

## **CIRCULAR ECONOMY AS A DIRECTION OF INDUSTRY 4.0: BARRIERS AND OPPORTUNITIES IN BELARUS**

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**Summary.** *The article shows that the circular economy is one of the directions of industry 4.0. Barriers to implementing the principles of circular economy in Belarus have been identified. The key directions of introduction of the circular economy in Belarus are formulated.*

The circular economy is a new trend, the basis of the «Fourth industrial revolution», as was stated at the 46th international economic forum in Davos. «Industry 4.0» involves the rational use of natural and technical resources, the most efficient energy saving, repairs instead of new purchases and rentals instead of property, recycling of all waste and obtaining new goods, raw materials, and energy from them.

The circular economy is one of the areas of the green economy. The commitment of the Republic of Belarus to the principles of the green economy is enshrined in national policy documents, including the National strategy for sustainable socio-economic development for the period up to 2030 and the national action plan for the development of the green economy in the Republic of Belarus until 2020.

The economic impact of implementing the circular economy concept is huge. It is expressed in reduction of consumption of raw materials and energy resources, and as a consequence reduce the demand on them to increase the number of jobs due to the formation of new sectors of a circular economy, and to reduce the ecological footprint of production and produced goods and thus preserving the environment.

However, there are barriers to the introduction of a circular economy in Belarus, such as:

lack of a comprehensive strategy for the development of the circular economy and recommendations for its implementation in Belarus;

in practice, priority is given to the use or disposal of waste rather than to the prevention of waste generation;

there is a shortage of waste processing technologies;

insufficient motivation of heads of local authorities and enterprises for the development of the circular economy due to the lack of appropriate indicators for evaluating the effectiveness of their activities, depending on the implementation of the principles of the circular economy;

official waste statistics are not reliable, in particular municipal solid waste is not differentiated by the place of formation and type of waste, which does not allow determining the share of processing of each type of waste; municipal solid waste landfills are not equipped with scales for recording buried waste, and enterprises often have problems with the correct classification of waste;

in Belarus, there are no financial incentives for separate collection of waste by households and there is no understanding of the need for separate collection (the amount of payment for the export of municipal solid waste does not create incentives to reduce waste);

there are no regulatory requirements for the environmental design of products, the suitability of materials for recycling, durability or maintainability;

domestic enterprises are not sufficiently aware of the circular economy in General and examples of best practices, lack of professional knowledge and competencies in this area;

there are no powerful network structures that would unite enterprises, and there is a lack of communication channels between enterprises at the intersectoral level: companies do not know who can offer what waste and who may need what waste

the investment costs of switching to circular business models are high and have a long payback period, which complicates the procedure for obtaining loans.

As priority steps to create a circular economy in Belarus, it is necessary to ensure the introduction of eco-design principles in production to improve the efficiency of manufactured materials, in particular: promoting the maintainability and durability of goods and products; priority attention to packaging; reducing the use of single-use plastic packaging and containers, etc.

The next steps associated with implementation of the business models of a circular economy, including:

the development of economic mechanisms to stimulate the implementation of projects of circular economy;

the adoption of measures to stimulate R&D in the field of circular economy, establish a technical database of best available practices;

the formation of an Internet platform that contains information about the possibilities of using waste ready solutions for business as well as information materials for promoting the concept of circular economy in society.

Industrial symbiosis is one of the key directions for further development of the circular economy in the country. In this area, the following is relevant:

conducting a comprehensive analysis of waste flows to identify possible areas of intersectoral interaction;

adoption of measures that encourage the practical implementation of the principles of industrial symbiosis;

implementation of a pilot project-a cluster organized according to the principles of industrial symbiosis

creation of new platforms and schemes for interaction between manufacturers and consumers of circular goods.

As a result, the circular economy allows manufacturers to target the production of more durable, maintainable, more environmentally friendly products without the content of substances harmful to health and the environment, and consumers – to use expensive goods on lease or leasing terms without having to buy, and, accordingly, dispose of outdated goods.