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PROSPECTS OF CIRCULAR ECONOMY FOR UKRAINE

The idea of a circular economy is emerging as a viable substitute for conventional linear consumption models in light of contemporary globalization and the quick advancement of technology. Although Ukraine is going through a challenging moment due to the war aggression, caused by rf, it is also creating chances for new approaches to resource and company management.

Based on the ideas of conservation, re-use, and recycling, the circular economy has the potential to be a vital instrument for both mitigating the effects of the war on the environment and aiding in the nation's post-conflict recovery. Ukraine must prioritize material optimization, waste reduction, and the promotion of innovative technologies in light of its limited resources and the need to maintain sustainable development.

The key elements and potential benefits of establishing a circular economy in Ukraine have been researched within this paper, highlighting its significance for both environmental sustainability and economic recovery. Additionally, it will examine possible approaches that could aid in the shift to a more sustainable economic model that addresses the issues of the present. This publication, which emphasizes resource efficiency, waste reduction, and the cyclical use of materials, describes the circular economy and includes examples obtained through surveys, collaboration with Ukrainian firms, and publicly accessible internet resources.

The circular economy, according to UNIDO, is an alternative to the conventional linear economic model, which uses resources for as long as possible, extracts the most value from them, and returns waste from the end of the supply chain back to the beginning, giving spent materials a new lease on life. [1]

Implementing resource-efficient and ecologically friendly manufacturing processes is the goal of the shift to a circular economy, which will help businesses become more competitive while preserving the environment. Businesses may drastically lower manufacturing costs, cut waste, and improve production efficiency by optimizing the use of energy, water, and raw materials. Three key tenets form the foundation of the circular economy: restoring nature; circulating goods and materials till they achieve their maximum value; eliminating waste and pollution.

Closing the loop, slowing down resource flows, and restricting resource flows are the three primary tactics described. [5] Renewable resources, clean and resource-efficient production, industrial symbiosis, eco-industrial parks, distribution optimization, consumption reduction, slowing resource flow (repaired and shared products), and closed-loop cycles (separation, collection, recycling, regeneration) are specific approaches within each strategy. As a result, several case studies demonstrate how the concepts of the circular economy are applied in diverse industries, such as:

- BIONUS. The company produces innovative disposable biodegradable tableware made from natural materials such as beet pulp, corn, flax, hemp and soya meal. From one tonne of plant meal, BIONUS produces up to 10,000 plates or bowls.
- Ochis. The company produces optical and sunglasses from coffee grounds, natural oils and a biopolymer based on vegetable oils. Ochis promotes zero waste production and recycling, preventing materials from ending up in landfills.
- Parada. The company specialises in tailoring, selling 80% of its products on the European market from tolling raw materials and 20% domestically. To ensure independence from the city's power grid and rolling blackouts, the company has implemented a project to build a rooftop solar power plant. In 2023, it received a 100 kW plant, which has been in operation since August and has generated 38,467 kW of electricity, reducing CO2 emissions by 48 tonnes. The rooftop power plant has reduced energy consumption from the grid by 70%, up to 85-90% in summer and 40% in winter.
- Oberbeton. The company implements resource efficient and clean production through production of by-products, with a potential 75% reduction in waste; reducing steel rope waste: implementation of measures to reduce the length and quantity of ropes, which will reduce waste by 11 tonnes per year; utilisation of concrete waste.
- Trypillia Packaging Plant produces corrugated cardboard and corrugated packaging by purchasing paper from paper mills. The production process generates about 20% of paper waste, which is collected, packaged and returned to the factory for recycling into new products. The plant sells 7-8 thousand tonnes of waste paper per year. This minimises waste accumulation and contributes to the efficient use of resources.
- Nova Poshta. The company has a number of standards for identifying and managing environmental aspects and risks. The 3R principle is applied in the choice of packaging to protect items during transport - Reduce, Reuse, Recycle. Used packaging (paper and polyethylene) is collected separately in the branches and sent for recycling.

- Waste recycling plant in Zhytomyr city. A waste recycling plant has been launched in Zhytomyr. The plant cleans, sorts and processes waste into biofuel, which is an alternative to coal and gas. Currently, the plant processes up to 15 tonnes of waste every hour, and the company plans to expand by 2025.

- Sem Ecopack is a manufacturer of environmentally friendly packaging. The company offers a wide range of moulded cellulose packaging for different types of products. In its day-to-day activities, Sem Ecopack is guided by the principles of ESG (Environmental, Social and Governance) and the circular economy. In addition, the company's research has shown that moulded cellulose packaging has a significantly lower carbon footprint than plastic packaging. [1]

Numerous case studies illustrate the application of circular economy principles in various sectors, including: biodegradable disposable products, a zero-waste approach, solar panel and plant installations, reducing carbon emissions, anaerobic digestion of waste, generating clean energy, secondary product use and waste recycling, reusing and recycling packaging, extending product lifespan. [2] A fundamental aspect of these initiatives is the extension of product lifespan—strategies and measures aimed at significantly reducing the overall environmental footprint. The objective is to minimize both the demand for new products and the waste generated from their production and disposal. [6]

On June 1, 2021, the Verkhovna Rada of Ukraine enacted legislation that significantly limits the distribution of specific types of plastic bags. Additionally, fit-for-purpose purchasing involves acquiring products that align with the actual needs and demands of consumers, rather than opting for more complex items that carry a greater environmental impact. [4] Such transformative changes in Ukraine will contribute to the promotion of responsible consumption and production.

Cooperation with the EU in the field of circular economy could bring investments, new technologies and exchange of experience to Ukraine. For instance, Zhytomyr Polytechnic State University has recently become a partner in the Interreg Europe programme to implement the PLASTIX project [3]. The project addresses the growing problem of plastic waste and is based on and closely aligned with the European Strategy for Plastics in the Circular Economy (2018) and the new EU Action Plan for the Circular Economy (2020). It is important and especially pleasing that Zhytomyr Polytechnic is among the 20 partners supported from Ukraine within the announced circle of the Interreg Europe partnership programme and the only partner in this project from Ukraine. Work on the project started in 2024 and hopefully results of the cooperation will be implemented in the future. Therefore, educational programmes and campaigns to raise public awareness of environmental issues can help drive demand for sustainable solutions and products.

Conclusion. Developing methods for recycling and reusing materials will help minimize waste and enhance the environment, and implementing the concepts of the circular economy would help Ukraine use its natural resources more efficiently. It lessens the detrimental effects on the environment and economic growth, making it a major step towards sustainable development. Together with the creation and implementation of legislative initiatives that support circularity, the circular economy will serve as a spur for the development of new technologies, boost investment in the economy, and stimulate recycling and the reduction of disposable product consumption.

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