

The importance of green bonds for the development of the green economy

Značaj zelenih obveznica i njihov uticaj na razvoj zelene ekonomije

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Abstract

The authors of this paper discuss the importance of green bonds and their impact on the development of a green economy. A green economy is the goal one should strive for and undertake activities in order to fulfill it. Green bonds are inextricably linked to the concept of a green economy. The Republic of Serbia issued green bonds in 2021, although it is still not a member of the European Union, thus becoming an example for other European countries. In this paper authors discuss the importance of the green transition, bearing in mind that the excessive consumption of natural resources has worsened the climate and ecological crisis, and therefore a change in the way we consume natural resources is necessary, i.e., a green transition is necessary.

Keywords: green economy, green bonds, banking sector, green transition

Sažetak

Autori u radu istražuju značaj zelenih obveznica i njihov uticaj na razvoj zelene ekonomije. Zelena ekonomija je cilj, neophodno je težiti ispunjenju cilja i preduzeti određene aktivnosti kako bi se isti ispunio. Zelene obveznice su neraskidivo povezane sa konceptom zelene ekonomije. Republika Srbija je emitovala zelene obveznice u 2021. godini, iako još uvek nije član Evropske unije i tako je postala primer ostalim Evropskim državama. U ovom radu autori razmatraju značaj zelene tranzicije, imajući u vidu da je prekomerna potrošnja prirodnih resursa pogoršala klimatsku i ekološku krizu, te je stoga neophodna promena načina na koji trošimo prirodne resurse, odnosno neophodna je zelena tranzicija.

Ključne reči: zelena ekonomija, zelene obveznice, bankarski sektor, zelena tranzicija

1. Introduction

This paper discusses the importance of the green transition, bearing in mind that the excessive consumption of natural resources has worsened the climate and ecological crisis, and therefore a change in the way we consume natural resources is necessary, i.e., a green transition is necessary. In discussing this topic, the concept of a green economy is defined, which arose due to the need for the economy to become more environmentally responsible, as well as the concept of green bonds and their importance, because they enable the collection of funds for projects that mitigate climate change and its impact.


The expansion of the green bond market has been observed year after year. The green economy arose due to

the need to become more environmentally responsible, and green bonds are inextricably linked to the green economy.

One of our main questions is how to finance the transition to a low-carbon global economy. It is for this reason that the subject of research in this paper is the green bonds issuance and their contribution to the development of a green economy that can be considered a low-carbon economy through increasing investments into the infrastructure of sustainable environmental development, as a prerequisite for the economic growth and development viewed across regions, sectors, and markets. Financing investments with the help of green bonds has seen significant growth in recent years, both at the micro and macro levels. If we look at regions, the data indicate an increase in the volume of debt on the topic of GSS

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(green, social, and sustainability) in 2022 the best area is Europe.

2. Green bonds in the function of a green economy

Rapid climate change represents an immediate threat. Climate change and environmental degradation increasingly affect people's lives by disrupting the economy and transforming ecosystems and pose a threat to the entire world, and climate stability is a prerequisite for financial stability.

The European Green Plan is "a package of political initiatives aimed at ensuring a green transition of the European Union, with the ultimate goal of achieving climate neutrality by 2050" (Jambrović, 2023).

It is important that the concentration of greenhouse gases in the atmosphere should be stabilized, and in order to achieve that, the world's greenhouse gas emissions must be reduced to net zero. The most important goal of the European Green Plan is to make Europe a climate-neutral continent. Climate neutrality includes the following activities like increasing the capacity for absorption or storage of those amounts of carbon whose emissions into the atmosphere cannot be prevented.

A European Green Deal is a complex strategy for economic growth. The following statement supports it: "The overall goal of the European Green Deal is for the European Union to become the world's first climate-neutral block by 2050 and implies more active action in several different sectors, including construction, energy, transport, agriculture, food production and similar. This strategy also includes potential customs tariffs for countries that are not actively working on reducing greenhouse gas emissions through the carbon border adjustment mechanism" (Smart collective, 2021).

"The green economy includes good practices such as ecological agriculture, development of green technology, areas of recycling or waste management, water management, green architecture, construction and design and related activities" (Simleša et al., 2021, p.6).

According to Šoja and Grujić: "The issue of green bonds facilitates the collection of money that finances projects which contribute to the preservation of the environment." (Soja et al., 2022, p. 350). Green bonds represent a hedge against environmentally related financial risks. That is why information is needed on the sensitivity of different bonds to the mentioned risks. The banking sector has begun to recognize climate risks. Transition risks can cause financial losses during the transition to environment economy through increased investments into the green economy, while physical risks refer to financial losses arising from natural disasters and climate change such as temperature changes, increased rainfall, etc.).

The green economy as an important basis at the starts of the 21st century on the regional and global level. It was created as a result of efforts to make the economy more ecologically responsible. The importance of the green

economy is emphasized by Popović and his colleagues: "In the conditions of globalization and comprehensive changes in the environment, the green economy has become an important function of modern and socially responsible business in an increasing number of countries over recent decades (Popović et al., 2015, p.693).

According to the presentation (John Scanlon) a green economy represents an (Scanlon, 2012, p. 5):

- "Increase in green investments;
- Increase in the quality and quantity of green jobs;
- Reduction of energy/resource usage per unit of production;
- Reduction of CO₂ emission and level of pollution/GDP;
- Reduction of wasteful consumption".

Karl Burkart defined six main areas of the green economy. (Smart collective, 2021). Increasing human well-being, without any risk to the environment, as the simplest determinant of the green economy, is recognized by UNEP. According to the definition of a green economy by UNEP presented in the works of Pahle and associates that: "Green economy results in improved human well-being and social equality, with a significant reduction of environmental risks and ecological scarcity" (Pahle, et al., 2016, p.1331) it is concluded that the green economy, human well-being and social equality are important in order to reduce, risk to the environment. (UNEP, 2011) In order to achieve progress towards a green economy, a significant increase in investments in the infrastructure for sustainable environmental development is needed as a prerequisite for economic growth and development. Green bonds should enable the collection of funds for projects that mitigate climate change or their impact, as well as enable the introduction of circular economy principles, because the connection between circular economy and climate change is well known. Green bonds are therefore inextricably linked to the concept of the green economy and represent a relatively new income instrument.

The importance of green bonds is impact in the creation of sustainable opportunities, considering the fact that they represent a financial instrument in the function of environmental protection. This is emphasized by Kadunac and Bažant when defining green bonds: "Green bonds are debt securities in which the yield is exclusively used for the operation or refinancing, in part or in whole, of new or existing acceptable green projects or assets, and which are designed in accordance with the conditions, standards established in the corresponding international regulations" (Kadunac, et al., 2021, p.1). In the explanation of the concept of green bonds, Lazić and Emerton also indicate that green bonds are necessary to achieve environmental goals: "It is a market instrument with a fixed yield that can be traded with and whose goal is to collect financial resources for environmental protection projects. Bonds are usually issued by sovereign states, provinces, municipalities or business entities in order to collect funds in advance, with the promise that they will repay the value of the bond to the investor and that they will periodically pay interest" (Lazić, et al., 2020, p. 5).

The main premises of the concept of "green economy" (GE- Green economy) is that low carbon emission technologies have significant potential for achieving environmental and socio-economic goals.

3. Research results and discussions

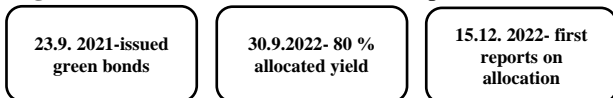
Green bonds are an instrument for financing specific projects, and their importance and scope are growing in Serbia as well. The framework of green bonds of the Republic of Serbia is aligned with the principles of green bonds published by the ICMA in 2021.

After the revision of the Green Bond Framework by the Government of the Republic of Serbia, in September 2021, the issuance of green bonds began. The framework document for issuing bonds defines six sectors for the investment of funds:

- Renewable Energy;
- Energy efficiency;
- Transport;
- Sustainable Water and Wastewater Management;
- Environment, Pollution Prevention and Control;
- Protection Environment Biodiversity and Sustainable Agriculture.

At the end of September 2021, Serbia issued green bonds in the amount of one billion euros with a due date of seven years and a coupon rate of 1%, as well as a yield rate of 1.26%. In the period of one year, i.e., at the end of September 2022, 80% of the yield was allocated, and, at the end of 2022, the first report on the allocation of bonds in Serbia was made. Reporting is one of the four components according to the (ICMA) International Capital Markets. Figure 1 shows the time frame of 2021-2022 in the context of issued green bonds in Serbia.

Figure 1. Green bonds in Serbia in the period 2021-2022



Source: Author according to Serbia Green Bond reporting

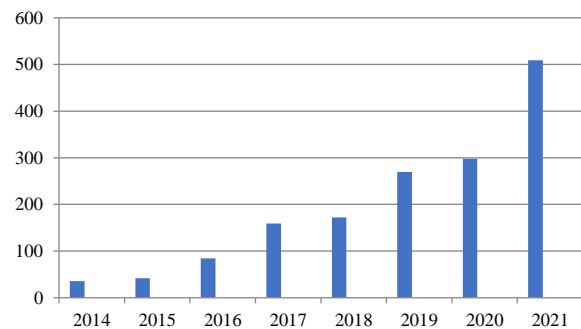
By issuing green bonds, Serbia has provided significant financial resources, contributing to a positive impact on society and the environment, through the provision of funds for projects that can mitigate climate change or its impact, as well as the transition to a circular economy.

The issuance of the green bond is in accordance with the Principles of Green Bonds of the International Capital Market Association ICMA, which are the world standard.

According to Mirković and colleagues, the issuance of green bonds represents the next step towards identifying the Republic of Serbia as a country that should be trusted. That is important for reputable investors (Mirković, et al., 2022). A positive trend has been observed in the world since their first issuance in 2007, issued by the EIB, until today. Šoja and Grujić point out: "The International Capital Market Association (ICMA) contributed to the regulation of the green bond market by publishing the Green Bond Principles (GBP)" (Soja, at al., 2022, p. 366). The green bond market is recognized as promising and its further expansion is expected (Laskowska, 2018).

Green bond issuance exceeded \$510 billion in 2021, Figure 2: Total Value of Global Green Bonds Issued (2014 to 2021), \$265 billion with Europe.

Figure 2. Total value of global green bonds issued from 2014 to 2021



Source: Dynamic Connectedness of Green Bond with Financial Markets of European Countries under OECD Economies

In the last period, a significant growth of the green bond market by region is noticeable. The leader in issuing green bonds is Europe. In Table no 1 in the period 2014-2022 shows that Europe increased the green bond market, from 18.3 billion dollars in 2014 to 228.6 billion dollars in 2022. Behind the European market are the North American market as well as the Asia-Pacific region. Analyzing the data, in the previous period, and it is expected that the trend will continue. The growth of the green bond market results in the financing and improvement of the green economy sector, which creates the conditions for reducing the carbon footprint in the economy. The paper further shows how bonds were issued by region in the period from 2014 to 2022 - Table 1: Issuance of Green Bonds by Region in US \$ bn, 2014-2022.

Table 1. The issuance of green bonds by region in US\$ bn, 2014-2022

Region	Climate Bonds Initiative - amount issued Green Total Amount Issued Global									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Africa	0.1	-	0.2	0.3	0.2	0.9	1.2	0.4	0.3	
Asia-Pacific	1.6	3.9	26.6	35.5	50.3	67	56.5	129.5	133.4	
Europe	18.3	20	25	61.2	68	122	158.2	264.9	228.6	
Latin America	0.2	1.1	1.6	4	1.6	4.9	9.1	8.2	3.1	
North America	7.4	12.8	20.9	49	39.7	60.1	59.7	92.5	76.6	
Supranational	9.4	8.3	10.2	9.5	12.7	14.4	13.5	13.3	45.1	
Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	

Source: The Climate Bonds Interactive Data Platform <https://www.climatebonds.net/market/data/#use-of-proceeds-charts>

The green bond issues can form funds with allocated to certain sectors in accordance with the Framework Agreement for the Issuance of Bonds, which defines six sectors for the investment of funds. Energy, buildings and transport were the most common sectors for issuing green bonds to finance their activity observed in the period from 2014 to 2022, followed by water and land use.

The data indicate that a significant part of green bond issue funds (85%) is placed in the areas of Renewable Energy, Construction and Transport. Investing in energy efficiency is very important because the electricity supply sector is considered to be the most dominant emitter of harmful gases. If we look at the level of emissions of harmful gases by individual sectors, the supply of

electricity produces the most negative effects on the environment in the form of emissions of harmful gases (about 70% of the total CO2 emissions). That is why it is highly expected that the largest part of green bond issuance funds will be channeled into this sector, because decarbonization of the energy sector is a strategic priority. The transport sector is a very important sector, and therefore investing in cleaner transport is a necessity, given that the emitted gas emissions record constant growth. Ensuring the conditions for cleaner transport is imposed as a priority. The paper further shows how bonds were issued by sector in the period from 2014 to 2022 - Table 2: Issuance of Green Bonds by Sector in US \$ bn, 2014-2022.

Table 2. The Issuance of Green Bonds by Sector in US\$ bn, 2014-2022

Year/Sector	Climate Bonds Initiative - Use of Proceeds Green Total Amount Issued Global									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Energy	18.3	23.7	33.2	53	53.7	85	104.8	200.9	158.3	
Buildings	7.5	8.3	17.9	46.3	46.9	81.4	82.6	164.8	122.3	
Transport	4.2	5.9	12.7	23.9	30.7	52.5	68.2	96.9	91.6	
Water	2.7	4	10.7	19.8	18.1	24.9	18.1	36.7	33.2	
Waste	1.1	1.5	4.4	6.1	7.6	9.7	7.8	24.6	24	
Land Use	1.5	0.6	1.7	5.3	7.3	8.9	15.5	30.9	26.5	
Industry	-	0.7	0.1	0.2	0.8	1.7	0.9	7.7	4.1	
ICT	-	-	-	-	0.1	1.6	1.5	5.2	6.2	
Unspecified A&R	1.2	0.9	3.9	3.5	3.5	2.6	2.4	11.4	18.6	

Source: The Climate Bonds Interactive Data Platform <https://www.climatebonds.net/market/data/#use-of-proceeds-charts>

By financing the green transition in certain sectors, opportunities are created for the sectors to be ready for transformation. The necessity of the green transition is reflected in the fact that we consume too many natural resources, which further affects the climate and environmental crisis. If the intense growth of green bonds

continues, as recorded in previous years, a reorganization of the global bond market in favor of green bonds is to be expected. An overview of issued bonds in emerging, developed or supranational markets is presented in Table 3 - Issuance of Green Bonds by Market.

Table 3. The Issuance of Green Bonds by Markets

Market	Climate Bonds - Market Type Green Total Amount Issued Global									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Emerging	0.8	3.7	26.5	33.3	40.7	58.7	49.7	112.2	113.4	
Developed	26.8	34.2	47.8	116.7	119	196.3	234.9	383.3	328.6	
Supranational	9.4	8.3	10.2	9.5	12.7	14.4	13.5	13.3	45.1	

Source: The Climate Bonds Interactive Data Platform <https://www.climatebonds.net/market/data/#use-of-proceeds-charts>

The green bond market is becoming increasingly important for developing countries and an intensive growth of green bonds in such countries is observed in the period 2014-2022. Therefore, developing countries should definitely decarbonize their economies, and at the same time improve their economic development. Although green bonds are becoming increasingly popular, they make up only a fraction of the total bond market in both developed and emerging markets. The green bonds are attracting, because significant funds will be needed to achieve the goals of reducing harmful gas emissions.

The green bond market is still small, and underdeveloped. As Bieliński and Mosionek-Schweda emphasize: "The green bond market is relatively new, but growing rapidly; however, to sustain this growth, investors' and issuers' trust in green bond credentials is necessary. Therefore, guidelines and standards accepted by financial markets and which clearly indicate what should be considered a

green investment are of key importance for the further development of the green bond market" (Bieliński et al. 2018). As stock exchanges represent markets where green bonds are traded, stock exchanges from all over the world have started to create green bond listings since 2015 (e.g., London, Euronext, Shanghai, Japan, Johannesburg, etc.).

Thus, hypothesis 1, that the availability of public accurate financial statements of companies listed on the Belgrade Stock Exchange is increasing, and hypothesis 2, that the availability of public inaccurate financial statements of companies listed on the Belgrade Stock Exchange is decreasing, were confirmed. Hypothesis 3, that the number of unavailable financial statements of companies listed on the Belgrade Stock Exchange is decreasing, was not confirmed.

4. Conclusion

The climate change and environmental protection occur in our day-to-day lives. The transformation towards a green economy is necessary. The realization of environmental goals initiated the emergence of green bonds. They represent a financial instrument in the function of environmental protection. The ICMA contributed to the regulation of the green bond market by publishing the Green Bond Principles.

In September 2021, Serbia provided significant financial resources (green bonds) for financing sustainable development and mitigating climate change.

A comparative analysis of issued green bonds by region (for the period 2014-2022) indicates that Europe significantly increased the comparing the green bond market and other markets in the region. The data indicate that the largest part of green bond issuance in the last period was in the fields of: Energy, Transport and Construction.

The dynamic expansion of the green bond market is noticeable in developing countries. Developing countries should definitely decarbonize their economies, and at the same time improve their economic development.

Green bonds are therefore inextricably linked to the concept of a green economy and represent a relatively new revenue instrument, and the growth to a green economy cannot be delayed. The green bond market is recognized as promising and is expected to continue to expand.

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