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ASSOCIAÇÃO DE POLITÉCNICOS DO NORTE (APNOR)

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Why circular instead of linear economy? Implementing a circular economy in Montenegro based on examples from Portugal

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Abstract

The work represents the overall understanding of new trends in the economy, influenced by the informatics revolution, new ways of thinking, and operating of economy and society. The circular economy can help modern society evaluate and develop digitalisation, environmental awareness, and social responsibility. The traditional (linear) economy highlights consumption and production, without carrying about the waste of products. The main goal of a traditional economy is to maximize profit without concern about what will be with the used product.

Today things are a bit different, circular economy presents a new way of design, technology, innovation, and product and operating overall businesses. The circular economy focuses on resources, creation, and the period after consumption. In that way, there is not a lot of waste, and even used products can have some other usage.

Environmental economics focuses on microeconomics, how and why people make decisions that affect the natural environment. The main objective of this research is to discuss how economic institutions and policies can be changed to bring these environmental impacts more into balance with human desires and the ecosystem's needs. Work pointed out the potential solutions, changes and progress areas.

In one section of the work, there is a mention of the situation in Portugal and their approach to implementing a circular economy, the new normal. This work includes a comparison analysis of two countries and practical examples from Portugal.

Providing research in Montenegro, the work consists of real-life results that express the current situation in the Montenegrin industry. The findings indicate that the industry is eager to begin the transition, and one possible solution is presented as recycling in Montenegro, transitioning from a linear to a circular economy is one way to begin implementing in Montenegro. The primary reason why recycling is the solution is familiarity. Many of the companies studied indicated a willingness to begin the transition process through recycling. This will eventually lead to other activities that support sustainability, such as digitalization, new manufacturing methods, and so on.

Keywords: Circular economy, Linear economy, Sustainable, Innovation, Development, Environment, Implementing.

Resumo

O trabalho representa a compreensão global das novas tendências da economia, influenciadas pela revolução informática, novas formas de pensar, e funcionamento da economia e da sociedade. A economia circular pode ajudar a sociedade moderna a avaliar e desenvolver, no sentido da digitalização, consciência ambiental, e responsabilidade social. A economia tradicional (linear) realça o consumo e a produção, sem transportar o desperdício de produtos. O principal objectivo de uma economia tradicional é maximizar o lucro sem se preocupar o que acontecerá ao produto usado.

Hoje em dia a economia circular apresenta uma nova forma de concepção, tecnologia, inovação, produto e funcionamento geral das empresas. A economia circular dá atenção aos recursos, à criação, e ao período após o consumo. Desta forma, não há muito desperdício, e mesmo os produtos usados podem ter alguma outra utilização.

A economia ambiental centra-se na microeconomia, como e porquê as pessoas tomam decisões que afectam o ambiente natural. A presente investigação tem como objetivo principal discutir como as instituições e políticas económicas podem ser alteradas para equilibrar melhor estes impactos ambientais com os desejos humanos e as necessidades do próprio ecossistema. O trabalho apontará as potenciais soluções, mudanças e área de progresso.

Numa secção do trabalho, há uma menção à situação em Portugal e à sua abordagem à implementação da economia circular, a nova normal. Este trabalho inclui uma análise comparativa de dois países, bem como exemplos práticos de Portugal.

Fornecendo investigação no Montenegro, o trabalho consiste em resultados da vida real que expressam a situação actual na indústria montenegrina. Os resultados indicam que a indústria está ansiosa por iniciar a transição, e uma solução possível é apresentada como reciclagem no Montenegro, a transição de uma economia linear para uma economia circular é uma forma de começar a implementar no Montenegro. A principal razão pela qual a reciclagem é a solução é a familiaridade. Muitas das empresas estudadas manifestaram vontade de iniciar o processo de transição através da reciclagem. Isto acabará por conduzir a outras actividades que apoiam a sustentabilidade, tais como a digitalização, novos métodos de fabrico, e assim por diante.

Palavras-chave: Economia Circular, Economia Linear, Sustentável, Inovação, Desenvolvimento, Ambiente, Implementação.

Abstrakt

Rad predstavlja opšte razumevanje novih trendova u privredi, pod uticajem informatičke revolucije, novih načina razmišljanja i delovanja privrede i društva. Osnovna hipoteza rada je da cirkularna ekonomija može pomoći savremenom društvu da proceni i razvije, u smislu digitalizacije, ekološke svesti i društvene odgovornosti. Tradicionalna (linearna) ekonomija naglašava potrošnju i proizvodnju, bez nošenja otpada od proizvoda. Glavni cilj tradicionalne ekonomije je maksimiziranje profita bez brige o tome šta će biti sa korišćenim proizvodom.

Danas su stvari malo drugačije, cirkularna ekonomija predstavlja novi način dizajna, tehnologije, inovacija, proizvoda i poslovanja celokupnog poslovanja. Cirkularna ekonomija obraća pažnju na resurse, stvaranje i period nakon potrošnje. Na taj način nema mnogo otpada, a i korišćeni proizvodi mogu imati neku drugu upotrebu.

Ekonomija životne sredine se fokusira na mikroekonomiju, kako i zašto ljudi donose odluke koje utiču na prirodno okruženje. Rad će razgovarati o tome kako se ekonomske institucije i politike mogu promeniti kako bi se ovi uticaji na životnu sredinu doveli u ravnotežu sa ljudskim željama i potrebama samog ekosistema. Rad je ukazao na potencijalna rešenja, promene i oblast napretka.

U jednom delu rada pominje se situacija u Portugalu i njihov pristup implementaciji cirkularne ekonomije, nove normalnosti. Ovaj rad obuhvata uporednu analizu dve zemlje, kao i praktične primere iz Portugala.

Sprovodeći istraživanje u Crnoj Gori, rad se sastoji od realnih rezultata koji izražavaju trenutno stanje u crnogorskoj industriji. Rezultati ukazuju na to da je privreda željna da započne tranziciju, a jedno moguće rješenje je predstavljeno kao reciklaža u Crnoj Gori, a prelazak sa linearne na cirkularnu ekonomiju je jedan od načina za početak implementacije u Crnoj Gori. Primarni razlog zašto je reciklaža rešenje je poznavanje. Mnoge od kompanija koje su proučavane pokazale su spremnost da započnu proces tranzicije kroz reciklažu. Ovo će na kraju dovesti do drugih aktivnosti koje podržavaju održivost, kao što su digitalizacija, nove proizvodne metode itd.

Ključne riječi: Cirkularna ekonomija, Linearna ekonomija, Održivost, Inovacije, Razvoj, Životna sredina, Implementacija.

To mom and dad.

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Studying in Portugal in the past 10 months was a bit challenging sometimes, but I think it was the perfect finish to my 5 years of studies. It taught me a lot, to be independent and brave, face all my fears and handle current life situations. Under the International Credit Mobility programme, this ERASMUS experience taught me that nothing is impossible, that every situation has a solution and that only if you are brave enough will you find a way.

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Acronyms

CE: Circular economy

EU: European Union

GDP: Gross domestic product

IoT: Internet of things

PERSU: Plano Estratégico para os Resíduos Urbanos

PNRG: Perfil de PrimeEnergy

R&D: Research and Development

SMEs: Small and medium enterprises

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Introduction

The economy is the main driver of society, back in the day trade was the first thing that separated society and made crucial changes in society. Economic activities through time have changed a lot and how people do it has changed. Putting a lot of pressure on natural resources during history has affected finding a new better way of handling economic activities, a circular way. A circular economy presents a way of minor pressure on resources, a more sustainable and responsible way of managing activities and manufacturing outputs for society. It doesn't mean that the traditional (linear) way of a functioning economy is bad it is just a warning that it is time for a new, innovative way of managing the economy.

Because of its uncertainty and not fully explored discipline, the circular economy leaves enough space for people to explore, find and come up with innovations, more efficient ways of doing economic activities, and so on.

Furthermore, in this research will discuss the advantages and disadvantages of a new trend in the economy, its approach and its realistic view in two completely different countries. And the results of the research will be compared and possible solutions will be given. This research will probably impact on future research on this specific topic and will lead to other conclusions and projects.

The framework and research methodology of this work is to answer the study's main objective and the research hypotheses, the study, the work will be followed into 4 parts. A brief introduction will allow the reader to know the basic topics of this work, the main topic. The first part is about the traditional (linear) economy, economy through time, and the impact of other parties that affected its development. After that, the second part will have a word about a new trend, circular economy, its vision, principles, and main goals. The work will focus on introducing the circular economy to its readers in this part. The third and the fourth parts will discuss strategic plans for implementing a circular economy in Portugal and then Montenegro. Keeping in mind that Portugal is already a circular economy familiar and in a specific number of companies already implemented, the work will make the comparison between these two countries and try to emphasise possible progress areas in Montenegro's economy.

The research methodology used for making this work relies on statistical research based on data from both countries' societies, case studies of many foundations, and statistical institutions of both countries. Obtained data in research will make it easier to come up with conclusions, questions, and future work. Using statistical technics and tests, conclusions will be supported with good arguments and fruitful background for other research of this type.

The purpose of this work aims to inspire, show and propose possible solutions and ways of managing economic activities nowadays. This work represents overall knowledge of historic changes in the

economy with an innovative way of thinking for improvement, development, and successful solution for the greater good.

The economy greatly impacts the environment and life on planet Earth. So the way of doing business will define the way of lifestyle of many people. Doing business as usual, in the traditional (linear) way, where the line is followed by sources-production-consumption, will impact on lack of natural resources and huge waste, which will destroy the environment of the Earth.

The circular economy gives space to entrepreneurs, people that are willing to take risks to invent and improve the current situation in society. The circularity, the circular way of thinking, can impact an entrepreneur's imagination, on his imagination and courage to use any opportunity given. The circular economy will open many new jobs and workplaces and define different work environments. Of course, there will be some disadvantages, but with an imaginative and innovative mind, everything can be handled and managed using economic subjects.

The research on this topic begins with the main hypothesis that a circular economy can lead a country to progress.

The circular economy can help young, and innovative people find better and new jobs. Implementing a circular way of thinking means embracing changes, uncertainty, and new challenges and being brave enough to accept them.

To address the main objective of this study, it is divided into four sections after this introduction. Thus, section one will address the topics such as traditional (linear) economy, then circular economy, which follows two topics about current situation with circular economy in Portugal and Montenegro.

The point of providing a reader with a timeline of economic progress in the beginning is to understand the meaning of all changes and evolution in economy. The second section contains additional information about the new global trend of circular economy, including its principles, vision, mission, tasks, goals, and objectives. The third section, which also covers theory, is concerned with Portugal and their strategic plan for transition, change, and implementation of the circular economy. This section depicts the work, how it should be done, and how to begin implementing changes. Finally, the final section is dedicated to the research of this work, and it follows the story of the current state of the circular economy in Montenegro. Regarding the research findings, the section provides possible solutions and areas of progress for Montenegro to implement more sustainable solutions.

1. Traditional (linear) economy

In this chapter of work, there will be more words about current and past events that define the economy nowadays. In this chapter, the reader will get the chance to understand the evolution process that the economy has been through.

Following the time training and the importance of process and time, it's needed for change, and this would be a great start, introducing the current and future changes.

1.1. Economy through time

The economy as a science is very late defined at, the end of the 19th century. But, it existed millions of years ago.

The first appearance of the economy was through trade, goods for goods. Society was divided into agriculture and hunters, exchanging goods and services between them.

Then with the increased needs and travelling and exploring new places on Earth, people discovered the atmospheric engine in Britain, also known as the industrial revolution. The industrial revolution changed the current way of living and doing business as usual. It improved, changed, and made things easier and better for the workers.

After seeing that improvement, people became curious, so they continued to explore to improve the situation in which they were. Time passed but the informatics revolution came, with the computers appearing. Especially this revolution changed the way of thinking about economic actors. With the first appearance of computers, technology started to grow, rapidly.

These changes affected economic actors to change their point of view, their way of doing things, and their behaviour on the market. The economy was adapting to these changes and has changed its orientation over time. From a product/service-oriented economy to a customer-oriented, then also a human-oriented economy it can come to a technology-oriented economy.

Passing all these stages, the economy changed the initial way of doing business and functioning by itself. So with the current trend and development of technology, it is the right time to change and improve the present situation. And preciseness development of technology will make possible the circular economy, be a common way of functioning business, and will affect other people's awareness and social responsibility.

1.2. Impact of informatic revolution on the development of economy

The main goal of this part of the work is to describe closely the effect of the informatic revolution on the economy, as a whole. New developments to the technology completely changed the way of functioning business as usual.

Figure 1 presents the annual growth of GDP from 1960-to 2020. As is visible on the graphic, the years such as 1975, 1980, 2008, and 2019 are followed by a huge decrease in the GDP. The reasons for that are the consequences of the oil crisis, big inflation, economic crisis, and the COVID19 virus.

But except for these specific years, it is clear that the world's economy has developed with the development of informatics. The information age has made business easier, faster, and more efficient. The advantages that the informatic revolution gave to the economy are speed and spread of information, increased global economy, it provided the market without limits.

With this development, the world has become a global village, one market. With this change, the market has become virtual, and the geographic distance became no more problem for enterprises. Companies at that point could sell their product or services, all over the world, without being physically present with their customers.

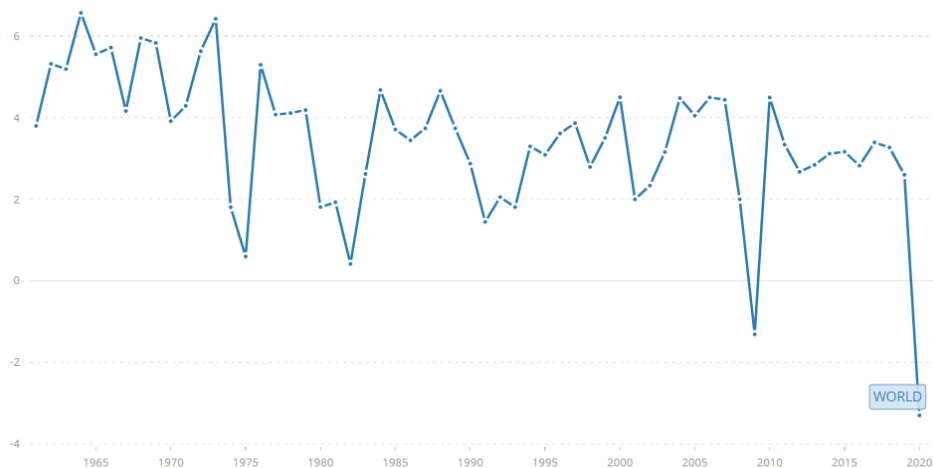


Figure 1: GDP annual growth in percentage (1960-2020).

Source: World Bank Data (2022).

Himmelweit, Simonetti, and Trigg (2001, p. 415) state that “technology development can be presented in two ways, depending on if innovation represents a new product or a new process of production. Innovation of products is equivalent to creating a new product with a completely new production process. The innovation process of production is a change of relation between inputs and outputs in an already

existing process of production; when the innovative process of production is aligned to the company, the company will produce more outputs (but never the same quantity as before)”.

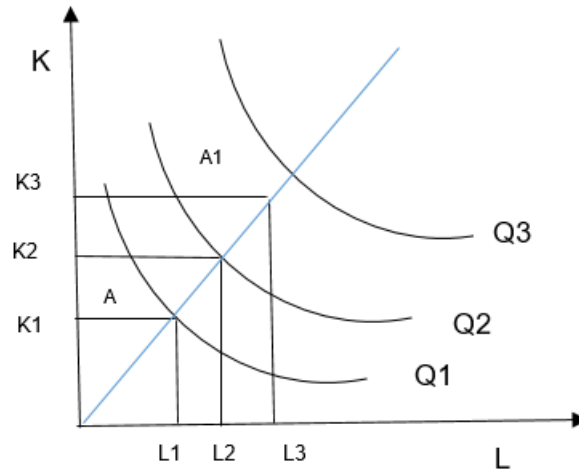


Figure 2: Increasing manufacturing due to the development of technology.

Source: Himmelweit, Simonetti and Trigg (2001, p. 419).

Figure 2 represents the quantity of production increases with the developed process of production. The capital in the economy represents labour, technology, and capital (money). Implementing new technology in production decreases the quantity of labour and increases the production speed. It means that process of production is faster and needs less physical work. That specific change represents before and after implementing the innovation of technology in production. So point A is production without technological innovations, and point A1 is the developed production. Development in technology will affect and increase the quantity and make the production process easier.

1.3. Transition of waste management from linear to the circular economy

“Technological tools enable smart management of communal waste through effective division into stream fractions which consequently allows for separation of the material for recycling and reuse management of the fraction obtained from mechanical-biological waste treatment and first minimising the amount of non-productively stored waste. Knowledge about the chemical composition of packaging getting into the waste stream tightens the process of precise selection” (Sztangret, 2020, p. 2).

Linear economy, traditional economy, is based on resources–production-consumption (take-make-dispose). After consumption, the lifecycle of products is over, and their waste is somewhere in the environment. Business as usual doesn't care about that, for the ages they thought that is not their concern. But with functioning businesses like this, there is huge pressure on natural resources and a huge waste on the other side. So with years of functioning businesses like this, it was time for a change.

The linear economy has led the world to 65 billion tons of resources extracted every year, and only 7% of that was recycled.

Therefore, with possible threats to the global environment, the world's economy should make some changes that would reduce pressure on nature and its sources, and reduce the waste that is useless and ruining the natural habitat.

“The new model of economic growth must satisfy two criteria: firstly to find a qualitatively new direction of growth, and secondly, to ensure the preservation and improvement of the quality of the environment for human life, that is to ensure new economic growth without negative consequences for the environment” (Murtazova & Ibragimova, 2021, p. 1).

The new model in the economy encouraged people to find another way of dealing with economic activities and challenges. It was based on principles of a new, green economy.

The green economy is all about opportunity cost, and it refers to the alternative used as a source instead of putting a lot of pressure on natural resources. Following that, the next important steps are decision-making and the process of choice, which managers should do wisely and efficient in the interest of a company.

The government regulations also affected economic subjects to pay more attention to the new model of an economy, a green economy. “The polluter pays principle. This principle was first formulated in 1972 by the Organization for Economic Cooperation and Development, which included Italy, France, and Germany. In 1987, this principle was included in the text of the Rome Treaty establishing the European Economic Community. In 1992, the principle was included in the Declaration of the II World Conference on Environment and Development” (Murtazova & Ibragimova, 2021, p. 4).

1.4. How does it work? The consequences of the linear economy transition

The traditional way of doing business has revealed many loopholes and missing points, indicating that it needs to be updated with new trends and new ways of doing business.

The shift from a linear to a circular economy should be accomplished in small steps. With that in mind, it could be argued that beginning with waste management is a good place to start when transitioning.

First and foremost, waste management should be divided into sections, such as:

- Wasted resources;
- Wasted capacity;
- Wasted lifecycles;
- Wasted embedded value.

According to Lacy, Long and Spindler (2020), five business models could promote more circular waste management. Those models could help and support the transition from the linear (traditional) “take-make-dispose” model to a circular way of approach to production and consumption.

Three of them are more concerned with production – circular inputs, product use extension, and resource recovery – while the other two are concerned with consumption and the relationship between the product and the consumer – sharing platforms and product as service.

The first business model is Circular inputs.

This business model, which promotes circularity within supply chains, is the most widely used in the industry. To implement this model, a company should replace "linear" resources with the circular alternative. In order to implement this business model in the short term, the company must identify, prioritise, and implement production input substitution. In the long run, the company's goal is to close and dematerialize resource loops completely.

One method for implementing this business model in a company is:

- Renewable resources: rainwater harvesting or desalination processes, wind and solar energy, hydrogen fuel produced from excess renewable energy;
- Renewable bio-based materials: bioplastics and microbial agrochemical solutions derived from living objects' chemistry;
- Renewable man-made materials: engineered materials based on non-organic chemistry that can be recycled indefinitely without losing significant quality or psychological properties.

Renewable energy and material innovation are two practical examples of this business model.

Renewable energy is the fastest-growing energy source; activities supported by this initiative include construction and zero-energy buildings as part of long-term energy strategies.

Material Innovation is concerned with resource scarcity and innovation involving material passports. A passport will contain information about materials throughout their lifecycle, facilitating recovery at the end of their useful life.

The second business model is Sharing platforms.

This model allows owners to make the most of their assets while creating a community and providing customers with affordable and convenient access to products and services. This business model is more popular among start-ups, which are proliferating across a wide range of industries, from fashion and accessories to shared workspaces, tools, and machinery, with many examples in the business-to-business sector (B2B). Platforms for renting cars, such as Airbnb, are examples of this business model..

The third business model is Product as a Service.

One or more customers use products under this model via a lease or pay-for-use arrangement. This business model is based on shifting the emphasis away from volume and toward performance. It assumes that companies can add value to their products by cultivating long-term customer relationships, selling additional services (cross-selling or upselling), monetizing usage data, or extracting material value at the end-of-life stage.

The fourth business model is Product Use Extension.

Unlike the other business models, this one is primarily concerned with the product and its lifecycle. The primary goal of this model is for the product to be repaired, reconditioned, and updated in order to extend its use or to be given a second life in a used product marketplace. On the other hand, this business model represents an extension of a company's capabilities or market channels, potentially resulting in a new revenue stream.

The last business model is Resource Recovery.

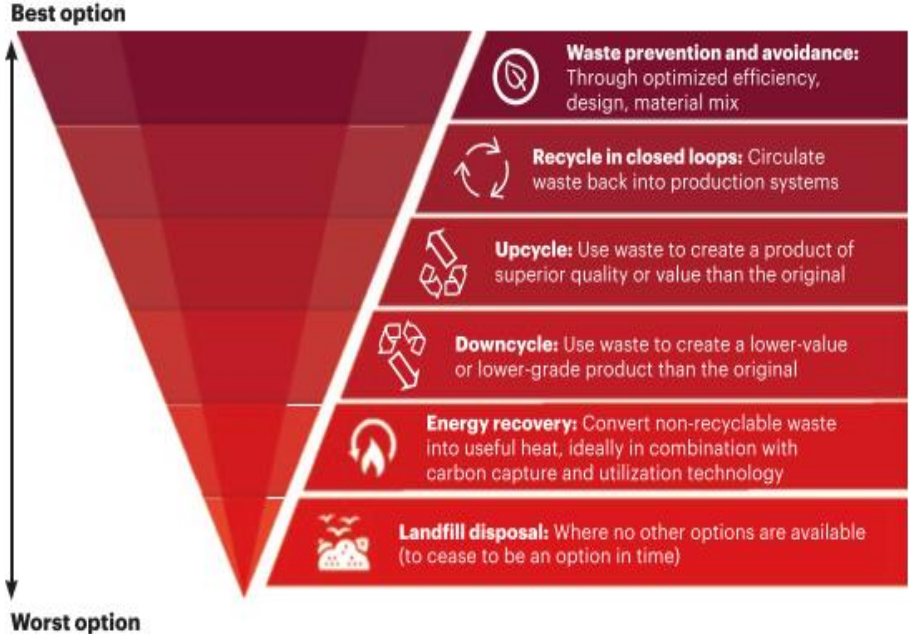


Figure 3: Hierarchy of waste from a circular point of view.

Source: Lacy, Long, and Spindler (2020, p. 29).

This is the most widely used model. It focuses on the value chain's final stages, specifically the recovery of materials and resources from products that are no longer functional in their current application. Instead of putting away the used materials, this business model promotes recycling and re-using materials as a

secondary material for another product. This way, waste management is used more efficiently, and the environmental damage is reduced.

A “greening” economy has emerged and become mainstream.

The company could try to replace the linear (traditional) way of managing a business by selecting one of the mentioned business models. By implementing this type of business leadership, the company demonstrates a positive intention to change, promote, and work on the social responsibility of environmental stewardship.

The circular economy represents a new way of doing things, not just in the economy, but in other industries as well. Starting a change is difficult, but there are many options. Leading more efficient waste management could assist in changing and improving the quality of products or services that a company provides to a market.

2. Circular economy

This part of the work will present a circular economy, its main principles, vision, so far work that has been done, and possible future changes.

The circular economy is an innovative way of handling business as usual, and it should be a common way of functioning business nowadays. It takes care of the environment and society and allows finding better, more ecological ways of running the business.

Besides that, a circular economy can affect increasing job opportunities and chances, opening new ways, unknown job positions, and so on. Every economic subject must be familiar with its principles, goals, and vision, so they could also impact increasing and promoting it.

2.1. Main ideas and vision of CE

The basic concept of the circular economy is based on the premise that location and circularisation of material and energy flow help to keep the use of natural resources in a state stable.

So sustainable development represents the foundation of the circular economy.

The concept of sustainability is based on and operationalised from its three dimensions – environment, society, and economy, also known as a Triple bottom line.

The circular economy can help and promote sustainability, finding appropriate instruments to handle all three dimensions of sustainability.

The whole circularity approach is precisely the direction of travel for improved sustainability performance. So based on that, the circular economy is focused on a few principles, such as:

- design out waste;
- build resilience through diversity;
- rely on energy from renewable sources;
- think in “systems”;
- waste is food.

The beginning of a new Millenium marks the turning point when real prices of natural resources began to surge upwards. Therefore rapidly people understood that traditional patterns lead to scarcity, volatility and pricing level, risk, and supply disruptions.

So it was time for a change, improvement, and development of how business was functioning. The circular economy has a vision of designing products that are easy to reuse, disassembly and

refurbishment or recycle. A circular economy takes labour as a central role in business functioning, in that way, it impacts less pressure on natural resources, and the environment.

A circular economy addresses monitoring resource-related challenges for businesses and economies and could generate growth, create jobs and reduce environmental impacts, including carbon emissions. A circular economy should be understood as a business model instead of a way of nowadays functioning businesses and small and medium enterprises. That will promote an innovative way of thinking, thinking outside the box, with different and brave ideas that could change the way of current world's economy functions.

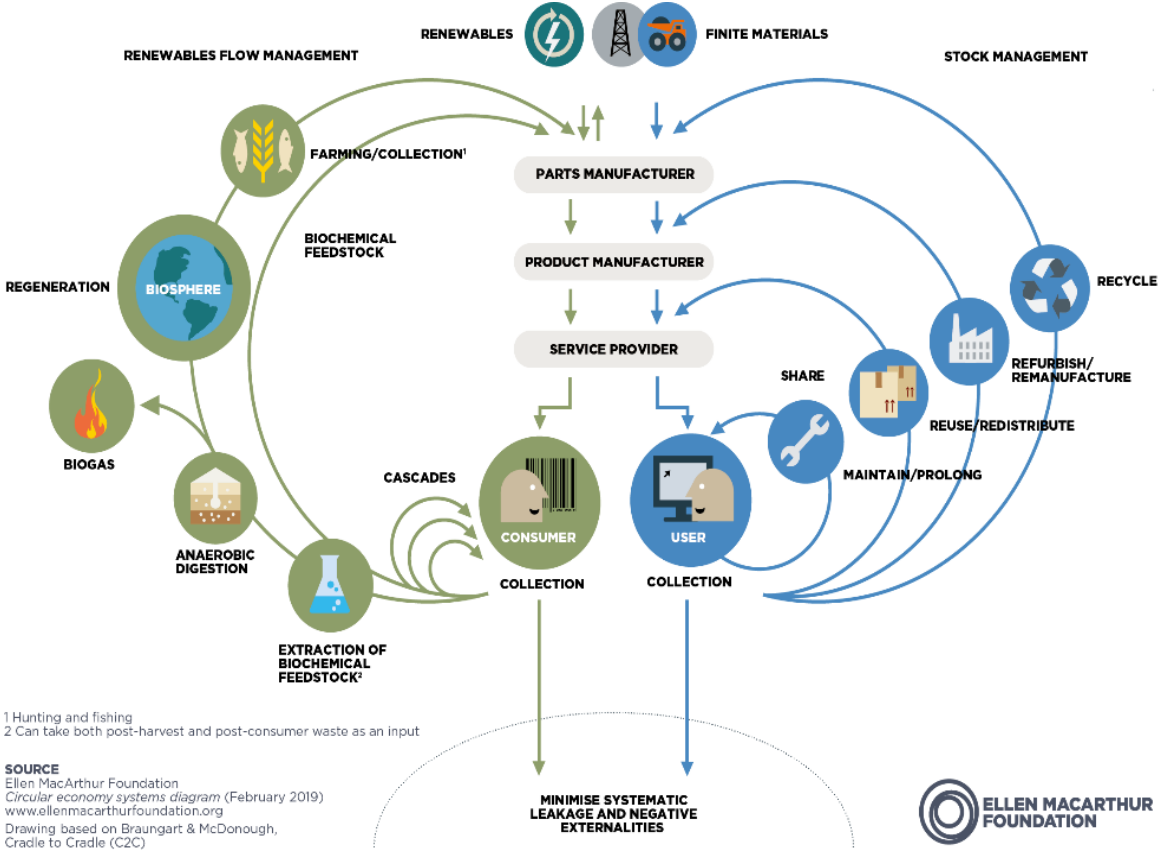


Figure 4: The butterfly diagram: visualising circular economy.

Source: Ellen MacArthur Foundation (2022).

2.2. Impact of CE on the world's economy

The goal of CE is a smarter, more efficient way of using natural sources through reuse, and recovery schemes, by reducing the energy, health, and environmental impact of extracting and processing.

This represents an opportunity that could and should change the world's economy. And following the roadmap towards 2025, it can come true.

The first step of the roadmap towards 2025 is (1) the pioneering phase – this step is consisted of accepting ideas, and acknowledging them as a way of regular thinking, then (2) companies will build core competencies in circular design – this step indicates the will of implementing CE in companies, (3) companies will drive business model innovation – CE becomes more and more common, starts to replace the traditional (linear) way of functioning business. In the final step (4) pioneering companies will create the capacities for a reverse cycle.

This roadmap can help society to come up with sustainable and possible solutions. For example, after accepting the main ideas of a circular economy, companies will try and put an effort into coming up with the most creative and innovative way of designing their product, so they can also participate in the circularity of the economy. That will lead them to education, training, and workshops promoting CE and a sustainable economy. Of course, on the other hand, it will also impact several start-ups and entrepreneurship ideas that will come to the market. And in the end, following the roadmap and providing a sustainable international set of environmental rules, will help the world's economy to find the proper new path to emerging new markets, jobs, and business models.

So how do economies win by implementing CE? Job creation, economic growth, substantial net material cost savings, instigation of price volatility and supply risks, growth multiplier due to sectoral shift, possible employment, reduced externalities, and lasting benefits for a more resilient economy.

And how do companies win? New profit pool potential in the reverse value cycles, collection, and reverse logistics, product marketers and sales platforms, material recycling systems, financing, integration of strategic challenges to build resiliency and competitive advantage, reducing material bills and warranty risks, improved customer interaction, and loyalty, less product complexity, and more manageable life cycles, and innovation boost due to system redesign/rethinking.

To summarise, CE gives many opportunities for companies, economic subjects, and economies, on the whole. Those opportunities are given through many varieties, which all lead to a better and more sustainable future. Changing one company in the system will make a difference. So implementing step by step, the world's economy could be changed, and a new circular business can replace a current business as usual.

2.3. Circular vs linear economy

A traditional (linear) model based on take-make-dispose is putting more and more pressure on natural resources and the environment. Precisely because of that, there are a lot of negative impacts and visible signs that this economy can not continue to exist or function.

In the following lines, there should be some more words about it. One of the first bad effects of a linear economy is economic losses and structural waste; putting more pressure on the sources could cause the scarcity and lack of sources, which can lead later to a difficult process of production and more expensive inputs.

That leads to price risks, economic losses, products, and services are being more volatile and the risk of unstable prices is higher and higher.

Another bad effect is also supply risks, as it is said, the supply of materials is also suffering because of pressure and scarcity of materials. Traditional (linear) business models use and take a maximum of materials, creating a lot of waste. Without considering and considering the quantity of materials and the needed time for making and creating new materials, and inputs.

The other bad effects are natural systems degradation, and regulatory trends, which can be a real problem if the economy continues to push the environment to the limits where it will be overwhelming.

So all the bad effects that have been listed, are the consequence of many years of the linear economy and that way of functioning economies. Because of that, it is needed to change and bring advanced technology, acceptance of alternative business models, and urbanisation.

With implementing a circular economy in society, the changes are natural to come. The circular economy is putting labour in the central role of one economy. It puts all the efforts to reduce the pressure on sources, replacing it with real physical work, and labour.

The circular economy will replace the linear economy with time, it will be needed to take some time to replace be done in steps. The first step to a circular economy is the transition scenario when the producer changes the design of a product and reverses supply chain skills. Usually, this step is hard to make and needs a lot of time and innovative ideas to do it. In this process of transition is most important to give up the old (traditional) way of production and obtain new, innovative ways of designing the product. The new design should be done according to sustainable progress and circular economy regulations. The new product design should promote and highlight the importance of reusable materials, recycling, and the secondary use of waste.

After that, the next step consists of advanced processes, which are developed new technologies, infrastructures, and other enabling conditions, such as customer acceptance, cross-chain, and cross-sector collaboration, led by legal frameworks.

To sum up, replacing a linear economy is hard and it needs a lot of steps to implement a circular economy, also it needs even more time for a circular to be accepted as a linear economy. But it starts with the transition process, which relies on skills in circular product design and production, which lead to new business models and skills in building reverse cycles and cascade.

The circular economy is based on three principles:

- 1) The Presentation and Strengthening of Natural capital – wherever allocation of resources is necessary, a circular economy uses different advanced technologies that can use renewable resources or high environmental performance;

- 2) The Optimisation of resources through the circulation of products – biobased materials and sources are put on the first plan, so there will be less pressure on the others, that can be reused after consumption;
- 3) The Promotion of System Efficiency is reflected in identifying negative externalities and respective exclusion of projects – it is obligatory to identify all the negative externalities and find the most efficient way based on circularity to solve them in new applied business models.

2.4. Innovation and environmental economics

The 2030 United Nations Agenda for Sustainable Development includes 17 goals. Standard will require a full review of linear models of production and consumption, in favour of a circular system, a system restorative or regenerative in which all products are designed and marketed with reuse, remanufacture, or recycling counts, supported by a change in models and business policies.

The triple bottom line gives three dimensions of sustainability – the environmental, the economic, and the social. In terms of combining ecological values in a development model, it refers to safeguarding the natural resources and preserving of nature, and economic refers to meeting human needs and implementing economic efficiency. Then social combines poverty, human potential and it deals with distributive justice.

Stated by United Nations (2015), the Sustainable Development Goals of Agenda 2030 are:

- 1) Eradicate poverty (in all its forms);
- 2) Eradicate hunger (achieve food security and improvement food and promote sustainable agriculture);
- 3) Health and well-being (ensuring healthy lives and promoting the well-being of all);
- 4) Quality education (ensure quality, inclusive and equitable education and promote lifelong learning opportunities for all);
- 5) Gender Equity (achieve gender equality and the empowerment of all women and girls);
- 6) Drinking water and sanitation (ensure availability and sustainable management of water and sanitation for all);
- 7) Renewable and Accessible Energy (ensuring access to reliable, sustainable energy, modern, and affordable for everyone);
- 8) Decent work and economic growth (promoting economic growth sustainable, inclusive and sustainable, full and productive employment, and decent work for all);
- 9) Industry, innovation, and infrastructure (build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation);
- 10) Reduce Inequalities (reduce inequalities within and between countries);

- 11) Sustainable cities and communities (making cities and settlements sustainable, inclusive, safe, resilient, and sustainable humans);
- 12) Responsible for consumption and production standards (ensuring sustainable standards of consumption and production);
- 13) Climate action (take urgent action to combat change climate and its impacts);
- 14) Protect marine life (sustainable conserve the oceans, seas, and marine resources for sustainable development);
- 15) Protecting life on Earth (protecting, restoring, and promoting sustainable use of terrestrial ecosystems, managing forests sustainability, combating desertification, halting, and reversing land degradation, and halting the loss of biodiversity);
- 16) Peace, justice, and effective institutions (promote peaceful and inclusive societies for sustainable development, granting access to justice for all, and create institutions effective, accountable, and inclusive at all levels);
- 17) Partnership for the implementation of the objectives (strengthen the means of implementing and revitalising the global partnership for sustainable development).

The circular economy directly responds to growing concerns about scarcity and volatility of natural resources and awareness of the unsustainability of models linear business, promoting innovation in circular business models, with less expenditure, on energy and materials.

It represents the opportunity for the economy, regarding the sustainable goals, the economic development could be reached and at the same time could promote sustainable development.

2.5. Implementing CE in different disciplines in the economy

Companies demonstrated creativity and innovation in implementing a circular economy in their day-to-day operations, changing society and keeping up with global trends.

Furthermore, in this section of the work, different economic disciplines and how circularity changed traditional ways of functioning, such as marketing, finance, accounting, and finance, will be presented.

Youn, Sungmin and Hye (2019) state that in today's business environment, creating and maintaining a competitive advantage is critical for short-term revenue generation or securing the growth of a family business. Securing a competitive advantage over competitors is becoming more important than anything else in providing superior value to customers. Market orientation is based on the acquisition of market information and responses from sources such as customers and competitors, so the higher the market orientation of the learning organisation, the greater the improvement in customer satisfaction, and customer satisfaction compared to competitors influences growth and profitability.

To gain a sustainable competitive advantage, sharing economy services should actively present innovative new product ideas, identify potential desires, reflect them, find opportunities, and increase communication innovation. In general, there is no universal definition of green marketing (also known as

environmental marketing, eco-marketing, social marketing, organic marketing, and sustainability marketing), but ecological awareness is a common component of definitions that business organisations are committed to promoting, designing, distributing, and pricing environmentally friendly products, concluded by Nekmahmud and Fekete-Farkas (2020).

Green marketing should improve and radicalise marketing mix related to products, price, distribution, and promotion, in order to strengthen marketing, practises and increase a company's competitiveness and performance. One of the way to implement circular economy in a company is to change the design of a product. Optimising the products and material usage, the company affects the disposal of waste after consumption. Following the current situation in the economy, companies want to provide the product to a market that will have a positive reaction and which will be purchased by future consumers. Green marketing tools such as green branding, green advertising, and eco-labels can be used by the company and marketer to educate consumers about green products.

Mohamed, Zainuddin, Sharifah and Wan (2017) proposed a framework for a sustainable green management system (SGMS) to manage an organization's sustainability elements holistically. An integrated management system would reduce document preparation time, document controller manpower, and internal and external audit costs, and encourage facility managers to implement cleaner production action plans.

The concept of cleaner production should provide a different way of managing things and should organise the business in general differently. Systems like this mean not having to worry about organisational issues, having a different way of producing and standards, and being more sustainable and cleaner. With such systems, it is possible to monitor, control, check, evaluate, and integrate all necessary tasks while supporting and relating to long-term goals.

Investing in a company's sustainability is a profitable long-term investment. Concerning the Informatics Revolution, society grew and developed. The internet, smartphones, and other types of technology have replaced the old ones, as has a business as usual. Digital platforms and automatically generated programmes are replacing old financial books and papers.

According to Kai, Sang-Bing, Xiaomin and Datian (2019) green finance implies that the financial sector considers environmental protection to be a basic policy, that any potential environmental impact should be considered in investment and financing decisions, and that the potential return, risk, and cost associated with environmental conditions should be incorporated into day-to-day financial business.

Managing green finance should be viewed as a long-term investment in support of sustainability and environmental concerns. Using the Internet and online platforms, the company demonstrates social responsibility and raises awareness about waste management, which is done in the traditional way of managing finances.

“Green accounting has become a necessity for an enterprise to develop methods for promoting green incentives for the present and for the future” (Nguyen, Hoang, & Ngyen, 2019, p. 31).

Green accounting in a company allows it to invest in and focus its actions on supporting sustainable goals. It also aids in decision-making by determining which direction is best for a company to move and develop in terms of sustainability. A company that practises green accounting is a great place to begin thinking circularly and dealing with day-to-day challenges.

This section of work was intended to lead and demonstrate various concepts and developments within disciplines such as marketing, management, finance, and accounting. All of this is in the context of implementing the circular economy and stressing the importance of transitioning from a traditional, linear way of doing business to a new, more sustainable, and "greener" circular way of doing business.

2.6. Circular economy and importance of digitalisation

The circular economy represents the transformation that goes hand in hand with digitalisation, which includes effectively utilising of big data, artificial intelligence, blockchain, the Internet of things, and cloud computing.

Implementing a circular economy can also be seen as an innovation that boosts the usage of new digitalisation, and the latest technologies. As is shown, in the figure above, there are a lot of opportunities for CE to develop through modern technologies. One of the most interesting, nowadays is blockchain.

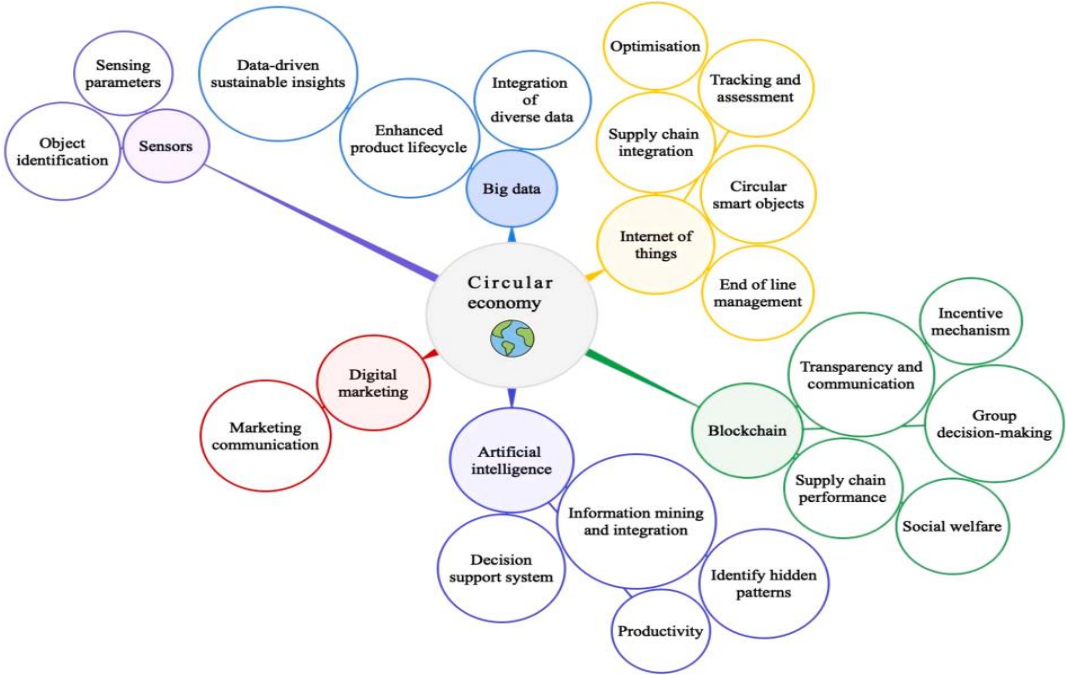


Figure 5: Visual representation of digitalisation capabilities in the sense of CE.

Source: Technological Forecasting and Social Change (2022, p 8).

Blockchain promotes decentralisation, a digital platform that reliably tracks all the demand and supply, and have a record of all input data. As one of that, blockchain can provide companies managing business with less waste and can promote environmental benefits, life cycles of products, and services. Using blockchain as a common platform for functioning companies, there is less waste and more efficient work, on the other hand, it promotes new innovative business models.

Internet of things (IoT), in the sense of the circular economy, can provide proactive decision-making and prolong the usage stage of products. Monitoring and reporting, tracking, and keeping records can also be easier using IoT technologies.

Big data supports new business models and can help companies get different aspects of the circular economy through physical, cyber, and stakeholder interactions. Big data reduces decision-making time, which is a very important fact for a company. Because all systems of qualified data, the company will have a clear situation, and they will be able to come up with the most efficient decision, regarding circular principles.

Artificial intelligence is an innovation combined with a circular economy that can provide many advantages for companies. Implementing AI companies would have productivity followed by optimisation, real-time data analysis, and unique design, which will support circularity. Also one of the aims of artificial intelligence is to help managers with decision-making identifying hidden patterns.

Digital marketing can also be a modern technologies that could provide an easier implementation of the circular economy. Through digital media, companies can reduce the costs of promoting their products and services. Especially nowadays, when digital media represent a common and most used way of transferring information and communication, this way can be the easiest and impact many people and economies worldwide.

Implementing change is not easy and takes time. Combining the transformation of technology and the transformation of the economy from linear to circular is even harder. Some of the evident barriers are lack of knowledge, experience, uncertainty, environmental conservation culture, and so on.

Being innovative, with a lot of changes takes time and courage. Modern society's future should focus on gaining more knowledge about modern technologies. The circular economy should focus on exploring and implementing new innovative business models and on new challenges and opportunities coming with the new waves of change.

2.7. Impact of COVID19 on CE

The situation caused by the virus COVID19 hit the world and also global economies. With the first case of an infected person from this virus, the world has stopped. And it was necessary to find a way to handle the new situation and reduce the damage that was going to happen.

Because of that, countries closed their borders and limited their economies to domestic producers. During this certain period of this chaos, it was seen how much each country has to offer, and how good they can maintain without international trade and foreign products and services.

Besides, that one more thing came to the spotlight: the importance of digitalisation and a circular economy. If the economy was different, more oriented to digitalisation, and had different supply chains, it would be easier to function in these remote conditions.

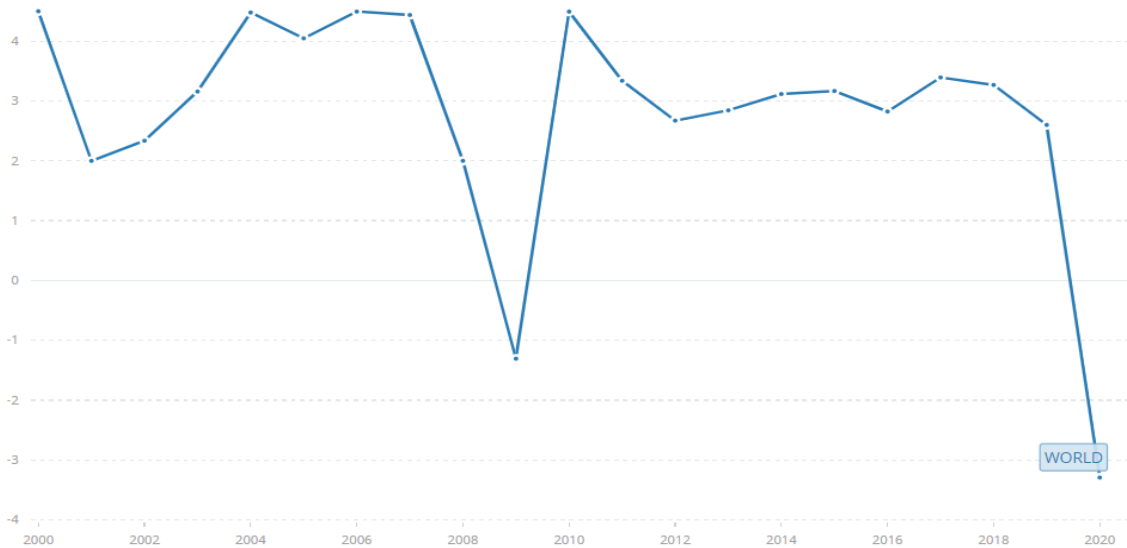


Figure 6: Annual growth of GDP in the period 2000-2020.

Source: Worl Bank Data (2022).

Regarding the situation, the economic subject had more time to reconsider how should companies be organised, and how principles of CE will help and upgrade the current situation. Keeping in mind that CE is taking care of products, and their life cycle, it is understandable that companies in this situation (crisis) realise the importance of materials, and their consumption, and after that, they're disposing of them.

“CE principles, when adopted holistically provide credible solutions to the majority of the structural weaknesses exposed by COVID-19, offering considerable opportunities in competitiveness and long-term reduced GHG emissions across value chains“ (T. Ibn-Mohamed, et al., 2021, p. 13).

Due to globalisation, implementing a circular economy in the world's economy would be the completely obvious choice. Why is that? Because implementing CE would offer innovative, new, sustainable business models which will manage business according to social, and environmental awareness. Pandemic time has just shown how society is oriented toward consumption without thinking about more than evident consequences. A society like that couldn't continue to produce like usual, because of the pressure on natural resources and the environment.

Considering new ways of functioning business will mean, that society is more than aware of how much damage it has already done to the Earth. And CE has the potential to reduce and minimise that damage, and pressure and create a new, more sustainable way of dealing with business and economic subjects, overall.

The post-COVID period is a fruitful field for the transformation economy from a linear to a circular one. Economies should be rebuilt, consumer behaviour which is now used online, digital shopping should be used as an advantage and it should companies think. That means companies should reconsider their business models and input digitalisation, redefine their supply chain, redesign their products and services, and should be socially responsible entities.

Providing that companies will show to market their desire for a more sustainable environment, they promote new sustainable functioning of business, and gain more sustainable investors.

On the global market, where many companies come and go, it is very important to stand up, make a difference, and be noticed. Especially in the conditions and uncertain times that the pandemic period made, it is extremely difficult to find the most efficient way to manage a business. Circular economy and digitalisation, also allow companies in these uncertain times of digital and modern society to handle their business in the most productive and less harmful way.

By implementing blockchain as a technology and re-designing products using materials that can be reused, companies show that they can keep up with the time and that they are ready for new challenges and opportunities.

3. Portugal – circular economy

In this particular part of the work, there will be more words about Portugal, its strategic plan of implementing a circular economy, the current situation and results, and some practical examples.

To meet this section's main objective, we collected information from official entities. The research methodology used was the production of quantitative information, carrying out a descriptive exploratory analysis.

This part aims to present besides the theoretical and practical side of the circular economy in Portugal.

3.1. Strategic plan for implementing circular economy in Portugal

Every change requires time and space. Implementing radical change in an already existing system is hard and takes time. Changing economic models is even harder because it is not just changed inside the country's borders, it is also the change in international relations and trade.

As one of the European countries, Portugal has a huge influence on international trade. So it is very important to take responsibility for its actions and consequences. As it is already said, the green or circular economy existed a long time ago, so it was needed to implement in the regular everyday functioning of businesses.

The Portuguese economy is known as an economy with a slow metabolism, it has a habit of accumulating materials. "Portugal already has a long history of policies to promote the efficient use of resources: in the management and valorisation of specific waste streams, energy efficiency, and green growth. This action plan is therefore not a beginning or an end: it is a means, in constant evolution, and requires the continuous contribution of all ministries, public institutions, companies, communities" (Council of Ministers Resolution, 2017, p. 5).

Furthermore, the change should cover all top-down and bottom-up economic actions. The strategic plan should involve micro, meso (or sectoral), and macro subjects in one country.

The more circular economy is, the less need it has to extract raw materials and the lower the environmental pressure is. The transition of the Portuguese economy from linear to circular needs concerned especially materials, importing materials in the measurement that is over the real production needs.

Service now dominates the Portuguese economy. The main service of its economy is tourism, especially attractive locations are around the region of Lisbon, the Algarve, and the Douro valley. Except for tourism, Portugal has also developed the wine and fishing industry. That is the reason, why the world's largest

exporter of tomato paste and wine in Portugal. Besides wine and tomato paste, Portugal also exports automobiles, transport components, machine tools, textiles, clothing, footwear, paper pulp, cork, and plastic moulds. On the other hand, import from Portugal primarily contains food and beverage, wheat, crude oil, machinery, automobiles, and raw materials.

The goals of the transition Portuguese economy are divided into companies, government, and citizens, as a systematic perspective of transition. Changing step by step can influence on big and important change, the transition. So it must be divided, as it is already said into macro, meso (sectoral), and micro levels.

The macro-level of transition concerns about the same regulations as in the EU's action plan for the circular economy – product, consumption, and waste as secondary raw materials. The macro-level goal is to support and encourage young entrepreneurs and innovative ideas.

The meso-level or sectoral level focuses on sectors such as the agriculture and construction sector. The change implemented in this sector will affect the whole of the value chain associated with a certain activity.

And at the end, the micro-level is all about creating agenda of regions and speeding up strategies for the CE that are most appropriate for the socio-economic profile. Those agendas are mostly initiated by the Coordination and Regional Development Commissions (CCDRs).

“An action platform consists of regularly and systematically held initiatives that enable interaction between governance actors (e.g. public institutions) and CE implementation actors (e.g. companies, municipalities, and consumers) to exchange knowledge, contacts, experiences, and good practices” (Council of Ministers Resolution, 2017). The ambitions of Portugal 2050 are:

- 1) A carbon-neutral economy – more efficient use of materials, fall in extraction and importing materials, a significant fall in final waste, and better waste management.
- 2) Knowledge as an impulse – focusing on research and innovation creates solutions, expanding knowledge about circularity, circular way of thinking, and circular economy.
- 3) Inclusive and resilient economic prosperity – a development that will affect all sectors of society, is resilient against price and risk volatility.
- 4) A flourishing, responsible, dynamic and inclusive society – better informed, participative, and more collaborative society.

3.2. CE as an innovation in Portugal

After setting the National Action Plan for implementing CE in Portugal, it was necessary to name all the barriers and drivers in the country.

Furthermore, the main problem that Portugal still has is the lack of involvement of the private sector, investments in eco-innovation efforts, and lack of specific programs that will promote circularity in, a circular economy.

On the other hand, some of the benefits and improvements that Portugal made till 2019 are defined regional agendas for a circular economy, opening the Collaborative Laboratories to create critical mass in specific R&D fields, and fostering knowledge transfer.

Beyond the environmental issues, eco-innovations could also help to boost the Portuguese economy by increasing the number of exports and helping to cut energy and material-related costs.

The progress of Portugal can be seen through an eco-innovation index, which represents performance compared with the EU average.

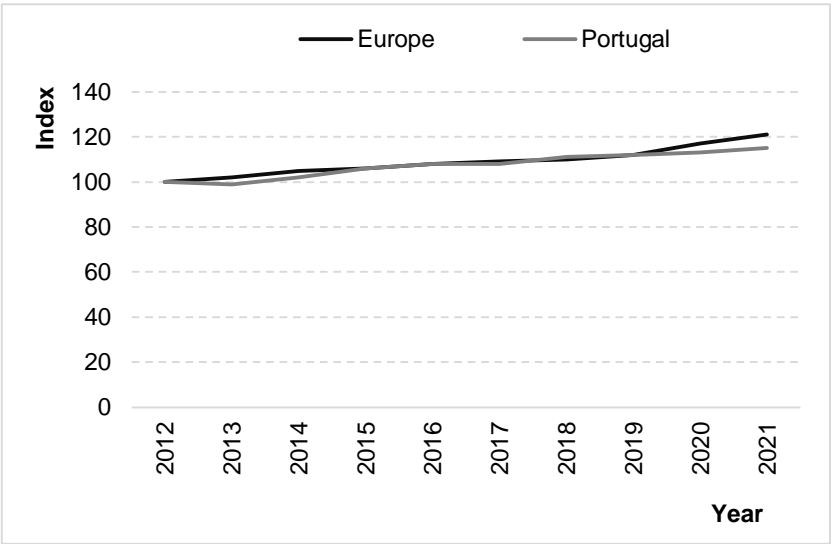


Figure 7: Eco-innovation index 2012-2021.

Source: EIO (2019).

The Eco-innovation index contains a lot of components, which as a result, has the index by itself. So observing the index on its whole, it can be noticed that Portugal was doing good, on the level with European Union. As time passed, Portugal upgraded its index, and it can be seen from the figure that when National Action Plan 2017-2020 is released, Portugal increased the eco-innovation index. Aggregated index (eco-innovation index) consists of five components, eco-innovation inputs, eco-innovation activities, eco-innovation outputs, resource-efficiency outcomes, and socio-economic activities.

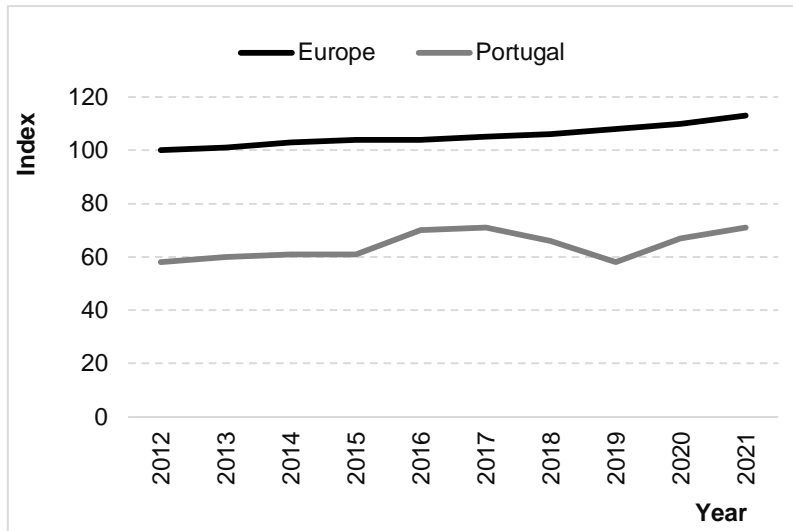


Figure 8: Eco-innovation inputs 2012-2021.

Source: EIO (2019).

The low result of eco-innovation inputs is highly linked to the governance environment, energy R&D appropriations and outlays, and the total value of green early-stage investments. So adapting Portugal as a country to an innovative way of thinking and functioning takes time. Observed results are not a surprise and are expected, but that doesn't mean that Portugal should stop there.

To improve the current situation, Portugal could change government expenditure, leverage existing venture capital to foster eco-innovate, and increase investment in R&D firms. It is necessary to start with regulations, investments, and governance behaviour to make a change. After that, only some change is possible and likely to happen.

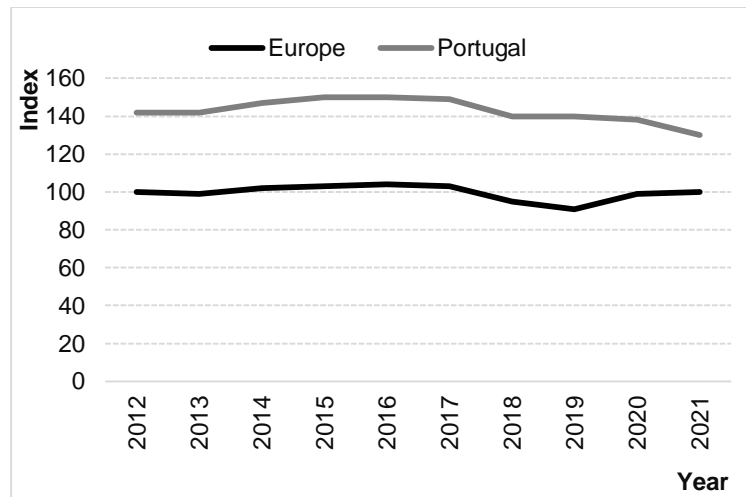


Figure 9: Eco-innovation activities 2012-2021.

Source: EIO (2019).

Will for change and social awareness of Portuguese people, can be most seen through this indicator. As is presented in the Figure 9, Portugal in the period from 2012 to 2021 did some serious changes and developments in the question of sustainability and the environmental economy.

The high score of the eco-innovation activities can be thankful for SMEs of Portugal. Small and medium enterprises realised that if they want to go and work in the international market, they should follow the trends and in the end set up the trends. Following the example of other developed countries, SMEs in Portugal have implemented resource efficiency actions and sustainable products.

Because of the nature of their work and the size of the company, it was easier for them to implement changes, but their successful work has gained very good results for Portugal, compared with European Union.

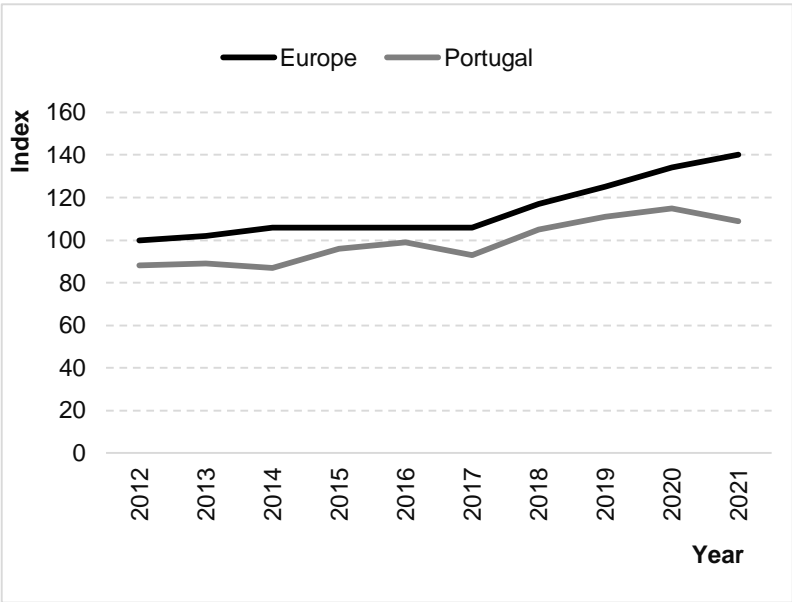


Figure 10: Eco-innovation outputs 2012-2021.

Source: EIO (2019).

The result of eco-innovation outputs is dependent on, a high score in the number of eco-innovation-related publications and eco-innovation-related media, and a low score on eco-innovation-related patents.

Considering the European Union, Portugal doesn't have that low result of eco-innovation outputs. Keeping in mind that, the National Action Plan for implementing CE has officially started in 2017, Portugal has made some serious improvements.

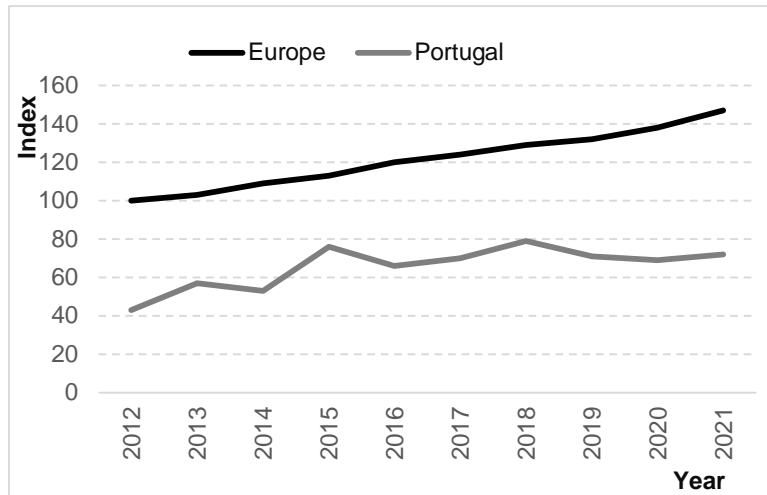


Figure 11: Resource efficiency outcomes 2012-2021.

Source: EIO (2019).

Resource-efficiency outcomes refer to changed, developed ways of energy management, water, and material productivity, GHG emissions intensity.

Observing the figure, it is clear that Portugal didn't find the most efficient way of using energy, water, or materials yet. But even though Portugal had low results in resource outcomes, it had higher results for managing energy performance, which can be a great start.

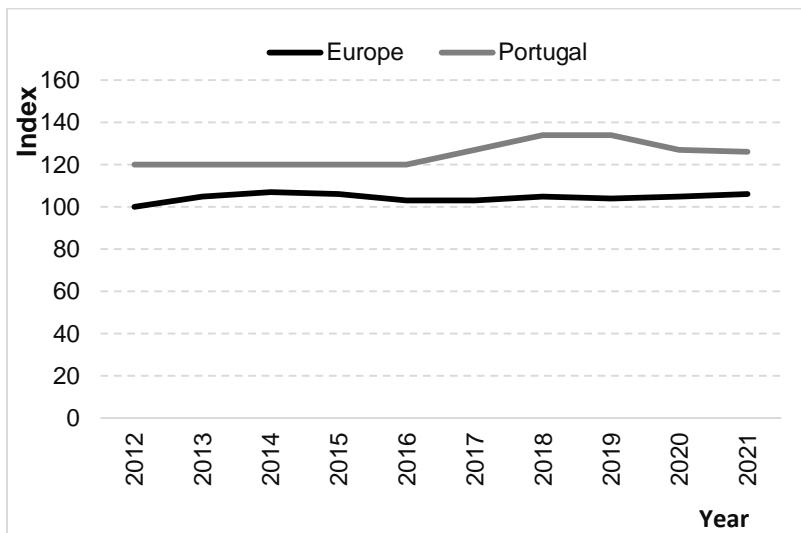


Figure 12: Socio-economic outcomes.

Source: EIO (2019).

Portugal in the observed period of 9 years had better results compared with Europe. The main reason for that result is a high score in employment in environmental protection and resource management activities and value-added in environmental protection and resource management.

Taking risks and implementing innovations in everyday functioning business has become Portugal's strategy. Based on that, the Portuguese have hired professionals, who will take care of and focus on a company's social responsibility, its environmental awareness.

3.3. Practical examples from Portugal

Portugal has made significant changes in the period between 2018 and 2019. The most relevant driver in Portugal was the National Action Plan for implementing a circular economy from 2017 to 2020. The plan gave the official framework, main idea, and goal for entrepreneurs, companies, and businesses in which direction they should plan their strategies.

“The circular economy has become the focus of the business community, particularly the corporate sustainability community, extending beyond policymaking and the environmental community”, concluded by Lorena (2018, p. 13).

Furthermore, waste management has been covered by the National Plan of waste management (PNGR) and the Strategic Plan for Municipal Solid Waste 2014-2020 (PERSU, 2020).

PNGR has a vision that recognises waste management as a key factor of the material cycle and a determining factor in the efficient use of resources and the transition from a linear economic model of production-consumption toward a circular one.

The PERSU 2020 is more focused on reaching the targets of EU 2020, municipal solid waste. It established the frameworks and regulations to help Portugal fulfil the measurements of EU 2020.

Expect that Portugal also established several programs that will impact the development of new products with recycled materials, and food production systems based on the introduction of IT technologies, modularisation, and verticalisation. Also, it is highlighted the importance of digitalisation in the sense of the circular economy. Digitalisation has an important role in the CE, in two ways. On the one hand, that is using artificial intelligence to prevent forest fires or improve daily waste management operations. On the other hand, that is the usage of advanced digital manufacturing technologies to reduce production waste.

A great example of some organisations and programs in Portugal are Associacao Smart Waste PT and BCSD – Conselho Empresarial para o Desenvolvimento Sustentavel, which have launched several initiatives and projects related to plastic pollution prevention. Also, the program Circularity4Good program represents an accelerator program designed by BGI to make the most of SMEs and start-ups projects in the circular economy areas funded by the Fundo Ambiental.

Regarding policy instruments that promote a circular economy is concerned, it is very important to mention the Fundo Ambiental, which has been used to help implement CE projects across private and public organisations. Besides the fund, which helps with the capital, there are a few main goals that the

Portuguese economy wants to explore and in that direction to implement the circular economy in the everyday system. These are:

- design new products, processes, and services;
- sustainable management of the resources cycles;
- governance and territory;
- new business models.

The other policy instruments that are also important to mention are:

- Vale Economia Circular (voucher program to help companies find specialised consulting services for resource efficiency and product certification);
- The Fundo de Inovação, Tecnologia e Economia Circular – FITEC (aims to support innovation policies, specifically regarding knowledge transfer, cooperation between higher education institutes and companies, and capacitation for resource efficiency);
- Program “Environment, Climate change and Low Carbon Economy” under the European Area Financial Mechanism – EEA Grants 2014-2021 (aims to promote close cooperation between the institutional entities and partners of the donors and beneficiaries States in projects linked to CE);
- Electronic Waste Tracking Notes;
- The GovTech competition (program to support innovative solutions that address one or more Sustainable Development Goals).

4. Montenegro – circular economy

This part of the work focuses on Montenegro, a little country in the south of the Balkans. Montenegro's economy offers a fertile ground for developing and implementing new, innovative technologies that will impact progress. Among the topics that will be discussed is the strategic plan of Montenegro, the circular economy as a new way of thinking, Montenegro as an ecological country and its connection to the environment economy, as well as the impact of COVID19 on the Montenegrin economy. To meet this section's main objective, we collected information from official entities. The research methodology used was the production of quantitative information, carrying out a descriptive exploratory analysis. To complete the study, 14 companies were interviewed using a semi-structured questionnaire. The interview aimed at obtaining an overview of Montenegro's economy and society.

By the end of this part of the work, the overall project will be completed and it will serve as a great background for future research.

4.1. Strategic plan for implementing circular economy in Montenegro

The economy of Montenegro is mostly dependent on services (60% of GDP) rather than products produced domestically. In addition to tourism, small and medium enterprises can also be considered a strength of Montenegro.

Currently, Montenegro's economy is based on a linear management model. In order to keep up with the world's business management trend, Montenegro should consider and implement a circular economy. In a circular economy, multiple value creation mechanisms are discovered as finite resources are consumed and depleted. As a result, it aims to maintain products, components, and materials in the highest state of usefulness and value over time. A technical cycle is distinguished from a biological cycle, which coexists with it.

Montenegro, a small and service-oriented country, has many potential areas where a circular economy could be implemented. Putting regulations in place and setting clear goals are the most challenging tasks.

The Chamber of Commerce of Montenegro introduced this topic to society through its “Roadmap towards a circular economy in Montenegro”. The roadmap is based on a systematic approach, and it recognises that the transition process will take time and effort. The main goals of the roadmap are to identify the potential of Montenegro, its stakeholders, and opportunities for implementing a circular economy, supporting and putting in the first picture improving the quality of life of people in Montenegro. This initiative and transition are examples of circularity from the Ellen MacArthur Foundation, which helped

organizations contribute one roadmap, representing an efficient strategic plan toward a circular economy in Montenegro.



Figure 13:The Roadmap towards a circular economy in Montenegro.

Source: The Chamber of Commerce – Montenegro and United Nations Development Programme (2021).

“Roadmap towards a circular economy in Montenegro” began with a draft of theoretical knowledge on the circular economy. Identifying CE mission and goals is the first step of a roadmap. The roadmap should next proceed down the route of reviewing the circular transition's priorities, creating the formal roadmap, papers, action, and communication plans, and finally releasing the Roadmap as an official document.

Furthermore, the plan to "green" the commercial sector is another strategic plan that will lead Montenegro toward a circular economy. Although tourism is one of Montenegro's main strengths, it has a significant negative impact on the environment.

Hotels are the main factor in tourism that has a negative impact on the environment. Hotel energy waste and usage are enormous, and something must be done about it. There are 470 hotels in Montenegro. However, not all of them recognize the significance of eco-design, sustainability, and the ecological environment. Only 14 hospitality establishments in Montenegro have the eco-sign. The sign represents the host's commitment to sustainable development and indicates that the object has taken on some measurements in the direction of circularity.

Some international hotel chains have already implemented some circular principles. It could be used in hotel construction and decoration, energy efficiency, water management, waste management, employee and guest education and training, and partnership development. Hotels should consider the 3R concept (recycle, reuse, and reduce).

Socially responsible behaviour of hospitality hosts will influence the behaviour of clients who use their services, resulting in societal change.

Restaurants, coffee shops, and supermarkets are also important parts of the commercial sector. Furthermore, these entities have a negative impact on the environment. Small changes to the regular working system could result in significant changes. The massive waste generated by these entities, as well as the packaging they use, are issues concerned with sustainability.

They could help and promote that kind of behaviour to their clients and customers if they are more environmentally responsible and take serious steps to reduce waste..

Implementing a circular economy in daily business operations could assist the commercial sector in managing the business more sustainably, paying attention to waste management and providing packaging that can be recycled or re-used.

"We must respect what we have and constantly add value to products and services with a circular approach because in that way we take care of nature and natural resources" (The Chamber of Commerce - MNE & UN, 2021, p. 38).

4.2. CE – innovative way of thinking in the Montenegrin system

The circular economy has the potential to drive development and progress in Montenegro. It has the potential to influence technological innovation and development.

This work is based on research conducted in Montenegro involving 14 small and medium-sized businesses. The findings of this study provided a nice and very interesting picture of Montenegro's economy and society.

The questionnaire contains 15 questions designed to assess how and to what extent the industry is familiar with the circular economy.

According to the research, 57% of the companies studied have some knowledge of the circular economy, and 79% want to implement a circular economy in their daily business operations.

Furthermore, 86% of the small and medium-sized businesses in Montenegro believe that implementing CE would change the way the industry thinks, and 86% believe that implementing CE would require experts in this field. According to the findings, 79% of the companies surveyed believe that a circular economy will result in new job opportunities for young and innovative people. As a result, all companies were given the task of rating the current state of the Montenegrin industry, and the results showed that 36% of them gave the industry a grade of 2 (not bad), while only 14% gave it a grade of 4, which was related to good.

All of the above results can provide an accurate picture of the Montenegrin industry. Given that the Montenegrin economy is based on small and medium-sized businesses, their opinion on a particular topic is more than reliable. Involving them in implementing CE in Montenegro will aid in the promotion and expansion of CE throughout the industry.

As previously stated, companies that are more oriented to the circular economy could assist Montenegro's industry in increasing demand for its needs by opening new positions for young and innovative people in circularity.

Changing the perspective of economic entities' thinking may be the most difficult task, but the current situation and previous period have caused societies to consider future situations and the possibility of changing and implementing a circular economy more quickly.

The COVID19 pandemic period influenced businesses to provide online work for their employees, online markets, and services for their customers/clients, in other words, to digitalize their work. This could be viewed as a great starting point for incorporating the circular economy into everyday business. How? Companies can reduce their environmental impact while also expanding their products to a more global market with no geographic limitations by providing online work or markets.

The current situation of rising gas prices will have an impact on the prices of other goods and services, so doing business as usual will cost more, and it may be a good time to consider alternative options. Furthermore, it implies that previously used resources will be more expensive or difficult to obtain, so companies should consider alternatives, and some new ways of doing business, so that this situation does not affect their business.

Circumstances such as those mentioned can have an impact on the implementation of new innovative business models, strategies, and opportunities. A good example of this is the rapid response of businesses and entrepreneurs during the pandemic period, when they switched to an online mode of working, selling, buying, purchasing, and other activity. So now might be a good time to consider and

implement a circular economy, as well as pursue economic entities to change their perspective – to think in a more circular innovative way. According to the data, 71% of the companies surveyed believe that a circular economy equals development and progress.

4.3. Montenegro's economy and environmental economy

A small country endowed with natural resources can adapt to changes and change the speed with which industry operates. However, this is not always an advantage, but in the case of a circular economy, research has shown that this could be Montenegro's main advantage.

Parallel to this work's research, The Chamber of Commerce – MNE conducted its own with the assistance of UNDP. The following are the final results of the preparations for the document "The Roadmap towards a Circular Economy in Montenegro":

- 34 small and medium-sized businesses are surveyed;
- 59% believe that investing is necessary to transition to a circular economy.
- Only 29% of them measure their company's waste, while 71% do not;
- All of the companies studied believe that the main reasons for the difficulty in changing the way things work are a lack of knowledge, a lack of human resources, employees from that field, and a lack of resources;
- They want the roadmap to include workshops on the following topics: the basics of circular economy, market stakeholders for transition, analysis of re-used resources, creation of reusable resources, collaboration with other entities, collaboration with clients, creation of a green brand, how banks support a transition to CE, and many others.

On the other hand, the findings of this work's research revealed the following situations:

- Of the 14 small and medium-sized businesses studied, 21% pollute the environment, and 36% do not;
- Only half of them have a solution for it;
- Recycling is viewed as the easiest to implement by 43% of the SMEs polled;
- Agriculture is easier to implement CE for 29% of SMEs, tourism for 14%, and SMEs for 14%;
- On the contrary, 36% of the surveyed SMEs believe that the energy, mining, and metallurgy industries are the most difficult to implement CE, while 21% believe that construction work is the most difficult.

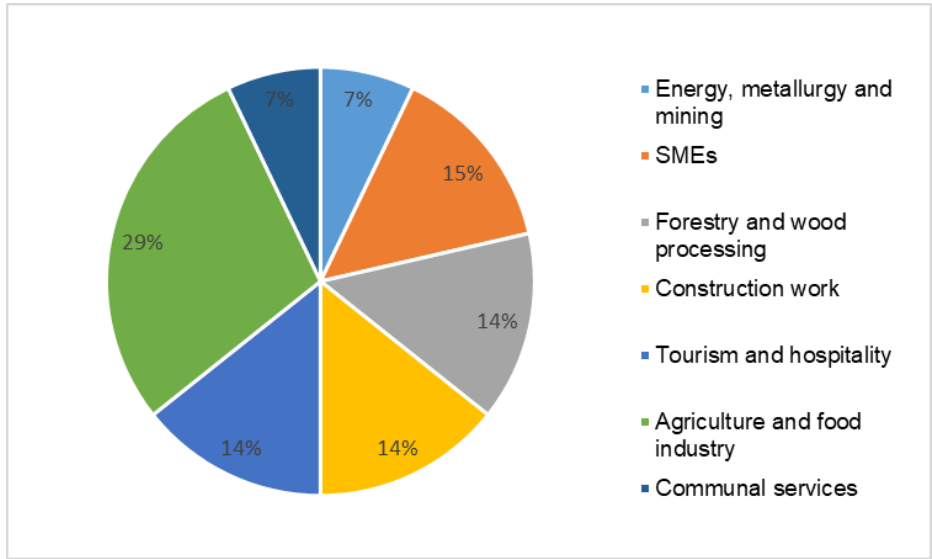


Figure 14: The opinion of companies about implementing CE in the industry sectors.
 Source: Authors' elaboration.

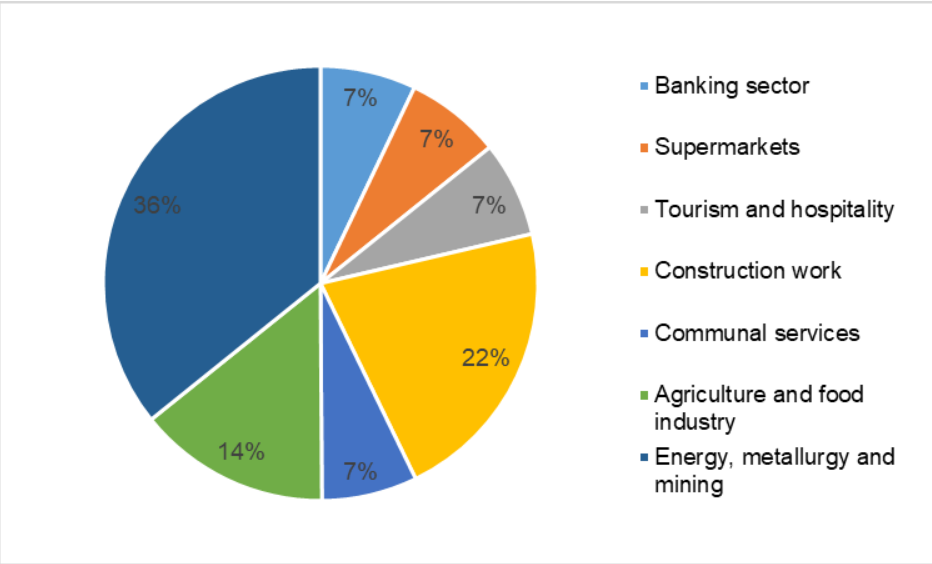


Figure 15: The opinion of companies about implementing CE in the industry sectors – the hardest to implement.
 Source: Authors' elaboration.

Summarising the findings of both studies, it is clear that Montenegro's industry is ready for change. According to the findings, Montenegrin SMEs believe that the agricultural sector is more adaptable to change. One of the reasons for this is the use of bio-materials in agriculture, which are agricultural inputs that can be converted from manufactured to natural. As previously discussed in the previous chapter, tourism could also be managed through waste management. Finally, SMEs may be the most amenable to change because of their adaptability to changes and market conditions. Entrepreneurs typically lead

SMEs with innovative ideas that can promote, upgrade, and influence the design of products and services.

Expect the mentioned to implement and learn more about the circular economy, as evidenced by research conducted by The Chamber of Commerce – MNE. Following the steps of the Roadmap, useful workshops on this topic could be discussed and small goals defined to begin.

Subventions and special programmes led by the Montenegrin government are one sure way to help the industry in Montenegro upgrade the current situation and implement CE faster. Programs like Fundo Ambiental in Portugal would have an impact on the industry's faster and more inclusive implementation of CE. Subvention programmes would assist businesses with investment and provide the foundation for them to begin to change their traditional business practises.

According to research, expectations about the future of the circular economy and its importance in the country are mostly approved. Companies are aware that doing business as usual is inefficient and only leads to scarcity and a lack of natural resources and production capabilities. As a result, businesses are willing to change their traditional business practises to implement new techniques and materials. Implementing CE in Montenegro could be done in several ways. The industry could impact many sectors and every sector could give a different solution, different variety of understanding and seeing circular economy. And precisely, that makes the circular economy interesting and different from a linear model.

In Montenegro, for example, tourism, companies, and hospitality of MNEs could improve their waste management and pay more attention to protecting the sea and the cost. Every summer, many tourists visit Montenegro to spend their vacation, but many leave a lot of trash and waste behind them. As a result, the tourism industry, as well as private and public hospitality establishments, should be more concerned with their customers' behaviour. Perhaps some warnings or different entry conditions would help to improve the current situation.

Small and medium-sized businesses could implement CE by redesigning their products and switching to reusable materials. Different product designs with more sustainable details will communicate to their customers that their company is socially responsible, sustainable, and committed to protecting the environment and its resources. Using reusable materials extends a product's life cycle and increases its usage.

In education, for example, institutions could better manage their waste. Because, as is well known, many people don't care how they dispose of their trash, influencing increased waste around these institutions. More warnings and rules on how to dispose of trash would make pupils and students more socially responsible and aware of their individual responsibility. Caring outside of educational institutions will allow them to transfer their knowledge to society and influence the behaviour of others.

Supermarkets and restaurants could use CE in recycling by repackaging their products and services. Because these two institutions generate a lot of waste, it is critical to be aware of the harm they cause.

Using more environmentally friendly packaging for their products, packaging that is easier to recycle and does not harm the environment, institutions would send a message to the market that the circular economy could be implemented easily, with small but significant steps.

When it comes to construction work, Montenegro's construction sector could improve and upgrade their materials, as well as their supply of zero-energy houses. Building sustainable houses with solar panels could improve energy efficiency and reduce electricity consumption. Houses and buildings could also last longer if that type of construction work was done, meaning they would not be ruined after a shorter period of time and would be more resistant to deterioration. In this way, the construction industry would implement CE while also upgrading their supply and gaining new clients and companies concerned with sustainability and the environment.

Finally, the public sector implementing CE could be more decentralised and digitally oriented. Companies owned by the Montenegrin government could use new digital tools, such as blockchain, to decentralise their businesses, reduce costs (as some positions will be rendered obsolete after implementing blockchain), and set a good example for the rest of the industry. The application of blockchain can be seen in saving data and personal information about businesses using this one-of-a-kind tool. Companies can also pay and trade with other companies using blockchain without incurring any additional costs. Everything would be much more simple and more efficient.

All of the methods mentioned for implementing CE in various sectors demonstrate how Montenegro can provide various sustainable solutions as well as innovative products and services to the market. And, in many of the ways mentioned, the circular economy could be promoted as a new trend, a new normal. Product and service differentiation presents Montenegro to the world as a distinct and beautiful country. As a result of the innovative circular way of thinking, the country can offer a wide range of products and services to the market.

4.4. Digitalisation in Montenegro

Digitalisation is one method of implementing a circular economy in Montenegro's industry.

Digitalisation has a significant impact on product production, design, and distribution. So, in a circular sense, digitalisation helps companies reduce production costs, emphasises the importance of the human factor in production, and has an impact on reducing environmental damage.

Companies' level of development and openness to digitalisation represents a company's ability to adapt to the industry's daily changes and challenges.

With the pandemic of the virus COVID19, the importance of digitalisation has grown significantly in Montenegro. Social media marketing, promotion, distribution, and sales are some of the most common applications of digital technologies in Montenegro's industry.

Social media created an online market, and social media and their massive influence created the need for a social network market.

Customers spend a lot of time on their mobile phones and social media platforms. As a result, businesses considered how to be available there as well, so that their customers could easily contact them and get in touch with them even through social media. Furthermore, because virtual ones are replacing physical stores, the negative impact that a company can have by opening a physical store is reduced.

The transition to digitalisation in Montenegro's industry takes time and several steps. As a result, it provided a few strategic plans that will lead to the desired outcome. The Ministry of Public Administration, Digital Society and Media (2021) stated that one of them is the Development Strategy Plan 2016-2020, which has resulted in 50% of digitalisation -related activities being implemented, 31% being partially implemented, and 20% not being implemented at all.

Implementing e-government, e-business, e-portals, e-education, e-inclusion, and eDMS – electronic document management system will help Montenegro achieve a digital society. A society like that will upgrade, improve, and make things easier for its citizens. A digital environment ensures that all collected data is saved, all transactions are recorded, and there is no room for failure.

The mentioned digital platforms in Montenegro would have an impact on the faster flow of information because everyone would have access to the platform, allowing every entity to be aware of current events.

According to the Development Strategy Plan 2016-2020, the main problems in Montenegro are a lack of knowledge and experience and a lack of investment. Institutions believed that Montenegro needed experts in specific fields and large investments to establish a digital society. Because of this, more attention should be paid to e-education and the provision of more young, innovative people who will promote this mode of communication and information dissemination in the future, so that the digital society can become the new normal.

4.5. Impact of COVID19 on digitalisation of society in Montenegro

The pandemic period caused crises all over the world and had a significant impact on Montenegro's industry. People were obligated to find alternative solutions and ways to keep their businesses running.

It was difficult and demanding, but it resulted in innovation, highlighted entrepreneurship, and uncertainty as a result of the virus COVID19, which provided more interesting supply and more products on the market.

The pandemic period demonstrated to society that the linear (traditional) business model no longer works and that it is time for a change. The impact of a pandemic was and continues to be significant. It simply increased the importance of digitalisation in businesses, and this change had to hasten the transition to digitalisation.

According to Golubović, Mirković, Mićunović and Srića (2021), due to the pandemic period, a scientific research project called DIGagCOV was completed at University Donja Gorica, to assist SMEs in their transition to digitalisation and digital payments. The study included 410 businesses that responded to the project's questionnaires.

Some of the research's most intriguing findings are as follows:

- 83.2% of the companies studied have a website or a social media profile;
- 49.5% of them have a website and a social media profile;
- Social media profiles are more common in smaller businesses;
- A widely held belief is that digitalisation is inextricably linked to faster market communication;
- 13% of businesses have already shifted to a digitalized business model;
- 46.3% of those planning to implement digital technologies cite increased efficiency and customer satisfaction as the primary reason;
- 23% want to use digitalisation to their advantage in the global market;
- 10.8% of them intend to use technology in business after the pandemic period.

DIGagCOV research also highlighted the most common issues and problems that businesses face. Some of the most common issues are a lack of knowledge, a lack of capacity, a lack of investment, and a lack of courage and experience. As a result, the future higher education system must provide educational programmes that attract young, innovative people from the field of information technology. Such academic personnel means having a competitive advantage in the local and global markets.

Aside from education, user-friendly equipment makes it possible to implement digitalisation more easily. A company's digitalisation requires a significant amount of work and changes. Setting up simple technology could help businesses adapt more easily and accept digitalisation as a new normal, a new business model.

In terms of circularity, as previously stated, digitalisation represents a method of implementing CE in the company. As previously stated, digitalisation has the potential to influence not only faster, cleaner, more sustainable production, but also waste reduction in a business. Furthermore, it is now required and the most commonly used method of communicating with market actors and information flow.

Implementing circular economy principles in Montenegro's industry may impact the country's profile, as well as its development and progress in the world. Montenegro has much potential for transformation and development in the field of circularity. The primary drivers should be innovation and sustainability; combining the two can result in significant progress in Montenegro.

As an ecological country, Montenegro should be more open to change and circularity and more socially responsible about the environment. There is plenty of room for advancement and development, but the main goal is to identify and initiate a change.

Change can take many forms and shapes, but the most efficient ones are characterised by entrepreneurship and innovation. University Donja Gorica and Instituto Politecnico de Braganca, for example, can supply the market with innovative young academics and entrepreneurs.

The ERAMUS+ exchange partnership may prepare students for life's challenges and opportunities. This type of knowledge impacts a student's mindset, way of thinking, characteristics, and behaviour. Travelling and studying abroad makes a person wiser and more equipped with new skills and abilities. Living abroad opens up new business opportunities and challenges, allowing you to improve your current situation.

New projects, future works, and research will result from social networking and new knowledge.

4.6. Possible progress area – recycling in Montenegro

In Montenegro, a circular economy should replace the linear (traditional) business model. The circular economy in Montenegro should represent a new era, a new period of prosperity, social development, and industrial development that will lead Montenegro to the European Union and the rest of the world.

Reduce, reuse, and recycling are all possible in Montenegro's industry, but only the right person, an innovative and entrepreneurial person, will know how to implement them most efficiently in Montenegro's current industry.

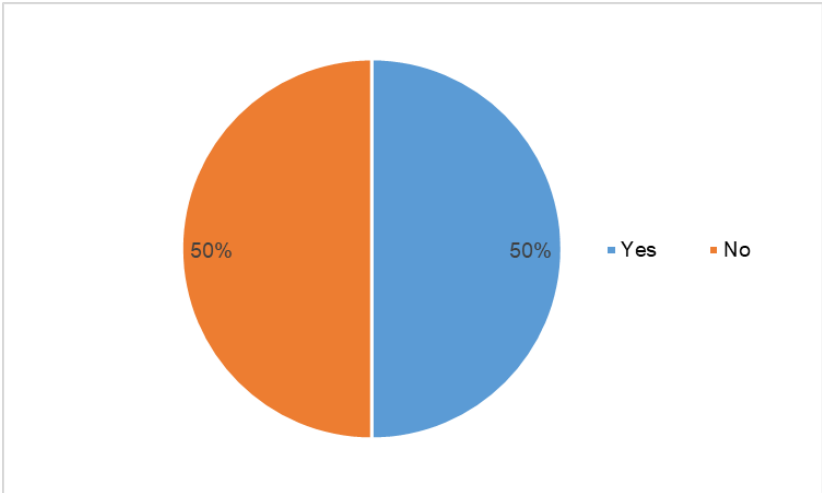


Figure 16: The solution for waste disposal.

Source: Authors' elaboration.

Recycling is one of the most well-known general principles of the circular economy. Many people are already familiar with this process, and many are unaware that it can make it easier to implement a circular economy not only in industry, but also in a country.

Precisely because of this, it is essential to promote and provide the country with available places to dispose of waste and ensure that it is sorted and recycled. In this manner, neither industry nor people

will have a negative impact on the environment, and the ecological system will remain unaffected by economic or other activities.

Per the research, half of the companies studied do not have a current waste disposal solution. One possible explanation for this situation is a lack of knowledge, resources, and capacity for "green" waste disposal. Recycling, on the other hand, is one of the simplest principles to implement in a business, according to the research.

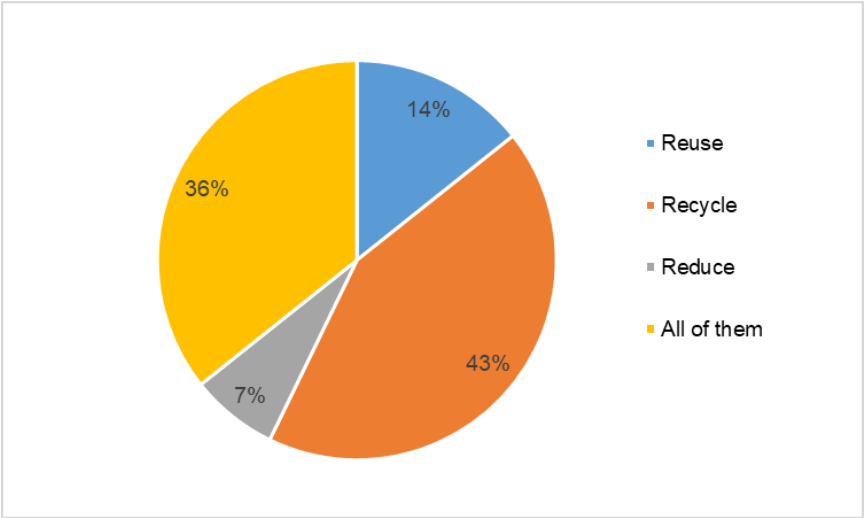


Figure 17: The easiest principle of the CE to implement.

Source: Authors' elaboration.

As shown in the figure above, companies have decided that recycling is the simplest way to implement a circular economy in a business. This result could be, as previously stated, familiarity with the recycling process and the capacities that are available for the recycling process.

Montenegro's waste infrastructure consists of nine recycling yards, 4 material sorting facilities and 2 sanitary landfills. As stated by European Environment Agency (2021), there are 155 small, unregulated landfills, 68 medium unregulated dumpsites, and 50 larger than 1000m³ in Montenegro.

Montenegro's waste management legislation is in line with EU standards. As a result, Montenegro must provide its people with the means to dispose of their waste in a sustainable manner. The National Waste Management Plan establishes targets and goals to strengthen institutional and individual capacities, such as designing and constructing new waste management facilities, raising public awareness of the importance of proper waste management and public participation in decision-making, establishing a mobile waste collection system, and many others.

In this regard, some of the activities could contribute to and increase the impact of recycling in the industry. Companies must determine the best way to recycle and dispose of their waste. In this way, in

addition to recycling, they demonstrate social responsibility to the environment and encourage the general public to do the same.

Recycling, as previously stated, is one of the three R's of the circular economy (reduce, reuse and recycle). Starting with recycling could provide a great foundation for implementing other principles.

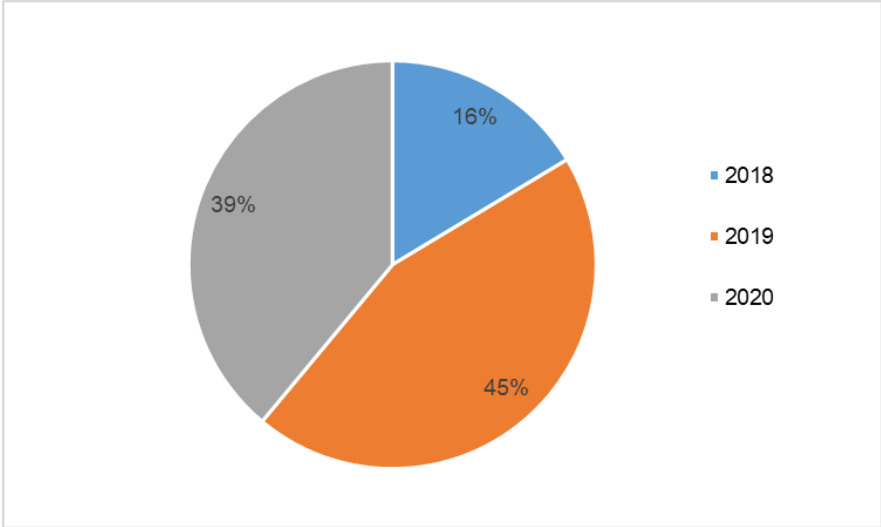


Figure 18: Recycling rate in municipal waste.

Source: Eurostat (2020).

Regarding the results presented in the Figure 18, it is essential to enhance them and thus affect the increase in recycling waste. Companies will find the most efficient way to dispose of their waste by providing special areas for waste disposal and recycling.

To summarise, recycling could be a potential growth area for Montenegro's industry. As previously stated, if the government provides proper disposal facilities for the population, the population and businesses will likely recycle and dispose of their waste more sustainably. Aside from protecting the environment, this could impact promoting and changing the way industry works in Montenegro, from a linear to a circular way of doing business.

Conclusion, Limitations and Future Research Work

Finally, this work and its research have supported the main hypothesis of the work, which is that the circular economy can assist young, innovative people in finding better and new jobs.

Many different disciplines and approaches are interpreted in this work, and their implementation in both countries would have an impact on the increase of circular economy practise in the world. Portugal, as a country that has already implemented some changes in the sense of circularity, has set a good example in terms of accepting new challenges, opportunities, and social situations. However, a good start must be followed by long-term practise and strategy.

The research for this work, on the other hand, was primarily focused on the opinions of a Montenegrin industry about the circular economy and its implementation in day-to-day business. According to the findings of a study, even though the industry is familiar with the circular economy, the simplest way to implement it would be through recycling. Which has also been the subject of a final section of this work as a possible progress area in Montenegro.

Due to a lack of time, the research could not be conducted in Portugal. However, theoretical and practical examples from Portugal provided the work with a direction in which a single country could begin the transition process. Portugal, as a country in transition, demonstrated interesting results and ways to adapt circular economy as a new normal, new ordinary way of doing business. And in this regard, Montenegro is an excellent example.

This work could serve as a solid foundation for future research and projects on the subject. One of the most intriguing aspects could be the results of implementing CE in Montenegro and the impact of the circular economy in Montenegro. This research would be a great continuation of this master's thesis and could be a useful document for preparing a strategic action plan for Montenegro's transition from a linear to a circular economy.

Circular economy is more than just a popular, current topic. It is still relatively unexplored, and it could be an excellent field for putting one's imagination and innovation to the test. The circular economy, in and of itself, offers a wide range of different things that could be implemented, alternatives to current, that could replace and improve current. As a result, all future works could experiment with this uncertainty, test and try all the limits, and get the most out of this as-yet unexplored field of economic discipline.

As a result, this work could provide an ideal setting for creative, young, and daring individuals to develop ideas for a possible advancement area in the circular economy.

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- Zero Waste Management Montenegro - <https://www.zerowastemontenegro.me/waste-management-status-montenegro>;
- Circular change - <https://www.circularchange.com/>.

Annexes

Interview semi-structured questionnaire – Implementing CE in Montenegro

The primary goal of this semi-structured questionnaire is to gain a better understanding of Montenegro's industry. The questionnaire provided answers to simple questions while also providing an overall view of the industry, providing a clear picture of the opportunities and challenges associated with it.

1. What is the main activity of your company?
2. How many employees do you have?
3. Are you familiar with principles of circular economy (3R reduce, reuse and recycle)?
4. Do you think that your company could implement circular economy in day-to-day doing business?
5. Does your company have a negative impact on the environment?
6. Do you have now the solution for waste disposal?
7. Which principle would be easiest to implement in your company?
8. Do you think that for implementing circular economy the company needs experts from this field?
9. Do you think that the circular economy would change the way of thinking in Montenegro?
10. Would that change have an impact on providing new workplaces for young and innovative people?
11. In your opinion, in which industry sector it would be easiest to implement innovative changes?
12. And in which it would require more time?
13. Can you rate the situation of Montenegrin industry?
14. Do you think that the implementing CE in Montenegro means, at the same time, development and progress of Montenegrin industry?
15. Do you think that implementing CE in Montenegro, would make Montenegro a better candidate for entering European Union?

Upitnik – Uvođenje CE u Crnoj Gori

Primarni cilj ovog polustrukturisanog upitnika je da se bolje razumije crnogorska industrija. Upitnik je podrazumjevaao odgovore na jednostavna pitanja, a istovremeno je pružio ukupan prikaz privrede, pružajući jasnu sliku mogućnosti i izazova povezanih sa njom.

1. Koja je osnovna djelatnost Vašeg preduzeća?
2. Koliko radnika broji Vaše preduzeće?
3. U kojoj mjeri ste upoznati sa principima cirkularne ekonomije (reduce-reuse-recycle)?
4. Da li smatrate da Vaše preduzeće može uvesti cirkularni način funkcionisanja?
5. U kojoj mjeri djelatnost Vašeg preduzeća narušava životnu sredinu?
6. Da li trenutno imate rješenje za odlaganje otpada koje proizvodi Vaše preduzeće?
7. Koji od principa CE biste najlakše mogli da uvedete u Vaše preduzeće?
8. Da li smatrate da za uvođenje cirkularne ekonomije su potrebni stručnjaci i eksperti iz ove oblasti?
9. Da li smatrate da bi cirkularni način razmišljanja promijenio način funkcionisanja privrede u Crnoj Gori?
10. U kojoj mjeri bi to uticalo na otvaranje novih radnih pozicija za mlade i inovativne ljude?
11. Po Vašem mišljenju, u koji sektor naše privrede je najlakše uvesti inovativne promjene?
12. A u kojem sektoru će ove promjene zahtjevati najviše vremena?
13. Po Vašem mišljenju, ocijenite trenutno stanje privrede u Crnoj Gori.
14. Da li smatrate da uvođenje CE u Crnoj Gori istovremeno znači i napredak i razvoj naše privrede?
15. Da li će uvođenjem CE Crna Gora postati atraktivnija zemlja za učlanjenje u Evropsku Uniju?