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Research Article

Toward Net Zero: Islamic Financial Innovation in The Carbon Economy

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Abstract. Green finance has gained significant momentum in recent years, but its alignment with Islamic finance principles remains under-explored, particularly in the context of carbon pricing and carbon trading mechanisms. This is illustrated by the fact that climate change has prompted the global community to adopt various strategies, including the development of carbon market mechanisms. Exploring the potential of the carbon market as an effective tool in reducing greenhouse gas emissions, while considering the principles of Islamic finance. This study aims to develop Sharia-based sustainable financial instruments as a strategy to address the impacts of climate change through the utilization of the carbon market. This research method uses a qualitative approach that combines bibliometric analysis, policy document reviews, and expert interviews. This study identifies critical gaps in the integration of Islamic finance with carbon market mechanisms and the design of sustainable financial instruments that comply with Sharia principles.

This study uses a qualitative approach with a descriptive-exploratory method. A qualitative approach is used to understand in depth the concepts, phenomena, and characteristics of Islamic financial instruments and how they can be implemented in the carbon market. The findings show that Islamic finance has great untapped potential to mobilize ethical capital and share risks for climate-friendly projects, especially in Muslim-majority countries and emerging economies. Nevertheless, regulatory standardisation, sharia governance frameworks, and investor education remain key challenges that must be addressed to enhance the scalability and credibility of such instruments. By bridging the gap between Islamic finance and carbon economy strategies, this study contributes to the growing discourse on green Islamic finance and offers practical policy recommendations to strengthen the role of Islamic financial institutions in achieving both national and global net-zero targets.

Keywoards: Islamic Finance, Green Sukuk, Carbon Market, Sharia Compliance, Sustainable Finance

INTRODUCTION

Climate change is a growing global challenge and has a serious impact on the sustainability of the earth's ecosystems (Dariah et al., 2023; Marinić, 2023). This phenomenon forces all elements of society, including the financial sector, to play an active role in reducing the carbon footprint towards the *net zero* target(Chen et al., 2022). One of the main causes of climate change is the increase in *greenhouse gas emissions*, which are largely produced by human activities, particularly in the industrial and energy sectors (Surakusumah, 2013). To demonstrate its seriousness in achieving net zero emissions, the Government of the Republic of Indonesia has committed to implementing Low Carbon Development as stipulated in Presidential Regulation No. 18 of 2020 concerning the 2020-2024 Medium-Term Development Plan.(Pratama et al., 2022)

To overcome these impacts, the global community has adopted various strategies, one of which is through the development of a *carbon market mechanism*(Pollitt, 2019). The carbon market serves as a trading platform for carbon emissions permits or credits that encourage industry players to reduce emissions while providing financial incentives for actors who are able to achieve carbon reduction targets (Bank, 2023). The Carbon Exchange is a platform provided to facilitate the trading of carbon certificates. Referring to the NEK Presidential Regulation, carbon trading can actually be carried out directly or through the Carbon Exchange. Then, to facilitate the carbon trading process, the Financial Services Authority (OJK) granted permission to PT Bursa Efek Indonesia (BEI) to become the

organizer of the Carbon Exchange in Indonesia. The Indonesia Carbon Exchange was launched as part of the IDX under the name IDX Carbon. Since its launch in 2023, the number of mitigation projects listed on the carbon exchange has continued to increase. This increase has also been accompanied by a growing public awareness of the importance of concrete actions to preserve the environment.(Muryanto et al., 2025)

In this context, Islamic finance exists not only as an economic instrument, but also as an ethical and sustainable means based on the principles of justice, social responsibility, and environmental preservation (*caliphate*)(Harahap et al., 2023). These values provide a strong foundation for climate-friendly financial innovation ((A'ini et al., 2024). Islamic finance has the strategic potential to support the transition to a green economy by ensuring that financing is oriented towards the benefit of the people (*maslahah*) and ecosystem sustainability. (Raimi & Bamiro, 2025)

Although there are instruments such as green *sukuk*, the involvement of the Islamic finance sector in the carbon market mechanism is still minimal (Zulfiqar et al., 2024). Challenges include the lack of standardized regulations, weak investor literacy towards sharia-based green instruments, and the lack of a carbon financing model that is fully aligned with Islamic principles (Laldin, 2021). Therefore, there is a need for innovation in Islamic financial instruments that are able to bridge the need for climate action funding with carbon market mechanisms.

The main objective of this research is to design a conceptual framework for sharia-compliant financial instruments that can effectively support carbon mitigation projects through carbon markets while adhering to sharia finance principles.

Sustainable finance theory explains that financial instruments must take into account environmental, social, and governance *(ESG) aspects to achieve long-term development* (Saidane & Ben Abdallah, 2021). In this context, carbon markets are part of sustainable financial innovation that supports measurable emission reductions.

The banking sector, which is quite large in the Islamic financial market, greatly influences the community's economy. By encouraging inclusive, high-value, and productive economic activities, Islamic banking has the capacity to help the economy. (Handoko et al., 2025) Islamic finance is based on the prohibition of *riba, gharar*, and *maysir*, and encourages real asset-based transactions and *risk-sharing*(Mirakhor & Iqbal, 2013). The concept *of maqashid al-shariah* is the main framework that ensures that economic activities bring benefits (*maslahah*) and prevent damage (*mafsadah*), including in environmental conservation (Dusuki & Bouheraoua, 2011). In Maqasid Syariah, achieving the primary objectives of Islamic law must fulfill five basic elements, namely: preserving religion, preserving life, preserving reason, preserving lineage, and preserving property.(Fadli & Pradipa, 2025)

Carbon markets work through the trading of emission permits or carbon credits resulting from emission reduction or sequestration projects. Carbon credits can be sold to parties in need to meet emission reduction obligations (World Bank, 2023). The integration of carbon markets with Islamic finance requires innovation of sharia contracts such as *wakalah*, *ijarah*, and *mudharabah* so that the funding mechanism remains in accordance with sharia principles. (Laldin, 2021)

By combining sustainable finance theory, Islamic finance principles, and carbon market mechanisms, this research is expected to provide an adequate conceptual framework to design Islamic financial instruments relevant to climate change challenges.

RESEARCH METHODS

This study uses a qualitative approach with a descriptive-exploratory method. A qualitative approach is used to understand in depth the concepts, phenomena, and characteristics of Islamic financial instruments and how they can be implemented in the carbon market. The descriptive-exploratory method is used to explore the novelty of the concept of developing sustainable Islamic financial instrument models and their relationship with the carbon market in the context of climate change.

This research is applicative-conceptual, namely developing a model of Islamic financial instruments based on literature review, policy analysis, and relevant case studies. The research focus is directed at designing conceptual models that can be adapted in practical contexts.

The data sources used are secondary data and data collection techniques, which are obtained from reputable scientific journals, conference proceedings, books, and reports of international institutions such as the World Bank, Islamic Development Bank, and UNFCCC as well as national and international policy documents related to sustainable finance, carbon markets, and Islamic finance. Meanwhile, primary data with data collection techniques through in-depth interviews with Islamic finance experts, regulators, and carbon market practitioners as well as focus group discussions (FGD) to obtain multi-stakeholder perspectives on the design of Islamic financial instruments in the carbon market.

The research stage examines sustainable finance theory, Islamic finance principles, carbon market mechanisms, and previous studies related to green *sukuk*, *waqf*, and *sharia* contracts for sustainable financing.

Identification of Needs and Challenges conducts an analysis of regulatory gaps, implementation barriers, and market needs through the study of policy documents and interviews with stakeholders.

Furthermore, in the development of the Islamic financial instrument model, designing a conceptual framework for Islamic financial instruments for the carbon market, including contract structures, financing mechanisms, and Islamic governance. Model Validation conducts expert judgement with academics, practitioners, and regulators to test the model's suitability for sharia principles, market feasibility, and regulatory support.

Analysis and preparation of recommendations, integrating field findings and model validation results to formulate policy recommendations, implementation strategies, and opportunities for the development of Islamic financial instruments in the carbon market. The analysis was carried out qualitatively using thematic analysis to identify patterns, concepts, and relationships between variables. Primary data from interviews and FGDs were transcribed, encoded, and grouped according to themes. Secondary data were analyzed using bibliometric analysis to map research trends and identify research gaps.

RESULTS AND DISCUSSION

This research aims to develop a conceptual framework for sharia-based sustainable financial instruments to support climate change mitigation through carbon market mechanisms. The qualitative approach with descriptive-exploratory methods produces an in-depth overview of the opportunities, challenges, and models for the development of Islamic financial instruments in the carbon trading ecosystem.

The primary data collection process was carried out through in-depth interviews with five resource persons consisting of muamalah fiqh experts, carbon market practitioners, Islamic banking practitioners, and regulators. The interviews were conducted in a semi-structured manner with guidance based on *maqashid al-shariah theory*, green finance frameworks, and global carbon market practices.

1. Perspective of Muamalah Fiqh Scholars

Contracts such as *wakalah bil istitsmar*, *ju'alah*, and *musharakah* can be used as the basis for the development of carbon financing, as long as there is clarity on the benefits and object of the transaction to avoid *the element of gharar*. Carbon can be seen as *a māl mutaqawwin* (asset of economic value) that can be an *underlying asset*, but it needs *collective ijtihad* from DSN-MUI for its legal determination.

2. Perspectives of Carbon Market Players

IDXCarbon as a national carbon exchange, supported by the Ministry of Environment and Forestry through SRN-PPI, implements strict verification based on international standards such as VERRA and Gold Standard. Collaboration between carbon project developers and Islamic banking has the potential to develop value-based and participatory financing.

3. Perspective of Sharia Banking Practitioners

Awareness of the sustainability agenda is increasing, but the integration of carbon financing is still minimal. Challenges include low internal literacy, the absence of specific regulations, and the absence of a carbon fatwa. Sharia financing products in Indonesia should be based on law as a foundation for the fair conduct of economic transactions. Given the many risks in an economic transaction, every investor must pay attention to the role of regulation and legal basis, which are crucial, including in sharia financing that exists in society. It must have a legal umbrella as an effort to create legal certainty to achieve justice and sharia economic stability(Yaniza et al., 2023). The potential for innovations such as *the carbon waqf fund* is welcomed if there is a clear contract structure and adequate risk mitigation.

4. Regulator Perspective

OJK through *the Sustainable Finance Roadmap Phase II* has opened up opportunities to integrate sharia and ESG principles. The *regulatory sandbox* approach is recommended for product trials such as green sukuk and productive waqf models. Synergy between institutions: DSN-MUI, BWI, KLHK, and BPDLH, is seen as crucial to harmonize law, markets, and sharia values.

Based on triangulation of interview data and primary literature (Ghaemi Asl et al., 2023; Hassan & Choudhury, 2019; Zhang, 2024) obtained four main themes:

Table 1.Key findings

Theme	Sources	Key Findings
Shariah Contract	Member of *Muamalah*	*Wakalah*, *Musharakah*, *Ju'alah* are adaptive to carbon projects if the benefits are clear.
Product Structure	Bank Practitioner	*Green sukuk* and carbon waqf require feasibility studies and collaborative trials.
Project Validity	Carbon Practitioner	Carbon certification must be accountable and marketable to be used as an *underlying asset*.
Regulation	Regulator	A national carbon fatwa standard and a *sandbox* of ESG-based sharia products are needed.

The interview results show that conceptually, sharia instruments are highly feasible for environmental project financing and carbon trading, but there are still obstacles in terms of fiqh, regulation, and literacy. This research is supported by a number of primary literatur from reputable international journals that examine the role of green finance, sharia instruments, and the effectiveness of the carbon market in the transition to a low-carbon economy. The following are some of the main findings that directly support the analysis of the interview results from the informants, such as the research results from (Elsevier-Non-Solus, n.d.) This study examines the dynamic relationship between sukuk and green bond indices and clean energy and clean technology indices using the quantile cross-spectral method. Sukuk with AA and A ratings show a significant positive correlation with the clean energy index. Sukuk serve as a financing instrument for environmentally friendly projects. Then, research results from This study uses the Dynamic OLS and FMOLS methods to evaluate the contribution of green finance and PPPs in reducing carbon emissions in China. This provides strong support for the proposed collaboration between sharia institutions and carbon projects, as conveyed by carbon market practitioners and OJK regulators.

Green sukuk has several opportunities to grow in Indonesia, such as (1) increasing demand for energy supply, (2) demand for increased energy financing, (3) investor awareness of socially responsible investment (SRI), (4) Indonesia's large Muslim population, (5) Indonesia's promising economic growth, (6) Support for infrastructure development(Karina, 2019). Additionally, these findings promote the idea of a collaborative carbon waqf model based on community and state. Furthermore, research findings from examine sukuk tokenization using Ethereum-based smart contracts. Supporting the idea that technological innovations such as blockchain can strengthen the credibility and efficiency of carbon project management in the context of sharia, in line with statements from practitioners and regulators who mention the need for a digital innovation sandbox, the Analyzing the impact of the carbon market in China using the Difference-in-Differences (DID) method. Providing a scientific basis that the integration of the carbon market with sharia financing has the potential to drive a real impact on the environment.

This is in line with the respondents' belief in the need for sharia to be a channel of contribution to a fair carbon ecosystem, and the results of the research. Criticizing dependence on carbon pricing and encouraging the role of the banking system and

green macroprudential policy. Promoting the idea from regulators and academics that the financial system (including sharia) needs a systemic and collaborative cross-policy approach to effectively support carbon projects. In economic improvement: Carbon trading can make a positive contribution to Indonesia's economy. Through carbon credit trading, Indonesia can generate revenue from selling its carbon credits to other countries or companies. In addition, carbon trading can also encourage investment in sectors that have the potential to reduce carbon emissions, such as renewable energy, waste management, and others. Thus, carbon trading can open up new opportunities for sustainable economic development. (Cadizza & Rizanizarli, 2024)

These findings are consistent with a number of previous studies

1. (Ghaemi Asl et al., 2023) showed that AA and A-rated *sukuk* have a significant positive correlation with the clean energy index, supporting the potential of *sukuk* as an instrument for financing environmentally friendly projects.
2. (Zhang, 2024) affirms the contribution of green finance and *public-private partnership* (PPP) schemes in reducing carbon emissions, relevant to the collaboration of Islamic institutions and carbon projects proposed by carbon market practitioners and regulators.
3. (Khan et al., 2022) prove that the tokenization of *sukuk* through *smart contracts* can increase the credibility and efficiency of carbon projects, in line with the recommendations for *implementing a digital* sandbox.
4. (Zhou et al., 2022) found that the carbon market in China is able to have a significant environmental impact, becoming a scientific justification for the integration of the carbon market with Islamic finance.
5. (Campiglio, 2016)criticizes reliance on carbon pricing alone and emphasizes the role of green macroprudential policies, in line with regulators' push for a systemic and collaborative approach across institutions.
6. (Agustinus Prajaka Wahyu Baskara, 2023)Referring to the development of the existing legal framework to date, refinement is still needed in several aspects, such as: Regulatory aspects: Institutional and professional aspects: Coordination and synergy aspects: to optimize the benefits of the carbon exchange.

The results of the study confirm that the development of Islamic financial instruments for carbon markets:

1. Conceptually possible, with the support of the principles of *maqashid al-shariah* and relevant contracts.
2. It requires structural innovations, such as *carbon waqf funds*, *green sukuk*, and *musharakah-based* models for carbon projects.
3. Constrained by regulatory and fatwa aspects, it is necessary to harmonize policies between institutions.
4. It requires the support of technology, including blockchain, to ensure transparency, accountability, and market trust.

Thus, the conceptual framework developed can be an initial reference for regulators, practitioners, and academics to pilot Islamic financial instruments in the carbon market through *sandbox* mechanisms and pilot *projects*.

CONCLUSION

This research shows that the development of sustainable Islamic financial instruments for the carbon market is a strategic step in supporting climate change mitigation, as well as integrating the principles of *sharia maqashid* in economic activities. Through a descriptive-exploratory qualitative approach, it was found that the opportunity for the implementation of Islamic financial instruments in the carbon market is very open, both through *green sukuk* schemes, environment-based productive *waqf*, and *profit-sharing-based financing* for environmentally friendly projects. The main challenges identified include specific regulatory limitations, lack of carbon market literacy in the Islamic finance sector, and the need for cross-sector collaboration.

This research is fundamentally based on Islamic values derived from the principles of maqāṣid alsharīʿah, particularly in the dimensions of protection of life (ḥifẓ al-nafs), property (ḥifẓ al-māl), and the environment (ḥifẓ al-bi'ah). The internalization of Islamic values in the context of this research is not only normative, but is also translated practically in the development of Islamic financial instruments that support sustainability and climate change mitigation.

The results of the model validation show that the design of instruments that combine sharia mechanisms with carbon markets can increase the participation of Islamic financial institutions, strengthen the attractiveness of green investments, and support the transition to a low-carbon economy in Indonesia.

Based on the findings of the study, there are several strategic recommendations for stakeholders. For regulators, it is necessary to prepare special regulations that regulate the integration of Islamic financial instruments in the carbon market mechanism, as well as encourage synergy between the Financial Services Authority (OJK), the Ministry of Environment and Forestry, and the National Sharia Council-MUI in the preparation of fatwas and technical guidelines. For Islamic Financial Institutions (LKS), it is important to develop innovative products such as *carbon sukuk, mudharabah financing* for renewable energy projects, and environmental *waqf*, accompanied by increasing internal literacy regarding carbon trading mechanisms and green financing potential. For academics and researchers, further research is needed to assess the financial feasibility and socio-economic impact of Islamic financial instruments in the carbon market, as well as to develop an evaluation framework based on *sharia maqashid* to assess the sustainability of the instruments implemented. For local governments and business actors, it is necessary to encourage collaboration in green projects that meet sharia principles while generating tradable carbon credits, as well as providing fiscal incentives for business actors who utilize sharia financing for environmentally friendly projects.

Approaches such as carbon productive waqf, sharia green sukuk, and CSR based on the value of tauhid are a tangible representation of the internalization of Islamic values in modern economic products. This study consciously proposes not only a contract structure, but also places the values of amanah, ihsān, and intergenerational responsibility as the moral foundation of sharia-based sustainable finance design. Thus, this research contributes to the current of thought that Islamic finance is not merely a riba-free system, but a value system capable of delivering ecological and social

justice, while encouraging community participation in the global agenda towards net zero emissions.

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