0.32	5.49	-5.17
3.	Sesa Goa Limited	0.04	5.49	-5.45
4.	Jai Prakash power venture Ltd.	0.04	5.49	-5.45
5.	Gujarat Fluorochemicals Ltd.	47.36	5.49	41.87
6.	Kalaptaru Power Transmission	0.15	5.49	-5.34
7.	Tamilnadu News Print & paper	0.22	5.49	-5.27
8.	Rana Sugar Limited	5.93	5.49	0.44
9.	Aditya Birla Nuvo Limited	0.08	5.49	-5.41
10.	JSW Steel Limited	0.35	5.49	-5.13
Chi Square calculated value		4.32		

Source: Computed

Critical Value at 5% Level of significance at (d.f.: 9) – 16.919

From table -3, it is observed that the actual carbon credit trading revenue is more than the estimated carbon credit trading revenue in two companies i.e. Gujarat Fluorochemicals Limited and Rana Sugar Limited. In rest of cases the estimated carbon credit trading revenue is more than the actual carbon credit trading revenue. The calculated value of chi square (4.32) is less than table value(16.919) at 5% level of significance at 9 degree of freedom hence the null hypothesis is accepted. The difference is observed due to sampling fluctuating no due to any major reasons. It reveals that there is no significant difference among different companies regarding generation

of percentage of revenue from carbon credit trading to total revenue of the firm.

H_{02} : There is no significant difference among the percentage average revenue of carbon credit trading to total revenue of different years of sample units.

To examine, whether the average value of carbon credit trading revenue of different years of different sample units is significant or not, analysis of variance has also applied at 5% level of significance, which is shown in Table no.4:

Table No. 4: Output of Analysis of Variance (ANOVA)

Source of Variation	S.S.	d.f.	M.S.	F-Ratio	5%F-Limit
Between Sample	16.42278	4	4.105695	20.40787	5.73
Within Sample	11060.08	33	335.15		
Total	11076.5	37			

Source: Computed

The output of ANOVA analysis is presented in above table no 4. The table shows that the calculated value of 'F' (20.4079) is much greater than critical value (5.73) at 5% Level of significance: hence the null hypothesis is rejected i.e. the differences among the average value of revenue of carbon credit of sample units are significant. It clearly indicates that the differences of revenue of carbon credit of various sample units are due to major reasons not due to sampling fluctuations. The performance of the all sample units under study period is not similar. Some units are performed very well but not others. Now it is further matter of research to identify the reasons for such differences.

Concluding Remark

The following conclusions can be drawn from above analysis and discussion:

On an average the sample units could be able to provide only 6.84 percentage of total income during five years of present study.

The highest average revenue (47.36%) is reported by Gujarat Fluorochemicals Limited and followed by Rana

Sugar Limited and Jai Prakash Power Venture Limited.

The lowest mean value of revenue from carbon credit trading is reported by Sesa Goa Limited followed by Aditya Birla Nuvo Limited and Kalaptaru Power Transmission Limited.

In the sample units only three companies could generate Carbon credit trading revenue more than 1% of total income.

It is also observed that trend of carbon credit revenue is declined in Indian corporate sector.

The calculated value of Chi- square test (4.32) is less than critical value (16.919) at 5% level of significance; hence the second null hypothesis is accepted that there is no significant difference among the different companies regarding generation of revenue from carbon credit trading.

Calculated value of 'F' (20.4079) is much greater than critical value (5.73) at 5% Level of significance: hence the second null hypothesis is rejected i.e. the differences among the average value of revenue of carbon credit of sample units are significant.

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