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# Integrating the Circular Economy into Business Processes to Reduce Waste and Increase Environmental Sustainability

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## Abstract

This article considers the possibilities of introducing the circular economy into various business processes in order to reduce waste and improve environmental sustainability in the conditions of transformational changes in the global economy. The combination of innovative approaches of the circular economy and the principles of environmental management allows business entities to reduce the costs of natural resources, improve the quality of products, and reduce the negative impact on the environment. This approach involves creating a sustainable economy where business works in harmony with nature, ensuring economic success and preserving the environment for future generations. The essence and significance of the circular economy from the standpoint of scientists, managers, and business for the sustainable development of the economic system and ensuring environmental sustainability are considered. The formation of institutional foundations (legislative acts) on the example of the EU member states for the integration of the circular economy into business is highlighted. This provided an opportunity to outline the main principles and directions of the circular economy in the business sphere in the context of global environmental security problems. An analysis of the effectiveness of the circular economy was carried out and its dynamics were considered on the example of the countries of Europe and Asia (CAGR), the city of Amsterdam. The change in the level of reuse of materials at the global level (2004-2022) and in the EU countries (2022) was evaluated as the main indicator of the effectiveness of the implementation of the circular economy in business processes. The advantages and challenges of implementing a circular economy are highlighted and the main principles of environmental management in business are defined. According to the results of the study, the possibilities of introducing a circular economy into business processes to reduce waste and increase environmental sustainability have been determined.

## Keywords

Circular economy; Environmental management; Natural environment; Sustainable development; Zero waste production

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## Introduction

Business plays a dominant role in today's economy and significantly impacts society and the environment. This impact ranges from providing goods and services that enhance and enrich our lives to exploiting our natural resources and causing harm to the environment. In our anthropogenic era, the planet's ability to sustain life ultimately depends on human activity. Therefore, it is vital to clearly understand how companies, particularly those with significant influence, impact the environment to determine the best way to preserve ecosystems suitable for life (Wong, 2023).

The concept of implementing a circular economy to ensure environmental safety on Earth is increasingly being discussed and explored by progressive society. The circular economy relies on business models that involve reusing and consuming materials or products in production processes. This approach aims to achieve sustainable development at all levels, from micro to macro, by preserving the natural environment, promoting social justice, and ensuring the environmental safety of future generations (Kirchherr, Reike and Hekkert, 2017). This model envisions the continuity of the process, whereby a consumed product is transformed into a resource for further production rather than being disposed of (Varfolomieiev and Churikanova, 2020). The closed-loop model aims to create a system where waste and pollution are minimized, and resources are conserved, reducing the impact of production and consumption on the environment (Prysmian Group, 2023). This economy perceives waste as valuable resources rather than garbage, which is a key feature. This approach is crucial due to the significant threat of depletion of many natural resources (Ellen MacArthur Foundation, 2015).

Implementing circular economy business models can increase resource efficiency, enhance differentiation, reduce costs and risks, create new reliable sources of income, and transition to new ways of doing business to increase customer loyalty in the long term (Filanovskyi, 2022). Researchers are investigating the social and ethical aspects of intellectual networks in the context of collaborative and closed-loop economics and digital technologies. It includes concerns regarding cybersecurity and data management (Bleicher and Pehlken, 2020). In essence, the circular economy is a concept that aims to minimize waste and optimize resource utilization in production processes. The primary objective is establishing a system that maximizes the efficient use of resources, materials, and waste rather than their mere consumption and disposal.

## Methodology

This article uses the method of generalization to highlight the importance of implementing circular economy in business processes in order to reduce waste and increase environmental sustainability. Based on the use of the Scopus, Web of Science and Google Scholar databases and the keywords "circular economy", "environmental management", "natural environment", "business process", "zero waste production", a number of scientific publications of scientists from different countries of the world were developed for determination of the main principles and directions of the circular economy in business development, taking into account the transformational changes in the world economy. The method of the system approach was used to analyze all elements and connections in the circular economy system, which allows considering the

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interrelationships between various aspects of the economy, society and the environment. Interdisciplinary research has helped us combine knowledge and methods from various scientific fields, such as economics, ecology, sociology, technology, and others, for a comprehensive understanding of the circular economy (Koshova, Parkhomenko-Kutsevil and Buryk, 2022). A detailed study of individual cases of circular economy implementation was carried out using the case study method (Metabolic, 2023). Data from various official analytical sites, in particular, Eurostat (2004 - 2022), The World Bank (2022), European Commission (2008, 2023), served as the information basis of the study. This gave us the opportunity to better understand the specific challenges, strategies and results of implementing the circular economy into business processes. Graphical and monographic methods were used to visually display the level of reuse of materials in business processes in the countries of the European Union. The system analysis made it possible to outline the advantages and challenges of introducing a circular economy into business and to determine the main principles of environmental management. The conclusions are formed on the basis of the method of empirical generalization.

## Results

The circular economy aims to achieve an economy where production and consumption costs do not lead to environmental problems or resource depletion. This concept is gaining popularity as a response to waste, pollution, and irrational resource use challenges. The legislative package on the circular economy and related waste legislation recently adopted by EU countries does more than incentivize a gradual transition to more sustainable waste management. The package contains commitments and goals to disrupt the status quo and stimulate real change. Resources - knowledge, people, and finances – are needed for this (Interreg Europe, 2020).

The monitoring system of the circular economy has been reviewed, considering climate neutrality and other priorities of the European Green Deal, as well as in line with the latest priorities of the circular economy outlined in the Circular Economy Action Plan for 2020 (European Commission, 2023, 2024). It has also been aligned with recommendations from other EU institutions and stakeholders.

The reviewed system aligns with indicators used to monitor progress towards the 8th Environmental Action Plan (European Commission, 2023) goals, monitoring and forecasting competitiveness and job creation, and enhancing protection of the environment from plastic pollution. By 2030, it is planned that plastic packaging in the EU market will be recycled, consumption of single-use plastic products will be reduced, and the intentional use of microplastics will be limited. The strategy envisages transforming the way products are designed, manufactured, used, and recycled in the EU towards a more circular approach. The goal is to protect the environment and lay the foundations for a new plastics economy where design and production fully meet the reuse, repair, and recycling needs. Alongside the Plastics Strategy, the EU has approved a monitoring system to measure progress made at EU and national levels on transitioning to a circular economy (COM, 2018). The Commission will also provide recommendations to national authorities and businesses on minimizing plastic waste at

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the source. It will continue to support technological innovations, allocating an additional €100 million (Interreg Europe, 2020).

The EU heavily relies on imported raw materials, especially metallic ores and non-metallic minerals, in electrical and electronic equipment (EEE). As product design directly influences how value chain management is handled, building circular, globally resilient value chains inevitably entails a fundamental shift in design practice. EU waste legislation has recently become part of a broader political discourse on sustainable production and consumption, moving towards implementing a circular economy (Atstaja *et al*., 2022). For example, within the Circular Economy Package, the European Commission proposed adding commitments to ensure that by 2030, the amount of municipal waste landfilled is reduced to 10% of the total amount of such waste (European Commission, 2023, 2024).

The EU Commission has committed to analyzing the current situation with critical raw materials in the circular economy context, focusing on efficiently recycling electronic waste, spent batteries, and other relevant complex products with expired service life. With the transition to renewable energy systems outlined in the EU Climate and Energy Package by 2020 and the EU Climate and Energy Framework Program by 2030, additional efforts are needed to incorporate circular economy principles into the design of systemic infrastructure. The consequences of this new approach are yet to be fully assessed. However, it is clear that existing waste management regulations need to be reviewed, and all stakeholders in the product supply chain must take on new responsibilities to change the current production system in the EU and close the loop, as demanded by the circular economy (Leal-Arcas, 2023).

The Enhanced Directives of the European Commission (2023) envisage intensifying the development of the circular economy through waste optimization. Therefore, the circular economy and environmental management are essential elements of the modern business and sustainable development approach. Studying the possibilities of integrating the circular economy into business processes has many advantages, including waste reduction, resource optimization, and increased environmental resilience of companies. The main directions and principles that require attention are highlighted in figure 1.

It is essential to consider that implementing a circular economy requires changes in all aspects of business and can lead to significant environmental and sustainable development benefits. The current economic system can be considered a “linear economy” built on a model of extracting raw materials from nature, transforming them into products, and then discarding them as waste. Only 7.2 per cent of materials used are returned to our economies after use (UNDP, 2023b). It significantly burdens the environment and contributes to the climate crisis, biodiversity loss, and pollution (Dvigun *et al*., 2022a).

On the other hand, the circular economy aims to minimize waste and promote sustainable use of natural resources through more innovative product design, longer use, recycling, and the regeneration of nature. In addition to helping address pollution issues, the circular economy can be crucial in addressing other complex problems, such as climate

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change and biodiversity loss (Tymoshenko *et al*., 2022). It is necessary to consider some critical examples of the circular economy.

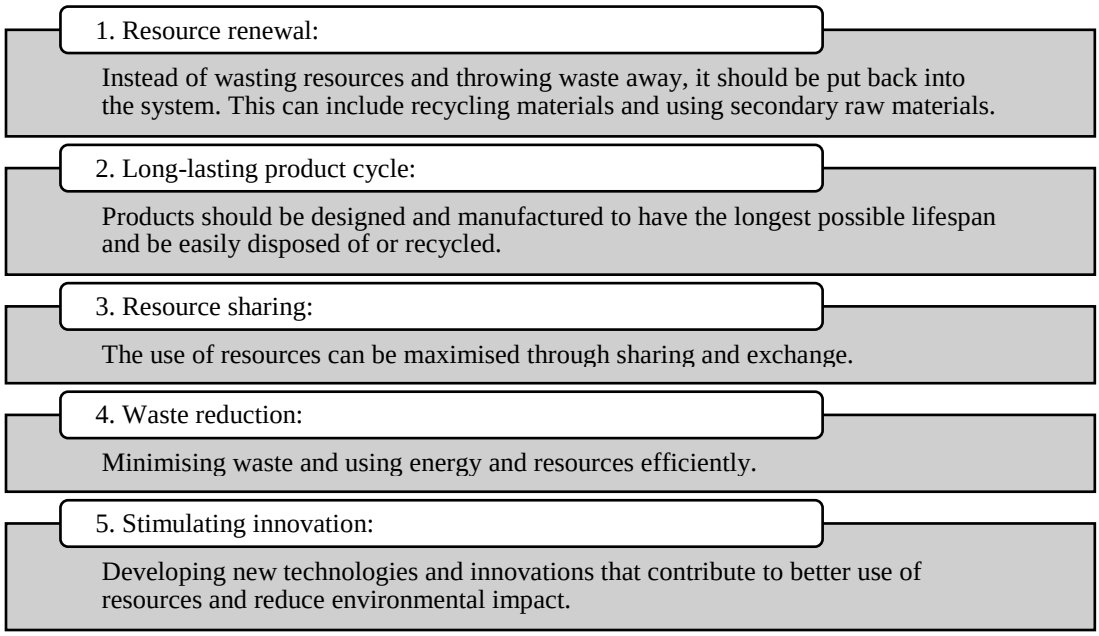


Figure 1: The Main Principles of the Circular Economy
*Source:* Compiled by the authors on the basis of Interreg Europe (2020), Metabolic (2023)

The first example most people think of when they consider the closed-loop economy is waste management, but in reality, the circular economy is much more than that. Circular economy approaches are all around us. They can be used in various industries, from textiles to construction and at various stages of a product's life cycle, including design, manufacturing, distribution, and disposal. In textiles and fashion, initiatives utilize regenerative agriculture to produce organic cotton and other natural fibres, using natural dyes and pigments, thereby providing higher quality and safer clothing for consumers' health and the environment. By producing higher quality clothing, garments can also last longer and be repaired, reused, and recycled.

In construction, circular solutions may include reducing primary materials, reusing existing materials in circulation, or substituting materials with carbon-intensive and regenerative alternatives such as timber. In a closed-loop economy, electronic goods are refurbished, water-soluble, suitable for secondary recycling, and truly biodegradable packaging becomes the norm, and waste of animal origin is used as natural fertilizers and processed into biogas for cooking, heating, and lighting (UNDP, 2023a).

The circular economy aims for maximum product and material longevity. It means avoiding waste through reuse or further use (recycling/reuse). If this is impossible, they are broken down into raw materials and recycled. Waste avoidance and reuse always precede recycling (Wasser 3.0, 2023). The circular economy fosters the development of products for durability, reuse, remanufacturing, and recycling to keep materials circulating for as long as possible. It is an economy that encourages many kinds of

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material uses rather than just consuming them. The circular economy avoids the use of fossil fuels and non-renewable energy. Preserving and increasing renewable resources returns valuable nutrients to the soil to support regeneration and active improvement of the environment (Complete Guide – RTS, 2024).

The circular economy is based on three design-driven domains: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature. Supported by the transition to renewable energy and materials, the circular economy is a resilient system beneficial to businesses, people, and the environment (Ellen MacArthur Foundation, 2023).

The circular economy, known as the "closed-loop economy", aims to achieve holistic, sustainable development goals based on "zero waste". This is related to the concept of dematerialization. The circular economy is part of the relatively new science of industrial ecology, which is crucial for sustainable development. The concept of the circular economy has a significant advantage. If you reuse something, you do not need to return to extracting natural resources and the production process when making the product. Instead, in the circular economy, the end-of-life stage of products and materials should be replaced by regeneration. It is about the concept of "from cradle to cradle". Even Mother Nature employs a cyclical economic approach. Thus, waste reduction is the cornerstone of the circular economy model. It is a concept that acknowledges the constant potential value of materials to reduce resource inefficiency in production and consumption, thereby showing that efficiency is essential. This should be the goal of profound transformation. Therefore, the standard approach to creating, manufacturing, and trading products must change.

Effective environmental management enables businesses to thrive while conserving natural resources and reducing emissions and waste. Environmental management is becoming increasingly crucial for businesses seeking to ensure their sustainability and interaction with the natural environment efficiently and responsibly (Table 1).

Environmental management involves implementing energy efficiency systems and emissions reduction, applying principles of responsible resource use, establishing partnerships with manufacturers and other companies for waste and resource exchange, training staff on circular economy and environmental management, implementing conscious practices among consumers and partners, applying financial incentives for companies adopting circular practices, and implementing taxation systems that consider environmental impact. The exacerbation of the crisis on our planet – ecosystem disruption, climate change, natural disasters, biodiversity loss – directly depends on the increase in the extraction of minerals and human intervention in the natural balance. Activating circular economy development is the only way to preserve the environment and ensure the development of competitive, eco-friendly production.

The updated circular economy monitoring system includes new indicators such as "material footprint" and "resource efficiency". These indicators track the material efficiency of production and consumption systems in the EU. It also includes new indicators to assess the circular economy's progress in developing zero-waste production. All of these are essential components for achieving the goal of sustainable

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development of economic systems through the implementation of environmental technologies, climate neutrality, and resilience, taking into account consumer footprint, minimization of harmful emissions into the air, reducing dependence on imported materials, and EU self-sufficiency in vital raw resources (Dvigun *et al*., 2022b).

Table 1: Key Environmental Management Elements in a Circular Economy System

| *Elements* | *Description* |
|---|---|
| Environmental management policy | Formulation and acceptance of business commitments to ensure environmental safety in the production process and optimization of negative impacts. |
| Planning and impact assessment | Develop plans and strategies to reduce the company's environmental impact.<br>Conducting environmental impact assessments to identify critical aspects and opportunities for improvement. |
| Legal compliance | Compliance with all environmental and environmental-related laws and regulations. |
| Environmental management systems | Implement environmental management systems (e.g., ISO 14001) that help systematically improve the environmental performance of the business (company). |
| Efficient use of resources | Improving energy efficiency and optimizing the use of water and other resources. |
| Reducing emissions and waste | Implementation of technologies and processes aimed at reducing emissions and waste.<br>Develop recycling programmes and use of recycled materials. |
| Employee education and engagement | Provide training and awareness raising for staff on environmental issues and practices.<br>Involve staff in environmental management initiatives and programmes. |
| Stakeholder engagement | Establishing effective communication and cooperation with all stakeholders, including customers, suppliers and public organizations. |

*Source:* Compiled by the authors on the basis of Youmatter (2018), Interreg Europe (2020), The World Bank (2022), European Commission (2023), Prysmian Group (2023)

Analysis shows that while production in the EU is becoming more resource-efficient, the level of consumption needs to be lowered and decreased in the future. By 2025, each European is projected to be “responsible” for 35 kg of plastic packaging, which is 25% more than in 2010. Waste management is becoming more sustainable, but there are still significant differences between member states, requiring increased economic activity to combat plastic (Environment Law Human, 2023).

Despite the positive gains from the circular economy, the EU economy remains linear. The recycling rate of many metals and rare earth elements (e.g., lithium, gallium, neodymium) at the end of their service life is around 1% (Zlotnik and Tkachuk, 2022). In recent years, the circular economy sector has become more innovative and is growing in terms of investment, profitability, and employment. In the EU, private investments in sectors related to the circular economy amounted to around €120 billion in 2021, accounting for 0.8% of the EU's GDP. These sectors employ 4.3 million people, which

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is 11% more compared to 2015, and the added value of the circular economy sector has increased to 30%, or approximately €300 billion (ZipDo, 2024).

Greenhouse gas emissions during economic activities in the EU have decreased by about one-quarter from 2018 to 2022, ensuring climate neutrality (ECDR, 2024). Regular analytical research on circular economy achievements and progressive approaches to environmental marketing significantly contributes to shaping effective environmental policies and measures in the EU and implementing best practices in the business sector. The EU's circular economy monitoring program is designed to serve this function as an official database source in European countries. This monitoring system includes ten indicators covering key aspects and priorities of the action plan, such as production and consumption, environmental management, recycled materials, competitiveness, and innovation.

The European Commission also seeks to ensure that the EU does not export its waste problem to third countries. After China banned the import of 24 types of waste in 2018, the EU faces pressure to increase its waste processing capacity significantly (COM, 2018). In 2017, the EU sent 60% of its plastic production and 13% of paper for processing to China, but by 2019, exports to China had ceased altogether. Since then, European waste has been redirected to other countries such as Malaysia, India, Indonesia, and Vietnam. Not only are these countries less capable of handling waste, but "waste tourism" also makes no sense (Bayev *et al*., 2022). It is a worrying signal for Europe, and the European waste management industry will contribute to job creation in product design innovation and the production and use of locally recycled materials (Interreg Europe, 2020).

The circular economy keeps materials and products in circulation for as long as possible. The European Union's Programme for conserving marine biodiversity aims to protect marine ecosystems and water biodiversity (UNDP, 2023c; EUR-Lex, 2022). This program aims to reduce pollution and conserve natural resources in seas and oceans. It includes measures to monitor the state of water resources, develop effective strategies for managing marine resources, and jointly promote cooperation between countries to conserve the aquatic environment. To achieve this program's goals, the public's active engagement in marine biodiversity conservation activities is essential. The circular economy reduces material usage, recycles materials and products to make them less resource-intensive, and turns "waste" into resources for producing new materials and products (European Commission, 2008).

The Sustainable Materials Management (SMM) approach, which the EPA and other federal agencies have adhered to since 2009, incorporates circularity. It demonstrates our continued focus on reducing the negative impact of materials throughout their life cycle, including their climate impact, reducing harmful materials, decoupling material use from economic growth and satisfying societal needs. The Environmental Protection Agency (EPA) aims to evaluate materials' impact on communities objectively. To achieve this, the EPA has released a series of strategies dedicated to building a circular economy for all. The circular economy involves a shift from owning products to leasing or sharing them, and the EPA's vision is comprehensive and equitable and reflects the urgency of the climate crisis (US EPA, 2023).

The circular economy shifts from owning products to leasing or sharing them. In addition to improving product utilization, leasing or sharing stimulates the development of more reliable products that are easier to service and repair, thereby reducing waste. The development of platforms and apps that connect buyers and sellers to earn transaction commissions promotes asset sharing (e.g., Uber and Airbnb or mobility as a service for public transportation). Trust is crucial for asset sharing and is facilitated by online reviews and ratings of buyers and sellers.

In the current economy, circularity refers to a model where used materials are recycled or returned to the biosphere without causing harm. A vital aspect of the circular economy is the perception of waste as a valuable resource rather than rubbish. This approach is crucial due to the depletion of many natural resources. In a closed-loop model, the economic cycle follows the same stages as a linear model but without interruption. After the product is consumed, its waste is not disposed of but sent to specialized recycling centres, where it is processed and becomes a resource for producing other goods (Varfolomieiev and Churikanova, 2020).

The circular economy is a model in which materials from waste are reused or returned to the biosphere without harmful consequences. In the circular economy, the production cycle undergoes the same stages as the linear model, but the cycle is not interrupted. After product consumption, waste is not disposed of but sent to recycling centres, where it is processed and transformed into resources for further production of goods (Koval *et al*., 2023).

The circulation of the economy has the potential to increase logistics efficiency. Product flows from manufacturers will be more balanced with flows of defective or depleted products, which are returned to manufacturers for repair, disassembly, refurbishment, or recycling (Ellen MacArthur Foundation, 2015) in a process known as “reverse logistics”. Examples at the lower end of the value spectrum include mass-produced products such as tyres, transport pallets, or consumer electronics, which may be subject to EPR legislation. In this case, the aim is to maximize return volumes and standardize reverse logistics for optimal value retention at minimal costs. Machinery and automotive parts are examples in the middle of the value spectrum. Returning used parts can be combined with sending new or refurbished parts from the manufacturer as part of a seamless replacement service. Finally, complex medical equipment is an example at the upper end of the value spectrum. Special handling may be required to retain the value of product returns. Manufacturer asset collection can be combined with its replacement with a new or refurbished asset to ensure continued service provision.

The impact of the circular economy on the environmental condition of large cities is complex, but it is generally believed to promote agglomeration and the development of multifunctional urban areas. Unlike mass production, reuse, repair, refurbishment, recycling, and waste utilization are small-scale, labour-intensive, and specialized activities that occur near markets and are interconnected through micro-logistics. Recycling, waste utilization, and incineration can occur on a larger scale and are often convenient for ports. For example, the port of Amsterdam considers itself a primary location for waste processing and recovery as Amsterdam moves towards economic circulation (Bell, 2021).

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Amsterdam is a leader in applying circular economy concepts to the environmental management of large cities. The city administration adheres to the following fundamental principles of the circular economy: not producing unnecessary products; intensive product use (designed for a more significant number of consumers or used in different ways); optimization of energy and raw material use; product reuse; repair of defective products to restore their initial function; reuse of product materials in new products; product recycling with energy recovery (Figure 2).

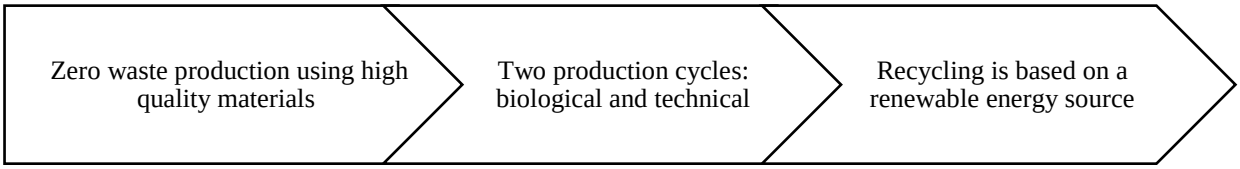


Figure 2: Basic Principles of Environmental Management in the Circular Economy in Amsterdam (*Source:* Metabolic, 2023)

The environmental management policy in Amsterdam aims to halve the use of new raw materials by 2030 and create a fully circular city by 2050 (European Commission, 2023). In transitioning to a circular economy, Amsterdam is supported by the Dutch government and the European Union. Significant political decisions are needed, such as shifting from taxing labour to taxing resources and energy to incentivize circular behaviour (Metabolic, 2023).

Implementing this approach will create many jobs in small businesses, which is highly needed in the post-pandemic world. It will also stimulate demand for a logistics analogue of micromobility: small-volume goods transported short distances on cargo bikes or electric vans (Youmatter, 2018). Cities worldwide have recently witnessed a rapid increase in bicycle couriers working in the gig economy for companies like Ubereats and Deliveroo, which provide micro-logistics for customers. It provides essential income for students and others who value the flexibility of the gig economy but raises important questions about labour rights (such as the right to paid leave and a minimum wage). Currently, the main products delivered this way are meals from restaurants, but this mode of delivery can be expected to grow in quantity, scale, and economic significance.

Key indicators of the circular economy: In 2019, the global circular economy market was estimated at $876.7 billion (Dagilienė *et al*., 2021); Europe dominated the market in terms of profitability, accounting for 34.82% of the global market in 2019 (Environment Law Human, 2023); by 2030, Europe aims to achieve 50% waste recycling in its movement towards a circular economy; by 2025, it could create an additional $4.8 trillion in global economic output (The World Bank, 2022). The Ellen MacArthur Foundation reported that by implementing a circular economy, Europe could gain a net benefit of €1.8 trillion by 2030 (Ellen MacArthur Foundation, 2015, 2023). The Asian circular economy market is expected to have a CAGR of over 12.0% during the forecast period 2021-2027. The World Economic Forum has called for a transition to a circular economy, which could yield an annual benefit of $700 billion (ZipDo, 2024).

In 2021, people consumed approximately 100 billion tonnes of raw materials, such as oil, metals, and gas. According to the Circularity Gap Reporting Initiative (2023), only 8.6% of this was reused (Environment Law Human, 2023). That is, over 90% was not. However, resource availability becomes an increasingly significant risk as geopolitical tensions rise (Sumets *et al*., 2022). It is one reason companies across many industries carefully examine new business models for efficient resource use and a closed-loop economy. This move could spark a boom for this type of business (Berger, 2021).

The primary measure of circular economy performance is the material reuse coefficient (CMU), determined by the ratio of recycled materials used to total usage. Total material usage is measured as the sum of gross domestic material consumption (GDMEC) and the use of secondary materials; GDMEC is defined in terms of economic material flows. Circular material use is assessed by the amount of waste recycled by domestic recycling plants minus the amount of waste imported for recycling plus the amount of waste exported for recycling abroad. Higher CMU values mean that more recycled materials replace primary raw materials, thus reducing the impact of primary resource extraction on the ecosystem (Figure 3).

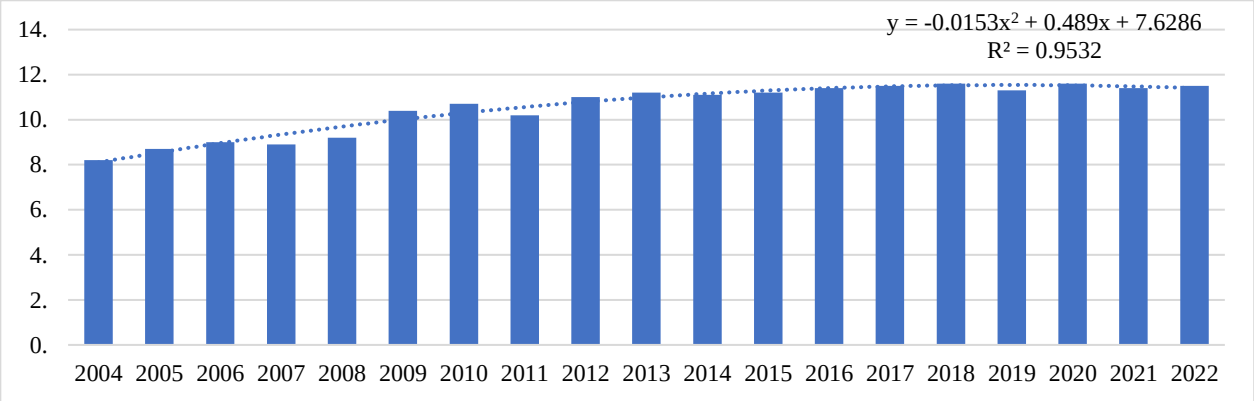


Figure 3: Changes in Material Recycling in the EU (2004-2022), %
*Source:* Eurostat (2004 – 2022)

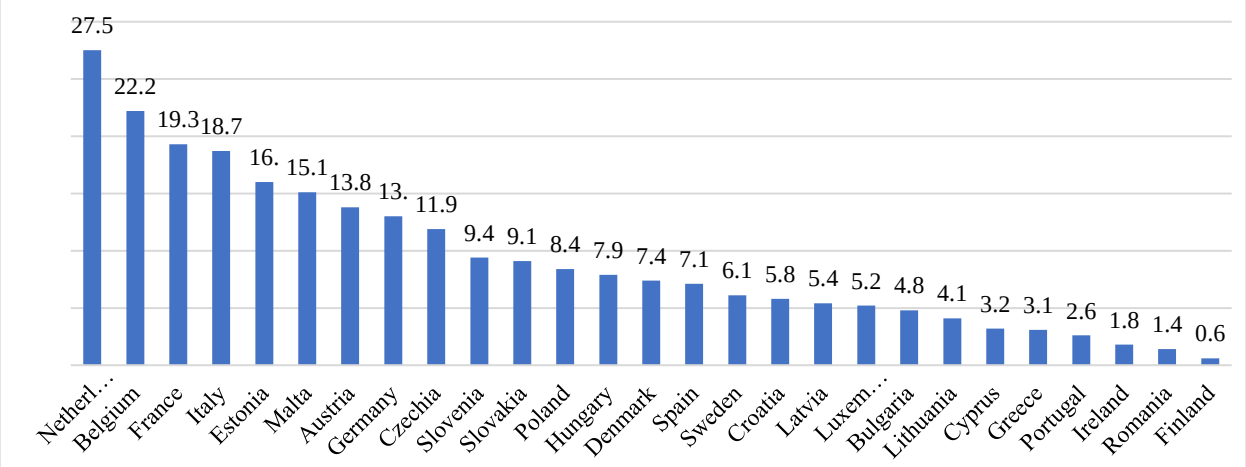


Figure 4. Recycling Rates in EU Member States, 2022 p. %
Source: Eurostat (2004 – 2022)

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Among the European Union countries, the level of material recycling is highest in the Netherlands (27.5%), Belgium (22.2%) and France (19.3%), and lowest in Finland (0.6%) (Figure 4).

The integration of the circular economy into business processes is becoming increasingly important amid global environmental challenges such as climate change, depletion of natural resources, and the growth of waste. The circular economy offers an alternative to the traditional linear "take-produce-discard" model by using resources more efficiently and creating closed production and consumption cycles.

## Discussion

Implementing a circular economy in business processes aims to reduce waste and improve environmental sustainability. It may be appropriate for businesses due to the growing focus on sustainability and environmental issues. Research shows that the transition to a circular economy can lead to lower costs, new sources of revenue, and a reduction in negative environmental impact. When implementing a circular economy in business processes, there are benefits and challenges for companies and industries (Table 2).

Table 2: Benefits and Challenges of Implementing a Circular Economy in Business

| *Benefits* | *Challenges* |
|---|---|
| Minimizing waste and $CO_2$ emissions | Inadaptability of markets to the latest business models |
| Encouraging the extension of the life of goods and limiting resource consumption | Complexity and high cost of transition to a circular economy |
| Optimizing production costs through the reuse of materials | Lack of knowledge and competencies among employees and managers |
| Improving corporate reputation and customer loyalty | Competition with traditional business models that do not involve the reuse of resources |
| Developing a sustainable pricing policy for resources and reducing risk | The importance of internal organizational efforts to implement a circular economy |
| Harmonizing legislation and environmental standards | Low level of initiative on the part of businesses to move to circular economy principles, limited availability and quality of secondary raw materials |

Caterpillar, Philips, Nike, and Airbnb have successfully implemented circular economy business models. Their experiences demonstrate that transitioning from the current linear growth model to a circular one is already underway. Therefore, it is vital for organizations, regardless of their market, region, or sector, to begin laying the foundation for decoupling growth from the use of limited resources (Filanovskyi, 2022).

The current growth model is no longer sustainable for our planet. To ensure a sustainable future for all, we must change our habits and seek ecological development paths. It is important to act together to preserve the environment, as we constantly use additional resources, pollute the environment, and contribute to climate change. In order to preserve

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our planet for future generations, we must find more sustainable and environmentally friendly development paths. Making conscious decisions and collaborating to preserve the environment and ensure a sustainable future for all is crucial. Resource scarcity, waste generation, and climate change are pressing issues today. The rapidly growing population's needs and consumer and policy demands to reduce businesses' negative impact are leading to linear growth. However, transitioning to a circular economy can improve reductions and contribute to the planet's sustainable development.

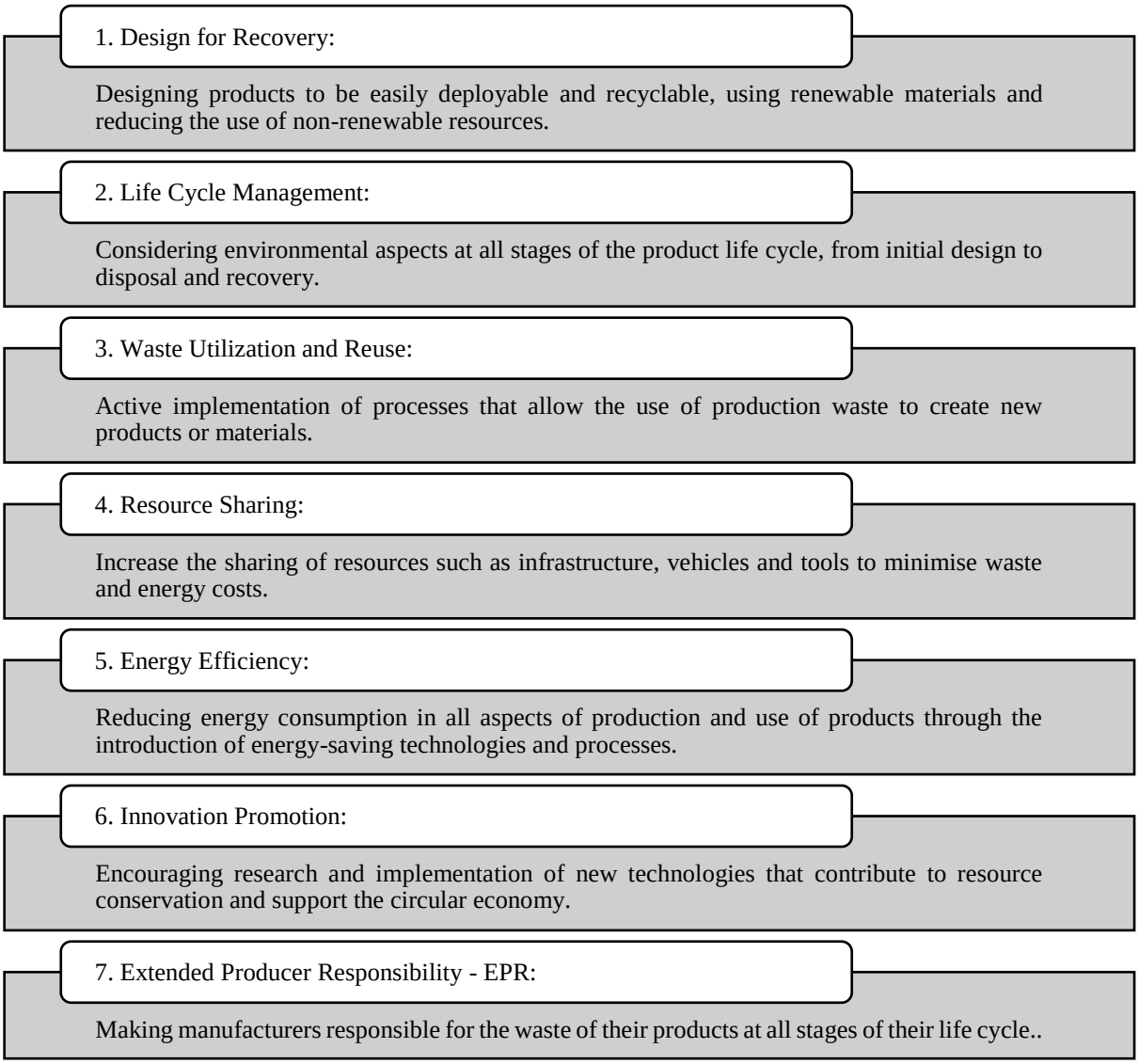


Figure 5: Basic Principles of Environmental Management in a Circular Economy

Companies can innovate, create more value, and gain circular advantages for decades with a clear understanding of the motivation for moving away from the linear model and a proactive strategy based on business models, technologies, and opportunities critical to success (Gurochkina and Budzinska, 2020).

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Several barriers exist to implementing the circular economy model in our current economic system. For instance, social and environmental externalities are not factored into prices, and financial markets are prioritized over people and nature when making decisions. Additionally, commodity prices are variable, and high-quality alternative secondary sources are not competitive at low prices. Developing circular business models is more challenging because most investors still operate under the logic of the linear economy and sometimes require initial capital investment. Furthermore, demand for circular and alternative products remains low (Ellen MacArthur Foundation, 2023).

In the field of Information and Communication Technologies (ICT), there is a need for more qualified professionals and technical knowledge. Environmental management in the circular economy involves strategies and approaches to conserve resources, reduce waste, and maximize material use. The circular economy is based on a “closed loop”, where resources are efficiently used, recycled, and reused, avoiding excessive consumption and waste. Seven main aspects of environmental management in the circular economy are highlighted in figure 5.

Ensuring effective environmental management in a circular economy is essential for preserving natural resources, reducing environmental impact and creating a sustainable and responsible business model.

Integrating the circular economy into business processes is a challenging but necessary step to achieve environmental sustainability. It requires cooperation between governments, businesses and the public sector, investment in new technologies and raising awareness among the public. The benefits that a circular economy can bring outweigh the challenges to its implementation and include economic, environmental, and social benefits.

## Conclusion

Implementing the circular economy into business processes offers several opportunities, including material and resource recycling and reuse, designing easily repairable or recyclable products, using alternative sources of energy and materials, and promoting long-term use of goods. This approach can help companies reduce costs and improve their reputation among consumers who value environmentally sustainable products. Resource scarcity, environmental pollution, and fragile supply chains are significant challenges of our time.

The circular economy offers sustainable solutions by minimizing waste and maximizing product lifespan. It includes encouraging shared use, repair, and recycling. The circular economy is the opposite of the traditional linear economic model, also known as the 'take-make-dispose' economy. Despite the low cost of resource extraction, transitioning to a circular economy and circular business models remains challenging.

Therefore, the circular economy aims to minimize waste and promote resilience by keeping resources in use for as long as possible, extracting maximum value from them, and restoring and regenerating products and materials at the end of their service life. The

circular economy is based on the idea that products should be designed for reuse, repair, or recycling instead of being disposed of after a single use.

Environmental management involves integrating environmental considerations into business processes and decision-making to reduce negative impacts on the natural environment.

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