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جدوى سندات التنمية الخضراء كآلية تمويل المشاريع الصديقة للبيئة لتحقيق التنمية المستدامة – التجربة الإندونيسية نموذجا–

The viability of green bonds as a financing mechanism for environmentally friendly projects to achieve sustainable development - The Indonesia experience as a model

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تاريخ الإرسال:

تاريخ القبول:

ملخص: تهدف هذه الدراسة إلى تسليط الضوء على أحد الأدوات المبتكرة لدعم وتعزيز التمويل الأخضر، فالتوازن البيئي هو أحد أهم أساليب تحقيق التنمية المستدامة في العالم والعالم الإسلامي خاصة من خلال تبني وابتكار صناعة مالية حديثة "صكوك خضراء" مناسبة لتمويل وانجاز استثمارات خضراء مستدامة، ففي الوقت الحالي تحتاج المشاريع صديقة البيئة إلى أدوات تمويلية غير تقليدية. للوصول إلى الأهداف المرجوة من هذه الدراسة اعتمدنا على المنهج الوصفي التحليلي إلى جانب الاعتماد على دراسة حالة التجربة الاندونيسية في هذا المجال. توصلت الدراسة إلى أن الصكوك الخضراء تلعب دورا كبيرا في تمويل الاقتصاديات التي تعول النهوض بالاقتصاد البيئي وتلتزم بخفض نسب انبعاث الكربون، كما أن تطوير هذه الأدوات يتطلب تفعيل دور أسواق رأس المال من خلال تنمية صناعات مالية

Abstract: This study aims to highlight one of the innovative tools to support and promote green finance. Environmental balance is one of the most important methods for achieving sustainable development in the world and the Islamic world through the adoption and innovation of a modern financial industry, "green bonds", suitable for financing and achieving sustainable green investments. Currently, environmentally friendly projects need non-traditional financial instruments. To achieve the desired objectives of this study, we relied on the descriptive analytical approach in addition to relying on a case study of the Indonesia experience in this field. The study found that green bonds play a major role in financing economies that rely on the development of the environmental economy and are committed to reducing carbon

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emissions. The development of these tools also requires the activation of the role of capital markets through the development of modern financial industries such as green bonds and social bonds, and the increase of issuances by stakeholders, such as the effective contribution of banks in supporting this trend through their financing of leading environmental friendly project models in many countries around the world
Keywords: green economy, Islamic finance, green bonds, green investments, sustainable development**.**

حديثة مثل الصكوك الخضراء والصكوك الاجتماعية، والرفع من إصدارات الجهات الفاعلة على غرار المساهمة الفعالة للبنوك في دعم هذا التوجه من خلال تمويلها لنماذج مشاريع رائدة للبيئة عبر العديد من دول العالم.
الكلمات المفتاحية: الاقتصاد الأخضر، المالية الإسلامية، الصكوك الخضراء، الاستثمارات الخضراء، التنمية المستدامة

Introduction

Green finance is a new approach to economic development that focuses on green investments that aim to address the relationship between the natural resources of the environment and sustainable development. As the world's population grows rapidly, the coming decades are expected to see unprecedented growth in demand for clean energy, water, transportation, renewable energy development, and agricultural infrastructure. This is matched by an increase in the financing needs of green projects, where the importance of finding tools to finance sustainable development is evident.

Since Islamic finance is constantly seeking new and innovative approaches to financial services and products and in developing strategies for financial institutions to achieve welfare and benefits, a new approach to financial instruments has been developed to finance development projects that are friendly to the environment, namely green bonds, which are based on investing in a variety of environmental projects such as renewable energy projects.

The basic idea of green bonds is their reliance on a set of principles that are primarily concerned with environmental protection and the conservation of natural resources, energy efficiency, the promotion of renewable energy, and the reduction of greenhouse gas emissions. Thus, green bonds are important tools to help the international community address the environmental challenges caused by modern

industrial civilization, which have exacerbated the severity of climate change, which has become a threat to humanity and nature

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The need for sustainable financing options to finance development projects is urgent. In this context, green bonds are considered to be one of the most important tools of sustainable finance, as they have the potential and readiness to deal with the challenges of economic fluctuations and crises, and to finance sustainable productive projects in order to achieve sustainable development. The problem of the study can be formulated as follows:

How effective are green bonds in financing environmentally friendly projects to achieve sustainable development?

The main problem gives rise to the following sub-questions:

- What are Islamic green bonds? Moreover, what are their characteristics?
- What are the areas of use of green bonds?
- Are there a global trend that confirms the effectiveness of green bonds in financing environmentally friendly projects?

Research Hypotheses:

To achieve the objectives of the study, the following hypotheses can be formulated:

- Green bonds have characteristics that make them suitable for financing environmentally friendly projects.
- Relying on green bonds in financing environmentally friendly projects offers many benefits to governments and investors.
- Indonesia Financial experience is a key factor in the success of green bonds in general.

Research Importance:

Countries around the world have been seeking alternatives that can help them achieve economic stability and face the financial crises that have plagued their economies in recent years. This has led to a renewed interest in finance tools and their potential to finance development projects, particularly green bonds, which are a type of Islamic bond. The importance of the study is further enhanced by the experience of financial institutions that have relied on green bonds to finance environmental projects.

Research Objectives:

The research paper seeks to achieve the following objectives:

- Identify environmental friendly project and their financing methods.
- Identify the guiding principles of Islamic green bonds.
- To identify the most important international players in green finance for environmental friendly project.

Research Method:

We followed the descriptive-analytical method, which involves analyzing some legal texts in the legal system. This is the most common method used in academic research, especially in legal sciences.

The importance of this study:

lies in understanding the codification of the legal rules governing environmental protection and their relationship and actual contribution to sustainable development through economic development and optimal investment in the realization of investment projects that respect the environmental system, and the extent of their contribution to achieving the equation between preserving the environmental balance and pushing the wheel of economic growth by virtue of investment in projects that generate financial profits without harming the environmental aspect. In addition we depend on analytical method to analyze the performance of green bonds in the global market, specifically in Indonesia.

1- Generalities of green finance:

In order to keep pace with the international trend towards sustainable development and a clean environment, it is necessary to increase investment in projects that

promote and facilitate this trend. For this reason, it was necessary to search for the most appropriate and best financing that works to preserve the environment, in order to address the financial needs related to sustainable development and meet them with the available resources. (Addae-Dapaah, (2011))

1-1 Definition:

Green finance is defined as a set of financial services and tools that help to increase investment, mobilize financial resources, operate projects, and manage risks in areas such as environmental protection, energy conservation, renewable energy, green transportation, and green buildings. It also includes the use of financial products and services such as bonds, insurance, equity, capital investments, and loans, among others, to finance green or environmentally friendly projects. (Azhgaliyeva, 2020)

The concept of green finance focuses on the restructuring and reorientation of businesses and economic activities to have a positive impact on the environment. It seeks to protect the environment not for the sake of financial gain, but rather to reduce environmental risks and social inequalities. Therefore, it is seen as a mechanism for achieving sustainable development.

Research's defined green finance as "a set of financial resources that achieve strategic balance in the medium and long term, with the aim of serving environmental objectives that meet the needs of individuals for goods and services and the protection and sustainability of the environment." (Addae-Dapaah, (2011)) In general, the concept of green finance refers to various investments and bonds that finance projects aimed at protecting the environment and conserving financial resources, as defined by the International Finance Corporation in the context of growing environmental concerns. This has led to a strong focus on green finance as an inevitable reality

1-2 Islamic green finance areas:

Green finance includes the following areas:

- **Renewable energy:** This includes solar energy, wind energy, and bio-fuels. This area aims to replace investments in fossil fuels with investments in clean energy. (Bank., 2013)
- **Green buildings:** As the transition to a green economy progresses, it is important to focus on green buildings. These buildings are characterized by the use of environmentally friendly materials and the conservation of water in the face of limited water resources. They also help to reduce the use of fossil fuels, which contribute to climate change.
- **Sustainable transportation**: Sustainable transportation provides the basic needs of individuals and society in a safe and healthy way, without harming the environment or the interests of future generations. It is the least polluting form of transportation, whether in terms of air, water, or soil pollution. It also helps to reduce greenhouse gas emissions, which contribute to climate change and global warming. (Azhgaliyeva D. K.-H., 2019)
- **Waste management:** This is the process of recycling waste to produce new products of lower quality than the original product. This includes recycling paper, plastic, metal waste, and glass. It also includes the recycling of organic waste through aerobic and anaerobic digestion, and the treatment of hazardous waste.
- **Sustainable agriculture**: It is important to focus on the concept of a green economy to green the agricultural sector. This will support livelihoods, implement policies to reduce poverty in development strategies, and use new agricultural technologies to mitigate the effects of climate change. It will also help to accelerate the pace of development to address contemporary environmental challenges such as desertification, deforestation, urban sprawl, soil erosion, and loss of biodiversity. This requires the development of a green growth strategy with a theoretical model and the use of various indicators that capture all dimensions of sustainable development. (Banga, 2019)

1- 3 Green finance projects:

Based on the aforementioned areas, the following projects can be considered as green finance projects: (SMI., 2018)

- **Air pollution reduction projects:** These projects aim to replace old vehicles with new vehicles that meet emissions standards. This will help to reduce air pollution and improve air quality.

- **Treatment of medical and solid waste:** These projects aim to establish a safe and integrated system for the disposal of hazardous waste. This will help to protect public health and the environment.
- **Financing of sustainable agriculture**: These projects support young people who are working to develop sustainable agriculture practices. They help to promote the use of environmentally friendly agricultural practices, such as recycling agricultural waste, using organic fertilizers, and adopting low-input agriculture. (Dumlao-Abadilla., 2019)
- **Green building projects:** These projects aim to build new green buildings or renovate existing ones. They use environmentally friendly materials and practices to reduce the environmental impact of buildings. This includes using recycled materials, installing green roofs, and managing rainwater.
- **Green insurance projects:** These projects provide insurance coverage for a variety of environmental risks, such as natural disasters and pollution. They also provide insurance for clean technology and renewable energy projects.

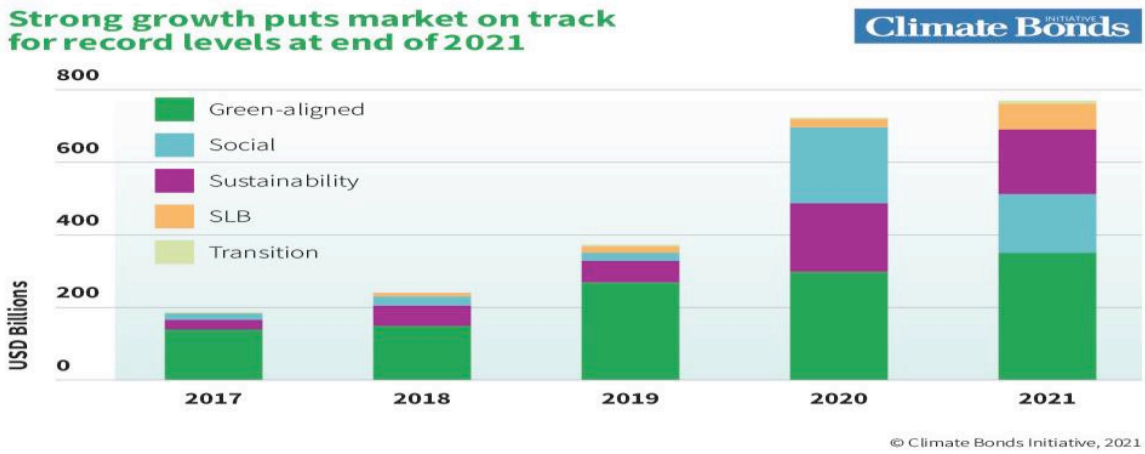
1-4 Green finance market size to 2022:

- Investors and companies are increasingly turning to green finance. This trend has helped to create a market for green bonds and loans that barely existed a few years ago. The following figure shows the evolution of green finance instruments over the periods (2022-2017), which include bonds, green bonds, green loans, social responsibility bonds, sustainability bonds, and sustainability-linked loans. (Bennett, 2011)
- The issuance of green bonds and loans - to finance environmental and climate projects - reached a record level of $894 billion in 2021. This follows the record growth in the green bond market seen in 2020, when the value of issuances exceeded $5.269 billion. (Benes, 2012)
- Meanwhile, green loan issuances reached $89 billion in 2022, down 1% on a year-on-year basis. This was the only type to see a decline, partly due to the lack of disclosure in the private loan market compared to the bond market. In general, a green loan is smaller than a bond, is executed in a private transaction, and cannot be listed on an exchange like a bond. (Wolf, 2014)

- On the other hand, sustainability bonds for environmental and social purposes together saw issuances of around $184 billion last year, up 149% on a year-on-year basis. Sustainability bonds are popular with development banks, which typically implement sustainable development projects in emerging markets.

- As a result, the green finance market has seen the emergence of new types of bonds to address environmental and sustainability challenges. These include green, social, and sustainability-linked bonds. These bonds have segmented the environmental and social debt market, as shown in the following figure, which gives us a breakdown of the green finance market as of the first quarter of 2021. (Viñals, 2010)

Figure 1: Evolution of the size of the new green finance.



Source: (https://www.latribune.fr)

- As we can see, green bonds dominate the green finance market with a value of $1.129 billion, followed by social bonds with a value of $0.66 billion, then sustainability-linked bonds and sustainability-linked loans with a value of $3.28 billion and $2.20 billion, respectively. The table below illustrates these results**.**

Table: Breakdown of the green finance market as of the first quarter of 2021

Type	Value (billions of dollars)
Green bonds	1.129
Social bonds	0.66
Sustainability-linked bonds	3.28
Sustainability-linked loans	2.20

The statistics provides an overview of the growth of the green finance market from 2017 to 2021. It notes that the market has grown rapidly, with the issuance of green bonds and loans reaching record levels in 2021. The statistics also provides a breakdown of the green finance market by type of instrument, and concludes by noting that the green finance market is likely to continue to grow in the coming years, as investors and companies become more aware of the importance of sustainability. (Wolf, The Giant Hole at the Heart of Our Market Economies Needs to Be Plugged, 2014)

2. Green bonds

Green bonds were introduced in France in 2012 in the first time. Since then, they have attracted a lot of interest, with the Islamic Development Bank raising billions of dollars for renewable energy sectors, including Morocco, Kazakhstan, Egypt, Tunisia and Syria. In 2013, Mauritania issued its first green bonds, as part of a wider package of Islamic bonds worth $5.1 billion (Dumlao-Abadilla, 2019).

Green bonds are fixed income securities, either taxable or exempt from tax, that raise capital for use in green or sustainable projects or activities with specific environmental or sustainability objectives.

2.1 Principals of green bonds

- Renewable energy
- Energy efficiency (including energy efficiency buildings)
- Sustainable waste management
- Sustainable use of land (including forests and sustainable agriculture)
- Conservation of biodiversity
- Clean transportation
- Sustainable water management (including clean and/or drinking water)
- Adaptation to climate change

Green bonds are used to finance or refinance green or sustainable projects or activities. These projects or activities typically include renewable energy, energy efficiency, clean transportation, sustainable water management, climate adaptation, sustainable agriculture and forests, and pollution prevention and control.

In 2015, the International Finance Corporation issued a five-year masala green bond on the London Stock Exchange. This was the first green bonds to be issued in the Indian market. The bonds raised 3.15 billion and attracted a wide range of international investors to support climate-smart investments in India. The IFC invested the proceeds of the bonds in green bonds issued by I S Bank, one of India's leading private sector banks. I S Bank invested the proceeds of the bonds in renewable energy and energy efficiency projects, particularly in solar and wind power.

In 2016, the IFC invested 2 billion (about $8.75 million) through a trust structure in green masala bonds issued by Punjab National Bank, India's largest state-owned bank. The bonds were guaranteed and aligned with the principles of green bonds. (Godlewski, 2013)

The following are some examples of green bonds that have been issued:

- In 2017, the Islamic Corporation for the Development of the Private Sector (ICD) issued a $500 million green bonds to finance renewable energy projects in the Middle East and North Africa.
- In 2018, the Islamic Development Bank (IDB) issued a $3 billion green bonds to finance climate-smart investments in developing countries.
- In 2019, the Malaysian government issued a $1 billion green bonds to finance renewable energy projects in Malaysia. (Board, 2014)

2-2 A new era for green bonds:

The global shift towards green bonds is one of the areas that are typically associated with environmental protection and sustainability. In recent years, green bonds have become a popular instrument for this aspect of the global bonds market. (Maziad, 2015)

For example, the European Investment Bank (EIB) issued green awareness bonds worth €600 million in 2007, focusing on renewable energy and energy efficiency. In 2008, the World Bank issued a total of $440 million of green bonds to support a climate-focused program for Nordic pensions. In 2013, the African Development Bank issued green bonds worth $500 million to finance climate solutions in Africa. As of June 2015, the World Bank had issued over 100 green

bonds worth $5.8 billion. And as of today, there are close to $9.65 billion of green bonds outstanding. (Miller, 2007)

The growth of the green bonds market is being driven by a number of factors, including:

- Increased awareness of the environmental and social impact of investments.
- The growing demand for sustainable financing.
- The development of standardized green bonds frameworks.

2-3 Challenges facing green bonds:

Based on studies by the Organization for Economic Co-operation and Development (OECD), the main challenges facing green bonds include:

- Lack of awareness of the benefits of green bonds and related international standards.
- Lack of local guidelines.
- High costs of green bonds requirements.
- Lack of green bonds classifications, indices and benchmarks.
- Lack of green bonds issuance.
- Difficulty for international investors to access local markets.
- Lack of local investors.

- **Lack of awareness of the benefits of green bonds and related international standards:** non-knowledge of existing international standards, in addition to a lack of understanding of the potential benefits of the green bonds market for policymakers, regulators, issuers and investors, can be a major obstacle in many countries.
- **Lack of local guidelines:** The environmental and regulatory challenges can vary from country to country. For this reason, incentive policies can be used to support the development of local green bonds markets. Some of these markets may require additional disclosures and transparency in addition to green bonds principles. For these countries, the lack of local guidelines and disclosure requirements can be a major obstacle.

- **High costs of green bonds requirements**: Green bonds requirements must be verified and monitored to ensure that issuers use the proceeds for sustainable purposes. This can be done by a second opinion or a third-party guarantee (such as accounting firms or specialized research firms). However, many issuers do not know how to conduct this process. In some markets, the cost of obtaining a second opinion or a third-party guarantee can be prohibitive, which can be an obstacle for some small issuers, in addition to increasing the cost of managing disclosure requirements.
- **Lack of green bonds classifications, indices and benchmarks**: Green bonds classifications, which provide environmental information specific to bonds categories, can help to assess the alignment of green bonds markets with international standards and guidelines. They can also help investors to understand how environmental factors affect the credit risk of issuers. Green bonds indices can help to guide investors to green bonds that meet their needs.
- **Lack of green bonds issuance**: Despite the availability of investors, low-level green bonds issuance in some markets may reflect a lack of sustainable projects that can be financed through green bonds. Even if a project meets one of the international standards, it may not be considered a green bonds if it does not meet all of the requirements.
- **Difficulty for international investors to access local markets:** International investors may find it difficult to access local markets due to differences in market practices and disclosure requirements. These differences can increase transaction costs, as green bonds issued in one market may need to be re-named or re-rated in another market. In addition, there may be no protection against risks (such as currency risk).
- **Lack of local investors:** In some markets, green bonds are mainly purchased by local investors, either due to capital controls or cultural barriers. In these cases, the availability of local investors is essential to ensure demand. (Tahir, 2020)

2-4 Evaluation of the size of international green bond issuances by 2023:

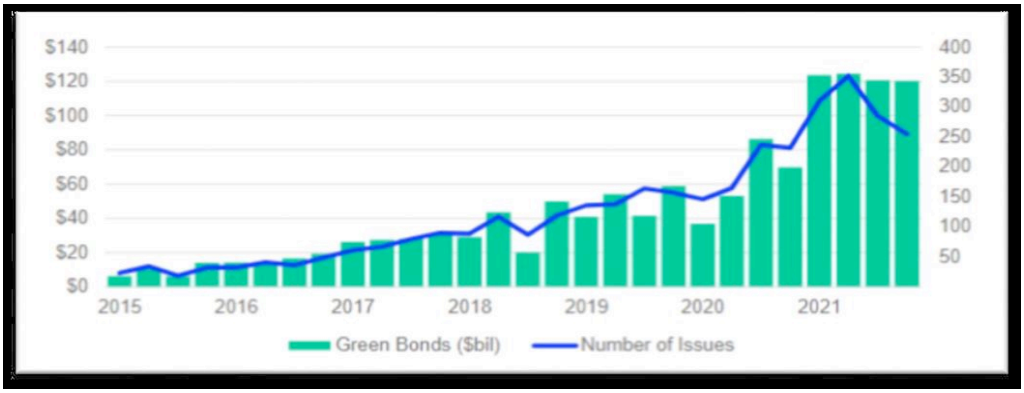
According to a report by the World Bank (2020), global green bond issuances reached a record high of $5.269 billion by the end of 2019. The report showed that green bonds are a growing asset class of fixed-income securities that raise capital for projects with environmental benefits, such as renewable energy projects or low-carbon transportation. Although issuances reached a new record high in 2020, that figure was only slightly higher than the total for 2019.

A recent report from Bloomberg New Energy Finance showed that green bond issuances doubled to $621 billion in 2020, a record high. By the end of 2021, the total sales of green bonds reached over $8.1 trillion since these bonds were first issued in 2007.

Europe remains the largest issuer of green bonds, with a value of $308 billion in 2021. However, Asia is the fastest growing region, with its share of total issuances rising from 10% to 24% in 2021. Emerging markets have also seen significant growth in this market recently, led by Indonesia, as well as plans from, Saudi Arabia to boost green project financing. The European Union is expected to continue to lead, with plans to issue €250 billion ($275 billion) in green bonds by 2026, according to Bloomberg Intelligence agency.

According to a report by the Climate Bonds Initiative in the first quarter of 2021, global green bond issuances reached a record high of $5.269 billion at the end of 2020. This figure is only slightly higher than the total issuances for 2019, which was $3.266 billion. This is due to a slowdown in issuances during the second quarter of 2020, which continued to a slight decline to the first quarter of 2021. However, issuances began to recover gradually in the second quarter of the same year, reaching a record year of issuances in 2021, and are expected to continue to rise in the coming years, as shown in Figure 2.

Figure 3: The evolution of green bond issuances until 2021.



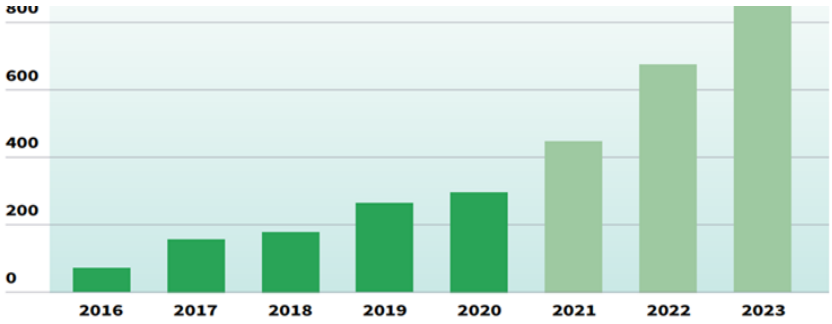
Source: (https://www.refinitiv.com)

According to the Climate Bonds Initiative's semi-annual report, green debt issuance continued to grow in the first half of 2021, with volumes listed in the Climate Bonds Initiative's green bond database in this period reaching $8.227 billion, which is double the amount compared to the first half of 2020 – a record figure for a six-month period since the market began in 2007.

In the first half of 2021, green issuances reached the equivalent of more than three-quarters (76%) of what was issued in full in 2020, and according to the initiative, it exceeds half of the expected volume for the whole of 2021, which is $450 billion. This brings the total volume of bonds issued (cumulatively) to $3.1 trillion. (Taylor, 2014)

According to the Climate Bonds Initiative, with these growth rates, it is likely that the annual volume of green bond issuances will exceed $1 trillion in 2023. (Wilson, 2018)

Figure 3: The evolution of green bond issuances until 2023



Source: (https://maaal.com/archives)

The accelerated growth in expected green bond issuances is the result of enhanced coordination efforts between the European Union member states. EU bonds are a potential future asset that could rival US Treasury bonds, as the EU's social responsibility bonds issued in 2020 saw the highest demand ever.

2-5 The role of International Finance Corporation (IFC) in the issuance of green bonds:

The International Finance Corporation (IFC), a member of the World Bank Group, is the largest global development institution focused on the private sector in emerging markets and developing economies. The Corporation works in over 100 countries around the world, using its capital, expertise, and influence to create markets and opportunities that improve lives. In fiscal year 2021, it invested a total of $5.31 billion in loan commitments to private companies and financial institutions in emerging markets and developing countries, in an effort to eliminate poverty and promote shared prosperity.

The first issuance of green bonds by the International Finance Corporation (IFC) was in 2010, in response to demand from investors looking for investments in climate-related activities with stable income. The IFC's first issuances were small in size to meet investor demand, but as investor interest in this type of bond and climate activities grew, the IFC met the demand and increased the size of its annual issuances.

The period 2018-2020 saw a significant increase in the share of green bond issuances, but from mid-2020 to 2021, this period saw a continuous decline in the share of bond issuances due to the covid-19 pandemic that hit the world. The covid-19 pandemic diverted the IFC's priority to addressing the economic crisis and helping to address this global crisis. Efforts continued to provide assistance to overcome the social and economic consequences of this pandemic, and the IFC issued six green bonds worth $8.165 billion in 2021. (Annie Massa, juin 2019)

2 The Future of Green Bonds

The green bond market has seen a remarkable development in terms of the participation of new types of investors and issuers. It has gone from a market dominated by early issuers such as the World Bank to a market in which governments, companies, banks, and financial institutions are involved. The types of green bonds have also expanded to include a variety of different bonds (green securitization), such as blue bonds. Seychelles issued the first blue bond, which is the latest in a series of innovations in the fixed income market, to support sustainable projects for marine activities and fisheries. The interest in the bond market also means an increase in government interest in green spending (transport and energy). Despite the health crisis of 2020, global issuances reached a record high in 2020. The geographic diversity of issuances was also evident in several countries, such as Ecuador, Saudi Arabia, Barbados, Russia, the UAE, Kenya, and

others, all of which are emerging markets looking for green investments. (Energy, 2017)

The European Union is working to develop a standard for green bonds and a classification for sustainable finance according to Moody's. The standard will support the growth and maturity of the market. Indonesia is also coordinating seriously with the European Union, the G20, and several initiatives, such as the UN Green Finance Initiative, to explore ways to develop the green bond market.
Although the contribution of green bonds to directing investment in climate change mitigation and adaptation projects is still considered marginal, there is an urgent need to strengthen confidence in this market in the medium to long term, and to gain a better understanding of the financial characteristics and challenges associated with this asset class.

3 Indonesia Experience in Issuing Green Bonds:

The World Bank indicates that the cost of environmental damage is between 3% and 6% of Indonesia's GDP. Indonesia Development Bank indicates that Indonesia needs about 310-620 billion US dollars per year in capital to invest in green projects. As a result, pollution control, recycling, and green investments have become a top priority in Indonesia, and green finance, especially green bond financing, can play an important role in this. (Rui, 2020)

The maturity terms and products include short-term bonds, longer-term bonds (up to 15 years), and perpetual bonds, as well as asset-backed securities and green asset-backed securities. The largest issuers of these bonds are the Indonesia Development Bank, the Industrial and Commercial Bank of Indonesia, and the Bank of Indonesia. As a result, banks are the main issuers, and non-financial corporate issuances are small. (Sandalow, 2020)

4-1 The Reality of Green Bond Issuance in Indonesia:

Green bond issuances in Indonesia reached around $11 billion in 2013, rising to $36 billion in 2014. In 2018, issuances reached $43 billion, and in 2019, they reached $120 billion. As a result, Indonesia is the second-largest green bond market in the world with issuances rising from $11 billion to $120 billion in just eight years. (Donovan Escalante, 2020)

Regarding the regulation of bond issuance, the first green bond standard was launched by the Indonesia Banking Regulatory Commission in 2015 as a foundation for serving the real economy. In 2016, the Green Bond Issuance Guidelines were

issued to encourage investment in 12 major types of green projects. In 2019, a green industry guidance manual was drafted, which clarified the definition and classification of green industries and projects. In 2020, the foundation for the green bond catalog was laid.

It is noted that Indonesia has adopted four versions in six years, and these versions have seen continuous improvement in content, including:

- The 2020 version is characterized by excluding the financing of projects related to clean coal. Some projects that involve the clean use of fossil fuels have been classified as green projects, while global standards do not recognize these projects as green.
- Previous versions allow the use of 50% of the proceeds to repay bank loans or invest in working capital, while the new version allocates proceeds to finance and refinance green projects, by providing a specific definition of green bonds.
- The 2015 version defined six first-level industrial categories: energy saving and environmental protection industry, cleaner production industry, clean energy industry, environmental ecology industry, green infrastructure development, and green services. The latest version defines four levels of categories (6 first-level categories, 25 second-level categories, 47 third-level categories, and 203 fourth-level categories). The fourth-level category includes specific project names in addition to guidelines and technical requirements. These levels represent a better and more detailed understanding for market practitioners to follow guidelines in order to better direct capital flows towards targeted green projects.
- The green bond market has attracted 160 new issuers, and support for clean projects has reported significant environmental benefits. Green bond financing has contributed to the reduction of 6.52 million tons of carbon dioxide equivalent and added 2.11 megawatts of clean energy (Escalante Donovan, 2020). The report of the Climate Policy Initiative recognizes the effectiveness of the green bond market in Indonesia. (Pauline Deschryver, 2020)

4-2 Green-eligible projects in Indonesia:

In the latest version of the green bond financing project, a set of green projects with a significant and positive environmental impact in addressing climate change, achieving the circular economy, and improving the environment in general, were examined. The most prominent projects that were eligible for green financing in Indonesia include: (REGLobal, 2020)

- Carbon capture projects
- Infrastructure projects that support renewable energy vehicles (urban rail transport/subway)
- Support for the carbon credit trading sector
- Technological improvements and product development and manufacturing
- Pollution prevention and treatment
- Water treatment plants
- Recycling facilities
- Green transportation
- Green cities

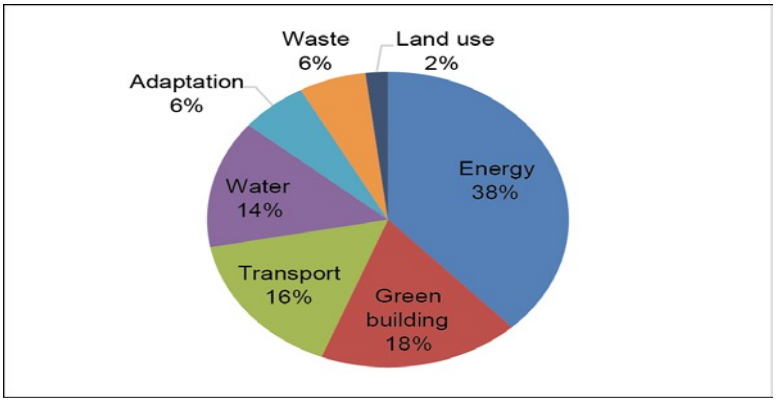
Statistics have shown that 28% of the proceeds of green bonds are distributed among solar energy, wind energy, and other clean energy projects. The largest share in the clean energy sector was for hydropower (7 billion dollars); and 33% of the proceeds were from the low-carbon transport sector. This means that the clean energy sector and the clean transportation sector had the biggest share compared to other sectors. 17% of the bond proceeds are for pollution prevention and control, and 17% are for resource conservation and recycling. 8% are allocated to environmental protection and adaptation to climate change. ((SBN), 2018)

4-3 **Evaluation of green bond issuance in Indonesia**

Despite the rapid development of the green bond market in Indonesia, it still faces significant challenges. There are a number of measures that can be taken to develop the market, starting with reducing the information gaps available about the benefits of green bonds, as well as institutional and corporate data, to ensure that green bonds are documented and evaluated according to the guidelines issued by the People's Bank of Indonesia and the Indonesia Securities Regulatory Commission, and to strengthen due diligence procedures for bond issuers and information disclosure requirements. In addition, the use of green bond indices and the issuance of green-linked securities can also make the market more attractive. Similar to other sectors in the Indonesia bond market, it is important to expand the investor base and promote international cooperation in the field of green bonds. The

green bond market helps to encourage growth that is consistent with environmental protection principles and contributes to global green finance initiatives.

Figure 4: Global Use of Green Bond Proceeds in Indonesia



Source: Authors' own based on data from Filkova et al. (2021).

Green bonds appear to be a promising financing mechanism for energy and green building projects in Indonesia, considering that a large proportion of green bonds are currently being issued to fund such projects.

According to an analysis by the Climate Bonds Initiative, approximately $7.3 billion of issuances in Indonesia did not meet international standards in 2019, as 50% of the proceeds could be allocated for working capital purposes for corporate bonds, while green bonds require the proceeds to be allocated to green projects. It was reported that 28% of bond proceeds go to new projects, 10% go to refinance debt or existing projects, while 51% are unknown. This can be attributed to the fact that bond issuers do not disclose information in detail or because the final allocation is pending.

The lack of a central repository for financial and environmental data for green bonds is also a major challenge to understanding the green bond market in Indonesia.

While the green bond market is attracting new issuers, it is still relatively small compared to the size of the challenges that the real market is supposed to face. Nevertheless, it achieves many benefits, the most important of which are opening up new financing channels for green businesses and projects, providing investors

with new asset classes, and promoting green investment for the issuer through the reputational effect as a step towards improving the development of the green bond market.

4 Conclusion

It has become more urgent than ever to focus on the environmental dimension to implement and finance projects on the ground. This is due to the growing environmental awareness of the population and the establishment of legal frameworks that are consistent with respect for the ecological system and sustainable development. These two are closely linked, so it is important that the financing and implementation of projects that generate financial profits and social benefits should not be at the expense of environmental security and stability.

Although the green bond market is still in its early stages of development, the diversity of investors is growing. This may also lead to an increase in the diversity of bonds that are issued, which could lead to the possibility of mobilizing more private capital to support environmental investments that take into account climate conditions. However, there are a number of challenges associated with issuing green bonds. These can be summarized as follows:

- Lack of awareness of the benefits of green bonds and the related international guidelines and standards
- Lack of local market guidelines and lack of definition and disclosure of green bonds;
- High costs of green bond issuance requirements at times for some small issuing companies;
- Lack of ratings, indices, and green bond lists that are aligned with international guidelines and standards;
- Difficulty of access for international investors to local markets, as green bonds recognized in one market need to be renamed or recertified in another market. In addition, there is no risk protection.
- Indonesia's experience in issuing green bonds is a pioneering experience, but it is not without obstacles that threaten its success.

5 Research results :

- Green bonds are an innovative solution to the challenges of financing climate action. Investing in these financial instruments guides participants in capital

markets in the right direction to reach an effective level and contribute to mitigating the effects of climate change.

- Although green bonds still represent a small segment of the overall bond market, the efforts of stakeholders have made them an increasingly popular tool used by companies to finance more environmentally friendly operations.
- The International Finance Corporation (IFC) contributes to providing climate-sensitive solutions by raising green bond issuances to attract new investors and mobilize more private capital, especially in emerging markets. What commends its efforts is its supervision of the financing of the largest environmental projects, such as the Indonesia atmospheric purification model since 2008.

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