Chapter 3.

GREEN FINANCING UNIVERSE IN THE TIME OF GEOPOLITICAL SHIFTS

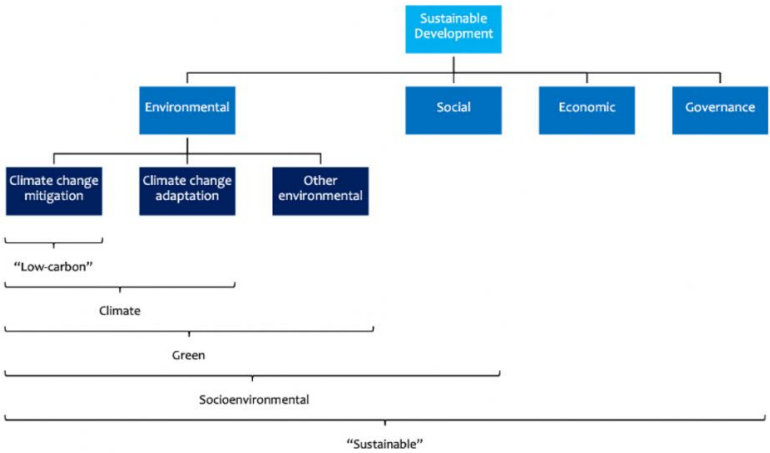
The term green finance refers to financial products and services that encourage environmentally friendly and sustainable investment alternatives and projects. Areas covered by this form of financing include, among others, the alternative energy sources, biodiversity conservation, water purification, waste management, green transportation, construction and agriculture. Green financing instruments direct financial resources towards companies, government, local authorities and individuals who, in their business and investment activities, support sustainability and reduce the negative impacts of their actions on the broader environment. Financial innovations that also characterise the area of environmentally responsible business activities facilitate the transition to a more efficient economy by enabling easier financing of projects that use available resources more rationally, reduce the emission of harmful gases and promote the use of alternative energy sources. Finally, the field of green financing creates new jobs and offers the possibility of environmentally conscious economic development.

1. THE GROWING NEED FOR GREEN FINANCING

The term sustainable finance refers to instruments and processes that generate value and financial assets in a way that meets the long-term needs of an inclusive and environmentally sustainable economy. The difference is made between the terms "sustainable", "green" and "climate" finance.[70] Sustainable finance is the most inclusive term, including social, environmental and economic aspects of financing activities. Green finance refers to financial instruments whose proceeds are used for environmentally friendly and sustainable projects and initiatives, environmental products and policies. The unique goal is a transition towards a low-carbon, sustainable and inclusive economy. Climate finance refers to climate change mitigation and climate change adaptation instruments, strategies and actions. The following Figure 1 presents these three categories of finance.

[70] United Nations Environment Programme (2016). *Inquiry: Design of a Sustainable Financial System*, Nairobi: UNEP, https://wedocs.unep.org/bitstream/handle/20.500.11822/10603/definitions_concept.pdf?sequence=1&isAllowed=y

Figure 1. Sustainable finance and development subcategories



Source: United Nations Environment Programme (2016), op. cit.

The negative consequences of accelerated climate change shape modern business and impose significant investments by the government and private sector in the research and development of new forms of green technologies and production processes. As Morgan Stanley predicts, it will be necessary to spend more than USD 50 trillion on a global level in order to meet the requirements of the Paris Agreement and achieve the status of zero emissions of harmful gases, resulting in the greenhouse effect.[71] The process of transformation of production and operational processes of companies and their direction towards ecologically sustainable businesses requires significant financial resources. Governments are aware of the growing financial needs for these purposes at the national, local and sectoral levels.[72] In these circumstances, the concept of green financing arises.

2. GREEN FINANCING INSTRUMENTS

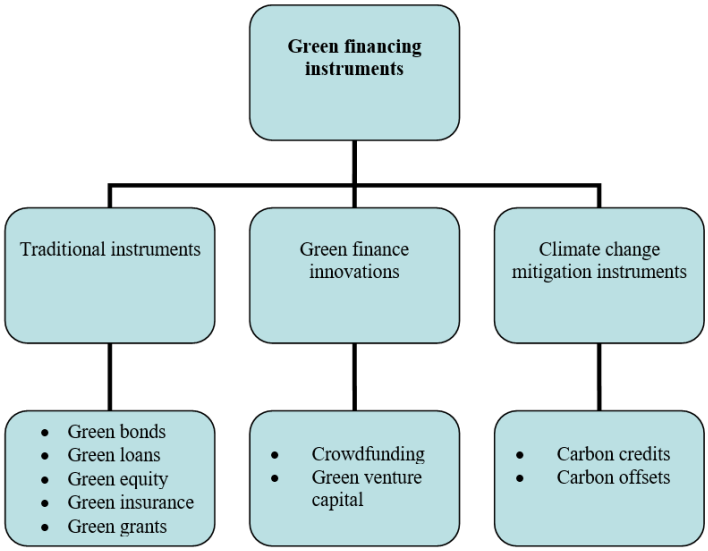
Green financing instruments are developed over time on the basis of classical financial instruments. The key difference between them is that green instruments have a dual purpose - achieving returns on invested funds (often accompanied by

[71] Klebnikov, S. (2019). Stopping Global Warming Will Cost $50 Trillion: Morgan Stanley Report. *Forbes*, https://www.forbes.com/sites/sergeiklebnikov/2019/10/24/stopping-global-warming-will-cost-50-trillion-morgan-stanley-report/?sh=2bb4b1eb51e2

[72] Janković, I., Vasić, V., & Kovačević, V. (2022). Does transparency matter? Evidence from panel analysis of the EU government green bonds. *Energy Economics, 114*, 106325, https://doi.org/10.1016/j.eneco.2022.106325

positive tax treatment)[73] while preserving and protecting the natural environment and reducing the negative effects of climate change. Green finance instruments can be classified into three key categories – traditional instruments, green finance innovations and climate change instruments.[74] The following Figure 2 shows the key categories and the individual instruments that belong to each of them.

Figure 2. Green financing instruments



The category of traditional green financial instruments includes green bonds, green loans, green equity, green insurance instruments and green grants and subsidies. Green financing innovations include crowdfunding and green venture capital. Finally, a special segment of the market consists of instruments focused on climate change mitigation, which include carbon credits and carbon offsets. In the following, the characteristics of each mentioned instrument and/or mechanism of green financing will be presented.

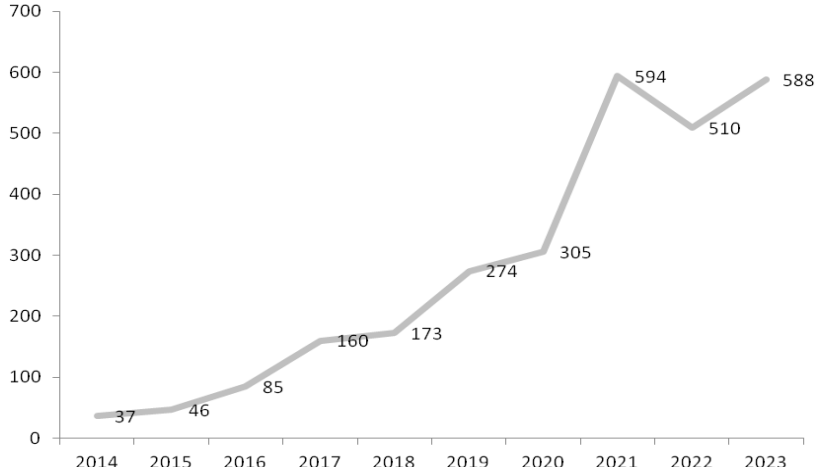
[73] Janković, I., Kovačević, V., & Ljumović, I. (2022). Municipal Green Bond Yield Behaviour. *Ekonomika preduzeća*, *LXX*(3-4), pp. 206-214; Janković, I., Vasić, V., & Basarić, J. (2022). Zelene obveznice u EU – Analiza determinanti prinosa. In: *Proceedings of XLIX International Symposium on Operational Research SYM-OP-IS 2022*, Mladenović, Z., Stamenković, M. (eds.), Belgrade: University of Belgrade, Faculty of Economics and Business, pp. 155-160.

[74] Chatterjee, D. (2023). 7 popular Green Financing instruments you need to know about. *Neufin*, https://neufin.co/blog/green-financing-instruments

Green bonds

Green bonds are debt financial instruments that are issued with the aim of collecting financial resources for the realisation of environmentally responsible projects. They can be issued by domestic and international financial institutions[75], companies, states and local governments. The first green bond was issued by the European Investment Bank in 2007. During 2008, the World Bank started issuing green bonds, collecting funds to reduce the negative consequences of climate change. Since then, until today, the green bond market has been growing significantly.[76] According to data from the Climate Bonds Initiative, USD 870 billion of green, social and sustainability bonds were issued globally in 2023, 3% more than the year before. The cumulative observed value of issued green, social and sustainability bonds thus reaches USD 4.4 trillion. Of the total stated amount of bonds issued in 2023, 68% are green bonds, reaching a value of USD 587.7 billion, which is an increase of 15% compared to 2022. Figure 3 shows the value of issued green bonds in the period from 2014 to 2023.

Figure 3. The value of issued green bonds at the global level in the period 2014-2023 (in billions of USD)



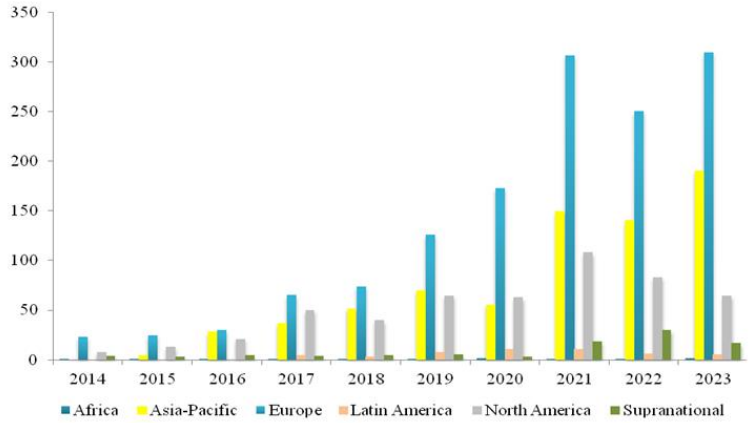
Source: Climate Bonds Initiative (2025), https://www.climatebonds.net/market/data/

[75] Kovačević, V., Janković, I., Vasić V., & Ljumović, I. (2023). Does Transparency Pay Off for Green Bonds' Issuers? Evidence From EU State Agencies' Green Bonds. *Economics of Agriculture*, *70*(4), pp. 997-1007.

[76] Janković, I. (2023). Tržište zelenih obveznica – stanje i perspektive. In: *Ekonomska politika u Srbiji i svetu u 2023. godini*, Zec, M., Šoškić, D., Radonjić, O. (eds.), Belgrade: University of Belgrade, Faculty of Economics and Business, pp. 119-129.

Regarding the regional distribution, Europe is the prime issuer in terms of the amounts issued per year, followed by Asia and North America. Figure 4 presents the regional distribution of green bonds' amounts issued in the previous period.

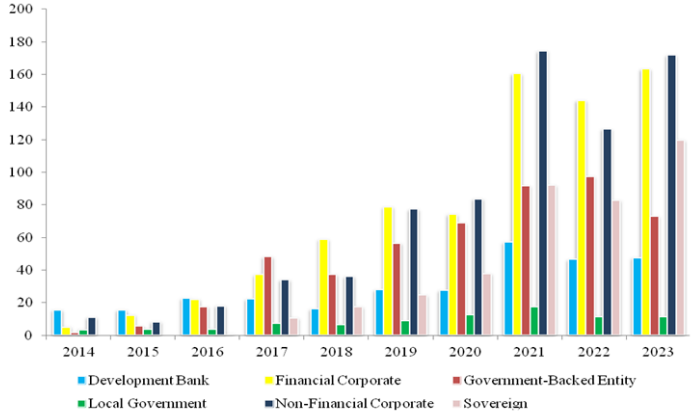
Figure 4. The amount of issued green bonds per region in the period 2014-2023 (in billions of USD)



Source: Climate Bonds Initiative (2025). https://www.climatebonds.net/market/data/

Among different types of issuers, the largest issuers in the last 5 years are non-financial corporations and financial corporations, followed by the government and government-backed entities. Figure 5 depicts the most significant green bond issuers.

Figure 5. Green bonds issued by type of issuer in the period 2014-2023 (in billions of USD)



Source: Climate Bonds Initiative (2025), https://www.climatebonds.net/market/data/

Green bonds help mobilise financial resources from individual and institutional investors and direct them towards projects and ventures that focus on sustainable energy sources, low-emission economies and other environmentally responsible alternatives. At this moment, these financial instruments are issued in more than 50 countries around the world.

Green loans

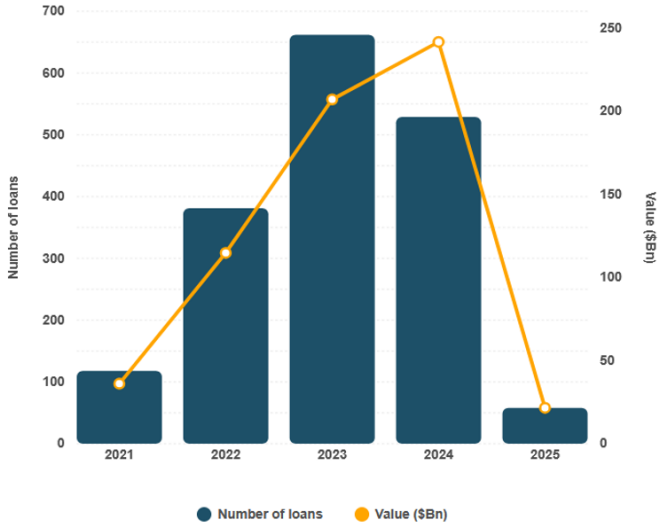
Green loans help individuals, businesses and governments to finance environmentally responsible projects and business ventures. It is a special type of loan according to its purpose, which is essentially twofold. They help finance profitable and environmentally responsible, so-called green projects. As a result, they are often characterised by a lower interest rate compared to similar "non-green" or traditional loans.

Seen from the perspective of the broader population, green loans can help finance the installation of solar panels, the purchase of electric vehicles, the construction of cisterns for rainwater collection, and the like. This encourages a more efficient, sustainable and quality way of living. When it comes to companies that are starting to introduce green practices into their operations, there is often a misconception that this process is necessarily accompanied by higher costs and a negative impact on their profitability. Green loans can help large companies and small and medium-sized enterprises to switch to a sustainable way of doing business and at the same time gain an advantage compared to traditional competitors by signalling to clients, partners and investors that they take into account the wider environmental impact of their activities.

The principles that provide guidelines for structuring green loans, Green Loan Principles, were developed by representatives of leading financial institutions active in the global credit market and aimed at promoting the development and integrity of green loans as a special type of financial instrument. However, in order for these principles to be applied in practice, it is necessary for all markets to have developed standards and a clear taxonomy of green loans in order to avoid abuses in sustainable financing (greenwashing).

Publicly available data on approved green loans are shown in Figure 6. According to Environmental Finance Data, the value of approved green loans in 2024 was USD 855.9 billion.

Figure 6. Number and value (in billions of USD) of approved green loans in the period from 2021 to March 2025



Source: Environmental Finance Data (2025). https://efdata.org/

Green equity

Green bonds are nowadays well-known and have been used for a long time. Green equity is a younger financing vehicle that aims to support the green transition. It attracts green investors to invest in businesses that respect sustainability principles. The green equity designation label is granted to companies that have 50% or more of their revenues and investments that are assessed as green. Companies that operate in the green sector are oriented towards circular economy, recyclable products, usage of renewable resources, protection of the ecosystem, biodiversity preservation, efficient land use and overall positive impact on the environment.

In March 2023, the World Federation of Exchanges published the WFE Green Equity Principles, which is the first global framework that can be used by stock exchanges in establishing green offerings for listed equities.[77]

Broader performances of green equity are followed through specialised green market indices. The following Table 1 presents green equity indices – their definitions and largest constituents.

[77] Sanches, C. (2024). Green Equities: Capital Markets as a Force for Good. *Focus*, https://focus.world-exchanges.org/articles/green-equities-b3

Table 1. Green equity indices

Provider	*Index*	*Partner*	*Green Definition*	*Number of stocks*	*Market capitalization (US$)*	*3 largest holdings*
Dow Jones	DJ Sustainability World	SAM	top 10% in each sector, of the largest 2,500 companies in the base index based on long-term economic, environmental and social criteria	342	9800bn	IBM, GE, Nestle
FTSE	FTSE4Good	Eiris	including environmental and climate change factors	730 (global)	12900bn	Apple, Microsoft, Nestle
	Environmental Opportunities	Impax	environmental business activities, incl. renewable & alternative energy, energy efficiency, water technology, waste & pollution control	475	1593bn	
	Environmental Technology	Impax	green technology, renewable & alternative energy, energy efficiency, water technology and waste & pollution control	50	100bn	Novozymes, Stericycle, Pall Corp
	CDP Carbon Strategy 350 (UK)	CDP, ENDS Carbon	track base index but reduce exposure to carbon risk	<350	Similar to FTSE 350	BP, National Grid, Anglo American
MSCI	MSCI World ESG Index	MSCI / RiskMetrics	best-of-class approach relative to sector peers	790	11700bn	IBM, Procter & Gamble, J & J
	MSCI Global Environmental	KLD	companies derive over 50% of their revenues from products and services in of five environmental themes: alternative energy, clean technology, sustainable water, green building, and pollution prevention.	167	413bn	ABB, Emerson Electric, Schneider Electric
	MSCI Global Climate	KLD	100 leaders in mitigating the causes or the impact of climate change (Renewable Energy, Future Fuels, and Clean Technology & Efficiency); equally weighted	100	2.4bn	Int. Power, Clean Energy Fuels, Owens Corning
S&P	Global Eco		clean energy; water; environmental services/waste management	40	178bn	Waste Management, Danaher, Geberit
	Clean Energy		clean energy producers; clean energy technology & equipment providers	30	60bn	
	S&P U.S. Carbon Efficient	Trucost	track base index whilst reducing exposure to carbon emissions by up to 50%	<375	Similar to S&P 500	Apple, Chevron, Procter&Gamble
	S&P IFCI Carbon Efficient	Trucost	track base index whilst considerably reducing exposure to carbon emissions	>500	Similar to S&P/IFCI LargeMidCap	Samsung, Itau Unibanco, Vale
BNEF	Wilderhill New Energy Global Innovation	WilderHill	innovative technologies and services focus on the generation and use of cleaner energy, conservation, efficiency and the advancement of renewable energy in general	97	187bn	Contact Energy, Verbund, Ormat
HSBC	HSBC Global Climate Change Benchmark		generate revenues, on a supply chain basis, from the provision of goods, products and services directly linked to the industrial shift towards a low carbon economy	342	682bn	Siemens, ABB, Honeywell
	HSBC Investable Climate Change		climate change related revenue is more than 50 per cent of the total revenue of the company	50	147bn	Waste Management, Fortum, EDF
Markit	Markit Carbon Disclosure Leadership	CDP	tracks the performance of companies according to the CDP annual scores	569 (global)	Similar to FTSE All World	Exxon Mobil, Microsoft, J&J
NASDAQ	NASDAQ OMX Green Economy Index	SustainableBusiness.com	13 'green economy' sectors (US)	417	1271bn	Cisco, EMC. ABB

Source: Inderst, G., Kaminker, C., & Stewart, F. (2012). Defining and Measuring Green Investments: Implications for Institutional Investors' Asset Allocations. OECD Working Papers on Finance, Insurance and Private Pensions, No. 24, OECD Publishing, p. 23.

A special form of green equity investing is presented through green funds that collect available financial resources from both individuals and institutions and channel them towards stocks of green-labelled companies. Green equity investments are often supported by public, international and development finance institutions.

IFC published the Approach to Greening Equity in Financial Institutions in September 2020, with a goal to end equity investments in financial institutions that do not have a plan to exclude investments in coal extraction-related activities. This is the first step in reshaping IFC's equity investment portfolio. The approach requires IFC's equity partners to increase climate-related lending to 30% and reduce exposure to coal-related projects to 5% by 2025 and to zero (or near zero) by 2030.[78]

Green equity is also gaining popularity at the Green Climate Fund, the biggest multilateral climate fund. Though equity investments comprise only 7% of the USD 10.2 billion of overall investments in April 2022, the fund management intends to increase its share.[79]

Green insurance

Green insurance aims to encourage sustainable production and consumption by providing lower insurance premiums to actors in the field of green business. At the international level, financial institutions are focusing on insurance services and products that are linked to sustainability. This is especially the case after the publication of the Principles for Sustainable Insurance by UNEPFI, which defines how insurance companies should contribute to the sustainable development agenda by helping them to better and more accurately quantify risks and provide adequate coverage for green projects.

One of the challenges in securing green loans is the absence of clear definitions of what exactly constitutes a specific green product that is financed by a loan. This also makes it difficult to offer an adequate follow-up protection product. One such example is electric cars. Although it is known that electric vehicles pollute the environment to a lesser extent compared to traditional vehicles, they still have a negative environmental impact. Lithium batteries used to power

[78] Geary, K., Schalatek, L., & Brightwell, R. (2022). *Putting people and planet at the heart of green equity.* Washington, DC: The Heinrich Böll Foundation, https://us.boell.org/sites/default/files/2022-04/Green%20Equity%20Updated.pdf, pp. 14-15.

[79] Ibid, p. 10.

electric cars create a significant volume of environmental waste that is difficult to safely dispose of, store or recycle. So, even when we have in front of us the so-called green product, the question arises whether it is completely green. This makes it difficult to offer adequate insurance products and correctly measure the accompanying insurance premium.

At the same time, green insurance is vital to encourage the further development of green products and services, especially in developing countries. Significant exposure to climate risks threatens key sectors in economies that rely heavily on the agricultural sector. The impact of droughts, floods, significant temperature changes, hurricanes and other weather disasters is encouraging an increasing number of agricultural producers to request insurance services for their agricultural plots and crops. Green insurance promotes sustainability in agriculture by offering a variety of customised insurance products and services with an acceptable level of associated premiums.[80] Finally, green insurance encourages companies that generate harmful effects on the environment to internalise the costs of their negative environmental impact, thereby better managing overall negative environmental externalities.

Green grants and donations

Green grants and donations are aimed at encouraging local communities and the private sector to initiate projects that enable reducing the impact or adapting to the negative consequences of climate change, effective management of local natural resources and innovative approaches to environmental protection. Green donations can be offered by the state, philanthropic organisations, private foundations and non-governmental organisations. Green donations are also directed to research centres and universities to encourage research on climate change and sustainable development. This helps to close the financial gap for projects that have a good purpose but are, from a financial point of view, unprofitable, i.e. without return on invested funds.

Examples of institutions operating in this sphere are, for example, Global Greengrants Funds[81], which through a bottom-up approach encourages the involvement of local communities in the implementation of innovative strategies to combat the effects of climate change, as well as the Green Climate Fund

[80] Janković, I. (2023). Green Bonds and Insurance – Complementary Tools to Address Climate-Related Risks. In: *Challenges and Insurance Market's Responses to the Economic Crisis*, Kočović, J. et al. (eds.), Belgrade: University of Belgrade, Faculty of Economics and Business, pp. 215-230.

[81] https://www.greengrants.org/

formed under the auspices of the UNFCCC in 2010, which primarily directs financial aid to the least developed countries.[82]

Green crowdfunding

Crowdfunding is a process in which companies or entrepreneurs collect financial resources for their business activities from a large number of investors, each of whom usually invests a small amount of money without the help of traditional financial intermediaries. The investment may be philanthropic, or a certain return may be expected, which may be financial, social and/or environmental. In the absence of access to traditional financing mechanisms, this form of fundraising can help green business ventures start their operations. In order for the green crowdfunding platforms to be successful in fundraising, they must clearly present the environmental and climate goals of the venture being financed. Also, they differ according to whether they are exclusively donor-oriented or collect funds in the form of equity or in the form of a loan. Investors' expectations about the type and amount of possible return on invested funds also depend on this. Accordingly, green companies must be able to clearly demonstrate the expected financial and environmental returns resulting from their activities in order to attract a greater number of investors.

Crowdfunding platforms certainly carry certain risks. They differ according to the level of management skills and operational standards, and as they become more and more numerous, it becomes difficult for investors to choose a reliable investment alternative.[83] Also, the inflow of funds in such investment alternatives is very volatile and sensitive to economic shocks. Finally, a large number of countries do not have developed regulations covering the field of crowdfunding.

Green venture capital

Green venture capital deals with the financing of projects and business ventures that develop sustainable technologies that ensure environmental protection and combat the negative consequences of climate change. The sectors in which the capital collected in this way is directed include energy, waste management, transport, construction and other related areas. It is about those segments of the mentioned activities that have difficult access to other sources of financing. Green startups focused on new technologies have difficulty obtaining capital

[82] https://www.greenclimate.fund/

[83] Yin, Z., Huang, G., Zhao, R., Wang, S., Shang, W. L., Han, C., & Yang, M. (2024). Information disclosure and funding success of green crowdfunding campaigns: a study on GoFundMe. *Financial Innovation*, *10*(1), p. 147.

from traditional sources of financing due to the high risks associated with this type of investment.

In the last three years, investments in the field of sustainable technologies have made up over 25% of all investments financed by venture capital. The transport sector, which accounts for about 20% of all emissions of harmful gases at the global level, accounts for over 60% of all investments in the field of green technologies. On the other hand, sectors such as sustainable agriculture, construction and industry do not have enough financial resources to green their production processes. Directing financial resources to these areas would speed up the process of reducing harmful gas emissions, while all pioneers in the area would gain comparative advantages both in terms of achieving the set environmental and financial goals.

State interventions can contribute to increasing investor confidence in the field of green entrepreneurial investment. Traditional government subsidy schemes in many countries still favour traditional sectors of the economy, while the absence of tax incentives for green startups may signal a low commitment to environmental and climate issues. All of the above often discourages environmental investment activities supported by venture capital. The absence of regulatory frameworks for green investments in the markets of a significant number of countries creates uncertainty for large institutional investors as well. In order to encourage green entrepreneurial investment, it is necessary to define a set of standards that define what green sectors are and to ensure stable capital flows to these sectors so that financed projects are essentially sustainable. On the other hand, there are markets, such as the USA and China, which are characterised by tax breaks and credits for companies that are focused on green economic areas.

Carbon credits and carbon offsets

At the climate change summit in Glasgow COP26 in 2021, the participating countries agreed on the creation of a global market for carbon credits. One carbon credit allows a specific company to emit up to one ton of carbon dioxide into the atmosphere. Based on the efforts made to make their operations more environmentally responsible and external verifications, companies are awarded a certain number of carbon credits that enable a limited amount of environmental pollution. Companies can sell unused carbon credits and use the collected funds to additionally finance environmentally sustainable activities. The supply of loans decreases every year, encouraging companies to reduce the level of harmful gas emissions and adapt their operations to environmentally friendly patterns.

The instrument called carbon offset refers to the removal/storage of up to one ton of already emitted harmful gases from the atmosphere. The goal of the carbon offset is to cancel out part of carbon dioxide emissions through funding of projects such as tree planting or investments in renewable energy. They help reduce the carbon footprint, having in mind that some emissions are at the moment unavoidable.

Table 2. Characteristics of carbon credits and carbon offsets

Carbon credits	Carbon offsets
• They can be traded by large companies and countries • They enable the emission of up to one ton of carbon dioxide per one credit • Trading is regulated and supervised by the state	• Available to individuals, small and large businesses • They support projects that remove harmful gases already emitted into the atmosphere • Trading on a voluntary basis

Source: Author's presentation

The market of the mentioned carbon instruments provides an opportunity for developing countries to improve their socio-economic development in the process of transition to a sustainable economy.

3. FUTURE STEPS IN THE DEVELOPMENT OF GREEN FINANCE UNIVERSE

Adequate regulatory support is of key importance for the development of green forms of financing and the transition of both the public and private sectors towards sustainable development. The set of necessary steps includes, among others, the following.

The first step involves increasing the state's fight against climate change and the development of specific policies and strategies that are dedicated to achieving specific environmental goals. The existence of developed green policies, strategies and action plans broadcasts a message to the investment public that a specific country is committed to long-term sustainable development. Concrete financial support in the form of tax exemptions, donations and subsidies for ecologically sustainable investments increases the confidence of investors and can result in the growth of green investments.

The second step refers to the development of classification systems, the so-called green taxonomy, which clearly defines what makes a product and service green and sustainable. This type of classification at the national and international level makes it easier for regulators, companies and investors to adequately and uniformly assess the environmental impact of business activities and investments. In financial markets, the developed green taxonomy reduces the level of information asymmetry and encourages investors to invest available surpluses in undeniably green projects and initiatives. Companies become aware of the concrete environmental impact they generate with their operations and possible permitted alternative courses of action. Green taxonomy reduces the risk of abuse in the financing and investment process. It encourages standardisation in the process of reporting on the environmental impact of business and thus enables investors to make an informed decision about investing funds.

The third step refers to the connection of individual markets with the international market of carbon financial instruments that contributes to a more effective reduction of harmful gas emissions and the harmonisation of prices of carbon instruments among different jurisdictions. In order to achieve this kind of integration, international cooperation and standardisation of permitted levels of harmful emissions, as well as adequate supervision of the process, are necessary.

Finally, in countries that issue green bonds, it is desirable to include them in the relevant international bond indices, which indirectly verify the quality of the mentioned instruments and attract more international investors to these markets.

4. POLICY ACTIONS IN TIMES OF GEOPOLITICAL SHIFTS

Policymakers are obliged to create a regulatory landscape that promotes green finance. That includes creating green finance policies and encouraging investments in environmentally friendly and socially responsible projects. These policies should be followed by incentives that support green finance initiatives in the financial sector. They should develop policies that result in reduced emissions, encouraging companies to reduce their carbon footprint.

Policymakers should create tools and frameworks for the assessment and mitigation of risks, making financial systems resilient to environmental shocks,

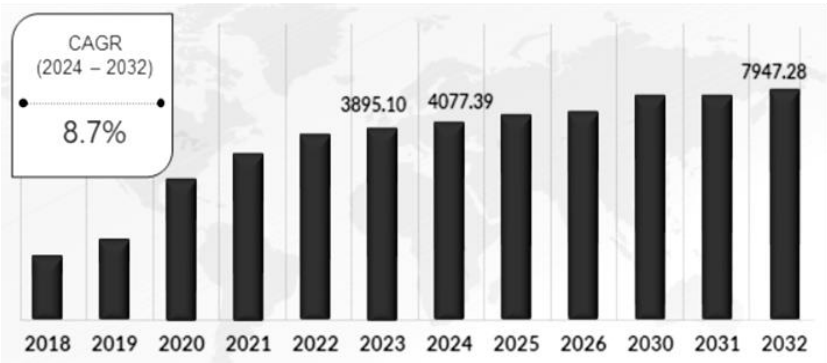
particularly climate change. They should promote the development and adoption of sustainable technologies.[84]

Understanding how the latest geopolitical factors impact the green universe on the global, regional and local levels is of tremendous importance. Policymakers should customise green finance policies to address the specific needs and challenges of each concrete geographical area.

5. THE FUTURE OF GREEN FINANCING

According to the latest forecasts, the green finance market is expected to grow at a rate of approximately 8.7% p.a. in the forecast period (2024-2032), reaching the value of USD 7.95 trillion by 2032 (please see Figure 7).[85]

Figure 7. The green finance market size in the period 2018-2032 (in USD billions)



Source: Dhapte (2025), op. cit.

Key challenges the green finance market is still facing include the lack of standardisation, often limited data availability and high transaction costs. On the other hand, key opportunities are seen in increasing government support, growing demand for sustainable investments and technological advancements.

Latest trends in the green finance market indicate a shift towards integrated sustainability reporting, the development of green Fintech solutions, and rising

[84] Fu, C., Lu, L., & Pirabi, M. (2024). Advancing green finance: a review of climate change and decarbonization. *DESD, 2*(1), https://doi.org/10.1007/s44265-023-00026-x, pp. 5-6.

[85] Dhapte. A. (2025). Green Finance Market. *Market Research Future*, https://www.marketresearchfuture.com/reports/green-finance-market-24469

cooperation between financial institutions and non-governmental organisations to promote sustainable finance strategies and actions. Through a focus on these emerging trends, market participants and stakeholders can capitalise on the growing demand for green finance instruments, contributing to a more sustainable financial world.