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# Circular Economy as a New Stage of Economic Development

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## Abstract

The chapter is devoted to understanding circular economy as a new stage of economic development, which is aimed to respect limited quantity of water, soil, clean air and ecosystem services, strongly connected to the new global social tensions, and how to achieve this stage. The literature survey has shown the current concepts for circular economy discuss new usage of resources, but not who and how will provide such changes. That is why it is suggested application of the Hegelian doctrine for economic development which is answering similar (we mean social) to the above questions – how to get freedom and society consolidation in market economy, suggesting state regulation of market economy. Consequently such regulation is needed to overcome the social tensions strongly connected to limited quantity of resources, vital for the future of society. Taking this doctrine as a theoretical background, it is assumed each new stage of economic development is characterised by different content of goals, subject and means for achieving the goals. The applicability of the notion circular economy is a new stage of economic development is tested and approved by demonstrated contemporary changes in policies for economic development, taking place in the European union, by recently changed and achieved goals of its development.

**Keywords:** circular economy, economic development, Hegel, theory, measure

## 1. Introduction

The recent tensions in the globalised world are strongly connected to resources in limited quantities. In this regard, the importance of producing more value using less material and diversifying consumption has been become a driver for developing variety of concepts of circular economy. The chapter is aimed at:

- summarising the recent achievements in understanding economic development and circularity of resources presented in these concepts;
- identifying understandings how and who will transform linear free market economy into a circular one;
- defining a theoretical background to solve the above problems;
- approbating its applicability into the practice.

## **2. Understanding the economic development and circularity**

Economic development is a term in which different content is invested. Based on etymology, it means a constant process of transition of the state of the economy from one stage to another more advanced one. In the scientific literature many different classifications of the stages of economic development and respected criteria for their identification take place. Practically none of them discusses circularity as a criterion for belonging to a specific stage. For this study we accept the main characteristic of the recent stage of economy development is that it is a free market one, and that the main challenges before is digitalization and circularity implementation. The latter is the focus of the further analyses.

### **2.1 Circular economy concepts**

The basic concept of a circular economy depicts a production and consumption system that relies on the recycling, re-use, repair, remanufacturing, sharing of products, changing the consumption patterns and new business models and systems. Defining circular economy concepts and their problems could be find in academic literature, including contemporary academic reviews, official documents of the European Commission [1], OECD, G-8, etc., and from charities and NGOs, most prominently, the Ellen McArthur Foundation [2].

Contemporary academic rethinking of the progress within the limits of the planet has contributed to development of different theoretical and methodological dimensions of a concept for circular economy and for a transition from linear to a circular economy [3, 4]. They have concerned also measurement of the change like to redefine growth, focusing on society – wide benefits. The concept of circularity transforms all the elements of the take-make-waste system how to manage resources, how to make and use products, and what is done with the materials afterwards in the process of transforming linear to circular economy. (See: **Figure 1**).

Another dimension of concepts on the circular economy identified is focussed on how materials enter, flow within and (eventually) leave the economy. A visual overview is provided by a material flows diagram (See **Figure 2**<sup>1</sup>). It shows all raw materials — aggregated as well as grouped by categories of materials — throughout the economy, from their extraction until they become waste.

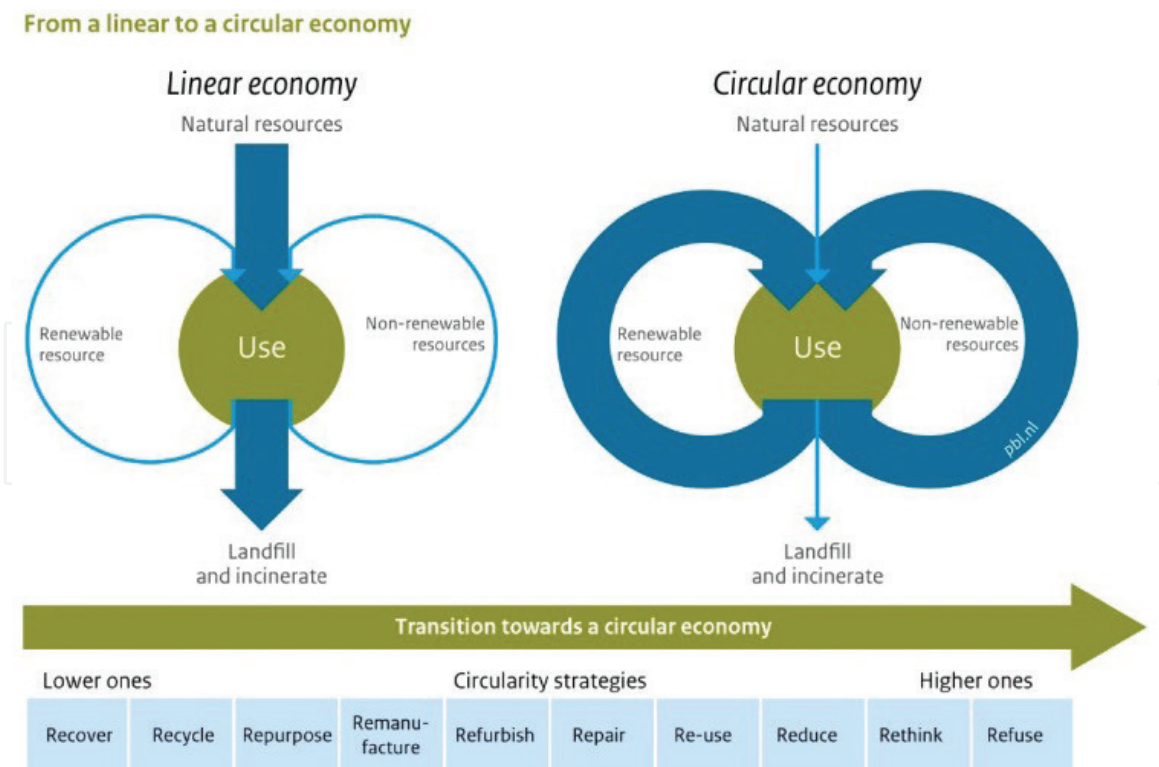
More concretely, the input-side on the left shows that only 0.6 billion of 8 billion tonnes of materials are processed into energy or products annually in the EU originate from recycling. On the output-side, out of the 2.2 billion tonnes of waste that are generated only 0.6 billion tonnes re-enter the system as recycled materials. It means that the rest of the materials, equivalent to 1.5 billion tonnes, is waste. This concept for circular economy points to a significant potential for improvement in particular by increasing the share of materials recycled as secondary raw materials and decreasing the production of waste.

It could be assumed the above two dimensions of concepts for circular economy discuss how resources are used, or have to be used. But they do not characterise who and how will transform the linear free market economy to a circular one. Such answer could be found applying the Hegelian doctrine for economic development.

### **2.2 Hegelian economic development doctrine**

The most of the recent conflicts are originating from the limited quantities of resources such as water, soil, clean air and ecosystem services which are vital to health and quality of life, but also to the human society as such.

<sup>1</sup> Energetic use covers raw materials used for combustion or production of food and feed.

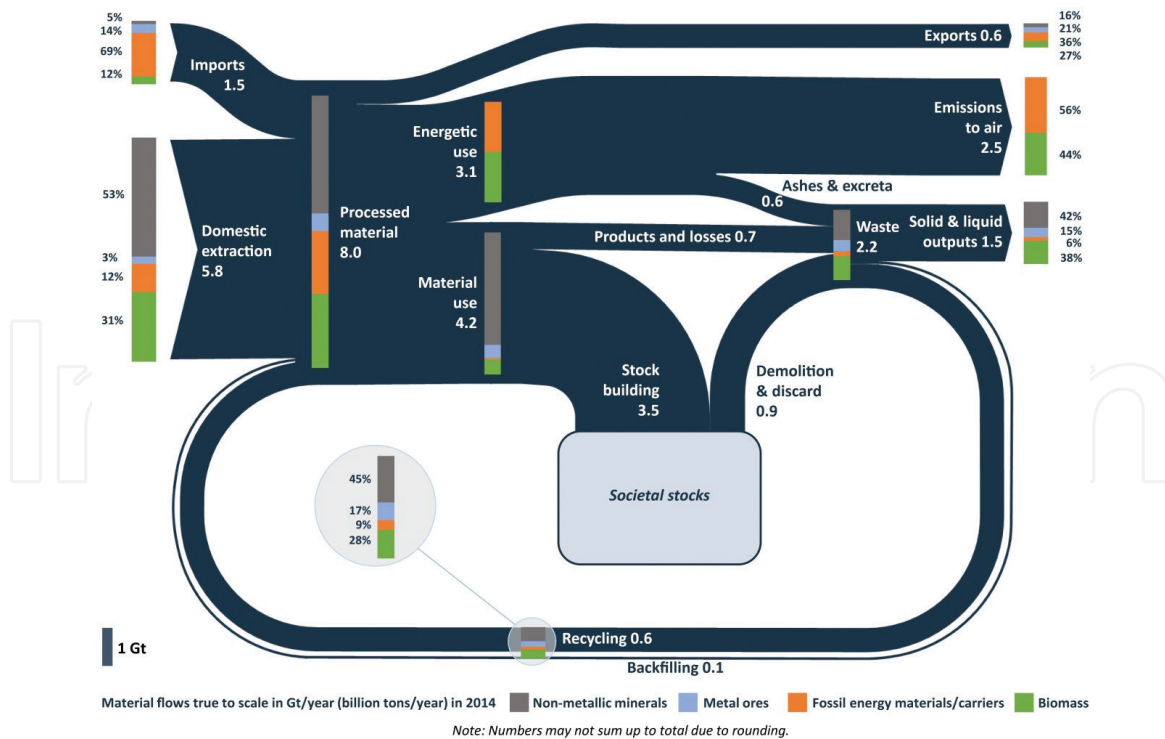


**Figure 1.**  
 From linear to circular economy. Source: [5].

In all of this Hegel appears to be providing a philosophical account of modern economic developments<sup>2</sup>. He argues the economy, especially through the division of labor, produces fragmentation and diminishment of human life and the state must not only address social problems but also provide the means for the people's political participation to further the development of social self-consciousness. Regarding to it the state must not only address this phenomenon but also provide the means for the people's political participation to further the development of social self-consciousness. Such participation could be understood as defining and introducing the objectives and means for economic development. Hegel repeats the need for strong state regulation of the economy, which if left to its own workings is blind to the needs of the social community.

Since start of Industrial revolution, the Hegelian doctrine for economic development has become more attractive in the frame of the concept for forth industrial revolution. It is because the notion the free market economy without a state does not contribute to meeting challenges such as diminishing freedom and fragmentation of social community is still correct now-a-days. Today the Hegelian doctrine is attractive also for understanding and approaching the challenges before health and life of human beings, which affect freedom and social community fragmentation also. This doctrine suggests an answer to the question how to avoid the negative effects of traditional linear economy, where raw materials are used to make a product, and after its use any waste (e.g. packaging) is thrown away. Here we are not discussing the level of which a state is able to meet such expectations.

<sup>2</sup> The core of Hegel's social and political thought are the concepts of freedom, reason, self-consciousness, and recognition. Regarding economic development, although Hegel provides a defence of modern market societies, he calls into question their corrosive effects on society as a whole. The thoughts for economic development could be find in the manuscripts entitled *Realphilosophie*, based on lectures Hegel delivered at Jena University in 1803–04 (*Realphilosophie I*) and 1805–06 (*Realphilosophie II*), and were originally published by Johannes Hoffmeister in 1932.



**Figure 2.** Material flows in the economy (EU-28, 2014). Source: [6].

It could be assumed in regard to economic development the Hegel's theory [7] respects criteria for identification of different stages of this development - the object (goal), the subject (state) and the means for achieving the goals (free market vs., or with state regulation). If this assumption is correct we could conclude the circular economy is a stage of economic development, where circularity of resources is important integral part of the goal of the economic development. The achievement the goal of circularity, understood as minimising the usage of natural resources, minimised or 0 waste needs strong state monitoring and regulation in the frame of a free market economy.

### 3. Monitoring circular economic development

Monitoring circular economy is of vital importance for the society. It will be analysed on the case of European union. The monitoring there is based on identification of main areas of appearance of circularity and defining the available indicators to measure them. This approach has allowed monitoring assessment, strategy development and policy making and implementation. As such areas of circularity appearance identified are:

- Sustainable resource management;
- Societal behaviour;
- Business operations.

The content of indicators and interpretation of their contribution to understanding of circular economy is grouped according to the areas of circularity appearance as follow [8]:

SUSTAINABLE RESOURCE MANAGEMENT - indicators examining the performance of the EU Member States in transforming their economies toward circularity

by lowering resource demands, thereby increasing resource security and lowering pressures on the environment domestically and abroad.

**SOCIETAL BEHAVIOUR** – indicators, reflecting citizen awareness, engagement and participation in the circular economy. Citizen engagement, behaviour change and social norms are integral to the success of a circular economy transition. This means that people participate in new forms of consumption (e.g. sharing, product-service systems, willingness to pay more for durability), re-use (requiring changed mindsets regarding repair and refurbishment), and disposal (separating waste streams and bringing “waste” to remanufacturing/ recycling/ sorting sites).

**BUSINESS OPERATIONS** – indicators, which depict eco-innovation activities toward changing and adapting business models according to the principles of a circular economy. Business activities and their digitalization are the engine behind the circular economy transition. They foster circularity across the life-cycle of material use, beginning with how and what materials are sourced (quality, environmental and health standards). The design stage of business operations is particularly crucial to enabling re-use /re-manufacturing / recycling and raising the durability of goods for keeping within the economy longer. Remanufacturing and recycling are key business operations critical to scaling up the circular economy.

The monitoring and assessment of circularity have become a fundament for developing vast majority of economic development policy measures.

#### **4. Circular economy development policy measures in Europe**

The transition to a more circular economy in Europe is accompanied by implementation of several specific policy measures.

In 2015 the EC adopted an action plan to accelerate Europe’s transition to a circular economy. It was aimed at strengthen global competitiveness, promote sustainable economic growth and create new jobs. This action plan contains 54 measures to “close the loop” of the life cycle of products - from production and consumption to waste management and the market for secondary raw materials. Five priority sectors to accelerate the transition along the value chain are identified: plastics, food waste, critical raw materials, construction and demolition, biomass and bio-based materials.

The strategic documents of today EU institutions include:

- A clear resource efficiency agenda;
- Roadmap to a resource efficient Europe;
- The Circular Economy package;
- Amendments to renewable energy policy that seek to address resource issues.

The transition to a circular economy is in the agenda of world fora as well. It was in the focus of discussions during the 2019 Annual Meeting in Davos. The four key priorities emerging for the year ahead identified are as follow:

- a. Leadership is critical;
- b. Leverage the potential of the Fourth Industrial Revolution;

c. Circular material value chains;

d. Collaboration is key.

Implementation of the developed visions, strategies and respective policy measures has required developing respective instruments. On the first place they concern defining appropriate indicators.

## **5. Circularity: indicators for assessing economic development policy implementation**

The literature suggests different methodologies to be applied for collecting and interpreting data for monitoring and assessing policy measures for circular economy. There are a variety of indicators applied now, although most have limitations. There are two most used indicators, predominantly applied by the OECD and G-8, more concretely those:

- for resource productivity and
- for resource efficiency.

The first indicator is measuring circularity as a ratio between GDP and domestic material consumption, in other words, it is focusing circularity on the resource use.

The second one means using the Earth's limited resources in a sustainable manner while minimising impacts on the environment. It allows interpreting the level of creating more with less and to deliver greater value with less input. Such indicator is also measured through EU resource efficiency scoreboard [9], as EU eco-innovation index recycling rates [10, 11], through the amount of municipal waste per capita, or amount of waste per GDP output.

The monitoring framework on the circular economy as set up by the European Commission consists of ten indicators, some of which are broken down in sub-indicators, selected in order to capture the main elements of a circular economy. These ten indicators are divided into four thematic areas [8]:

Production and consumption. This area comprises four indicators:

- Self-sufficiency of raw materials for production in the EU;
- Green public procurement (as an indicator for financing aspects);
- Waste generation (as an indicator for consumption aspects);
- Food waste.

Waste management. This area comprises two indicators:

- Recycling rates (the share of waste which is recycled);
- Specific waste streams (packaging waste, bio-waste, e-waste, etc.).

Secondary raw materials. This area comprises two indicators:

- Contribution of recycled materials to raw materials demand;
- Trade of recyclable raw materials between the EU Member States and with the rest of the world.

Competitiveness and innovation. This area comprises two indicators:

- Private investments, jobs and gross value added;
- Patents related to recycling and secondary raw materials as a proxy for innovation.

This European monitoring framework aims at measuring progress toward a circular economy in a way that encompasses its various dimensions at all stages of the lifecycle of resources, products and services. In this regard the monitoring framework has a set of the ten indicators (see **Table 1**), grouped into four stages and aspects of the circular economy: (1) production and consumption, (2) waste management, (3) secondary raw materials and (4) competitiveness and innovation. The logic and structure of this monitoring framework broadly follows the logic and structure of the European circular economy action plan.

Production and consumption			
1	EU self-sufficiency for raw materials	The circular economy should help to address the supply risks for raw materials, in particular critical raw materials.	Raw Materials Initiative; Resource Efficiency Roadmap
2	Green public procurement*	Public procurement accounts for a large share of consumption and can drive the circular economy.	Public Procurement Strategy; EU support schemes and voluntary criteria for green public procurement
3a-c	Waste generation	In a circular economy waste generation is minimised.	Waste Framework Directive; directives on specific waste streams; Strategy for Plastics
4	Food waste*	Discarding food has negative environmental, climate and economic impacts.	General Food Law Regulation; Waste Framework Directive; various initiatives (e.g. Platform on Food Losses and Food Waste)
Waste management			
5a-b	Overall recycling rates	Increasing recycling is part of the transition to a circular economy.	Waste Framework Directive
6a-f	Recycling rates for specific waste streams	This reflects the progress in recycling key waste streams.	Waste Framework Directive; Landfill Directive; directives on specific waste streams



Secondary raw materials			
7a-b	Contribution of recycled materials to raw materials demand	In a circular economy, secondary raw materials are commonly used to make new products.	Waste Framework Directive; Eco-design Directive; EU Ecolabel; REACH; initiative on the interface between chemicals, products and waste policies; Strategy for Plastics; quality standards for secondary raw materials
8	Trade in recyclable raw materials	Trade in recyclables reflects the importance of the internal market and global participation in the circular economy.	Internal Market policy; Waste Shipment Regulation; Trade policy
Competitiveness and innovation			
9a-c	Private investments, jobs and gross value added	This reflects the contribution of the circular economy to the creation of jobs and growth.	Investment Plan for Europe; Structural and Investment Funds; InnovFin; Circular Economy Finance Support Platform; Sustainable Finance Strategy; Green Employment Initiative; New Skills Agenda for Europe; Internal Market policy
10	Patents	Innovative technologies related to the circular economy boost the EU's global competitiveness.	Horizon 2020

*\*Indicators under development.  
Source: [8].*

**Table 1.**  
*Indicators on the circular economy included in the monitoring framework.*

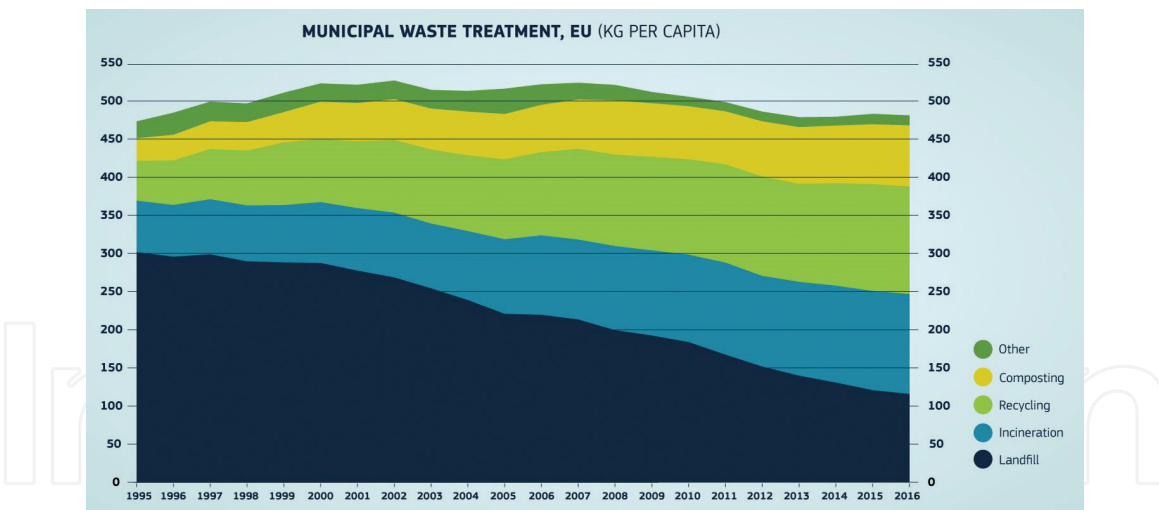
## 6. Assessment of circularity of European economic development: first findings

The analyses of data for the ten indicators of the monitoring framework provide a broad picture of increase the circularity of the EU's economy [8]. The areas of the European economic development where circularity is of importance could be characterised as follow:

*Production and consumption:* progress can be observed toward more circular trends in production and consumption e.g. in terms of waste generation; considerable room for narrowing the gap in performance between Member States and across materials. The EU is largely self-sufficient for most non-metallic minerals such as construction materials and industrial minerals; for the EU's critical raw materials [12] the EU is relying on imports to a large extent, which highlights the need for secure access and diversification of supply<sup>3</sup>. EU municipal waste<sup>4</sup> generation per capita has dropped by 8% between 2006 and 2016 to an average of 480 kg per capita per year; large

<sup>3</sup> E.g. cobalt for batteries used in electric cars, silicon for solar panels.

<sup>4</sup> Waste from households and in public spaces and similar waste from other sources.



**Figure 3.**  
*Municipal waste treatment, EU (kg per capita). Source: Eurostat.*

variations among Member States are observed (between 250 and 750 kg per capita per year)<sup>5</sup>, and municipal waste generation is still growing in several Member States.

It is positive that the data on total waste generation (including industrial and commercial waste but excluding major mineral waste) per unit of GDP shows a decrease of 11% since 2006. According to Eurostat's preliminary estimates, EU food waste decreased from 81 to 76 million tonnes (i.e. by around 7%) between 2012 and 2014, equivalent to a drop from 161 to 149 kg per capita.

*Waste management:* between 2008 and 2016, EU recycling rates for municipal waste increased from 37–46% (See: **Figure 3**). Five Member States recycle more than half of their municipal waste, while some countries are approaching the 2030 recycling target of 65% proposed by the Commission, however, five Member States are still below 25%.<sup>6</sup>

Between 2008 and 2015, the recycling rates for packaging waste also increased in the EU, from 62–66%; it increased in almost all Member States, and in 2015 almost all Member States had met the 2008 target of 55% (the Commission has proposed a target of 65% by 2025 and 75% by 2030 [12]). For plastic packaging, the average recycling rate in the EU is significantly lower, at 40%, even though there have been improvements in recent years. The recycling of municipal bio-waste in the EU was 79 kg per capita in 2016, an increase of 23% compared to 2007.

## 6.1 Secondary raw materials

In the EU, the level of demand for raw materials exceeds what could be supplied even if all waste were turned into secondary raw materials. Therefore, the supply of primary raw materials will remain necessary. On average, recycled materials only satisfy around 10% of the EU demand for materials, in spite of a steady improvement since 2004. For a number of bulk materials, secondary raw materials satisfy over 30% of total demand for materials (e.g. copper and nickel). The EU is a net exporter of several major recyclable waste streams such as plastics, paper and cardboard, iron and steel, copper, aluminium and nickel. Trade within the EU of plastics, paper and cardboard, copper, aluminium, nickel and precious metals waste

<sup>5</sup> Differences in the way Member States measure waste generation can explain some of the differences.

<sup>6</sup> Member States are using different methods to calculate recycling rates, which can explain part of the differences. The Commission has proposed a common method in its legislative proposal on waste.

increased considerably between 2004 and 2016, allowing economic operators to reap the benefits of the EU internal market for secondary raw materials [13].

## **6.2 Competitiveness and innovation**

The transition to a circular economy is accompanied by an increase of investments, value added and jobs, and stimulates innovation. In 2014, private investments in economic sectors relevant to the circular economy<sup>7</sup> are estimated to have been 0.1% of the GDP. There were more than 3.9 million jobs in these sectors, having an increase of 2.3% compared to 2012. The circular economy sectors created value added in 2014 an increase of 6.1% compared to 2012. Significant role for these achievements play EU funding programmes, available to support the transition to a circular economy, such as the European Fund for Strategic Investments, the European Structural and Investment Funds, Horizon 2020 and the LIFE programme. In January 2017 a Circular Economy Finance Support Platform was launched.

For patents on recycling and secondary raw materials, the data show an increase of 35% between 2000 and 2013. EU patents for glass recycling represent 44% of the world total for such patents, while the EU's share is 18% for plastics and 23% for paper.

Concluding the analysis of the above figures we could assume the transition to a circular economy is taking place in the European Union. For the period 2012–2014 the circular economy sectors created 3.9 mln. Jobs, contributed to the increase of 6.1% value added in 2014 (Euro 141 billion), compared to 2012, attracting private investment of Euro 15 bln. Circular economy is realised as a vital necessity and has become an important part of the strategy and of policy making of the society. Thus it has become an integral part of the goals of economic development.

## **7. Conclusions**

The chapter provides some arguments for understanding circular economy as a new stage of economic development, where the goal is to meet the challenges of tensions in globalised world, which are strongly connected to resources in limited quantities. The content of the goal is transforming, addressing not only resource productivity and efficiency, but also waste minimization, and many other areas of circularity. The analyses have shown market forces are limited and not strong enough to achieve the new goal of economic development, reflecting the needs of society, vital for its future. It was shown the Hegelian doctrine for economic development provides instruments for understanding and solving new challenges. The new instruments include state regulation and respective monitoring, analysing and drawing conclusions and recommendation, using new indicators, developed for monitoring economic processes and for new economic policies concerning achievement of the new goals of society.

The above notion is argued on the case of Europe: A new policy for a new stage of economic development focused on circularity on European level has taken place, first achievements are registered. This new policy, in Hegelian tradition, includes A state regulation, aimed at SUSTAINING economy IN ORDER TO

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<sup>7</sup> I.e. reuse and recycling activities. Renting and leasing activities can also contribute to circular economy, but are for now not included because current statistics may not distinguish with sufficient granularity those activities that clearly contribute to circular economy from those that do not. For further details, see the Staff Working Document.

CONTRIBUTE TO ACHIEVING SOCIAL GOALS - preservation of the world's resources, create local jobs and in this way to generate competitive advantages in globalised economy IN ABILITY TO COOPERATE FOR ACHIEVEMENT BETTER COMMON FUTURE.

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