

Analysis of the Implementation of Green Financing at PT Bank Syariah Indonesia Tbk in Supporting the National Net Zero Emission Target

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Abstract

Indonesia's commitment to achieving Net Zero Emission (NZE) by 2060 requires the active involvement of all sectors, including the financial sector. Islamic banking has a strategic role through the implementation of green financing that aligns with sustainability principles and the maqashid of Sharia. This study aims to analyze the implementation of green financing in Bank Syariah Indonesia in supporting the national net zero emission target. The research method used is qualitative descriptive with a case study approach. The data obtained in this study consisted of documentation studies of annual reports, sustainability reports, sustainable financing policies, and official publications available on the BSI website for the period 2023-2025. The results of the study indicate that Bank Syariah Indonesia has implemented green financing through the provision of sustainable financing in the renewable energy sector, eco-efficient products, sustainable land management, as well as financing for environmentally-oriented micro, small, and medium enterprises. This study concludes that the implementation of green financing at Bank Syariah Indonesia plays an important role in supporting national net-zero emission targets, although there are still various challenges in its implementation.

Keywords

Indonesia Sharia Bank; ESG; Green Financing; Net Zero Emission; Sustainable Finance.

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1. INTRODUCTION

Global climate change has become a strategic issue that drives various countries around the world to undertake transformations toward sustainable development. This phenomenon is marked by rising global average temperatures, climate changes, increasingly extreme weather patterns, rising sea levels, and ecosystem degradation that threaten the sustainability of life on this planet.

According to European Commission data, Indonesia's greenhouse gas emission volume in 2022 was recorded at 1,240.8 million tons of carbon dioxide equivalent (MtCO₂e) or equivalent to 1.24 gigatons of carbon dioxide (GtCO₂e). This amount reflects a contribution of around 2.3% to the world's



total greenhouse gas emissions, thus placing Indonesia among the countries with the highest emission levels in the Southeast Asian region (Irma & Gusmira, 2024).

As one of the countries with the largest territories and populations in the world, Indonesia needs to pay serious attention to the greenhouse gas emissions it produces. According to data from the Emissions Database for Global Atmospheric Research (EDGAR), Indonesia's greenhouse gas emissions increased by 6.7% during the period from 2022 to 2024. In 2022, Indonesia produced greenhouse gas emissions amounting to 1,240.8 mtCO₂e per year. This amount then increased in 2024 to 1,323.78 mtCO₂e per year (EDGAR, 2025). Bank Indonesia has encouraged banks in Indonesia to implement environmentally sustainable practices as part of corporate social responsibility. In response to this, several banks in Indonesia have begun developing products and services that consider environmental aspects, one of which is Bank Syariah Indonesia. (Husen & Fitrijanti, 2024).

Green financing is a financing mechanism directed towards business activities that are environmentally friendly, sustainable, and contribute to climate change mitigation and adaptation. (Green Finance Latin America Report, 2017). Green financing requires that financial institutions now must prioritize protecting the environment, the planet, and improving the living standards of society (humans), in addition to their financial responsibilities and operating as profitably as possible for shareholders (Syarvina et al., 2023). The Indonesia Financial Services Authority (OJK) has promoted the implementation of sustainable finance through various regulations, including the application of Environmental, Social, and Governance (ESG) principles (OJK, 2021).

Banking has an important role in collecting and distributing public funds to support the achievement of national development goals and vision. As an intermediary institution, banks also play a crucial role in supporting economic development by "forcing" debtors to apply for financing that pays more attention to sustainable economic issues (green economy) and environmentally friendly businesses (green business) in carrying out their business activities and operations. In addition, as social and economic entities, the banking sector is required to contribute in supporting the public and the government in creating a green economy and sustainable business practices towards sustainable development (Anggraini & Purnama, 2023).

In the context of Islamic banking, green financing has a strong alignment with the values of maqashid sharia, particularly in preserving environmental sustainability (hifz al-bi'ah) and the welfare of the people (Nurjannah et al., 2024). Bank Syariah Indonesia (BSI), as the largest sharia bank in Indonesia, has a strategic responsibility in integrating sharia principles with the national sustainability agenda (Darmayanti et al., 2026).

The green financing program implemented by Bank Syariah Indonesia is part of an environmentally friendly economy that aligns with the Islamic economy. An environmentally friendly

economy emphasizes sustainable development, equitable distribution, and economic efficiency in efforts to preserve the environment (Lelawati et al., 2023). One of the efforts of Bank Syariah Indonesia in reducing national greenhouse gas emissions is the green financing program through the provision of sustainable financing in the renewable energy sector, eco-efficient products, sustainable land management, limitations on the brown sector, as well as environmentally oriented micro, small, and medium enterprise financing.

The implementation of green financing in Indonesia is beginning to develop, one of which is through the policy of Bank Syariah Indonesia (BSI) which is fully committed to reducing carbon emissions to create a carbon-free Indonesia by 2060. In accordance with the established Sustainable Finance Action Plan (RAKB), one of the targets of priority activities is the development of products that comply with the Sustainable Business Activity Criteria (KKUB). The KKUB criteria used by BSI refer to the Technical Guidelines of POJK No. 51/POJK.03/2017 concerning the Implementation of Sustainable Finance for Financial Service Institutions, Issuers, and Public Companies, which regulate sustainable financing or environmentally oriented business of BSI.

The Ministry of Energy and Mineral Resources (ESDM) emphasizes that the period after the year 2030 will be a critical stage in achieving Indonesia's Net Zero Emission (NZE) target by 2060. This is due to the national emission trend still showing an increase, necessitating an acceleration of decarbonization efforts so that emissions can begin to decline significantly. Without a change in this trend, achieving the NZE target may face various obstacles in the future (Yudha, 2025).

Although Bank Syariah Indonesia (BSI) has implemented green financing as part of its commitment to sustainable finance, the implementation still raises critical questions regarding the alignment between the concept and practice on the ground. Conceptually, green financing not only emphasizes the provision of funding, but also requires that the financed business activities comply with environmentally friendly principles and do not cause significant negative impacts on the ecosystem.

The 2023–2025 period was chosen based on the significance of this phase in accelerating the energy transition agenda and achieving Indonesia's NZE targets. This period is characterized by the strengthening of sustainable finance implementation in the banking sector, the increased integration of ESG principles, as well as various sustainability initiatives that have begun to be applied more comprehensively by BSI. Furthermore, the post-pandemic period also serves as an important momentum to assess the extent to which the Islamic banking sector is able to direct financing toward economic activities that support low-carbon development.

This research refers to the study conducted by (Aminin & Khayati, 2025), however, it has a different focus and scope. While previous research emphasized the role of green sukuk as a sustainable financing instrument, this study examines the implementation of green financing in the Islamic banking sector,

specifically PT Bank Syariah Indonesia (BSI) for the 2023–2025 period, in supporting the achievement of the national Net Zero Emission (NZE) targets. In addition, this study broadens the observation range and conducts a more comprehensive analysis of the impact of green financing on various economic sectors targeted by financing.

The novelty of this research lies in the analysis of the relationship between the implementation of green financing by Islamic banking and the agenda for transition toward a low-carbon economy and the national NZE target. This study not only evaluates the development of BSI's sustainable financing portfolio, but also examines the integration of ESG policies, the application of the Do No Significant Harm (DNSH) principle, Digital Carbon Tracking, as well as the direction of financing allocation in sectors that contribute to carbon emission reduction. Therefore, this research is expected to provide a more comprehensive perspective on the role of Islamic banking in supporting sustainable development and the energy transition in Indonesia.

2. METHODS

This study uses a qualitative approach with a descriptive analytical method to examine and analyze the implementation of a phenomenon in depth based on data obtained in the field regarding PT Bank Syariah Indonesia Tbk's (BSI) efforts to implement green financing in support of the national Net Zero Emission (NZE) target. The subject of this study is PT Bank Syariah Indonesia Tbk as the largest Sharia bank in Indonesia that applies sustainable financial principles. The research procedure was conducted through the collection, grouping, and analysis of data related to BSI's green financing policies and implementation for the 2023–2025 period. The materials and research instruments use secondary data in the form of annual reports, sustainability reports, financial statements, sustainable financing policies, as well as various official company publications obtained from BSI's official website. To enhance the objectivity of the analysis, this study also uses comparative documents from independent sources, such as reports from the Indonesia Financial Services Authority (OJK), reports from international institutions, studies from civil society organizations, as well as scientific journals discussing the effectiveness of green financing and sustainable finance in Indonesia.

The data collection technique was conducted through documentation studies and literature studies of various literatures, regulations, scientific journals, and documents related to sustainable finance. Furthermore, the data analysis technique was carried out through qualitative descriptive methods by interpreting data on the implementation of green financing, ESG policies, the development of sustainable financing, as well as its contribution to achieving national NZE targets. The analysis was conducted through a process of data triangulation by comparing information obtained from BSI's

internal documents and various independent sources to enhance the validity and objectivity of the research findings.

3. FINDINGS AND DISCUSSION

3.1. *Green Financing from the Perspective of Islamic Banking*

The implementation of green financing in Islamic banking is not only a response to global demands regarding sustainability, but also a normative consequence of the basic principles of Sharia (Yulianto & Manurung, 2026). As an entity operating based on Islamic principles, Islamic banks are not solely oriented towards profitability, but also towards achieving the maqasid sharia as the primary objective of economic activity (Saputri & Ansori, 2024).

In the context of Islamic banking sustainability theory, Maqasid al-Shariah functions as a normative framework that asserts that the activities of Islamic financial institutions are not solely aimed at obtaining financial profit, but also to support the creation of social welfare and the well-being of the broader community. This approach is described by (Bedoui & Mansour, 2015) who identify maqasid sharia as the ethical foundation guiding the activities of Islamic banks in integrating social and institutional objectives to achieve both community welfare and institutional stability simultaneously.

Conceptually, the objectives of Shariah encompass the protection of religion (hifz al-din), life (hifz al-nafs), intellect (hifz al-aql), progeny (hifz al-nasl), and wealth (hifz al-mal). In its development, environmental protection (hifz al-bi'ah) is also regarded as part of the objectives of Shariah, emphasizing the importance of ecosystem sustainability and the preservation of nature. (Faisal et al., 2023).

From the perspective of industrial and economic policy, the principle of Hifz al-mal emphasizes the efficient management of resources without harming the environment. The circular economy concept, which focuses on recycling processes, energy savings, and waste reduction, aligns with the Sharia principle of managing wealth in a productive and sustainable manner (Budi Harianto et al., 2025).

The Islamic banking sector plays an important role in supporting sustainable finance by instilling the principles of maqasid al-shariah, which focus not only on economic aspects but also on the environment (hifz al-bi'ah). Research by (Syarvina & Batubara, 2025) shows that strengthening human resource capacity, the role of the Sharia Supervisory Board, and increasing environmental awareness through certification mechanisms are key strategies in reinforcing Sharia-compliant green banking, which in turn can help reduce the carbon footprint and strengthen financial performance sustainably.

In the context of green banking, the principle of hifz al-bi'ah is realized through financing policies that systematically take environmental risk aspects into account. Islamic banking is required to ensure that financed projects or companies do not cause significant negative impacts on the environment. This

is reflected in the implementation of environmental risk assessments, the obligation to comply with environmental standards, as well as the requirement for Environmental Impact Assessment (AMDAL) documents for financing above certain amounts (Nurjannah et al., 2024). Environmental Impact Analysis (AMDAL) is a crucial process used to assess the environmental effects of development plans, particularly activities that have the potential to cause significant impacts on the environment (Desy Marsolihah et al., 2023).

This approach demonstrates that green financing in Islamic banking not only functions as a business instrument but also serves as a preventive mechanism in mitigating environmental risks while supporting sustainable development goals. By integrating the principles of prudence and maqasid sharia, Islamic banks play a role in promoting environmentally friendly economic activities and contributing to the achievement of national Net Zero Emission targets.

3.2 Green Financing Policy at PT Bank Syariah Indonesia Tbk

Basically, green financing policies are very important for the growth of sustainable finance in developing countries, particularly Indonesia. This green financing is then allocated and pioneered by banks in the green financial sector, making it an important factor in the development of a sustainable economy within Indonesia's financial sector (Bapang, 2023).

However, at present, the formulation of green financing policies is considered a new policy in Indonesian Islamic financial institutions, so there has not been an in-depth study regarding the implementation of these policies and the extent of the urgency of their application in Islamic banking, particularly Bank Syariah Indonesia (BSI), or whether it merely serves as one of the instruments in the category of problematic financing (Bapang, 2023).

As a form of support for the sustainable finance agenda, PT Bank Syariah Indonesia Tbk also demonstrates its commitment to supporting the achievement of the national Net Zero Emission (NZE) target. This is shown through BSI's participation along with six other banks in the signing of a declaration of commitment to support Indonesia's NZE target by 2060 or earlier. The declaration was made during the launch event of Climate Risk Management and Scenario Analysis by the Indonesia Financial Services Authority (OJK) (BSI, 2024).

Regulatorily, the policy aligns with the sustainable finance roadmap of the Indonesian Financial Services Authority (OJK), which requires financial service institutions to integrate environmental and social aspects into their financing processes. In this regard, Bank Syariah Indonesia applies the prudential banking principle by incorporating environmental and social risk assessments as part of the financing analysis process.

Since 2023, BSI has formally adopted a Sustainable Finance framework by adding a negative list and an exclusion list to its financing standard procedures. This policy aims to prevent funding for activities that have significant environmental and social impacts, including illegal logging, human rights violations, wildlife trafficking, as well as businesses that do not comply with the provisions of the Environmental Impact Assessment (AMDAL) (BSI, 2024). This step reflects the application of the principles of prudence and environmental risk management as part of governance within the ESG framework.

In addition, BSI also implements portfolio restrictions on brown sectors, such as coal, oil, and gas, with certain limitations. Financing in these sectors is provided selectively and in a limited manner, accompanied by strict requirements such as possession of an AMDAL (environmental impact assessment), official business licenses, environmental certification, and waste management standards. This policy indicates that BSI does not immediately cease financing high-emission sectors, but applies a measured transition approach.

In the context of green financing, BSI designates sectors classified as Environmentally Sound Business Activities (KUBL) as priorities for green financing, while still adhering to the principle of Do No Significant Harm (DNSH). This principle ensures that projects categorized as green do not cause significant negative environmental impacts on other aspects (BSI, 2024).

The policy is in line with the provisions of POJK Number 60/POJK.04/2017, which stipulate that green financing or funding must be directed towards Environmentally Sound Business Activities (KUBL), such as renewable energy, energy efficiency, environmentally friendly transportation, sustainable natural resource management, and eco-efficient products (OJK, 2017). Nevertheless, the suitability of the KUBL classification has not yet been fully reflected in BSI's green financing portfolio composition, considering that the share of renewable energy financing is still relatively low compared to the eco-efficient sector and sustainable land management.

3.3. Implementation of Green Financing at PT Bank Syariah Indonesia Tbk

The implementation of green financing at PT Bank Syariah Indonesia Tbk (BSI) is part of a long-term sustainability strategy integrated within the Sustainable Banking framework. This approach places Environmental, Social, and Governance (ESG) principles as part of the development of the financing portfolio as well as the business decision-making process.

Islamic banks have a strategic position in supporting the achievement of the Sustainable Development Goals (SDGs) through the application of principles of fairness, balance, and social responsibility. These characteristics make Islamic banks not only focused on profitability but also prioritize social welfare and environmental sustainability, making them potential catalysts for

sustainable development that can address the challenges of economic inequality, poverty, and environmental degradation (Ketaren et al., 2026).

Table 1. Portfolio in Environmentally-Conscious Projects (2023-2025).

Description	Value (IDR)		
	2023	2024	2025
Green Financing (KUBL)	12,23 T	14,08 T	15,66 T
Sosial Financing (KUBS)	45,46 T	52,41 T	58,26 T
Total	57,70 T	66,50 T	73,92 T

Source: (BSI, 2025)

Based on data from 2023-2025, the implementation of green financing at PT Bank Syariah Indonesia Tbk (BSI) shows significant progress in supporting the application of sustainable finance in Indonesia. The total sustainable financing portfolio of BSI has continued to increase from IDR 57,70 trillion in 2023 to IDR 66,50 trillion in 2024, reaching IDR 73,92 trillion in 2025. This increase indicates that BSI consistently strengthens the integration of sustainable finance and banking principles in its business activities. Nevertheless, the ratio of sustainable financing to BSI's total financing remains relatively stable in the range of 23–24%, indicating that the growth of green financing is still in line with the growth of overall financing.

The increase in the sustainable financing portfolio consists of green financing and social financing. In 2025, green financing reached IDR 15,66 trillion, while social financing amounted to IDR 58,26 trillion. This data indicates that the implementation of BSI's sustainable financing is still more dominated by social aspects compared to environmental aspects. This condition reflects that BSI's main focus remains on empowering MSMEs, community development, distribution of ZISWAF, and social community programs, although the environmental sector has begun to show positive developments.

Looking at the composition of green financing, the most dominant sector in 2025 is eco-efficient products, amounting to IDR 6,442 trillion or approximately 41.15% of total green financing. Next is the sector of biodiversity resource management and sustainable land use, totaling IDR 5,777 trillion or around 36,90%. Meanwhile, financing for the environmentally friendly transportation sector reaches IDR 948 billion or 6,05%, and renewable energy amounts to IDR 710 billion or about 4,54%. Financing for environmentally conscious buildings and water and waste management remains below 1%.

As a form of support for the national Net Zero Emission (NZE) target, BSI has begun increasing financing in the electric vehicle sector. In 2025, financing for electric vehicles reached IDR 396 billion with a total of 1,755 customers. This figure represents a significant increase compared to 2023, which was only IDR 41 billion with 131 customers. This increase demonstrates that BSI has begun actively supporting the transition towards low-emission transportation as part of the national green economic development agenda. In addition, the issuance of Sustainability Sukuk amounting to IDR 5 trillion in

2025 is also a strategic step in strengthening sustainable funding sources based on Sharia principles.

These findings are in line with reports on the financing needs for energy transition in Indonesia, which indicate that achieving Net Zero Emission targets requires very large investments in the renewable energy sector and low-carbon infrastructure. The high investment needs indicate that the role of financial institutions, including Islamic banks, becomes crucial in supporting the national energy transition agenda (CASE, 2025).

Analytically, this composition shows that BSI's green financing is still focused on efficiency-based and land management sectors, while renewable energy financing hasn't become a dominant part yet. This indicates a gradual transition approach in supporting a low-carbon economy, in line with the just transition principle that considers the stability of the national economic sector.

The low portion of renewable energy financing, which only reaches 4,54% of BSI's total green financing, indicates that this sector has not yet become a primary focus in the Company's green financing portfolio. This finding aligns with the study conducted by the Institute for Essential Services Reform (IESR), which shows that renewable energy financing by domestic banks is still relatively limited, contributing only around 0,9%–5,5% of the total sustainable financing portfolio of several major banks in Indonesia. IESR also highlights that the low allocation of financing is influenced by the still low bankability level of renewable energy projects, as well as the need for stronger guidelines and instruments to encourage credit distribution in the clean energy sector (IESR, 2022).

Thus, the low proportion of renewable energy financing at BSI not only reflects the company's internal strategy but also illustrates the structural challenges still faced by the green financing sector in Indonesia. This situation is closely related to the characteristics of new renewable energy (NRE) projects, which are generally long-term, require substantial initial investments (capital intensive), and carry a relatively high level of risk. Furthermore, there is a mismatch between banking funding sources, which are generally short-term, and the financing needs of renewable energy projects that require long tenors. As a result, although the renewable energy sector plays a strategic role in achieving Net Zero Emission targets, its contribution to BSI's green financing portfolio remains relatively limited.

The implementation of BSI's green financing is reflected not only in the increase of its green portfolio but also through the strengthening of sustainability-based financing policies. This is realized through the addition of a negative list, the application of portfolio restrictions on high carbon-intensive sectors, and the use of an exclusion list to limit financing for activities that are not aligned with sustainability principles. These policies serve as a preventive mechanism in mitigating environmental risks and transition risks from the early stages of the financing process.

In addition, BSI has updated the Industry Acceptance Criteria (IAC) by incorporating environmental aspects as a parameter for financing feasibility assessment and implementing the Do No

Significant Harm (DNSH) principle to ensure that the financing provided does not cause significant negative impacts on other sustainability goals. This policy demonstrates that BSI has integrated ESG aspects and environmental risk assessments into the financing decision-making process as part of support for the Net Zero Emission (NZE) target.

Tabel 2. Financing by Sector (2023-2025)

Sector	Value (M)		
	2023	2024	2025
Agriculture, Hunting, and Forestry	17.124	23.550	22.819
Fishery	765	720	606
Mining and Excavation	2.393	2.765	3.034
Manufacturing Industry	11.806	12.765	12.943
Electricity, Gas, and Water	4.768	6.756	6.842
Construction	19.833	18.843	17.220
Wholesale and Retail Trade	17.484	19.747	30.649
Provision of Accommodation, Food, and Beverages	2.758	3.204	3.683
Transportation, Storage, and Communication	8.346	8.647	12.280
Financial Intermediaries	5.870	5.807	6.265
Real Estate, Leasing, and Business Services	3.868	5.299	6.270
Government Administration, Defense, and Mandatory Social Insurance	-	-	254
Education Services	4.499	4.929	5.238
Healthcare and Social Services	6.818	9.402	11.049
Community, Socio-Cultural, Entertainment, and Other Individual Services	3.315	3.732	3.681
Personal Services of Households	160	168	148
Activities with Unclear Boundaries	4.499	-	-
Household	130.481	151.918	175.849
Other Non-Business Sectors	30	19	13
Total	240.316	278.481	318.844

Source: (BSI, 2025)

Based on financing data by sector for the years 2023–2025, the total financing of PT Bank Syariah Indonesia Tbk (BSI) increased from IDR 240.316 billion in 2023 to IDR 278.481 billion in 2024 and IDR 318.844 billion in 2025. The financing structure is still dominated by the household sector, with a share of more than 54% each year, amounting to IDR 130.481 billion in 2023 and increasing to IDR 175.849 billion in 2025. The dominance of the household sector indicates that BSI's financing orientation is still focused on retail and consumer financing. In the context of implementing green financing, this sector has the potential to support the Net Zero Emission (NZE) target if directed towards financing electric vehicles, environmentally friendly homes (green building), and energy efficiency-based products.

However, various independent reports indicate that the funding needs to achieve Indonesia's Net Zero Emission targets are still far greater than the available financing capacity at present. Therefore, although BSI's sustainable financing trends show positive developments, its contribution to national

decarbonization investment needs still requires more substantial enhancement. This condition is reflected in the development of the national renewable energy mix, which to date remains below the targets set by the government.

Based on data from the Central Bureau of Statistics (BPS), the share of renewable energy in the national energy mix increased from 4.9% in 2015 to 12.16% in 2021. The government targets the renewable energy mix to reach 23% by 2025 (Annur, 2022). However, the achievement of the new and renewable energy (NRE) mix in 2023 only reached 13.1%, still below the annual target of 17.9% (Laia, 2024). This finding indicates that accelerating investment and financing in the renewable energy sector remains an important necessity in supporting the achievement of national NZE targets.

Although the household sector dominates BSI financing with a value of IDR 175.849 trillion in 2025, the penetration of green financing in this segment is still relatively low. This is evident from electric vehicle financing, which only reached IDR 396 billion, or around 0.23% of the total household sector financing. In fact, various studies indicate that electric vehicles are one of the important instruments in supporting the green economy, as they contribute to carbon emission reduction, the development of environmentally friendly transportation, and the acceleration of the transition towards sustainable development (Nasrullah et al., 2024; Zola et al., 2023). Thus, the low share of electric vehicle financing indicates that the potential of the household sector as a driver of the transition towards a low-carbon economy has not yet been optimally utilized.

The formula used is:

$$\text{Electric Vehicle Financing Ratio} = \frac{\text{Electric Vehicle Financing}}{\text{Total Household Financing}} \times 100\%$$

$$\text{Electric Vehicle Financing Ratio} = \frac{396}{175.849} \times 100\% = 0,225\% \approx 0,23\%$$

In addition to the household sector, the trade, agriculture, hunting, and forestry sectors also show a considerable contribution to financing. Financing for the trade sector increased from IDR 17.484 billion in 2023 to IDR 30.649 billion in 2025, while the agriculture sector reached IDR 22.819 billion in 2025. The increase in these two sectors indicates opportunities for the development of green financing through financing of green MSMEs, sustainable supply chains, environmentally friendly agriculture, as well as sustainable natural resource management. The agriculture sector, in particular, has a close connection with the carbon emission reduction agenda, as it is directly related to land management and environmental conservation.

Meanwhile, the transportation, warehousing, and communication sectors, as well as the electricity,

gas, and water sectors, also experienced an increase in financing during the 2023–2025 period. Financing for the transportation sector increased from IDR 8.346 billion to IDR 12.280 billion, while the electricity, gas, and water sector rose from IDR 4.768 billion to IDR 6.842 billion. This condition indicates the potential support of BSI for the energy transition and the development of low-emission transportation. Overall, the sectoral financing structure of BSI still shows that the implementation of green financing has not fully focused on low-carbon sectors, thus requiring the strengthening of green financing strategies so that its contribution to achieving the national NZE target can be more optimal.

In addition to the financing aspect, the implementation of green financing is also reinforced through environmentally friendly operational management. Throughout 2025, BSI will develop a Digital Carbon Tracking system used to monitor Scope 1 and Scope 2 greenhouse gas (GHG) emissions in an integrated and sustainable manner.

BSI proactively conducts measurement and monitoring of operational emissions as a basis. As part of the commitment to the Sustainable Operation pillar in the Sustainability Framework, BSI implements the Net Zero Emission in Operation program as support for Indonesia's NZE target by 2060 or earlier. To support this commitment, BSI has developed and implemented Digital Carbon Tracking, a system used to calculate and monitor operational carbon emissions in an integrated manner across the company's network in tCO₂e units. The implementation of this system demonstrates BSI's efforts in managing risks and opportunities related to climate change through continuous measurement and monitoring of operational emissions (BSI, 2025).

Currently, BSI's Digital Carbon Tracking is used to calculate greenhouse gas (GHG) emissions in Scope 1 and Scope 2. Scope 1 emissions are direct emissions originating from sources owned or controlled by the company, which in the context of BSI come from fuel usage in all operational activities. Meanwhile, Scope 2 emissions are indirect emissions resulting from the consumption of electricity used across BSI's entire operational network.

Based on the 2025 calculations, BSI's total operational emissions were recorded at 89.730,95 tCO₂e, coming from operational activities at the company's 1.190 outlets. Compared to 2024, these operational emissions increased by 7,5%. This increase was influenced by the start of operations at BSI Tower as well as business expansion through the addition of outlets and ATMs. Nevertheless, emission intensity per revenue improved, from 2,70 tCO₂e/billion in 2024 to 2,55 tCO₂e/billion in 2025. This shows that BSI's growth and business expansion are still accompanied by improved resource use efficiency and operational emissions management (BSI, 2025).

Since its establishment from 2021 to 2025, BSI has continuously strengthened the implementation of sustainability through various environmentally friendly initiatives. Cumulatively, the Company has operated 2 green buildings, 144 electric vehicles, 13 electric vehicle charging stations at the headquarters

and branch networks, 11 solar panel installations spread across outlets and fostered villages, 70 recycling bottle collection machines at 133 collection points in the Jabodetabek and Bali regions, as well as planting and distributing 65,000 trees. These various initiatives reflect BSI's commitment to supporting energy efficiency, reducing carbon emissions, and achieving the company's sustainability targets (BSI, 2025).

Conceptually, this step demonstrates the consistency between green financing (external impact) and internal operational decarbonization (internal alignment). This implementation is important because it shows that sustainability commitments are not only imposed on financing clients, but are also applied within the bank's own operational activities.

Nevertheless, there is room for strengthening in the renewable energy sector, which still has a relatively small proportion compared to the eco-efficient sector and sustainable land use. To support the national Net Zero Emission target more progressively, increased financing in the renewable energy sector and low-carbon technology needs to be continuously promoted.

The growth of the sustainable financing portfolio at PT Bank Syariah Indonesia Tbk (BSI) during the 2023–2025 period shows a consistent upward trend. In 2023, sustainable financing was recorded at IDR 57,7 trillion, then increased to IDR 66,5 trillion in 2024, representing a 15,2% year-on-year (YoY) growth, and continued to rise in 2025 to IDR 73,9 trillion, an increase of 11,2% YoY).

However, if analyzed further, it appears that the growth rate is slowing, from 15.2% in 2024 to 11.2% in 2025. This may indicate that BSI is beginning to enter a consolidation phase, where the focus is not only on financing expansion but also on strengthening portfolio quality and risk management. This condition is reinforced by the implementation of Climate Risk Management & Scenario Analysis (CRMS) across the entire financing portfolio, which demonstrates an increased attention to climate risks, both physical and transition risks.

On the other hand, the slowdown in sustainable financing growth from 15,2% in 2024 to 11,2% in 2025 indicates challenges in scaling up green financing more rapidly. This condition has the potential to create a gap between the growth rate of sustainable financing and the increasing national decarbonization investment needs as the 2030 target approaches. Therefore, although the implementation of Climate Risk Management and Scenario Analysis (CRMS) is important to maintain portfolio quality, BSI still needs to accelerate the expansion of green financing so that its contribution to the energy transition agenda and Net Zero Emission targets can be more significant.

From a compositional perspective, social financing still dominates compared to green financing. This condition indicates that BSI's role in supporting financial inclusion and community economic empowerment remains a top priority. Nevertheless, the increasing value of green financing from year to year reflects a gradual effort to support the transition towards a low-carbon economy.

Overall, the implementation of green financing at PT Bank Syariah Indonesia Tbk (BSI) demonstrates a structural and systemic commitment to supporting the sustainable finance agenda as well as national decarbonization targets. This is reflected in the growth of the sustainable financing portfolio, which has not only increased quantitatively but also accompanied by strengthened governance and the integration of sustainability aspects into banking business processes.

3.4. BSI's Green Financing Contribution to the National Net Zero Emission Target

Net Zero Emission (NZE) is the condition in which the amount of greenhouse gas emissions released into the atmosphere is balanced with the amount of emissions absorbed back through natural mechanisms or carbon capture technologies. This concept has become one of the main agendas for global climate change mitigation since the adoption of the Paris Agreement at COP21 in 2015, which aims to limit the global temperature increase to 1,5–2°C compared to the pre-industrial era. For Indonesia, achieving NZE requires an economic and energy transformation supported by significant funding needs as well as the strengthening of technological and institutional capacities (IRID, 2022).

In the 2025-2029 RPJMN, Indonesia aims to reduce greenhouse gas emissions by 29% by 2030 through various policy interventions covering the energy, forestry, and agricultural sectors (Romadhoni et al., 2025). In addition, Indonesia is also committed to increasing the mix of renewable energy in total national energy consumption, which aims to reduce dependence on fossil energy and lower CO₂ emissions generated from the energy sector (Sudarwanto & Daryanti, 2025).

Banking serves as an intermediary institution that determines the direction of capital flow. Therefore, increasing green financing and restricting financing in carbon-intensive sectors are important factors in supporting national decarbonization. According to the data, (BSI, 2025) BSI's green financing portfolio of IDR 15,66 trillion demonstrates a concrete commitment to supporting sectors that contribute to emission reduction and energy efficiency improvement. This contribution is realized through financing electric vehicles as part of transportation sector decarbonization, eco-efficient financing that promotes energy efficiency and industrial waste reduction, sustainable management of biological resources to mitigate deforestation, as well as renewable energy financing.

Although nominally the amount is quite significant, the share of renewable energy financing, which is still around 4,54%, indicates that the contribution to sectors with a direct impact on reducing carbon emissions is still relatively limited and requires enhancement to be more aligned with the needs of achieving national Net Zero Emission (NZE) targets. (BSI, 2025). BSI's contribution to NZE is also reflected through the strengthening of sustainability risk management, such as portfolio restrictions, exclusion lists, Environmental Impact Assessments (AMDAL), and the DNSH principle. These policies demonstrate BSI's efforts to balance banking prudence principles with the agenda of transitioning to a

low-carbon economy.

3.5. NZE Challenges in the Implementation of Green Financing in Supporting NZE

In achieving the NZE target, Indonesia still faces various challenges, including the post-pandemic impacts, dependence on fossil energy, and a development orientation that is still focused on economic growth. These conditions have the potential to hinder the acceleration of the transition towards a low-carbon economy (Chandrarini et al., 2022).

Normatively, Indonesia has established a fairly comprehensive regulatory framework to promote sustainable finance. The Indonesian Financial Services Authority (OJK) has issued the Sustainable Finance Roadmap Phase I (2015–2019) and Phase II (2021–2025), OJK Regulation Number 51 of 2017 regarding the Implementation of Sustainable Finance, as well as the Indonesian Green Taxonomy (IGT) which classifies hundreds of economic subsectors based on their contribution to climate change mitigation (Humaira, 2022).

At the institutional level, BSI still faces challenges in integrating environmental, social, and corporate governance aspects comprehensively into its business activities and operations. The limited capacity of human resources (HR) in understanding regulations as well as sustainable financial instruments is one of the main obstacles (BSI, 2024). This is in line with the statement of the OJK, which emphasizes that limitations in technical capacity and ESG understanding still pose challenges in the national financial services sector.

Another significant challenge is the limitation of environmentally sound Business Activity (KUBL) projects that are feasible to finance, particularly in the non-SME segment. Green projects are generally long-term, capital-intensive, and carry relatively high technological and regulatory risks. The mismatch between the financing term and the characteristics of the project becomes a distinct obstacle within the banking financing structure (BSI, 2023).

In addition, the difficulty of obtaining insurance companies willing to underwrite the KUBL project increases the bank's exposure risk. In the context of Islamic banking, which upholds the principles of prudential banking and risk balance, this condition makes aggressive expansion of green financing unfeasible. Therefore, although green financing aligns with the maqashid sharia principles in maintaining environmental sustainability, its implementation still requires adequate product innovation and risk mitigation (BSI, 2023).

From the demand side, according to data (OJK, 2022) the level of Islamic financial literacy, which is still low at around 9.14%, poses a serious challenge in the development of instruments such as green sukuk and green financing. Surveys indicate that although the majority of the public considers green finance principles important, 42,3% of respondents still do not know whether the banks they use have

implemented these principles (Aminin & Khayati, 2025).

Most people still consider price and financial gain as the main factors in choosing financial products. This condition indicates a gap between environmental awareness and economic behavior in practice, so green financing in Indonesia still tends to be supply-driven and is not yet fully supported by strong market demand. The low level of socialization and education concerning green sukuk as well as sustainable sharia investment instruments also limits the participation of domestic retail investors, even though mobilizing public funds could serve as an important financing source to support renewable energy projects and the transition toward a low-carbon economy (Aminin & Khayati, 2025)

On a macro level, the greatest challenge lies in the substantial investment required to achieve the national NZE targets. The energy transition financing gap until 2030 is estimated to reach hundreds of billions of US dollars, while the contribution of green financing, including green sukuk, to the reduction of emissions in the energy sector remains relatively small. On the other hand, the allocation of climate change action spending in the state budget is still limited compared to the total financing needs (Aminin & Khayati, 2025).

Thus, optimizing the role of BSI's green financing in supporting the national Net Zero Emission targets requires strengthening ESG integration, enhancing human resource capacity, developing globally interoperable reporting standards, expanding public literacy, as well as policy support that provides incentives for green project financing. Without strengthening all these dimensions, the contribution of green financing to achieving NZE is potentially unable to reach the expected level of effectiveness.

4. CONCLUSION

The implementation of green financing at PT Bank Syariah Indonesia Tbk (BSI) has evolved from merely a normative commitment into a part of strategic integration within corporate policies and governance. The application of green financing is not only a response to the global sustainability agenda and the Net Zero Emission (NZE) targets, but also aligns with the principles of maqashid sharia, particularly the issue of environmental preservation (*hifz al-bi'ah*). This is evident from the integration of Environmental, Social, and Governance (ESG) principles through the implementation of a negative list, exclusion list, portfolio restrictions on brown industry sectors, updates to the Industry Acceptance Criteria (IAC), as well as the application of the Do No Significant Harm (DNSH) principle. These policies indicate that BSI is beginning to direct its financing system toward more sustainable Islamic banking practices in line with national sustainable finance regulations.

From the implementation side, BSI's sustainable financing portfolio increased from IDR 57.7 trillion in 2023 to IDR 73.92 trillion in 2025, demonstrating the company's commitment to supporting

sustainable finance. The sectoral financing structure, dominated by the household, trade, agriculture, and transportation sectors, indicates that BSI is beginning to expand financing into sectors related to the national green transition agenda. The increase in financing for electric vehicles, environmentally friendly transportation, as well as the electricity, gas, and water sectors demonstrates BSI's contribution to supporting low-carbon development. The composition of green financing, which is still dominated by the eco-efficient sector and sustainable land management, as well as the still low portion of renewable energy financing, indicates that the contribution to sectors that have a direct impact on carbon emission reduction still needs to be increased. In addition to increasing green financing, BSI's contribution to the NZE target is also reflected through the transformation of the company's internal operations, such as the implementation of Digital Carbon Tracking, the use of electric vehicles, the development of green buildings, and various energy efficiency programs.

Although it has shown significant progress, BSI's implementation of green financing still faces several limitations, particularly the low share of renewable energy financing, which has only reached 4.54% of total green financing, the limited number of bankable green projects, as well as high risks and investment needs in the energy transition sector. Therefore, BSI needs to develop more competitive financing schemes for renewable energy projects, such as offering lower financing margins or long-term financing schemes to enhance the attractiveness of this sector.

In addition, the penetration of green financing in the household sector needs to be expanded through the development of financing products for electric vehicles, environmentally friendly homes, and energy-saving technologies, considering that financing for electric vehicles in 2025 is still around 0,23% of total financing in the household sector.

From the regulator's perspective, the Financial Services Authority (OJK) and Bank Indonesia can consider providing incentives for banks that allocate financing to Environmentally Responsible Business Activities (KUBL), such as adjustments to the risk weight of green financing or certain liquidity incentives, in order to increase banking interest in financing sustainable projects, which have so far been considered relatively high-risk.

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