

Carbon Credit Accounting - A Study

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Abstract:

Introduction: One challenge faced by the human race is global warming. 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 (GHGs) in the atmosphere. Kyoto Protocol came into force in February 2005 which sets limits to the maximum amount of emission of GHGs by countries. Kyoto Protocol provides three market based mechanisms. The only mechanism relevant in Indian context is Clean Development Mechanism (CDM) under which Carbon Credits (Certified Emission Reduction Certificate - CERs) are granted.

Carbon credits are the certificates which are issued for certifying emission reduction. These certificates are traded in the international market and purchased by the companies of developed countries which are signatory to Kyoto protocol in order to cut down GHGs emission with the most cost effective way. Carbon credit is a financial instrument and it is an intangible asset. They need to be treated as asset(inventory) in the balance sheet till they are sold.

Objectives:

- To understand the concept of carbon credit accounting.
- To understand its treatment in the books of accounts.
- To understand the effectiveness of carbon credit accounting with the help of a case study.

Scope: This study includes application of accounting principles for the carbon credits. The study also includes the inception of carbon credit accounting and its effects on the pollution emitted entities in India.

Tools For Data Collection: The data required for the study is collected from the various business magazines, newspapers, articles and internet.

Limitations: This study is limited to the secondary data available.

Keywords:

- Carbon Credit
 - Green House Gases
 - Kyoto Protocol
 - UNFCC
 - Financial Instrument
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I. Literature Review

The review of literature was done by taking account of six factors. The factors identified were Carbon Credit Accounting, Kyoto protocol, Carbon Trading, Credits, Emissions Trading, and Clean development mechanism. A survey was done so as to find out the awareness of carbon credit accounting. Since it is a latest topic to ponder upon not much of its basic concept have been touched and looked upon. Theoretical research has been made in the context in aid to carbon emission, controlled and simultaneously credits earned by sundry designs of solar still in India. Carbon accounting is a social activity undertaken to keep a check of amount of carbon dioxide equivalents which will not be released into atmosphere as a result of variability projects under Kyoto protocol mechanism. Emissions trading system is often called as cap and trade. The main motto of this principle is to reduce pollution and fight against global climate change. Sovereignty versus egalitarianism has been highlighted to provide a pragmatic answer to the equity debate. Then mixed with international emissions trading the constructive approach stands out for offering the developed countries huge amount of emoluments for participation in the lowering of greenhouse gas effect. Global warming has been the foremost and front runner theme which paves more insights to have climate finance in the agenda. Present scenario is more pertains to financial selected professionals to leverage capital for emission free trading and clean energy. A significant additional change in economy through the crawling of socially responsible investment has been inadequately looked upon.

II. Introduction To The Study

Evolution Of The Concept Of Carbon Credits

The Concept of Carbon credit came into existence as a result of increasing awareness on the need for pollution control. It took the formal form after the international agreement between 141 countries, popularly known, as Kyoto Protocol. Carbon Credits are certificates awarded to countries that are successful in reducing the emissions that cause global warming.

Green House Gases And Their Emission

One challenge faced by the human race is global warming. 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 in the atmosphere. Subsequently, to supplement the Convention, the Kyoto Protocol came into force in February 2005, which sets limits to the maximum amount of emission of Green House Gases (GHGs) by countries. The Kyoto Protocol originally committed 41 developed countries to reduce their GHG emissions by at least 5% below their 1990 baseline emission by the commitment period of 2008-2012. The government gave its nod to ratify the second commitment period of the Kyoto Protocol(i.e.,2013-2020) that commits countries to contain the emission of greenhouse gases.

The Kyoto Protocol

As per the Kyoto Protocol, developing and least developed countries are not bound by the emissions they produce. Under the Kyoto Protocol, countries with binding emission reduction targets (which at present are applicable to developed countries) in order to meet the assigned reduction targets are issued allowances (carbon credits) equal to the amount of emissions allowed. An allowance (carbon credit) represents an allowance to emit one metric tonne of carbon dioxide equivalent.

To meet the emission reduction targets, binding countries in turn set limits on the GHG emissions by their local businesses and entities. Further, in order to enable the developed countries to meet their emission reduction targets, Kyoto Protocol provides three market-based mechanisms.

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.

Under **CDM**, a developed country can take up a GHG reduction project activity in a developing country where the cost of GHG reduction is usually much lower and the developed country would be given carbon credits for meeting its emission reduction targets. Examples of projects include reforestation schemes and investment in clean technologies.

In case of CDM, entities in developing/least developed countries can set up a GHG reduction project, get it approved by UNFCCC and earn carbon credits. Such carbon credits generated can be bought by entities of developed countries with emission reduction targets. The unit associated with CDM is Certified Emission Reduction (CER) where one CER is equal to one metric tonne of carbon dioxide equivalent.

Under **IET**, developed countries with emission reduction targets can simply trade in the international carbon credit market. This implies that entities of developed countries exceeding their emission limits can buy carbon credits from those whose actual emissions are below their set limits. Carbon credits can be exchanged between businesses/entities or bought and sold in international market at the prevailing market price. These mechanisms serve the objective of both the developed countries with emission reduction targets, who are the buyers of carbon credits as well as of the developing and least developed countries with no emission targets (at present), who are the sellers/suppliers of carbon credits. The non-polluting companies from less developed countries can sell the quantity of carbon dioxide emissions they have reduced (carbon credits) and earn extra money in the process. This mechanism of buying and selling carbon credits is known as **Carbon Trading**.

Accounting Treatment Of Carbon Credit Accounting CER is an 'asset'

For CER to be an asset, it should be a resource controlled by the generating entity arising as a result of past events, and from which future economic benefits are expected to flow to the generating entity. In order to generate CERs, an entity undertakes a CDM project activity and thereby reduces carbon emissions. There are various stages involved in a CDM project activity to generate CERs. After a successful registration and operation of CDM project, carbon emission reductions are generated and these continue to be generated over the course of the project. However, at this stage, i.e., when the emission reductions are taking place, CERs do not

arise. It may be argued that as soon as emission reductions take place these should be considered as assets since certification there of subsequently in the form of CERs is a procedural aspect. In this regard, it is noted that issuance of CERs is subject to the verification process i.e. CERs are applied for and on the expiry of 15 days having received no request for review and after having satisfied all requirements; a communication is received from UNFCCC thereby crediting CERs to the generating entity. It is, thus, possible that emission reductions may not eventually result in to creation of CERs. Accordingly, at this stage when emission reductions are taking place, CERs can, at best, be said to be contingent assets as per Accounting Standard (AS) 29, Provisions, Contingent Liabilities and Contingent Assets, which defines Compendium of Guidance Notes – Accounting a contingent asset as “**a possible asset that arises from past events the existence of which will be confirmed only by the occurrence or nonoccurrence of one or more uncertain future events not wholly within the control of the enterprise**”. This is because when the generating entity reduces carbon emissions by way of a CDM project, the generating entity becomes eligible to receive CERs from UNFCCC. However, whether CERs will actually arise and be received by the generating entity or not will depend on a future uncertain event, i.e., certification of the same by UNFCCC. It follows from the above that a CER comes into existence and meets the definition of an asset only when the communication of credit of CERs is received by the generating entity. This is because only at this stage the CER becomes a resource controlled by the generating entity and therefore leads to expected future economic benefits in the form of cash and cash equivalents which would arise on the future sale of CERs. As stated above, at other earlier stages of the CDM project activity, there is no resource in existence for the generating entity, and hence the question of ‘resource controlled’ and ‘expected future economic benefits’ therefore do not arise. Accordingly, CER is an ‘asset’, when it comes into existence as stated aforesaid.

Recognition of CERs

According to the ‘Framework for the Preparation and Presentation of Financial Statements’, once an item meets the definition of the term ‘asset’, it has to meet the criteria for recognition of an asset as laid down in the Framework so that it may be recognized in the financial statements. In other words, it has to be seen when the CERs should be recognized in the financial statements.

An asset is recognized in the balance sheet when it is probable that the future economic benefits associated with it will flow to the enterprise and the asset has a cost or value that can be measured reliably. It follows that CERs come into existence when these are credited by UNFCCC in a manner to be unconditionally available to the generating entity. Therefore, CERs should not be recognised before that stage. It also follows that for CERs to be recognised in the financial statements of the generating entity as assets, after duly satisfying the criterions as mentioned below;

(a) As regards the probability criterion for recognition of CERs, it may be mentioned that the concept of probability refers to the degree of certainty that future economic benefits associated with CERs will flow to the entity. Therefore, the probability criterion is said to be met when there is a reasonable assurance that future economic benefits will flow from the CERs to the entity. As the market for CERs is relatively new, the future economic benefits may not always be assured. Thus, an entity needs to make an assessment for the probability of future economic benefits. Accordingly, if there is a probable market for the self-generated CERs ensuring flow of economic benefits in the future, CERs should be recognised.

(b) As regards the criterion for measurement of cost or value, there are certain costs which are incurred to generate CERs, and therefore the cost of CERs can be measured reliably.. For reasons stated above, the recognition of CERs as an asset at any earlier or later stage than when they are credited by UNFCCC is not justified in the following cases:

(a) CERs are recognized upon execution of a firm sale contract for the eligible credits.

(b) CERs are recognized on an entitlement basis based on reasonable certainty after making adjustments for expected deductions.

What type of asset is a CER

Keeping in view the non-physical form of CERs, the definition of ‘intangible asset’, as per Accounting Standard (AS) 26, Intangible Assets, is noted as follows:

“An intangible asset is an identifiable non-monetary asset, without physical substance, held for use in the production or supply of goods or services, for rental to others, or for administrative purposes.”

From the above, it is noted that though CERs are non-monetary assets without a physical form, they do not strictly fall within the meaning of ‘intangible asset’ as per AS 26. The reason is that CERs are not held for use in the production or supply of goods or services, and neither are CERs used for administrative purposes nor are they used for the purpose of renting to others.

Instead, CERs generated by the generating entity are held for the purpose of sale. However, it may be mentioned that though the definition of 'intangible asset' does not mention assets held for sale, the other requirements of AS 26, such as the following, indicate that intangible assets include assets which are developed by an entity for sale:

An intangible asset arising from development (or from the development phase of an internal project) should be recognised if, and only if, an enterprise can demonstrate all of the following

- (a) the technical feasibility of completing the intangible asset so that it will be available for use or sale;**
- (b) its intention to complete the intangible asset and use or sell it;**
- (c) its ability to use or sell the intangible assets;**
- (d) the availability of adequate technical, financial and other resources to complete the development and use or sell the intangible asset**

Accounting for Self-generated CERs in the ordinary course of business are excluded from the scope of AS 26 (paragraph 2) and therefore, are to be accounted for as per Accounting Standard (AS) 2, Valuation of Inventories. In this context, the definition of the term 'inventories' as given in AS 2 is noted below:

"Inventories are assets:

- (a) held for sale in the ordinary course of business;**
- (b) in the process of production for such sale; or**
- (c) in the form of materials or supplies to be consumed in the production process or in the rendering of services."**

It follows that CERs are inventories of the generating entity as they are generated and held for the purpose of sale in the ordinary course of business. Therefore, even though CERs are intangible assets these should be accounted for as per the requirements of AS 2.

Measurement of CERs

As stated above, CERs are inventories for an entity which generates the CERs. Therefore, the valuation principles as prescribed in AS 2 should be followed for CERs. As per AS 2, inventories should be valued at the lower of cost and net realisable value. Accordingly, CERs should be measured at cost or net realisable value, whichever is lower.

Cost of Inventories

AS 2 prescribes the composition of cost of inventories as follows:

"The cost of inventories should comprise all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition."

Various costs are incurred by the generating entity to set up a CDM project activity, operate the CDM project and generate CERs. These may include the following:

- (i) research costs arising from exploring alternative ways to reduce emissions;
- (ii) costs incurred in developing the selected alternative as a process/ device to reduce emissions;
- (iii) costs incurred to prepare the Project Design Documents;
- (iv) fees paid to DOEs for validation and verification and to the National Authority for approval;
- (v) fees of registering with UNFCCC;
- (vi) costs incurred for monitoring the reductions of emissions;
- (vii) costs incurred for certification of CERs; and
- (viii) operating costs incurred to run the CDM project.

CERs do not come into existence and, therefore, do not become the assets of the generating entity till the UNFCCC certifies and credits the same to the generating entity. Accordingly, not all costs incurred by the generating entity give rise to CERs and therefore not all costs can be considered as the costs of bringing the CERs to existence (i.e., their present location and condition). For example, the research and development costs are the pre-implementation costs of the CDM projects which do not result in CERs. Accordingly, these should be treated as per Accounting Standard (AS) 26, Intangible Assets when they bring into existence a separate intangible asset such as a patent of a process to reduce carbon emissions. Similarly, the other costs such as those incurred for preparation of PDD and registration of the CDM project with UNFCCC, etc., do not result in CERs coming into existence, and therefore these costs cannot be inventorised. It is only the costs incurred for the certification of CERs by UNFCCC which bring the CERs into existence by way of credit of the same by UNFCCC to the generating entity. Thus, the costs incurred by the generating entity for certification of CERs, are the costs of inventories of CERs. In order to certify and issue CERs, UNFCCC imposes two types of levies on the generating entity. The first type of levy is in kind whereby a specified percentage of the CERs earned are

deducted at the point of issuance by the Accounting for Self-generated CERs by UNFCCC. In other words, the generating entity is issued CERs net of this levy. For example, if this levy is 2% and if 1000 CERs are to be issued, then after deducting 20 CERs, 980 CERs will be credited. This levy is applied to all projects other than those of the Least Developed Countries. The second type of levy imposed is in the form of a cash payment which is charged by the UNFCCC towards meeting administrative costs of UNFCCC. In this levy, a fixed payment per unit of CER is charged for the total CERs credited to the generating entity.

Taking the above example further, if USD 0.10 per CER is charged towards the second levy, then the generating entity will need to make a payment at this rate for the 980 CERs credited to it, i.e., USD 98. Apart from these two levies, the generating entity normally pays a fee to the consultant for the services rendered to obtain the certification of CERs by UNFCCC.

From the above, it follows that the 'costs incurred for certification of CERs' at which the inventory of CERs should be valued include the consultant's fee and the cash payment made under the second levy to the UNFCCC for obtaining the credit of CERs. The deduction of CERs by UNFCCC under the first levy is in kind which increases the per unit cost of the CERs credited to the generating entity.

Net Realisable Value

AS 2 defines net realisable value as follows:

“Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.”

In the determination of the net realisable value of CERs, paragraph 22 of AS 2 reproduced below should be used as guidance:

“Estimates of net realisable value are based on the most reliable evidence available at the time the estimates are made as to the amount the inventories are expected to realise. These estimates take into consideration fluctuations of price or cost directly relating to events occurring after the balance sheet date to the extent that such events confirm the conditions existing at the balance sheet date.”

Income Recognition

Since CERs are recognised as inventories, the entity should apply AS 9 to recognise revenue in respect of sales of CERs.

Measurement of underlying assets related to CERs

For the generation of CERs, the generating entity may create certain intangible and tangible assets. For example, for reducing emissions, an entity may carry out some research and development which may result into creation of an intangible asset. Insofar as expenditure on research and development is concerned, the entity should apply AS 26, Intangible Assets.

In some cases, an entity may use a tangible asset to reduce emissions. For example, an entity may use incinerators for the purpose of reducing carbon emissions. In respect of such devices, the provisions of the Accounting Standard (AS) 10, (Revised) Tangible Fixed Assets³ will apply. Items of tangible fixed assets may be acquired for safety or environmental reasons. The acquisition of such tangible fixed assets, although not directly increasing the future economic benefits of any particular existing item of tangible fixed asset, may be necessary for an enterprise to obtain the future economic benefits from its other assets. Such items of tangible fixed assets qualify for recognition as assets because they enable an enterprise to derive future economic benefits from related assets in excess of what could be derived had those items not been acquired. For example, a chemical manufacturer may install new chemical handling processes to comply with environmental requirements for the production and storage of dangerous chemicals; related plant enhancements are recognised as an asset because without them the enterprise is unable to manufacture and sell chemicals. However, the value of such an asset and related assets is reviewed for impairment in accordance with AS 28, Impairment of Assets.” From the above, it is clear that any pollution control/emission reduction devices installed by the generating entity for the purpose of generating CERs are fixed assets and therefore they shall be accounted for as per AS 10 (Revised).

Presentation

An entity should present certified emission rights as part of Inventories, in the balance sheet, separately from other categories of Inventories such as Raw Materials, Work-in-process, Finished goods and others.

Disclosure

An entity should disclose the following information relating to certified emission rights in the financial statements:

a) No. of CERs held as inventory and the basis of valuation.

- b) No. of CERs under certification.
- c) Depreciation and operating and maintenance costs of Emission Reduction equipment expensed during the year.

A Case of Delhi Metro Rail Corporation

India has a large potential to earn carbon credits. India is currently the fourth largest GHG emitter in the world, although its per capita emissions are less than half of the world's average. India has generated 1,77,360,206 CER's through CDM till 2014 and India stands second in the world in terms of CDM projects registered and issuance of CER's next to China. Delhi Metro Rail corporation has become first ever railway project in the world to claim carbon credits because of using regenerative braking in its rolling stock. DMRC reduces 30% electricity consumption with regenerative braking system in its trains. DMRC claimed 4,00,000 CERs for a 10 year crediting period starting December, 2007 when the project was registered by the UNFCCC. This converts to 1.2 crore per year for 10 years. DMRC has also been certified in June, 2011 by the United Nations body as the first Metro Rail and Rail based system in the world to get carbon credits for reducing GHG emissions as it has helped to reduce pollution levels in the city by 4.5 lakh tons every year, thus helping in reducing global warming.

DMRC so far has helped in removing more 91 thousand vehicles from the roads of Delhi on daily basis. Accordingly DMRC's second CDM project has been developed, based on the shift of public travels in cars/buses and other means of road transport to the metro trains. Further, in Phase-III, lifts and escalators designed with regenerative braking are proposed so as to use the data for claiming carbon credits.

III. Conclusion

Carbon trading is an effective tool to earn extra benefits for developing countries and non developed countries. Clean Development Mechanism is also an effective source of technological and economic development for developing countries with environmental upgradation. Although India is the largest beneficiary of carbon trading, it still does not have a proper policy for trading of carbons in the market. For appropriate functioning and development of carbon markets and carbon trading practices, separate financial accounting standard must be established.

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