ARMA Update 8 November 2022
(English Version)

ESG Update: How Blockchain Technology Contributes to Climate Change Mitigation

General Overview

With the recent rise of digital technology, especially the current existence of trading through Blockchain systems, cryptocurrency trading is not the only virtual phenomenon that interests digital market traders.

As we speak, many global companies have already adopted long-term risk management with the standard of Environmental Social Governance ("**ESG**"), including the effort to mitigate climate change through carbon trading (*cap and trade*), investing in carbon credits as the result of carbon offsets and other nature-based solution activities. The growth of the carbon credit market can help the Government and companies to mitigate climate change and reduce greenhouse gas ("**GHG**") emissions as well as achieve the transition to net zero.

As we understand, based on the enhanced Nationally Determined Contribution (NDC) document, Indonesia has raised the GHG emissions target to 21.89% with its own effort and 43.20% with international cooperation. In order to achieve the target, embracing digital technologies, including blockchain, may potentially improve the development of carbon trading in the country.

ESG and the Rising Trend of Carbon Trading

ESG is a company standard in its investment practice that consists of three concepts or criteria, which are environmental, social, and governance. In other words, companies that apply ESG principles in their business and investment practices will also integrate and implement their company policies to align with the sustainability of these three concepts.

At this time, the world's carbon emissions continue to increase at an alarming rate. Carbon trading is rapidly becoming increasingly important to combat climate change and global warming. For carbon offsets, a company that is a carbon emitter is able to invest in offsets rather than actively reducing its own emissions. Carbon offsets allow companies to balance climate impacts and compensate for the emissions they produce. This is achieved with the aim of reducing carbon dioxide (CO_2) and other GHG emissions in other parts of the world.

Many businesses are now beginning to implement carbon offset strategies. Carbon offsetting is an effort to compensate for a company's carbon emissions by purchasing carbon emissions from other sources.

Blockchain, How Does It Work?

Cryptocurrency traders are no strangers to the role of blockchains. A blockchain is essentially a distributed database that can be shared among users through a computer network and acts as a database that stores valuable information electronically in a digitalized format. Commonly, blockchains are known for their role in cryptocurrency transactions.

As some may relate blockchains similar to digitalized notaries, blockchains provide a more sophisticated method of collecting data that guarantees fidelity and security without needing a trusted third party.

Evolution of Blockchain

Blockchain technology has gone through multiple phases to become what it is today, the most notable changes can be seen in the following table below:

Version	Notable Innovation
Blockchain 1.0	• The first generation of blockchain technology which mainly emphasizes on decentralization and cryptocurrency (Bitcoin).
Blockchain 2.0	• The second generation of blockchain technology which introduces smart contracts. • Smart Contracts are the automatic self-managing program that executes on the basis of predefined terms between two parties which are made impossible to be hacked or tampered with. • Smart Contracts reduce the cost of verification, execution, and fraud prevention and enable transparent contract transactions.
Blockchain 3.0	• An upgraded version of blockchain 2.0, built to improve the capabilities of the technology while using decentralized applications. • It focuses on solving the existing problems of blockchain technology. It also aims to facilitate faster, more cost-effective, and more efficient transactions.
Blockchain 4.0	• Aims to deliver a business-usable platform to create and run applications with the implementation of various prosperous technologies such as Artificial Intelligence.

Why Blockchain?

Blockchain-based systems may improve traceability by creating a more open, accountable, and transparent system for supply chains. Through maintaining accurate and trustworthy sustainability data with the use of blockchain, businesses can track carbon emissions from their supply chain and identify where and how they can reduce their carbon footprint. With the use of blockchain

databases in carbon trading, blockchains play an essential role in securing and creating transparency of the transactions of offsetting, especially avoiding issues such as double counting when it comes to GHG emissions reductions. The blockchain also provide a collaborative effort between the relevant stakeholders to achieve the net zero targets.

Further, as we note based on the Minister of Environment and Forestry ("**MOEF**") Regulation No. 21 of 2022 ("**MOEF Reg 21/2022**"), the mandatory emission certificate trading will be in the form of the certification of GHG emission trading reduction (*Sertifikat Pengurangan Emisi GRK or "***SPE GRK***"),* with the adoption of blockchain technology in the emission trading system may provide more efficient and reliable data for the national system registration for climate change control and have a more reliable measurement, reporting, and verification ("**MRV**"). With the use of blockchain technology for emission certificate trading, it will be consistent with Article 2.1 (c) of the Paris Agreement which makes finance flows consistent with a pathway towards low GHG emissions and climate-resilient development.

On the other hand, based on Article 60 (2) MOEF Reg 21/2022, emission reduction certificates issued by different certification agencies may be deemed equal to SPE GRK after mutual recognition for international carbon trading from the MOEF. The use of blockchain technology can provide room for relevant parties in international carbon trading to have more reliable MRV, standardization of mutual recognition system and mobilization of climate finance from other sources.

The Challenges of Blockchain Usage for Climate Change Mitigation

While the opportunities for blockchain-based systems are vast in Indonesia with the growing market aptitude, there are still challenges that need to be tackled for its implementation. There are also challenges requiring massive amounts of computing power and electricity for the usage of blockchain-based systems, which would be counterproductive in its usage for climate change mitigation projects. On the regulatory side, the legal framework for the usage of blockchain in the private sector, including for climate change mitigation projects, are yet to be regulated. Further, there are plans for the Financial Services Authority (*Otoritas Jasa Keuangan* or "**OJK**") to regulate the carbon trading sector further to accommodate the growing carbon market in Indonesia. Thus, coordination between various government agencies will be important to ensure the adequate development of Indonesia's blockchain and carbon market, including from MOEF, OJK, and the Minister of Information and Technology.

Potential Growth in Indonesia

While the carbon market is expanding rapidly, blockchain technology is uniquely positioned to help the market expand further by making access less exclusive. Indonesia also has a great opportunity to become a major player in implementing blockchain technology in the carbon market by including the world's largest crypto holders, along with Brazil, with companies or crypto traders becoming a part of this. Blockchain may solve the problem of transparency in voluntary

markets while also making mandatory markets available to everyone. Contrary to popular belief, blockchain technology is not limited to cryptocurrency. Many industries can use asset tokenization to enable efficient transactions, optimize workflow, streamline multi-stakeholder processes, increase accountability while minimizing disputes, and open up new markets.

This will be a challenge for the Indonesian Government to accommodate companies in Indonesia to be able to keep up with the times by utilizing blockchain technology in carbon trading. In order to provide legal certainty to its users, the Indonesian Government is required to regulate its implementation legally in Indonesia.

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