CIRCULAR ECONOMY IN ROMANIA WITHIN EUROPEAN CONTEXT

Marcela-Cornelia Danu
"Vasile Alecsandri" University of Bacău
marceladanu@ub.ro
Valentin Nedeff
"Vasile Alecsandri" University of Bacău
vnedeff@ub.ro

Abstract
In the present paper we have approached some conceptual and coordinated marks of the societal reality connected to the circular economy. Generated by „the limits of certainty" regarding the future of the world business, the operationalization of the circular economy has become a part of the EU strategies and started the various stages of implementation as an active process in all countries. We have highlighted the opportunities and the risks related to the circular economy, the European dimension and, in particular, the Romanian one of this process, the role of the triad: consumer-company-natural environment, while implementing the circular economy. Circular economy is both a new approach of the societal life, based on changing the mentalities of the individuals having the role of decision makers at the company level and public administration and the decision makers – consumers, as well as a policy meant to be made operational across all entities: governmental, entrepreneurial, individually – human.

Keywords
circular economy; resources; waste; protection of the environment; sustainable development

JEL Classification
O13; O18; O29; Q01; Q50; Q56

Introduction

The circular economy is a system of production and consumption which produces minimal losses. If until now, the economy has been operating in accordance with the pattern "purchasing-production-disposal" (EC, 2015); the transition to the circular economy reshapes the pattern into „purchasing – production – reuse – repair – reconditioning - recycling." According to this meaning, „wastes can turn into resources." This idea started to take shape when the industrial revolution „gave a new theme to solve" to the society: management of waste (Giarini, Stahel, 1996). The level of concentration and accumulation of wastes has increased as the tendency of concentration and specialization of production has increased, too. Similarly, the process of the transformation of these reusable by-products or even totally new products has started to develop, too. In addition to the industrial wastes, the wastes produced by the consumer, as a result of increasing consumption, have gradually become evidence of the developed countries and, at the same time, risks which these could not avoid, mitigate or treat immediately.

Risks and opportunities in the implementation of circular economy in Europe

At present, at the EU level, each citizen uses, on average, 15 tons of materials, every year, generating more than 4.5 tons of wastes. In this context the role of the relational

system „consumer-company" becomes all the more important; the consumer behavior and their attitude towards the environment should be amended; the companies will have to change their policies in general and their marketing policy in particular, having in view the attracted resources throughout the entire circuit (Andersen, 2007). With the support of the modified consumer behavior, new consumption patterns, implicitly, and correlated; the companies will be able to create new markets or new market segments. More than that, it is also possible to create new opportunities and/or new jobs 13 (EC, 2010), (Prothero, Dobscha, 2011).

The Europe 2020 „A strategy for smart, sustainable and inclusive growth" aims a „the sustainable growth and job creation through a better use of the resources." Having in view the system of relations in the world, there should be a global approach of circular economy. In this respect, EU leaders have established a plan of measures which includes ideas such as (EC, 2015):

- Ranking of waste and prioritizing of their reduction and recycling
- Gradual elimination of toxic substances with very high risk
- Projects supporting related to the circular economy by using European funds
- Stimulation of products and services demand that are most eco-friendly as a result of the initiatives of public authorities to purchase eco goods and services
- Encouraging the companies to choose the ecological products
- EU Directive on eco-design of products which are related to energy, encouraging thus the companies to launch products with a low environment impact.

The European Resource Efficiency Platform (EREP) has requested the EU to establish a target meant to ensure the increasing of the resource productivity by more than 30% by 2030. The implementation of the circular economy is an objective requested by the stage of the economic and social development and by the potential of the resources our planet holds as always.

In the process of the circular economy implementation, both opportunities and potential risks have been identified (EC, 2015). The main risks faced by business decision makers within the application procedure of the circular economy are:

- Lack of interest of companies in undertaking the promotion of circular economy
- Lack of interest of consumers to accept the change of this type
- Lack of knowledge required in order to apply the components specific to circular economy
- Production infrastructure that is inadequate to new requirements
- Business models and production systems that are both unsuitable
- Inappropriate technology
- Small investment in the field
- Low demand for sustainable goods and services.

The opportunities in the implementation of the circular economy are:

- Net savings obtained by companies, at the EU level, meaning 604 billion Euros or 8% of their annual turnover
- Reduction in the total annual emission of greenhouse gases by 2-4%
- GDP growth with 1% up to 2030
- An increase in the number of jobs of about 2 million at the EU level
- Favorable perception of the population regarding the valences of the circular economy (Euro barometer surveys on trends), such as:
- 86%: positive impact on the quality of life
- 80%: favorable effects on economic growth
- 78%: opportunities for employment
- 51%: recycling at home has a positive effect on efficiency in the use of resources
- 50%: recycling of waste in industry and construction has a positive effect on efficiency in the use of resources.

Starting from the words of the authors Giarini and Stahel (Giarini, Stahel, 1996), that is, „each product ends up becoming waste in the long term" decision makers will have to take into account the life cycle of the products which are reused, repaired, refurbished, recycled, their lifetime and possible barriers to these activities: economic entropy, that is, very high full recycling costs, or absolute physical entropy, respectively physical impossibility of full recycling. However, in the last few years developments in technical progress and scientific research have changed many of the physical and technical-functional coordinates of the products, as well as the possibility of their reintegration into the economic circuit.

Considerations relating to the protection of the environment in Europe and Romania

The national decision makers' concern for the improvement of the relation with the natural environment and, on this basis, the efficiency of the economic activities by entering the circular economy within the production systems, is expressed by the economic and environmental indicators such as: environmental protection expenditure per capita and environmental protection expenditure (% of GDP), generated waste (kg), treatment of waste (kg), etc. At the European Union level, the evolution of the environmental protection expenditure (Fig. 1) reveals a European average of 167.79 Euros per capita in the year 2008, and a slight increase, that is, 172.65 Euros per capita in the year 2012. The Luxembourg (736.28 Euros per capita in 2012), the United Kingdom, Denmark, Malta, Belgium and the non-EU countries (i.e. Norway, with very high levels and growing along the 5 years, reaching thus to 552.15 Euros per capita in the year 2012) exceed the EU average registered in the period 2008-2012. In the same way as the other ex-communist countries that were analysed, Romania allotted amounts of money much smaller than the European average (respectively 39.01 Euros per capita in 2008; 39.2 Euros per capita in 2011, with a peak of 62.13 Euros per capita in the year 2011) to the environment protection.

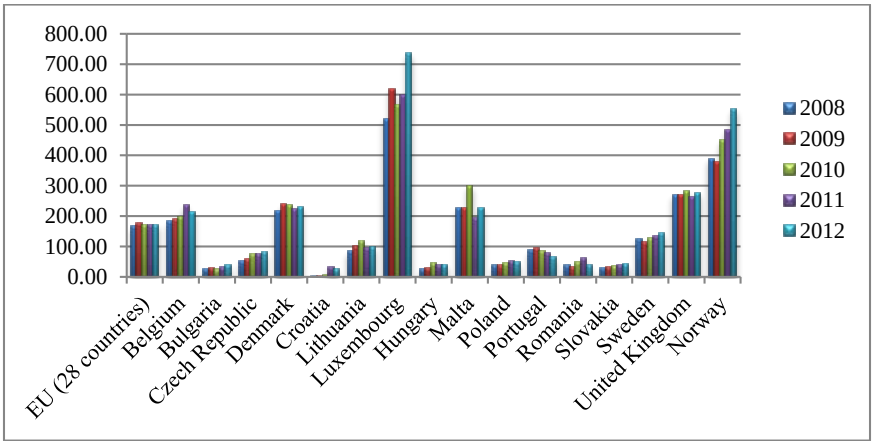

Figure 1. Environmental protection expenditure in Europe - EUR per capita
Source: Processed from http://ec.europa.eu/eurostat/

With respect to the environmental protection expenditure, as a percentage of the GDP (Fig. 2), the situation is different in the sense that, if the European average was 0.67% of the GDP in the year 2012, Sweden and Denmark were below this level (0.53% and 0.34%), Malta outran, obviously, all EU countries or non-EU ones even if, in the period

2008-2010, Malta recorded an increase from 1.54% to 1.92% after which, in 2011, a decrease to 1.2% followed by an increase to 1.39%. It is to be noticed that, if in the case of the environmental protection expenditure (euro per capita), Romania ranked below the EU average, in the case of weighting of these expenditure of the GDP, starting from the year 2010, the situation has been changing, which means that our decision makers are interested in the relationship with the natural environment. More than that, the reduction of activities in the underground economy, many of which directly affect the quality and the perennial potential of the natural environment, led to an increased involvement in the environment protection.

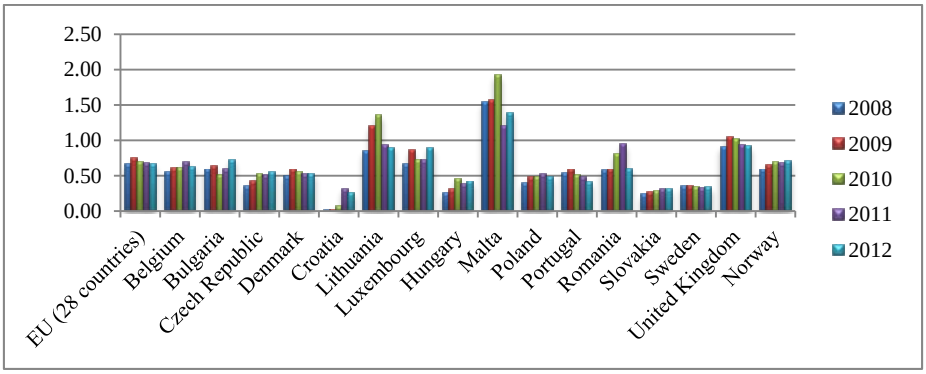

Figure 2. Environmental protection expenditure in Europe - % of GDP
Source: Processed from http://ec.europa.eu/eurostat/

As regards the treated waste (kg per capita) (Fig. 3), the European average of the year 2012 was of 4,539 kg per capita and 13,653 kg per capita aggregated in the years 2008, 2010 and 2012; with levels well above the EU average that were registered by Bulgaria (21,729 kg in 2012 respectively 64,866 kg per capita, aggregated in the 3 years) and Luxembourg, Finland, Estonia, and Sweden, too.

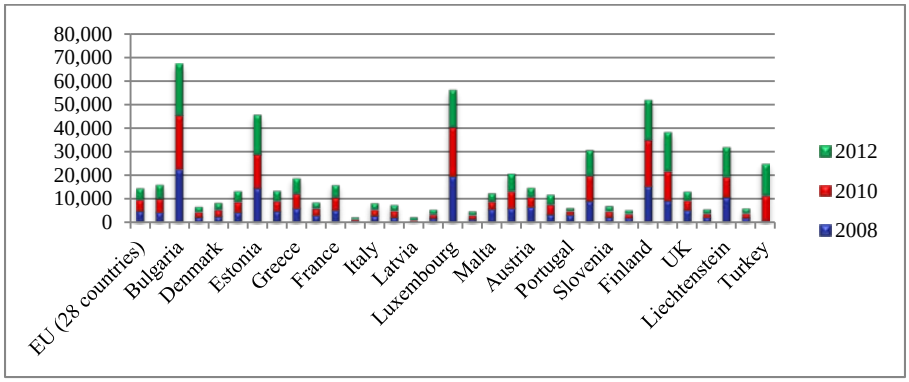

Figure 3. Treatment of waste in Europe - kilograms per capita
Source: Processed from http://ec.europa.eu/eurostat/

Romania exceeded, when it comes to this chapter, the European average, recording a volume of waste to be treated that reached to 7,718 kg per capita in 2008 and 10,612 kg per capita in 2012. In Romania the quantity of waste to be treated, combined on the 3 years, has reached 28,843 kg per capita, that is, 2.11 times more than the EU average.

The treatment of waste is a major coordinate on the sustainable development of the country and obviously, the appropriate implementation of the concept of the circular economy.

The treatment of waste shall be carried out by means of the following options: deposit onto or into land, land treatment and release into water bodies, incineration/disposal, incineration/energy recovery, and recovery other than energy recovery – backfilling, recovery other than energy recovery – except backfilling. If the average of the European Union in the treatment of waste (Fig. 4) is predominated by the depositing of the waste in or on land meant to this destination (1,835 kg per capita in 2012, representing 40.42% of the total number of 4,539 kg per capita), in Romania the situation is pushed to this extreme less agreed in the context of the sustainable development and of the circular economy: in 2012 the weighting of the waste treatment by storage was of 90.52% (9,607 kg per capita out of 10,612 kg per capita). The energy recovery treatment or the treatment that does not involve the energy recovery occupies very small weights in Iceland, Bulgaria, and Romania (under 10%) and very large weights in Slovenia, Italy, the Czech Republic, Belgium, Poland, Germany, Luxembourg, France, Estonia, Denmark, Austria, the United Kingdom, Spain, the Netherlands, Latvia (all holding weights higher than the EU average at this indicator, that is, 46.96%). An environmental policy oriented toward recovery, reuse, and recycling signals the efficient management of the resources and their reintroduction in the production processes. In these countries the circular economy is not just a concept to be implemented but an advanced stage in this approach.

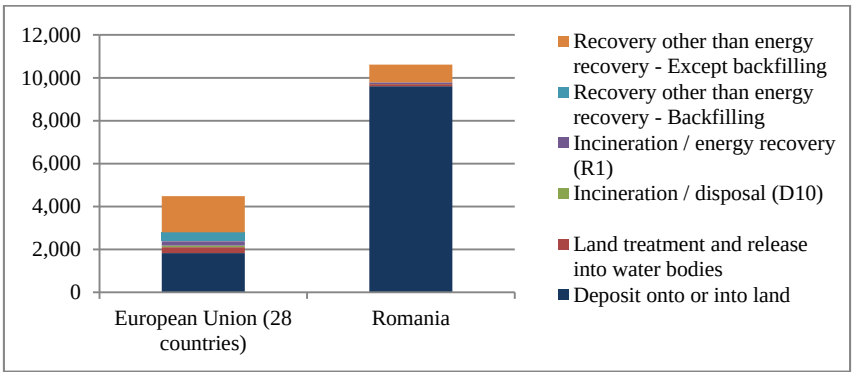

Figure 4. Treatment of waste, Romania and EU - kilograms per capita, 2012

Source: Processed from http://ec.europa.eu/eurostat/

Having in view the criterion of the environmental protection expenditure, in Romania, depending on the category of producers concerned: specialized producers, non-specialized producers, and public administration in the period 2005-2013 (see Fig. 5), we remember that time between the years of the economic crisis 2008 and 2009, with a consequent increase supported by the year 2011, that was faster in the case of the specialized producers and slower in the case of the non-specialized producers; after the year 2011 a regress of the environmental protection expenditure has followed in the case of the specialized producers and public administration, counterweighted by the increase of the expenditure supposed to be made by the non-specialized producers. In absolute sizes, the specialized producers register the biggest expenditure with the environment protection. The policy of the non-specialized producers is significant thus starting from 915.87 thousand Lei spent for the environment protection in 2005 they allotted 7,875.17 thousand Lei in 2013 (increase of 411.04%) coming closer to the level

of the expenditure the specialized producers allotted for the environment protection in the year 2013, that is, 8,731.38 thousand Lei. The attitude of the public administration toward this major topic, namely, the low level of the expenditure for the environment protection was alarming in all these years and the decreasing trend recorded after the year 2011 (maximum level reached in the year 2011 was of 5,367.40 thousand Lei followed by decrease to 3,571.21 thousand Lei in the year 2012 and 2,905.37 thousand Lei in the year 2013).

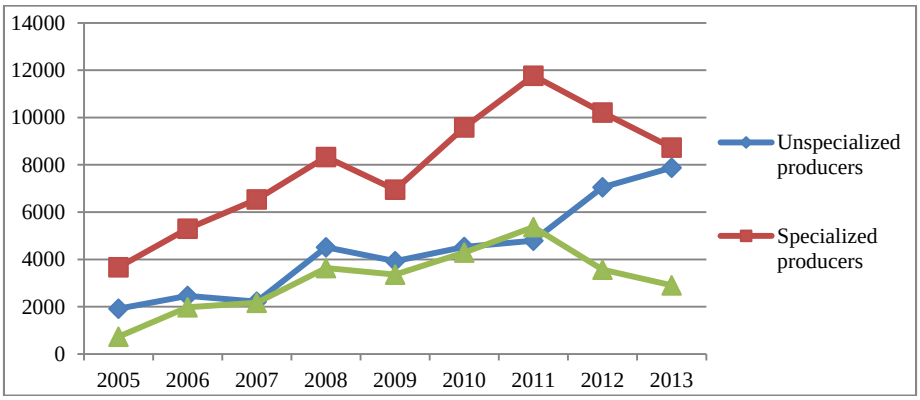

Figure 5. Environmental protection expenditures in Romania, by producer categories, 2005-2013 (thousand lei)
Source: Processed from www.insse.ro

The position of the company and the consumer in the circular economy

Both the producer and the consumer are important in the greening economy (EAA, 2015). The companies will have to change their strategic options in the politics of the products, that is, from the rise in rate new products launch to the prolongation of the lifecycle of the existing products and the creation of new products that are durable over time. The increase of the cooperation at the level of the supply chains and between them will create the possibility to reduce the costs and minimize the negative externalities. The development of the eco-innovation will be the framework of the appearance of new products, new processes, new technologies, and new organizational structures. It is also possible to re-orient the companies from the production and sale of products to the production and sale of production services. The business development is estimated in general, and mainly the small and medium-sized companies based on leasing, sharing, repair, modernization or recycling. The European Resource Efficiency Platform (EREP) identified, among other things, some significant areas for the companies:

- Information on resources a product contains
- Information on the way in which the products can be repaired, recycled
- New business models
- Principles connected to the standards of durable supply.

The efficient use of the resources and the circularity will require the reconfiguring of the financial and accounting framework of the organizations, market analysis of bonds, including for small projects and small and medium-sized firms.

A strategic alternative agreed by firms, in the last time, is that of „consumption in collaboration", offering the consumers the possibility to resort, in the first place, to the services the products are offering and meet their needs by renting , agreements for the common use of the products, and less by purchase.

The product policy is redesigned and the focus moves away from the product sale-purchase process to the sale-purchase right to use the product. The sale-purchase action begins to lose ground in the tangible area, in favor to the advantage of the intangible one. In this context, we consider that the development of the circular economy has the economy of the intangible as the development axis. On the other hand, the products manufacturing whose lifecycle is desired to be as long as possible moves the conduct of the competition from the innovation area, of the launching of new products in the area of sustainable innovation, of existing products modernization and, not ultimately, in the in the services area offered by existing products. In some European countries „the libraries" of garments operate, where users can borrow clothes. It is considered that any reduction measure of the rate of extraction of the raw materials, the reduction in the quantity of waste, the increase in the resource productivity, the recycling and re-use of products, reduces the pressures on the environment by increasing the ability of ecosystems to cover one's needs (Preston, 2012). The human health and the activities people are carrying out depend on the health the environment, both on short- and long-term.

The consumer is a major pawn of the successful implementation of the circular economy (Rambo, 1983). He must be in a position to know and understand the viable and perennial benefits that the business environment offers to the consumer by improving the circular economy. Furthermore, the consumer must become an integrated part of the triad „consumer-company-natural environment" to respond in a favorable and active way to the policies the firms apply in the direction of the growth of the level of recycling, re-use, reintegration of the outputs in the production process and in the level of supply of rental services, sharing, exchange, repair, and product manufacturing. The relational system „consumer-firm" will inherently and implicitly lead to mentality changes – from the consumer to the user, from the owner to the co-owner. The benefits of the consumer will be of a financial nature, too: affordable prices for products, lower costs and higher benefits. In this way, the economic utility will increase, the level of satisfaction of consumers being determined by the size of the prices of the tangible and intangible products they have purchased.

Conclusion

The physical limits of the planet conditions and determines the limiting of the consumption of resources. The problem does not belong to the present but is the direct reflection of the historical actions of individuals. However the solving of the problem is in the present and the future as well.

From a technical point of view the use of the externalities of production and consumption, as raw material reincorporated in the production processes, involves changes in the technological environment – upgraded technologies but also new technologies, methods of organization of production and labour adapted to this type of politics (Casagrandi, Guariso, 2009).

From a financial point of view the application of circular economy involves some strategic alternatives that are meant not to envisage the objective of profit maximization for the previous activity (production and/or sale of the products and/or services) joined with the objective of profit maximization for new activities (waste attracting and use, their processing, etc.) but a new strategic approach based on business relation extending upstream: suppliers of raw materials, wastes resulting within production processes, suppliers of modernized and/or new technology, suppliers of specialized labor in this direction. More than that, the development of the relational system of a company shall be carried out horizontally, too, through inter-firm cooperation having the same vision in view.

References

Andersen, M.S. (2007), An introductory note on the environmental economics of the circular economy, *Integrated Research System for Sustainability Science*, 2:133–140, available at http://www.environmental-expert.com/ .

Casagrandi, R., Guariso, G. (2009), Impact of ICT in Environmental Sciences: A citation analysis 1990–2007, *Environmental Modelling & Software* 24(7), pp 865–871.

European Commission (2008), EUROSTAT, data set, available at http://ec.europa.eu/environment/, accesed on 11 March 2015. (The circular economy – Connecting, creating and conserving the values).

European Commission (2014), On the review of the Sustainable Development Strategy. A platform for action, data set, available at http://eur-lex.europa.eu/.

Giarini, O., Stahel, W.R. (1996), *The Limits of Certainty – Facing risks in the New Economy of Services*, Bucharest, Edimpress-Camro.

National Environmental Protection Agency (2014), National Environmental Protection Agency, Bacău Branch, available at website, http://apmbc.anpm.ro/.

National Institute of Statistics (2014). National Institute of Statistics, Bacău Branch, available at http://www.bacau.insse.ro/.

Preston, F. (2012), A Global Redesign? Shaping the Circular Economy, *Energy, Environment and Resource Governance*, available at http://www.chathamhouse.org/sites/files/ chathamhouse/ public/Research/ Energy, (accesed on 1 February 2015).

Prothero, A., Dobscha, S., Freund, J., Kilbourne, W.E., Luchs, M.G., Ozanne, L.K., Thøgersen, J. (2011), Sustainable Consumption: Opportunities for Consumer Research and Public Policy, *Journal of Public Policy & Marketing*, Vol. 30, No. 1, pp. 31-38, available at http://journals.ama.org/doi/abs/ 10.1509/ jppm.30.1.31.

Rambo, A.T. (1983), *Conceptual Approaches to Human Ecology. Research Report* No. 14, Honolulu: East-West Center.

Schlüter, M., McAllister, R.R.J., Arlinghaus, R., Bunnefeld, N., Eisenack, K., Hölker, F., Milner-Gulland, E.J., Müller, B., Nicholson, E., Quaas, M. & Stöven, M. (2012), New Horizons for Managing the Environment: a Review of Coupled Social-Ecological Systems Modeling, *Natural Resource Modeling*, 25(1), pp 219-292.