



European Union policy on financing eco-innovations in the transition to a green economy

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Abstract

The purpose of the article is to identify the systemic interconnections of the main elements of the policy of financing green transformation and eco-innovation in the European Union EU, highlighting the main challenges and further strategic directions of development. EU policy in the field of green economy and innovation has been studied. Identified core economic systems for «green» finance. The policy of stimulation of eco-innovative activity in the EU and primary financing programs are considered. A scheme of the system of sustainable finance and eco-innovation in the EU has been elaborated, and the direct relations between the elements of this system have been clarified. The methodological basis of the article are the fundamental provisions of economic science, the theory of green finance and innovative development. Dialectical, systematic, logical and historical methods of scientific knowledge were used. The conclusions demonstrate the urgent need for a green transformation and the importance of developing a policy for financing eco-innovation activities in the EU.

Keywords: green economy; innovation summary index; eco-innovations; EU green policy; eco-innovation policy infrastructure.

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Política de la Unión Europea sobre la financiación de innovaciones ecológicas en la transición a una economía verde

Resumen

El propósito del artículo es identificar las interconexiones sistémicas de los principales elementos de la política de financiación de la transformación ecológica y la ecoinnovación en la Unión Europea UE, destacando los principales desafíos y las direcciones estratégicas de desarrollo adicionales. Se ha estudiado la política de la UE en el campo de la economía verde y la innovación. Sistemas económicos centrales identificados para las finanzas «verdes». Se considera la política de estímulo de la actividad ecoinnovadora en la UE y los programas de financiación primaria. Se ha elaborado un esquema del sistema de finanzas sostenibles y ecoinnovación en la UE, y se han aclarado las relaciones directas entre los elementos de este sistema. La base metodológica del artículo son las disposiciones fundamentales de la ciencia económica, la teoría del financiamiento verde y el desarrollo innovador. Se utilizaron métodos dialécticos, sistemáticos, lógicos e históricos del conocimiento científico. En las conclusiones se demuestra la necesidad urgente de una transformación verde y la importancia de desarrollar una política para financiar actividades de ecoinnovación en la UE.

Palabras clave: economía verde; índice resumen de innovación; ecoinnovaciones; política ecológica de la UE; infraestructura de la política de ecoinnovación.

Introduction

In the modern world, a radical reassessment of values has taken place, and in the near future, money or GDP will not be a measure of a country's economic power or prosperity. By adopting the 2030 Agenda, the international community recognised that current consumption and production patterns are unsustainable and that there is a need for a systematic change in consumption and production patterns.

More important for long-term development is the integration of ESG into public policy, the transition to a sustainable business model through sustainable financing, the formation of a green economy, and the development of a knowledge economy. According to the UN Environment Program, eco-innovations actively contribute to separating economic growth from resource consumption and help achieve sustainable development goals. Also, implementing a green economy reduces negative externalities and maximises social value through ESG-related activities, which must consider the needs of all participants (shareholders, consumers, customers) (IFC, 2021).

Climate policy is most developed in the EU, one of the world's first to create regulations and goals to transition to a green economy. The EU implements a permanent collection of environmental data and monitoring indicators and develops relationships and mobility in the institutional sphere at the local, national, and international levels (Oleksenko *et al.*, 2021; Gulac *et al.*, 2022a). European institutional and political support includes the development of climate legislation, consolidation of climate neutrality and reduction of CO₂ emissions in all types of economic activity, increasing the involvement of citizens, society and businesses to participate in climate measures.

The EU's main ambitious goal is to become the first climate-neutral economic union by 2050 and develop measures to implement the UN's sustainable development goals by including them in all its policies. The EU's ambitious goals contribute to a rapid transformation to a green economy. To achieve this, it is necessary to transform state institutions and the economy and increase funding.

The green finance market has excellent growth potential, as the demand for eco-innovation and financing of global sustainable development will grow, especially in such sectors as energy, construction, infrastructure, water supply. However, compared to the serious environmental problems and energy shortages that Europe already faces, the supply of green finance remains very scarce, and the financial resources invested in green sectors still cannot meet the demand. Between now and 2030, both developed and developing countries must actively develop green finance (Li and Shen, 2022).

One of the important and priority measures is the development of a sustainable financing policy, especially for eco-innovative activities (Trusova *et al.*, 2021). The main directions of eco-innovation financing policy are the development of institutional financing mechanisms and the support of the environmental, social and sustainable development (GSS) bond market as effective instruments for financing green projects for both the public and private sectors.

1. Objectives

The purpose of the article is to justify the need to increase financing of the green economy and eco-innovations. Study of the policy of financing eco-innovations in the EU and its components. Determining the main challenges and obstacles of financing the green economy and outlining further promising directions for the development of financing sustainable development and innovative activities in the EU.

2. Materials and methods

The article used analytical articles and studies of world economic organizations: the World Bank, the IMF, United Nations and others. Analytical reviews and studies of economic associations and the European Commission were used. The main research methods were scientific abstraction, logical generalization when determining the need for financing and supporting green transformation and eco-innovation activities; graphical method for visual reflection of trends in financing innovative activities and R&D; analytical method for determining the components of the policy of financing eco-innovation activities and their interrelationships; economic-statistical and comparative - for assessing the state of financing of the green economy in the EU; a visual reflection of the sustainable finance and eco-innovation system in the EU; situational analysis to identify problems of financing eco-innovation activities.

System-structural analysis - for the development of a conceptual model of green economy financing, a theoretical model of network partnership in the formation of alliances and relationships, a structural-logical scheme of the formation of the main elements of the green transformation financing policy; complex empirical and applied analysis - to determine directions, conditions, mechanisms of financial support for green transformation and development of eco-innovations

3. Results and discussion

A new EU growth strategy aimed at a sustainable, prosperous and fair society was launched with the European Green Deal. Which sets out the transformation of the EU into a resource-efficient and competitive economy with no net greenhouse gas emissions in 2050 and where economic growth will not be linked to the use of resources. Europe has set ambitious plans to become the first climate-neutral continent by 2050. Based on the European Green Deal, the «Climate Target Plan 2030» was developed, which increased climate ambitions and commitments to reduce net emissions by at least 55% in a responsible manner by 2030 (The European green deal investment plan and just transition mechanism explained, 2020).

The implementation of such ambitious EU plans means the need to increase the contribution of all sectors and increase funding. To achieve the goals set by the European Green Deal, the European Commission plans to mobilize at least €1 trillion in sustainable investment over the next decade, or 30% of the EU's multiannual budget (2021-2028). The necessity and value of the European Green Deal has only increased in the light of very serious geopolitical events in Europe, which threaten the social and economic well-being of EU citizens.

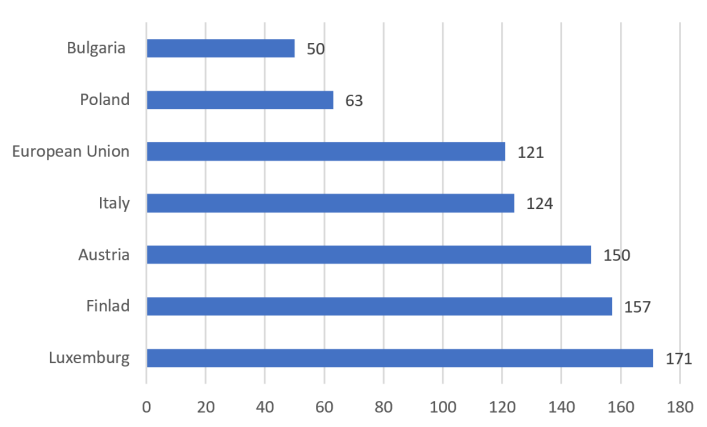
Eco-innovations are becoming one of the main priorities of EU policy in almost all types of economic activity. At the level of the countries and in the EU, it is necessary to evaluate and define the promising social, economic and environmental dimensions of developing the eco-innovation strategy (Gulac *et al.*, 2022b). The new economy that is being formed is not only an economy of knowledge and human capital but also of conscious and responsible behaviour for the consequences that future generations may feel.

The development of the green economy should be carried out in three dimensions: green innovations, sustainable and inclusive development. What determines the development of the main factors (World Bank, 2021):

- investments in human capital;
- preservation of nature and increase of social capital;
- implementation of macroeconomic and structural policy;
- development of institutions for innovative activity and economic transformation;
- capital mobilisation and attraction of private investments to finance eco-innovations (European Commission, 2021a).

Today, innovation policy is one of the main policies of the European Union, as technological progress is one of the main drivers of economic development. As of 2021, the prominent leaders of eco-innovations in Europe are: Luxembourg, Finland, Austria, Denmark, Sweden, Germany, France, Spain and the Netherlands. Average Eco-Innovation indicators include: Italy, Portugal, Slovenia, Czech Republic, Ireland, Belgium, Greece, Estonia and Latvia. The following countries were included in the “Catching up eco-innovations” category: Lithuania, Croatia, Slovakia, Cyprus, Romania, Poland and Bulgaria.

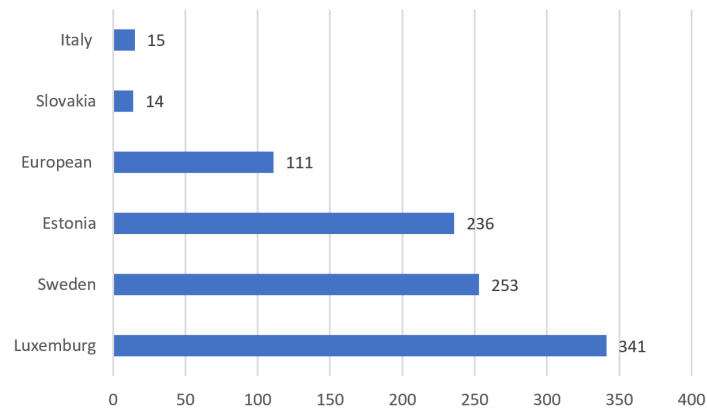
Figure No. 1: Eco-innovation index (2021).



Source: (European Commission, 2022a).

Despite the established policy of sustainable financing, EU countries differ significantly in the amount of financing of eco-innovation activities. Total value of green early stage investment (per capita) is highly differentiated between countries from 14 (Slovakia) to Luxembourg with an indicator of 341 (a 24-fold difference).

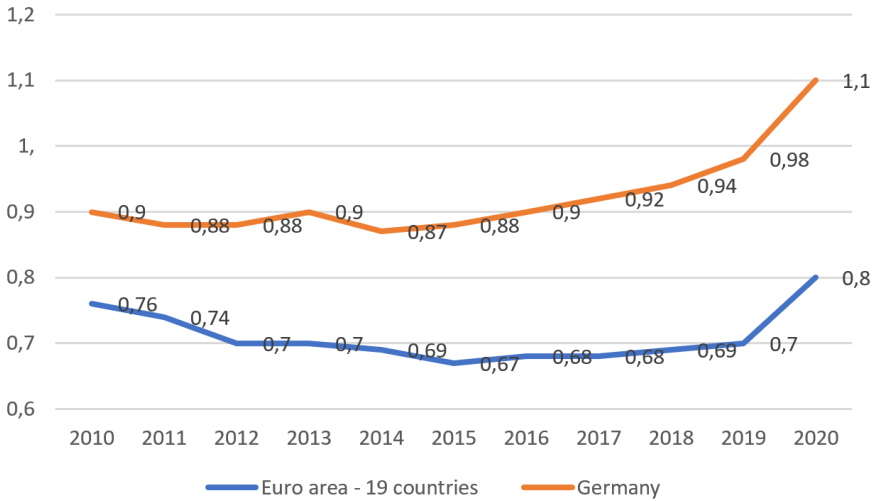
Figure No. 2. Eco-innovation index. Total value of green early-stage investment (per capita)



Source: (European Commission, 2022a).

Total government budget allocations for R&D. The percentage of gross domestic product (GDP) on average across EU countries is 0.8. In general, there is a close direct relationship between a country’s economic development and the share of its R&D expenditures.

Figure No. 3. Total government budget allocations for R&D. Percentage of gross domestic product (GDP).



Source: (Eurostat, 2022a).

Total government budget allocations for R&D euro per inhabitant in the EU was 264.9 Euros in 2020 and had a tendency to grow every year, the most developed countries spend about 2 times more on R&D than the EU average (for example, Germany spends 519, 2 euros). Also, increasing the share of the public sector in the R&D financing structure has a positive effect on the efficiency of the R&D sector. Ensuring competitiveness in the R&D sector in the EU is the main goal.

On the one hand, there should be enough funding and support for R&D; on the other hand, it is advisable to ensure effective communication between science and the real sector of the economy, to ensure the effective use of R&D in practice. In the last decade, highly developed countries have significantly increased the share of scientific work in total employment and the number of scientific workers. In the EU, human resources for the development of innovation and cooperation should be strengthened, thus creating even more space for innovation processes (Eurostat, 2022a).

Due to the planned increase in the EU's 2030 greenhouse gas reduction targets, as announced in the European Green Plan, investment needs will continue to grow. There is already a significant increase in the number of eco-technologies. Environment-related technologies accounted for 12% Percentage of all technologies in 2019 (Euro-19), which is 47% more than the level of 2000 (OECD, 2021a).

Achieving the existing climate and energy targets by 2030 requires an additional investment of €260 billion per year. This figure mainly includes investments related to energy, buildings and partially the transport sector. Therefore, it is necessary to maintain the continuity of investment flows in these areas, and especially to ensure the financing of eco-innovation activities.

For the development of sustainable green financing, it is advisable to form a favorable policy, which includes: the policy of regulation of green financing; strategic plans for climate change mitigation and adaptation; green taxonomy; dissemination of ESG best practices; implementation of climate stress testing for enterprises of various sectors and financial institutions; regulation of environmental emissions; development of information disclosure platforms and changes in financial reporting standards; development and implementation of new financial instruments and products for green financing. The main economic systems that need to be financed for climate transformation are: climate-smart agriculture; green buildings and cities; development of renewable energy sources; distributed generation; energy efficiency; water supply and sewage systems; waste management; development of the circular economy; transport infrastructure and mobility (European Commission, 2021a).

The financing of innovative activities has its own specificity due to the high risk of innovation failures and high development costs, which necessitates the development of a policy to stimulate the introduction of eco-innovations, especially in small and medium-sized enterprises. (Oleksenko *et al.*, 2022).

Also, environmental regulation and a developed institutional environment stimulate enterprises to reawaken eco-innovations, formulate and implement environmental protection strategies. It is important to measure the degree of policy implementation to assess the achievement of established strategies and to monitor and control the established goals of the strategies. The main problem of such actions is the correct selection of relevant indicators. An important challenge and a necessary development factor is the motivation of the business sector to invest in environmental innovations.

It is desirable for the international community to encourage politicians to take action to create new legislative frameworks to support investments

in eco-innovation, develop new financial schemes to support the private sector in investing in eco-innovations, and new programs for society to encourage local communities to participate in eco-actions (Jesic *et al.*, 2021).

Achieving the goals of sustainable development is possible only through the implementation of eco-innovations, introducing the best possible conditions for the implementation of innovations. The introduction of the innovation principle means that in the future, when the EU Commission develops new initiatives, it will take into account the impact on innovation. This principle ensures that innovation is supported in all new EU policies and regulations, and the legislative framework will facilitate innovation (European Commission, 2019).

EU Cohesion Policy helps EU countries, regions, local governments and cities make major investments that contribute to the European Green Deal. They must dedicate at least 30% of what they receive from the European Regional Development Fund to these priorities. The European Commission has adopted a series of measures to make the EU's climate, energy, transport and tax policies fit to reduce net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels (European Commission, 2021b).

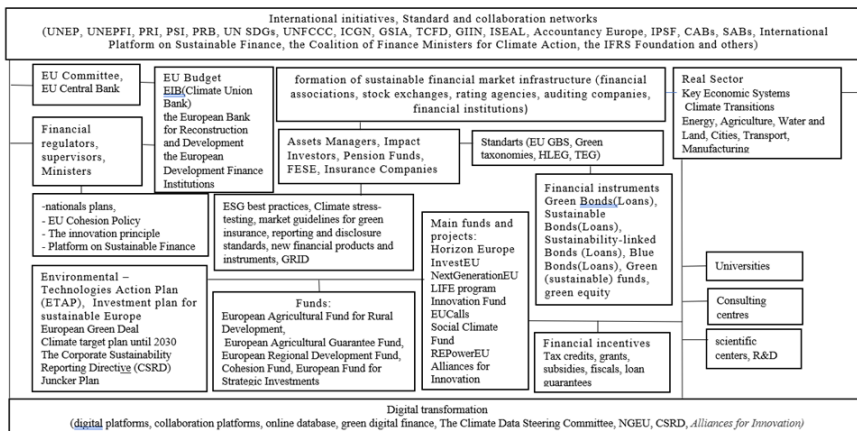
In general, the financial market is of great importance for financing climate resilience. Eco-innovation financing tools are classified into own resources, financial resources of institutions (bank loans, private equity financing, venture capital), can be divided into external and internal financing, state financing, and financing of international organizations. The formation of financial market infrastructure is important for financing eco-innovations: financial regulators at the national and regional level, supervisory bodies, associations, stock exchanges, rating agencies, auditing companies, financial institutions (IFC, 2021).

The main elements and their relationship of the sustainable finance and eco-innovation system in EU are shown in the Figure 4. In more detail, the main parts of the sustainable finance and eco-innovation system in EU are studied later.

The investment plan for a sustainable Europe envisages EU spending aimed at combating climate and environmental policy. In addition, the European Investment Bank intends to increase the share of financing measures for climate protection and environmental sustainability to 50% of the total volume of operations in 2025. Gradually financing the green economy, it will transform into the Climate Union Bank. The long-term EU budget covers seven years from 2021 to 2027 and will invest heavily in climate and environment-related objectives. The EU Commission has offered 25% of the total to promote climate action and environmental spending under several programs (e.g. European Agricultural Fund for

Rural Development, European Agricultural Guarantee Fund, European Regional Development Fund, Cohesion Fund, Horizon Europe and Life Funds) (The European Green Deal Investment Plan And Just Transition Mechanism Explained, 2020).

Figure No. 4. The sustainable finance and eco-innovation system in EU.



Source: own research based on (World Bank, 2021; IFC, 2021)

EU support for eco-innovation has never been greater. The following effective programs with EU funding for green projects have been developed in the EU:

- **Social Climate Fund.** It is planned that a part of the proceeds from emissions trading for buildings and road transport will go to the Fund. The fund aims to mitigate the impact of the new carbon pricing and will provide funding to member states to support their policies to address social impacts (EUR-Lex, 2021).
- **Horizon Europe** —with a budget of more than 95.5 billion euros for European research and innovation, it is the largest and most important European funding program for green innovation. In cooperation with other EU programs, Horizon Europe is a key factor in attracting national public and private investments. A new wave of scientific and innovative partnerships is planned as part of Horizon Europe. It is the development of partnerships that will help bring about the huge environmental, social and economic changes required by the European Green Deal.

- InvestEU has plans to attract additional private investments with EU budget guarantees. InvestEU will attract around €279 billion of climate and environment-related private and public investment between 2021 and 2030 (European Union, 2022). The program is based on the Juncker Plan Investment for Europe model. Which combines the European Fund for Strategic Investments and EU financial instruments. It is also planned to create, within the framework of the program, a consulting centre and an easily accessible database that corresponds to the projects of potential investors around the world (European Commission, 2022b).
- The LIFE program is a European funding program dedicated to financing environmental, climate and clean energy goals. The allocated budget for financing EU environmental projects is approximately 5.4 billion euros.
- The Innovation Fund (IF), funded by the EU Emissions Trading System, provides EU funding of up to €10 billion by 2030 for environmental projects contributing to the reduction of greenhouse gases.
- The EUcalls platform was also created to find EU funding for environmental projects. The purpose of the project is to ensure the search process for European tenders for environmental projects, as well as to establish connections with reliable and experienced project partners with whom it is possible to cooperate and form consortia.
- In the plan to recover the EU from the adverse effects of COVID-19 - NextGenerationEU is provided with an additional budget of 750 billion euros to increase investments in important digital and sustainable innovations EU intends to raise 30% of funds within the framework of the NGEU through the issuance of green bonds (EUcalls, 2022a).

An important step was the introduction of the EU taxonomy, which is a classification system that establishes a list of environmentally sustainable types of economic activity. This helps the EU increase sustainable investment and implement the European Green Deal. The EU taxonomy provides companies, investors and policy-makers with relevant definitions by which economic activities can be considered environmentally sustainable.

Thus, it creates security for investors, protects private investors from «green» laundering, helps companies with the transition to green technologies, mitigates market fragmentation and attracts investments. The taxonomy regulation was published on June 22, 2020 and entered into force on July 12, 2020 (European Commission, 2019b).

The banking sector has a significant impact on green finance. It is expedient for banking institutions to develop a strategic green vision, green obligations; implement the organization and culture in accordance with the values of the green economy; to expand the offer of green products; improve climate and ESG risk management mechanisms; develop green digital finance and engage stakeholders.

The policy of green lending has a significant and positive impact on the implementation of environmental innovations by enterprises. Currently, banks provide a wide range of services related to the financing of the green economy: assessment of environmental risks, provision of «green loans», issuance of green bonds, implementation of green ratings, green insurance, environmental stress testing.

One of the most effective financing tools are green bonds, which have been developed specifically to support climate and environmental projects. The green bond market is a dynamic and rapidly growing market. Regulators are also looking at the green bond market as one of the main financing tools for the green economy.

The establishment of «green bond» standards goes in this direction with the aim of making it easier for investors and companies to identify sustainable investments and ensure confidence. The EU Green Bond Standard (EU GBS) is based on the European taxonomy. Europe was the first region to issue the first green bonds in 2007, with the European Investment Bank as the main first bank in this market.

Nowadays, the EIB remains the largest supranational issuer and leads the application of the EU taxonomy and the EU GBS, spreading EU standards around the world. In the developed Climate Bank Roadmap for 2021-2025, the EIB commits to gradually align CABs and Sustainability Awareness Bonds (SABs) with the proposed EU GBS.

Organizations that certify green bonds seek to reassure investors that their certification standards are transparent and based on scientific criteria. Thus, certified bonds tend to be more attractive to a wider range of socially responsible investors. Some regulators are proposing to supplement the sustainability standard by including social and governance factors. The European Central Bank (ECB) on 5 November 2021 proposes to assess and monitor over time the attractiveness of EU GBS compared to market standards.

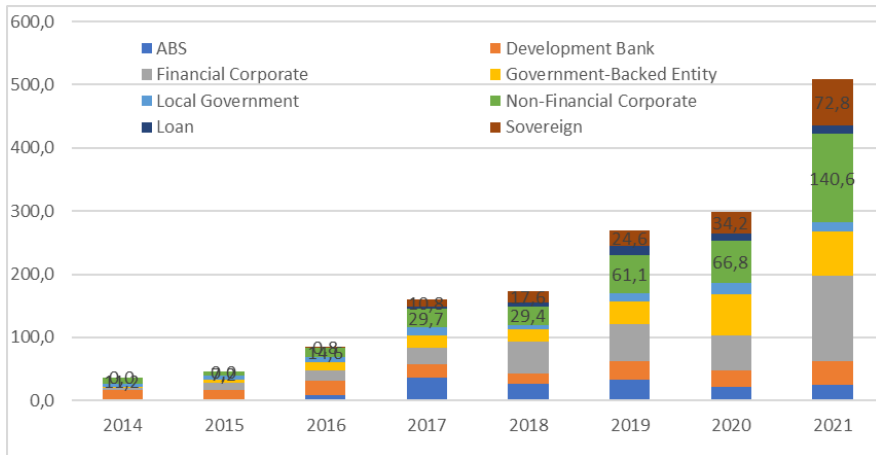
At the same time, it is important to identify problematic points for both investors and issuers when issuing green bonds. For investors, the main challenges are the determination of truly green investments and obtaining complete information. For issuers, this can be additional costs and potential risks.

The main obstacles to the development of green bonds are: 1. the need to reach an agreement on the joint definition of environmental projects and environmental bonds and their assessment methodology; 2. complex procedures for reviewing and evaluating green bonds. 3. the difficulty of financing green projects and their small number. In general, the green bond market also has potential risks that must be leveled at the expense of the right policy: potential possible «green washing»; heterogeneity and lack of transparency; insufficient number of green bonds, demand exceeds supply; the need to increase investment in important projects (Green Finance & Development center, 2022).

Currently, there are the following types of bonds (loans) that are used for sustainable development: green bonds/loans; bonds/loans related to sustainable development; blue bonds/loans; transitional financing; green/sustainable funds; green structured financing; green capital

Climate and sustainable bonds occupy a larger share in the financing structure of the green economy, the volume of which has a steady upward trend. In 2021, annual green bond issuance surpassed the half-trillion mark for the first time, amounting to US\$522.7 billion, a 75% increase over 2020 (Climate Bonds Initiative, 2022).

Figure No. 5. Climate Bonds by Insure type



Source: (Climate Bonds Initiative, 2022).

Green bonds issued the most in Europe, while the Asia-Pacific region had the largest annual growth (129%). The US is the leader in terms of

emissions, while China is the second largest emitter (\$199 billion). Most of the issue is carried out at the expense of Non Financial corporate and Financial corporate (Climate Bonds Initiative, 2022).

With a large-scale green bond issuance program, the EU is demonstrating confidence in the green bond market as an effective source of financing for the green economy. But it is especially important to support the green transformation of small and medium-sized companies. Among professional associations in the EU, there is no consensus on the implementation of standards and their obligation for such enterprises.

The Federation of European Securities Exchanges (FESE) recommends the implementation of special benefits and incentives to facilitate the issuance of EuGB by small and medium-sized enterprises, and emphasizes the importance of having a standard compatible with other taxonomies and international frameworks. Together with the European Banking Federation (EBF), the EU supports the proposal to introduce a voluntary GBS.

Accountancy Europe supports the EU's mandatory GBS and recommends the creation of a centralized European accreditation system for external assessment, building on existing national schemes and processes. The organization also puts forward proposals for reporting on actual environmental impact on a regular basis and proposes the creation of independent third-party assurance on distribution and environmental reporting with the development of standards for sustainable development bonds incorporating environmental, social and governance objectives. "Better Finance" believes there should be a degree of flexibility for companies not included in the taxonomy but who want to raise money for specific, effective environmental projects, and offers transitional tax breaks to encourage market development (European Parliament, 2022).

In the coming years, regulatory requirements for disclosure of information about environmental and climate risks will become more stringent. Central banks have already begun to conduct pilot climate stress tests en masse, and they will undoubtedly become more complex in the future. The market for ESG data is also developing and is expected to grow significantly as regulation grows and becomes more complex in the future.

Consulting firm Opimas has set the value of the ESG data market to exceed \$1 billion in 2021 for the first time as demand for ESG data and products continues to grow rapidly. Also, information disclosure is stimulated by such initiatives as: The Corporate Sustainability Reporting Directive (CSRD), a proposal of the US Securities and Exchange Commission (SEC) regarding the disclosure of climate information. This leads to increased sustainability disclosure requirements for investors. ESG disclosure has strong positive relationships with corporate performance, return on assets, and market value components of a company's financial performance (Tolliver *et al.*, 2021).

There is also a global initiative, The Climate Data Steering Committee, which contributes to simplifying access to data, including through the EU's planned European Single Point of Access - a database for sustainable development and financial data. The regulation of ESG rating providers is important, the increase in the amount of data and digital platforms is pushing the use of artificial intelligence for reporting and modelling the development of world events. But the data of the platform should be open and not allow obtaining asymmetric information for market players, stimulate small and medium-sized firms to use this data and implement innovations, reduce barriers to market entry.

According to the NGEU, each country must develop its national investment and reform plans with the mandatory inclusion of the digital transition and environmental initiatives, reduce dependence on fossil fuels, increase energy efficiency and align these plans with the EU taxonomy.

Development of an action plan for sustainable financing is an urgent need. Special attention should be paid to standardization and disclosure of information. To ensure integrity in the market, the High-Level Expert Group on Sustainable Financing (HLEG) was established in 2016. It provided advice on: channeling public and private capital to sustainable investments; determining the role of financial and supervisory bodies in the stability of the financial system in connection with climate risks; development and development of the European Green Policy. Subsequently, the EC convened a Technical Expert Group on Sustainable Finance (TEG).

A digitalization policy in tandem with a flooded policy can have a significant positive synergistic effect. Since it is digitalization that is the main driver of innovative processes and an opportunity to achieve social and environmental sustainability. The implementation of digital solutions can significantly accelerate the transition to a green economy. In addition, it is digitalization that makes innovations more transparent, cross-industry, allows them to be quickly distributed and manage data for the purposes of sustainable development.

There is a positive relationship between public-private partnerships (PPPs) and project finance (PF). PPP and PF approaches are the most important tools for the development of new infrastructure systems and there is a recognized need to develop green resilience infrastructure development carried out on the basis of public-private partnerships. Thus, the introduction of sustainable financing mechanisms will allow to increase eco-innovation projects.

Dialogue and close cooperation between a wide range of stakeholders from the public and private sectors will be critical to achieving the goals of sustainable development. The Platform on Sustainable Finance plays a key role in enabling such collaboration, bringing together the best practices of

the corporate and public sectors in the field of sustainable development, industry, as well as academia, civil society and the financial industry.

IPSF offers a multi-stakeholder forum for dialogue between policymakers responsible for developing regulatory measures for sustainable finance to help investors identify and pursue sustainable investment opportunities that truly contribute to climate and environmental goals (EU Green Bonds, 2022).

Today, the EU is investing more than 1.8 billion euros in 17 large-scale innovative clean technology projects. The Innovation Fund aims to create the right financial incentives for companies and public authorities to invest in the next generation of low-carbon technologies and to give EU companies the first priority to become global technology leaders (European Commission, 2022c).

Developing alliances for innovation is important. The goal of Alliances for Innovation is to develop digital skills that have become a prerequisite for today's labor market. In addition, the twin transitions proposed by the Green Deal require changes in qualifications and curricula to meet the demand for green skills to support sustainable development. To drive innovation, the focus will be on digital skills as they become increasingly important in all occupations across the labor market. In addition, the transition to a circular and greener economy must be supported by changes in qualifications and national education and training programs to meet new professional needs for environmental skills and sustainable development (EUcalls, 2022b).

Conclusion

The transition to a low-carbon economy requires increasing social and political awareness of society regarding the environment. It is important to cooperate with other companies, industries, countries in joint research and development. Innovation today is a very interactive process. Cooperation leads to the expansion of the scope of development projects and increases the company's competence. A strong and reliable system of environmental innovations ensures technological sustainability and the realization of the goals of sustainable development.

It is important to increase the level of knowledge and skills of entrepreneurs regarding eco-innovations with the help of infrastructure, small and medium-sized enterprises need special attention and support (Ruralia institute, 2022). The main trends in the development of the green economy are: 1. gradual abandonment of non-green assets in financial portfolios; 2. increasing the financing of eco-innovations and improving the

mechanisms of adaptation to climate change in all sectors of the economy; 3. reduction of state support for polluting sectors and reorientation towards green energy; 4. financing and supporting ESG information disclosure; 5. harmonization of the taxonomy of green financing with the provision of uninterrupted capital movement (Green Finance & Development center, 2022).

The main challenges for financing eco-innovations in the coming years are: 1. the need to implement new initiatives due to the geopolitical and energy crisis in Europe; 2. improvement of international cooperation between countries for joint developments and financing; 3. development of multilateralism in the spread of eco-innovations and access to digital databases. Sustainable financing helps to achieve sustainable development faster and should become part of financial decision-making at all levels.

The formed green financing policy should support the development of climate-neutral, energy- and resource-efficient and cyclical projects. However, it is necessary to form the infrastructure and develop a policy of financing the transformation to a green economy and eco-innovations (European Commission, 2022d). The role of the state in these processes is only growing and is fundamental because of its ability to mobilize national resources and encourage innovation.

The effective activity of the state should be complemented by the private sector, the financing policy of the green economy should be focused on stimulating investments from the private sector. But it is necessary to ensure the conditions of a stable legal framework and intellectual property rights (World Bank, 2021). It can be noted that the development of eco-innovations is an important factor in the further economic development and one of the drivers of the transition to the knowledge economy.

Eco-innovations generate synergistic effects, solving economic and climate challenges, strengthening connections and establishing a common space between people, countries, economies and the environment. Countries and enterprises realized the need to transition to green resilient infrastructure development based on green innovations. It is this approach that will help make a qualitative leap in development, open new sources of job growth, and increase resilience to shocks.

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