CIRCULAR ECONOMY – CREATING AN ECONOMY THAT SERVES HUMAN DIGNITY AND PRESERVES OUR PLANET

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Abstract: The economic model in the service of the common good will be based on universally recognized values as universal: human dignity, solidarity, ecological sustainability, social justice, transparency and democratic participation. The transition from the linear economy to the circular economy implies a major transformation of current production and consumption patterns that will have a significant impact on the economy, the environment and society. Understanding these effects is important for decision-makers involved in future policy making in the field. Sustainable production and consumption are the foundation for sustainable development, impacting on well-being and quality of life. Moving to a circular economy is imperative for the world's states. An efficient resource use policy should aim to reduce consumption in the context of commodity price volatility in recent years. This can be achieved through the transition to the circular economy, which involves reducing subsidies to counterproductive production structures and supporting resource efficiency systems through financial incentives. Other issues to consider include the delimitation of economic growth from the use of resources through switching from production to services, increasing labor productivity and capital, as they provide incentives for investment and reduce consumption of natural resources by improving the processes of manufacturing, using state-of-the-art technologies, technological innovation in resource efficiency, improved waste management and increased environmental taxes to ensure sustainable development. Thus, the article analyzes the concept of circular economy and the business potential it proposes, followed by descriptive analyzes that have completed and nuanced the influence of the braking factors in the process of circular model implementation.

Keywords: competitiveness, efficiency of resources, sustainability, transition to circular economy, development SMEs

Classification JEL : O12, O52, L1

Introduction

From the Christian perspective the ecological problem is posed in terms of the relationship between man and the world, nature. Is it shocking and frightening to find that it took 200 years - the ones that separated us from the beginning of the industrial era - for the human species to be able to threaten even the very basis of life on our planet? So what is man's place in the divine plane?

Man can never be alone or self-sufficient; neither humanity nor the world is exhausted through it. By creation, its definition and becoming are determined by the relationships with the deity, with the fellows and the cosmos; only on these coordinates can he assert his freedom and achieve perfection.

The Eastern parents constantly approached the problem of man from the perspective of the secret of creation and from the angle of anthropology, the man thus appearing as a synthesis of the universe, as a microcosm, part and mirror of the whole, point of interference between the seen and the unseen. Until the making of man, the mind (the intelligible world) and the feeling (the sensitive world) lay within their boundaries, separated from one another, and they carried within them the greatness of creation, there being no mixture of both (...). That is why all the abundance of goodness had not been made known. Wanting to show the abundance of creation, the Creator creates man as a living being made up of both, that is, of the seen and the unseen.

The alienation of the technique is the last consequence of the superficial knowledge in which humanity has chosen to understand the world and implicitly the relation with it, and seeing in them the only acceptable method in deciphering the hum, the man no longer realizes that any knowledge is the result of the method used and that art, as the technique, offers him only what he wants to know.

Exit from the crisis of technology and convenience is not possible without a remodeling of the premises and intentions of contemporary technology, so that it becomes compatible with the intrinsic order of the world. This remodeling requires the transfiguration of the human mind to recognize creation from the perspective of its rational basis, in an effort of theocentric reorientation. The essence of the relationship between man and the world cannot be solved through externalism, but it does not consist only in contemplation, as the synthesis and part of the world,

the man being inside the moon, giving and receiving in this relation. The solution of technological violence wants to assert at any price a superiority of man and a foreign order of the deep sense of creation, a symptom of ignoring the true relation between man and the world.

Between man and the cosmos there is a reciprocity, a interweaving and a fundamental communication, the world being in body by nature, the body in the world by feeling, and each of them being subject to the other through communication from one to another of one's property.

What happens in man has a universal resonance and significance, ordering or disorganizing the cosmos, this understanding of the human relationship with the world becoming a last-minute certainty of scientific cosmology. After massive devastation, the contemporary man seeks to defend the heritage of life, the environment through legislation and ecological attitude, but they remain palliative and not the beginning of a true, profound and lasting victory, as long as the change of man and the reconsideration of the system of human relations are not contemplated and creation from the perspective of holiness. Alone or with others, but without God, man is powerless to remedy even the wickedness he produces.

The alienation of the technique is the last consequence of the superficial knowledge in which humanity has chosen to understand the world and implicitly the relation with it, and seeing in them the only acceptable method in deciphering hum, man no longer realizes that no knowledge is a result of the used method and art, as technically, it offers him only what he wants to know.

Exiting the crisis of technology and convenience is not possible without a change in the premises and intentions of contemporary technology, so that it becomes compatible with the intrinsic order of the world. This remodeling requires the transfiguration of the human mind to recognize creation from the perspective of its rational basis, in an effort of theocentric reorientation.

The essence of the relationship between man and the world cannot be solved through externalism, but it does not consist only in contemplation, as a synthesis and part of the world, the man being inside the moon, giving and receiving in this relation. The solution of technological violence wants to affirm at any cost a superiority of man and a foreign order of the deep feeling of creation, a symptom of the ignorance of the true relation between man and the world. Man lives in a world where the objectives of natural resource management are as good

as the values he proposes, as goals and guide, the so-called "ecosystem management, which is quite difficult to define, and can vary from the protection of a habitat limited to the protection of thousands of hectares, in the conditions in which the vague concepts are poorly defined.

In terms of its basic values, the scale extends from an anthropocentric to an ecocentric approach, the management of natural resources having to strike a balance between the two and between the short and long term implications and, in this sense, the key it represents the compromise, so that a balanced approach must judiciously harmonize the two perspectives.

For example, the traditional industrial forestry approach puts at the center the basic human needs for consumption of products supplied by the forests of the planet, this utilitarian point of view being a pure manifestation of the anthropocentric values. This perspective aims at ensuring the needs of mankind through the industrial exploitation of the forest, without taking into account the ecological implications of this exploitation. A forest is seen as a basic natural resource, and should be treated as such, the utilitarian approach taking into account the managerial goals of an owner, recognizing the inevitable influence of people on the forest. Thus, the anthropocentric truth is guided by domination and economic gain.

On the other hand, the egocentric point of view is abandoning the consumerist, traditional utilitarian approach of the natural environment, paying greater attention to the integrity of the interconnected ecosystems. It favors the protection and conservation of the natural environment and states that no economic gain is more important than maintaining the health of the natural environment.

In terms of a personal philosophy on the environment, it is necessary to problematize either pure anthropocentrism or egocentrism, given that the conservation represents the state of harmony between man and nature, people being unable to separate from nature.

The future will appeal, in one form or another, to the exploitation of the natural resources necessary for the economy to ensure growth and well-being, and to try to stop or at least slow down the trend of society, the economy is absurd.

Thus, I consider that the transition to the linear economy based on a very large consumption of resources (renewable and non-renewable), to the circular economy based on saving, in which the waste is recirculated

and reduced to almost zero, is a late sign of humanity's reason, of the expression of the right to choose between good and bad.

The current economy model is hard to support because it is based on the linear flow of waste, it is detrimental to the environment, cannot provide essential services for the growing population and naturally leads to tense profitability. The linear economy has been very successful in generating material wealth, but has shown inability to reappear in the new millennium, so a final breakdown was expected in the near future as commodity prices have reached a critical point and material costs have seen a volatile upward momentum.

Some of the current trends have extrapolated further deterioration of the potential of the linear economy. The increase in natural resource extraction costs has been associated with increasing competition, which has prevented companies from shifting prices to their customers - eventually exerting a reduction in profits on firms and causing the total value of economic output to fall.

Demographic change has further changed the concentration of the population from densely populated industrialized nations to emerging markets. This trend, combined with the explosive economic development of China and India, has led to an increase in the world average of middle class consumers, estimated at 3 billion, with an appropriate consumption estimated at US $ 3 trillion.

Currently, the predominant economic model is the linear model that has a starting point the uneven historical distribution of wealth by geographic regions. As resource users have mostly concentrated on the most developed regions (Western societies), and material resources have increasingly come from economically less developed countries, industrial nations have experienced an abundance of material resources and energy. The consequence of the use of cheap materials was their extensive use, neglect of recycling and reuse.

Regulatory, accounting and tax rules also supported this system as no protocol for charging producers for negative externalities was developed and therefore they were less likely to take into account the external costs of their activity.

In addition, the system has a natural lock-in inertia, as formal product approval procedures tend to favor existing practices of radical change and reinvent basic principles. The result of this economic model is the linear economy, which is summed up in the phrase "cradle to grave" - to

make the necessary resources, to make the goods sold, to obtain profit and to have all that is no longer needed - waste, including product at the end of the life cycle. Environmental issues such as biodiversity loss, water, air, soil pollution, both exhaustion and excessive use of resources and land are increasingly threatening society, and economic challenges such as supply risk, problematic structures deregulated markets and weak incentive structures lead to an increase in financial and economic instability.

Overview of the concept of circular economy

The first paper, in which the term Earth Economy, the Boulding (1966) describes the earth as a closed and circular system with a limited assimilation capacity. The author deduced from this that the economy and the environment should coexist in balance. He suggested the implementation of a cyclical ecological system instead of the wasteful linear economic model.

In the following years, Stahel and Reday (1976) introduced certain features of the circular economy, focusing on the industrial economy. They conceptualized a loop economy to describe industrial strategies for waste prevention, regional job creation, resource efficiency and dematerialization of the industrial economy. The linear open system can be transformed into a circular system when considering the relationship between resource use and waste streams.

The first law of thermodynamics argues that energy and total matter remain constant in a closed system. Thus, the amount of waste generated in any period should be equal to the amount of depleted resources. Capital goods can function as a temporary materialization of resources, but when consumed, they are transformed into waste into the environmental system. Energy cannot be destroyed, but can be converted or dissipated. However, due to the stock of natural resources embedded in capital goods, in practice, the relationship between resource use and waste at any time is more complicated.

In the open system, some of the waste can be transformed into resources. In this way, the economy becomes circular. However, not all waste is recycled - due to lost opportunities and partly due to basic physical laws - the second law of thermodynamics.

The term entropy describes how matter and energy are organized; the more organized and uniform they are the less entropy is. However, as resources are extracted and circulated through the economy, their entropy increases. Even if this is particularly noticeable for fossil fuels reaching the atmosphere as CO2 molecules, entropy growth also applies to most metals.

The deterministic thesis Entropy laws and economic processes, Georgescu-Roegen (1971), assert that the degree of entropy will increase as people extract more and more energy and energy for the economy. Circulating materials and energy would reduce the need for new entrances to the economic system and could drive entropy growth.

Nicholas Georgescu-Roegen using the law of entropy, introduced another paradigm, that of returning to nature, the irreversible time of cosmic evolution. Analyzing the Western economic fundamentals and reforming them from the perspective of thermodynamics and biology, Nicholas Georgescu-Roegen highlighted the relationship between entropy law and economic processes, revealing a fundamental truth that applies everywhere: economic development can sustained without restructuring and reorientation and so sustainable "growth" cannot be sustained, not even "zero growth," and so the decrease would be inevitable.

It is now recognized that the economy of biological processes is governed by the law entropy, not the laws of mechanics. Obviously irreconcilable domains in the 1960s, economics and ecology, are brought together by Nicholas Georgescu-Roegen, who enunciates and demonstrates the impossibility of solving environmental problems through advances in science and technology.Afișați mai multAfișați mai puțin Georgescu-Roegen's critique of traditional growth theory is based on the demonstration that, on the one hand, it is impossible to abstain from natural resources (replacing man-made capital) and, on the other hand, that technological progress considered as a whole, does not involve a reduction in the impact on ecosystems but, on the contrary, an increase in resource consumption.

It is not just about pollution and environmental degradation, Georgescu-Roegen said: "It is clear that most people interpret sustainable development as a new magical formula not only for" sustainable ecological development "but also for" sustainable growth. Economist Herman Daly contributes to the spread of the new

"economic model" with its link to Georgescu-Roegen's bioeconomy. It states that growth should not be confused with development and that sustainable global growth cannot take place.

According to Joseph A. Schumpeter, "growth means producing more, and development means producing in another way," and Georgescu-Roegen considers that global economic growth (and demographics) must not only be stabilized but vice versa, as his titles and his book Sugerați o modificareTrimiteți traducerea"Demain to décroissance" - "Tomorrow's Decrease" - if you want to save the resilience of the biosphere.

In this perspective, global environmental limits must be respected in terms of the ability to change ecosystems, primary productivity, and Earth's climate equilibrium. The syntax of circular economy itself was introduced by Pearce and Turner (1989), although the concept has deep roots in the 1960s and has been contributed by a large number of researchers, theorists and professional parties.

Stahel (1982) highlighted the use of services instead of property ownership as the most relevant business model for a loop-saving economy, allowing industry to seize without outsourcing social costs and risks to waste. The notion of self-renewed economic construction of a spiral loop (or closed loop) has been developed by Stahel in 2010 to the notion of "performance" of the economy. The essence of the performance economy is redefining the object of production, sales and maintenance. Instead of goods, businesses should sell performance, such as in recent business-based business models.

Stahl's concept has been incorporated into Braungart and McDonough's initiative, from swing to swing, which considers all materials involved in industrial and commercial processes to be nutrients, of which two main categories: technical and biological.

The environment has values in itself, but in the neoclassical ecological economic analysis an anthropocentric approach is applied, with an emphasis on the usefulness of the environment for people, measured in terms of economic well-being. The circular economy from the perspective of environmental economics is based on a principle of material equilibrium (Kneese et al., 1970), which implies that all material flows must be taken into account, although they will be economic values, not physical flows. From this perspective, the environment can be recognized as fulfilling four fundamental economic functions of welfare:

- the values of satisfaction;
- a resource base for the economy;
- a waste stream container;
- a life-saving system.

Satisfaction values (positive externalities) are those that the environment offers directly to man without interfering with the economic system; Secondly, the environment provides a resource base that works as a contribution to the economy, both in terms of renewable and non-renewable resources. More problems arise in case of non-regenerability, where the physical stock, by definition, will be exhausted as resources are introduced into the economic system. It is important, however, to understand that exhaustion is possible for both non-profitable and renewable resources. Thirdly, the environment functions as a waste bin for the residues of economic activity, whether the emissions are in water, soil or soil.

The environment has a certain assimilative capacity to receive waste from the economic system, but once the assimilation capacity is exceeded, the environmental damage begins to increase;

The environment functions as a life support system. This function recognizes the biological inherent nature of the environment and the fact that the function of sustaining life can be influenced by economic activities.

The four economic functions of the environment are mainly analytical categories. However, there are interactions between them, which require an improvement in the economic analysis of environment.

The life support function for biological systems can, for example, be affected as a result of the excessive use of the environment as a waste container. Another example is waste that is discharged into the environment, which not only has the potential to cause damage (if waste exceeds assimilation capacity), by affecting the values of satisfaction and life support function, they are also lost from the point of view of the economic system.

This loss of residual materials in the economic system can be delayed for non-renewable resources if a circular economy is in place that promotes recycling, product re-use, rebuilding and renovation. They require less resources and energy and are more economical and recyclable as low-grade raw materials. The time in which resource values

exist within inner circles should be maximized. Materials must first be recovered for reuse, refurbishment and repairs, then for recovery and only subsequently for the use of raw materials, which was the main objective in traditional recycling. Thus, the product value chain and life cycle retain the highest value and quality as much as possible.

Once the raw material is extracted, processed and produced at normal costs, it is economically and useful to use the value produced as much as possible, namely, to preserve the product function / service and the value of use in economic movement as much as possible. This also results in environmental gains compared to traditional extras-production-use-storage.

Linear economy versus circular economy

Linear economy, the dominant notion that governs production and consumption, has to be replaced in its entirety by "positive development in which markets operate" In order to systematically ensure a better functioning at local level and global.

Circular economy implies a design or system that preserves as much as possible the added value of a product and eliminates waste. When a product completes its life cycle, must be kept in the economy as a resource that can be used again productively creating additional value

The circular economy is based on several specific approaches that revolve around a set of core principles. In order to understand the concept, it is desired to establish the ideas of composition. The relevance of this approach is underlined by the fact that pan-national organizations (such as the World Economic Forum, 2016) have signed and adopted the interdisciplinary composition of the circular economy.

The current circular economy concept extends the use of conventional waste, the use and recycling of byproducts by increasing the use of value incorporated in materials in applications with a maximum value. Traditional recycling, which typically recycles raw material, is added in applications where much of the economic value of the product has already been lost. Based on these contributions, we can say that the circular economy is the economy of energy-generating systems where energy sources, waste, emissions and energy leaks are minimized by decreasing the intensity, closing and narrowing of material and energy

loops. This can be achieved through long-term design, maintenance, repair, re-use, redesign, reconditioning and recycling.

The current economy relies heavily on a linear economic approach based on resource extraction, goods and services, and waste disposal. Non-renewable resources previously considered to be inexhaustible reach the limits of affordable supply, and the negative environmental impacts such as climate change and biodiversity loss are accelerating and regulated at local, national and international levels. Moreover, new technological disruptions, emerging markets and business models change the way of thinking about the production and consumption of goods and services. Linear business models depend on short life cycles of products and maximize sales. Improving sustainability focuses on eco-efficiency: maximizing economic gain with minimal impact on the environment. These models are market conditions that are threatened by technology-based service models and changing consumer demand for more tailored and sustainable products.

As a result, companies that continue to operate in the old linear paradigm risk losing customers and access to markets, increased costs, and so on.

In a circular economy, the use of resources is decoupled from economic growth, which means that economic development no longer requires similar consumption of resources. Resources are used more efficiently and the economy becomes less dependent on unprofitable resources.

Circular economy is based on an emerging economic model that covers both techniques and business models to keep the materials and resources used as much as possible and ideally for all time in a closed extended use cycle, reuse and recycling. The critical elements of the circular economy are industrial symbiosis, renewable materials, shared economy, product as a service, close relationship between producer and consumer, proximity economy, reuse, recycling and recycling, urban mining, detoxification of material cycles and sustainability of consumption and production (Table 1).

Table 1: Comparisons between the elements of linear economy and circular economy

Linear economy	Circular economy
Dependence on raw materials resources	Reducing inputs of primary resources and energy The necessary initial investments can damage the profit of companies in the short term
Volatility of primary resource prices	Major changes in the consumer / products or service relationship in the circular economy, in the sense that we may become users rather than consumers
Limited opportunities for expansion to new markets	Market demand for products is dependent on collaboration on the value chain
Increasing the number of legislative acts related to environmental protection, impacting on the prices of the products	Reducing value losses Reducing waste management costs
Growth in population and financial wealth with positive effects on consumer demand but with negative effects on the environment	The unknown residual value of many products due to the narrow market for manufacturing companies that recycle, reuse, reprocess or repair Products / businesses that become useless in old linear business practices

Source: own processing

Use of material resources in the EU-28 and in Romania

Sustainable development is one of the key coordinates of the European Union's programs and a goal of each member country, as the superior valorisation of resources is the premise of the stability and welfare of the population. This implies, at the same time, increasing the added value for the raw material unit and saving the resources employed in the economic process, which translates into inexpensive domestic financing resources. In reaching its goals, Romania can capitalize on the European experience and can put its economic policies on the international competition.

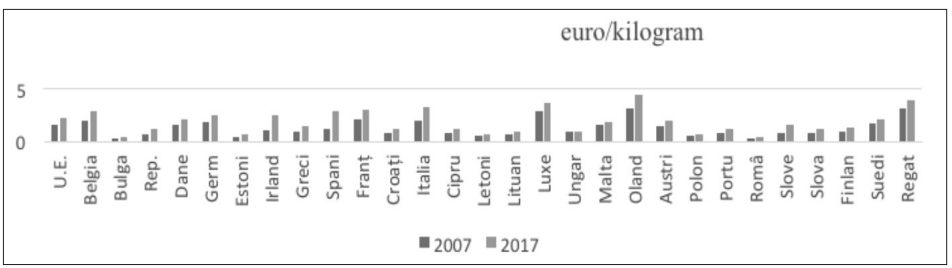
In Romania, Romania has important reserves of progress in capitalizing on primary resources, renewable energy, and promoting circular economy objectives, meaning improved efficiency, low cost production, reduced resource dependency.

In the EU, policy programs are geared towards eco-efficiency defined as delivering goods and services that meet human needs and lead to an increase in the quality of life, progressively reducing the environmental impact and the intensity of resource use throughout the life cycle. Increasing resource productivity means making resource cycles more flexible in the future, with the exception of recycling, which should become more consistent, thus reducing the net resource flow. The amount of resources used by an economy plays a crucial role in generating environmental pressures, from the extraction of natural resources for production and consumption activities to materials released into the environment, such as waste and air and water emissions.

The resource productivity indicator (PPS per kg) is calculated as the ratio of gross domestic product to GDP (PPS per capita) and the amount of natural resources used in a given year per country - DMC (tonnes per capita). It can be seen that the level of resource productivity varies greatly between EU Member States. (Annex 1) because it depends on the country's natural resources, the diversity of its industrial activities, the role of the service sector and construction activities, the scale and patterns of its consumption and its various sources of energy.

In 2017, average resource productivity in the European Union increased to 2.04 euro / kg, an increase of 39% over the value of 1.47 euro / kg recorded in 2000 and 0.6% above the level in 2016. There is a general trend of continuous growth of resource productivity in the overwhelming majority of member countries (Figure 1).

Figure 1: General trend of material productivity in European Union member countries (GDP / kg)



Source: Eurostat data, 2017

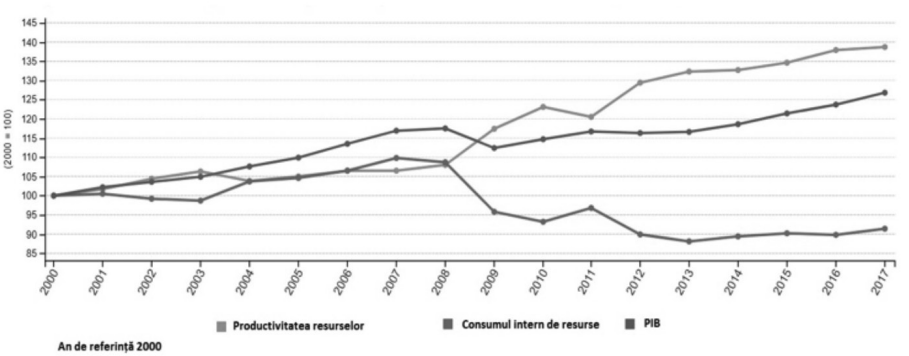
Since 2008, resource productivity has been progressing in the EU, both in terms of growth in economic activity, measured by GDP, and low material extraction as measured by domestic input of raw materials.

Romania had a better natural resource productivity than Bulgaria in 2017 (0.74 euro / kg compared to 0.71 euro / kg), but it is 2.5 times less than the European average, which was 2, 04 euro / kg.

In the Member States, the highest values of resource productivity were recorded in the Netherlands (3.96 euro / kg), the United Kingdom (3.56 euro / kg), Italy (3.38 euro / kg) and Spain (3, 16 euro / kg) and, on the opposite side, four Member States of the European Union have a resource productivity below 1 euro / kg - Bulgaria (0.71 euro / kg), Romania (0.75 euro / (0.78 euro / kg) and Latvia (0.88 euro / kg).

Apart from the conjunctural effects, such as the sharp decline in construction activity, following the economic crisis that started in 2007-2008, which has led to a significant decline in material use, with an impact on GDP, long-term trends show that the absolute decoupling of economic growth from the use of resources has taken place (Figure 2).

Figure 2: Long-term trends in resource use in U.E. -28



Source: date Eurostat, 2017

Although recent trends in material use and resource productivity have been positive, the main challenge is to support earnings and avoid the model returning to growth accompanied by increased resource consumption. In the industrial sector, it is already recognized that improving resource productivity is a major economic asset. It is estimated that improving resource efficiency across value chains could reduce

material needs by 17% to 24% by 2030 and that better use of resources could represent a general saving potential of EUR 630 billion per year for European industry.

Enterprise-based and product-based modeling studies show that circular economy approaches provide significant cost reduction opportunities for U.E. and that there is potential for stimulating its GDP, up to 3.9% by creating new markets and products and value for business.

Developed countries should improve their resource productivity in the coming years by encouraging industrial ecology, environmental design and tools such as life cycle assessment, environmental audit, accountability and cost, risk assessment and resource efficiency.

DMC composition in each country is influenced by natural resources with material resources and the latter can be an important structural element of each economy.

Consumption of non-metallic minerals varies in most countries from about 2 tonnes per capita to more than 15 tonnes per capita. Differences between countries are influenced inter alia by levels of construction (investment), population density and infrastructure dimensions, such as road traffic.

The consumption of biomass also varies greatly in countries ranging from 2 to more than 10 tonnes per capita. Biomass-intensive economies are specialized in wood production (Latvia, Finland) or in certain livestock productions (Ireland, Denmark).

Consumption of fossil energy material is about 3 tons per capita for U.E. and more balanced between countries. Countries below average are based on nuclear and biomass (for example, France, Sweden, Latvia). Countries well above U.E. are those with extraction of fossil fuels (eg Norway, Estonia). Consumption of metal ores is highest in the extraction countries (Finland, Sweden and Bulgaria).

The Romanian economy has a significant gap with the overwhelming majority of the European Union's economies.

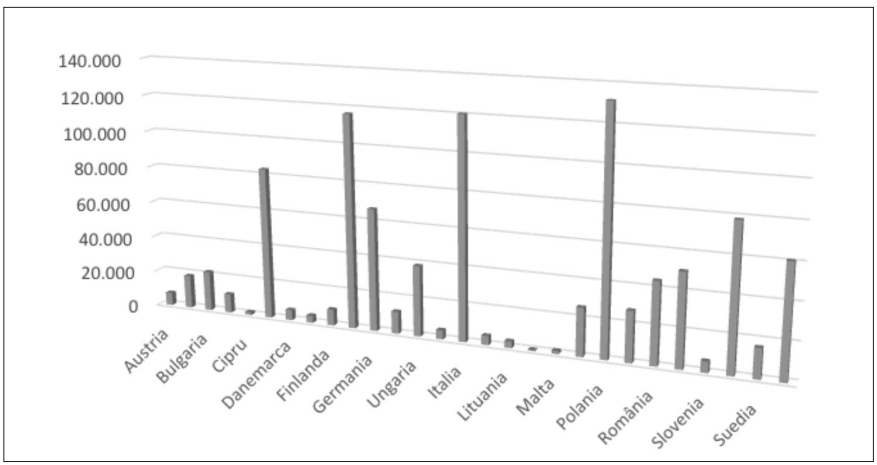
Reducing resource costs for SMEs in EU member countries

In generating an overview of the potential for resource cost reduction in SMEs, we used a data collection from RPA (Risk and Policy Analysts) (2014) and contain figures on the annual savings on resource efficiency

made in four sectors of the economy: food, energy and services, environmental technologies and construction over a 1 year period (2014).

SMEs can be considered a key factor of European economic growth. In 2013, there were 21,614,909 non-financial enterprises in the EU-28, of which 99.8% could be considered as SMEs. In the Figure, information is available on the number of SMEs in 4 sectors of the economy: food, energy and services, environmental technologies and construction, which have implemented at least one type of activity specific to the circular economy (Figure 3).

Figure 3 : Number of SMEs that have taken resource efficiency measures



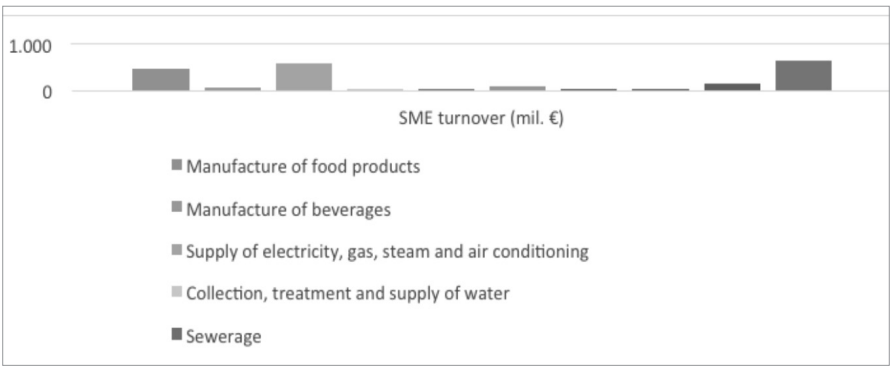
Source: own processing

The construction sector accounts for approximately 88% of all enterprises, followed by food (7.8%). The other two sectors together account for 4% of the total number of enterprises. Both the number of SMEs and the level of employment (Annexe 2) are not equally distributed, the services sector and environmental technologies are more capital than the other two sectors analyzed.

As a result, they account for only 7.2% of all jobs, compared to the construction and food sectors, accounting for 73.2%, or 19.5% of the total employment.

Turnover has a more balanced distribution in all sectors, although construction continues to have a large share (49.7%) of total turnover, followed by services (24.2%) and food (21.3%), (Figure 4).

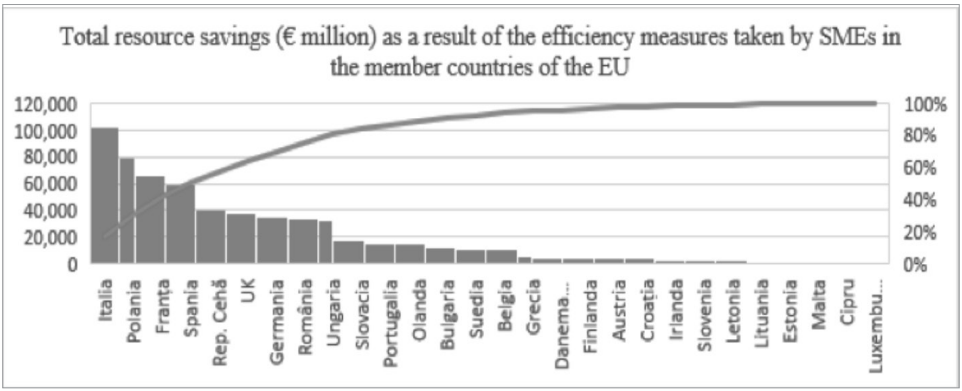
Figure 4: The turnover of SMEs that have implemented at least one type of circular economy activity



Source: own processing

The implementation of resource efficiency measures for all SMEs in the four sectors led to savings of EUR 54.6 billion (Figure 5).

Figure 5: Cost savings for each member country of U.E. as a result of resource efficiency measures (for four sectors of the economy)



Source: own processing

In the 28 EU Member States, the cost savings achieved through the implementation of circular models with an investment of EUR 4 billion were used by approximately 975,219 SMEs in the four sectors, of which 602,274 produced cost savings of resource efficiency; this equates to about one-fifth of the total number of SMEs in these sectors. Italy has achieved the largest resource savings, followed by France, the United Kingdom, Spain and Germany.

Transition of Romanian SMEs towards a circular economy

Romanian SMEs are generally oriented towards a low-cost competitiveness model that could explain why this is considered a barrier to resource efficiency measures (Flash Eurobarometer 456, 2017).

An identified major barrier is the reduced capacity of the public sector at national level to overcome the implementation of EU legislation ad litteram (especially in the field of waste). In this respect, working towards better enforcement of existing laws and monitoring their implementation, building efficient waste collection systems is the most important and important challenge.

Creating the capacity to invest in new waste management infrastructure is another challenge at the local level. In general, Romanian SMEs have a low environmental awareness and are mainly driven by compliance with regulations in their environmental practices for reasons cost. However, there are signs that SMEs are increasingly committed to self-assessing their waste management practices, trying to find potential opportunities to improve their management and thus improve environmental awareness (Green Business Index Romania, 2017). Thus, 70% of the companies monitored by Green Business Index Romania collect selectively more than 75% of their waste, although their number decreases (Green Business Index Romania, 2017).

In terms of value chain sustainability, few SMEs (11.8%) prioritize green public procurement in their policies, while 65% of them say they do not have GPP policies within companies (Green Business Index Romania , 2017). Moreover, mentioning GPP as a priority does not mean that it is effectively implemented. This shows that SMEs in Romania have a long way to go before tackling the environmental footprint of the company and products from the product lifecycle perspective.

Through the Europe 2020 strategy, clear objectives have been set for the European Union to become a sustainable economy, while the legal framework for small and medium-sized enterprises states that it should help SMEs to seize the opportunities created by the new paradigm - the circular economy.

In Romania there are the following types of activities specific to the circular economy: minimizing waste by recycling or reusing waste or selling it to another company, rethinking energy consumption in order to minimize, rethinking products and services to minimize the use of materials or the use of recycled materials, rethinking how to use water in order to minimize consumption and maximize reuse, use of renewable energy. These activities have enabled SMEs to turn environmental challenges into business opportunities.

The analysis of Romania's situation in the context of the EU-28 Member States reveals that the share of circular economy activities implemented or under implementation at the level of 2015 by Romanian SMEs is 41%.

These activities are those related to minimizing waste by recycling or reusing or selling it to another company. The percentage value recorded for this type of circular economy activity is the largest difference compared to the EU-28 average (Flash Eurobarometer 441 - European SMEs and the Circular Economy, April 2016) of 14 percentage points, which places Romania 23rd in the ranking of the EU member countries where such activities take place.

Flash Eurobarometer 441 places Malta as a leader in the development of waste minimization activities through recycling with 83.2% of SMEs. Only in the case of rethinking the use of water to minimize consumption and maximize reuse is the percentage 18.7% and for rethinking products and services to minimize the use of materials or the use of recycled materials is 32.9%. These two activities place Romania slightly above the EU-28 average, in the first case ranked 9th in the hierarchy of the Member States, and in the second place 14th place.

Activities related to the use of renewable energy place Romania on the lowest position compared to the other types of circular economy activities in the EU-28 ranking, with 7.2% (25th place).

The regional situation for each of the five types of circular economy activities developed by Romanian SMEs highlights regions with faster pace of development and regions with lower growth rates.

The Northwest of the country is the pole for the development of waste minimization activities by recycling or waste reuse or sale to another company among SMEs, the percentage being 46.1% for this type of circular economy. In the South-Muntenia region, the lowest percentage (37.8%) for this type of activity is recorded.

The Northeast region is experiencing more rapid pace than other countries' development regions in rethinking products and services to minimize the use of materials or the use of recycled materials, while SMEs in regions West and South-Muntenia occupy the top positions in the ranking of renewable energy use activities.

The European Commission's report on the implementation of environmental policies at European level (European Commission, 2017a) showed that the circular economy is underdeveloped in Romania. That is why it is important to know what the opening of the business environment in activities of the circular economy in Romania is (Annex 3).

Recycling of Municipal Waste and Packaging

The efficiency of material resources and waste management are considered to be very closely related issues. This indicates an opportunity to address both themes together, for example, through the circular economy, the recovery of secondary materials or industrial symbiosis.

As a member state of the European Union, Romania has the following objectives to be achieved by 2020: minimum 50% reuse and recycling rate of the total mass of the waste, at least 70% preparedness for re-use, recycling and other operations of material recovery of at least 70% of the mass of non-hazardous waste from construction and demolition activities, 60% recovery of the packaging waste from the total packaging placed on the national market.

Also, the collected annual amount of electronic waste will have to be 4 kg / inhabitant and bio-waste will be collected separately for composting and fermenting.

Regarding waste management, the situation is worrying, and Romania's chances of achieving the objectives of the legislative package are minimal. According to the U.E. report, Romania has very low recycling and composting levels, ie 16%, compared to the European average of 44%, as well as high rates of waste disposal.

Thus, even if the overall waste disposal rate is around 52%, there are still significant municipal waste and agricultural and biomass wastes that are not quantified with acceptable accuracy so that the data presented does not really reflect reality.

The recycling rate for municipal waste is only 3%, with no other EU country recycling less than 10%. Under these circumstances, reaching the 65% target is unfeasible by 2020. Along with Malta and Estonia, Romania is among the three countries of the United States. where economic growth has not been decoupled from pressure on the environment and natural resources, and the chances of this occurring are minimal.

Annually, some 1.3 million tons of packaging is placed on the market in Romania, leading to an obligation to recycle 750000 tons of waste. This activity is currently funded only by manufacturers and importers of ambulatory goods whose interest in collecting packaging waste has grown significantly and there is a real chance that this year's recycling targets imposed on producers will be achieved. On the other hand, Romania recycles only 5% of the municipal waste annually, occupying the last place in the European Union, far away from the next ranked.

Thus, regard to the general recycling rate of municipal waste, Romania recorded the largest increase over the period 2008 - 2014, which was over 14.5 times. With all this spectacular growth, in 2014, Romania places a 13.1% recycling rate on the forefront of the European Union, outpacing only Malta and Slovakia. Also noteworthy is the average 43.9% recycling rate of municipal waste, registered at the European Union level. At the opposite pole of Romania, over 50% are: Germany, the Netherlands, Austria and Switzerland (non-U.E.). Occupation of the last place in the ranking of the member countries of U.E. to packaging waste involves the possibility of applying the infringement procedure. In Europe, especially in countries with a functioning system, recycling is supported by various economic measures and instruments.

By 2020, Romania will have to recycle 50% of the total mass of municipal waste. According to estimates, the targets for packaging waste will be achieved this year by producers, accounting for only about 13% of the 50% demand. Throughout the waste management chain, each actor must bear the responsibility of costing: producer, citizen and local authorities. At present, those who fulfill all their obligations in this chain are only manufacturers, those who place packaging waste

on the market. Thus, if public authorities would ensure the financing and infrastructure of the value and recycling system, the recycling rate will increase. Moreover, the authorities are responsible for implementing economic instruments to boost the value-added business environment, one of the controversial measures being the so-called "pitfall" (postponed taking effect in 2014).

Legislative changes introduced from 2015 to the present day have regulated the system and have had a positive impact, and as an immediate effect has been the significant increase in the collection and recycling of packaging every year. Thus, the packaging recycling rate increased 1.64 times, at the level of Romania, over the same period, from 33.5% to 54.8%. The registered growth places Romania on the second place at the level of the European Union (which registered a general increase of only 5% from 60.5% to 65.5%), being surpassed only by Cyprus.

The 54.8% rate places Romania in the second part of the European ranking, surpassing only Liechtenstein, Malta, Croatia and Greece. It is important to note that Romania is at the level of 2014 at about 29.84% of the EU average with respect to the recycling of municipal waste and at 83.66% of the average U.E. regard to the recycling rate of the packaging. At the level of the national economy, the evolution of the sector of the NACE 38 companies had a downward trend over the analyzed period. At the level of 2014, the number of active companies is only 2904, which represents only 65.41% of the number of active companies in 2008. The registered decrease has led the sector to decrease its share in the total economy (total number of active companies) from 0.67% to 0.48%.

Several SMEs have started investing in recycling and waste collection infrastructure, trying to capture this business opportunity. The 2017 resource efficiency indicator Eurobarometer shows that Romanian SMEs are starting to be more committed to investing in resource efficiency measures than in the past. Approximate. 30% of companies implemented energy saving measures (33%) and waste minimization measures (31% of companies), which is half of the EU average.

In Romania, 59% of companies invest no or less than 1% of their annual turnover to become more resource efficient, which is slightly more than the EU (51% of companies), in while 5% of companies invest more than 5%, significantly higher than in the EU (1%). Several SMEs in Romania intend to provide organic products and services over the next

two years (19%), which is a sign that companies have begun to understand the value of these investments (Flash Eurobarometer 456, 2017).

Eco-innovations

Eco-innovation represents all innovations that have the purpose or effect of protecting the environment and sustainable development. It involves the development of innovative products, services, technologies that reduce resource consumption, diminish the depreciation of natural capital and encourage the circular economy. The basis of eco-innovation is the development of research regardless of how it is financed: public, private or in partnership.

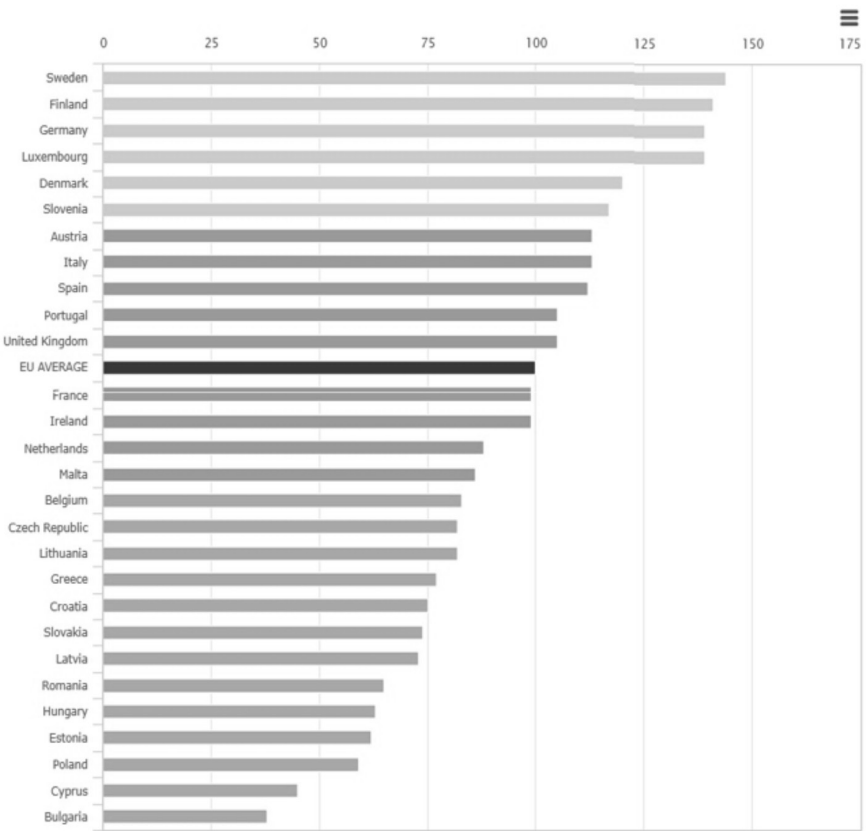
The eco-innovation index measures the number of eco-innovations (per inhabitant) in each country, is based on 16 indicators covering five areas of innovation: - the means of production of eco-innovation; - eco-innovation activities; - achievements of eco-innovation; - environmental performance, - socioeconomic outcomes.

Estimation of the means of production of eco-innovation results from the simple average of the scores obtained for «State budget expenditures or credits for environment and energy R & D (percentage of GDP)», «total number of employees and researchers in the R & D sector (percentage of total jobs) «and» total initial investment (USD / capita) «.

The score for eco-innovation activities results from the simple average of the scores obtained for "enterprises that have carried out innovation activities aimed at reducing inputs of inputs per unit of production (% of total enterprises)","enterprises carrying out innovation activities aimed at reducing consumption of energy per unit of production (% of total enterprises) "and" registered ISO 14001 organizations (per million inhabitants) ".

The score for eco-innovation results from the simple average of the «eco-innovation patents (per million inhabitants)», «eco-innovation related publications (per million inhabitants)» and «media coverage of eco-innovation electronic communication)». Score for resource efficiency results from the simple average of scores for raw material productivity, water productivity, energy productivity, and greenhouse gas emission intensity (Figure 6).

Figure 6: EU Eco-innovation Index in 2017



Source: Eurostat data, 2017

Countries with significant results in eco-innovation are Sweden, Finland, Germany and Luxembourg 30% above the EU average. Romania, even if it is somewhere in the low-eco-innovation countries, comes out of the tandem with Bulgaria and succeeds to outdid countries with a higher economic development (if we refer to GDP per capita) like Cyprus, Poland, Estonia and Hungary.

Relate to the EU average, the eco-innovation index for Romania had a minimum in 2010, accounting for around 50% of the European average, to reach 75% of the EU average in 2012 and 2015. In 2017, the eco-innovation index for Romania was about 67% of the EU average in a slight decline compared to previous years.

Barriers to the development of circular economy activities

In Flash Eurobarometer 441 (European SMEs and the Circular Economy, April 2016) are recorded as the main causes that prevent the implementation of circular economy activities from the following: lack of specialized human resources and expertise, complex legal administrative procedures, costs related to the fulfillment of standards, difficulties in accessing finance and turnover.

Also, SMEs in Romania face three major systemic problems: excessive bureaucracy of the legal procedures related to the circular economy, the inability to develop a sustained dialogue with the regulatory environment, and reduced investment in human capital and innovation.

Financing of circular economy activities

Most of the circular economy activities implemented by SMEs in Romania were self-financed (72.5%), this percentage being above the EU-28 average in terms of self-financing of circular economy activities, even if overcoming only 2 percentage points. Only 1.4% of the SMEs surveyed said they have funded their circular economy through non-reimbursable funds, although financial support to SMEs continues through the 2014-2020 Cohesion Funds.

Conclusions

The need for the conservation of natural systems, as an opposite paradigm, cannot be ignored, both science and popular sentiment have begun to merge, in recent decades, in the sense of raising awareness of environmental issues. For example, research clearly states the need for natural resources, for their conservation as a reservoir of existential elements.

However, in a world with over 6.5 billion people this basic conflict is at the center of the debate, both of which should ideally be compromised. We need to look for an effective system of basic values that will guide the management of the natural environment, the ecological management, in particular of the natural resources. In order to develop ecosystem management, the relationship between the new objective of integrated environmental protection and the old requirements of the

provision of goods and services by the environment for human needs must be reconciled. A balanced approach to ecosystem management involves confronting reality, gathering opinions and information from opposite perspectives, accumulating experiences and knowledge to substantiate future policy objectives. This depends on the recognition by the anthropocentrists, by the utilitarians of the madness of the consumption without limits, and the acceptance by the ecocentricists, ecologists of the reality of the continuous growth of the needs of the society.

When conflict points of view are able to meet on common ground, real progress is made and, overall, the manifestation of harmony and balance in approaching the natural environment is obtained with the honest attempt, responsible for promoting ecosystem management.

Although difficult to define and difficult to fully understand, the balance of anthropocentrism and ecocentrism represents a realistic approach for ecosystem management, which addresses the ongoing needs of humans, taking into account the importance of the health of the natural environment, its protection and conservation. Based on the review of the literature, the article provides a reflection on the concept of circular economy, an overview of the main circular economic processes, and their applications in different sectors.

The multitude of interpretations of the concept of circular economy and the wide range of issues and priorities it embodies is reflected in the diversity of definitions presented. While some definitions and interpretations focus on physical and material aspects, others envisage a major transformation of the economic system that involves different sectors and issues that go beyond material resources and waste.

Circular economy is a complex concept and it is unlikely that in the short term there will be an international consensus on its meaning. However, at the level of EU policies, more clarity is needed with regard to the areas and sectors that can enter the circular economy. This can help to avoid confusion and to produce impact assessments that will provide consistent messages on the potential effects of the circular economy.

Circular processes presented in the study can be implemented by businesses and have significant potential to provide economic, environmental and social benefits. In each case where a circular economic process is applied to a sector, careful consideration must be given to all

parameters that may play a role in the overall sustainability of the circular process that replaces a linear one. It is also necessary to understand the indirect effects on the economy (eg impact on the value chain and / or changes in consumption patterns) to estimate the overall impact at EU or national level.

Understanding the concept of circular economy at the level of SMEs is important for identifying the specific activities developed that have implemented the circular model, as well as the barriers that hinder these types of activities.

In this respect, descriptive analyzes were used in the first phase, followed by data that complemented and nuanced the influence of the braking factors in the process of implementation of circular economy activities among SMEs.

The results demonstrate that despite the existence of public policy instruments and measures designed to facilitate the transition to a circular economy, there are a number of barriers that hamper this move. The descriptive analysis showed that the majority of SMEs in Romania mention the lack of human resources and the lack of expertise in the implementation of circular economy activities as the main barriers.

The importance of cost drivers that SMEs have to bear to ensure compliance with industry regulations and standards and complex administrative legal procedures also plays a major role in this process. In the absence of management commitment to overcome barriers to human resources and know-how, resistance to change in SMEs can be manifested, with unfavorable consequences for attitudes towards the circular economy and the capacity to achieve innovation which implementation of the concept implies.

The analysis of the behavior of SMEs in Romania regarding the implementation of circular economy activities can be nuanced and the number of barriers encountered by them can be extended, the boundaries of this study being related to the variables included in the instrument applied to the SMEs and the nature of the set data used.

Although the European Union supports the green initiatives of SMEs and encourages Member States to have similar behavior, this paper shows that national policies should pay more attention to training of workers and the development of knowledge, while reducing the degree of bureaucracy in assessing the compliance of activities carried out of

SMEs in the field. In conclusion, we appreciate that the implementation of circular economy activities in SMEs also requires a commitment of managers and decision-makers.

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Annex 1

Table 2: Productivity of resources, GDP and DMC that characterize EU member countries

Country	PIB_{PPS} per capita (PPS per capita)	DMC per capita (tone per capita)	Resource (PPS per kg)	Productivity PIB/DMC (U.E. =100)
U.E.	29.110	13.6	2.2	100.0
Belgia	34.039	13.2	2.6	119.5
Bulgaria	14.266	20.8	0.71	27.0
Rep. Cehă	28.438	15.2	1.7	244.7
Danemarca	37.439	32.6	1.6	91.7
Germania	35.870	15.6	2.4	147.9
Estonia	21.895	29.4	0.8	33.2
Irlanda	51.902	24.3	2.3	289.0
Grecia	19.727	12.0	1.7	74.0
Spania	26.669	8.7	3.2	188.6
Franța	31.168	11.3	2.8	87.6
Croația	19.448	9.7	1.9	68.7
Italia	28.282	8.5	3.4	177.7
Cipru	24.017	19.4	1.3	38.2
Letonia	20.074	22.7	0.9	68.5
Lituania	22.292	16.8	1.4	157.4
Luxemburg	75.824	25.0	3.0	218.3
Ungaria	19.717	13.4	1.5	50.2
Malta	28.908	13.3	2.1	141.1
Olanda	38.391	9.7	4.0	184.3
Austria	36.876	20.8	1.8	46.4
Polonia	21.111	18.9	1.1	60.7
Portugalia	23.038	15.3	1.5	134.7
România	18.796	25.1	0.74	49.9
Slovenia	24.063	13.5	1.9	250.1
Slovacia	22.380	13.2	1.7	93.0
Finlanda	31.832	32.3	1.0	58.1
Suedia	35.473	23.0	1.6	157.3
Great Britain	31.518	8.9	3.6	223.2

Source: Eurostat data, 2017

Annex 2

Table 3: SMEs performing at least one activity specific to the circular economy

Sector	SMEs that have as object of activity	No SME	Employees	Turnover (mil. €)
Food	Manufacture of food production	246,650	2,590,810	465,386
	Manufacture of beverages	22,366	212,233	62,530
Energy and services	Supply of electricity, gas, steam	65,182	261,436	577,976
	Colection, treatmen-t,and supply of water	14,240	141,295	22,101
Environmental technologies	Sewerage	11,498	95,822	15,144
	Waste collection	44,056	516,492	101,284
	Repair and other waste management services	2,986	24,978	4,143
Construction	Construction of buildings	741,463	2,817,417	425,690
	Civil engineering	89,353	920,136	142,788
	Specialized construc-tion activities	2,190,282	6,780,506	662,963
Total		3,428,031	14,361,124	2,479,973

Source: DG Enterprise Annual Report on European SMEs,, 2014, http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance review/index_en.htm on

Annex 3

Table 4: The circular economy activities in Romania in the year 2016

The circular economy activities in Romania	SMEs that intend to develop	SMEs that not intend to develop
Minimizing waste through recycling - reuse of waste or selling it to another company	11,9% București-Ilfov (17%)	42,3% Sud-Muntenia (54,2%)
Redefining energy consumption in order to minimize it	23,9% Sud-Vest Oltenia (33,7%)	39,3% Sud-Est (67%)
Rethinking products and services to minimize the use of materials or the use of recycled materials	15,7% Sud-Vest Oltenia (32,3%)	45,6% Vest (62,5%)
Rethinking how to use water to minimize consumption and maximize reuse	18,2% Sud-Vest Oltenia (27,3%)	60,6% Sud-Muntenia (68,9%)

Source: own processing having as a source of information Flash Eurobarometer 441. European SMEs and the Circular Economy. April 2016. TNS Political & Social [Producer]; GESIS Data Archive: ZA6779, dataset version 1.0.0. (2016), doi:10.4232/1.12668.