



A Practical Application in Carbon Credit Accounting Practices with reference to Bharat Heavy Electricals Ltd

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Abstract: *In this modern era, every industries focus to achieve a new development and innovation which indirectly affects the nature. Repeated carbon pollution will affect all the resources in future. In order to bring out the carbon emission reduction among the industries all over the world, one of the practices named carbon credit accounting policies initiated in Kyoto protocol as carbon is tradable good which motivating companies to do more eco-friendly activities. This paper enlightens 1.The key initiative practices on carbon credit accounting followed by BHEL for sustainable development. 2. To evaluate the performance of carbon credit accounting in BHEL. 3. To enumerate the tax subsidies on carbon emission reduction. The research is based on case study approach and quantitative. The data has been retrieved from secondary sources such as sustainability report of BHEL.*

Key Words: *Carbon credit accounting, carbon emission reduction, Kyoto protocol.*

1. Carbon Credit Accounting: A Bird's Eye View:

Carbon credits have been introduced in Kyoto protocol in Japan involved by 192 parties for developed countries and in the Paris agreement by United Nations Framework Convention on Climate Change on 2016 by 194 countries to gain a non-quantifiable benefit for the industries in coming times. A carbon credit is equal to 1ton of carbon released in the atmosphere. Carbon credits certification will be issued when the industry is controlling or reducing the actual level of carbon footprint in the atmosphere. India planned to get zero carbon pollution in future and it also involves the cost procedures.

BHEL is Engineering and Manufacturing company established in 1964 and it took initiative to reduce carbon emission by adopting the framework of United Nation Framework Convention on Climate Change, which is an advantage for eco-system. BHEL also do carbon capture since 2009, which helps to reduce carbon in greenhouse gases.

2. Review of Literature:

Marlowe and Clarke (2022) Exhibit the need of carbon credit accounting to identify the issues on climate change, they have explained the working mechanism of carbon credit accounting and suggested that lack of transparency, reliability and comparability in this area.

Namrata Prakesh et.al (2022) the research delineate that carbon credit accounting is a yardstick tool for developing and underdeveloped nations. India needs many standard policies and structures to implement carbon credit trade activities.

Rong He et.al (2021) the study reaches out by finding major streams such as developing the legislation towards carbon credit accounting, corporate carbon disclosure and low investmnts towards carbon and it creates awareness of climate change to key managerial personnel and helps the firms to do the cost analysis with an aid to policy makers to make policies and regulations towards carbon assurance, carbon management and carbon performance.



Akhila Sedimi(2017) it determines the concept of carbon credit accounting, Kyoto protocol, recognition of certified emission reduction certificate, preparation of financial statement, cost of inventories and enumerate the net realizable value. This author revealed the case study approach on Delhi Metro Corporation and concluded that carbon credit accounting policies helps to reduce the pollution 4.5 lakhs per ton every year.

Figen öker and Hünerya Adigüzel (2017) it determines about the financial reporting standards towards certified emission reduction, emission reduction units(ERU) and Assigned Amount Unit (AAU) as a carbon credit accounting mechanism.

Patnaik et.al (2016) the study conveys that awareness on carbon credit accounting should be increased in different media platforms and new programs from Government should be initiated to create the awareness among the people.

Sarkar and Dash (2011) the study highlights the development to be made on carbon credit accounting policies on transaction and accountability at global standard towards Clean Development Mechanism (CDM), Joint implementation (JI) and Emission Trading System(ETS)

3. Statement of the Research Problem:

Many industries use technologies and innovations to illuminate their fame and financial gain to the next level but at the same time they have to be cautious on exerting the nature. Carbon credit accounting is one of the imperative and trending practices in the developing and underdeveloped nations. Industries pollute carbon which directly became a reason for climate change. The research paves the way for other manufacturing sectors to get rid of carbon emission gradually in future to save the nature by developing the practices of carbon credit accounting policies like BHEL.

3.1 Importance of the study:

A case study approach on Bharat Heavy Electrical Limited will be an epitome for other developing industries to realize the importance of mitigating the carbon emission and making the substitutes which boost the sustainable development. It induces the other manufacturing sectors to concentrate on decarbonize by involving more electrical technologies and other eco-friendly activities. This research acts as a foundation to get aware of the carbon credit accounting practices for the upcoming industries in India.

4. Objectives of the Study:

The aim of the study is to give an idea

- To identify the key initiative practices on carbon credit accounting in Bharat Heavy Electrical Limited for sustainable development.
- To evaluate the performance of carbon credit accounting in Bharat Heavy Electrical Limited.
- To enumerate the taxation framework on carbon credit practices.

5. Research Methodology:

Type of research	Case study approach
Methods of research	Quantitative
Sources of data	Secondary data from BHEL sustainable development reports
Statistical tools	Graph and charts like Trend analysis, cone and cylindrical pattern.

Practices on Carbon Credit Accounting:

Bharat Heavy Electrical Limited follows UNFCCC protocol to reduce the carbon footprints,

- BHEL accompanied with Indra Gandhi Centre for Atomic Research, National Thermal Power Corporation on developing the Advanced Ultra Supercritical technology to accomplish the mission called clean coal technology with this coal utilization and carbon dioxide reduced 11% compared to previous year.



- In order to have a periodical check towards carbon emission online statck monitoring system has been implemented in some of our units in order to maintain the records with in a stipulated period for state pollution control boards and statutory authorities.
- Since 2009 BHEL concentrated on capturing the carbon dioxide (CO₂) and with the help of pipelines the captured carbon will be transacted to the underground storage place.
- Where BHEL is the first industry in India to transform the ash coal to methanol with integration of 1.4 tons per day of captured carbon and the company stated that “they bring out 99 percentage pure methanol from the ash coal”
- The first solar based charging stations have been introduced by BHEL from Delhi-Chandigarh highway and it is named as first eco-friendly highway in India.
- It produces solar panels, batteries, inventories and cells which helps to promote the nation’s green initiative
- With the help of research and development, they implemented Passivated Silicon Hetrojunction solar cells with 21% efficiency.
- For transportation facilities BHEL also introduced and successfully implemented 12m E-bus tested at ARAI motors and with charging facilities.
- It has developed 1.25kw fuel cell powered hybrid electric Golf cart vehicle.

Taxation Framework:

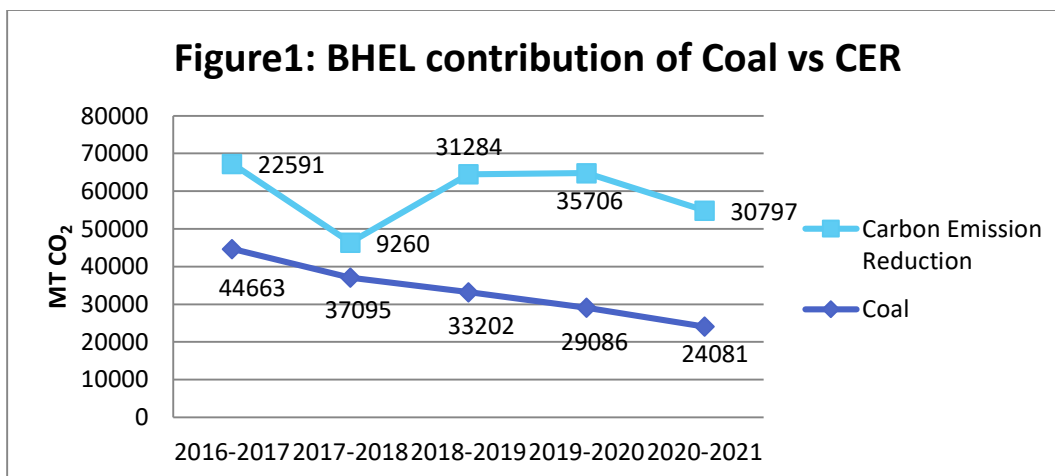
- Carbon Boarder Tax imposed on imported goods for producing carbon and the countries with low carbon emission regulations which lead to increase the carbon price all over the world.
- IAS standard 2,20,37,38 applied for ISAB polluting project mechanism
- Carbon emission reduction is applied on AS9 for revenue recognition in carbon trade
- Section 115BBG the finance act 2017, implemented for income by way of transfer of carbon credit at 10%

6. Data Analysis and Discussion:

Table 1: Coal usage and Carbon Emission Reduction(MT CO₂)

Years	Coal	Carbon Emission Reduction
2016-2017	44663	22591
2017-2018	37095	9260
2018-2019	33202	31284
2019-2020	29086	35706
2020-2021	24081	30797

Source:- BHEL sustainability report 2020-2021



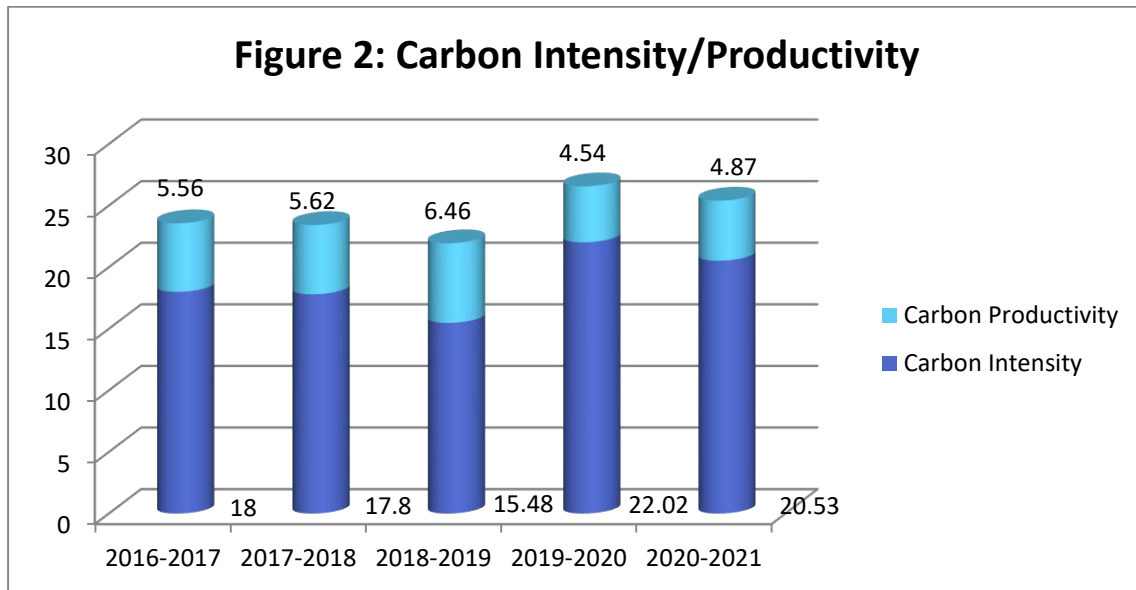


Interpretation: In the above figure-1, the usage of coal has been declined from 44663(MTCO₂) in 2016-2017 to 24081(MTCO₂) in 2020-2021 has resulted in high carbon reduction emission from 22591(MTCO₂) in 2016-2017(MTCO₂) to 30797 in 2020-2021 due to adoption of carbon credit accounting practices from UNFCCC.

Table 2: Carbon Intensity and Carbon Productivity(Gross turnover in crores MTCO₂)

Years	Carbon Intensity	Carbon Productivity
2016-2017	18	5.56
2017-2018	17.8	5.62
2018-2019	15.48	6.46
2019-2020	22.02	4.54
2020-2021	20.53	4.87

Source:- BHEL sustainability report 2020-2021

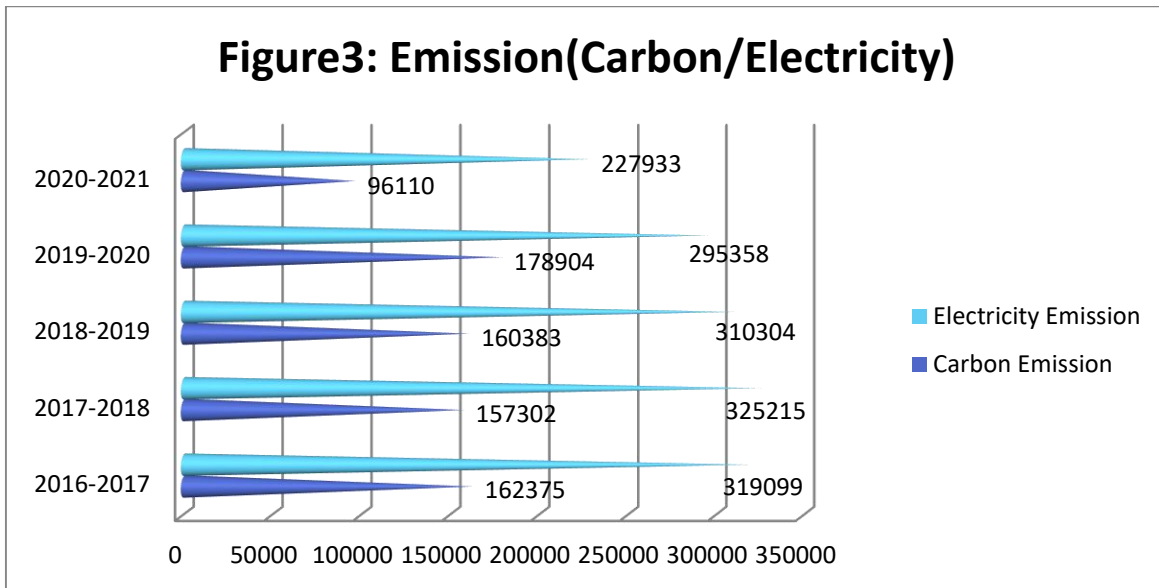


Interpretation: In the figure-2, Carbon intensity in turnover has been increased from Rs18 crores to Rs 20.53 crores during the year 2016 to 2021 and the amount spent on carbon productivity on the overall revenue of BHEL has been declined from Rs5.56 to Rs 4.87 crores in 2016-2021 due to carbon capture mechanism.

Table3: Carbon emission to Electricity Emission (MTCO₂)

Years	Carbon Emission	Electricity Emission
2016-2017	162375	319099
2017-2018	157302	325215
2018-2019	160383	310304
2019-2020	178904	295358
2020-2021	96110	227933

Source:- BHEL sustainability report 2020-2021



Interpretation: In the above figure 3, Carbon reduction avoidance and energy efficiency in BHEL has been achieved from 162375(MTCO₂) to 96110(MTCO₂) in 2016-2021 and electricity limits production through carbon decreased from 319099 to 227933 in 2016-2021. The usage in carbon in electricity production has been gradually decreased from 319099 to 227933(MTCO₂) in 2016-2021.

(Note: MTCO₂ – Metric Tonnes carbon Dioxide)

7. Findings of the Study:

- In the above figure 1, coal usage declined from 44663(MTCO₂) in table 2016-2017 to 24081(MTCO₂) in 2020-2021 as resulted in carbon emission reduction from 22591(MTCO₂) to 30797(MTCO₂) in the year 2016-2021.
- From the figure 2, carbon intensity has increased from 18 crores to 20.53 crores per MTCO₂ and carbon productivity has been turn down 5.56 crores to 4.87 crores in MTCO₂.
- In the figure 3, CO₂ emission has been gradually Fallen from 162375(MTCO₂) to 96110(MTCO₂) during the year 2016-021 whereas electricity emission using carbon has been declined from 319099 to 227933(MTCO₂) during the year 2016-2021.

8. Suggestions and Recommendations:

- Government of India initiated frame work related to carbon credit and investors can invest in the carbon trade for the better future.
- More funds should be invested in research and development department on conversion of captured carbon into mineralization, biological and, it can also converts into urea for fertilizer usage in agricultural field.
- Tax benefits on implementing the carbon credit should be given to the industries as a motivating factor which creates more innovations of controlling the carbon.
- Carbon trading market such as cap and trade market should be implementing in India both globally and domestic sectors.
- Proper accounting standards should be assigned on the carbon credit accounting.
- E-websites for carbon trading and carbon credit certificates can be brought out in future for easy handling.
- A conference/business meeting along with respective governing bodies should be conducted to illuminate the practices of carbon credit accounting.
- Economic mechanism such as Cap & trade or Emission Trading Scheme (ETS) be implement instead of carbon tax which helps to mitigate the usage of carbon beyond the allocation budget of carbon level in atmosphere.



8. Scope and Limitations of study:

The research is restricted with only one industry i.e. BHEL not any other industries. It focuses only on certain industries that follow these practices. Further this will act as a base to implement carbon credit accounting practices in further industries. A comparative study on performance of similar manufacturing product can be analyzed in an empirical manner based on the data available and their improvements can be a positive and negative can be noted in future

9. CONCLUSION:

Carbon credit accounting is slowly emerging concept in India and the bill has been passed to implement the carbon credit trading. BHEL has been initiated to do more eco-friendly activities and followed the protocols of UNFCCC to capture the carbon and convert it into the useful resources and at the same time implementing the new conversion and eco-friendly technologies includes more cost for the developing industries. BHEL is in the starting stage of capturing carbon integrated with ash coal to make methanol. Many more process has to be implemented and guidelines of carbon credit accounting should be implemented

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