Polgári Szemle, 17. évf. 1–3. szám, 2021, 390–398., DOI: 10.24307/psz.2021.0728

Diana Kucherenko – Olena Martyniuk

The European Green Deal: Challenges for Ukraine in Implementing the Circular Economy Model

Summary

Climate change and the depletion of natural resources are the two most pressing global problems of our time. Finding ways to solve the problem of climate change and conservation of natural resources has led to the creation of a global business model with a very fast growth rate – a circular economy. In a circular economy, the most important thing is not material flows or waste, but much more valuable methods, such as maintenance, reuse and recycling of equipment. The circular economy creates new and unprecedented opportunities for wealth and prosperity and is a major driver for achieving the UN 2030 agenda and the goals of sustainable development.

Journal of Economic Literature (JEL) codes: O33

Keywords: circular economy, green transition, EU Green Deal, sustainable development, waste disposal and recycling, UN sustainable development goals

Introduction

In 2014 in Davos, the Ellen MacArthur Foundation (the main initiator of the idea of a circular economy) presented a second report on the "circular economy", which estimated that the average OECD citizen annually buys for consumption 800 kg of food and beverages, 120 kg of packaging and 20 kg of new clothes and shoes, and almost 80% of these goods are not reused (Global Ekolabelling Network). The purpose of the article is to reveal the peculiarities of formulating the paradigm of circular thinking and the concept of circular economy, to consider the features of the green transition in the European Union in order to determine the implementation of a sustainable, ecological, climate-neutral economy in Ukraine.

Presenting the main material

The concept of the circular economy appeared in literature in the 60s of the twentieth century

Dr. Diana Kucherenko, Ph.D. in Economics, Associate Professor, Science and Research Institute of Social and Economic Development (diannaa@ukr.net), Dr. Olena Martyniuk, Ph.D. in Economics, Associate Professor, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine

in connection with the transition from an industrial society and economy to a post-industrial (information, digital) one. A systematic study of the theoretical foundations of the circular economy was carried out in the works of British economists David W. Pierce and R. Carrie Turner in 1989.Their concept is based on the assertion that the traditional linear economy does not have its inherent built-in mechanisms to stimulate businesses to recycle waste and extend their life cycle, but on the contrary – leads to the formation of huge landfills, which has an extremely negative impact on the environment. The principles of the circular economy were formulated by Ellen McArthur in 2015. According to the Global Environment Forum (2014, Tokyo), the circular economy (closed-loop economy) is defined as a concept aimed at eliminating material loops and extending the life of materials through longer use and increasing the use of secondary raw materials (Global Ekolabelling Network). This concept applies to the following components:

- product design – improved design can make products stronger or easier to restore, upgrade or recycle. This will help to better recover valuable materials and components by waste management companies;
- production processes – inefficient use of resources in production processes can lead to loss of business opportunities and significant waste generation. Primary raw materials, including renewable materials, continue to play an important role in production processes, even in the circular economy. In addition, it is necessary to promote innovative production processes. For example, the formation of industrial clusters makes it possible to attract waste or by-products of one industry as resources for another;
- waste management – plays a central role in a closed-loop economy. The waste management hierarchy establishes a priority order from prevention, preparation for reuse, recycling and recovery of energy to disposal (as a final option). This approach aims to encourage those production processes that provide the best overall environmental result. Adherence to or non-compliance with the hierarchy can lead to a high level of recycling of valuable materials that will be returned to the economy, or an inefficient system where waste is disposed of in landfills or incinerated in a potentially harmful manner;
- from waste to resources – strengthening the development of secondary raw materials markets and water reuse. In a cyclical economy, recyclable materials are reintroduced into the economic cycle as new raw materials, increasing the security of supply of resources.

In 2015 the European Commission also adopted a Circular Economy Action Plan and developed a system of recommendations for the implementation of the BREFs (Best Available Techniques Reference Documents) process for 32 economic activities (Internet-1). In general, EU economic policy measures aimed at enterprises that include reuse, treatment or recycling of materials in the production cycles include: minimum requirements for waste sorting, reuse and recycling, as well as taxation / bans on landfills and incineration; developing requirements for products, building or sharing infrastructure, as well as communication campaigns; minimum requirements or prohibitions on the product, environmental permits and taxes in the development of production technology or in the implementation of the production process; when ensuring the transportation, distribution or spatial development of products, the focus should be on transport taxes, mandatory recommendations for spatial development, obligations for the distribution and co-organization of waste collection; enterprises advanced in the field of waste processing are entitled to subsidies to launch pilot projects, exemption from taxes on innovative areas of activity and exceptions in legislation that allow for conducting experiments; "green" public procurement.

The European "green course" was presented by Ursula von der Leyen, President of the European Commission on December 11, 2019. It is a roadmap to a "climate-neutral" economy, in which growth is not tied to resource consumption. The EC estimates that the circular economy could further increase the EU's GDP by 0.5% by 2030 creating around 700,000 new jobs. The EU has set for itself the goal of transforming European countries into the world's first climate-neutral region by 2050. To achieve this goal, the European Green Agreement and related documents have been developed.

According to this plan, goods on EU markets should be designed for long-term operation, reuse, repair and recycling, and contain as much recycled materials as possible instead of primary raw materials. Disposable use will be limited, destruction without disposal of unsold durable goods is prohibited. Consumers will receive reliable information on the maintainability and durability of products to make environmental choices.

Today, the European Commission is developing a wide range of regulatory measures in such areas as increasing the service life of electronic devices, batteries and vehicles, improving waste collection and recycling. New mandatory requirements for packaging of goods, plastic composition, possibilities of secondary use of textiles, construction of buildings are introduced. The new legislative initiative is aimed at replacing disposable packaging, utensils and cutlery in the field of catering, minimising waste.

The European Green Agreement investment plan (InvestEU) has three main objectives:

- First, it will increase funding for the transition to a climate-neutral economy and mobilize at least €1 trillion to support sustainable investment over the next decade through the EU budget and relevant instruments, including InvestEU.
- Second, it will create favourable conditions for private investors and the public sector to promote sustainable investment.
- Third, it will support public administrations and project promoters in identifying, structuring and implementing sustainable projects.

Some European companies have already been able to successfully "embed" these principles in the modernization of industrial production, while ensuring a level of profitability that guarantees a timely return on investment and further business growth. They partially refuse to use products made of materials that are difficult to process, or use a trade-in system – the exchange of goods that have already been used for new ones. H. Nguyen, M. Stachtey and M. Zils (Nguyen – Stuchtey – Zils, 2014) analyzed the activities of global clothing retailer H&M, which abandoned the use of plastic packaging for consumers and launched a programme to collect old customers' clothes in exchange for discounts on new clothes. The received clothes are sent through a partner company for further processing and cascaded uses until they can be no longer used as materials. Renault's plant in Choisy-le-Roi is renovating car engines, transmissions, pumps and other components for resale. The plant's remanufacturing operations use 80% less energy and 90% less water than comparable new production does, while the plant's operating profit is higher than corporation's as a whole (Nguyen et al., 2014).

Sweden uses waste-to-energy technology. 99% of garbage in the country is used as fuel for power plants or raw materials for production. At the same time, the country imports garbage from Norway, Great Britain and Germany, which pay extra for the use of their waste. Austria has turned a waste incinerator plant into a thermal power plant, disposing 265,000 tons of waste per year for the production of thermal energy. Belgium has introduced its innovation, the Ecolizer, which allows to estimate the amount of production waste, its impact on the environment and the costs of transportation and disposal.

More than 100 waste processing plants have been built in Poland. Alternative fuels and secondary raw materials (plastic, metal, aluminum) are produced from waste. In the Netherlands, the introduction of the principles of the circular economy has become a leading strategy for sustainable development: it saves 7 billion euros annually and creates about 54 thousand jobs (Kocheshkova – Trushkina, 2017).

In recent years, SITRA, the Finnish Innovation Fund of the Future, has established the FISU network of Finnish communities, which has helped create sustainable business ecosystems among companies (industrial symbiosis) in the mining sector, the Finnish Renewable Energy Association and the Climate Aid Council (CLC), and industrial sectors to understand and maximize the opportunities associated with combating climate change.

In Belgium, about 30% of solid waste is burned (150 kg per person per year). At the same time, incineration is carried out by large high-efficiency complexes with a capacity of more than 500,000 tons per year with the production of significant amounts of energy (48% of energy in the country is obtained from renewable sources). More than 23% of MSW is composted in anaerobic plants in Belgium. Composting is mainly carried out in small plants with a capacity of 20,000-65,000 tons per year. Most aerobic composting plants are also designed to produce biogas, which is used to generate electricity.

The state of waste management in the EU-28 shows that most countries, especially those with higher GDP per capita, are expanding their programmes and recycling projects, but the share of landfilling remains significant. The reprocessing and reuse of products is largely driven by EU programmes, communiqués and strategic documents, as a result of which countries even acquire their own specialization in the global circular economy (Deineko, 2018):

In general, we can identify the following targets for the transition towards the circular economy of the EU as a whole:

- recycling 65% of household waste by 2030;
- recycling 75% of packaging waste by 2030;
- reducing landfilling to a maximum of 10% of household waste by 2030;
- promoting economic instruments to combat landfilling;
- simplified and harmonized calculation methods for processing rates throughout the EU;
- specific measures to promote reuse and industrial symbioses – transformation of a by-product of one industry into raw materials of another industry.

It is not only European countries that are implementing the principles of a green renewable economy. In 2013, the United States passed a law banning the use of disposable polystyrene packaging for food and beverages in restaurants and grocery stores. Colorado has a Green Building and Green Points programme, which requires that at least 50 percent of construction waste is recycled.

China passed a law to promote a circular economy back in 2009, which focusses on reducing resource use, reuse and recycling. According to experts, the circular economy in China is in practice more a topic of interest than a target of action. However, China is expected to become a major player in the circular economy in the future.

In Australia, 75-80% of landfills are being recycled, with greenhouse gas emissions falling below 1990 levels, although the economy has grown by more than 60% over the same period. Almost 40% of the state's energy is wind and solar energy. Also, according to experts in this country, the circular economy can create 25,700 more jobs by 2030, as well as reduce greenhouse gas emissions by 7,700 tons (carbon dioxide equivalent), which is 27% less compared to the linear model of the economy.

Along with the long-term benefits of the transition to a circular economy, there are also short-term obstacles along the way. Such challenges and threats can be:

- the difficulty of promoting systemic change;
- economic challenges (a circular eco-

nomy can be unprofitable in the short term);
- imperfect markets (lack of necessary products and infrastructure, competition, knowledge and / or incentives in the market);
- imperfect regulation (imperfect legislation and / or its implementation);
- social factors (insufficient knowledge and skills related to the circular economy);
- insufficient waste sorting;
- difficulties in obtaining adequate funding;
- lack of agreed procedures in various areas.

These factors have different effects depending on the industry and the value chain.

At the same time, the benefits of introducing a circular economy will not be evenly distributed among all sectors of the economy. Businesses, regions or social groups incurring losses will remain, while others will make a profit. Examples are jobs in the extractive industries, which are declining, and in activities that produce cheap consumer goods. The full benefits of the circular economy also depend on how quickly and efficiently skills can be acquired and educated for the circular economy, which is important to ensure the modernization of the industry with the necessary qualifications. In addition, modernization of production will require changes in the business processes of enterprises, the establishment of new connections and, probably, the rupture of old ones.

Thus, the topic of the European Green Deal today is one of the most pressing issues on the agenda in the European Union. The roadmap provides a set of measures to increase energy efficiency, transition to a "clean" circular economy, reduce pollution and prevent climate change. All this will improve the quality of life of people and the state of the environment. Quite strict environmental requirements for products to be imported into the EU are planned. This is the so-called "Carbon Border Tax". This means that "dirty" carbon-intensive products may not be allowed on EU markets. Therefore, Ukraine should already take into account the new EU strategy and accelerate the issue of improving energy efficiency and the circularity of the economy.

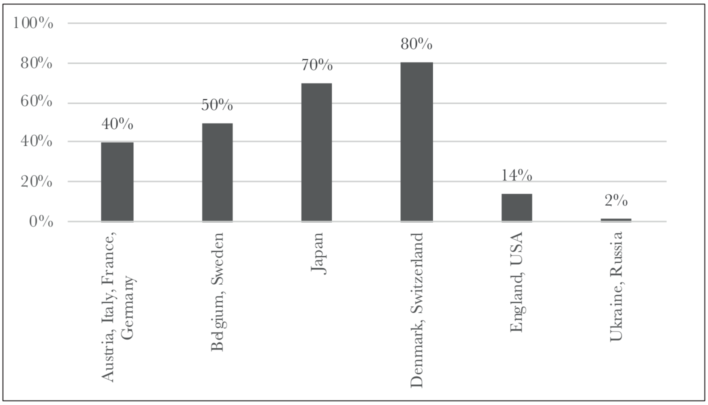
But today a gap is emerging and widening between the EU climate policy, which has been formed and developed significantly over the past 20-25 years, and the state of constant uncertainty in Ukraine.

The annual generation of industrial waste in Ukraine is approximately 420 million tons (including 250 million tons of coal and 100 million tons of metallurgical slag). Every year in Ukraine more than 13 million tons of solid household waste are generated. More than 95% of this waste is sent to landfills and dumps. For example, in the EU, slags generated as a result of energy generation at thermal power plants (removed ash) or in metallurgical industries are not classified as waste. Slag materials are successfully used in construction and can be placed in the landfills of enterprises only for temporary storage. In Ukraine, these materials are still considered "industrial waste". We lag far behind the EU in terms of their disposal. More than 15% of landfills are overloaded and do not meet sanitary standards. Opportunities to expand existing landfills are significantly limited. According to the State Statistics Committee, the volume of accumulated industrial waste in specially designated places or facilities is ~ 14 billion tons. Figures 1 and 2 show the levels of waste recycling in the world compared to Ukraine.

Thus, the high level of waste generation and low rates of its use as secondary raw materials have led to the fact that in Ukraine every year industry and utilities accumulate significant amounts of solid waste, of which only a small part is used as secondary material resources; the rest ends up in landfills. Industrial waste has a different morphology, depending on the type of industrial production.

The difference between the situation with waste in Ukraine compared to other developed countries is the large volume of waste genera-

Figure 1: Proportion of municipal solid waste incineration in different countries of the world



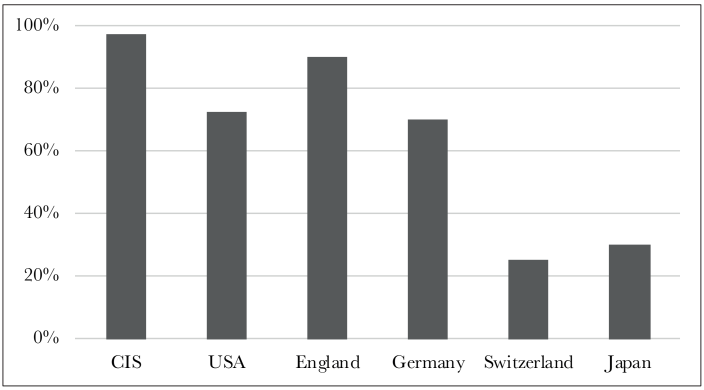
Source: Home, Sustainable Development (un.org)

tion and the lack of waste management infrastructure.

In our opinion, in order to implement the industrial strategy for the circular economy in Ukraine, it is necessary to abandon the very concept of "waste" as such. There is no waste; there are unusable goods and raw materials that have not yet been involved in production. The technologies of 100% reusability need to be developed.

According to the European Investment Bank (2018), in the period between 2013 and 2018, the European Investment Bank financed 622 energy projects worth 56.4 billion euros, 93 solid waste projects worth €1.8 billion, and 234 projects in the field of water supply and sewerage worth 19.6 billion euros. The Bank co-finances not only projects from the Europe-

Figure 2: Proportion of solid waste disposed of in landfills in different countries of the world



Source: Home, Sustainable Development (un.org) an Union, but also other countries, including Ukraine. Thus, in 2013, the Ukrainian project for the development of alternative energy sources received co-financing (credit) of 2.5 million euros. In 2015, the programme for the development of Ukrainian municipal infrastructure in terms of urban energy supply, solid waste management and water supply and sewerage received 360 million euros (Internet-1).

Ukraine, as a Party to the Kyoto Protocol and the Paris Agreement, has also committed itself, in particular, to measures to limit greenhouse gas emissions and adapt to climate change. In the first Nationally Determined Contribution (NDC) submitted in 2016, Ukraine independently set its goal of limiting GHG emissions – not to exceed 60% of the 1990 level in 2030. This level of GHG emission reductions is not ambitious in the context of the Paris Agreement, as it envisages a 75% increase in national GHG emissions by 2030 compared to 2017.

Major pieces of current legislation on public policy and governance in the field of climate change include: Basic principles (strategy) of the state environmental policy of Ukraine until 2030, the Concept of Public Policy in Climate Change for the period up to 2030 and the corresponding Action Plan.

The Low Emission Development Strategy identifies three key objectives (Zvarych – Iryna, 2016):

- transition to an energy system that provides for the use of low-carbon energy sources, development of sources of clean electricity and heat energy, improving energy efficiency and energy saving in all sectors of the economy and housing and utilities infrastructure facilities, encouraging the use of alternative petroleum products to oil motor fuels, and the transition of freight and passenger transport systems to cleaner modes of transport;
- increase carbon sequestration and retention through the application of best practices in agriculture and forestry adapted to climate change;
- reduction of greenhouse gas emissions, such as methane gas and nitrogen oxide, related mainly to fossil fuel production, agriculture and waste.

The strategy states that Ukraine will make efforts to reduce greenhouse gas emissions in 2050 to the level of 31-34% of the 1990 level.

As noted above, achieving the ambitious goals of the European Green Deal will require the EU to introduce protection for its own markets and producers, such as the carbon import adjustment mechanism. This may reduce the competitiveness of Ukrainian goods in the EU market. First of all, this applies to energy and resource-intensive goods, which occupy a significant share in the structure of Ukrainian exports: products of metallurgy, agriculture, food industry, energy, heavy chemicals, mechanical engineering and more. The transport infrastructure, such as gas pipelines, may also be under the pressure of such mechanisms taking carbon emissions for logistics into account, which will affect their competitiveness.

Conclusions

A closed-cycle economy, or circular economy, is a model of economic development based on the recovery and rational use of resources; an alternative to the traditional, linear economy. The closed-loop economy is focused on products and services that minimize waste and other types of pollution, and is designed to change the classic linear model of production. The basic principles of the circular economy are based on extending the life cycle of products, the recovery of resources, recycling, a transition from fossil fuels to the use of renewable energy sources and other renewable resources, so as to reproduce within man-made civilization natural mechanisms for waste disposal at different levels and stages of human life.

The strategic priority for the development of the Ukrainian economy is sustainable growth, which is based on a closed-loop economy (circular economy), which not only improves the environmental situation, but also increases customer confidence and the operational efficiency of the business. The introduction of a circular economy should be based on basic market laws – in the absence of demand for recycled waste and products, it loses its economic viability. Therefore, to justify investment, it is necessary to stimulate market demand, to create new value chains within the country. This will inevitably lead to the extinction of certain activities and enterprises engaged in them and the reorientation from old activities to new ones or the creation of new businesses. As a result, the system of economic relations and relations inside and outside the country will change, and so will the design of the country's economy.

Circular transformation of industrial production, and the introduction of a circular economy in general require further steps to develop public economic policy, study the most promising sectors of the economy in terms of including waste processing in production chains, and identify possible sources of investment to finance projects using best practices in waste disposal.

The main prerequisites for the transition to a circular economy in the world are, first, resource problems – uneven distribution and consumption, irrational use, a significant reduction in resource requirements requires a mixture of non-renewable resources in production; and second, the problem of environmental pollution – the accumulation of garbage in cities, environmental problems, climate change problems today require immediate action and a paradigm shift in consumption.

The problems that may hinder Ukraine's transition to a circular economy include the following: insufficient knowledge of the circular economy; possible short-term unprofitability of the circular economy; the presence of certain barriers that limit access to bank financing; insufficient waste sorting; lack of necessary infrastructure, competition, knowledge and incentives in the markets; expensive transportation of raw materials for recycling; quality of roads; and in general, imperfect legislation and its implementation when addressing the problems of the circular economy.

Solving the problems of transformation of social reproduction in Ukraine on the basis of a circular economy requires systematic action at state, regional and local levels. One of the key areas of the circular economy is to identify and eliminate significant bottlenecks that affect supply chains and manufacturers.

Thus, the circular economy is an approach based on the recycling of almost any materials. By developing and further implementing innovative business models in Ukraine, it will be possible to ensure that technical and biological materials continue to actively "participate" in the economy, and valuable reserves and natural resources are preserved.

Literature

Kocheshkova, I.N. – Trushkina, N.V. (2017): *Development of recycling logistics in the context of the circular economy: foreign experience*. Trushkina N.V.// ScienceandPractice: innovativeapproach. Collectionofscientificarticles. – Paris, LesEditionsL'Originale, 2017. 19-23

Deineko L. V. (2018): Circular economy as a route to industrial modernization: the European experience / L. V. Deineko, O. O. Tsyplitska. In: *Economics: time realities. Scientific Journal*. 5 (39). – P. 30-40. DOI: 10.5281/zenodo.2568944.

Hanh, Nguyen – Martin Stuchtey – Markus Zils (2014): *Remaking the industrial economy.* McKinsey Quaterly, February 2014. – Access mode: https://www.mckinsey.com/business–functions/sustainability–and–resource–productivity/our– insights/remaking–the–industrial–economy

Internet-1: Reference documents under the IPPC Directive and the IED [Електронний ресурс]. Joint Research Centre "Circular Economy and Industrial Leadership". – Access mode: http://eippcb.jrc.ec.europa.eu/reference/

Internet-2 (2019): Law of Ukraine "On the basic principles (strategy) of the state environmental policy of Ukraine for the period up to 2030" of February 28, 2019 № 2697-VIII – Access mode: https://zakon.rada.gov.ua/laws/show/2697-19

Internet-3: The European Investment Bank. Financed Projects [Електронний ресурс]. – Access mode: http://www.eib.org/en/projects/loan/list/index

Internet-4: Global Ekolabelling Network (GEN) – Access mode: https://www.globalecolabelling.net/

Internet-5: Order of the Cabinet of Ministers of December (2016): № 932-r "On approval of the Concept of implementation of state policy in the field of climate change until 2030" - Access mode: https://zakon.rada.gov.ua/laws/show/932-2016-%D1%80

Internet-6: Order of the Cabinet of Ministers of December 6,2017 № 878-r "On approval of the action plan for the implementation of the Concept of implementation of state policy in the field of climate change until 2030" - Access mode: https://zakon.rada.gov.ua

Internet-7: Strategy of low-carbon development of Ukraine until 2050 – Access mode: https://menr.gov.ua/news/31815.html

Internet-8: Strategy for Sustainable Development of Ukraine - 2030– Access mode: http://nbuviap.gov.ua/index.php?option=com_content&view=category&layout=blog&id=160&Itemid=501

Internet-9: Department of Economic and Social Affairs. Sustainable Development – Access mode: https://sdgs.un.org/

Internet-10: MacArthur Foundation: Towards a Circular Economy: Business Rationale For An Accelerated Transition. – Access mode: https://www.ellenmacarthurfoundation.org/assets/downloads/TCE_EllenMacArthur-Foundation-9-Dec-2015.pdf

Internet-11: Ukraine: 2050 Low Emission Development Strategy – Access mode: https://unfccc.int/node/181275/

Internet-12: A circular economy can be a 2.5billion euro opportunity for Finland [Electronic resources]. – Access mode: http://www.sitra.fi/en/ecology/circulareconomy

Internet-13: Closing the loop - An EU action plan for the Circular Economy [Electronic resources]. – Access mode: http://ec.europa.eu/environment/circulareconomy/index_en.htm

Internet-14: European Commission. Eurostat – Access mode: https://ec.europa.eu/eurostat/en/home

Internet-15: Municipal solid waste in Ukraine: development potential. Scenarios for the development of solid waste management - IFC in Ukraine, 2015. – Access mode: https://www.ifc.org/wps/wcm/connect/

Pearce David (1989): *Economics of Natural Resources and the Environment* – Access mode: https://www.amazon.com/Economics-Natural-Resources-Environment-Pearce/dp/0801839874

Zvarych Iryna (2016): Global circular economy as way of building a new sustainable ecological society Introduction – *Світ фінансів* 4(49) pp148-155