

«Green bonds» as a key instrument for sustainable investment and eco-innovation

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Abstract. The article analyses the peculiarities of using green bonds as one of the effective tools for maintaining environmental sustainability, stresses the need for further development of innovative financial instruments to support sustainable development goals. The author notes the opinion of leading academic economists on the necessity and usefulness of introducing green finance instruments. The article analysed the key aspects of green bonds, their role in the modern economy, as well as the factors affecting their effectiveness and demand in the market. The author also reviewed the main standards that establish criteria for classifying projects as sustainable development projects, certification mechanisms, and requirements for issuing green securities. The author emphasised the need for further research in the field of green finance, as current research is insufficient to provide a clear picture of the implementation of the mechanism of issue and circulation of green finance instruments.

1 Introduction

Historically, the emergence of green bonds has been driven by several factors. First and foremost, it is worth noting the need for alternative innovative financing instruments to emerge due to the growth of innovative financing mechanisms. These were spawned by the need to achieve the Millennium Development Goals (MDGs), which 192 United Nations Member States and at least 23 international organisations agreed to achieve by 2015. First, it was a response to the growing awareness of environmental issues and the need to finance projects aimed at reducing environmental impact. The second factor was the support from governments and international organisations to introduce standards that encourage the development of green finance. The focus of many countries on the implementation of environmental programmes has contributed to the successful establishment and rapid development of this segment, and the presence of socially responsible investors has generated increased demand for such financial instruments [1]. In addition, the emergence of green bonds is partly related to financial benefits for issuers, as they can access new sources of financing and receive favourable terms for green projects [2].

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2 Materials and Methods

In the process of the research the system approach, evolutionary approach, approaches of the theory of sustainable development were used. The methods of analysis and synthesis, grouping and comparison were used as a methodological technique of the research.

3 Results and Discussion

The basic principles of green bonds, including their standards and criteria, are based on the following key aspects:

1. the main principle of green bonds is that the funds raised by the issuer through their issuance are used to finance projects and initiatives that promote environmental sustainability and reduce the negative impact on the environment;
2. Green bond standards define exactly those categories of projects that can be financed with bond proceeds, i.e. those projects that are consistent with sustainable development goals: renewable energy, energy efficiency, sustainable transport, waste management and others;
3. in order for green bonds to meet the standards, their issuers must also ensure a high level of transparency and reporting, i.e. provide timely and reliable detailed information on how the funds raised from the sale of bonds are used, as well as on the assessment and monitoring of the environmental impact of projects [2].

To date, there is no single standard applicable to green bonds, nor is there a mechanism to monitor compliance with these standards. There are the following most popular standards that represent important tools for the regulation and development of the green bond and credit market (Table 1):

Table 1. Standards for green bonds and credits

Name of standard	Development organisation	Description
Climate Bonds Initiative Standard	Climate Bonds Initiative (CBI)	The CBI establishes criteria to identify projects that are consistent with sustainable development principles and can be financed through green bonds. The CBI provides certification mechanisms for green bonds to ensure that issuers meet the established criteria and principles. The CBI also provides guidance on monitoring and reporting of projects financed through green bonds, allowing investors and stakeholders to assess the value for money and the achievement of sustainability goals [3]
Green Bonds Principles (GBP)	International Capital Market Association (ICMA)	The Principles recommend that issuers use the funds collected from green bonds exclusively to finance projects related to environmental sustainability, such as renewable energy, energy efficiency, clean transport and other projects. The Principles regulate the level of openness and transparency of information provided by bond issuers, which includes a detailed description of the purpose of the funds, the selection of project selection criteria, the environmental impact assessment process and mechanisms for monitoring project

		implementation. The Principles recommend that issuers assess the environmental impact of projects financed by green bonds and monitor the results to ensure compliance with the stated objectives, and provide guidance on the process of issuing green bonds, including structuring bond programmes, documentation and reporting, and investor relations.[4]
EU Green Bond Standard	European Commission	The EU Green Bond Standard (EU Green Bond Standard) is a set of criteria and requirements to define green bonds issued in line with the EU's environmental objectives. It provides uniform standards and transparency for green bonds issued in the European Union and promotes the development of the market for sustainable financial instruments. [5]
Climate Resilience Principles for Sustainability Bonds	Climate Bonds Initiative (CBI)	Climate Resilience Principles for Sustainability Bonds is a set of principles developed by the Climate Bonds Initiative that provides guidance to bond issuers on how to incorporate climate change adaptation into their projects and sustainability strategies [6].
Green Loan Principles (GLP)	Loan Market Association (LMA), Asia Pacific Loan Market Association (APLMA) и Loan Syndications and Trading Association (LSTA)	The Green Lending Principles (GLP) are a set of guidelines for financial institutions and borrowers on structuring and disbursing loans for green projects, includes guidelines on the definition of green projects, utilisation of funds and reporting on project performance [7].

It is worth noting that the lack of clear and precise, unified requirements for the mechanism of issuing and using green bonds is not an obstacle for investors. The commitment to the "green" orientation of issued instruments is demonstrated by investors who are trying to occupy key niches, as there is a growing interest of private financial institutions in sustainable development issues. The international community has set a clear vector for further development of green finance principles, which implies joint work of the global community; undoubtedly, only a joint business strategy will help to achieve the set results of sustainable development goals.

Green bonds can be categorised according to various criteria, including their structure, type of issuer and purpose of funds (Table 2):

Table 2. Types of green bonds and their features

View	Description
Corporate green bonds	Issuers of such bonds are private companies that use the proceeds to finance green projects within their organisations or in their supply chains. Examples include bonds issued by companies that produce renewable energy or improve energy efficiency in their production processes.

Public green bonds	Issuers of these bonds are state or municipal organisations that use the funds to finance green infrastructure projects. These bonds can be issued by states to finance projects to reduce greenhouse gas emissions or provide access to clean water and energy.
Securitised green bonds	This type of bond is created by securitising the revenue stream from green loans or green assets. Issuers can be either public or private organisations and the bonds can be backed by different types of assets, such as green mortgages or green car loans.
Subordinated green bonds	These bonds are different in that they are issued with a lower priority to other obligations of the issuer. They can be used to finance riskier, yet innovative and environmentally relevant projects.

Each of these types of green bonds has its own features and advantages, and the choice of a particular type depends on the objectives of the issuer and investor, as well as the characteristics of the projects to be financed.

The development of the global green bond market over the past 10 years has shown impressive growth dynamics. According to the Climate Bonds Initiative, the size of the green bond market has increased significantly from USD 3 billion in 2011 to more than USD 270 billion in 2020, demonstrating a more than 90-fold increase in a decade [8]. A number of factors have a positive impact on the development of the green bond market:

1. The creation of new financial instruments such as green bonds with variable coupon or green promissory notes expands the possibilities of financing green projects.
2. Introduction of government or international regulations that incentivise investment in green projects or provide incentives for issuing and investing in green bonds.
3. The growing interest in investments that bring not only financial returns but also social or environmental benefits is undoubtedly increasing investor interest in the green bond market.

However, there are some negative factors affecting the development of the green bond market:

1. The illegibility of green labelling, i.e. the fact that bonds advertised as green may not meet standards and may be used for green labelling without any real environmental impact, which in turn further erodes confidence in the market and further dilutes it.
2. The green bond certification process is quite costly and complex, making it difficult for smaller issuers or projects to access the market.

Priorities for further development of the green bond market include strengthening standardisation and transparency, broadening the base of green projects, supporting innovation in the financial sector and ensuring sustainable growth. Leading economists have a variety of opinions on green bonds and their role in sustainable development below (Table 3):

Table 3. Opinion of leading economists on green bonds.

Author	Utterance
Nicholas Stern British economist, author of the Stern Report on the Economics of Climate Change.	"Green investment represents a huge opportunity for innovation, growth and employment"[9].
Jeffrey Sachs American economist, author of many works on sustainable development.	"Green bonds have the potential to be a key financing tool for the transition to a low-carbon economy"[10].

Adair Turner British economist, former chairman of the Financial Services Authority (FSA).	"Green bonds have the potential to become a key financing tool for environmentally significant projects"[11].
Mark Carney Former Governor of the Bank of England, an active advocate of green finance.	"The development of green bonds is helping to accelerate the transition to a low-carbon economy"[12].
Joseph Stiglitz American economist, winner of the Nobel Prize in Economics.	"Green bonds have the potential to become a powerful tool for investing in solutions to environmental problems"[13].

4 Conclusion

Forecasts indicate that the green bond market will continue to grow in the coming years. The pursuit of global sustainable development goals, including the Paris Climate Conference Agreement, will drive demand for green investments [14,15]. A forward-looking issuer should recognise that an instrument that, through the financing of environmental, energy efficient and low carbon projects, emphasises policies aimed at long-term and sustainable development can help to successfully expand the range of assets available to borrowers and attract new investors. More and more issuers with different industry and geographical affiliation are entering the market. For example, Georgia, Kazakhstan and Ukraine have already announced their first issuance. Investor interest in this type of bonds is also growing due to the inclusion of environmental risks in the list of investment evaluation criteria. However, the very process of circulation of green bonds, their issuance, standards for classifying bonds as green, and the difference between green bonds and conventional bonds raises more and more questions. The development of green finance is expected to become an integral part of the global financial system, playing a key role in the transition to a low-carbon and sustainable economy. Despite the obvious benefits of introducing green bonds, there are also risks associated with the process. First and foremost is the risk of misuse of funds, i.e. the risk that funds raised through green bonds may be misused or for projects that do not meet stated environmental objectives, which could also negatively impact investor confidence in the green bond market. Second, the risk of low liquidity -some green bonds may have low liquidity due to the limited number of investors interested in this asset type, which may create difficulties in selling the bonds when needed. Third, the risk of market fluctuations. As with conventional bonds, green bonds are subject to the risks of changing market conditions, such as changes in interest rates, inflation and general economic conditions. Fourth, the complexities of assessing project performance –Assessing the environmental performance and social impact of projects financed through green bonds is undoubtedly a complex process and subject to a certain degree of subjectivity, which necessarily creates uncertainties about the real contribution to sustainable development.

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