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Article

Improving the Targeted Use of Green Bond Proceeds and the Monitoring of Environmental Performance

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Abstract: This article examines the targeted use of proceeds raised through green bonds and the monitoring of the environmental performance of financed projects. It analyses trends in the global green bond market and Uzbekistan's experience. The study highlights the need to strengthen the relationship between fund allocation, expenditure control, and environmental impact assessment. It proposes a "green bond–green project" financing mechanism under which at least 70 percent of proceeds would be directed to priority environmental projects and issuers would publish annual financial allocation and environmental performance reports.

Keywords: green bonds, green finance, targeted financing, environmental performance, monitoring, environmental reporting, capital market, transparency.

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1. Introduction

Today, climate change, the rational use of natural resources, and environmental protection have become important priorities for economic development. Addressing environmental challenges requires substantial amounts of long-term financial resources. In this context, green bonds serve as an important instrument for governments, financial institutions, and businesses to raise funds through capital markets to finance environmental projects [1].

The development of the green bond market is supported internationally by a range of regulatory and methodological documents. In particular, the Green Bond Principles developed by the International Capital Market Association (ICMA) establish the key principles governing the use of proceeds from green bonds, the evaluation and selection of projects, the management of proceeds, and reporting on environmental outcomes. In addition, the international standard ISO 14030-1:2021 provides a framework for establishing criteria for evaluating green bonds and determining environmental performance. Regulation (EU) 2023/2631 establishes requirements and disclosure procedures for European Green Bonds [2].

Uzbekistan is also developing the legal framework for transitioning to a green economy and financing environmental projects. In particular, Resolution No. PQ-4477 of the President of the Republic of Uzbekistan, dated 4 October 2019, entitled "On Approval of the Strategy for Transition to a Green Economy of the Republic of Uzbekistan for the Period 2019–2030," is one of the key policy documents in this area. Furthermore, Presidential Decree No. PF-199, dated 23 November 2023, entitled "On Measures to Further Increase the Level of Greenness in the Republic and Ensure Environmental Sustainability through the Consistent Implementation of

the Nationwide 'Yashil Makon' Project," provides for the issuance of sovereign green bonds and sustainable development bonds among the sources of financing. This Decree contributes to establishing the legal foundations for using bond instruments to finance environmentally oriented projects in the country [3].

A distinctive feature of green bonds is that their proceeds are allocated to financing or refinancing projects that deliver specific environmental benefits. Such projects may cover areas including renewable energy, energy efficiency, environmentally friendly transport, water resource management, and waste recycling.

However, the issuance of bonds and the allocation of funds to projects do not automatically guarantee the achievement of environmental outcomes. Effective monitoring of the targeted use of proceeds, tracking project implementation, and measuring the environmental results actually achieved are essential. If the relationship between expenditure and environmental performance is not adequately demonstrated, investors may find it difficult to assess the outcomes of financing [4]. For this reason, international practice places particular emphasis on linking reports on the use of proceeds with environmental performance indicators.

From this perspective, improving the targeted use of green bond proceeds and the monitoring of environmental performance represents a relevant scientific and practical challenge. In particular, developing mechanisms to track the allocation of funds to designated environmental projects, assess environmental indicators against clearly defined criteria, and ensure regular reporting is of considerable importance.

Previous research has examined these issues from several angles. T. Ehlers and F. Packer emphasize the lack of uniform criteria for classifying green bonds and the importance of certification mechanisms for the credibility of the market [5]. Market-based studies show that green bond issuance is associated with positive investor reactions a small negative yield premium reflecting investors' pro-environmental preferences and subsequent improvements in issuers' environmental performance which underlines the importance of verifying the environmental outcomes of financing. The World Bank's 2024 study of emerging-market sovereign green, social and sustainability bonds found that approximately 90% of the issuers examined adhered to the fundamental principles of allocation and impact reporting, although one-third did not publish their reports within the 12-month period expected by investors [6].

For Uzbekistan, the OECD has analyzed opportunities for developing the green bond market, priority sectors and the institutional barriers faced by issuers while the textbook Green Economy by A.V. Vakhabov, Sh.Kh. Khajibakiyev and co-authors explores the theoretical foundations of the transition to a green economy and its financing. Nevertheless, the integration of proceeds allocation, project-level environmental performance indicators, regular assessment of outcomes and independent verification within a unified monitoring mechanism has not yet been sufficiently studied [7].

The purpose of this article is to develop scientific and practical proposals and recommendations aimed at ensuring the efficient and targeted use of funds raised through green bonds, assessing environmental outcomes, and enhancing the transparency of reporting [8].

The research object is the set of financial and economic relations arising in the process of allocating and using financial resources raised through green bonds to finance environmental projects.

2. Methods

1. Research Design and Data Collection.

This study employs a comprehensive methodological approach combining comparative analysis, systematic evaluation, and quantitative assessment to investigate mechanisms for improving the targeted use of green bond proceeds and monitoring environmental performance. The research draws on green bond issuance frameworks, allocation reports, environmental impact disclosures, and international guidelines, particularly the Green Bond

Principles developed by the International Capital Market Association (ICMA). A comparative analytical approach is applied to examine international practices in green bond management, focusing on transparency, project eligibility, financial accountability, and environmental reporting. Particular attention is paid to identifying institutional and methodological mechanisms that support the effective allocation of financial resources to environmentally sustainable projects.

2. Assessment of the Targeted Allocation and Utilization of Green Bond Proceeds.

The second methodological component focuses on evaluating the efficiency, transparency, and accountability of green bond proceeds allocation. Financial and structural analysis methods are employed to examine the relationship between funds raised through green bond issuance and their actual utilization in eligible environmental projects. The assessment considers the proportion of proceeds allocated to renewable energy, energy efficiency, sustainable infrastructure, pollution prevention, and other qualifying activities. Allocation efficiency is measured as the ratio of verified expenditures on eligible projects to total net proceeds raised. Additionally, comparative and institutional analysis is used to identify potential weaknesses in fund distribution, including delayed disbursement, insufficient project-level disclosure, and inadequate independent verification. These indicators provide a methodological basis for developing recommendations aimed at strengthening targeted financing mechanisms.

3. Environmental Performance Monitoring and Evaluation Framework.

The third methodological component develops an integrated framework for monitoring and evaluating the environmental outcomes of green bond-financed projects. The proposed framework combines quantitative environmental indicators, performance benchmarking, and independent verification mechanisms. Key indicators include greenhouse gas emission reductions, renewable energy generation, improvements in energy efficiency, water conservation, and waste reduction. Environmental performance is assessed by comparing verified project-level outcomes with predetermined baseline indicators and expected environmental targets. Where reliable counterfactual evidence is unavailable, observed improvements are distinguished from impacts directly attributable to green bond financing. The methodology also incorporates standardized reporting procedures, periodic environmental audits, and third-party assessments to strengthen the reliability and comparability of disclosed information. The resulting framework provides a systematic basis for improving environmental accountability, reducing greenwashing risks, and enhancing the long-term effectiveness of green bond financing.

3. Results

The global sustainable bond market has experienced substantial growth in recent years, reflecting the increasing importance of sustainable financing instruments in international capital markets.

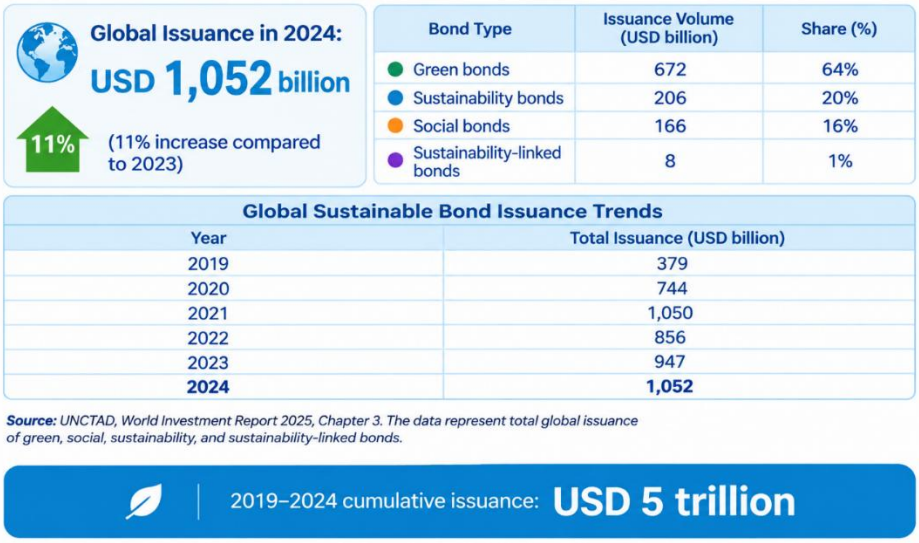


Figure 1. Dynamics and composition of global sustainable bond issuance

The data presented in Figure 1 show that global sustainable bond issuance increased from USD 379 billion in 2019 to USD 1,052 billion in 2024 [9]. Following a decline in 2022, the market resumed its growth in 2023–2024, reaching a record level in 2024.

In 2024, green bond issuance amounted to USD 672 billion, accounting for approximately 64% of total issuance [10]. This demonstrates the leading role of green bonds in financing environmental projects. At the same time, improving monitoring and reporting systems is essential to ensure the efficient use of proceeds and the achievement of environmental outcomes [11].

The issuance of green bonds in Uzbekistan reflects the ongoing development of practices for mobilizing resources through capital markets to finance environmental projects. In October 2023, Uzbekistan issued sovereign green bonds worth UZS 4.25 trillion, which were listed on the London Stock Exchange [12].

A report on the allocation of proceeds and environmental impact of these bonds was prepared through cooperation between the Ministry of Economy and Finance of the Republic of Uzbekistan and the United Nations Development Programme (UNDP). This experience demonstrates that a practical foundation has been established for allocating proceeds and documenting project outcomes.

Three areas are particularly important when assessing Uzbekistan's experience. The first is the allocation of proceeds raised to designated projects. The second concerns the actual expenditure of financial resources within those projects. The third involves measuring and disclosing the environmental outcomes achieved through the use of these funds [13].

When these indicators are reported in an integrated manner, investors can assess which projects received the bond proceeds, what expenditures were incurred, and what environmental benefits were achieved as a result.

The effectiveness of green bond proceeds is determined not only by financial execution but also by the environmental outcomes of the projects financed. For example, allocating funds to a renewable energy project represents financial implementation, whereas the amount of electricity generated and the reduction in greenhouse gas emissions reflect its environmental outcomes.

Table 1

Monitoring indicators for green projects

Project Area	Financial Indicator	Environmental Performance Indicator
Renewable Energy	Funds allocated and spent	Electricity generated; reduction in CO_2 emissions

Energy Efficiency	Modernization expenditures	Amount of energy saved
Green Transport	Funds spent on vehicles and infrastructure	Reduction in fuel consumption and emissions
Waste Recycling	Funds allocated to recycling facilities	Volume of waste recycled

The table shows that environmental performance indicators vary depending on the type of project. Therefore, it is not appropriate to assess all projects using a single environmental indicator. For each project, the baseline situation, planned outcomes, actual performance indicators, and the methods used to calculate them should be clearly defined.

Furthermore, monitoring should cover the unallocated balance of proceeds, project implementation timelines, and the reasons for deviations from expected outcomes. This approach makes it possible not only to track the flow of funds but also to assess environmental outcomes objectively.

4. Discussion

The above analysis demonstrates the need to link the use of green bond proceeds to clearly defined environmental priorities and to establish an integrated system for financial and environmental reporting.

In this regard, the introduction of a "green bond–green project" financing mechanism is proposed. Under this mechanism, at least 70% of the proceeds raised through green bonds would be allocated to renewable energy, energy efficiency, green transport, and waste recycling projects. In addition, green bond issuers would be required to publish annual reports on the use of proceeds and the environmental outcomes achieved.

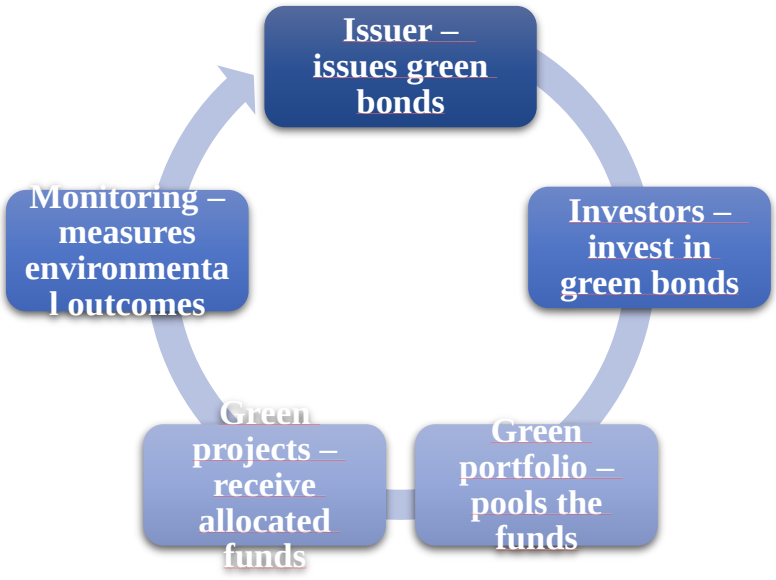


Figure 2. "Green bond–green project" financing mechanism

The distinctive feature of the proposed approach is that it combines the requirement to allocate proceeds to environmental priorities with a mechanism for regularly measuring environmental outcomes and reporting on them. As a result, the ability to track the relationship between bond issuance, the expenditure of proceeds, and the environmental outcomes actually achieved is enhanced [14].

To implement this mechanism in practice, the calculation method for the 70% threshold, the list of priority projects, the reporting format, the methodology for calculating performance indicators, and the verification procedures should be established in the relevant regulatory documents [15].

Consequently, the transparency of the green bond market will improve, investor confidence in environmental projects will be strengthened, and opportunities to attract long-term financial resources for green investment through capital markets will expand.

5. Conclusion

The research findings indicate that green bonds are an important market-based instrument for financing environmental projects. However, their effectiveness also depends on the targeted allocation of proceeds and the effectiveness of environmental monitoring systems. The growth of the global sustainable bond market is creating new opportunities for financing green projects. Uzbekistan's issuance of sovereign green bonds in 2023 and the subsequent publication of a report on proceeds allocation and environmental impact demonstrate that the practical foundations for developing this area are being established in the country. Based on the analysis, the following recommendations have been developed: Introduce a "green bond–green project" financing mechanism that provides for allocating at least 70% of the proceeds raised through green bonds to renewable energy, energy efficiency, green transport, and waste recycling projects. Establish a procedure requiring issuers to publish annual reports on the use of proceeds, their unallocated balances, and the environmental outcomes achieved. Define measurable environmental performance indicators and the methodologies for calculating them in advance for each project. Link proceeds allocation reports with environmental performance reports and develop independent verification mechanisms to enhance the reliability of the disclosed information. The proposed mechanism will help strengthen transparency in the use of green bond proceeds, establish a reliable information base for investors, and expand opportunities to assess the performance of environmental projects.

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