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EUROPEAN EXPERIENCE IN FINANCING THE CIRCULAR ECONOMY AND OPPORTUNITIES FOR ITS USE IN UKRAINE

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Strapchuk S. I., Moroz S. G., Strapchuk O. D. European Experience in Financing the Circular Economy and Opportunities for Its Use in Ukraine

The paper discusses the European experience in financing the circular economy and explores opportunities for its implementation in Ukraine. The importance of effective policy strategies and appropriate instruments at different levels and among different stakeholder groups is highlighted. The development of circular economy policy is recommended to be based on international experience, particularly the approaches used by the European Union. The European Union's active development and implementation of policies for a circular economy, aimed at optimizing resource use through material and product recovery and reuse to reduce waste and ensure production sustainability, are outlined. The challenges posed by climate change and resource use are emphasized, and the need for joint efforts and cooperation with other countries and international organizations is highlighted. The European Green Deal and various strategies, plans, and projects associated with the circular economy are presented. The financial resources needed for emission reduction measures under the European Investment Plan and the various funds designed to finance economic activities contributing to the transition to sustainable goals are detailed. Furthermore, the paper provides insights into Ukraine's regulatory documents related to the circular economy, including the Strategy for Environmental Safety and Climate Change Adaptation until 2030, the Low-Carbon Development Strategy of Ukraine until 2050, and various laws and resolutions related to waste management, environmental protection, and sustainable development goals. The importance of aligning Ukraine's environmental laws with those of the European Union is highlighted.

Keywords: European Union, financing, circular economy, policy resource, use waste, reducing the impact of climate change, European Green Deal, European Investment Plan.

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Страпчук С. І., Мороз С. Г., Страпчук О. Д. Європейський досвід фінансування циркулярної економіки та можливості його використання в Україні

У статті розглядається європейський досвід фінансування циркулярної економіки та досліджуються можливості його впровадження в Україні. Підкреслюється важливість ефективних політичних стратегій і відповідних інструментів на різних рівнях і серед різних груп зацікавлених сторін. Розробку політики циркулярної економіки рекомендується ґрунтувати на міжнародному досвіді, зокрема на підходах Європейського Союзу. Окреслено активну розробку та впровадження політики Європейського Союзу для економіки замкнутого циклу, спрямованої на оптимізацію використання ресурсів шляхом відновлення та повторного використання матеріалів і продуктів для зменшення відходів і забезпечення сталості виробництва. Наголошується на викликах, пов'язаних зі зміною клімату та використанням ресурсів; підкреслено необхідність спільних зусиль і співпраці з іншими країнами та міжнародними організаціями. Представлено європейську «Зелену угоду» та різноманітні стратегії, плани та проекти, пов'язані з циркулярною економікою. Детально описано фінансові ресурси, необхідні для заходів зі скорочення викидів у рамках Європейського інвестиційного плану, та різні фонди, призначені для фінансування економічної діяльності, що сприяє досягненню цілей сталого розвитку. Крім того, у статті міститься інформація про нормативні документи України, пов'язані з циркулярною економікою, зокрема Стратегію екологічної безпеки та адаптації до зміни клімату до 2030 року, Стратегію низьковуглецевого розвитку України до 2050 року, а також різноманітні закони та постанови щодо поводження з відходами, охорони навколишнього середовища та цілей сталого розвитку. Підкреслено важливість узгодження екологічного законодавства України із законодавством Європейського Союзу.

Ключові слова: Європейський Союз, фінансування, циркулярна економіка, політичний ресурс, використання відходів, зменшення впливу зміни клімату, європейський «зелений» курс, європейський інвестиційний план.

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Supporting Ukraine's transition to a low-carbon and circular economy (CE) is based on the development of effective policy strategies in various areas of economic development and the use of appropriate instruments at different levels and among different stakeholder groups. The development of circular economy policy should be based on international experience, in particular on the approaches used by the European Union. The framework for developing such a policy should be based on the recommendations of international organisations such as the World Bank and the UN Economic Commission for Europe, as well as on the best practices of other countries that have already made a successful transition to a circular economy. The European Union is actively developing and implementing policies aimed at developing a circular economy, which involves optimising the use of resources through the recovery and reuse of materials and products. This helps to reduce waste and ensure the sustainability of production. However, the challenges posed by climate change and resource use are global, and there is a need for joint efforts and cooperation with other countries and international organisations. To this end, the EU develops and implements various documents, plans and strategies aimed at supporting the circular economy.

The *purpose* of the article is to analyse international experience, in particular, the approaches used by the European Union and recommendations of international organisations, such as the World Bank and the United Nations Economic Commission for Europe, for the development of CE policy in Ukraine. The European Union is actively developing and implementing a circular economy policy, which stimulates the adoption of relevant regulations for Ukraine, as updating and adapting Ukrainian standards to European legislation is a necessary step for the successful implementation of circular economy policy in Ukraine.

The strategic vision and global roadmap for Ukraine's transition to a circular economy are based

on international and European standards, including the ISO 59000 series; GS1 systems; ETSI industry standards and ITU-T recommendations related to circular economy and waste management in the ICT sector, as well as the standards of the UNECE project "Traceability for Sustainable Garment and Footwear". Creating the conditions for the transition requires large-scale action by all stakeholders, including central executive authorities, business and the public sector.

The *Tbl. 1* shows the main documents of the European Union that contribute to the development and implementation of the circular economy.

Special attention in this list should be paid to normative legal acts containing provisions on financing the circular economy. Among them are the European Green Deal [1], the European Green Deal Investment Plan [2], the European Climate Law [3], the "Farm to Fork" strategy [7].

The European Green Deal (2019) [1] lays the foundations for the further development of EU policies in many areas, including agriculture. The document provides reducing the risks of using chemical pesticides, as well as fertilizers and antibiotics. At least 40% of the total CAP budget and at least 30% of the Marine Fisheries Fund will be dedicated to climate action by 2027.

The European Green Deal Investment Plan (2020) [2] aims to increase the financing of the transition by mobilizing EUR 1 trillion for sustainable investments over the next decade through the EU budget and its instruments. A key element of the strategy is access to the latest technologies, products and solutions needed to transition to a zero-emissions economy. The European Green Deal Investment Plan is defined as a long-term strategic course for 30 years aimed at implementing the energy transition, developing a circular economy, conserving biodiversity and reducing pollution. In July 2021, an updated strategy for sustainable finance was released, which focuses on financing economic initia-

Table 1

The main documents of the EU (plans, strategies, projects, programs) in the field of circular economy

Document, source	Date of adoption
European Green Deal [1]	15.01.2020, (2019/2956)
The European Green Deal Investment Plan and Just Transition Mechanism [2]	14.01.2020
European Climate Pact [3]	09.12.2020, COM/2020/788
European Climate Law [4]	(PE/27/2021/REV/1)
European Industrial Strategy [5]	10.03.2020 COM/2020/102
Circular Economy Action Plan [6]	11.03.2020
«Farm to Fork» strategy [7]	20.05.2020
EU Biodiversity Strategy for 2030 [8]	20.05.2020
EU strategies for energy system integration and hydrogen [9]	20.09.2023 (EU) 2023/1791
2030 Climate Target Plan [10]	17.09.2020
Chemicals Strategy [11]	14.10.2020 (COM/2020/667)
Methane Strategy [12]	14.10.2020 (COM/2022/108)
Renovation Wave [13]	14.10.2020
European Battery Alliance [14]	12.07. 2023 (EC) 2023/1542
New European Bauhaus [15]	18.01.2021 COM/2021/573
EU strategy on adaptation to climate change [16]	24.02.2021 COM/2021/82
Organic Action Plan [17]	25.03.2021 COM/2021/141
Zero Pollution Action Plan [18]	12.05.2021 COM/2021/400
Sustainable Blue Economy [19]	17.05.2021 COM/2021/240
REPowerEU [20]	08.03.2022 COM/2022/108
Nature Protection Package [21]	22.11.2022 (EU) № 1107/2009
Energy prices: commission proposes emergency market intervention to reduce bills for Europeans [22]	14.09.2022
Emergency Market Intervention [23]	20.07.2022
The Net-Zero Industry Act	16.03.2023

Source: compiled by the author based on the materials [1–23].

tives aimed at achieving sustainable goals, increasing the resilience of the financial sector to risks and ensuring opportunities for small and medium-sized enterprises and private individuals to access sustainable financial resources. Most estimates of the annual additional investment needed to meet the EU's climate and energy targets by 2030 range from €175 billion to €290 billion. President Ursula von der Leyen stressed that in the context of the European Green Deal, these targets will be raised to 50-55% emissions reduction. Accordingly, the need for investments is expected to increase, which will be provided from various sources (*Tbl. 2*).

Investment resources are needed to implement emission reduction measures under the European Investment Plan. Part of these resources, for example 25% of the long-term EU budget, will be provided through a number of programs such as the European Agricultural Fund for Rural Development (EAFRD),

the European Agricultural Guarantee Fund (EAGF), the European Regional Development Fund (ERDF), the Cohesion Fund, the Horizon Europe program and the LIFE program. These funds are not included in the general budget of the EU, but are financed from a part of the profits from the auctions of greenhouse gas emissions quotas within the framework of the EU Emissions Trading System. This will provide approximately €25 billion to support the European Union's transition to climate neutrality.

The InvestEU program, with a budget of 279 billion euros, is an important tool for mobilising additional private and public investments at the expense of European Union funds. This program enables Member States to implement their national strategies under the Recovery and Resilience Fund. InvestEU is implemented through four main directions:

- ✦ development of sustainable infrastructure, including transport, energy, digital communica-

Table 2

European Union funds designed to finance economic activities that contribute to the transition to sustainable goals

Fund abbreviation	Name of the fund	Brief description
EAFRD	European Agricultural Fund for Rural Development	It supports and finances the development of renewable energy and energy efficiency projects in rural areas
Covenant of Mayors	Union of Mayors for Climate and Energy	The initiative encourages local authorities to develop and implement sustainable energy and climate action plans and provides access to EU funding
ERDF	European Regional Development Fund	It provides financing for projects aimed at improving energy efficiency and the use of renewable energy sources, including the installation of renewable energy systems, energy efficiency measures and smart grid technologies
EEPR	European Energy Programme for Recovery	It was created to support the European economic recovery after the 2008 financial crisis. It provides funding for projects aimed at improving energy efficiency, using renewable energy sources and implementing smart grid technologies.
Horizon Europe	Strategic plan	It is a programme of the EU's Framework Programme for Research and Innovation. It provides funding opportunities for research and innovation in energy systems, including renewable energy, energy efficiency and energy storage
InvestEU	Programme	The programme provides financial support for private sector investment and strategic infrastructure projects in the EU, including energy projects
Just Transition Fund	Just Transition Fund	It was created to persuade countries to commit to the EU's ambitious climate goals. Up to 50 billion euros of additional funds are planned for the regions most affected by the transition period
Innovation Fund	Innovation Fund	Financing innovative low-carbon technologies to achieve climate neutrality in Europe
Modernisation Fund	Modernisation Fund	Special funding program aimed at supporting 10 low-income EU member states in their transition to climate neutrality by helping to modernise energy systems and increase energy efficiency
CEF	Connecting Europe Facility	A key EU funding tool for the implementation of the European Green Deal and an important tool for achieving the EU's 2030 and 2050 decarbonisation targets

Source: compiled by the author based on the materials [24].

tions, circular economy and innovative technologies;

- ✦ support for research, innovation and digital transformation, including the development of new products and the creation of market mechanisms;
- ✦ financing of small and medium-sized enterprises, including innovative companies and enterprises in the cultural and creative industries;
- ✦ social investment and skills development, covering microfinance, social enterprises, health-

care, gender equality, education, training and other social services.

The **InvestEU funds** are not included in the general budget of the European Union, but are financed from a portion of the revenues generated by greenhouse gas emission allowance auctions under the European Emissions Trading System. These funds are envisaged to provide around €25 billion of support for the European Union's transition to climate neutrality.

The **European Climate Law** (2021) [4] sets out new powers for the European Commission, which include a framework for engaging with sectors to pre-

pare sectoral roadmaps. They define a path to climate neutrality in various sectors of the economy and affirm the need to increase carbon sequestration in the EU through more ambitious regulation of land use, change in land use and forestry.

The **Farm to Fork** (F2F, 2020) [7] strategy is a key step in contributing to the Green Deal by deeply transforming the food system at European level. This strategy addresses various aspects of agriculture, production and supply of food to EU consumers. In the agricultural sector, the strategy envisages significant changes, such as reducing the use of hazardous pesticides and antibiotics in livestock, expanding organic production and reducing the use of fertilisers. Particular attention is paid to the importance of food and drink labelling, including nutritional information, country of origin, sustainable food, animal welfare and date. The strategy emphasises research, innovation and the development of knowledge and skills at the centre of its efforts. Much attention is paid to funding through the Horizon programme and support through EIP-Agri and the Regional Development Fund. In addition, it is noted that support for small and medium-sized enterprises will be strengthened through the Enterprise Europe Network and the European approach to skills training and advisory services will be updated.

The **EU Biodiversity Strategy for 2030** (2020) [8] is harmonised with the initiatives and objectives of the Farm to Table strategy [7] and the new Common Agricultural Policy (CAP) by promoting environmental and pay-for-performance schemes. The main directions in agriculture by 2030 are to stop the decline in the number of pollinators, reduce the use of chemical pesticides by 50%, reduce the use of fertilisers by 20% by reducing nutrient losses from fertilisers by 50%, have at least 10% of agricultural areas in landscapes with high biodiversity, use at least 25% of agricultural land for organic farming, and others. To implement this strategy, including the investment priorities for the Natura 2000 network and green infrastructure, at least €20 billion per year from private and public funding sources at national and European levels is required. This is possible through the mobilisation of private and public funds at national and European levels through various programmes in the upcoming EU long-term budget. As nature restoration plays an important role in achieving climate goals, at least 25% of the EU budget for climate action will be invested in biodiversity and nature-based solutions.

The **EU Methane Strategy** (2020) [12] is a set of measures aimed at reducing methane emissions in all sectors of the economy. The main goal is to solve the problem of methane emissions in every area of activity. One of the key areas of the strategy is the introduction of the concept of carbon farming, which aims to retain

carbon in the soil. This can be done through a variety of measures, from small adjustments at the individual farm level, such as applying high-carbon fertilisers or reducing tillage, to more systemic changes across the entire farming sector, such as enriched crop rotation or agroforestry. In terms of cross-sectoral activities in the EU, the Methane Strategy envisages accelerating the development of the market for biogas from sustainable sources such as manure or organic waste through future policy initiatives. For example, the Commission intends to propose a pilot project to support rural areas and farming communities in setting up biogas projects and obtaining financing for biogas production from agricultural waste.

The **European Commission** (EC) has launched an initiative called Renovation Wave for Europe: Greening our buildings, creating jobs, improving lives (2020). This programme includes such instruments as the European Local Energy Assistance Programme (ELENA), which aims to expand the scope of technical support and make it more accessible to regional and local authorities. Funding under the Horizon Europe programme provides assistance in developing projects aimed at preparing investments in the circular economy at the local and regional levels. In addition, the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the European Regional Development Fund (ERDF), the European Union Carbon Emissions Trading Scheme (EU ETS) and the European Energy Efficiency Fund (EFE) provide financial support for energy efficient renovations of buildings in EU countries.

The **EU Adaptation Strategy** (2021) [16] covers various sectors of the economy that need to adapt to climate change. In particular, in the agricultural sector, it is envisaged to increase preparedness for climate risks, increase water reserves, reduce crop losses, increase resilience to extreme weather conditions, and ensure access to finance and innovation. Funding for the measures is provided from the EU budget, from programmes and initiatives such as the LIFE programme, the EU Climate Change Programme, the Global Climate Change Fund, the United Nations Development Programme, the USDA Foreign Agricultural Service, and UNDRR. In addition, the EU Adaptation Strategy cooperates with various private organisations that provide funding for climate change adaptation projects and encourages EU member states to develop their own funding plans for support.

In 2021, an action plan for the development of organic production [17] was developed, addressing three key areas that correspond to the structure of the food supply chain: production, processing, retail and consumers. The main objective of this plan is to

promote positive changes in the organic sector and ensure a balanced and profitable market. To achieve these goals, it is proposed to:

- ✦ promotion of organic farming and the EU logo: The Commission will provide financial support for information campaigns on organic products and the EU organic logo, and support organic products on the EU market.
- ✦ increased purchases of organic products from small farms and small businesses for public canteens.
- ✦ increasing the share of organic products in schools and strengthening the fight against food fraud.
- ✦ increasing the role of business in the distribution of organic products and promoting partnerships with business.

The plan also includes funding for research and innovation projects on alternative approaches to controversial inputs and promoting the use of alternative plant protection products containing biologically active substances.

In 2021, the Sustainable Blue Economy initiative [19] was launched to develop an economic system that ensures harmony between economic growth, social justice and environmental conservation in the area of oceans and their resources. The BlueInvest initiative promotes innovative small and medium-sized enterprises and start-ups and helps investors expand their opportunities in this area. The aim of this initiative is to develop the financial ecosystem necessary to support a sustainable blue economy. Financial instruments associated with a sustainable blue economy include:

- ✦ the principles for financing a sustainable blue economy, developed by the European Commission together with WWF, the World Resources Institute (WRI) and the European Investment Bank (EIB), which aim to support investments in projects aimed at preserving and restoring ocean resources and ensuring sustainable economic development;
- ✦ Blue Bonds, which are issued to finance projects related to the sustainable blue economy and can be issued by both government and private companies;
- ✦ Blue Venture funds, which specialise in financing projects related to the sustainable blue economy and can be set up by both public and private initiatives;
- ✦ Blue Carbon loans, which are provided to finance projects for the conservation and restoration of marine ecosystems that can store carbon and reduce greenhouse gas emissions;

- ✦ various Blue Innovation Challenge funds that provide financial support for innovative projects related to the sustainable blue economy.

To facilitate the transition to a circular economy, academic researchers and finance experts are considering a categorisation system for the circular economy proposed by the European Commission. This system, known as the "Categorisation system for the circular economy", has been developed by the Circular Economy Financing Expert Group, which operates as part of the Circular Economy Financial Support Platform. The aim of this group is to provide advice and expertise to the Commission on how best to facilitate the creation and financing of circular economy projects in the European Union Member States (*Tbl. 3*).

These groups are aligned with the Value Hill Business Model Tool [25], shown below (*Fig. 1*).

Value Hill offers a classification based on the phases of the product life cycle: before, during and after use. This allows companies to position themselves on the value hill and understand the possible circular strategies they can implement, as well as identify the missing partners in their circular network. The Value Hill provides an overview of the circular partners and collaborations required for a successful circular value network.

According to these circular categories, taking into account circular economy strategies, the European Investment Bank proposed a list of typical investments/projects (*Tbl. 4*).

The Financial Expert Group on the Circular Economy calls on EU and national policy-makers to work with financial institutions, business associations and research organisations. The aim of this cooperation is to provide financial, advisory and methodological support to the initiators of circular economy projects, including start-ups and SMEs. This includes conducting life-cycle impact assessments of circular products, technologies and business models. The development and use of simplified life cycle assessment approaches is encouraged to reduce the cost and time required to verify circular economy activities and projects. This includes assessing the impact of circular products, technologies and business models based on their life cycle.

According to Association Agreement between Ukraine and the EU, Ukraine is obliged to consult with the European Commission to assess the compatibility of draft laws with the relevant provisions of EU law. Therefore, the EU environmental law is reflected in the existing regulations of Ukraine, which helps to bring the national legislation closer to the European standard in the field of waste management and environmental protection.

The EU Circular Economy Categorisation System

Group	Code	Circular categories
Group 1 – Circular design and production (circular design)	1.1	1. Developing and manufacturing products and assets that support circular economy and strategies: – increased resource efficiency, durability, functionality, modularity, upgradeability, ease of disassembly and repair; – use of materials that can be recycled or composted
	1.2	2. Development and implementation of technological processes that ensure the circularity of the economic strategy
	1.3	3. Development and sustainable production of new materials (including biological materials) that can be reused, recycled or composted
	1.4	4. Replacing or significantly reducing the amount of hazardous substances in materials and products to implement circular economy strategies
	1.5	5. Replacement of primary materials with recycled materials
Group 2 – Cyclical use	2.1	6. Reuse, repair, modernisation, and repurposing
	2.2	7. Reconstruction and extension of service life
	2.3	8. Product-as-a-service model for reuse and/or sharing, including leasing, pay-as-you-go, subscription or deposit, which generally enables a circular economy
	2.4	9. Rehabilitating degraded land to return it to a useful state and restore abandoned territories
Group 3 – Circular value recovery	3.1	10. Separate collection and reverse logistics of waste, as well as by-products, parts and materials, enabling circular value conservation and recovery strategies
	3.2	11. Recovery of materials from waste as part of preparation for a cyclic value chain and recovery strategy (excluding feedstock)
	3.3	12. The recovery and use of waste and residual biomass from food, feed, nutrients, fertilisers, biomaterials or chemical feedstocks
	3.4	13. Waste water reuse/recycling
Group 4 – Circular support	4.1	14. Development/implementation of tools, applications and services that ensure the circularity of economic strategy

Source: compiled from the materials of [25].

Tbl. 5 provides a list of Ukraine's main regulatory documents in the field of circular economy.

The Strategy for Environmental Security and Climate Change Adaptation until 2030 [27] defines important steps to fulfil Ukraine's international obligations under the Paris Climate Agreement. Its implementation is aimed at reducing greenhouse gas emissions and adapting to the effects of global climate change. The Strategy includes general goals and objectives, which are further implemented in specific measures of the Operational Implementation Plan for 2022–2024.

The Low Carbon Development Strategy of Ukraine until 2050 [28] is a coordinated national plan that combines sustainable development priorities and strategies for the development of economic sectors.

It defines a possible trajectory of economic growth aimed at reducing emissions and increasing absorption of greenhouse gases.

The adopted Law of Ukraine "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030" No. 2697-VIII [29] launched irreversible processes of implementing new approaches to solving environmental problems inspired by European experience.

The adoption of Presidential Decree No. 722/2019 dated 30 September 2019 [30] on the Sustainable Development Goals of Ukraine for the period up to 2030 marks an important step in the country's civilisational development. This unique document reflects Ukraine's commitment to pursue national interests based on the principles of sustainable economic growth, civil society development and support for the

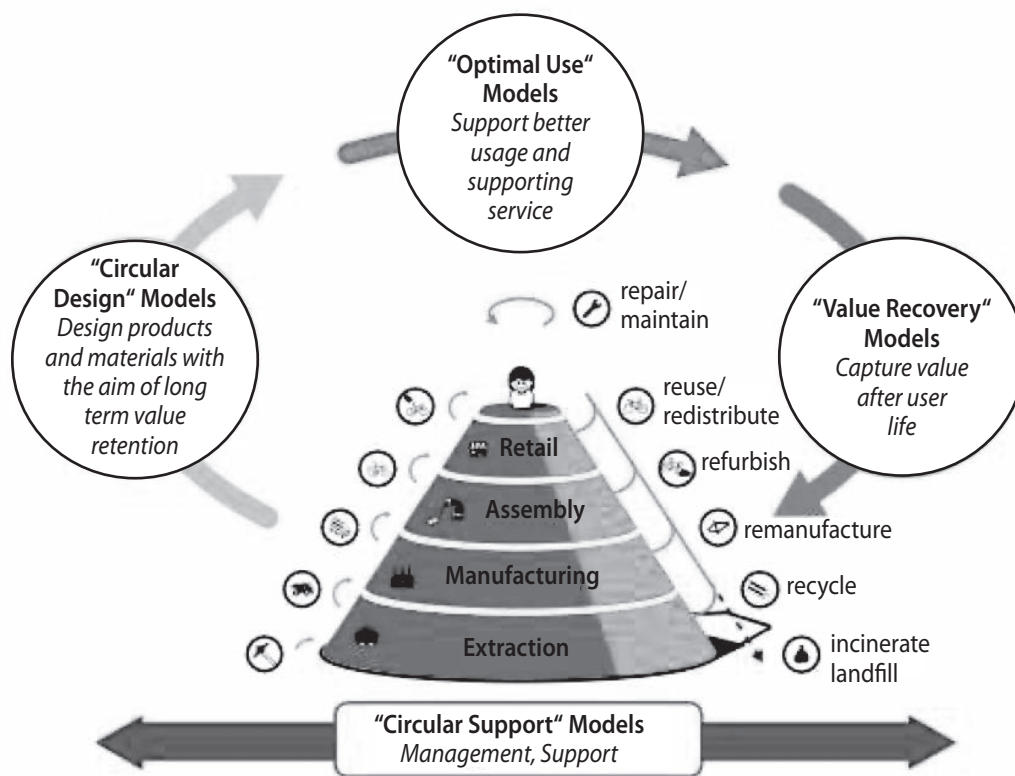


Fig. 1. Business Model Categories mapped on the Value Hill [25]

rights and freedoms of citizens. Its goal is to improve the quality of life of the population and ensure compliance with constitutional standards.

The Cabinet of Ministers of Ukraine's Resolution No. 686-p is an important step in the implementation of the 2030 Sustainable Development Goals [31]. This regulatory act is aimed at ensuring the collection of data to monitor the country's progress in achieving these goals, including environmental aspects. This will allow us to have adequate and comparable information at the international level on Ukraine's achievements in the field of sustainable development.

Ukraine's National Emission Reduction Plan for Large Combustion Plants is important for the country as a member of the Energy Community. However, for its successful implementation, it is necessary to clarify the legislation and take specific measures. According to the Order No. 448 of the Ministry of Environmental Protection dated 27 June 2023, the Instruction on the preparation of documents on emissions of pollutants into the atmosphere from stationary sources was approved. This Instruction establishes standards and requirements for the preparation of documentation containing arguments for emissions, in particular based on an inventory at the facility.

The Law of Ukraine "On the Principles of Monitoring, Reporting and Verification of Greenhouse Gas Emissions" is a key step in improving the legal and organisational regulation of monitoring, reporting and

verification of greenhouse gas emissions. This law is also a prerequisite for the establishment and operation of an emissions trading market. The adoption of Law No. 377-IX implements the requirements of Directive 2003/87/EC "Establishing a system for the trading of greenhouse gas emission allowances within the Union" [33], Directive 2004/101/EC "Implementing the mechanisms under the Kyoto Protocol" into the current legislation of Ukraine, and also fulfils the requirements of the UN Framework Convention on Climate Change and the Paris Agreement.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989) [34] is a key international treaty for Ukraine. It helps reduce the movement of hazardous waste between countries and prevents uncontrolled disposal of such waste in Ukraine. The Convention minimises the amount and toxicity of waste collected by working to ensure its environmentally sound management and assists countries in developing the management of the waste they generate.

The National Waste Management Strategy until 2030 [35] is the main document for the development and operation of the waste management system. It includes measures to prevent the generation, collection, recycling, utilisation and safe disposal of waste, in accordance with European legislation.

The National Waste Management Plan until 2030 [36] is in line with the National Waste Management

Typical investments and projects for circular categories proposed by the European Investment Bank

Group	Examples of typical investments/projects
Group 1 – Circular design	<ul style="list-style-type: none"> – RDI programmes and infrastructure for circular events; – implementation of new technologies and commercial tools; – design and construction of circular infrastructure
Group 2 – Cyclic use, Code 2.1	<ul style="list-style-type: none"> – Recovery and reuse of products/assets; – development of production facilities for repair and refurbishment; – establishing a business for the reuse of consumer goods
Code 2.2	<ul style="list-style-type: none"> – Circular design/construction for easy disassembly, reuse, repair and recycling of materials; – use of reused or recycled materials and construction components; – investment in product-as-a-service; – equipment and technologies for collecting and processing rainwater and greywater; – equipment and technologies for the treatment and reuse of black wastewater; – production of fertilisers and compost for landscaping
Code 2.3	Investments in product-service, reuse and sharing arrangements, including leases, user fees, subscriptions and deposit refunds
Code 2.4	Investments in land rehabilitation for further use and renovation of existing buildings and infrastructure if they meet the criteria for circular economy
Group 3 – Circular value recovery Code 3.1	<ul style="list-style-type: none"> – Physical equipment and infrastructure for the return of materials and recycling; – separate waste collection; – mobile equipment (containers, bunkers); – vehicles for waste collection; – supporting infrastructure for waste collection, transport and temporary storage
Code 3.2	<ul style="list-style-type: none"> – Material recovery facility equipment (MRF), including manual, semi-automated and fully automated equipment for mechanical processes; – chemical waste processing plants using various technologies (gasification, pyrolysis, depolymerisation)
Code 3.3	<ul style="list-style-type: none"> – Bio-refineries for the extraction of bioproducts from biowaste and wastewater; – anaerobic digestion and composting plants for the production of digestate and compost
Code 3.4	Equipment and technologies for the collection, treatment and transmission of wastewater for the purpose of reuse for household, industrial or agricultural needs instead of discharging treated wastewater into water bodies
Group 4 – Circular support	<ul style="list-style-type: none"> – ICT for predictive product maintenance; – digital tools for reverse logistics and waste avoidance; – virtual marketplaces for recyclable materials; – digital material data sheets; – a methodological framework for measuring progress in the circular economy; – tools for education about the circular economy; – consulting services for the transition to a circular economy

Source: compiled from the materials of [25].

Strategy. It contains a clear algorithm of measures and performance indicators for the responsible authorities, facilitating the adaptation of Ukrainian legislation to European standards.

The Law of Ukraine No. 1489-IX on Plastic Bag Restrictions aims to reduce the use of plastic bags in Ukraine [37]. However, its effective implementation is hampered by the lack of a procedure for labelling plastic bags, which must be approved by the Cabinet of Ministers. Currently, only a draft resolution on this topic is available.

The Law of Ukraine No. 2320-IX [38] on Waste Management has launched a new waste management system. This law is in line with the requirements of the EU-Ukraine Association Agreement and also complies with EU waste management directives for the transition to a circular economy.

The Law of Ukraine No. 2718-IX on Materials and Objects intended for Contact with Food [39] was adopted to protect the health and rights of consumers. Its main objective is to ensure the safety of these materials and objects in contact with food.

List of regulatory documents of Ukraine in the field of circular economy

Document title, source	Date of adoption
1. Strategy for Environmental Safety and Climate Change Adaptation until 2030 [27]	Order of the Cabinet of Ministers of Ukraine No. 1363-p dated 20.10.2021
2. Low-Carbon Development Strategy of Ukraine until 2050 [28]	Resolution of the Cabinet of Ministers of Ukraine No. 244-p dated 28 March 2018
3. Law of Ukraine "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine until 2030" [29]	No. 2697-VIII dated 28 February 2019
4. Decree of the President of Ukraine "On the Sustainable Development Goals of Ukraine for the period up to 2030" [30]	No. 722/2019 dated 30 September 2019
5. Data collection issues for monitoring the implementation of sustainable development goals [31]	Order of the Cabinet of Ministers of Ukraine No. 686-p dated 21.08.2019
6. On the National Plan for Reducing Emissions from Large Combustion Plants [32]	Order of the Cabinet of Ministers of Ukraine No. 796-p dated 08.11.2017
7. The Law of Ukraine "On the Principles of Monitoring, Reporting and Verification of Greenhouse Gas Emissions" [33]	No. 377-IX dated 12 December 2019
8. Basel Convention [34]	Law of Ukraine No. 803-XIV dated 01 July 1999
9. National Waste Management Strategy in Ukraine until 2030 [35]	Order of the Cabinet of Ministers of Ukraine No. 820-p dated 08.11.2017
10. National Waste Management Plan until 2030 [36]	Order of the Cabinet of Ministers of Ukraine No. 117-p dated 20.02.2019
11. Law of Ukraine "On Restricting the Circulation of Plastic Bags in the Territory of Ukraine" [37]	No. 1489-IX dated 1 June 2021
12. The Law of Ukraine "On Waste Management" [38]	No. 2320-IX dated 20 June 2022
13. Law of Ukraine "On Materials and Objects intended for Contact with Food" [39]	No. 2718-IX dated 3 November 2022
15. Technical Regulations on Conformity Assessment of Packaging Materials and Packaging Waste [40]	No. 289 dated 24 December 2004

Source: compiled from the materials of [27–40].

The Technical Regulation on Packaging and Packaging Waste [40] is the implementation of the requirements of the Directive of the European Parliament and of the Council of 20 December 1994 on packaging and packaging waste (94/62/EC) in Ukrainian legislation.

Several significant draft laws are expected to be approved in 2020, including the Law on Batteries and Accumulators, the Law on Packaging and Packaging Waste, and the Law on Forest Reproductive Resources.

The Laws of Ukraine "On Waste Management" and "On Scrap Metal" should be harmonised, and the Law of Ukraine "On Alternative Fuels" should be amended, in particular to create a register of facilities using biofuels as the main fuel. It is also necessary to strengthen the bylaw regulation of the implementation and public control over the implementation of regional and financing waste management programmes, as well as the approval of environmental labelling standards for products.

CONCLUSIONS

The paper provides a comprehensive overview of the European experience in financing the circular economy, including detailed information on EU policies, strategies and initiatives. It also describes the financial resources available for emission reduction measures and discusses the circular economy framework for categories and typical investments/projects proposed by the European Investment Bank. The article offers an overview of Ukrainian regulations related to the circular economy and emphasises the importance of harmonising Ukraine's environmental legislation with that of the European Union. Prospects for further research lie in the area of further analysis and adaptation of international experience to develop effective policy strategies in Ukraine. ■

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СУЧАСНИЙ СТАН ТА ОСОБЛИВОСТІ РОЗВИТКУ ЛОГІСТИЧНОЇ ІНФРАСТРУКТУРИ МАЛАЙЗІЇ

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Макарчук К. О., Непрядкіна Н. В. Сучасний стан та особливості розвитку логістичної інфраструктури Малайзії

Метою статті є визначення сучасного стану та особливостей розвитку логістичної інфраструктури Малайзії. Під час аналізу й узагальнення наукових праць вчених було розглянуто визначення поняття «логістична інфраструктура». У результаті дослідження проаналізовано місце Малайзії в Рейтингу ефективності логістики (LPI). Логістична інфраструктура Малайзії останніми роками зазнала стрімкого розвитку. Малайзія є однією з найрозвиненіших за логістичною інфраструктурою країн Південно-Східної Азії. За рейтингом ефективності логістики, що аналізує Світовий Банк, Малайзія посіла у 2023 р. 26 місце. Розглянуто основні чинники розвитку логістичної інфраструктури Малайзії. Визначено та проаналізовано динаміку вантажних перевезень різними видами транспорту. Країна має виходи до морів з розвинутою портовою інфраструктурою. Малайзія інвестує значні ресурси в розвиток транспортної інфраструктури, включно з портами, аеропортами, дорогами та залізницями. Це сприяє підвищенню якості логістичних послуг. Регулярне інвестування в розвиток логістичної інфраструктури та впровадження сучасних технологій сприяють підвищенню ефективності логістичних процесів, що є важливим фактором для економічного зростання та розвитку Малайзії. Перспективними напрямками розвитку логістичної інфраструктури Малайзії є: автоматизація та цифрові технології; розвиток електронної комерції, що сприяє доставці «останньої милі»; інтеграція та співпраця в межах ланцюга поставок; імперативи сталого розвитку; розвиток талантів і підвищення кваліфікації, аналіз даних і прогнозне моделювання. Малайзія займає стратегічне положення в Південно-Східній Азії, що робить її достойною для отримання звання регіонального центру.

Ключові слова: Малайзія, логістична інфраструктура, транспортна інфраструктура, аеропорти, морські порти, вантажні перевезення, електронна комерція, рейтинг ефективності логістики.

Рис.: 6. **Табл.:** 1. **Бібл.:** 23.

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Makarчук K. O., Nepriadkina N. V. The Current State and Development Features of Logistics Infrastructure in Malaysia

The aim of the article is to determine the current state and features of the development of the logistics infrastructure of Malaysia. During the analysis and generalization of scientific works of scientists, the definition of the concept of «logistics infrastructure» was considered. As a result of the study, the place of Malaysia in the Logistics Performance Index (LPI) is analyzed. Malaysia's logistics infrastructure has undergone rapid development in recent years. Malaysia is one of the most developed countries in Southeast Asia in terms of logistics infrastructure. According to the logistics efficiency ranking analyzed by the World Bank, Malaysia ranked 26th in 2023. The main factors of development of the logistics infrastructure of Malaysia are considered. The dynamics of freight transportation by different modes of transport has been determined and analyzed. The country has access to the seas with a developed port infrastructure. Malaysia invests significant resources in the development of transport infrastructure, including ports, airports, roads, and railways. This contributes to improving the quality of logistics services. Regular investment in the development of logistics infrastructure and the introduction of modern technologies contribute to improving the