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Grigoryan, A. A.; Borodavkina, N. Yu.

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ECONOMICS



THE BALTICS ON THEIR WAY TO A CIRCULAR ECONOMY

*A. A. Grigoryan*¹
*N. Yu. Borodavkina*¹



Circular economy has been studied extensively both in Europe and worldwide. It is largely viewed as a potential strategy for societal development, aimed to increase prosperity while reducing dependence on raw materials and energy. Many businesses regard circular economy as a way to enhance economic growth and increase profits. Governments across the world actively engage in the discussion about the benefits of a transition to a circular economy and about its impact on employment, economic growth, and the environment.

This paper aims to study the major issues of circular economy, to identify its advantages, and to offer an insight into the transition stage the Baltic States are undergoing today on their way to circular economy. It is stressed that the Baltic countries are not fully using the opportunities offered by a circular economy. For example, Latvia's, Lithuania's, and Estonia's recycling rates are significantly below those of other European countries. The Baltics depend heavily on EU financial support. An increase in funding will contribute to the implementation of circular economy technologies.

Key words: circular economy, recycling, and raw materials, national development strategy, sustainable development strategy

Introduction

Circular economy is believed to be a means of achieving harmony between economy and environment. Since nature and economy have been in conflict for many years, it is impossible to give priority to one without damaging the other.

If economic growth, attained through extensive consumption and production, is

¹ Immanuel Kant Baltic Federal University,
14 A. Nevski Str., Kaliningrad,
236041, Russia.

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declared to be the principal goal, valuable non-renewable sources are spent and a significant amount of waste is produced. On the other hand, the ambition to preserve environment by switching to renewable energy may threaten a number of countries that heavily depend on fossil fuels, where environmental initiatives may leave millions of people unemployed and impoverished. A commitment to environmental protection and economic development are not easily coupled, and compromises should be made. The new model questions a paradigm that counterposes the economy to the environment. Circular economy is a promise that economic growth can benefit rather than harm the environment [17].

Firstly, it is important to define *circular economy*. Circular economy is a model that functions similarly to a natural ecosystem [8]. An ecosystem does not produce waste, nor does circular economy — all materials can be reused.

The idea was formulated several decades ago, when in the 1960s Kenneth E. Boulding wrote about an ideal economy [6]. He argued that the available resources should be managed as if one was on a spaceship, without a source of fresh products or a waste storage. Circular economy was born as an amalgam of several concepts, including industrial ecology, Cradle to Cradle, the Blue Economy, biomimetics, etc [13].

The basic distinguishing characteristics of the concept are practice-orientation, changeability, scalability, and a bottom-up approach [1]. As early as the 1970s, many researchers, innovators, and companies started to support the idea of circular economy, yet until very recently it remained little more than a thought exercise. Now, circular economy is advocated by McKinsey & Co. and the World Economic Forum (WEF). Unilever, Cisco Systems, and Philips are adhering to the principles of circular economy [25]. The Ellen MacArthur Foundation — an institute established in 2010 to accelerate the transition to circular economy — identifies the following as the *key circular economy principles* [12]:

- 1) Design out waste;
- 2) Understand that everything within the economy has value;
- 3) Differentiate between consumable and durable components. Biological materials go back into nature; durable, or technological, materials stay in use for as long as possible;
- 4) Find ways to reuse materials across the value chain;
- 5) Eliminate toxic chemicals, making it easier to reuse components without risk of contamination;
- 6) Fuel the system with renewable energy;
- 7) Build resilience through diversity;
- 8) Adjust prices to reflect the true cost of the effort required to produce a product;
- 9) Design with disassembly and reuse in mind, with minimal changes required to reuse components of a product;
- 10) Think in systems, taking into account how one action will impact the whole.

1. Linear economy Vs. circular economy

Within modern linear system, producers take natural resources to manufacture a product that will be soon disposed of as waste (the take-make-dispose model). Unsustainable resource management has a negative effect on not only the environment but also producers [7]. Companies are at risk because of growing resource expenditures and delivery failures. Some companies cannot recover materials and production costs. According to McKinsey & Co., of the USD 3.2 trillion spent annually on consumer goods materials, 80% is never recovered. Circular economy, on the other hand, strives to recover capital — financial, human, social, natural, or physical. According to this model, production should be organised as a natural system, where ‘waste’ is turned into food or a source of growth for something new (fig. 1) [26].



Fig. 1. Differences between the linear and circular economy concepts

Source: [33].

There are two material flows in a circular economy — the flow of biological materials, which can go back into nature, and that of technological materials, which are reused and recycled without affecting the biosphere [9].

Nike is launching a programme that collects old shoes to transform them into treadmill surfaces. The ultimate goal of a closed loop is products of greater value — products that remain whole from creation to utilisation and that can be restored within the production system [4].

The German chemist Michael Braungart and the US architect William McDonough wrote the book *Cradle to Cradle®: Remaking the Way We Make Things*, which popularised the namesake concept. Braungart and McDonough study how companies are making a transition to the ‘cradle to cradle’ model or, in other words, a circular economy. Such brands as Puma and Aveda have certified their products as Cradle to Cradle [6].



Linear economy follows the ‘take-make-dispose’ principle. Technological and biological materials are not differentiated and energy is produced from non-renewable resources. Circular economy is based on the principle of differentiating between technological and biological materials and producing energy from renewable sources.

2. Benefits of circular economy amid globalisation

Within circular economy, producers increase their revenues per unit. Products are designed with reuse in mind, which attaches additional value to the initial production resources — labour, material, and capital. According to the Chief Executive of the Ellen MacArthur Foundation, Jamie Butterworth, ‘the circular economy is effectively a way businesses can begin to decouple future economic growth from resource constraints’. One key incentive to make the transition to circular economy is ever-increasing prices for energy products and resources [22].

Circular economy advocates stress that transition to closed loops will reduce production costs and create new jobs. According to the Ellen MacArthur Foundation, transition to circular economy in the consumer goods sector alone will save up to USD 700 billion a year [14]. A joint report by the World Economic Forum and the Ellen MacArthur Foundation concludes that circular economy can generate USD 1 trillion annually by 2025. The Foundation predicts that, within five years after such a transition, 100,000 jobs will be added by the growth of the waste utilisation and recycling industries [27].

Circular economy advocates also predict an increasing economic efficiency of the cities that were built for linear economy production (for instance, Detroit). The regional governments of Scotland, Denmark, and Belgium are creating jobs in recycling [34].

Developed over 30 years ago, the closed loop concept is gaining wide popularity today. The companies involved are guided by both practical (resource constraints, growing raw material prices) and technological considerations (new instruments to introduce circular principles). From the economic perspective, closed loops contribute to the rate of return through a reduction in raw materials and waste management costs [2]. Many countries support the idea of such a transition and people are becoming accustomed to new consumption patterns. Key reasons for the rapid development of circular economies are as follows [31]:

1. *Resource constraints.* According to McKinsey & Co., by 2030, middle class will grow by an additional 3 billion people, which will be the greatest expansion throughout history. These new consumers will continuously demand more energy, materials, food, and water. The need for resources will grow exponentially and experts are warning about possible shortages. Gold, silver, indium, iridium, and tungsten reserves may be depleted within the next 50 years. Another concern is the possible shortage of arable lands as demand for cotton and food crops will increase [3].

2. *Rapidly growing raw materials and energy costs.* Many businesses have been affected by rising raw materials prices. In 2002 — 2012, the prices went up by 150%. Energy demand is growing, especially, in new industrial countries. According to a report by the US Department of Energy, the world energy consumption will increase by 56% between 2010 and 2040 [5].

3. *Technology advances.* The emerging Internet of Things and other technological breakthroughs reveal the actual costs. RFID chips и GPS help to trace components, their lifecycle, and the materials of which they are made. This simplifies utilisation, reuse, and recycling. For instance, General Motors uses a system that traces the formation of by-products to maximise revenues from their processing [24].

4. *Urbanisation.* According to the World Health Organisation, approximately half of the world's population lives in cities. By 2030, this proportion will increase to 60% [11]. High population density encourages transition to a closed economy. City districts may become home to cost-effective systems for collecting recyclable products [29].

5. *Government pressure.* Many governments and regulatory agencies have set out to draft circular economy legislation. The European Union and Japan have already adopted strict laws regulating utilisation and waste treatment. Some American states place emphasis on fighting food waste. For instance, the state of Massachusetts, whose companies produce over a tonne of food waste a week, has introduced a ban on disposal of commercial organic waste [30].

6. *New consumption patterns.* The global economic downturn has had a strong effect on people who live by the 'buy now, think later' principle. Today, buyers are more concerned with what they buy and consume than they have ever been before. Trying to find higher-quality, durable goods, people are becoming increasingly aware of the effect of their purchases on the environment and society. They look for the ways to buy high-quality products without damaging the environment [20].

3. The Baltics' transition to circular economy

On December 2, 2015, the European Commission adopted a new *Circular Economy Package* that included revised waste initiatives. These measures are meant to accelerate the EU's transition to circular economy, increase Europe's competitiveness in the global market, contribute to economic development, and create new jobs. The package consists of an action plan embracing the whole cycle — from production and consumption to utilisation and recycling [5], benefiting both the environment and the economy.

The package sets clear waste reduction and treatment targets [10]:

- 1) recycling 65% of municipal waste by 2030;
- 2) recycling 75% of packaging waste by 2030;
- 3) reduction in landfill to maximum of 10% of municipal waste by 2030;
- 4) promotion of economic instruments to discourage landfilling;

5) simplified and improved definitions and harmonised calculation methods for recycling rates throughout the EU;

6) concrete measures to promote re-use and stimulate industrial symbiosis —turning one industry's by-product into another industry's raw material;

7) economic incentives for producers to put greener products on the market and support recovery and recycling schemes (e. g. for packaging, batteries, electric and electronic equipment, vehicles).

The EU's circular economy package was presented by the First Vice-President of the European Commission, Frans Timmermans, whose scope of responsibilities include sustainable development, and the Vice-President of the European Commission, Jyrki Katainen, responsible for jobs, economic growth, investment, and competitiveness. Frans Timmermans stressed that 'the circular economy is about reducing waste and protecting the environment, but it is also about a profound transformation of the way our entire economy works' [11]. According to Jyrki Katainen, 'the job creation potential of the circular economy is huge, and the demand for better, more efficient products and services is booming' [19].

The package has been actively discussed in the Baltics. Latvia, Lithuania, and Estonia have affirmed their commitment to making a transition to circular economy.

The Baltics indicators for circular economy fall much below the EU average. According to the 2016 Eurostat data, Lithuania recycled only 21 % of the household waste in 2014. The performance of the other Baltic States is even poorer — 14% of the household waste was recycled in Estonia and 11 % in Latvia [23]. The methodology takes into account municipal waste, i. e. that produced by households, small businesses, and public institutions.

The Baltics waste treatment performance is also below the EU average. For instance, Slovenia recycles 55 % of the household waste, Germany 47 %, Belgium and Ireland 34 % each [21]. Recycling is defined as any means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes, except use as fuel.

As to the landfills, the Baltics also lag behind. The highest shares of municipal waste landfilled were recorded in Romania (97%), Malta (88%), Croatia (85%), Latvia (83%), and Greece (81%). Waste burials are completely absent in Germany. In Lithuania, 64 % of municipal waste is landfilled. Estonia outperforms the other Baltics with only 16% of the waste landfilled and 64 % incinerated. Lithuania incinerates only 7% of the waste and Latvia does not do it at all [3]. Frans Timmermans stressed that the European Commission supported recycling rather than incineration. However, if recycling is impossible, incineration is preferable to burial [9].

3.1. Latvia

In Latvia, the responsibility for developing and implementing a circular economy policy is shared between several agencies — the Ministry of Economy, the Ministry of Education and Science, and the Ministry of Environ-

mental Protection. The measures to develop the environmental industry are rather fragmentary. Moreover, most studies into the environmental and circular economy policies are financed only from the European structural funds.

Major national policy documents recognise the importance of ecosystem services and the transition to green economy. Latvian strategy for sustainable development until 2030 identifies ‘nature as the future capital’ as a priority. In the national development plan for 2014 — 2020, key priorities — economic growth, energy efficiency, growth-oriented energy production, spatial development, and sustainable nature and culture management — incorporate sustainable development components [3]. Unfortunately, Latvia does not have mechanisms to solve the problems of sustainable development today.

Targeted governmental strategies and plans to popularise closed loop principles are at a very early stage of development. The declaration adopted by Latvia’s new government in February 2016 identifies the following priorities [18]:

- 1) develop a lucrative and comprehensive waste management system to unlock the circular economy potential;
- 2) implement a plan for the use of alternative energy sources and encourage the use of alternative fuel vehicles across Latvia;
- 3) develop a bioeconomy strategy and auxiliary mechanisms to forge connections between traditional industries — agriculture, forestry, pharmaceuticals, construction, energy, and ICT.

3.2. Lithuania

Lithuania’s legal framework for closed economy is emerging. In 2016, Lithuania’s Ministry of Environment affirmed its commitment to the EU circular economy measures. However, the country’s government is taking the very first steps in that direction [9]. In 2015, Lithuania adopted a new development strategy. Its priorities include the transition to circular economy. It is planned to use alternative fuels to increase energy efficiency, to revise the utilisation and recycling policy, and to ensure the sustainability of production cycles [15].

The following documents have affected Lithuania’s transition to circular economy:

- Lithuania’s Law on Waste Management (1998) — the principal law regulating waste management, including recycling;
- Lithuania’s Law on the Management of Packaging (2001), which contains information on packaging utilisation and on the responsibilities of waste treatment organisations;
- National Waste Management Plan for 2014—2020 (2014), which stresses the need to increase the efficiency of waste utilisation.

The Lithuanian government encourages innovations and the use of renewable resources. The country is committed to environmental pollution

control, waste management, and solving relevant economic and environmental problems. The plans of the Lithuanian government have been reconciled with the EU policies and the EC normative acts.

3.3. Estonia

Estonia's national waste management plan for 2014—2020, adopted by the Ministry of the Environment in 2013, describes a gradual transition to circular economy and lays down waste hierarchy principles. The Ministry's plan encourages reuse and recycling. Waste reuse is one of the plan's three strategic goals. Key objectives include the optimisation of waste collection, assistance to companies committed to waste reuse, and raising waste reuse awareness [28].

Shale extraction accounts for almost 80% of Estonia's waste. This attaches major significance to waste management initiatives.

Estonia's shale oil extraction plan for 2016—2013 is a strategy that embraces effective extraction techniques and a reduction in the impact on the environment. The plan lists techniques for reusing shale extraction waste. However, these techniques require a thorough study [12].

In 2014, Estonia's government reconciled the national policy with the EU requirements. The national document fully complies with the European Commissions' circular economy plan adopted in 2015. The policy stressed the need for new resource efficiency initiatives. The circular economy was a focus of the conference held by the Waste Management Association in Estonia in 2016 [6]. However, no political initiatives have been launched so far.

Conclusions

Although the idea of circular economy is not new, its growing popularity is explained by rising raw materials prices, resource constraints, relevant governmental measures, technological advances, and changing consumption patterns [16].

The Governments of Latvia, Lithuania, and Estonia support circular economy. This is reflected in national economic strategies. Although a full transition to a circular economy is a complicated process, many Baltic companies across industries are reinventing production and sales mechanisms to attain a circular economy. Such mechanisms include leasing instead of purchasing durables, a search for the ways to extend product life cycles, and waste management.

Circular economy is an entirely new business model, which requires a revision of absolutely everything from production to customer relations. This model is the best way to increase companies' competitiveness and contribute to the development of the society.

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The authors

Anet A. Grigoryan, PhD student, Center for Analysis and Strategic Planning, Immanuel Kant Baltic Federal University, Russia.

E-mail: AAGrigoryan@kantiana.ru

Dr Natalia Yu. Borodavkina, Associate Professor, Director of the Center for Analysis and Strategic Planning, Immanuel Kant Baltic Federal University, Russia.

E-mail: NBorodavkina@kantiana.ru

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