DOI: 10.15587/978-617-7319-98-5.CH6

Maksym Kolesnyk, Olena Arefieva, Dmytro Onopriienko,
Yuliia Kovalenko, Tetiana Ostapenko, Iryna Hrashchenko

CHAPTER 6

CURRENT ISSUES OF INNOVATIVE DEVELOPMENT AND EVOLUTION OF THE CIRCULAR ECONOMY AT THE REGIONAL SCALE

ABSTRACT

The essence and features of the circular economy as an innovative component of the modern economy, which functions and develops on the basis of sustainable development, the deep reasons for its emergence, formation and transformation into a factor in the formation of a new paradigm of the global economy are considered. Being a mechanism for the implementation of the Global Goals of sustainable development, the concept of a closed cycle economy encourages highly developed countries and businesses to introduce innovations and define the development of a circular economy as a priority in their long-term strategies. Special attention is paid to the analysis of the evolution of the circular economy in the countries of the European Union, the problems and prospects of the development of the circular economy in Ukraine.

KEYWORDS

Linear economy model, sustainable development, innovative development, circular economy, innovative system, innovative infrastructure, evolution of the circular economy, business model of a closed cycle.

In recent decades, there has been a sharp increase in the negative anthropogenic impact of humanity on the natural environment both at the national and global levels. According to experts, further economic growth will inevitably lead to an increase in the use of natural resources and consumption waste. This, in turn, will further exacerbate environmental problems, such as loss of biodiversity, pollution of water, air and soil, depletion of resources, and will increasingly endanger the Earth's life support system. On the other hand, societal expectations are not being met due to issues such as high unemployment, poor working conditions, social vulnerability, the poverty trap, intergenerational injustice and widening inequality. Economic challenges such as supply risk, problematic ownership structures, deregulated markets, and imperfect incentive structures lead to increasingly frequent financial and economic instability for individual companies and the entire economy [1].

So, the model of the traditional linear economy, which functions according to the principles: "Take, Make, Waste (Dispose)" (extract, use, throw away (dispose); "raw materials – processing – waste"; "production – use – disposal" has already exhausted itself. It should be replaced by a new model of modern economic development, based on the rational consumption and restoration of resources and the minimization of negative human impact on the environment. This model has received the name closed-loop economy or circular economy (English closed-loop economy, circular economy). At the same time, society itself must change – from the choice of raw materials, product development methods and new service concepts to the widespread use of by-products of one industry as complete raw materials for another [2].

The circular economy emerges from the innovation economy, when breakthrough innovative technologies together with innovative business processes form closed cycles of processing, exchange and consumption.

Today, the path to a circular economy is being overcome by many countries of the world, according to researchers, 9 % of the world economy is circular. The analysis of trends in its development gives grounds for asserting that the share of the circular economy will continue to grow steadily. In some highly developed countries, the formation and development of the circular economy is becoming the main factor in achieving the goals of sustainable development. That is why the study of various aspects of the evolution of the circular economy is extremely relevant.

The study of the circular economy attracts considerable attention of many scientists. Among the researchers, it is worth noting the works of M. Geissdoerfer, P. Savaget, R. Merli, M. Preziosi, A. Acampora, A. Petit-Boix, S. Leipold, among the domestic ones – O. G. Melnyk., D. Bayura, M. O. Varfolomeeva, I. Ya. Zvarycha, D. Z. Nechitailo, S. M. Lyholat, L. V. Deineko, O. Sysoev, M. V. Rudy, K. V. Savitska The aim of research the peculiarities of the formation and evolution of the development of the circular economy in the regional dimension as a fundamental direction of the development of the modern global economy.

The basis of the economic growth of any country and the successful functioning of enterprises is the process of innovative development, which forms positive qualitative and quantitative changes in the production and economic system. At the same time, it is important to understand that in the new economy, accelerating the pace of economic development becomes one of the priority tasks at the same time as ensuring its sustainability.

Innovative development can be defined as a complex economic category that is associated with innovative changes and adaptation of enterprise management processes to the requirements of the external and internal environment [3].

In other words, innovative development represents changes aimed at updating and qualitatively increasing the efficiency of processes or products, which is accompanied by a transition to a new level of system organization [4].

Therefore, innovative sustainable development can be understood as an irreversible, directed, natural change in the economic situation, innovative and social infrastructure of the socio-economic system, as a result of which it moves to a qualitatively new progressive state.

Let's clarify that we do not apply the characteristic "fundamental" to the specified changes, since sustainable development implies, in our opinion, the "soft" nature of changes with smaller losses due to transformational changes in the market economic system.

At the same time, the innovative development of the enterprise, as an activity of the enterprise, is based on the constant search for new methods and means of satisfying consumer needs and increasing the efficiency of management; development, which involves the expansion of the boundaries of innovative activity and the introduction of innovations in all spheres of enterprise activity, the creation and practical use of innovations [5].

It is important to understand that innovative ideas emerge and transform ordinary economic projects into innovative development when different creative thoughts are combined into a single system supported by an institutional environment and innovative infrastructure. They are the ones who should ensure the integration between research and development, marketing and other components, for example, a large enterprise with structured scientific and research capital, or, for example, an innovative cluster of medium and small enterprises, when the circulation of innovative ideas can occur more chaotically, as, for example, by the modern method of open innovation. Chaoticity in this case also brings positive opportunities for generating unexpected innovative ideas and results.

The innovation system plays the role of an institutional basis for the innovative development of the national economy. Its functioning creates prerequisites for the transformation of ideas, new knowledge into innovation with their further implementation with the aim of obtaining an economic or any other effect. Within the innovation system, there is an interaction of all subjects directly or indirectly involved in the innovation process, and the effectiveness of its functioning is determined by the effectiveness of the interaction of all structural elements [6].

It is important that the national innovation system itself, on the one hand, is a process of interaction between various institutions involved in the process of production and commercialization of scientific knowledge within the state, and on the other hand, it is the result of this interaction. The determining factor of the effective functioning of the national innovation system is the degree of partnership in the "science-business-state" system, which combines technological, financial and organizational factors of generating and spreading innovations [7].

Modern innovative infrastructure is an important factor in the innovative development of the region. Thus, innovative infrastructure, in particular its most concentrated elements, forms the centers (poles) of the growth of entrepreneurial activity and the placement of science-intensive technologies. Therefore, the supporting frame of the industry is being built on the basis of such centers. At the same time, it is necessary to take into account that the development and implementation of innovations at enterprises has a twofold effect on the functioning of the industry of the region. On the one hand, the innovative activity of enterprises helps to increase their competitiveness both on the regional, national and international markets, and on the other hand, a large share of innovative products in a specific enterprise leads to a significant increase in the risks of entrepreneurial activity itself [8].

When considering the essence of the modern concept of economic development, first of all, it is necessary to consider the development of the scientific and technical revolution as a result

of scientific and technical discoveries, as a result of which society receives fundamentally new equipment and technologies that allow increasing labor productivity tens and hundreds of times [2].

At the same time, the modern paradigm of global development is the idea of sustainable development, which is shaped by the Sustainable Development Goals (SDGs) of the United Nations and relevant scientific theories. Importantly, sustainable development implies system-driven development, when the concept of innovative activity also falls under the positive influence of the SDGs.

Thus, innovations in the European Union shape markets, transform the economy, stimulate gradual changes in the quality of public services and are indispensable for achieving the main goals of double "green" and digital transit [9].

As stated in the Decree of the President of Ukraine "On the Goals of Sustainable Development of Ukraine for the period until 2030", the SDG of Ukraine for the period until 2030 are guidelines for the development of projects of forecasting and program documents, projects of regulatory and legal acts in order to ensure the balance of economic, social and environmental dimensions sustainable development of Ukraine. SDG No. 9 is aimed at building sustainable infrastructure, promoting sustainable industrialization and stimulating innovation [10].

It should be noted that a new wave of innovation is on the horizon: deep technological innovation that is based on advanced science, technology and engineering, often combining advances in the physical, biological and digital spheres and with the potential to provide transformative solutions in the face of global challenges. In particular, the deep technological innovations emerging from the growing cohort of innovative start-ups in the EU have the potential to drive innovation in the economy and society. This, in turn, can change the business landscape of the EU and related markets and help in solving the most pressing societal problems, in particular by achieving the UN Sustainable Development Goals [9].

Europe is also one of the fastest growing private equity investment regions. Between 2016 and 2020, it experienced faster growth than China and the US, albeit from a lower base. It is important to pay attention to the following:

1. EU companies are world leaders in high-value environmental patents and environmental patents in energy-intensive industries.

2. Europe's powerful industrial base is characterized by an increasingly dynamic startup ecosystem. Deep technological innovation results in physical products, not pure software services.

3. Deep technological innovations are aimed at solving key societal problems. This is particularly evident in the EU's position in wind energy: bold policy decisions such as climate change interventions and environmental protection, combined with close cooperation between the public and private sectors, the strengths of the single market have created the conditions for European companies to thrive in the sectors of the future, which are based on deep technologies [9].

At the same time, it is advisable to take into account that the advantages of borrowing new knowledge from abroad for Ukraine are obtaining technologies that have been used in practice and meet world standards. This contributes to the formation of technological cycles together with foreign enterprises, the acquisition of experience in the implementation of marketing approaches

in the field of innovation. However, it is important for Ukraine to prevent the receipt of morally outdated innovations, as well as the deepening of dependence on technology supplier countries [11].

Recently, the economy of Ukraine has suffered significant losses as a result of the military aggression of the Russian Federation against our country. In particular, industrialized regions suffered significant destruction, leading to a significant loss of both productive capital and the destruction of value chains and related commercial linkages.

The recovery of Ukraine's economy, in terms of its integration into the European economic system, should be based on the activation of innovative development processes. Accordingly, in the post-war period, innovation policy in Ukraine should implement system tools for appropriate modernization of the economy and activation of internal and external factors of the country's socio-economic development in interaction with the European innovation ecosystem [12].

It is important to note that the process of innovative development at the micro level may differ from enterprise to enterprise, which is influenced, among other things, by the sector of activity or the size of the company. For example, the structure of small and medium-sized enterprises is lean and flexible compared to large companies and can be considered more organic than mechanical. Such businesses have a highly skilled workforce, few hierarchical levels, few if any divisions, and proximity to customers. This means that from the point of view of the innovation development process, they have the potential to manage knowledge faster than large companies in order to create new products [13].

Small and medium-sized technology companies do not innovate systematically, but intuitively and focus on the ideas of their founders and, mainly, on satisfying customer and market needs. Small and medium-sized technological companies in the innovation process are characterized by high adaptability and flexibility in their management and innovation methods, even though they have few resources to invest in research and development [13].

Evaluation of innovative projects should be optimally balanced in modern conditions. Making an appropriate decision regarding their feasibility requires the use of a comprehensive approach and the development of new tools for evaluating the effectiveness of innovative projects using IT technologies [14].

When considering the requirements for the content of the concept of evaluation of various aspects of innovative activity, as a rule, the influence of a set of factors on it is taken into account, such as, for example, a set of indicators in the following areas: technological, economic, political-legal and organizational-management [1, 13].

At the same time, it is advisable to consider innovative and investment activities as a single process, the separate implementation of the components of which is either ineffective or impossible [15].

As a rule, the economic effect is understood as the result that leads to a quantitative increase in the company's resources, in particular labor, material or natural resources. This effect is estimated on the basis of indicators of profitability from the implementation of innovative products, the introduction of new technologies into production, as well as at the expense of profit from the introduction of inventions and industrial samples into the production process. At the same time, an increase in the share of information technologies involved in the production process, an increase

in the level of automation and robotization of production, as well as an increase in the number of know-how developed within the enterprise form the basis for evaluating the scientific and technical effect. When considering social impact, it is important to understand that social impact is the result of the degree to which society's needs are met. This effect cannot be quantified and valued, so its measurement is mostly limited to qualitative methods based on consumer judgments. The resource effect shows the change in the volume of production and consumption of a certain type of resources depending on the impact of the corresponding innovative component. It is manifested in the release of resources at the enterprise [1, 16].

In addition, the assessment of the environmental effect, which reflects the impact of the innovative activity of the enterprise on the environment and is characterized by indicators of reducing environmental pollution, reducing the energy intensity of production, improving the environmental friendliness of products, etc., is becoming more and more relevant today for the assessment of innovative activity in the modern economy [1].

This relevance is confirmed by the formation of the emergent content of economic models of highly developed market economies, in particular, the active development of the circular economy.

The birth and formation of the circular economy began in the 70s of the 20th century, although the term "circular economy" appeared for the first time only in 1990 [17].

In wide usage, the term "circular economy" was preceded by the similar term "green economy", which entered wide circulation during the global economic crisis of 2008–2009. In 2009, the United Nations Environment Program published the report "Global Green New Deal", which considered the goals, tasks, elements, incentives and directions of domestic policy aimed at the development of the green economy. The priorities of the green economy were determined, on the one hand, by maintaining and restoring natural capital; use of renewable energy and low-carbon technologies for fossil fuels; increasing the efficiency of resource and energy use; formation of responsible behavior of city residents; transition to low-carbon mobility; and on the other hand, creating new jobs and improving social justice [18].

In the last decade, special attention is paid to the research of the circular economy itself as a new model of economic development, based on the implementation of closed cycles in the processes of production, circulation and consumption, which allows creating additional value. The generally recognized basic principles of its functioning are the 3R principles recorded in many international documents: Reduce (reduction of resource consumption), Reuse (reuse of manufactured products), Recycle (processing of by-products and waste)). With the development of the circular economy, more detailed interpretations of the principles of the 6R circular economy began to be used: Reduce, Reuse, Repair, Refurbish, Recycle, Recover [19].

Over time, the principles of the circular economy were transformed into 9R [20]:

1. Refuse: rejection of excessive use of resources by refusing to use components that do not affect product quality or are not environmentally friendly at each stage of the product's life cycle.

2. Reduce: reducing the use of resources by implementing technical and organizational solutions to increase the efficiency of production, sales and responsible consumption of products.

3. Reuse: the process of using a product that has lost its value for one user, but represents value for another user and can be used for the purpose of generating additional profit and reducing the burden on the environment.

4. Repair: Is the process of extending the life of the product through repair and additional maintenance.

5. Refurbish: Updating an old product in order to match the functionality and appearance to modern customer requirements.

6. Remanufacture: production of new products from elements of the old one.

7. Repurpose: using the product for other purposes.

8. Recycle: recycling and secondary use of materials.

9. Recover: production of energy from materials.

It should be noted that in 2018, the principles of the closed-loop economy were expanded to 10R by the World Economic Forum (**Fig. 6.1**).

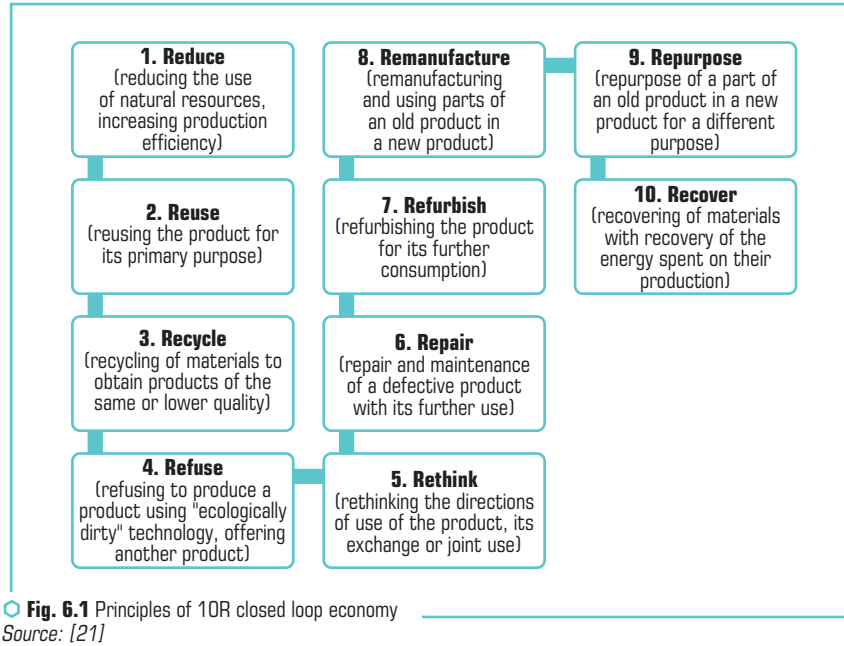

Fig. 6.1 Principles of 10R closed loop economy
Source: [21]

In general, the evolutionary development of circular can be divided into three stages [19]:

1. At the first stage (1970–1990), work with waste took center stage. In European countries and the USA, a number of environmental legislation was adopted. The greatest interest at this time is the concept of 3R. The principle known as "polluter pays" is emerging. At the same time, due to

the insufficient development of ecological culture at that time, the approach is gaining popularity, according to which the territory of less developed countries begins to be used for the burial of waste and/or its processing.

2. In the second stage (1990–2010) – the stage of the environmental efficiency strategy – the introduction of environmental payments (charges for pollution) had a significant impact on the development of the circular economy. In the early 2000s, a number of environmental problems were recognized as global (in particular, the destruction of the ozone layer, global warming). During this period, the scientific community is actively developing possible ways of waste-free industrial production.

3. In the third stage (approximately from 2010 to the present) – the stage of maximum conservation in the era of resource depletion – the threat to the survival of humanity due to the reduction and gradual disappearance of the necessary natural resources, the growth of the global population and the amount of waste is recognized as the central problem. Producers of goods and services are offered to develop taking into account three key principles: green innovation, alternative sources, and a change in the industrial paradigm.

Today, the main activities within the circular economy include reuse, repair, renewal and restoration (Recover), recycling of existing materials and products, as well as preventive actions to reduce the amount of waste. The main idea is that what was previously considered "waste" can turn into a valuable resource [22]. This reduces the negative impact on the environment and allows efficient use of limited natural resources, as used materials and waste become raw materials for the economy again. New sales markets are emerging, new products are being developed, competitive business models are being created, manufacturers are preparing for the challenges that the future will bring them.

The implementation mechanism of one of the Global Sustainable Development Goals (SDGs), approved at the UN Summit in September 2015, namely: "Responsible consumption and production", is recognized as "...the introduction of a circular economy model, primarily by focusing on energy saving, regenerative, environmentally friendly production and consumption" [23]. It is important to note that the circular economy concept not only corresponds to all 17 UN Sustainable Development Goals, but also encourages countries and businesses to innovate. And today, most EU countries, the USA, China, Japan, South Korea and other countries have prioritized the development of the circular economy in their long-term strategies. This can be explained by the fact that the use of circular production, unlike linear production, allows optimal disposal of waste, reducing the scarcity of resources, especially natural ones, reducing the negative impact on the environment and achieving competitive advantages in international markets due to innovations [18].

The circular economy strategy as an integral part of the modern economy is implemented by 44 % of companies from the top 100 Fortune Global list, and around 500 multinational companies in the world. According to The Circularity Gap report, presented annually at the World Economic Forum in Davos, in 2018, 9 % of materials in the global economy were reused. The leaders in implementing the principles of the circular economy are the production of goods of daily

demand (FMCG – "Fast Moving Consumer Goods") and the automobile industry [24]. Other industries do not yet practice the closed loop so widely.

To date, the most significant results from the point of view of the transition to a circular economy are demonstrated by the countries of the European Union, where the European Resource Efficiency Platform, which unites EU countries, is designed to ensure the transition to a circular economy, strengthen global competitiveness, promote sustainable economic growth and create new jobs [25].

In the package of Directives in the field of waste management, adopted by the EU Commission in December 2015, the EU Action Plan was approved, which provides for specific measures for the development of the circular economy, covering the entire cycle: from production and consumption to waste management and the market for secondary raw materials, and also defines time limits for performing the described actions. The proposed measures involve "closing" the life cycle of the product through recycling and reuse, which will benefit both the environment and the economy [19]. It should be noted that on March 11, 2020, the European Commission adopted a new special plan – the Circular Economy Action Plan, which is also the basis of the Strategy for the Development of the "Green" Economy in the EU and provides for a number of innovations and changes, the implementation of which will make it possible to transform Europe into a climate-friendly one by 2050 – a neutral continent, will contribute to economic growth, increase in well-being and standard of living of citizens, greening of the economy and protection of the environment. According to the plan, it is expected to double the level of reuse of resources in the next ten years and to create an additional 700,000 new jobs [26, 27].

Separate (main) areas of circular economy development in EU countries are [28]:

1) **marine litter processing**, which can ensure a reduction of marine litter from 13 % in 2020 to 27 % in 2030;

2) **use of construction and demolition waste** by implementing a mechanism for assessing the environmental performance of new buildings;

3) **reduction of food waste** in production, retail trade, food services and households by at least 30 % by 2025;

4) **improving the management and processing of plastic waste**. It is assumed that by 2030, all plastic packaging should be recycled;

5) **promotion of the processing of the most important raw materials** within the framework of the raw materials initiative and the European innovative partnership for raw materials.

According to the calculations of the EU institutions, "the implementation of resource-efficient production technologies at all links of production chains will allow to reduce the industrial demand for raw materials by 17–24 % by 2030, the annual costs of enterprises – by 630 billion EUR" [25], and the transition to a circular economy will generally increase Europe's GDP by 17 % by 2030 [29].

In some countries of the European Union, models of circular economy development at the macroeconomic level are already being formed today. For example, the Netherlands is creating a circular economy due to innovations, Scotland – thanks to a special investment fund that finances

circular economy projects, and Finland was the first in the world to develop a national road map for the transition to a circular economy [18].

Factors related to averting a climate catastrophe, as well as the dependence of many countries on limited natural resources, and primarily energy, became the impetus for a new rethinking of the provisions regarding the circular economy. In these conditions, the creation of so-called durable products and the improvement of the efficiency of resource reuse in the industrial sector are of particular importance [18]. The very nature of the circular economy provides for the broad development of an innovative model of the economy. At the same time, "circularity becomes one of the forms of dynamic development of the socio-economic system at different levels of management" [30].

At the micro level, the principles of the circular economy are implemented with the help of various business models, strategies and tools.

In work [19], business models of the circular economy are divided into 2 groups:

The first group includes business models of reuse of resources due to repair, reconstruction, modernization, re-equipment of already operating enterprises.

The second group includes business models of materials processing. They envisage the creation of completely new factories that will be able to process waste after linear enterprises.

Today, various strategies, business models and approaches to the circular economy, which provide an opportunity to obtain additional sources of income, have become widely used in companies around the world. Among the main researchers [20, 24, 26, 31] single out the following:

1. Design of the future. It involves the production of goods in which traditional materials can be replaced by renewable or recycled ones. This optimizes the use of resources and reduces the amount of waste in the production process. For example, Adidas has developed running shoes made of 100 % recycled materials. In production, one type of material is used and no glue is used. After use, the shoes can be recycled to produce a new pair.

2. Design without waste. According to this strategy, product design takes into account the possibility of repair, restoration and reuse after the end of the service life.

3. Shared use and virtualization – the business models of Uber, BlaBlaCar, and Airbnb, already familiar to many, use this approach. Ukrainian examples include the Oh My Look! brand, which is transforming from a dress rental service to offering a subscription-based virtual wardrobe. Similar services work successfully in many countries of the world.

4. "Segmentation of flows" involves the separation between consumables and components of long-term use of products for the purpose of reuse or safe return to the biosphere.

5. "Goods as a service" strategy seeks to replace traditional models of selling goods with the implementation of services. Thus, the Rolls Royce concern with the "Power-by-the-Hour" service offers customers from the aviation industry, instead of buying aircraft engines, payment for their use based on a fixed rate for 1 hour of work. Due to the service approach, the life cycle of the engine increases by 25 %.

6. Reuse in production – when used products or components become part of new products. So, Canon takes back products at the end of their life cycle and uses the components in new

devices, without reducing the functional characteristics of the materials. And the Michelin group annually returns 17 million tons of used car tires to the production process. Thanks to R&D developments, they become a valuable material again.

7. Reuse in consumption involves the sale and purchase by companies of used functional goods at reduced prices. In Sweden, there is an entire Retuna supermarket, the range of which consists of second-hand items, from furniture to books. And most Kyivans know about the "Courage Bazaar" project, which promotes reuse.

8. Industrial symbiosis and recycling of production waste can also significantly increase business efficiency.

The project in the city of Kalundborg, Denmark, is considered the first example of symbiosis in the concept of circular economy. Participating companies were united there by the principle of interaction, when production waste of one business becomes a resource for another. At the same time, economic costs and CO_2 emissions are reduced. The consortium includes the largest oil refining company in Denmark, the pharmaceutical company Novo Nordisk, the municipal water and heat supply company for city residents, a waste management operator and other participants.

In Ukraine, there are also examples of effective use of resources in the production process. For example, the company "Myronivskyi Hliboprobukt" is building biogas complexes for processing waste from poultry farms and obtaining energy. Concern "Obolon" sells to agricultural companies by-products of beer production, which become fodder for animals. And in the "Silpo" chain of supermarkets, special heat recovery tanks from refrigeration equipment are installed to meet the need for hot water supply.

9. The term "**recycling**" is also a circular economy strategy. At the end of the product's life cycle, the materials are recycled in a safe way. For example, sports shoe manufacturer Nike launched the Nike Grind initiative almost 30 years ago. Old sneakers, collected all over the world, were used as a material for the manufacture of coverings for sports fields. Since its launch, about 28 million pairs of shoes have been recycled into sports surfaces.

10. Clean energy involves the use of energy from renewable sources to increase the stability of the cycle system and reduce dependence on changes in the cost of resources.

It should be noted that obtaining competitive advantages for business, according to experts, is also achieved by changing the rate of resource consumption and applying a complex of cyclical principles "3R", "6R", "9R".

So, as the experience of developed countries, primarily European, shows, the circular economy offers a more rational approach to the use of resources in general and waste management, in particular.

The situation in Ukraine in this regard is much more modest, since the circular economy in our country is just starting to develop, and the topic of its widespread implementation remains open according to some estimates [31]. Despite the fact that there are already the first significant steps on the way to the transition to a circular type of economy, which are based on the experience

of Europe [17, 32, 33], on the one hand, there are many issues that require practical implementation both at the state level and at the level of business, and on the other hand, very few steps have been taken on the way to a circular economy, although there is an understanding of the need for reforms at different levels (government, business and the public) [4].

In practice, the implementation of circular economy principles faces significant obstacles. The main factors that negatively affect the development of the circular economy in our country are [28, 21, 31]:

1) extremely high prices for transporting raw materials for repeated processing;

2) imperfect logistics infrastructure, mostly poor-quality roads;

3) the market of secondary raw materials is opaque, as more than 50 % is in the shadows. At the same time, the market for recycling and waste-free technologies is at an early stage of development;

4) absence of tariffs for processing of secondary resources;

5) low level of environmental tax and other eco-payments, which, on the one hand, leaves support for measures aimed at building a circular economy, and on the other hand, does not stimulate manufacturers to implement closed-loop technologies;

6) practice of public procurement, where the main criterion for choosing a supplier is usually the cheapest offer. At the same time, other criteria are not taken into account, such as energy efficiency, chemical safety, resource conservation, prevention of environmental pollution, reduction of the negative impact of climate change, and reduction of waste volumes. Products that are better in terms of environmental friendliness and energy efficiency usually do not have the opportunity to beat cheaper products made with the help of "ecologically dirty" technologies;

7) uncertainty with tariff policy in green energy.

As a result, the Ukrainian economy is characterized by low efficiency of resource use, has a very low share of recovery and reuse of waste, and in this respect lags far behind developed European countries.

Fig. 6.2 presents statistical data on waste management in the EU and Ukraine. The given data show that both the EU countries and Ukraine still lack technologies to prevent the generation of waste. At the same time, if in Ukraine more than 94 % of waste is buried or burned, then in the EU – only one fourth (25.3 %). Accordingly, in the EU, preparation for reuse and recycling make up almost half (48.1 %) of waste, in Ukraine – only about 6 %. In addition, for 265.6 % of waste in EU countries, another type of disposal is used, which includes energy recovery.

According to experts, the transition from a linear model of the economy to a circular one will contribute to the improvement of the country's economic climate, the creation of new market niches (remanufacturing, engineering, processing, service), an influx of investments, as well as new business models. Ukraine can become an Eastern European hub in this new reality by joining its construction at an early stage. But in order to reach this qualitatively new level of resource efficiency, technological innovations and changes in behavior patterns, large-scale investments and special packages of state incentives will be needed [25].

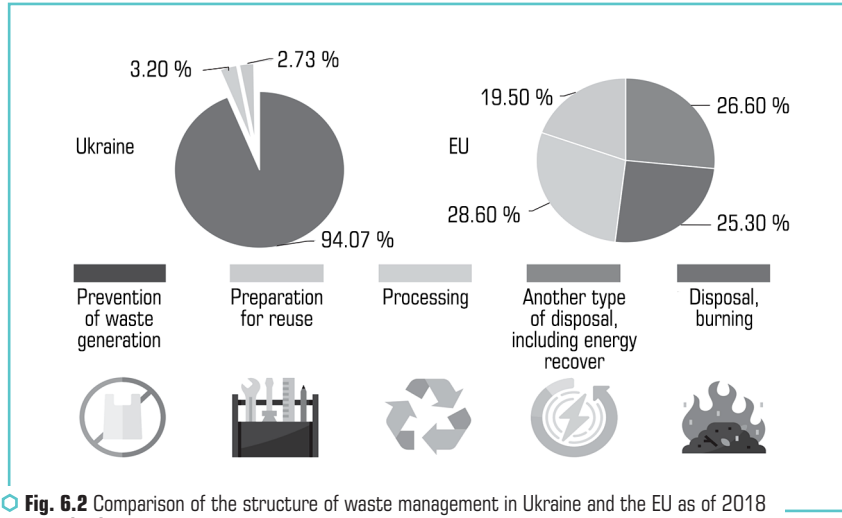

Fig. 6.2 Comparison of the structure of waste management in Ukraine and the EU as of 2018
Source: [19]

The first step in the field of state support for the transition to the principles of a circular economy was the approval by the Cabinet of Ministers of Ukraine in November 2017 within the framework of the Association Agreement between Ukraine and the EU of the National Waste Management Strategy in Ukraine until 2030.

The implementation of the principles of the circular economy will also be facilitated by the gradual harmonization of our country's legislation with European legislation within the framework of EU membership. In this context, the Law of Ukraine "On Waste Management" was adopted in June 2022, which is an important step on the way to the functioning of extended producer responsibility (EPR) systems, which should stimulate producers to implement closed-loop technologies.

Currently, the Government of Ukraine is considering the issue of forming a Ukrainian green course based on the strategy of the European Green Course (European Green Deal), the basis of which is, as already mentioned above, the Circular Economy Action Plan.

The main program documents on the circular economy in Ukraine are as follows:

– national waste management strategy until 2030;

– national Waste Management Plan until 2030, adopted by the CMU on February 20, 2019;

– national waste management plan until 2030;

– strategy of the state environmental policy of Ukraine for the period until 2030;

– concept of implementation of state policy in the field of climate change for the period up to 2030 and its implementation plan;

– low-carbon development strategy of Ukraine until 2050, etc. [1, 4].

These documents provide [21]:

– implementation in Ukraine of the best European practices in the field of handling various types of waste (industrial, solid household, agricultural waste, construction, hazardous and other types of waste);

– construction of an innovative waste management model;

– specific tasks and measures that will allow Ukraine to move to a new model of waste management, to a closed cycle economy, which is used by leading European countries by 2030;

– measures to reduce water and air pollution through the introduction of environmental norms and standards;

– transition of Ukraine's economy to a low-carbon development model, which consists in the transition to renewable energy sources and mainly in reducing emissions of greenhouse gases into the environment;

– implementation of the concept of ecological production in Ukraine through the use of "green" (ecological) technologies.

Despite the large number of adopted program documents, Ukraine has not yet formed a coherent system of support for the development of the circular economy. Concrete, rapid changes are needed that will contribute to the formation of a closed-loop economy.

At the macro level, in addition to the goals, tasks and specific measures defined by the set of program documents, the state must develop effective mechanisms for their implementation. The first direction of effective state regulation of the development of the circular economy should be the formation and harmonization with European legislation of the legislative and regulatory framework, which would encourage producers of goods and services to use effective innovative technologies of the closed cycle.

In our opinion, one of the key mechanisms for stimulating the introduction of closed-loop technologies is the transformation of the public procurement system in accordance with the needs of the development of the circular economy. The main element of the procurement system (this will be especially relevant in the conditions of the post-war reconstruction of the economic and social infrastructure) should be the unconditional (unquestionable) consideration of the criteria of environmental friendliness and energy efficiency of the purchased products at all levels: from state to local.

The third direction of state support for the development of the circular economy should be partial or full financing of waste processing and disposal projects at the state and regional levels.

All this will allow enterprises to more actively transition to modern business models of the circular economy and closed-loop technologies. By developing and further implementing innovative business models, it will be possible to guarantee that natural resources will be preserved.

Current areas of circular economy development in Ukraine are:

– development of green energy (alternative energy sources);

– development of production of organic food products;

– creation of production facilities for the processing of household and industrial waste (according to statistics, 1/7 of the country's territory is littered with garbage, the amount of industrial waste increases annually by hundreds of million tons);

– processing of plastic waste. As in the whole world, in Ukraine the problem of plastic recycling is urgent and private business is included in its solution. So, for example, the "Morshynska" brand updated its packaging design, reducing the amount of plastic used by 15 %.

As already mentioned, the basis of the development of the circular economy is the application of a wide range of innovations and innovations of financial, production, economic, social, ecological direction, without which the implementation of the specified processes is not possible. Considering the essence of the circular economy as a new way of using and consuming resources and material goods, it is appropriate to analyze, in particular, marketing innovations that contribute to the implementation of its main principles. In general, marketing innovations involve the development and implementation of fundamentally new or significantly optimized marketing methods, techniques, technologies and tools in all areas of marketing activity. The main direction of marketing innovations is to meet the growing and constantly changing needs and demands of consumers, optimization of the influence of marketing tools on consumer behavior, expansion of sales markets. With this in mind, marketing innovations of the circular economy allow to achieve the goals presented in **Fig. 6.3**, which produce a synergistic effect for the development of enterprises and industries.

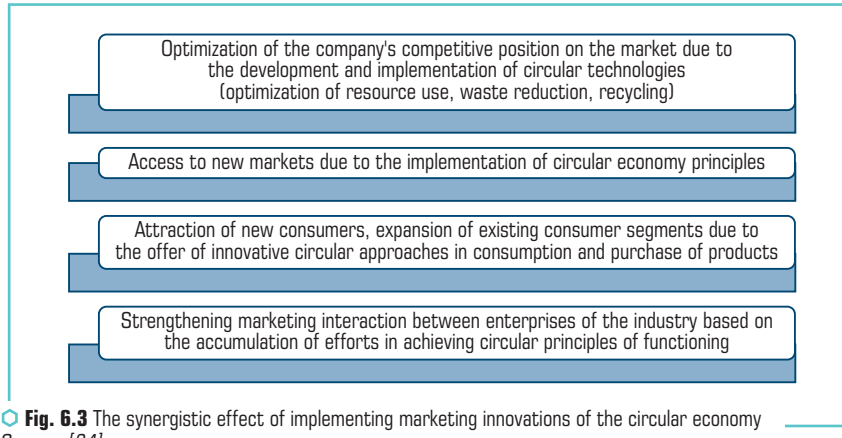

Fig. 6.3 The synergistic effect of implementing marketing innovations of the circular economy
Source: [34]

Marketing innovations of the circular economy are an important component of the implementation of its principles in all spheres of economy, but they are especially important in light industry, in the field of textiles, fashion and design. The textile industry is an important branch of the world economy with an annual turnover of more than 2.5 trillion USD. The fashion segment leads

the textile market. In 2022, it accounted for more than 70 % of global income [9]. However, this industry requires the application of the principles of a circular economy, since greenhouse gas emissions occur throughout the entire life cycle of textile products: from the extraction of raw materials to production, transportation, use and disposal. The impact of textiles on the environment is negative, since textiles often consist of synthetic materials, the impact of which on the environment depends on the type of fiber, its origin and the production process. In addition, many textile products contain carbon, which is released during the incineration of waste. For example, 4–6 % of the EU's "ecological footprint" is caused by textile consumption. From 2025, all European member states will have to create separate collection systems for textile waste [35].

The increase in material extraction in recent years has reduced global circularity from 9.1 % in 2018 to 8.6 % in 2020 and 7.2 % in 2023 [36]. This means that more than 90 % of materials are wasted, lost, or remain unavailable for reuse for years because they are locked in long-term inventory. Among the main business principles that apply to the textile industry, the Global Report on the Circular Gap noted the need to avoid fast fashion for environmentally friendly textiles, to prioritize natural textiles, as well as better quality and longer-lasting clothes, reuse or recycle clothes; the need to buy only what is needed, which means a shift to responsible purchases supported by circular policies such as commodity taxes and service-based business models such as sharing or pay-for-use.

In the implementation of marketing innovations of the circular economy in the field of fashion and design, the main provisions of the National Waste Management Strategy in Ukraine until 2030 are of great importance [37]. In this document, industrial waste is defined as one of the most problematic components of sustainable development, and light industry is included in the list of industries where the main volumes are generated. Among the tasks of the Strategy, the implementation of which will contribute, in particular, to the circular development of business entities in the field of light industry, include the following:

– determination of directions and priorities for the development of secondary resource use;

– wide introduction of public-private partnership, interaction and cooperation;

– provision of financing and implementation of specified measures for further improvement of the management system of waste management on traditional basis [37].

Priority in this regard will be the definition of the main technological processes – the best available technologies for reuse, recycling and disposal of waste and the provision of financial assistance to business entities (loans, grants, etc.) for environmental modernization, introduction of cleaner technologies, creation of own capacities for processing and disposal of waste (**Fig. 6.4**).

We consider it expedient to analyze those of the basic principles of the circular economy "1OR" established by the World Economic Forum (**Fig. 6.1**, **6.4**) that are effectively implemented by Ukrainian clothing brands and the corresponding marketing innovations that involve their application (**Table 6.1**).

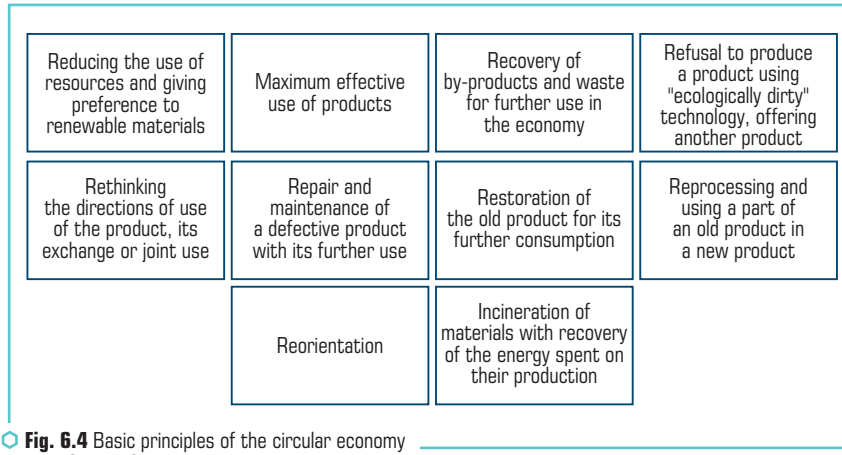

Fig. 6.4 Basic principles of the circular economy
Source: [21, 36]

Table 6.1 Marketing innovations of the circular economy in the activities of Ukrainian clothing brands

The principle of circular economy	Marketing innovations	Ukrainian brands
Restoration of the old product for its further consumption	Transformation of vintage clothes found in outlets, resale sites into new products	Hate Date Oversized Studio Tokonikomu Buro26 Bettter UliUlia **Ksenia Schnaider**
Reprocessing and using a part of an old product in a new product	Creation of bags, backpacks from advertising banners in order to combat marketing production waste	RE:ban
	Creating purses, backpacks and bags from banners, scraps of fabric and unwanted clothes	Potrib
	Production of designer bags and accessories from genuine vintage leather recycled from jackets	Remade
Maximum effective use of products	Refusal of mass production of collections in order not to create a stock and sale and production of exactly the amount of clothes that customers need	The Coat by Katya Silchenko
Recovery of by-products and waste for further use in the economy	Production of clothes from fabric that is in warehouses in remnants	Hate Date
	Using regenerated nylon created from recycled fishing nets	*Atelier Handmade* IENKI IENKI
Rethinking the directions of use of the product, its exchange or joint use	Transformation from a dress rental service to offering a subscription-based virtual wardrobe	Oh My Look!

Note: compiled by the authors based on materials [38–42]

Therefore, the mentioned marketing innovations are used by Ukrainian clothing brands and contribute to the implementation of the principles of the circular economy. However, it is worth noting that we are talking about small and medium-sized business structures, on the other hand, large enterprises that work in the field of sewing clothes and other textile products are only at the beginning of this path. At the same time, it is worth noting that the products manufactured by some of the mentioned Ukrainian brands are in high demand in foreign markets [40]. The main marketing advantage of light industry products made on the basis of circular economy principles is their uniqueness.

In general, the main principles of the circular economy, which are most often used in this field, are presented in **Fig. 6.5**.

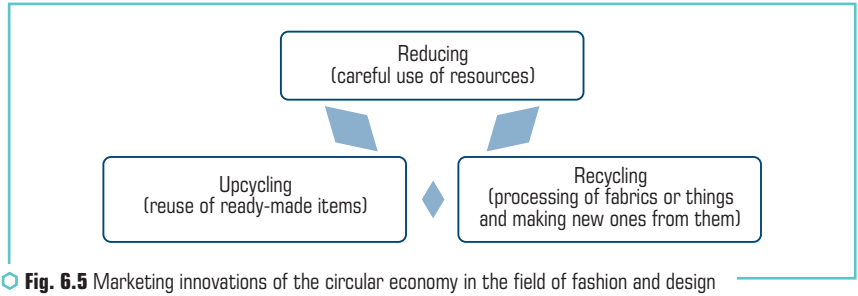

Fig. 6.5 Marketing innovations of the circular economy in the field of fashion and design

In our opinion, it is advisable to use the experience of Great Britain in the application of marketing innovations of the circular economy in the considered area, in particular, paying attention to the following important aspects:

– ensuring a favorable attitude of consumers towards processed products and processing enterprises in general, as well as understanding the importance of processing in the transition to a sustainable society;

– financial and business support for processing enterprises, such as incentives and grants provided by the government and other public bodies;

– creation of "guilds" to provide the technical knowledge, tools and skills needed to expand the recycling business. This should be done with government support and allow access to this kind of knowledge, thus helping businesses of all sizes to do the right thing;

– cooperation between the private and public sectors together with educational institutions can help educate future professionals and especially designers about recycling, circularity and efficient use of resources [43].

In Denmark, circular economy marketing innovations are primarily aimed at sorting textile waste, providing a deeper understanding of consumer behavior and further work on strategies to reduce consumption and switch to products of higher quality and durability, which will become an investment in the future, making repair, exchange and resale more charming; transfer of textile products purchased by households to charitable and private collectors for reuse and recycling,

providing an opportunity to experiment and pilot innovations and technologies for collection, sorting and processing plants, which makes it possible to get closer to closing the textile cycle [35].

It should be noted that these principles are already partially implemented in Ukraine. In this connection, it is worth noting, first of all, the creation of the Podillia Fashion Cluster, among the main goals of which is functioning on the basis of the circular economy, as well as the construction of a processing plant [44].

Secondly, the provision of complex services for the utilization of textile waste, which are provided, in particular, by such companies as "UtilVtorProm", "Ecological Investments" [45, 46] and others. This involves collecting clothes, classifying them into groups, processing, making new fibers. Raw materials produced from textile waste can be used in various industries, including construction, production of interior items, shoe production, and production of new polyester fabrics.

Thirdly, the involvement of consumers in interaction based on the principles of the circular economy. So, for example, the Remade company accepts things for free from people who have decided to get rid of unnecessary leather jackets, they are given a 10 % discount on a permanent basis for a product from their old thing or for buying a ready-made product [39]. The Ukrainian clothing brand Trempel implemented the No Trash project, the purpose of which was to collect and sort any textile that was accepted from anyone for use in three directions: for ecological recycling, for charity, and for sewing new things [47]. Each consumer received a 5 % discount on goods from partner brands.

Among the companies operating in foreign markets, it is worth noting an interesting marketing approach in interaction with consumers, which is used by the Finnish brand ARELA, which launched the concept of sustainable development called "For Good" [48]. This concept includes the aspect that the clothes are designed to avoid waste and to make them more durable and long-lasting in terms of quality and design. The brand educates consumers on how to best care for their clothes to avoid premature disposal. ARELA also offers repair training and repair services, and has a return system to offer the sale of own-brand used items. The company also takes responsibility for its knitwear: it takes back all used knitwear and gives the consumer a 20 % discount on a new product.

Among other foreign brands, it is worth noting Beyond Retro, ASOS Reclaimed Vintage line (production of new products from vintage), Patagonia (creation of shorts and jackets using plastic), Zero Waste Daniel (production entirely from leftovers), Re/Done (production of jeans from old denim products using water-saving methods and the rejection of aggressive chemicals), Antiform (production of knitwear and other products from used materials), Insecta Shoes (production of shoes from old fabrics and recycled plastic bottles) [49].

In general, the successful implementation of marketing innovations by light industry enterprises will be facilitated by the analysis of product functions in the context of consumer value, that is, the possibility of replacing materials with renewable ones without loss of quality and value for the consumer; optimization of contacts with consumers in order to determine their attitude to the company's use of the principles of the circular economy, influence on the consciousness of consumers using marketing techniques, search for secondary use markets, expansion of presence on them.

CONCLUSIONS

The basis of economic growth at the macro, meso, and micro levels in modern conditions is the process of innovative development, which forms positive qualitative and quantitative changes in any socio-economic system. At the same time, the modern paradigm of global development is the idea of sustainable development. The key tool (mechanism) for the implementation of the Global Sustainable Development Goals is the concept of circular economy as an innovative component of the modern global economy, characterized by breakthrough innovative technologies that, together with innovative business processes, form closed cycles of processing, exchange and consumption.

The circular economy as a new model of economic development, which provides efficient use of limited natural resources and reduces the negative impact on the environment, was born in the early 70s of the last century. As education has shown, the transition to a circular economy is a complex and long process. In general, the evolution of the circular economy can be divided into three stages.

At the first stage (1970–1990), at the beginning of its formation, the circular economy began with the introduction of technologies that reduce environmental pollution. At the same time, work with waste took center stage.

In the second stage (1990–2010), the implementation of environmental payments had a significant impact on the development of the circular economy. During this period, waste-free industrial production technologies were actively developed.

Today, the circular economy has become an integral part of the modern economy at all levels: from the global to the micro level, and the effect of its principles, which are filled with additional content, is expanding and deepening.

The leaders in the development of the circular economy are the leading countries and regions of the world, the EU, the USA, Japan, China, and South Korea. In business, 44 % of the world's 100 largest companies have chosen a circular economy strategy.

From the point of view of the evolutionary development of the circular economy, the most significant results today are demonstrated by the countries of the European Union, where the comprehensive policy of supporting resource efficiency is designed to ensure a complete transition to a circular economy in the foreseeable future, strengthen global competitiveness, and promote sustainable economic growth in the region.

Today, the principles of the circular economy at the micro level are implemented with the help of various new technologies (closed-loop technologies, green technologies, nanotechnologies), various innovative business models, strategies and tools.

In Ukraine, the circular economy is just beginning its formation. Despite the fact that there are already significant first steps on the way to the transition to a circular type of economy, the implementation of the principles of the circular economy faces significant obstacles. The main factors that negatively affect the development of the circular economy in our country are: extremely high prices for transporting raw materials for repeated processing; imperfect logistics infrastructure, mainly poor-quality roads; opacity of the market of secondary raw materials; lack of tariffs

for recycling of secondary resources; low level of environmental tax, which, on the one hand, leaves support for measures aimed at building a circular economy, and on the other hand, does not stimulate manufacturers to implement closed-loop technologies; the practice of public procurement, where the main criterion for choosing a supplier is usually the cheapest offer without taking into account the environmental friendliness and energy efficiency of the purchased products.

Despite the large number of adopted program documents, Ukraine has not yet formed a coherent system of support for the development of the circular economy. Specific rapid changes are needed that will contribute to the formation of a closed cycle economy in our country.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

REFERENCES

1. Maistrenko, N. V., Serdiuk, B. M. (20115). Basis the evaluation of efficiency innovation in enterprises. Available at: https://ela.kpi.ua/bitstream/123456789/14310/1/2015_1_Maystrenko.pdf
2. Kosovych, B. (2022). Innovative development of Ukraine in the conditions of war and post-war period. Economics & Education, 7 (4), 6–12. doi: https://doi.org/10.30525/2500-946x/2022-4-1
3. Kniazevych, A. O. (2018). Upravlinnia infrastrukturnym zabezpechenniam innovatsiinoho rozvytku ekonomiky. Rivne: Volynski oberehy, 362.
4. Horbach, L. M., Kobuk, A. L. (2017). Innovatsiinyi rozvytok u suchasnomu sviti: osnovni pidkhody do vyvchennia. Available at: http://www.confcontact.com/2017-ekonomika-i-menedzhment/10_gorbach.htm
5. Boichuk, N. Ya. (2021). Innovatsiinyi rozvytok ta potentsial pidpryiemstv v Ukraini. Biznes, Innovatsii, Menedzhment: Problemy ta Perspektyvy. Available at: http://confmanagement.kpi.ua/proc/article/view/231791
6. Hladynets, N. Yu. (2014). National innovation system as a basis for innovative development of industry in Ukraine. Available at: http://dspace-s.msu.edu.ua:8080/bitstream/123456789/39/1/07_Hladynets.pdf
7. Buniak, N. M. (2011). The essence of the national innovation system. Efektyvna ekonomika, 7. Available at: http://www.economy.nayka.com.ua/?op=1&z=633
8. Holod, A. P., Izhevska, O. P., Korkuna, O. I. (2019). Cluster model of the hospitality industry development in a region. Skhidna yevropa: ekonomika, biznes ta upravlinnia, 4 (21), 375–380. Available at: http://www.easterneurope-ebm.in.ua/journal/21_2019/60.pdf

9. Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions A NewEuropean Innovation Agenda. COM/2022/332. 05.07.2022. Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52022DC0332
10. Pro Tsili staloho rozvytku Ukrainy na period do 2030 roku (2019). Ukaz Prezydenta Ukrainy No. 722/2019. 30.09.2019. Available at: https://zakon.rada.gov.ua/laws/show/722/2019#Text
11. Yurynets, Z. V. (2016). Formuvannia innovatsiinykh stratehii: teoriia, metodolohiia, praktyka. Lviv: SPOLOM, 412.
12. Yatskevych, I. (2022). Innovation policy of ukraine in the postwar period. Economy and Society, 39. doi: https://doi.org/10.32782/2524-0072/2022-39-53
13. Silva, F. M. da, Oliveira, E. A. de A. Q., Moraes, M. B. de. (2016). Innovation development process in small and medium technology-based companies. RAI Revista de Administraçãoe Inovação, 13 (3), 176–189. doi: https://doi.org/10.1016/j.rai.2016.04.005
14. Naumov, O., Voronenko, M., Naumova, O., Savina, N., Vyshemyrska, S., Korniychuk, V., Lytvynenko, V.; Babichev, S., Lytvynenko, V. (Eds.) (2022). Using Bayesian Networks to Estimate the Effectiveness of Innovative Projects. Lecture Notes in Computational Intelligence and Decision Making. ISDMCI 2021. Lecture Notes on Data Engineering and Communications Technologies. Vol, 77. Cham: Springer. doi: https://doi.org/10.1007/978-3-030-82014-5_50
15. Orel, A. (2019). Competitive strategies for innovation and investment development of agricultural production entities. Ukrainian Journal of Applied Economics, 4 (4), 411–418. doi: https://doi.org/10.36887/2415-8453-2019-4-46
16. Otsinka efektyvnosti innovatsiinoi diialnosti pidpryiemstva. Available at: https://elearn.nubip.edu.ua/mod/book/tool/print/index.php?id=357320
17. Closing the loop: Commission adopts ambitious new Circular Economy Package to boost competitiveness, create jobs and generate sustainable growth (2015). European Commission – Press release. Available at: http://europa.eu/rapid/press-release_IP-15-6203_en.htm Last accessed: 15.04.2018
18. Baiura, D. (2021). Tsyrkuliarna ekonomika – maibutnie uspishnoi Ukrainy. Enerho biznes, 42 (1235).
19. Melnyk, O. H., Zlotnik, M. L. (2020). Analyzing the Status and Tendencies of Circular Economy Development in Lviv Region. Business Inform, 2 (505), 125–133. doi: https://doi.org/10.32983/2222-4459-2020-2-125-133
20. Model tsyrkuliarnoi ekonomiky (2021). Diia. Biznes. Available at: https://business.diia.gov.ua/handbook/impact-investment/model-cirkularnoi-ekonomiki
21. Ruda, M., Yaremchuk, T., Bortnikova, M. (2021). Circular economy is Ukraine: adaptation of European experience. Management and Entrepreneurship in Ukraine: The Stages of Formation and Problems of Development, 3 (1), 212–222. doi: https://doi.org/10.23939/smeu2021.01.212
22. Towards the circular economy. Vol. 1: an economic and business rationale for an accelerated transition (2013). Ellen McArthur Foundation. Available at: https://www.ellenmacarthurfoundation.org/towards-the-circular-economy-vol-1-an-economic-and-business-rationale-for-an

23. Natsionalna dopovid "Tsili Staloho Rozvytku: Ukraina" (2017). Available at: https://www.kmu.gov.ua/storage/app/sites/1/natsionalna-dopovid-csr-Ukrainy.pdf
24. Nechytailo, D. (2020). Z chystoho arkusha: yak pratsiuie i chym vyhidna tsyrkuliarna ekonomika. Ekonomichna pravda. Available at: https://www.epravda.com.ua/columns/2020/09/2/664626/ Last accessed: 17.03.2021
25. Viikman, A., Skonberh, K. (2017). Tsyrkuliarna ekonomika ta perevahy dlia suspilstva. Available at: http://www.clubofrome.org.ua/wp-content/uploads/2017/08/The-Circular-Economy-CoR_UA-2.pdf Last accessed: 17.03.2021
26. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A new Circular Economy Action Plan For a cleaner and more competitive Europe (2020). Document 52020DC0098. COM/2020/98 final. European Commission. Brussels. Available at: https://bit.ly/3rnvl0s
27. New EU policy on the "circular" economy: opportunities for Ukraine (2020). Publikatsiia HO "Diksi Hrup", 16.
28. Lykholat, S. M. (2021). Tsyrkuliarna ekonomika yak napriam promyslovoi modernizatsii: peredovyi mizhnarodnyi dosvid. Biznes, innovatsii, menedzhment: problemy ta perspektyvy. Available at: http://confmanagement.kpi.ua/proc/article/view/230935
29. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Towards a circular economy: a zero waste pro- gramme for Europe" (2014). Brussels. COM(2014) 398 final. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:50edd1fd-01ec-11e4-831f-01aa75ed71a1.0001.01/DOC_1&format=PDF
30. Kuzior, A., Arefieva, O., Poberezhna, Z., Ihumentsev, O. (2022). The Mechanism of Forming the Strategic Potential of an Enterprise in a Circular Economy. Sustainability, 14 (6), 3258. doi: https://doi.org/10.3390/su14063258
31. Varfolomieiev, M., Churikanova, O. (2020). Circular economy as an integral way of ukraine's future in the aspect of globalization. Efektyvna Ekonomika, 5. doi: https://doi.org/10.32702/2307-2105-2020.5.200
32. Sergiienko, L. (2016). Directions of reforming of the state policy in provision of a circular economy in the context of international cooperation. Investytsii: praktyka ta dosvid, 23, 100–110. Available at: http://www.investplan.com.ua/pdf/23_2016/24.pdf
33. Stalyi rozvytok kompanii. Shliakhy rozviazannia problem zi smittiam – pershyi krok do tsyrkuliarnoi ekonomiky (2020). Available at: https://www.ukrinform.ua/rubric-presshall/2877667-stalij-rozvitok-kompanij-slahi-rozvazanna-problem-zi-smittam-persij-krok-do-cirkularnoi-ekonomiki.html
34. Lipych, L. H., Khilukha, O. A., Kushnir, M. A., Volynets, I. H. (2022). Eko-innovatsii v konteksti ekonomiky zamknutoho tsyklu. Naukovi zapysky Lvivskoho universytetu biznesu ta prava. Seriia ekonomichna. Seriia yurydychna, 32, 16–23.

35. Tsyrkuliarna ekonomika z aktsentom na plastmasy i tekstyl. Dorozhnia karta 2030–2050. Available at: https://www.astar.agency/wp-content/uploads/2023/02/22_3889_ASTAR_CircEco_broshyra_UKR.pdf
36. The circularity gap report 2023. Available at: https://www.circularity-gap.world/2023
37. Pro skhvalennia Natsionalnoi stratehii upravlinnia vidkhodamy v Ukraini do 2030 roku (2017). Rozporiadzhennia Kabinetu Ministriv Ukrainy No. 820-r. 08.11.2023. Available at: https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80#Text
38. Hate Date, Upcycling Freaks ta ReRe:Sklo: yak ukrainski upcycling-brendy daiut nove zhyttia starym recham. Available at: https://vctr.media/ua/hate-date-upcycling-freaks-ta-rereskло-yak-ukrayinski-upcycling-brendi-dayut-nove-zhittya-starim-recham-185730/
39. Rodygina, A. (2020). 20 vidomikh ukrainskikh sustainable-brendiv. Available at: https://elle.ua/moda/fashion-blog/20-vdomih-ukranskih-sustainable-brendv/
40. Modno, stylno, ekolohichno: yak odiahatysia, shchob ne shkodyty pryrodi ta yaki ye v Ukraini ekobrendy (2021). Available at: https://tsn.ua/exclusive/modno-stilno-ekologichno-yak-odyagatisya-schob-ne-shkoditi-prirodi-ta-yaki-ye-v-ukrayini-ekobrendi-1766455.html
41. 4 ukrainski brendy, yaki pratsiuiut z pereroblenym plastykom (2021). Available at: https://vogue.ua/article/fashion/brend/4-ukrainskih-brenda-kotorye-rabotayut-s-pererabotannym-plastikom-44840.html
42. Stepanenko, V. (2022). Dlia prodazhu chy na utylizatsiiu? Available at: https://media.zagoriy.foundation/velyka-istoriya/dlya-prodazhu-chy-na-utylizacziyu-kudy-viddaty-nepotribnyj-odyag/
43. Challenges and opportunities for scaling up upcycling businesses – The case of textile and wood upcycling businesses in the UK (2021). Available at: https://knowledge-hub.circle-lab.com/article/8942?n=Challenges-and-opportunities-for-scaling-up-upcycling-businesses-%E2%80%93-The-case-of-textile-and-wood-upcycling-businesses
44. Podillia Fashion Cluster: narodzhenyi viinoiu (2022). Available at: https://www.clusters.org.ua/success-stories/podillia-fashion-cluster-narodzhenij-vijnoyu/
45. Posluhy. Ekolohichni Investytsii. Available at: https://ecological.investments/poslugi/
46. Utylizatsiia odiahu. Available at: https://xn--80ancaco1ch7azg.xn--j1amh/uk/utilizatsiya-othodov/utilizatsiya-odezhdy/
47. Ukrainskyi brend pochav pryimaty nepotribnyi odiah na pererobku (2020). Available at: https://lb.ua/society/2020/02/05/449093_ukrainskiy_brend_nachal_prinimat.html
48. For Good. Available at: https://www.arelastudio.com/pages/for-good
49. Opys brendiv odiahu, yaki vypuskaiut odiah za dopomohoiu metodu pererobky. Available at: https://newsdaily.org.ua/522-9-brendiv-odyagu-yaki-vipuskayut-odyag-za-dopomogoyu-metodu-pererobki.html