

Green packaging role toward circular economy

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Introduction

Relevance. As the world struggles with climate change, resource scarcity and environmental degradation, more and more attention is being paid to the development of the circular economy and the integration of green practices into business operations. Circular economy (CE) covers a wide spectrum of topics ranging from waste management, through materials to supply chain, amongst which packaging is an essential part for achieving a truly circular economy.

Packaging is an integral part of a company's supply chain, but the growth rate of its waste poses social, economic and environmental problems. This does not meet the basis of the CE, which is built on the principles of resource efficiency and a low-carbon footprint. To enable a smooth transition from a linear to a circular system, packaging design has been recognized as the fundamental stepping-stone towards a circular economy (Zhu et al, 2022).

In order to reduce pollution, companies are encouraged to switch to more sustainable packaging in their supply chain process. Research shows that the use and promotion of green or sustainable packaging, the use of sustainable materials and design is an important part of green supply chain management (Wandosell et al, 2021). From a business perspective, companies are forced to switch to more sustainable packaging not only due to laws and regulations, but also due to public pressure. Pålsson and Olsson (2023) emphasize that new policy measures and sustainable practices must be promoted not only through regulations, but also through incentives for economic benefits, such as tax breaks or subsidies that encourage the use of sustainable packaging, increase consumer awareness of waste reduction and its importance.

As part of global sustainable development initiatives, companies using green packaging (GP) can gain public recognition for their efforts to protect the environment (Yen and Wong, 2019); improve the company's image and competitiveness in the global market; can help companies optimize resources, materials and waste to achieve corporate sustainability goals (Maziriri, Citation 2018).

Despite ongoing research on this topic, it is relevant to find out the benefits of using GP, the driving and limiting factors, the impact of using packaging on the green supply chain and the development of the CE.

This study aims to reveal the role and benefits of using green packaging in contributing to sustainability and the development of a circular economy.

Research method: analysis and synthesis of scientific literature.

Methodology

The search for scientific literature was carried out using Web of Science, Scopus, Elsevier, Google Scholar databases.

The following keyword combinations in English were selected for the search: "green packaging and circular economy" or "packaging innovations" or "sustainable packaging and circular economy" or "benefits of green packaging for circular economy".

The publication years of the articles had to cover 2017-2023 period. Full-text articles were included in the analysis.

Out of 324 literature sources found, 27 sources met the criteria and were included in the systematic review.

The analysis of the articles was carried out in three stages: 1) review of the title, 2) review of the summary, 3) review of the entire text. The results of the analysis are based on the content of the examined text.

Results

GP benefits	Explanation
R e d u c e d Environmental Impact	GP involves materials that are renewable, biodegradable, or recyclable, leading to reduced resource consumption, energy use, and waste generation.
R e s o u r c e Conservation	By utilizing recycled paper, cardboard, or bioplastics, GP helps conserve natural resources like forests and petroleum, promoting a more sustainable use of resources.
Lower Carbon Footprint	GP often involves materials sourced from renewable sources or those with lower carbon emissions during production, transportation, and disposal.
Support for CE Principles	By prioritizing materials that can be reused, recycled, or composted, thus closing the loop on material flows and reducing dependence on finite resources.
C o n s u m e r Preference	Consumers increasingly favor products packaged in eco-friendly materials, leading to a competitive advantage for businesses that adopt GP practices.
R e g u l a t o r y Compliance and Risk Mitigation	Adopting GP helps businesses stay compliant with existing and future regulations, reducing the risk of fines and reputational damage.
Cost Savings in the Long Run	Businesses can realize cost savings through reduced waste disposal fees, lower packaging material costs, and improved efficiency in packaging processes.
Innovation and Brand Differentiation	Embracing GP encourages innovation in materials and packaging design, offering opportunities for brands to differentiate themselves in the market by demonstrating commitment to sustainability.
Enhanced Brand Image and Customer Loyalty	Companies that prioritize environmental sustainability through GP initiatives often enjoy a positive brand image, leading to increased customer trust, loyalty, and brand affinity.

Results

The principles of green packaging toward circular economy.

Resource-saving packaging

- Reduce the amount of materials
- Use recycled materials
- Reduce the impact of transport
- Change the packaging process
- Increase water and energy efficiency
- Use materials from responsible suppliers

The packaging is made of harmless materials

- Reduce the risk associated with hazardous materials
- Use renewable or recyclable materials

Standardization of packaging

- The change in the quantity of the primary package in the secondary package
- Standardization of materials
- Standardization of dimensions

Reusable packaging

- Design for reuse
- Design for recovery

Main conclusions

- The essence of Green packaging is to protect the environment by using resources efficiently.
- Packaging using recycled materials has a positive effect on the economic results of the business, while green packaging reduces material costs, allows efficient use of space in warehouses and during transportation, and increases productivity and efficiency throughout the supply chain.
- The implementation of a strategy for the use of green and sustainable packaging and further innovation in the packaging sector should be one of the main goals for the implementation of circular economy principles and environmental protection goals.