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GREEN BANKING IN THE MECHANISM OF CLIMATE ADAPTATION OF UKRAINE'S ECONOMY

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Abstract. *The purpose of the study is to reveal the role of green banking in the mechanism of climate adaptation of the national economy of Ukraine. The objectives of the article are: to clarify the essence of green banking, to reveal its role in the mechanism of climate adaptation and tools, to get acquainted with foreign experience in the formation and operation of green banks and their regulation. The results of the study showed that the banking sector plays a critical role in supporting a country's adaptation to climate change and enhancing its financial resilience to climate risks. Especially, the role of central banks and financial regulators is key as they have the power to change and control dynamics and landscape of the financial sector. Prospects for further research on this issue are the study of international and European experience in implementing incentives for the green economy, namely a number of fiscal and financial instruments, including such as: green tariffs, CO2 (carbon) tax, environmental taxes, green bonds, etc.*
Keywords: *banks, green banking, green bank models, green financial products and services, legalization and capitalization.*

Introduction. The problem of climate change is one of the key for modern society, which affects its sustainable development, security, determines the ways of further development. In recent decades, changes in the climate system have gone far beyond the scientific problem and affect all sectors of the economy, environment and human life, due to a significant increase in their speed and scale.

The issue was first widely covered in 1979, when the World Meteorological Organization, the United Nations Environment Program, UNESCO and the World Health Organization held the first international conference on climate change. At the beginning of the 21st century, the world community has recognized that climate change is a major global development challenge with potentially serious threats to the global economy and international security due to increased direct and indirect risks related to energy security, food and drinking water, and sustainable livelihoods. ecosystems, risks to human health and life. And even if measures are taken to reduce greenhouse gas emissions, the amount of damage to the global environment and the negative impact on climate processes will continue to grow inertially for a long time. By joining the SDG and the Paris Agreement, Ukraine has declared its commitment to a new trend – the green economy. Banks are emerging as a major force in reaching the UN Sustainable Development Goals (SDGs). By implementing financial instruments to support the green economy, the country has begun to take steps towards green growth: promote renewable energy, implement energy efficiency measures, promote clean technologies in industry and agriculture, develop green construction.

Despite this, domestic state policy in the field of climate change is fragmentary in nature and is seen as part of a purely environmental policy. The formation and further implementation of an integrated state policy in the field of climate change, harmonized with international law, is a difficult task due to the multidisciplinary nature of the problem. This is especially important at the local level, as the region's readiness to withstand or adapt to these impacts can play an important role in exploiting the potential of climate change. Given the ambitious goals of the European Green Deal to achieve climate neutrality by 2050, Ukrainian businesses must now resume production in order to meet strict European requirements for reducing all types of emissions in the future. Given this central banks, supervisors and policymakers started undertaking various green banking initiatives. The banking sector plays a critical role in supporting a country's adaptation to climate change and enhancing its financial resilience to climate risks. Banks can help reduce risks associated with climate change and sustainability, mitigate the impact of these risks, adapt to climate change and support recovery by reallocating financing to climate-sensitive sectors[9].

Analysis of recent research and publications. A significant number of scientific works of foreign and domestic researchers are devoted to the problems of green banking. In particular, the Park and Kim [9] study examines the role of financial regulators and financial institutions in the transition to green banking. Engelen [6] tries to answer the question "how does your choice of bank affect the climate?" Zhang et al. [13] study the mediating effect of green finance. The study by Lalon [7] is devoted to the study of the essence, mechanisms and tools of implementation. In addition, Noh [8] explores financial strategies to accelerate green growth, Tkachenko [11] – stages of development of green banking in Ukraine, Dyma [5] – financial instruments to promote green economy in Ukraine, Prutska [10] – policy NBU on the development of sustainable financing. Alekseev et al. [1] analyzed international practice and prospects for the implementation of financial instruments of social and environmental responsibility in Ukraine, Chen et al. [3] estimated impact of green banking practices on environmental bank efficiency and green finance, and Barua [2] describes the principles of green banking: environmental risk management and sustainability. Noting the significant results of scientific achievements, it should be noted that a number of theoretical and practical issues of green banking in Ukraine need further study and analysis. This applies, first of all, to clarifying the problems of financial support for green investment in Ukraine and substantiation of strategic guidelines for climate adaptation of Ukraine's economy in the context of Russia's military aggression and postwar recovery.

The purpose and objectives of the study. The aim of the study is to reveal the role of green banking in the mechanism of climate adaptation of the national economy of Ukraine. The objectives of the article are: to clarify the essence of green banking, to reveal its role in the mechanism of climate adaptation and tools, to get acquainted

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with foreign experience in the formation and operation of green banks and their regulation.

Methods. In the article the following scientific methods are used: systematization, comparison, generalization, analysis and synthesis. These methods were used to investigate the role of green banking in the mechanism of climate adaptation of the national economy of Ukraine.

Results. The effects of climate change are already visible and will only get worse every year, so in addition to reducing greenhouse gas emissions, we need to adapt to these changes. According to the Intergovernmental Panel on Climate Change (IPCC), our planet will warm by about 3 to 5 degrees Celsius by 2100 if businesses continue to operate as usual. If left unmitigated, extreme weather events could cause hundreds of billions of dollars in damage and lead to the loss of many human lives. This is most true for the world's 60 largest private banks, which, according to a report by Banktrack, funneled a shocking $3.8 trillion into coal, oil, and natural gas projects between 2016 and 2020. The expansion of the fossil fuel industry risks jeopardizing the achievement of the Paris Climate Agreement goals[6]. Climate change adaptation is the adaptation to existing or expected risks posed by climate change. Timely adaptation measures create additional opportunities and reduce the need for funds to eliminate the negative consequences.

The transition of banking institutions from the position of non-interference to the realization of their role in the field of environmental management and social responsibility has become the embodiment of the concept of sustainable development in the banking sector and is called green banking. There is no universally accepted definition of green banking. Most often green banking is defined as financing activities by banking and nonbanking financial institutions with an aim to reduce greenhouse gas emissions and increase the resilience of the society to negative climate change impacts while considering other sustainable development goals such as economic growth, job creation and gender equality[9]. Green banking, also known as socially responsible banking, sustainable banking, and ethical banking, is widely used in academic and business settings and has a variety of meanings. Green banking was first introduced by the Dutch bank, Triodos Bank, in 1980, and later implemented in 2009 by the State of Florida. It can be said that green banking contributes towards the development of sustainable business practices and alleviation of the negative effects of banking activities on the environment through the supply of loans for environmentally favorable initiatives[13].

Green banking is implemented firstly as a mechanism of banking management aimed at reducing environmental damage and costs due to the current operating activities of banks (so-called internal or own green banking), and secondly as a mechanism for providing cash loans resources to stimulate environmental projects, the production of green technologies, environmental goods and services or to develop environmental activities[12, 242]. Five simple ways to get started with sustainable banking shown in Figure 1.

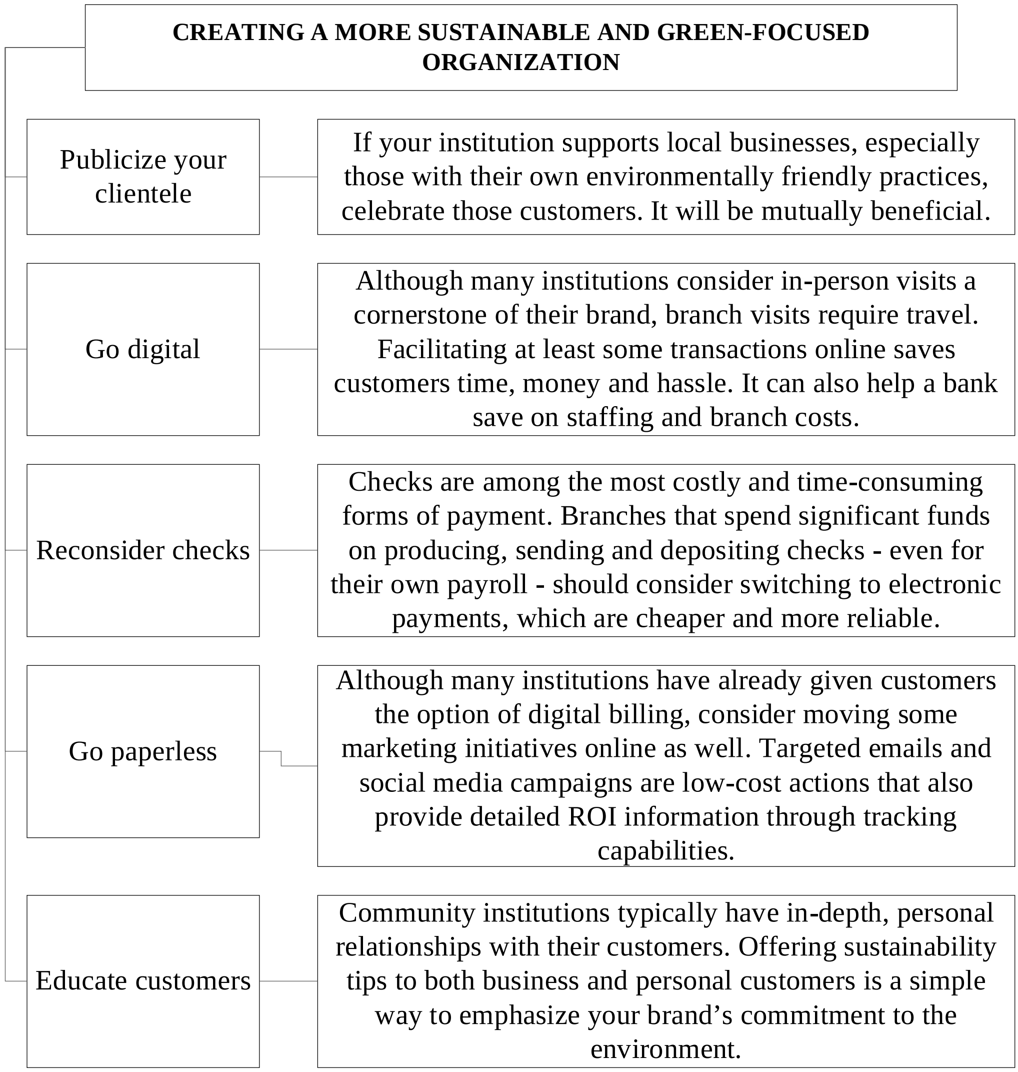

Fig. 1. Directions of creating a sustainable and environmentally friendly bank

Emerging green banking practices across G20 countries can be grouped into two categories: 1) Mainstreaming environmental factors across bank strategy and governance, risk management functions, as well as culture and skills. 2) Mobilizing private capital for green investments, including funding through loan origination and credit provision, retail savings products, as well as intermediation and capital markets activities. The breadth of the green banking agenda is summarised in Table 1 below.

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Table 1

The Breadth of the Green Banking Agenda[7]

#	Function	Mainstreaming	Mobilizing
1	**Credit and Lending**	Ensuring environmental and social due diligence in credit decisions Assessing loan portfolios for emerging environmental and social risks Enhancing the positive performance and impact of lending	Extending green credit to key retail sectors, such as energy efficient housing Extending green credit to a broadening range of commercial sectors, such clean energy, clean transport, green buildings, water and sanitation
2	**Savings**	Reducing environmental impacts of banking operations	Offering green savings products to retail customers
3	**Capital Markets**	Integrating environmental and social risks into investment research, including sell-side equity & credit research	Raising capital through equity market placements and IPOs Raising capital through debt market underwriting of green bonds
4	**Overall**	Monitoring and reporting environmental risks and performance	Tracking and reporting flows of green credit and financing

There are three different types of Green Bank models currently being used: public banks like the US' Clean Energy Finance Corporation (CEFC), whose mission includes investing in clean power projects and cleantech firms, private banks that offer green versions of traditional bank accounts or credit cards – for example, Banca Monte Dei Paschi di Siena which provides loans for solar and wind power, green mortgages or investment in clean technologies – and hybrids that combine the two[7]. Green banks can use an array of financing mechanisms to support clean energy investments for a variety of customers, including businesses, homeowners, institutions, and others. These mechanisms include: loans, co-investment, credit enhancements, bonds, warehousing and securitization (see Fig. 2)

As more green- and climate-related themes have increasingly become mainstreamed in the banking sector and demands by their clients grow, banks started launching dedicated green financial products and services, mostly using and customizing their existing offerings. Currently, green financial products are becoming more and more diverse and can become an opportunity for financial institutions to improve their market share; to increase profit; to create customers' loyalty with new products; to improve employee satisfaction and retention; to enhance their brand image; to catch positive media attention; to improve licenses to operate delivered by governments; and to strengthen relationships and partnerships with external eco-friendly stakeholders[8].

According to Veklych [12, 250], among the green financial products that are most adequate to the economic realities of Ukraine are: preferential lending rates (ie lower than market) to finance environmental projects, production of green technologies, environmental goods and services, purchase of environmentally friendly equipment leasing conditions, as well as to mobilize green private investments (for example, for green construction, which uses environmentally friendly materials, production methods meet environmental construction standards, and electricity and heat supply are provided by energy-saving technologies); extended loan term for financing large-scale infrastructure projects for environmental

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protection, etc., providing loans, credits or other services for the purchase of certificates for emissions of pollutants (trade in certificates for emissions); issue of asset-backed securities to finance large-scale infrastructure projects aimed at environmental protection (issue of green securities); sale by financial institutions of municipal bonds to finance environmental protection projects (partial credit guarantee for the implementation of green projects).

FINANCING MECHANISM TO SUPPORT CLEAN ENERGY INVESTMENT	
Loans	Green banks can facilitate access to market-rate or below market-rate loans. Loans may be senior or subordinated to other capital providers and can help attract private investors by protecting them from a portion of the risk. Revolving loan funds use an initial source of capital to make direct loans to borrowers. As loans are repaid, the proceeds are returned to the fund and become available for additional loans.
Co-investment	Green banks can directly invest in a project alongside a private investor, reducing the investor's financial risk. Green banks can also facilitate participation loans by recruiting multiple lenders to contribute funds toward one combined loan issued by the green bank. In this way, green banks can help other lenders gain experience with clean energy investments.
Credit enhancements	Green banks often use their funds to alleviate some of the perceived risks of loans or investments in clean energy technologies. Examples include offering loan loss reserves and loan guarantees.
Bonds	Green banks can issue bonds, depending on their structure, to capitalize clean energy initiatives. These can include green bonds, environmental impact bonds, and social impact bonds designed to promote clean energy.
Warehousing and securitization	Green banks can use these two techniques to bundle loans and sell them to the private sector.

Fig. 2. Financing mechanisms to support clean energy investments[4]

Because green banks generate demand for clean energy and assist in mobilizing capital for projects to meet that demand, they can create substantial economic benefits at the community level. Green banks also tend to function as "one-stop shops" for lenders, borrowers, energy service providers, and other parties, making collaboration easier. This can lead to robust green economies built around green bank-cultivated partnerships. These partnerships can contribute to local economic benefits, such as job creation[4].

In general, the two main steps involved in establishing a green bank are legalization and capitalization. Legalization is the process by which a green bank is established and made a legal entity. This can involve several types of actions. For example, a local government could use legislative action through a county or municipal governing body to create a new green bank, including as an independent entity separate from government; establish a green bank as a new entity within existing institutional frameworks; or adapt existing entities or funding sources (e.g., revolving loan funds) and repurpose them in the form of a green bank. Local governments can capitalize (provide initial funding for) green banks using public and/or private funds. Green banks may be capitalized with a combination of funds to allow for large infusions of start-up capital and sustained funding sources for longer-term projects.

Green banking as a progressive model allows achieve four effects: increasing the economic efficiency of banks (1); forming the social image of banks (2); reducing the harmful effects on the ecosystem (3) and generating future social benefits (4). (see Fig. 3). In the future, this will contribute to the formation of a sustainable economy.

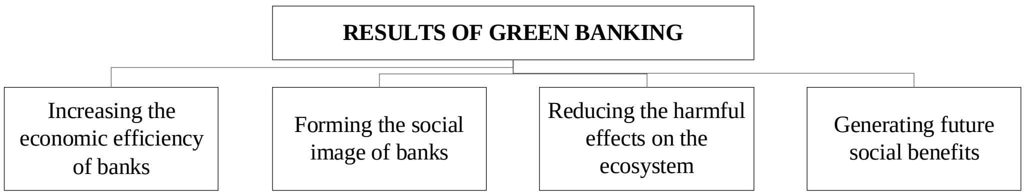

Fig. 3. Results of green banking

The central bank of the country has an important place in the system of institutions that should promote the development of sustainable financing. Central banks' role is imperative in introducing and implementing green banking. Green banking policy instruments can be grouped into four different policy areas which include macro-prudential policy, micro-prudential policy, market-making policy and credit allocation policy. In this regard, on April 16, 2021, a three-year Cooperation Agreement was signed in Kyiv between the National Bank of Ukraine and the International Finance Corporation (IFC), part of the World Bank Group to implement the Sustainable Finance Development Project in Ukraine. The project is aimed at building out sustainable finance in Ukraine by developing green finance standards and integrated environmental, social and management standards. In 2021, the concept of development of environmental, social and governance instruments (ESG) and green finance in Ukraine was developed. The result of the practical implementation of the concept of ESG development and green finance in Ukraine was the approval in November 2021 of the Policy for the Development of Sustainable Finance in Ukraine until 2025 and the Roadmap for its implementation.

Conclusions. The problem of climate change is one of the key for modern society, which affects its sustainable development, security, determines the ways of further development. In recent decades, changes in the climate system have gone far beyond the scientific problem and affect all sectors of the economy, environment and human life, due to a significant increase in their speed and scale.

Policy makers and regulators have been increasingly realizing the importance of adopting green banking policy interventions as a means to transform the financial sector which can immensely contribute towards helping countries meet their climate targets and goals. Especially, the role of central banks and financial regulators is key as they have the power to change and control dynamics and landscape of the financial sector. Prospects for further research on this issue are the study of international experience in mobilizing private capital for green investments, including funding through loan origination and credit provision, retail savings products, as well as intermediation and capital markets activities in the context possibilities of its use for postwar recovery of Ukraine.

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«ЗЕЛЕНИЙ» БАНКІНГ У МЕХАНІЗМІ КЛІМАТИЧНОЇ АДАПТАЦІЇ ЕКОНОМІКИ УКРАЇНИ

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Анотація. Мета дослідження – розкрити роль зеленого банкінгу в механізмі кліматичної адаптації національної економіки України. Завданнями статті є: з'ясувати сутність зеленого банкінгу, розкрити його роль у механізмі кліматичної адаптації та інструментах, ознайомитись із зарубіжним досвідом формування та функціонування зелених банків та їх регулювання. Результати дослідження показали, що банківський сектор відіграє вирішальну роль у підтримці адаптації країни до зміни клімату та підвищенні її фінансової стійкості до кліматичних ризиків. Особливо, роль центральних банків і фінансових регуляторів є ключовою, оскільки вони мають повноваження змінювати та контролювати динаміку та ландшафт фінансового сектору. Перспективами подальших досліджень з цього питання є вивчення міжнародного досвіду мобілізації приватного капіталу для «зеленого» інвестування, включаючи фінансування шляхом залучення позик і надання кредитів, роздрібних заощаджувальних продуктів, а також посередницької діяльності та діяльності на ринках капіталу в контексті оцінки можливості його застосування для післявоєнного відновлення України.

Ключові слова: банки, зелений банкінг, моделі зеленого банку, зелені фінансові продукти та послуги, легалізація та капіталізація.

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