Will Carbon Credits Become the Currency of the Future While Reducing Global Carbon Emissions?

Ananya Agarwal

Abstract

Beneath the canopy of climate agreements, the need for transformative action gains prominence. If carbon emissions remain unchanged, global temperatures could increase 2.7 degrees Celsius by 2050, resulting in a sea-level rise of 0.5-0.7 meters, drastically impacting coastal populations (Krishnamurthy, 2023 & National Ocean Service, 2022). Furthermore, agricultural productivity may decrease by 10-25%, exacerbating food security concerns (International Institution for Sustainable Development, 2023). Urgent action is vital to mitigate these threats and transition to a sustainable, low-carbon future. One solution to this problem is using carbon credit as a tool to reduce carbon emissions. Carbon credits revolutionise emission reduction with a market-based approach. By offsetting emissions, companies will drive investment in cleaner technologies, breaking down barriers in hard-to-change sectors. Proper monitoring and verification will ensure real reductions, reinforcing their role in global climate change mitigation and low-carbon economies. This paper explores the transformative power of carbon credits as a solution to mitigate carbon emissions, highlighting the broader benefits, as well as the social and economic co-benefits of carbon credits. The research will be conducted using databases like Google Scholar as well as other sources like articles, news, and books. At the conclusion of this research, it was deduced that carbon credits hold a compelling role in addressing climate change's complex challenges and advancing a more sustainable future for all.

Introduction

Climate change and global warming are prominent concerns due to their profound impact on the planet. Human activities, such as burning fossil fuels, deforestation, and industrial processes, have led to the accumulation of greenhouse gases in the atmosphere. These gases, including carbon dioxide and methane, trap heat and contribute to rising global temperatures. The consequences of climate change are far-reaching. They include sea-level rise, extreme weather events, ecosystem shifts, and threats to biodiversity (Nunez, 2022). Additionally, climate change poses risks to human well-being, including food security, water availability, and public health.

The global growth rate of atmospheric carbon dioxide reached 2.4 ppm per year during the 2010s. The annual rate of increase in atmospheric carbon dioxide over the past 60 years is about 100 times faster than previous natural increases, at 417.83 ppm as of May 2023 (Lindsey, 2023). This will, and already is, having profound impacts which require modern and innovative solutions.

What Are Carbon footprints and Why Do They Exist

The term ‘carbon footprint has become tremendously popular over the last few years and is a widely used term in the public debate on responsibility and action against the threat of global climate change (Wiedmann & Minx, 2007). But what exactly is a ‘carbon footprint’?

A carbon footprint can be defined as the total amount of greenhouse gas emissions, particularly carbon dioxide, released into the atmosphere as a result of human activities. This environmental indicator measures both direct and indirect emissions of compounds like methane, nitrogen, sulphur hexafluoride, and hydrofluorocarbons (Iberdrola,2023).

In the pursuit of combating climate change, various effective strategies have emerged to reduce carbon footprints and promote environmental sustainability.

A large tree absorbs up to 21.8 kilograms of carbon dioxide a year. Moreover, studies show that humans emit 0.7 kilograms of carbon dioxide per day.For a year, a human produces about 365 x 0.7 kilograms, or 255 kilograms, Ten of these trees are needed to cancel the carbon dioxide emitted (Peggy, 2008).

Adopting a more sustainable lifestyle is the critical approach, which involves making environmentally friendly choices such as using renewable energy sources, minimising water consumption, and adopting eco-friendly products. The principles of ‘reuse, reduce, recycle’ guide us towards reducing waste, promoting a circular economy where materials are reused or recycled rather than disposed of. Proper waste management and recycling of electronics and gadgets are vital to prevent harmful chemicals from entering the environment and to recover valuable materials. Advancements in technology have also paved the way for new and more efficient/ sustainable solutions, such as renewable energy systems, electric vehicles, and smart grids.

Carbon Credit: The Catalyst

To begin, carbon credits were first discussed when international agreements like the Kyoto Protocol and the Paris Agreement provided the original backdrop for its implementation.

Paris Agreement: It is a legally binding treaty adopted by 196 countries at the climate change conference in Paris in 2015 (known as COP 21). The main goal of the agreement is to cut global greenhouse gases in order to limit global temperature increases as close as possible to 1.5 degrees Celsius (UN, 2021).

Kyoto Protocol: The Kyoto Protocol operationalizes the United Nations Framework Convention on Climate Change by committing industrialised countries and economies in transition to limit and reduce greenhouse gas (GHG) emissions in accordance with agreed individual targets (UN,2021).

Carbon Credit, with its emission reduction incentive, is a quantifiable unit that represents the reduction or removal of one metric ton of carbon dioxide (CO_2) or its equivalent in other greenhouse gas emissions from the atmosphere. It is a tradable instrument that reflects efforts

to mitigate climate change by reducing the net amount of carbon emissions released into the environment. It is a system of meticulous monitoring and verification of emission reduction.

Carbon credits are created by the governing organisation and are allocated to companies by these bodies. A single credit represents one tonne of sequestered CO2 (Kenton,2023).

Projects like hydropower installations, clean cookstove projects, solar energy initiatives, etc. have earned carbon credits, which provide an economic incentive to organisations to adopt sustainable practices around the world.
People would opt for Carbon Credits as a strategic approach to reduce their emissions. Companies and individuals become more conscious by opting and can align their actions with carbon reduction incentives. It will help enhance the company's reputation and make it attractive to socially conscious investors, potentially increasing financial performance.

Adoption of carbon credits offers individuals and companies a tangible way to control their footprints, align with international goals and play a proactive role in mitigating climate change. From a financial perspective, it gives individuals and companies an incentive to adopt clean technologies and sustainable practices by offering economic rewards. From a social standpoint. it will help enhance the company's reputation and make it attractive to socially conscious investors. Bolstering its standing in the market and strengthening its commitment to social responsibility. On the environmental front, it fosters awareness and helps companies be more conscious of their emissions.

Lastly, from a sustainable view, it paves the way for the widespread adoption of sustainable practices across industries and individual behaviours, eventually leading to an increase in clean energy. In addition, Corporate Social Responsibility (CSR) is a management concept whereby companies integrate social and environmental concerns into their business operations. Environmental Social Governance (ESG) is a comprehensive framework that assesses before investing. It emphasizes evaluating environmental concerns, social factors, and corporate governance.

The Current State of Carbon Markets

The Carbon market, seen as a small part of the climate change fight is now going through a dynamic shift. Over two-thirds of the world has opted to reach its Paris Agreement goals. This has managed to signify the departure of conventional methods and approaches. The Carbon Market which was dominated by private sectors is now poised to embrace an invigorating twist, giving us hints about the carbon market and its empowering future.
The carbon Markets are composed of several unique intriguing segments, including:

Cap-and-trade systems:

Cap-and-trade systems exist to achieve a specific reduction in overall carbon emissions. Some Carbon Credits operate based on the fundamental principles of "Cap and Trade", where the company's emission limit is symbolized by the quantity of credit it possesses, constituting the crucial "Cap" element of "Cap and Trade". If the company manages to keep

its emissions below its ‘Cap’, then the company can either retain the credit or sell it; this constitutes the “Trade” part of the “Cap and Trade” (Wagner,2013). This creates a financial incentive for companies to reduce emissions and rewards those who emit less.

The focus is on achieving emissions reduction targets by creating a market for emission allowances and encouraging industries to adopt cleaner practices.

Compliance markets:

Compliance markets aim to ensure that industries stick to specific emissions limits set by regulatory authorities.
Governments establish emissions standards for industries and allocate emission allowances accordingly. Companies must ensure their emissions stay within the allocated allowances. If a company emits more than its allowances, it must buy additional allowances to cover the excess emissions.

The focus is on enforcing emissions limits and incentivizing companies to stay within the mandated boundaries, thereby ensuring regulatory compliance.

Lately, there has been a combined initiative of people from companies and the government to make Carbon Markets better. These types of carbon markets are usually distinct in nature but multiple initiatives have created hybrid models of Carbon markets.

Countries, in order to reach their sustainable goals, are embracing the establishment of carbon markets for a multitude of reasons. With the urgent need to reduce carbon emissions, the Carbon Markets are acting as driving forces for the creation of these markets.

Governments realise that a market-driven approach to reduce emissions creates change. Putting a price on carbon has developed a sense of incentive in industries, causing companies to adopt cleaner technology and aim to reduce emissions directly.

The strategic alignment resonates with its global commitments under the Paris Agreement.

Economically, carbon markets offer a dual benefit by not only incentivizing emission reduction but by also generating revenue streams for governments. This money can be used to support and promote greener projects and clean energy plants. Eventually, this leads to a positive change in the environment in a smart way.

A transition to a low-carbon economy will involve the usage of cleaner technologies, which will eventually lead to overall less greenhouse gas emissions. It will also help improve air quality as there will be a decrease in burning fossil fuels.

Planting trees runs parallelly with this idea which will help sequester carbon dioxide from the atmosphere. An increase in tree plantation will help with biodiversity preservation.

The transition to a sustainable future creates job opportunities in clean and renewable energy sectors, this not only leads to employment creation but also helps the environment.

Investment in cleaner energy will drive innovation and development of advanced technology to ensure optimum utilisation of resources.

Several carbon markets have already been established and are expanded upon here:

Japan GX League:

In 2022, the Ministry of Economy, Trade, and Industry (METI) of Japan launched the GX League initiative as part of the country's strategy to achieve carbon neutrality by 2050 (Dawas, McGeady & Majkut, 2023). This initiative is a key component of a 10-year roadmap approved by the Cabinet of Japan in February 2023, outlining a comprehensive approach to attain climate neutrality. The GX League functions as a voluntary emissions reduction system, with participation from Japanese corporations. As part of its evolving efforts, Japan has also expressed its intention to introduce an emissions trading system and a carbon levy in the future.

European Union Carbon Market Framework:

Some of the most transformative carbon markets and policies have caused substantial changes in how societies approach carbon emissions and contribute to addressing climate change. One notable example is the European Union Emissions Trading System (EU ETS). This cap-and-trade system places limits on greenhouse gas emissions from various industries while allowing companies to buy and sell emission allowances, thereby incentivizing emission reductions. The EU ETS has led to emission reductions across the region, encouraging companies to invest in cleaner technologies to comply with regulations, fostering a transition to a low-carbon economy.

Future Outlook

In summary, placing a price on these emissions, carbon markets have encouraged companies to work in a cost-effective way to reduce their emission, increasing innovation among them. It facilitates companies in achieving their goals. Carbon Markets have brought clean energy and sustainable topics into the spotlight and significantly increased the funding and adaptation of such projects.

Carbon markets require monitoring, reporting, and verification which is crucial for transparency and tracking accountability and transparency.

One of the most important barriers to the success of carbon markets is trust and confidence in the carbon markets. The market is facing issues related to the quality and legitimacy of carbon credits. There is a need for potential regulation to restore confidence in these credits and the market. Buyers are concerned that sellers may not fulfil their promises of emission reduction. The problem of double counting also comes into the picture as the same emission reduction

project might be claimed by the country as well as the company that funded it which will greatly affect the Paris Agreement commitments and goals.

"Bad money drives out good" is an economic principle stated by Gresham's Law.In the context of the carbon offset market, this suggests that low-quality or questionable carbon credits are becoming more prevalent than high-quality ones.

Carbon credits, which are meant to represent genuine emissions reductions, might not effectively fulfil their intended purpose if a significant portion of them lacks credibility.

Industries have also used carbon credits to justify their increasing emissions, such as the expansion of flights, under the assumption that purchased offsets would compensate for the added emissions.

The article "Why Enron Wants Global Warming" written by Patrick J. Michaels in 2002, highlighted that Enron supported the policies of global warming because he saw financial opportunities in emission trading. He used carbon markets as a speculative tool. in the early 2000s which led to accusations of manipulation and contributed to the scepticism surrounding carbon markets.
In order to move forward with carbon markets and to ensure the enhancement of efficiency and effectiveness at global levels, there is a need to establish a global standard of these credits. This will help instil credibility and foster confidence in carbon markets worldwide.

It is recommended to leverage technology, such as satellite imaging to help track the progress of projects to give investors a good sense of GHG removal. A detailed picture can be developed with the help of a third party for anyone to look at and check.

Carbon credits should be linked to international targets such as the Paris Agreement aligning market activities and contributing to broad climate objectives.

For the world to reduce carbon levels, the creation of a link among the carbon markets around the world can help in the innovation of a new liquid trading system. This encourages international cooperation and emission reduction at lower costs.

Conclusion

As we stand on the brink of a climate crisis, there's an alarming truth we can't ignore, our current trajectory of greenhouse gas emissions is leading us down a perilous path. But within this crisis lies an opportunity. Throughout this endeavour, we delved deep into the realm of carbon credits, discussing its potential as a catalyst in climate change. Moreover, we discussed their advantages and underscored the urgent need for change. Carbon markets possess the potential for a transformative change but necessitate reorientation and refinement. It calls for immediate action. We put forth recommendations that encompass a global commitment to standardized practices.

At the conclusion of this research paper, we find ourselves at a pivotal juncture where swift and resolute action is paramount. Carbon markets can play a pivotal role, provided they undergo essential reforms.

Consequently, we deliver a potent appeal to governments, industries, and individuals. Acknowledge the acute urgency of the matter, welcome essential reforms and bring about a transformative change towards a sustainable, low-carbon tomorrow. The burden of responsibility lies collectively upon us, we possess the capacity to alter the course in the fight against climate change.

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