

Innovations as a Means of Transition to a Circular Economy and Innovatively Active Enterprises in Bulgaria

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Abstract. Climate changes shortened life cycles of products and services, the consumption of a large part of non-renewable natural resources, the continuous increase in the population of the planet all lead to the need to find new ways and means to satisfy people's needs. The matter of utilizing more efficient use of resources, development of such products that allow reuse through repair and recycling is crucial nowadays. A reorientation is needed from the well-known traditional linear system of using raw materials and creating large amounts of waste to a new system that allows circularity. This is the basis of the circular economy, the implementation of which implies the creation of new products, that allow their subsequent recycling and reuse of the resources invested in them. *The aim* of this article is to analyze the features of the circular economy, its interrelationship with innovation and the degree of innovation orientation of the Bulgarian enterprises.

1 Introduction

At the basis of the circular economy is the use of fewer materials and the production of such products that are subject to subsequent recycling. This implies a change in the previous, well-known, way of unlimited use of all available resources - renewable and non-renewable, which also requires the search for new means and methods for renewing the transformation processes. In this regard, organizations should focus on creating appropriate conditions to innovate their activities as a whole. Everyone's efforts should be directed towards actions that will lead to the successful construction of a circular economy in a global aspect.

2 Materials and Methods

For the purposes of the present study, literary sources from Bulgarian and foreign authors, as well as sources with secondary data, were used. The methods of scientific analysis of existing concepts and scientific synthesis of author's views are applied. Data on innovation activity of enterprises in Bulgaria for the period 2012-2020 are included. Excel Office 2019 was used to visualize the observed trends.

3 Results and Discussion

3.1. Circular economy and the need for innovation that will lead to a transition to it

The appearance of the concept of "circular economy" is associated with the name of the Swiss architect Walter R. Stahel, who in 1982, in a joint report with Genevieve Reday to the European Commission, proposed a model for economic circular cycles, the new jobs associated with them, the increase of competitiveness, limiting the use of resources, reducing waste. Two decades later, in 2007, the circular economy model gained popularity and began to be seen as an alternative model for economic development. Today, this concept shows potential for successfully combating climate transformations and their negative consequences.

The circular economy implies the replacement of the well-known and traditional linear model, consisting of the following: "extraction of natural resources - production - consumption - waste generation" with a new model having the opposite nature [1]. Its essence boils down to creating conditions for the construction and functioning of a kind of closed system. The main goal of the circular economy is that the goods and services produced allow a reduction in the resources and energy used, as well as a reduction in the waste generated. As a result, better efficiency and resource efficiency should be achieved, reducing the harmful impact on the environment, as well as improving the well-being of the society. Serious potential possibilities can be explored from different organizations by finding ways to recover the generated waste, reuse it and above all – significantly limit it during the immediate transformation process. At the core of the circular economy concept is the understanding of reusing and recycling of material resources and products. Achieving this, however, presupposes the creation of a new type of product that will allow them to be subsequently repaired or reworked (recycled) in order to be included again in the production cycle. As one of the three biggest concerns, about the state of the environment, is identified the trend of continuous growth of waste, which leads to the inefficient use of resources. Finding ways and means to effectively use them as a resource as well as preventing their formation in the long term becomes important for successfully dealing with this problem [2].

The circular economy can also be defined as a model for structuring socio-economic relations and activities, based on the observance of three main principles, namely:

- creation of materials, products and services based on life cycle analysis to remove waste and pollution;
- creation of such materials, products, services, which are characterized by longevity;
- regeneration of the environment.

On the other hand, we can point out that the circular economy is also a source of innovation in the various economic sectors, which are generally associated with the need to redesign the materials used, as well as the products for the purpose of their cyclic circular use. From this point of view, the transition to a circular economy implies the creation of new jobs as a result of the increased growth. It is closely related to achieving sustainability. In the course of transition to it, three main processes are indicated: innovation (emergence), large-scale implementation of sustainable solutions (diffusion) and system reconfiguration [3]. In this sense, the process of transformations can be seen as a long and complex course of action, requiring effective programming, management and public support.

Innovations are the engine of the positive development of the society. Some authors also define them as a "cornerstone of growth" through which organizations get the opportunity to counter market transformations [4]. As an important priority in everyone's activity today, the stimulation of innovations with the aim of improving the management of the environment, as well as the realized ecological results [5]. From the point of view of the circular economy, innovation should contribute to achieving the maximization of the benefits provided by an already created product, service or technology during all stages of its life cycle. This implies

constructing the individual components in a way that will allow them to be reused after a product is out of use, including out of use due to obsolescence. It is necessary to change the type of resources used, as well as the way they are put into the work process, to overcome the challenges related to the increasingly difficult provision of all needs with exhaustible resources and the limitations imposed by this. A change in the way of thinking and working of all companies is necessary in order to make their activities ecology-friendlier. Limiting the negative impact of enterprises on the environment implies the introduction of environmental standards, defining environmentally friendly norms that must be observed in the production process. Innovations are a key factor in societal progress. Given the peculiarities of the circular economy, process innovations should be implemented in this case, on the basis of which product and market innovations should be developed. All of them should lead to the formation of flexible circular systems, allowing high productivity and saving resources, improving their efficiency and increasing the competitiveness of organizations. At this stage, the attention of the European Commission is focused on the revision of measures related to waste management [6]. Since the circular economy is reduced to recycling, maintenance and improvement, this means changing the applied business models and building closer relations of cooperation between enterprises, the greater part of which in Bulgaria are small and medium-sized enterprises (SMEs). All of them should work towards covering the whole cycle, including production, consumption, waste and their management, as well as the market for secondary raw materials, aiming to "close the circle" and reduce the impact on the environment. Achieving the above presupposes the availability of an appropriate innovation infrastructure to allow access to modern technologies and newly created materials to be used to move to the new business model through modernization. Re-designing products, services and even businesses is innovation and is closely related to the circular economy. In this regard, the willingness of enterprises from all sectors of the economy to carry out innovative activities is of particular importance.

3.2. Innovation Activity of Bulgarian Enterprises

From the point of view of the innovation activity of the enterprises in Bulgaria, the reported favorable trend of their increase for the period 2012-2020 is impressive. We make the clarification that the data used are from the National Statistical Institute (NSI) in Bulgaria, which conducts a statistical survey of innovation activity every even year, covering a three-year period [7]. Enterprises in the non-financial and financial sectors that employ 10 or more persons and carry out any of the economic activities included in the 2008 classification of economic activities are monitored. According to the NSI, an innovation-active enterprise is an enterprise that has carried out one or more activities for the development and implementation of new and improved products and/or business processes within the reporting period [7]. The relative share of innovatively active enterprises increased to 36.2% in 2020, while in 2012 it was 27.4% of the total number of enterprises in the country (See Fig. 1).

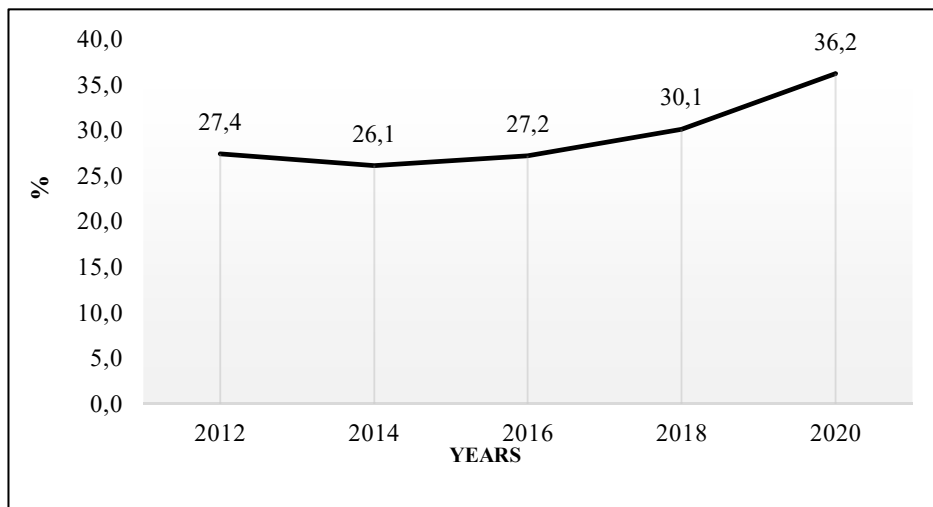


Fig. 1: Dynamics of the relative share of innovatively active enterprises in Bulgaria from the total number of enterprises (2012-2020)*

Over the entire considered period (2012-2020), a higher share of enterprises carrying out innovations in the sphere of industry, excluding construction, compared to innovatively active enterprises in the sphere of services (See Fig. 2).

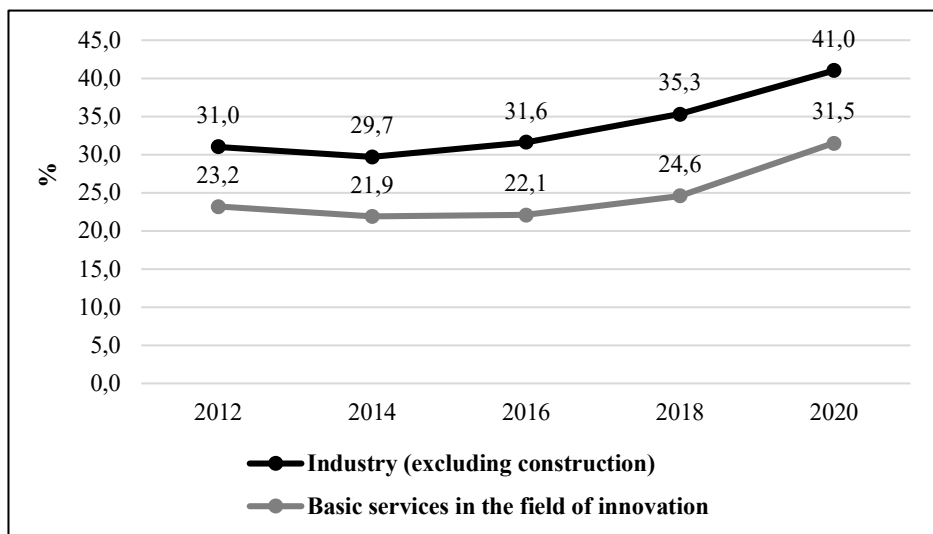


Fig. 2: Relative share of innovatively active enterprises in Bulgaria by sector out of the total number of enterprises (2012-2020)†

As a result of the observed increasing trend, the relative share of the turnover realized by innovatively active enterprises in Bulgaria for 2020 represents a significant 58.4% of the total turnover of all enterprises in the country (See Fig. 3).

*The Figure is based on data from the National Statistical Institute (NSI)

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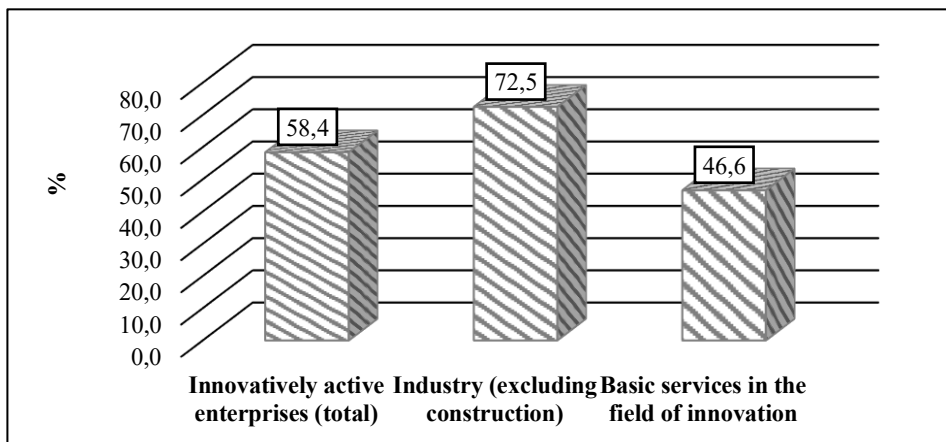


Fig. 3: Share of the turnover of innovatively active enterprises from the turnover of all enterprises in Bulgaria for 2020[‡]

As a maintained consistence, we can consider the trend that almost 60% of the country's workers are engaged in these enterprises (See Fig. 4).

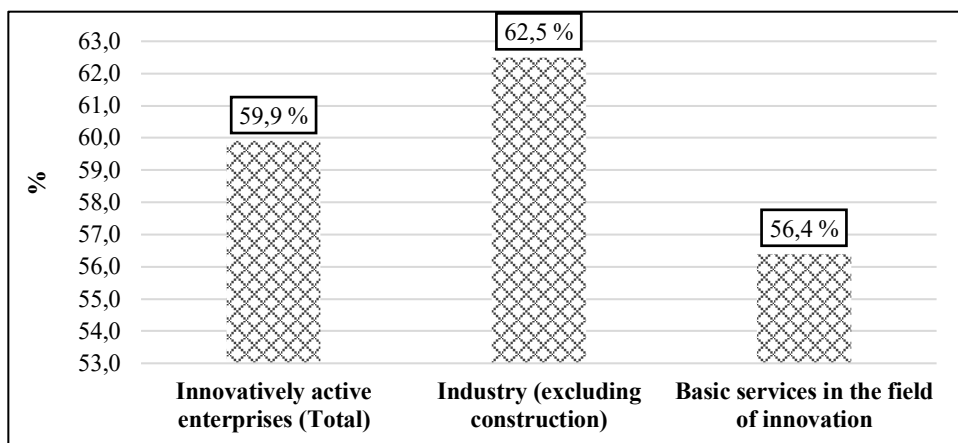


Fig. 4: Relative share of the employed persons in innovatively active enterprises of those employed in all enterprises in Bulgaria for 2020[§]

The transition to a circular economy implies a change in the business models that organizations use to enable the transition to an economy that is environmentally friendly and lowers the carbon dioxide emissions that humanity generates. The starting point in the field of innovation should be the development of innovative ideas that are oriented towards increasing the efficiency of resources by achieving sustainable management of natural resources, preserving the biodiversity of ecosystems, effectively using the opportunities provided by agriculture, replacing with other materials that do not harm the environment. All this implies investment in scientific research and development, for which the role of the state and public institutions is important. Experience shows that they are the main investor in research and development. The funds they appropriated for their financing in Bulgaria can still be defined as insufficient. Therefore, ways to overcome this negative trend must be sought.

[‡]The Figure is based on data from the National Statistical Institute (NSI)

[§]The Figure is based on data from the National Statistical Institute (NSI)

4 Conclusion

The circular economy is defined as the economic model of the future, allowing a reasonable, effective and efficient use of the planet's resources. Making the circular model a practice for all organizations will allow the formation of serious economic, natural and social capital, as well as an accelerated transition to renewable energy sources, successfully compensating for non-renewable energy resources. The circular economy requires a reorientation from the linear system of material use and waste generation to a new system that assumes the regeneration of resources. The basis of this idea is the improvement of the efficiency of natural resources, reduction of the adverse impact on the environment by enterprises, as well as the achievement of social sustainability. Minimizing waste and reusing resources creates opportunities for long-term sustainability while generating profit.

The circular economy can have a different practical manifestation depending on the specifics of the relevant economic entities, but there are also common elements covering:

- drastic reduction and, if possible, prevention of the formation of waste and pollution;
- extending the life cycle of products and materials with the aim of using them for a longer period;
- restoration of nature;
- social aspect, expressed in thinking about future generations.

Achieving all this would benefit the society as a whole. Conditions will be created for more harmonious coexistence of people with the natural environment, providing basic prerequisites for their wellbeing and development. The achievement of all this is closely related to innovation. The search for new ways of using resources, covering the whole flow from raw material extraction and transformation to waste recycling, implies involving more and more enterprises in collaborative and innovative activities, including cooperation in this field.

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