



How Blockchain Can Empower the Growth in Green Finance

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ABSTRACT

In 2021, the climate action roadmap took the first step towards ensuring further tokenization of the security of green finance assets. This means the sensitive data will be replaced by non-sensitive equivalents and data security can be ensured. Through the application of tokenization, there is the automation of trading activities and further deployment of climate awareness actions that are funded by green finance. Green finance refers to credit facilities that are meant to assure the sustainability and protection of the environment. In the blockchain system, the technology promotes the tracking of the financial resources which plays a role in ensuring that once the funds have been allocated, they are utilized most efficiently. This article will explore the possibility of applying blockchain technology to promote sustainable development and how it will empower green finance. It can be concluded that blockchain technology fosters the authenticity and verification of green bonds.

Keyword: *Blockchain, Green finance, Fintech*

1. INTRODUCTION

According to the United Nations Sustainable Development, there is a growing urgency for climate change solutions and actions across the world [1]. Blockchain appears to be the main concept that will lead to additional solutions to green finance. On May 6th, 2022, the Paris Climate Agreement was reviewed and 192 nations that joined in the agreement are now taking a more serious approach toward the concept of preservation and climate change, and some of the new concepts in this phase will help to achieve this goal. A Blockchain constituted of a growing list of records (blocks) is based securely on cryptography and has been perceived as the future of sustainable development; but just a few years ago, the concept of blockchain was futuristic, and its ability to help the world with environmental preservation and to collect the necessary resources to establish initiatives was largely underestimated[2].

Green finance appears to be one of the leading technology solutions which will further promote the increase in regulating environmental impact activities[3]. Therefore, the asset holders, bondholders, and issuers, among others, will have to refocus their efforts to guarantee that green finance is more useful, significant, inclusive, and environmentally protection oriented. The

issues that could influence green finance to be driven by key blockchain technologies will be addressed in this thesis. The cross-border exchange of crucial data and information and cross-border security trading will form a critical component of the paper. The need to assure that assets are verified, and the financial instruments are tokenized will be a step in the right direction. This paper will serve as a good reference for the follow-up research on the impact of blockchain technology on green financial projects.

2. THE CONCEPT OF BLOCKCHAIN AND GREEN FINANCE

2.1 The Concept of Blockchain

It is relevant to first understand the terms 'blockchain' and 'green finance' before attempting to comprehend how blockchain technology can contribute to the growth of green finance in 2022 and beyond. The term 'blockchain' was introduced to the public in 2008. Specifically, blockchain has been associated with other terms such as 'cryptocurrency' and 'decentralization'. A blockchain is a spread-out database containing numerous records of the public transactions of digital assets[4]. The digital assets and the cryptocurrency have undergone execution and they have

equally been shared among the entities participating in the transaction. The participating entities or the stakeholders in the system have the responsibility of verifying the transactions in the system to make sure the transaction is fair and open. In blockchain technology, every transaction record that is put into the system can easily be verified. A transaction cannot be erased, implying that one entity may not have all the control of the transactions that take place in the system. This means that there is no room for manipulation of prices and all the transactions are the real reflections of the market.

2.2 The Concept of Green Finance

‘Green finance’ also referred to as ‘green financing’, is a term used to describe the practice of offering loans, credit facilities, and micro-credit facilities as well as increasing the financial flows and investments to areas that would promote sustainability and protection of the environment [5]. This concept involves obtaining money from the public sector, the non-governmental sector, the private sector and even from private individuals so sustainable economic development that has unique benefits to the people and all communities is enhanced. Green finance, if it is employed properly, could increase the ability of the communities to finance blue economy activities such as fisheries and tourism, it could lead to the adoption of highly sustainable green technology goals and it could have a high-level effect on the attainment of the Medium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) of the United Nations (UN) (United Nations Environment [6].

2.3 Reasons that Explain Why Blockchain Can Power the Growth in Green Finance

Blockchain can power a further growth in green finance because it will allow the securities to be marketed or even traded in smaller units [7]. The growth of tokenization is also an important element. Tokenization is poised to improve the need to trace where some of the funds have been allocated to increase the transparency in certain financial transactions. Blockchain technology will assist investors in improving their contributions to green finance because it will facilitate the issue of green bonds. Blockchain technology will also enhance the granularity of financial products where most can easily become diversified over a wide variety of assets and investments, therefore helping investors diversify the type of portfolio they hold. Blockchain also facilitates the issues of cross-border exchanges of data.

2.3.1 Allowing Securities to Be Marketed in Small Portions

The security issuers, which may be public or private market issuers, can now focus on green finance since the

securities are marketed in even smaller portions [8]. When a set of securities is distributed in even smaller units, they can easily and freely be tradeable on several stock exchanges. For instance, an investor may focus on trading on the New York Stock Exchange because of the opportunity to trade in the green bonds or they can trade in another exchange such as the London Stock Exchange which does not have the option of green bonds but the conventional debentures. Therefore, the investor is now capable of distributing part of the investments in green bonds whilst other investments are placed in different types of stocks. The marketing of securities in small portions is a tool that ensures that more investors can become part of the blockchain security processes.

Blockchain enables the marketing and distribution of stocks into smaller portions because it can divide company stocks into smaller digital stocks which can be converted into tokens and distributed in a peer-to-peer (P2P) transaction system. The trading in these small assets does not lead to any delays because the process is fully optimized.

All the exchanges, transactions, and trading operate under the same type of rules and regulations. There are no instances of putting the manipulation of these transactions under one ledger or system where an entity, such as a bank, could have unlimited control of the system.

2.3.2 Facilitation and Managing the Cross-Border Exchanges of Data

As previously described, green finance may refer to pumping the financial solutions into projects or investments that are environmentally sustainable or promote environmental sustainability. Nonetheless, the need for sustainability and protection of the environment tends to be different among regions. For instance, people who live or work near a large factory that generates pollutants may need a significant investment in green finance to have access to clean, drinking water and fresh air. The holders of capital may not be urged or encouraged by the local government to invest in green finance but they may need a system that promotes cross-border exchanges so they can contribute significant amounts of money toward the protection of the environment in developing countries[8].

According to data from the World Resources Institute, during the board meeting that took place in March 2021, the Green Climate Fund donated \$ 1.2 billion to fund projects aimed to promote the sustainable usage of the environment in developing nations [9]. Most of these resources are channeled to institutions that should prioritize green financing projects. Yet in certain cases, due to bureaucracy, just a small portion of this money finds its way to the local people to fund green projects.

Blockchain technology will thus ensure that there is an increase in the digitization process of the rules of origin, that money is directly assigned, and also help in the resolution of some of the projects that affect the cross-border exchanges of data [10]. The streamlined cross-border exchanges of finance from one public company to another or from one private firm to another reduces the opportunities of intermediaries, who may be tempted to divert some of these funds for their personal use [11].

2.3.3 The Ease of Issuance of Green Bonds Through Blockchain Technology

The World Bank issued 2007 one of the first green bonds worldwide. Green bonds are financial instruments issued to protect the environment and promote sustainable projects. Green bonds promote the protection of water bodies and natural resources and concentrate on the need to ensure the employment of renewable energy and other waste management practices.

It can be difficult for users to become green bond compliant since they need to go through a set of audits such as the spending of the investment and quality checks to become compliant. Blockchain technology facilitates this process and constitutes a way to securely store green body information. The transaction is further simplified and becomes clearer, hence a user can easily qualify for trading or investing in the green finance sector.

The efficiency of the bonds is reflected in the costs and time saved when checking whether the transactions are secure, transparent, realistic, and valuable. Blockchain makes these transactions more secure because it controls the people, communities, or companies that do not interfere in the process.

Blockchain technology also secures the verification and eligibility tests of green bonds. Eligibility testing frequently involves the following process: labeling of the bond as green, an external review or verification of the bond, and once the external review process is completed, the Climate action initiatives are taken by the local government like Hong Kong and the UK have the role of certifying the bonds as green. Under the eligible bond structure, the proceeds of some of the bonds must at least be connected to green investments. For instance, the bond yield achieved after a given time frame should be utilized for projects such as conservation of the environment through tree planting or promoting farming using minimal resources.

3. THE IMPACT OF TOKENIZATION THROUGH BLOCKCHAIN ON GREEN FINANCE INVESTMENT

When discussing the impact of tokenization, it is necessary to first explore the challenges that investors

face when they are intending to use green investment vehicles to contribute to the sustainability of the environment.

3.1 Challenges Faced By the Green Finance Investors

Investors may be inclined to make use of their assets like vehicles for green investments, but they could be held back by a set of market factors, such as market failure, where the demand and the supply for some of the investments are negatively skewed and it does not support the needs of the market [12]. Other challenges include failure in the market and high minimum investment size, which does not give the investors with low amounts of funds the opportunity to invest in some of these financial assets. For instance, an investor with \$100,000 may want to invest a small portion of this investment in green finance projects but they are held back because the rules state that the minimum investment size should be 70% of the portfolio which would be \$70,000. Green investment vehicles need various certifications and monitoring since the government and/or environmental organizations must ensure that the investments are being channeled to the right use. Whilst the objective of certifications is to increase the value and quality of transactions, green finance investors could be facing another challenge in continuing with some of these investments due to the high costs involved in certification [12].

3.2 Tokenization As a Solution

It is fundamental to comprehend that in the blockchain environment, tokens are small assets that promote the exchange of information and value via the system of transferring, value measurement, and verification. All these activities are carried out efficiently and effectively. The tokens are unique and they may be calibrated to contain a unique set of passwords and security features, for instance. This can make the transactions further enhanced, easily promoted, and serve the needs of the stakeholders [13].

Some of the green bonds that can be tokenized include debentures, Sukuk, green convertible bonds, and securitization bonds. Securitization bonds refer to a variety of bonds that are grouped. Other types of bonds that fall into this category are climate awareness bonds, tesla energy resource bonds, and commercial papers (these are issued by financial institutions).

The token is issued on an asset basis, which is known as asset-based tokens. Asset-based tokens represent part ownership in a security, for instance, someone owning part of a green asset like a real estate company that is pioneering the building of environmentally friendly houses and utilizing materials that can be recycled and are easily accessible in the environment [12].

Other tokens are issued in the format of debt tokens, which are a representation of an individual who has taken a loan to invest in a green asset like mortgages or green energy projects [12]. For instance, a situation where a company in Africa obtains a loan from The World Bank to invest in green energy projects.

Company equity tokens are also included. These are the asset or the security-based tokens that allow the investor the opportunity to invest in a green energy project to obtain part-ownership in the company[12]. This part-ownership enables investors to share in the profits and losses and in case the company is sold to outside parties, the investors are also entitled to receive some of the proceeds.

Security tokens can increase the investment in green bonds and green investment vehicles because they assist in ensuring that the demand and supply size follow the normal changes in the market[12]. The low transaction costs, the automation of the system, and the reduction in red tape are some of the features that will make some of the green bonds an attractive investment vehicle for the users.

International financial institutions such as Central Banks and Credit Unions have been at the forefront of the issuance of green bonds. In 2017, the inaugural green bonds were issued by the European Investment Bank. These are also known as the Climate Awareness Bonds, where the loan disbursements are supposed to benefit climate action projects[14]. Various of these climate action projects include establishing initiatives to help people affected by the consequences of climate change such as high incidences of floods and famine, among others. Climate Awareness Bonds also had a theme of sustainability. The idea behind this argument is that aid alone is not going to be sufficient to help people affected by climate change thus they must adopt practices such as sustainable agriculture which will be of greater benefit apart from receiving help. The shift to sustainable development will not only bring long-term financial profits but also attract more investments for them.

The 2021 to 2025 climate action roadmap could make use of blockchain technology to track the methodologies which affect the issuance of green bonds [14]. The methodologies should be aligned with the goals, rules, and standards of the European Union (EU). The sustainability objective of green bonds is also about linking these financial instruments to the economy so that they contribute to its growth.

When the security bonds and other debt instruments are tokenized through the use of blockchain technology, the financial disintermediaries are removed [15]. The process of removing financial intermediaries is known as intermediation. Intermediation removes the transaction costs investors could have incurred [16]. The majority of the financial intermediaries are the common financial

sector and services stakeholders. These intermediaries include banks, credit unions, insurance firms, investment schemes, and brokerage firms that assist traders to invest in company shares and transfer these shares to other users through a system of the stock exchange. Therefore, tokenization assists investors who may be inhibited by intermediaries who hold financial and bureaucratic power [16].

Tokenization also enhances the automation of trading activities. Tokens act as the agent of reducing the size and liquidity requirements of the investments, thus making it easy for investors with small amounts of liquid capital to invest and benefit from the interests and benefits accrued from green bonds[16].

4. CONCLUSION

Blockchain technologies and their impact on green finance are the main subjects of this thesis. The empowering of green finance focus is particularly on removing financial disintermediaries, security tokenization, allowing the stocks to be traded in smaller units, promoting sustainability of the environment and blockchain verification, disambiguation, and automation.

Blockchain technologies, specifically, issues such as Bitcoins have been around for quite some time. People are trading cryptocurrencies like Bitcoins actively and in the global monetary market, Bitcoin is playing a more and more important role. They have started being incorporated into financial instruments such as green bonds. They reduce the volume and size of the allowable transactions ensuring that investors can easily invest in cryptocurrency technology. Blockchain promotes division and further tokenization, therefore facilitating trading stocks in smaller units. The tokenization and further division of the trading units into smaller units can reinforce the green economy and help companies to take a leading role in promoting environmental conversion in the regions. Both investors and common consumers should be aware that every action they take might have an impact on the Earth. Blockchain technology has been regarded as the future of the Internet, which will profoundly change how our society operates and the application of blockchain technology to green finance has made the investment trackable and transparent to the investors. It can be expected that shortly blockchain technology will empower more green finance projects and a sustainable circle will be formed by blockchain to foster more growth and investment.

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