

## CARBON CREDITS : A CONTEMPORARY REVIEW

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**Abstract**– This article examines the critical need for tackling global warming caused by damaging emissions such as CO<sub>2</sub> along with other greenhouse gases. The Kyoto Treaty of 1997 is portrayed as an approach that achieves a balance of economic growth and pollution reduction. Greenhouse gases like both methane and carbon dioxide have a huge impact on the heat equilibrium in the atmosphere of the planet, causing global warming and posing an imminent danger to life. To overcome this challenge, we must try to discover a way to reduce pollution credits that can be used to reduce or eliminate carbon dioxide emissions. They are derived by determining the quantity of atmospheric carbon that would have been emitted by industries. We analyze carbon credits extensively in this research because they have grown as an indispensable instrument for lowering industrial carbon emissions.

### INTRODUCTION

The evidence is clear, the Earth's temperature is on the rise due to harmful emissions like carbon dioxide and other greenhouse gases. These emissions result from activities such as manufacturing, burning fossil fuels, and deforestation, and we must take action to reduce them if we hope to protect our economy, land, and people from the damaging impacts of climate change. It won't be an easy task, as acknowledged by the United Nations (UN, 2024a), but we must act now to address this urgent issue. Fortunately, the sustainable Clean Development Mechanism has emerged as a promising means of achieving our goals under the Kyoto Protocol (NSWAI, 2007). The goal is to stabilize the release of greenhouse gases at a level that will protect the climate from harmful human interference. India produces a large amount of municipal solid waste, creating an opportunity to implement Clean Development Mechanism (CDM) projects that generate electricity. It's important to note that fossil fuels, such as coal and oil, contain carbon and produce carbon dioxide, a greenhouse gas when burned. Carbon and nitrogen oxides produced by incomplete combustion are also considered greenhouse gases, according to Mishra

*et al.* (2014). Taking steps to decrease our carbon footprint and reduce the impact of greenhouse gases on the environment is necessary for a sustainable future. Natural gas emits methane, another greenhouse gas. The buildup of greenhouse gases on the planet's surface traps heat, resulting in global warming. This poses a threat to plant and animal species, along with the possibility of rising sea levels, flooding, and climate change (NRDC, 2024). Carbon management was initiated in response to the ratification of the Kyoto Protocol in 1995, with a focus on addressing the global consequences of climate change. Around 180 nations signed the Kyoto Protocol in December 1997, requiring about 38 developed nations to cut their emissions of greenhouse gases between 2008 and 2012 to levels 5.2% fewer than those of the year 1990. A financial value is assigned to carbon, enabling businesses, organizations, or governments to purchase, sell, bank, and exchange carbon credits known as Certified Emission Reductions, or CER's (UNFCCC, 2023a).

### The Protocol of Kyoto

It is believed that the laws and policies intended to reduce pollution are not entirely successful. The lack of compelling suggestions in front of the industry is

one of the causes of such systems' failure. Economic attraction is necessary for the answer. In light of this, the United Nations Framework Agreement on Climate Change (UNFCCC)-backed Kyoto Protocol of 1997 provided a brilliant answer that might end up being an ideal compromise between the growth of the economy and the decrease of pollution. A deal known as the Kyoto Protocol was reached as part of the UNFCCC, or the United Nations Framework Convention about Climate Change.

December 1997 saw the negotiations of the treaty in Kyoto, Japan. It was made available for signing on the sixteenth of March 1998 and ended on the fifteenth of March 1999. The agreement, which went into effect on the sixteenth of February, 2005, calls for the industrialized nations to cut their overall greenhouse gas emissions by 5.2% from 1990 levels (though it should be noted that the above target represents a decrease of 29 percent from the emission quantities that would have been expected by 2010 in the absence of the Protocol) (UNFCCC, 2023b). The objective is to reduce total emissions from six greenhouse gases, which are measured as an average throughout the five years of 2008–12: Carbon dioxide, methane, also nitrous oxide, sulfur hexafluoride, HFCs, and Perfluorocarbons (PFCs). National targets vary between 8% cuts for the US, six percent for Japan, 0% by the Soviet Union, and a permissible growth of 8% for the nation of Australia and ten percent for Iceland, to 7% for the US and several other countries. As an alternative to what are typically thought to be more expensive emission reductions through their own countries, industrialized countries with a commitment to reduce greenhouse gas emissions can invest in emission-reducing projects in developing nations through the Kyoto Protocol's Clean Development Mechanism (CDM). A developed country may undertake a greenhouse gas mitigation project activity under the CDM in a developing country, where the project's costs are often substantially cheaper. The developing nation would receive the funding and clean technology needed to carry out the project, while the developed nation would receive credits (known as Carbon Credits) for reaching its emission reduction targets. According to Millock (2013), carbon credits are certifications granted to nations that lessen their emissions of greenhouse gases, or GHG's, which are the primary cause of global warming.

Certified emission reductions (CER's) are the units of measurement for carbon credits. One tonne

of reduced carbon dioxide is equal to one CER. Its rate was 22 euros during April, 2024 dropped to less than 7 euros, and then steadied around 12–13 euros. Countries are allowed to trade in the global carbon credit market under the IET (International Emissions for the trading) framework. Under the Kyoto Protocol, nations with quantifiable emission limitation and reduction commitments can purchase excess credits from other nations. Developed nations that produce above the thresholds have three options: reduce their emissions, borrow or purchase carbon credits with developing nations (Mishra *et al.*, 2014).

### **The UNFCCC Separates Nations into two Major Categories**

The Convention's Annex-I currently lists 41 industrialized nations, including the relatively wealthy nations that belonged to the Organization to Obtain Economic Cooperation & Development, better known as the OECD, in 1992 as well as nations with economies in transition (EIT's), such as the Russian Federation, the Baltic States, and a number of states in Central and Eastern Europe.

Annex-II of the Convention lists the members of the OECD (not the EIT's). These Annex-II Parties are number twenty-four at the moment.

Non-Annex-I countries are those remaining nations not included in the Convention's Annexes, primarily developing nations. There are 145 of them at the moment. The nations listed in Annex I, including the United States, the Kingdom of England, the nation of Japan, New Zealand, the Netherlands, Australia, Canada, Austria, Spain, France, Germany, and others, have committed to bringing their emissions—especially those of carbon dioxide—down to levels that are below those of 1990. If not, they have to purchase emission credits from underdeveloped nations or make conservation investments. Annex II also includes nations such as the USA or America, the United Kingdom, Japan, New Zealand, Canada, Australia, the Austrian Empire, and Spain.

The UNFCCC places no immediate constraints on developing nations (those that are not in Annex I), including Saudi Arabia, Singapore, the Republic of South Africa, Afghanistan, India, Brazil, China, Iran, Kenya, Kuwait and the other countries like Malaysia, Pakistan, Philippines, and the United Arab Emirates. This accomplishes three goals (UNFCCC, 2023a):

a) Avoids growth constraints because pollution

and industrial expansion are closely associated, and developing economies have the capacity to grow rapidly.

- b) It implies that they are unable to offer industrialized countries emissions credits in order to allow those countries to over pollute.
- c) They receive financial assistance and advances in technology from Annex II developed countries.

## REVIEW

Carbon credits are an important component of the emissions trading system, designed to reduce greenhouse gas emissions. The carbon credit is a license that allows a country or organization to emit a certain quantity of carbon emissions, provided that the license is not used in its entirety. One carbon credit reduces one metric tonne of CO<sub>2</sub> in the atmosphere, as well as other greenhouse gases. In the words of Kenton (2023), such credits are tradable commodities used to fund and promote carbon-reduction programs. Developing economies now have new opportunities as a result of efforts to divorce resource use from economic development and green economies around the world. Countries, businesses, and communities all over the world are working to establish legislation that will accelerate the transition to a “green economy”. This economic model seeks to accomplish development while minimizing the environmental impact of human activities. Such a transformation will result in enormous social benefits, including decreases in poverty and the development of quality jobs. As the region is most affected by damage to the environment, it is refreshing to learn that there is an opportunity to profit both financially and biologically from the global trends that are driving it by utilizing Asia’s abundant organic or alternative energies for less harmful to the environment energy. The carbon market is increasingly being used to fund this change by assigning a market valuation to emissions-reducing operations. According to Eggertson (2008), there are two types of carbon-based markets: voluntary and mandatory. Compliance markets emerge in response to every national, regional, or global policy or regulatory requirement.

As part of their efforts to promote green economies and combat climate change, Annex II in developed countries provides financial assistance and access to advanced technologies to developing

economies. This support enables the latter to introduce environmentally friendly innovations and raise significant commercial capital, potentially worth billions of dollars, to sustain their green initiatives. The carbon market is increasingly being used to fund these efforts by assigning a market valuation to emissions-reducing operations, which helps to fund and promote carbon-reduction programs. Voluntary and mandatory carbon markets both play a role in this process, with demand being driven by businesses promoting corporate sustainability goals, private individuals seeking to mitigate their carbon emissions, and other actors looking to trade credits at a higher price (UNFCCC, 2023a).

Voluntary carbon markets relate to the voluntary issuing, buying, and exchange of carbon credits on a domestic and worldwide scale. Currently, almost all of the production and distribution of voluntary carbon credits comes from governments or commercial organizations that develop carbon projects that meet carbon requirements and result in the removal or reduction of emissions. Businesses promoting corporate sustainability goals, private individuals wishing to mitigate their carbon emissions, and other actors seeking to successfully trade credit at a higher price all drive demand. Using carbon markets, developing countries can introduce environmentally friendly innovations and raise significant commercial capital—potentially multi-billion dollar—to sustain environmentally friendly efforts.

Carbon markets have been a topic of controversy due to various concerns such as fraudulent reporting, human rights violations, and double counting of greenhouse gas emission reductions. The UNDP has faced several controversies in its project on carbon credits, but it aims to address these concerns and highlight the advantages that funding through carbon markets can offer if implemented correctly. The launch of this project indicates a significant change in the UNDP’s approach as it strives to apply its principles of social responsibility and ecological integrity. Carbon markets attempt to alleviate these concerns while emphasizing the benefits that this type of funding can provide when implemented properly. The UNDP’s latest launch is a powerful symbol of its unwavering commitment to the principles of social responsibility and ecological integrity. With this groundbreaking initiative of carbon markets, they are ushering in a new era of sustainable

development that promises to transform our world for the better (UNDP, 2022).

Carbon markets possess the potential to be a game changer in closing the trillion-dollar gap that developing countries must bridge to meet their climate change commitments. However, to ensure that this strategy is fair and just, no compromises should be made on the rights of humans, indigenous communities, or the detrimental effects on climate change. According to UNDP Director Achim Steiner, *“This effort represents an innovative approach that emphasizes the integrity of the carbon credit supply while also ensuring equality for the countries that host them, farmers, families, and marginalized groups such as indigenous peoples, local communities, and women.”* By taking this strategy, we may not only tackle climate change but also help to build a more equal and just society (UNDP,2022).

The World Bank announced today its daring ambitions to establish high-integrity global carbon markets, particularly the objective of earning cash for 15 countries through the sale of carbon credits arising from forest protection. These countries will have generated over 24 million credits by the end of the year, increasing to 126 million credits by 2028. Under the right market conditions, these credits might earn up to 2.5 billion dollars, with the vast majority of that value returned to the nations and communities they benefit. Long-term success in the market for carbon may have a similar impact on other nations. The World Bank’s Forestry Carbon Partnership Facilities (FCPF) includes the following 15 countries: The following countries are included: Chile, Cote d’Ivoire, Costa Rica, Ghana, Indonesia, Fiji, Lao PDR, Madagascar, Guatemala, Dominican Republic, Mozambique, Nepal, the Democratic People’s Republic Congo, the nation of Congo, and Vietnam.

Since 2018, the FCPF has supported pilot programs aimed at establishing effective mechanisms for carbon-crediting initiatives.

The World Bank will assist five nations in 2024 by collaborating with their governments and local populations to gain access to carbon markets. It is anticipated that all 15 FCPF nations will be able to engage with carbon markets by 2028. A third party verifies, reports, and tracks every carbon credit in accordance with the World Bank’s Environmental with Social Standards and the FCPF Standard, which is maintained by the World Bank. State-of-the-art technology is employed by the 15 programs to guarantee precise measurement and accounting

of carbon credits. Because the projects cover entire jurisdictions, efforts to save and reforest are not hampered by deforestation elsewhere. The World Bank (2023) notes that the Bank assists nations in determining the best use for their carbon credits, including monetizing them via carbon markets, utilizing them for their own Environmentally Determined Contributions, or engaging in other transactions to generate additional funding (World Bank,2022).

*“These countries, endowed with abundant natural resources, stand to gain financially from the market for carbon by generating revenue from forestry conservation and more environmentally friendly land use,”* stated Ajay Banga, President of the World Bank Group. World bank works with partners to scale efficient global carbon markets using the World Bank’s Partnership Pathway for High-Integrity Carbon Markets. Through the FCPF along with additional projects, world bank has developed a formula that may effectively stimulate carbon markets, enabling them to fulfill their potential benefits for both people and the environment.

The Road map outlines the Bank’s goal of collaborating with others to offer solutions that will raise the scope of clear and liquid carbon markets. This includes developing standardized frameworks for organizations that authenticate & monitor funding, such as independent credit rating agencies, as well as partnering with the private and public sectors in order to apply integrity criteria to credit purchases and sales (World Bank, 2023). These innovative digital technologies are rapidly evolving as the creation of a new worldwide greenhouse gas market approaches. COP 26, the

The 2021 world climate agreement meeting in Glasgow saw the ratification of the sixth article of the landmark Paris Agreement’s comprehensive set of laws managing global carbon markets. The clearance paved the way for the establishment of a market in which nations could exchange carbon credits generated by reducing or eliminating greenhouse gases from the atmosphere. Examples of such initiatives include transitioning from petroleum and coal to sources of renewable energy and increasing or protecting carbon stores in ecosystems such as forests. The importance of lowering emissions of greenhouse gases is increasing as the repercussions of climate change worsen in all countries.

According to Monali Ranade, a senior energy specialist at the World Bank, *“the pace of de-*



carbonation and adaption ought to be accelerated towards carbon trading platforms provide an opportunity to offset the costs of transitioning beyond petroleum and coal and towards an environmentally sustainable economic transition." Carbon markets lend a hand in resource mobilization and cost reduction, allowing nations and businesses to more easily make the shift to a low-carbon economy.

By 2030, trading with carbon credits is predicted to cut the total expense of carrying out NDC's by up to \$250 billion, or more than half. Carbon markets should eventually become obsolete as all nations achieve net zero emissions and the necessity for emission trading should decrease. Countries can work together in a variety of ways to accomplish their climate goals under Article 6 (World bank 2022).

### **Equilibration of emissions**

Carbon offsets, or carbon credits, are licenses that let the bearer emit a specific quantity of greenhouse gases, such as carbon dioxide. One tonne of atmospheric carbon dioxide or the same amount in the form of other greenhouse gases can be emitted with one credit.

After a stringent verification process overseen by the UN global climate change secretariat, greenhouse gas (GHG) mitigation initiatives in developing nations are awarded Certified Emission Reductions (CER's). Through this portal, you can purchase and cancel CERs and get their environmental benefit. The CERs are removed from usage by being taken out of circulation. By doing this, you are addressing the issue of climate change and advancing the goal of global climate neutrality, or having no net effect on the climate. Furthermore, you are aiding deserving initiatives that benefit poor nations through sustainable development. Accordingly, carbon offsets are beneficial to your business as well as to you as a human emitter (Kenton, 2023).

The process of claiming the positive environmental effects of greenhouse gases mitigation efforts to make up for emissions that cannot be avoided elsewhere is known as "offsetting." Offset certificates serve as a representation of the potential environmental benefit for mitigation efforts. The certified reductions in emissions (CERs) are offset certificates granted by the cleaner development mechanism (CDM). The amount of the greenhouse gas carbon

dioxide (CO<sub>2</sub>) that is prevented or eliminated from the atmosphere is equal to one CER. Emissions are compensated by the use of CERs. CERs can be applied voluntarily or towards mandatory emissions reduction goals. Offsetting voluntarily is supported on this platform. In a technical sense, the offsetting happens in the context of the CDM registry database, which keeps track of CER usage through transactions akin to cancellations.

As the name implies, a cancellation transaction renders CER null and void, meaning they are no longer usable for any other purpose. The execution of CDM initiatives in underdeveloped nations is financed by offsetting, which promotes equitable growth and a range of socioeconomic advantages (UN, 2024b).

### **The demand for carbon credits**

Fossil fuel combustion contributes significantly to industrial greenhouse gas emissions, particularly in the electricity, cement, steel, textile, and fertilizer industries. These sectors emit a large amount of greenhouse gases, including Nitrous oxide (NO), carbon dioxide, methane, and hydro fluorocarbons (HFC's), all of which enhance the capacity of the atmosphere to capture infrared radiation and alter climate. Carbon dioxide credits are reductions of greenhouse gas emissions resulting from a project or commodity that anybody may use that in turn in one way or another reduces or eliminates greenhouse gases. At the moment, the emission of carbon dioxide diminution is utilized to measure this reduction. A single credit for carbon is equivalent to one unit of CO<sub>2</sub> offset.

A fundamental part of national & international trading of emissions programme designed to mitigate or prevent the effects of global warming are carbon credits. By lowering total yearly emissions and allowing the market to place a monetary value on any shortage through trading, they offer a means of decreasing the release of greenhouse gases on a commercial level (Kenton W., 2023).

Growing public awareness of the necessity to regulate emissions led to the creation of the idea of carbon credits. The Kyoto Protocol, a global agreement involving over 170 countries, formalized the process, while the Marrakesh Accords that followed agreed on the market mechanisms. The method used to lessen some industrial emissions was comparable to the US Acid Rain Programme, which was successful.

Businesses in the poor world can earn carbon

credits by switching to greener technologies, which reduces energy consumption and, in turn, lowers greenhouse gas (GHG) emissions. Credits can be bought and sold on global markets at the going rate, or they can be transferred between companies. Carbon reduction plans among trading partners and globally can be funded using credits. The entity can obtain a carbon emission certification for each tonne for carbon dioxide (the primary greenhouse gas) emission prevented. They can then sell the certificate immediately or via a futures market, just like they can with any other commodity.

The licenses are sold to wealthy nations' organizations, such as electricity companies, that have emission reduction goals to meet and find it more cost-effective to purchase "offsetting" certificates than to do a backyard cleanup. Credits can be bought and sold on worldwide marketplaces at the going rate, or they can be transferred between companies. Carbon reduction plans among trading partners and globally can be financed using credits (ICSI, 2024). This trade is conducted in order to assist wealthy nations in lowering their emissions under an international climate change convention that is governed by the UN.

Credits can be used for funding carbon reduction initiatives among trading partners and globally. They can also be traded between enterprises or traded for goods on global markets at the going rate. It was made official by the international pact known as the Kyoto Protocol, which brought 169 nations together. Certificates of achievement in the form of carbon credits are given to nations that successfully lower their greenhouse gas emissions. The Kyoto Protocol led to the creation of the carbon trade as a response to the awareness of the dangerous circumstances caused by global warming. As a result, industrialized nations set goals for themselves to lower emissions of greenhouse gases by implementing internal production unit reduction strategies. Since it is not feasible to shut down the production facilities, the countries promised to maintain the equilibrium of greenhouse gas emissions by pressuring developing nations to implement policies to cut back on their emissions or to promote policies that encourage the utilization of alternative energy sources, such as the promotion of pollution-reducing products and plantation-related projects, in order to reduce these emissions. Since reducing emissions is the goal of business, using the idea of carbon credit is therefore a very effective strategy to lessen the harmful effects of pollution

(UNDP, 2022).

Carbon exchanges operate in the same manner as other stock and commodities exchanges. Here are the top four carbon exchanges that are worth betting on.

Air Carbon Exchange (ACX) is the most simplified platform for the technology of distributed ledgers (DLT). ACX uses DLT and blockchain to create securitized carbon credits. It leverages digital warehousing, allowing investors to easily manage assets inside their portfolios.

Carbon Trading Exchange (CTX): The most cost-efficient spot exchange serves as a member-based spot market with diverse participants, including brokers, project developers, and large organizations. It allows you to exchange credits recognized by several standards, including the Gold Standard and Verra's Verified Carbon Standard.

CTX allows trading of the following credits:

1. Voluntary Emission Reduction (VER).
2. Certified Emissions Reduction (CER)
3. Verified Carbon Units (VCU).
4. EUA (EU Allowance).
5. EUAA (European Aviation Allowance)

Toucan Protocol created the most dynamic carbon-to-crypto exchange.

Toucan converts Verified Carbon Units (VCUs) into cryptocurrency via its own Toucan Bridge. Authentication is straightforward everything the way down to the offset's source registry, such as Verra and Gold Standard. Furthermore, "retiring" an on-chain credit from the parent register eliminates double-counting. This is accomplished by "burning" the data and storing it in an address on blockchain that no one can access.

Xpansiv CBL is the most intelligent marketplace for ESG-inclusive commodities.

Xpansiv CBL is a global platform for trading based on data, ESG-inclusive commodity like carbon. And the platform accomplishes this in a simple, user-friendly way based on richer data. The platform allows you to trade numerous carbon offsets from key registries across the world. Xpansiv dominates the market, hosting over 90% of all voluntarily carbon credit transactions worldwide. Here is a quick look at how to join the Xpansiv CBL's exchange system (Kenton, 2023).

### **Mechanism and procedures involved**

Companies in countries purchase emission reductions (carbon credits) realized through CDM investment that would not otherwise exist. Pricing is

determined through a competitive bidding process. The Kyoto Protocol includes three systems that allow industrialized countries with quantifiable emission restriction and reduction pledges to get decreased greenhouse gas credits. The mechanisms are:

1. Joint Implement (JI): Under Joint Implement (JI), an advanced nation with relatively high domestic greenhouse gas reduction expenses will establish a project within another developed country.
2. The Clean Development Mechanism, (CDM): The CDM, or Clean Development Mechanism, allows a developed country to 'sponsor' an emissions decrease project in a developing nation where the cost for greenhouse gas elimination project operations is typically much lower, but the resulting environmental effect is globally equivalent. The industrialized country would receive credit for reaching its carbon reduction targets, whilst the developing countries would receive capital investment, clean technology, or a favourable change in land use.
3. International Emissions Trade (IET): Governments can use the globally traded carbon credit industry to compensate for any allowance shortages. Surplus credits are able to be traded to locations having constrained emissions objectives under the Kyoto Protocol. A developed country having relatively high expenses for domestic greenhouse gas reduction would establish an endeavour in other developed country with comparatively cheap costs.
  - CDM allows developed countries to take on greenhouse gas reduction projects in developing countries, which are typically less expensive.
  - The developed country receives credits for meeting emission reduction desired outcomes, while the developing country receives capital as well as clean technologies to implement the project. Countries participating in IET are able to trade in the worldwide carbon credit market. Surplus credits can be sold to nations with quantifiable emission reduction targets under the terms of the Kyoto Protocol (Sanderine *et al.*, 2001).

### Carbon capturing and storage (CCS)

This technology captures and stores emissions of carbon dioxide, keeping them from exiting the atmosphere. CCS is one of the biggest and most

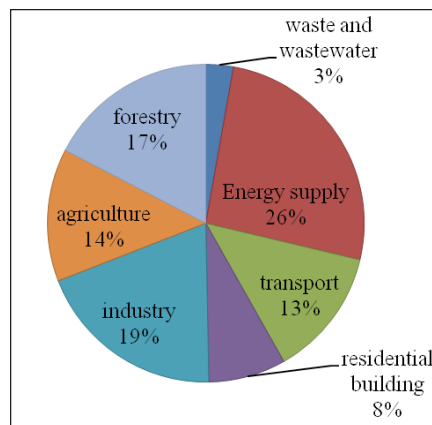


Fig. 1. Industries that utilize carbon credits  
Source: Adapted from Mishra *et al.*, 2014.

promising approaches for reducing large-scale carbon dioxide (CO<sub>2</sub>) released from energy use. CO<sub>2</sub> can be harvested from power plants powered by fossil fuels or other big CO<sub>2</sub> sources, including those in the chemical, steel, or cement industries, electricity projects, or natural gas production. CO<sub>2</sub> can be kept in formations of rock such saline aquifers, depleted oil and gas reservoirs, or specially designed storage facilities.

Procedure for acquiring credits and certification requirements.

If you wish to trade in carbon credits to investors, you ought to concentrate on lowering emission levels and promoting environmental stewardship.

1. Identify and prepare a viable CDM project, as well as calculate the project's emissions reduction.
2. Prior to this, a baseline must be developed, which is a circumstance in which additional proof concerning greenhouse gas emissions up to 2012 without the investment you made is presented.
3. Comparing this baseline to the lower emissions that will result from CDM investments. The amount of sell-able carbon credits is what distinguishes them.
4. In the case of JI initiatives, only the reductions realized between 2008 and 2012 can be sold, not those achieved in prior or subsequent years.

### CONCLUSION

Currently, the retail value of just one carbon credit is roughly USD 27, however purchases can be made for approximately USD 10 per CER. Locking down a tonne of carbon costs around US\$10 and \$15 per

tonne, depending on the product or technology utilized, with a margin of \$5 USD each Carbon Credit (CER). Assuming economies of magnitude, this becomes an appealing model for businesses, power plants, and customers alike to increase revenue or cut expenses while satisfying their commitments to pollution control and environmental stewardship. They would rapidly turn to Clean Technologies and would begin trading their carbon credits with companies in the US and the European Union. The carbon credit business is a rapidly changing business, and people should be aware that market rates, protocols, and registration programs can change quickly

In summary, the world of carbon credits in Asia holds immense potential for driving sustainable development and combating climate change.

### Conflict of interests

The author certifies that it's true that there aren't any personal opinions or convictions (ideological, religious, ideological, or otherwise) about paper's content that might cause problems with an unbiased publication process.

### REFERENCES

- Eggertson, B. 2008. Renewables in the carbon market. *Refocus*. 9(1): 30-31.
- IEEFA, (Institute for energy economics and financial analysis). 2023. *Carbon Capture and Storage*. Available online at: <https://ieefa.org/resources/fact-sheet-carbon-capture-and-storage> (accessed on 6<sup>th</sup> April 2024).
- ICSI, 2024. *Carbon Credits - Procedure.doc* Available online at: <https://view.officeapps.live.com/op/view.aspx?> (accessed 6 april,2024).
- Kenton, W. 2023. *Carbon Credits and How They Can Offset Your Carbon Footprint*. Available online at: [https://www.investopedia.com/terms/c/carbon\\_credit.asp](https://www.investopedia.com/terms/c/carbon_credit.asp) (accessed on 15<sup>th</sup> April 2024).
- Millock, K. 2013. *Introduction: The Organization of the Clean Development Mechanism*. Available online at: <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/clean-development-mechanism>. (accessed 6<sup>th</sup> April 2024).
- Mishra, A., Jain, R., Afrin, H. and Sinha, B.A.A. 2014. Carbon credit for sustainable development. *Recent Research in Science and Technology*. 6(1): 9-4.
- NRDC, 2024. *Greenhouse Effect 101*. Available online at: <https://www.nrdc.org/stories/greenhouse-effect-101> (accessed 6<sup>th</sup> April 2024).
- NSWAI, 2007. *Carbon Credits in India*. Available online at: <https://www.nswai.org/docs/feb2007.pdf> (accessed 6<sup>th</sup> April 2024).
- Sandrine, M., Jean-Charles, H. and de Gouvello, C. 2001. Clean Development Mechanism: leverage for development. *Climate Policy*. 1(1) : 251-268.
- UN, 2024a. *Causes and Effects of Climate Change, United Nations*. Available online at: <https://www.un.org/en/climatechange/science/causes-effects-climate-change> (accessed 6<sup>th</sup> April 2024).
- UN, 2024b. United Nations Framework convention on climate change. Available online at: <https://offset.climateutralnow.org/faq> (accessed 15 April,2024).
- UNDP, 2022. *What are carbon markets and why are they important?* Available online at: <https://climatepromise.undp.org/news-and-stories/what-are-carbon-markets> (accessed 6<sup>th</sup> april,2024).
- UNDP, 2023. *UN Development Programme launches plan to boost integrity in carbon markets and increase access to finance schemes for developing countries*. Available online at: <https://www.undp.org/press-releases/un-development-programme-launches-plan-boost-integrity-carbon-markets-and-increase-access-finance-schemes-developing-countries>.(accessed 15 April,2024).
- UNFCCC, 2023a. *What is the Kyoto Protocol?* Available online at: [https://unfccc.int/kyoto\\_protocol](https://unfccc.int/kyoto_protocol) (accessed 6<sup>th</sup> April 2024).
- UNFCCC, 2023b. *The Kyoto Protocol-status of Ratification, UNFCCC*. Available online at: <https://unfccc.int/process/the-kyoto-protocol/status-of-ratification>. (accessed 6<sup>th</sup> April 2024).
- UNFCCC, 2024. *A guide to the climate change convention process* Available online at: <https://unfccc.int/resource/process/guideprocess-p.pdf> (accessed 15 April, 2024).
- World Bank, 2022. *Climate Stories Carbon Markets*. Available online at: <https://www.worldbank.org/en/news/feature/2022/05/24/countries-on-the-cusp-of-carbon-markets> (accessed 15<sup>th</sup> april, 2024).
- World Bank, 2023. *World Bank Carbon Credits to Boost International Carbon Markets*. Available online at: <https://www.worldbank.org/en/news/press-release/2023/12/01/world-bank-carbon-credits-to-boost-international-carbon-markets> (accessed 6<sup>th</sup> april,2024).