

How Do Carbon Credits Influence Corporate Sustainability Practices?

Adil Afridi

Gems Dubai American Academy

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ABSTRACT

Climate change is the pivotal challenge of this modern era, which needs broad sustainability practices in different sectors. Industrial sectors are at the core of climate impact mitigation, considering that these industries belong to the most significant GHG emitters, and one of the critical tools in this fight is carbon credits. Carbon credits allow an organization to offset its GHG emissions through purchase; the latter is generated through specific projects that reduce or avoid GHG emissions. In this paper, the carbon credit issue has become part of corporate sustainability strategies, given their implications for how business is done, incentives, and the challenges inherent in this approach. Given the rise in sustainability goals and regulations, carbon credits foster a better financial foundation and corporate reputation.

However, fraud, lack of transparency, and price volatility remain challenging. Critics claim that reliance on carbon credits undermines genuine emission reductions and extends environmental injustices. Case studies on carbon credit use vary from large corporations like Microsoft and Shell to SMEs like Illy. The effective use of carbon credits calls for a balanced mix of direct emission reductions and carbon offsetting that will create significant sustainability impacts. This paper underlines that the full integration of carbon credits within a company-wide corporate sustainability strategy allows the challenges linked to climate change to be comprehensively met.

1. Introduction

Climate change is one of the most significant problems of the present century, and its effects have prompted calls for sustainability in all sectors. Businesses are among the most significant contributors to greenhouse gases, making them crucial in managing climate change. As stated by Dwivedi et al. (2022), the carbon credit system is one of the fundamental leverage tools available to companies pursuing the goal of sustainability. Carbon credits permit an organization to release a specified amount of carbon dioxide or any other gases causing the greenhouse effect (Trouwloon et al., 2023). The best example of how carbon credits function is when an

organization has minimized emissions below its minimum volume; the extra volume of credits may be sold to organizations that have not minimized emissions at an intended level. It provides an incentive and enables companies to cut carbon emissions while helping the rest of the globe in the war against climate change.

Sustainability practices within organizations have evolved significantly, especially over the last two decades. Despite being linked initially to governmental and public relations frameworks, sustainability has shifted into a strategic matter linked to firms' competitiveness and survival horizon (Kiehle et al., 2023). By practicing sustainability, a firm can reveal the multivariate characteristics of environmental and social governance (ESG) criteria that act as guidelines to study the firms based on major non-financial parameters. These factors have been gaining importance for investors and customers, among other stakeholders, as a performance indicator of environmental and social consequences related to business operations (Kiehle et al., 2023). Introducing carbon credits into the corporate sustainability strategy represents a relationship between ecological responsibility and economic opportunity where a business can balance its sustainability goals with the financial benefits arising from such efforts.

The world struggles with the impact of climate change. Therefore, there is a need to understand the relationship between carbon credits and corporate sustainability. This paper seeks to determine how carbon credits influence corporate sustainability practices by exploring their work, opportunities, challenges, and internal relative influence within big and small companies. The paper discusses these factors in detail concerning the effectiveness of carbon credits in improving corporate sustainability and guiding business strategy in the future.

2. Understanding Carbon Credits

2.1. Definition and Types of Carbon Credits

One of many global solutions concerning reducing GHG emissions on a global scale involves carbon credits. Carbon credits are tradable certificates, representatives of the right to emit one metric ton of carbon dioxide or an equivalent amount of another greenhouse gas (Guan et al., 2023). Initially, carbon credits came from the Kyoto Protocol, an international treaty that committed its signatories to reduce GHG emissions. There are two primary forms of its existence: Certified Emission Reductions and Verified Carbon Units.

They are also credited under the Clean Development Mechanism of the Kyoto Protocol (KP). Projects in developing countries may generate these by reducing or avoiding greenhouse gas emissions, such as installing renewable energy, enhancing energy efficiency, or reforestation (Cansino et al., 2022). Besides, developed countries can buy these CERs to meet their commitments to reducing emissions under the Kyoto Protocol (KP). This mechanism will

contribute to achieving the targets set by developed countries. It will also ensure that developing countries continue developing along a sustainable path through financial incentives for projects that reduce carbon emissions.

On the other hand, Verified Carbon Units (VCUs) are credits issued within the voluntary carbon market. However, while CERs involve international treaties, VCUs are used by companies and individuals to offset the greenhouse gas footprint voluntarily. Corporate social responsibility, investor expectations, and consumer demand for green products and services influence the trend in the voluntary market (Constantino, 2022). Projects that generate VCUs undergo strict verification so that emissions reduction is real, measurable, and permanent.

Activities related to renewable energy, forestry, waste management, and any community-based initiative that aims to reduce carbon fall under the list.

2.2. How Carbon Credits Work

The mechanism of carbon credits is elaborate and innovative. The system is designed to develop a financial motive for enterprises to reduce carbon emissions. Firms that can reduce their emissions below a certain level may produce carbon credits to sell in carbon markets (Arya et al., 2017). In this way, it becomes a financial reward for the companies that proactively reduce their carbon emission. Companies that do not make a surplus in their carbon emissions limits can sell the extra carbon credits to companies that go over their limits, which means the latter will be able to meet regulatory requirements or fulfil voluntary sustainability targets.

Carbon credits are traded on both regulated and voluntary markets. Examples of regulated markets are those that operate under the European Union Emissions Trading System-mandatory government schemes that limit the total amount of emissions allowed within a particular jurisdiction (Verde & Borghesi, 2022).

Those who emit more than their share must buy additional credits; those who emit less can sell extra credits. The cap-and-trade system gradually cuts overall emissions by tightening the cap over time.

On the other hand, voluntary markets do not come from a regulated drive but from companies' commitments to sustainability. In this market, companies can buy credits to voluntarily offset their emissions, mainly as part of their corporate social responsibility initiatives (Parra-Paitan et al., 2023). The Voluntary Carbon Market is less standardized than regulated markets, with quite a wide variety of projects and credits available. Nevertheless, it is growing fast because more companies must take care of their carbon footprint.

3. Corporate Sustainability Practices

3.1. Definition and Goals

Corporate sustainability means that companies conduct operations in an economically viable, socially bearable, and environmentally sustainable way over a long period. It entails business practices that minimize negative environmental impacts, enhance social equity, and ensure transparent and ethical governance (de Oliveira et al., 2023). Sustainability is increasingly viewed as the driver of business success, as companies embracing sustainable practices are better placed to manage risks, reduce costs, and attract and retain customers and investors.

Environmental social governance criteria should guide and serve to evaluate a company's sustainability performance. The environmental criteria assess a company's operations with respect to their impact on the natural environment in terms of carbon emissions, waste disposal methods, resource utilization, and energy use (Mohd, 2023). The social criteria assess how a company manages its relationships with employees, customers, suppliers, and communities, including issues related to labor practices, diversity, human rights, and community involvement. Governance criteria offer insights into the quality of a company's leadership and composition of its board, executive compensation, audits, internal controls, and the rights of its shareholders.

Common business goals towards sustainability include GHG emission reduction, efficiency of resources, reduction of waste, and enhancing social responsibility. Most of these goals relate to the UN social development goals, a universal call to action toward ending poverty, protecting the planet, and ensuring that by 2030, all people have enjoyed peace and prosperity (Manzoor et al., 2024). By integrating the sustainability approach within the core competencies, the tangible benefits that a firm can achieve include cost savings, improved brand reputation, ensured customer loyalty, and market and investment opportunities.

3.2. Strategies for Implementing Sustainability

The introduction of sustainability practices should be a strategic and aligned process that matches the general business objectives of a company. One of the most effective strategies is investing in energy efficiency and renewable energy. Energy-efficient technologies and practices can significantly reduce companies' energy consumption and associated carbon footprint (Oloruntobi et al., 2023). These include upgrading lighting and heating, ventilation, and air conditioning systems, improving insulation, optimizing manufacturing processes, and installing energy management systems. Other opportunities exist in renewable energy sources, such as wind and biomass, where a company could reduce its carbon footprint (Liton et al. et al., 2023). Some firms directly install renewable energy systems on their facilities or purchase renewable energy certificates.

Resource conservation and waste minimization are other strategic approaches to sustainability. The idea of the circular economy has begun to enter companies interested in minimizing resource loss and obtaining the maximum performance from materials (Patel et al., 2022). The circular economy aims to get the most out of products and materials by using them repeatedly through recycling, reuse, and remanufacturing. This approach helps in reducing the overall effect of destruction and creation on the environment but, at the same time, also creates value since waste can be used again as a raw material (Kirchherr et al., 2023). The circular economy principle can be adopted through product design for durability and recyclability, take-back systems, and engaging suppliers to reduce waste across the supply chain.

In addition to the above strategies, firms integrate sustainability into the corporate culture and business policies. This would include clear goals related to sustainability, means of measurement, and management, as well as engaging employees, customers and other stakeholders in sustainability matters (Kirchherr et al., 2023). Organizations could respond to challenges, develop new and creative solutions, and create sustainable value by integrating sustainability into their business frameworks.

4. Influence of Carbon Credits on Corporate Practices

4.1. Incentives for Participation

Carbon credits are also powerful motivators for firms participating in the carbon market.

Among these are the financial opportunities and cost savings that carbon credits provide to an organization (Raina et al., 2024). These credits enable a company to offset its emissions at a lesser cost rather than taking in-house measures, which can be more costly. This comes in handy in companies that operate in industries where reducing emissions is either technical or expensive (Raina et al., 2024). Heavy industries in cement, steel, and aviation have fewer options for reduction and, therefore, could also use the option of buying carbon credits to meet their sustainability goals.

Besides cost savings, involvement in the carbon market might also provide a reason for enhanced corporate reputation and brand image. Often, consumers and investors increasingly want the companies they deal with to account for their environmental footprint (Chen et al., 2021). Such firms usually reward them with increased customer loyalty and access to capital. Companies that publicly declare a carbon footprint reduction and neutrality may differentiate themselves from competitors and attract ecologically conscious customers and investors (Kinnunen et al., 2022). Additionally, companies participating in carbon markets will have an advantage in their relationship with regulators because they can show themselves to be proactive about sustainability.

4.2. Integration into Corporate Strategies

Carbon credits require much planning and attention to detail to incorporate into corporate sustainability strategies. Many companies set ambitious carbon neutrality goals, promising to offset their emissions by buying carbon credits (Radu et al., 2020). However, this is far from the big picture of achieving long-term sustainability targets like net-zero emissions by a specific date. For instance, big multinational companies like Microsoft, Apple, and Google have set ambitious targets regarding carbon neutrality and developed proper strategies for carbon offsetting.

Sustainability reporting ensures transparency in companies that incorporate carbon credit use into their reports so that stakeholders understand how they minimize their carbon footprints (Kumar et al., 2023). Hence, the number of credits bought, the type of projects supported by them, and how far they have been able to impact the reduction of the same. It may lead to gaining the trust of stakeholders through the transparency created within carbon credit usage.

However, the complete dependence on carbon credits is also a greenwashing trick if the company is not trying to reduce its emissions. The only way to avoid this challenge is for companies to adopt carbon credits as a complement, not a substitute, to direct measures of reducing their emissions (Trouwloon et al., 2023). It involves investing in energy efficiency, renewable energy, and other sustainability initiatives hand in collaboration with buying carbon credits. Hence, it enables companies to catch a glimpse of meaningful progress along their journey toward their sustainability goals.

5. Challenges and Criticisms

5.1. Challenges in the Carbon Credit System

Even as carbon credits present these advantages, the system has several challenges that could be improved in effectiveness. For instance, fraud and insufficient transparency of carbon markets can be considered major challenges. Carbon credits are a kind of intangible asset, and there is a risk of carbon credits getting double-counted when the same credit is sold to more than one buyer (Trouwloon et al., 2023). Lack of permanence or weak project management also implies that several carbon offset projects cannot provide the expected emission reductions. For instance, public projects such as reforestation to generate carbon credits are vulnerable if the trees are chopped down or burnt.

The other challenge is the insecurity of carbon prices. Carbon prices remain uncertain or volatile in many regions and markets. Carbon markets suffer from several issues that act as catalysts to change regarding regulation, economic conditions, and market demand (Fujii et al., 2024). Due to

such influences, carbon prices tend to range from one level to another. The fluctuation in prices may trigger insecurity in companies depending on the credits they use to strive to achieve their sustainability objectives; thus, planning on future reductions is likely to be a hard nut to crack. Dong et al. (2021) noted that a low carbon price discourages investment in long-term projects by emission reduction companies because purchasing such credits is less costly than adopting environmentally sustainable technologies.

The carbon credit system is also quite elaborate; it is difficult for firms, particularly the smaller ones, which may require more time and talent to comprehend a market of this nature (Trouwloon et al., 2023). It includes understanding types of carbon credits, verification processes, and legal and regulatory requirements with shades of gray that sometimes challenge companies newer to carbon markets. The complexity here may set a barrier to entry for small firms, where their complete involvement in carbon trading and all the financial benefits that come with it would be severely limited.

5.2. Criticisms of Carbon Credits

Carbon credits have also faced myriad criticisms, especially about their effectiveness in reducing global emissions. Critics argue that carbon credits would allow companies to buy their way out of making actual changes in their operations (Pretis, 2022). This "pay-to-pollute" mentality avoids the purpose of carbon markets to incentivize meaningful and permanent reductions in greenhouse emissions. Sovacool et al. (2021) further criticize that carbon credits entrench environmental injustice since companies in developed countries would easily offset their emissions by investing in projects in developing countries rather than reducing their emissions.

Other criticisms of carbon credit systems include the fact that they can create perverse incentives that lead to undesirable outcomes. A case in point would be specific carbon offset projects, like large-scale monoculture plantations, which have adverse environmental and social impacts, such as reducing biodiversity or displacing local communities and depleting water resources (Herr et al., 2019). In this way, such projects generate carbon credits without contributing much to sustainable development and may result in increased environmental and social problems.

The associated risk is that dependence on carbon credits would decrease the speed towards a low-carbon economy. Since carbon credits permit the continuance of GHG emissions by companies, they retard the significant technological and practice changes essential for deep decarbonization (Xu et al., 2023). In particular, this is a concern for sectors where technologies are available but have yet to be widely taken up, such as renewable energy, energy storage, and electric vehicles. The result is that many critics believe it is time for a stronger focus on direct emission reductions rather than carbon offsetting if acceleration toward a sustainable economy takes place.

6. Case Studies

6.1. Large Corporations

Large corporations have been at the forefront of incorporating carbon credits into their sustainability practices. A perfect example is Microsoft Corporation, which vowed to be carbon-negative by 2030 (Microsoft, 2023). As part of the commitment, Microsoft is reducing its emissions and investing in carbon removal projects that generate carbon credits. The projects include afforestation, reforestation, soil carbon sequestration, and carbon capture and storage technologies (Sovacool, 2023). The Microsoft approach demonstrated that edits could be helpful as part of a broader approach to more ambitious sustainability goals.

Another great example is Shell, an international energy company committed to being a net-zero emissions energy business by 2050. Shell invests in a raft of carbon offset projects, including nature-based solutions such as reforestation and peatland restoration (Shell, 2023).

This will create a flow of carbon credits that Shell can use to offset the emissions produced by its products. It is also developing a global carbon market that can support the scaling up of carbon credits as a pathway to net zero.

6.2. Small and Medium-Sized Enterprises (SMEs)

Small and Medium-Sized Enterprises (SMEs) play a vital role in the carbon credit market, though much more limited than more prominent corporations. Among the unique challenges SMEs face in accessing carbon markets are a need for more financial resources,

expertise, and complications within the carbon credit system (Immaculate Maumoh et al., 2022). However, some SMEs have effectively integrated the credit instruments of carbon into their sustainability goals by showing that even small companies have the potential to participate in global emissions reduction. For instance, South Pole is a sustainability consultancy agency supporting SMEs and other carbon market companies (Blake, 2023). It helps the companies design and implement various carbon offset projects, including renewable energy installations, enhanced energy efficiency, and reforestation. By providing the necessary expertise and support, they can participate in the carbon credit market while pursuing sustainability objectives.

A perfect example is Illy, an Italian coffee company committed to becoming carbon-neutral by 2033. To help compensate for coffee production and distribution emissions, Illy will invest in various carbon offset projects, from reforestation to renewable energy (Illy, 2023). Integrating carbon credit into Illy's sustainability strategy allows Illy to speak with credibility about its commitment to environmental responsibility and differentiate itself in a highly competitive

market.

Conclusion

Carbon credits were part of integrated corporate sustainability practices that offered businesses a range of opportunities to take responsibility for reducing their carbon footprint and to contribute to efforts against climate change. Carbon credits give companies financial motives by investing in projects that reduce emissions, improve their reputation, and achieve their sustainability objectives. The Carbon Credit system faces significant challenges and criticisms regarding transparency, effectiveness, and environmental justice.

Companies will have to use carbon credits as part of an overall strategy involving direct reductions in emissions, energy efficiency, and renewable energy investments to maximize the impact of carbon credits. Companies ensure they make a significant contribution toward their journey to sustainability while taking responsibility for the world's transition toward a low-carbon economy. In the fight against climate change, carbon credits will have an even more significant role to play in corporate sustainability. Companies embracing this tool within their varied strategies stand a better chance of prospering in an increasingly changing world.

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