TRANSITION TO A CIRCULAR ECONOMY - STRATEGIES AND PROGRESS

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Please cite this paper as:

Paraschiv (Ganea), G.I., Hubel (Anghel), S.R. and Dumitrache (Serbanescu), A.M., 2020. Transition to a Circular Economy - Strategies and Progress. In: R. Pamfilie, V. Dinu, L. Tăchiciu, D. Pleșea, C. Vasiliu eds. *6th BASIQ International Conference on New Trends in Sustainable Business and Consumption.* Messina, Italy, 4-6 June 2020. Bucharest: ASE, pp. 815-821

Abstract

This article wants to highlight the importance of shifting from a global linear economy to a circular economy, given the level and fast diminution of availability of natural resources, the rapid deterioration of the quality of air as well as water and soil quality and of the impact upon natural ecosystems; at international level this type of concerns regarding the management of waste have acquired a dynamic character and a clear intent to identify the best solutions and technologies.

The concept of circular economy shows us, very concisely, that in order to harmonize the in a sustainable manner the development needs of mankind in the long term, it is necessary to optimize the consumption of resources so that we waste as little as possible and reuse as much as possible. Improving the use of resources must reach such a threshold that the net quantity of natural resources consumed does not jeopardize the rate of natural recovery, making sure that there are enough left for future generations.

The European Commission had defined the circular economy as being one where the aim is to prolong the value of products and materials and ensure economic prosperity by creating additional value through recycling and reusing.

To this end, the research for this paper aimed at promoting a systemic perspective of the circular economy, identifying the necessary steps to operationalize this concept, developing inter-industry value chains, highlighting synergistic aspects in relation to the green economy.

Keywords

Circular economy, necessity, strategies, progress.

JEL Classification

A10, D04, O13, Q01, Q53, Q58

Introduction

The circular economy is presented as an alternative to the so-called "linear" economy, which is currently dominant - less than 10% of material flows are currently closed (Wit et al., 2018) and which consists of extraction, production, consumption and dumping.

In fact, the circular economy is a system of production, exchange and consumption meant to optimize the use of resources at all stages of the life cycle of a good or service, according to a circular thinking, thus reducing the footprint on the environment and contributing to the well-being of individuals and communities (Institut EDDEC, n.d.).

The concept of circular economy involves taking into account elements such as the fact that resources are finite, the flow of materials at both at company and territory level as well as their potential to be reintegrated in the economic system, thus preventing their final state from being dumped. Still relatively young, the concept of circular economy brings together many scientific disciplines, but there is still no universal definition. However, all the existing definitions have in common the consideration of a circular logic and the efficiency of the use of resources through different strategies.

Regarding the negative impact of human activity on the environment, there is a global consensus, underlined by the activity of the international community that has adopted various measures such as the Paris Agreement - United Nations Framework Convention on Climate Change, the first global agreement with binding legal force, which aims to minimize the consequences of climate change in the medium and long term. Thus, several strategies were presented regarding potential solutions to the problem. However, given the impact and negative factors - the problems of environmental pollution, the limited existence of resources and the growth of the middle class, which in turn generates a global increase in consumption - an approach that is unsustainable and can be called into question.

Given the focus on the subject, there has been increased interest in recent years on the concept of circular economy that has been gaining momentum, especially in Europe and Asia – mostly in China and Japan. The circular economy model calls for a complete transformation of the business models, while at the same time aims to increase the efficiency in using resources, reducing the residual materials and certain potential derivatives.

It is estimated that the efficient use of resources could reduce, by 2030, raw material needs by 17% to 24% (Meyer, 2011). Prevention of waste generation, ecological design, reuse and other similar measures could generate net savings of up to 600 billion Euros, this amount representing 8% of the annual turnover of EU companies, while reducing by 2-4% the total annual greenhouse gas emissions

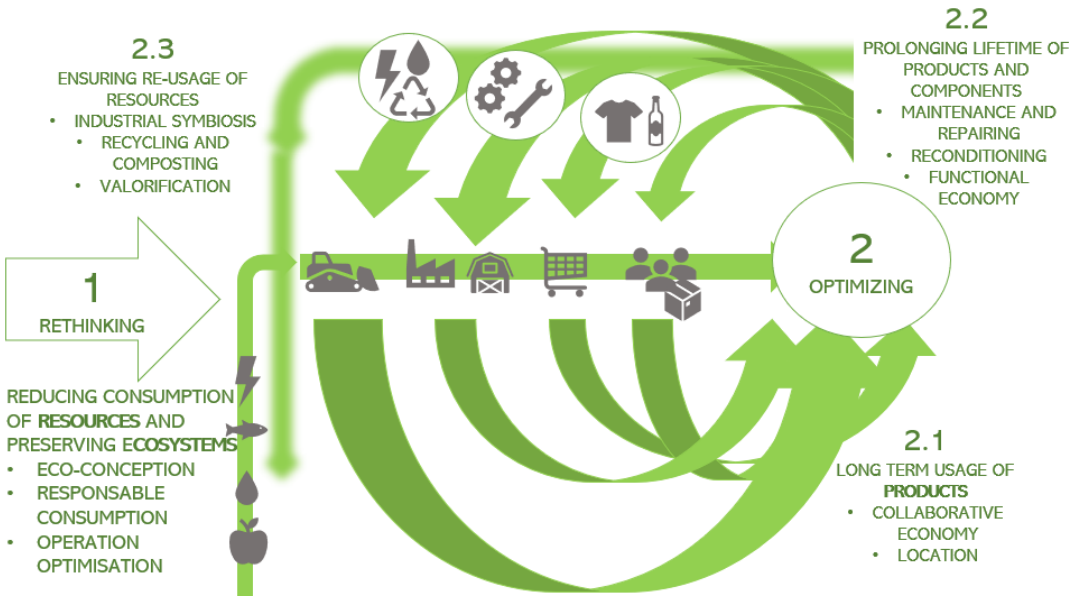

Fig. no. 1 Circular Economy
Source: EDDEC Institute, 2018 in collaboration with RECYC-QUEBEC

Strategies of the circular economy

The circular economy integrates various strategies and tools that are based, among other things, on three principles known for limiting the impact on the environment: reduction at source, reuse and recycling, commonly known as 3R.

These strategies and tools are integrated in all stages of the production process, be they upstream (eco-design), during production (industrial ecology), distribution (functional economy) or consumption (collaborative economy).

As the figure below illustrates, the circular economy is constantly integrating many existing tools and strategies, but in an isolated way.

The five strategies that we will consider in the following are: functional economy, collaborative economy, remanufacturing and reconditioning, industrial symbiosis and recycling.

1. Functional economy, also called performance economics, consists in selling the use of a product and not the product itself. Thus, this economy aims to optimize the use of goods and services with the objective to maximize their use for a long time using limited resources. This creates a sustainable space, considerably more dematerialized than the current economy focused on production. This leads to the decoupling of the added value and the consumption of energy and virgin raw materials and moves the aim towards maximizing the value created and ensuring the circularity of the materials, which represents an essential change of the business model for most companies and at the same time a major policy change at state level. Trying to explain the functional economy in simple words, it moves all systems from a finite linearity to a true natural system (such as that of water in nature), trying to emphasize the importance of the circularity of the elements so that it is necessary to understand in detail the elements that contribute or could contribute to the circularity of the system.

Globally, it is known that 20% of the population consumes 80% of resources, which in turn ensures a major impact in the transition to a functional economy of large states, as well as of multinational companies. The most obvious examples showcasing the complexity of moving from a linear economy to a functional one, as well as the profits generated by it, are

represented by the companies that are trying to extend from selling a product to a 360 type of service - the most common examples are those of Schindler and Xerox. Schindler sells 360 vertical transports instead of elevators, which means that it provides all the necessary services for the functionality, thus ensuring the diminution of necessary resources and ensuring those are being reused during several processes (production, maintenance, etc.) (Stahel, 2005)

2. Collaborative economics, also known as sharing economy, uses products and services to optimize resource consumption (Rizos, et al., 2017). This type of economy involves new forms of work and organization of exchange and is also the easiest to observe in everyday life. In general, for a predominant efficient collaborative economy there is a need to introduce a digital platform that allows consumers and producers to enter into direct contact and inter-change their roles depending on the products and services offered.

In the last decade, the development of this economy has revolutionized many industries, the most popular being the transportation of people (the appearance of Uber and car-sharing applications), the hotel industry (the appearance of Airbnb), the retail industry (the emergence of e-commerce) through extended sales platforms like Amazon or EBay that allow anyone to become both seller and buyer.

The collaborative economy has registered annual growths of over 25% worldwide with countries such as China seeing an impact of more than 10%, US 20%, European Union 30% (Rinne, 2019), thus becoming an economic force in itself, estimated to exceed $ 335 billion by 2025 in the US alone (Yaraghi and Ravi, 2017).

3. Reconditioning consists in the refurbishment of a product by disassembly, cleaning, inspection, sorting, reconditioning and reassembly. Reconditioning allows the components to be restored to their working state (Parkinson and Thompson, 2003; Lieder and Rashid, 2016). Over 70% of countries recognize the importance of ensuring a continuous flow of goods, including refurbishment and refurbishment, with a reconditioning rate estimated at around 15% globally. At the regional level, there are different measures which require to some extent the implementation of strategies aiming to obtain a faster transition to a higher percentage of reuse, yet the costs are still high when it comes to the implementation of such processes.

In the European Union there is a platform dedicated to the Circular Economy in which there is a section aiming at reconditioning with the aim of remodelling, where stakeholders can see actions taken by different companies with examples such as RepescaPlas - Spain announcing the recycling of marine waste into fuel for fishing boats. (2.5 tonnes of marine waste reused by mechanical filtration operations) or SINTEF - Norway announcing the possibility of recycling broken solar cells in silicon raw material having an impact in the electronics and metallurgical industry (Uniunea Europeana, 2019), these examples given by private companies are encouraged by national policies and laws that are more and more frequently observed in developed countries.

On the other hand, in the countries that are still developing, such as Romania, private companies are the engines that generate the refurbishment and the refurbishment, generally following the regional directions of the companies of which they belong, one of the most impactful measures was the introduction of packaging biodegradable and compostable together with the collection of household appliances for recast (Business Review , 2018).

The range of applicability and the extensions of this strategy are numerous and from day to day more and more options are observed as a result of the increase of investments at regional level, in the European Union alone, in 2014-2020 5.5 billion EURO (4% of the funds allocated allocated to the encouragement of the circular economy) were directed to support the reduction of waste, with the purpose of reusing and recycling them, followed by another 2.3 billion EURO allocated to the creation of ecological processes and the efficient use of resources, aiming to reduce the costs and create new opportunities in the medium and long term, to turn waste into a resource (Comisia Europeană, 2016)

4. Industrial symbiosis connects companies in the same industrial area. The residues or results from one business then become the raw material, or they are contributors the manufacturing processes of another. This exchange system is based mainly on, but not limited to, the geographical proximity (Erkwan, 2004; Institut Montaigne, 2016). In fact, «industrial symbiosis allows one company to benefit from the residues of another (products, heat, space, logistics, etc.), by selling them to a nearby company or their interchange as needed. This method reduces the costs of both parties while also involving benefits in terms of the resources involved and consumed, with a high potential for the environment » (Neves et al., 2019).
As far as countries' interest in the subject is concerned, China is the most advanced in the field, followed by the United States, United Kingdom and South Korea (Neves et al., 2019). This fact shows the influence of the production industries on the importance given to the industrial symbiosis. Proof of the increased interest in the subject is the emergence of industrial parks and especially those listed as environmentally friendly. In 2001, China already had 60 such parks, expressing a clear vision for this kind of strategy and considering it as fundamental to healthy economic growth.
The companies themselves have developed different ways to help each other, an example would be the Loop Company that helps reduce food waste by promoting fruits and vegetables considered unsuitable for sale in food stores, which are processed into juice and residual pulp and in turn used and incorporated into dog pies produced by their business partner Wilder & Harrier.
5.Recycling includes a set of operations to process the residual materials recovered at the end of the cycle in order to be re-introduced into a new production cycle (Agenția de mediu și managementul energiei, 2014; Lieder and Rashid, 2016).
These materials are reused either in closed loops - they are then reused in similar products - or in open loops, meaning the materials are used in other types of products.
The importance of recycling has perhaps the most traction from the press, given that it includes other strategies as well, and influenced also by the increase level of tangibility. Thus, we observe in the recent period events, documents and actions dedicated specifically to this area, such as the meetings of the European Parliament (EBCD, 2016) with NGOs and different players in the industry stressing the importance of the role of recycling in the circular economy, highlighting in turn the amount of potentially recyclable materials and the impact of their recycling, both in terms of the use of new resources and in the production costs of the recycled items. Similar meetings like this are held regionally in both the US and Asia, with the ultimate goal of creating policies that facilitates and accelerates recycling.
The importance of this area is also given by the size of the industry itself which registers growth year on year starting at $ 265 billion in 2017 and estimated to reach $ 377 billion by 2024 (Statista, 2019).

Conclusions
More and more countries are turning to the circular economy to mitigate the impact of human activity on the environment. To this end, various governmental authorities as well as companies create various strategies that aim to encourage and facilitate the transition to a circular economy, some of which have been highlighted in this article.
The transition to the circular economy does not mean a decrease in economic activity, but on the contrary, an optimization of the use of resources in order to reduce the impact on the environment and to use the resources more efficiently so as to ensure a maximization of the utilization rate of the resources. This in turn should encourage not only the development of new products, but also the development of new markets.
However, companies are called upon to rethink their business model and methods of production, which can raise difficulties in terms of speed in adopting strategies that lead to a circular economy, so a gradual and long-term transition is needed ensuring there are benefits

being generated, so that the continuation of the implementation of identified measures can be secured.

From the point of view of the sectors, as highlighted in the article, almost any sector has a high potential for high circulation, and those identified in the context of this study were mainly based on a review of international literature. A good understanding of the specific characteristics of each local authority will facilitate the choice of strategies and sectors to focus on. The main impediment is still that the circular economy is only very little known to the players on the market (companies, customers, legislators, etc.), so it is still necessary to create extensive awareness campaigns, specific training programs to ensure that the same actors are participants at the transition to a circular economy.

This transition to a circular economy should be accompanied by aid programs, incentives, appropriate taxation and favourable legislation so that it can be fully implemented and able to stimulate both public and private investment. An advantage in this direction is that highly developed countries already have policies in place that specialize in different areas, so that they can serve as inspiration for future initiatives in less developed or non-developed countries. This economic model has proven to have a great entrepreneurial potential, as it can contribute to gains in productivity, efficiency and profitability, in addition to stimulating the research for innovation.

The use of the circular economy in business models and processes, in order to gain momentum, should therefore be able to rely on the development of strategies, analysis tools, financial and regulatory solutions that enable the identification of the flow of materials with potential, as well as to find new uses and selling power for them.

Without being quantified, an advantage of recycling and capitalization would be to reduce the sensitivity of companies to the change in prices of virgin raw materials. This variation represents a risk to the sustainability of the enterprises, and a better use of the resources would surely contribute to ensuring their future access to the resources they need.(Institut Montaigne, 2016)(Rebaud, 2017)

Waste and resource usage are minimized, and when a product reaches the end of its life, it is used again to create additional value. This can bring major economic benefits, contributing to innovation, growth and job creation.

The circular economy offers an opportunity to stimulate the economy, making it more sustainable and competitive in the long run. It will reduce costs for European industries, lead to investments, create a level playing field.

Acknowledgement

„This paper was co-financed by The Bucharest University of Economic Studies during the PhD program".

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