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Fostering Sustainable Packaging Industry: Global Trends and Challenges

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ABSTRACT:
The article is focused on the examination of market dynamics of eco-friendly packaging both in Ukraine, the European Union and globally. This involves a comprehensive analysis of companies operating within the eco-friendly packaging sector with a focus on understanding their methodologies and tactics for introducing new products into the market. It investigates the prevailing trends and primary catalysts shaping the regulation, consumption, and production patterns of eco-friendly packaging on a global scale. This considers a broad spectrum of factors, including the rising trend of on-the-go food consumption, concerns environmental sustainability and human health, governmental initiatives, and strategic collaborations across various industries. These factors collectively contribute to the expansion of the eco-friendly packaging industry, enhancing its efficacy and allure for investment. The research provides overview of important trends and main challenges, causing discussions in the context of fostering sustainable packaging industry. In particular, there are discussion about the long-term environmental effect of certain materials and eco technologies. There is a complexity in understanding the diversified legislative basis for sustainable packaging industry development in different countries. There is also an area for discussions on the issue of consumer's understanding of eco-friendly packaging advantages. Additionally, the research explores shifts in consumer preferences, the integration of novel technologies in packaging material manufacturing, and the establishment of standards and regulations governing eco-friendly packaging. It focuses on evaluating the growth trajectory of the eco-packaging sector and the operational strategies adopted by companies within this domain specifically in Ukraine. This analysis encompasses an assessment of financial metrics, innovative methodologies, market competition dynamics, and other pertinent variables influencing the performance and viability of companies operating in this sector within the Ukrainian market context.

Keywords: sustainable development, sustainable finance, ecological packaging, environmental polution.

1. Introduction

Modern society is facing an urgent problem of environmental pollution, which has become a challenge for the entire humanity. Environmental pollution caused by various industrial processes and unbalanced consumption is one of the most pressing issues of our time. Natural resources are dwindling, the climate is changing, and careless attitude to the environment leads to environmental disasters. Ensuring sustainable development and preservation of natural resources is becoming a priority for all countries of the world.

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Increasing consumer awareness of environmental issues and changes in legislation are aimed at reducing the negative impact of human activity on nature. Eco-packaging can help reduce waste and pollution by attracting consumers to environmentally conscious products. The introduction of eco-packaging can also have a positive impact on the economy by reducing waste disposal costs and helping to support environmentally conscious brands. The growing demand for environmentally friendly products creates opportunities for companies working on innovative eco-products. Innovations in production, packaging, and promotion are key to successfully bringing a product to market. However, it is also important to work actively to create environmental awareness among consumers using modern marketing and communication tools. All of this will contribute to the development of the sustainable sector and increase environmental awareness among the population. Thus, the study of the use of innovative technologies to bring a new eco-product to the market and to shape the environmental awareness of consumers is an important and relevant area that meets modern challenges.

The increase of the above-mentioned trends at practice globally caused the growing attention to these issues within the researches. Green marketing, also known as environmental marketing or sustainability marketing, is an important topic in modern business and marketing. In the global literature and research, green marketing has been the subject of some scientific papers and publications of the prominent authors who have made significant contributions to the field, including Ph. Kotler, D. Specker, M. Porter, J. Frosen and F. Lobel. The following experts have written about the problems of innovation marketing: E. Rogers, D. Peppers, P. Kotler, G. Armstrong, etc. (Peppers and Rogers, 2011; Kotler and Armstrong, 2015). These practical experts and researchers have made a significant contribution to the development and understanding of innovation marketing, and their works can be valuable sources of information for studying this topic. However, due to the complexity of above-mentioned issues, there is lack of practical considerations on the issues of regulation, consumption and production of ecological packaging.

To estimate global trends in regulation, consumption and production of ecological packaging, a measure of following aspects are considered within the current article. Firstly, the research tends to explore eco-packaging technologies and their role in reducing the negative impact on the environment. Secondly, the regulation of environmental initiatives and its impact on the sustainability and effectiveness of environmental protection measures are considered. Thirdly, we will analyze trends in eco-consumption and the impact of environmental awareness on consumer behavior. Then, we will look at the prospects for the European biodegradable packaging market. It is reasonable also to analyze regional markets in terms of macroeconomic indicators, and investigate the main players in the eco-packaging market by assessing their microeconomic activities and analyzing company reports and ORBIS data.

2. Eco-packaging technologies and their role in reducing the negative impact on the environment

According to a report by the World Wide Fund for Nature (WWF), more than 80% of local water systems in the world were contaminated with chemicals in 2022 (Living planet report, 2022). Approximately 300-400 million tonnes of toxic waste, including plastic waste, is dumped into the oceans each year, causing serious harmful effects on marine animals and ecosystems (Dincer, 2016). Air pollution causes millions of deaths annually, and the effect of thermal greenhouse gas leads to climate change, which can have far-reaching consequences for our planet (Craves, 2019).

The problem of environmental pollution has a different nature and severity in different regions of the world (Daft, 2018). There are countries and regions where pollution is a very serious threat, while others have better indicators of sustainable use of natural resources and environmental protection.

In response to environmental pollution, eco-packaging technologies are being developed, such as 3D printing, nanoparticles, biodegradable materials, recycled materials, and plant materials (Table 1).

Table 1

Technologies for creating eco-friendly packaging

Technology	Description.
3D printing	Allows you to create unique and effective packaging with minimal use of materials
The use of nanoparticles	Adds extra strength and protection to packaging with minimal material usage
Use of biodegradable materials	Allows packaging to decompose naturally, reducing waste
Use of recycled material	Allows to reduce waste and reuse materials
Use of plant materials	Allows you to create biodegradable packaging with the smallest environmental footprint

Source: compiled based on (Dincer, 2016; Craves, 2019; Daft, 2018).

We have not included PET technology in Table 1, although many eco-packaging market researchers include this technology in the category of eco- friendly technologies (this issue will be discussed later in this section). At the same time, the PET market is a significant driver for the development of alternative eco- packaging technologies. According to a study by Allied Market Research, in 2021, the European market saw an increase in prices for PET raw materials. The sharp rise in PET prices was caused by a restriction of PET supplies in Europe due to high freight rates from Asia and a lack of raw materials. In addition, in Northwest Europe, the cost of recycled PET (RPET) compared to virgin PET reached a record level in June 2021 (Global 500, 2022; Hakala etc., 2015; Sustainable packaging research, 2022). Prices for virgin PET were under pressure from supply and demand, as well as weak buying interest, which led to a lack of consumption capacity. Such fluctuations in raw material prices significantly hampered the growth of the PET packaging market (Formel, 2015; Regulation (EU) 2019/2088, 2019).

While the price differential between recycled and virgin plastic has been growing in recent years, the COVID-19 pandemic has further accelerated this disparity. As a

result, most European plastic recyclers are suspending production due to current market changes. Factors contributing to the shutdown include the following: lack of demand due to the closure of recycling plants; record low virgin plastic prices; and a decline in activity worldwide (Economies in 2023, 2022; Action Plan, 2018). These factors affect the spread of more environmentally friendly, alternative PET technologies in the eco-packaging market.

3. The regulation of environmental initiatives and its impact on the sustainability and effectiveness of environmental protection measures

The global community is searching for legislative ways to address the problem of environmental pollution caused by the mass production and consumption of plastic packaging (Lado, 2018). The rapid increase in the amount of packaging waste that causes irreparable damage to the environment stimulates the need for active implementation of environmentally friendly packaging (Dodds, 2011). At the same time, there are different approaches to regulating the issues of standardisation and legislative control over environmentally friendly packaging between countries, including in Europe (Simoes, 2014). This creates difficulties for solving the problem at the global level. The level of regulation of environmental initiatives in countries/regions varies and indicates the general state of environmental regulations and legislation in each of the entities under consideration, helping to compare approaches to environmental protection at the international level.

The regulation of the eco-packaging market in the United States of America deserves special attention. The US government is adapting to other sources, such as biodegradable packaging, in response to the growing amount of packaging waste produced worldwide (Global Construction Plastics Growth Opportunities, 2022). Despite the fact that the US has only 4% of the world's population, it produces 12% of the world's municipal solid waste (MSW) (Market leaders, 2023; EPA, 2023). for the US Plastic Waste Reduction and Recycling Act, this law was passed in September 2020 and contains a number of measures to reduce the environmental impact of plastic waste. The law provides for the development of a national strategy to reduce the use of plastic, increase the efficiency of waste recycling and support the development of new recycling technologies. The law also sets standards for microplastics, which may become restrictions on plastic production in the future. Future restrictions governing plastic production may be more stringent for US packaging firms as a result of ongoing research into the microplastic law (Kerin, 2018). In addition, the use of renewable resources, as opposed to finite ones, and other positive environmental impacts throughout the life cycle make bioproducts potentially beneficial for the greenhouse gas balance (Deshpande, 2013). The use of biodegradable materials aims to promote sustainability and reduce the environmental damage caused by the disposal of polymers made from petroleum. The growing awareness of environmental issues among the world's population indicates an active development of environmental awareness. People are more aware of natural resources, energy efficiency and the environmental impact of business activities. This helps to improve the ecological state of the planet and engage society in joint efforts to preserve nature. As a result, there is a growing demand for

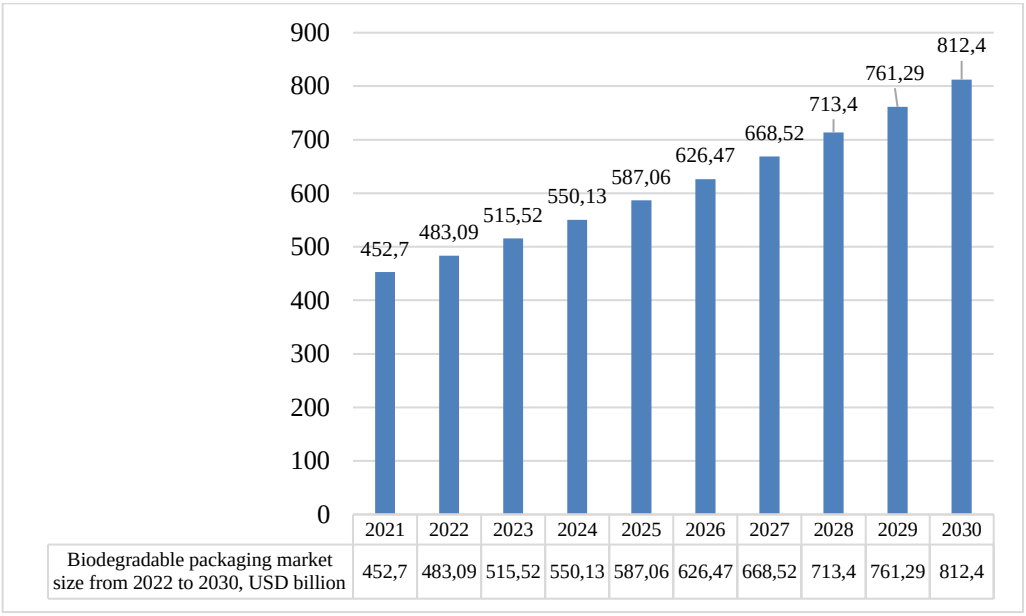
environmentally friendly packaging and a reduction in the use of environmentally harmful materials in packaging, so we can identify the main market drivers. The development of the eco-friendly packaging market is driven by the provision of a legislative framework and support from governments, as well as growing awareness among the population of the need to conserve natural resources and reduce negative environmental impact.

Thus, one of the main drivers of the food packaging market is the growing demand for biodegradable packaging, driven by the increasing number of customers choosing to eat on the go, as well as environmental concerns about non- ecological packaging materials. This is creating new opportunities for the biodegradable packaging market, but also poses major challenges in terms of product quality and consumer safety. Technological innovations, concerns about sustainability, and attractive economics are some of the factors contributing to the significant growth of consumer packaging (Mobility and Transport, 2022).

4. Trends in eco-consumption and the impact of environmental awareness on consumer behaviour

Packaging for the consumer goods industry plays a key role in making a product attractive to a potential buyer and delivering products that are sufficiently complex, safe, convenient and appropriate to the consumer (Brem, 2019). According to *Pro Carton* and their research conducted in 2021, more than half of Europeans consider the COVID-19 pandemic to be the biggest problem, while climate change was rated as the second most important problem (Sustainable food, 2023).

Although plastic packaging has become popular among consumers for other products due to its lightness and strength, major manufacturers are beginning to pay attention to the sustainability of the development and use of environmentally friendly packaging materials (Figure 1). Technological innovations, such as the use of polymers (PET and HDPE), can expand the use of plastic packaging while reducing its negative impact on the environment. The above-mentioned legislative initiatives and the development of eco-consciousness are having a positive impact on the development of the eco- packaging market, with forecasts indicating significant growth in this segment over the next few years. According to a study by *Frost & Sullivan* conducted in 2021, the global biodegradable packaging market was estimated at USD 452.7 billion, and is expected to grow to approximately USD 812.4 billion by 2030, with a registered compound annual growth rate (*CAGR)* of 6.71% between 2022 and 2030 (Figure. 1) (Market Leader, 2023).



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Biodegradable packaging market size from 2022 to 2030, USD billion	452,7	483,09	515,52	550,13	587,06	626,47	668,52	713,4	761,29	812,4

Figure 1. Growth of the eco-packaging market from 2022 to 2030, including PET packaging, USD billion
Source: compiled based on (Teleperformance Earns Frost & Sullivan's, 2023).

It should be noted that the volume of the eco-packaging market includes PET bottles as recyclable, i.e., theoretically, they should not pollute the environment. Recycled PET bottles are used by beverage companies such as *PepsiCo*. In North America and abroad, 30% and 7% of the packaging volume is made up of recycled PET bottles from *PepsiCo,* respectively. However, it is expected that the use of recycled PET for beverage packaging will be limited in developing countries such as India due to high production and recycling costs (Beverage Packaging Market, 2023).

However, in our opinion, PET bottles are not eco-friendly packaging, although their use can reduce the environmental footprint, as they can be recycled and reused (Hauser, 2016. However, they can hardly be called part of the green market, as in the long run, the production and use of PET bottles have a negative impact on the environment (Figure 2).

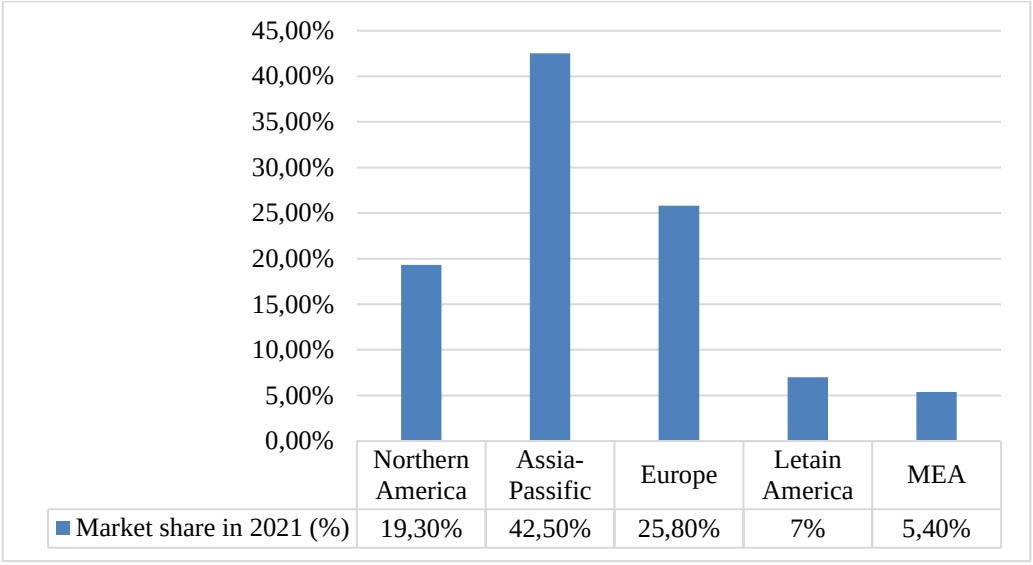


Figure 2. Market share of biodegradable PET packaging, by regions of the world, 2021 (%)
Source: compiled based on (Bearings & Pillow Blocks, Mechanical South America Database. 2023.)

Asia is projected to be the fastest growing region in the world, especially Asia Pacific. According to research by *Euromonitor International, the* consumer packaging market in Asia is projected to grow to USD 382 billion by 2025, a record high compared to other regions. This is due to the rapid population growth and economic development in Asia, which leads to an increase in spending on consumer goods and, accordingly, an increase in demand for consumer packaging. Thus, the Asia-Pacific region, in particular China, Japan and South Korea, is a powerful market for companies that produce and supply consumer packaging, so market forecasts in this region are important for global business strategy. Due to the increasing population density, convenient food and beverages are increasingly consumed. In Southeast Asia, it is easy to obtain the raw materials needed to manufacture boxes, bags, crates and other packaging equipment. As a result, positive market effects are also expected (Economies in 2023. 2022).

5. Prospects for the European biodegradable packaging market

According to the *MarketsandMarkets* report, in 2020, the European sustainable packaging market was valued at EUR 56.3 billion, and by 2025, it is projected to reach EUR 74.2 billion, with an average annual growth rate of 5.7% between 2020 and 2025 (Markets and markets, 2023). The report highlights the growing demand for sustainable packaging solutions, driven by growing environmental concerns, strict government regulations, and changing consumer preferences (Table 2).

Table 2

EU eco-friendly packaging market in figures, 2020-2025

Metrics.	Meaning.
Market size (2020)	56.3 billion euros
Market size (2025, forecast)	74.2 billion euros
CAGR (2020-2025)	5,7%
Leading environmentally friendly materials	Paper, cardboard, bioplastics, metal, glass
Leading areas of application	Food and beverages, healthcare, personal care, household, industry
Leading countries	Germany, France, Italy, UK, Spain

Source: compiled based on (Markets and markets, 2023)

The consumer packaging market in Europe appears to be fragmented due to the large number of suppliers (Action Plan, 2023). The European Union and the United States have different approaches to many issues, including the green transition and bio-based packaging (Table 3).

Table 3

Comparative analysis of approaches to green transition and bio-based packaging in the European Union and the United States

Optimism and pessimism	
EU	**USA**
Optimistic views can be observed in EU countries. For example, the level of optimism about the green transition is 80%.	They also show a positive attitude, but some states may be less active in the green transition. Some states may show only 60% support for the green transition.
Green transition	
EU	**USA**
Seeks leadership in the green transition by setting ambitious goals. For example, it plans to reduce greenhouse gas emissions by 50% by 2030.	There is also support for the green transition at the federal government level, but there may be opposition in individual states or at the company level. Emissions are projected to be reduced by 30% by 2030.
The costs of a green transition	
EU	**USA**
It has more funds to finance green projects. The annual budget for the green transition is about 100 billion euros.	It also has spending on the green transition, but the annual budget is approximately $60 billion.

Source: compiled based on (Gamoh, 2017; Collis, 2016; Markets and markets, 2023; Communication from the Commission to the European parliament, 2020; Regulation (EU) 2019/2088 of the European Parliament, 2019; Esma.europa.eu, 2023)

6. Development of eco-friendly packaging in Ukraine

The introduction of environmentally friendly packaging materials will help reduce emissions and create a smaller environmental footprint in Ukraine. Such an initiative is in line with current environmental trends and will help our country maintain the level of sustainable development in production and consumption. Packaging is used for a variety of purposes, which can be divided into several types depending on the intended use. Table 4 provides an analysis of the types of packaging used in Ukraine, including single-use and reusable packaging, and an overview of the regulation of single-use packaging on the market. The desire to preserve the environment and reduce the impact on nature is driving the search for a more sustainable approach to packaging and product consumption. Regulation of single-use packaging in Ukraine includes legislative measures and initiatives aimed at reducing the use of single-use plastic and encouraging a shift towards more environmentally friendly alternatives.

Table 4

Types of packaging and regulation of their use in Ukraine

Type of packaging	Characteristics	Examples	Regulation in Ukraine
1	2	3	4
Disposable packaging	Designed for single use and discarded after the first use. It is not recyclable or easily worn out.	Plastic bottles, bags, drink cups, etc.	Legislative initiatives are aimed at limiting the use of single-use plastic and supporting alternative environmentally friendly materials. Introduction of a fee for plastic bags.
Reusable packaging	Designed to be reused, usually made of stronger materials that can withstand many cycles of use.	Glass bottles, metal containers, thermoses, etc.	Developing and supporting reusable packaging exchange and return programmes, encouraging consumers to switch to reusable options.
Biodegradable packaging	Made from materials that can be decomposed naturally and do not leave harmful traces in nature.	Biodegradable plastic bags, containers made of organic material.	Development of standards and certifications for biodegradable materials,

Textile bags	Durable, reusable textile bags that can replace disposable plastic bags.	Cotton, linen, polyester bags.	Promote the use of textile bags as an environmentally sustainable alternative to single-use plastic bags.
Paper packaging	Paper and cardboard packaging that can be reused or recycled.	Paper bags, cardboard boxes.	Supporting the recycling of paper packaging and increasing the share of recycling.

Source: compiled based on (Lazebnyk, 2019)

Such measures could include banning or restricting the use of single-use plastic bags, introducing a plastic bag charge, supporting the use of biodegradable materials in packaging, developing reusable packaging exchange and return programmes, and informing consumers about the benefits of reusable packaging (Table 5). This table demonstrates the variety of packaging types and the potential for environmental improvement. The introduction of eco-friendly packaging for products is one of the ways to reduce environmental impact and ensure sustainable development. Companies and producers that adopt an environmentally conscious approach will be able to meet the growing expectations of consumers in terms of environmental protection and efficient use of resources.

Table 5

Types of packaging and eco-packaging for products

Type of packaging	Purpose	Eco-packaging
1	2	3
Plastic packaging	Food, beverages, cosmetics, chemicals	Biodegradable materials, bioplastics, recycling
Paper packaging	Food products, stationery	Recycling, use of wood from renewable sources
Cardboard packaging	Household goods, electronics, textiles	Recycling, use of renewable materials
Glass packaging	Food, beverages, cosmetics, pharmaceuticals	Recycling
Metal packaging	Canned food, beverages, chemicals	Recycling
Fabric/cotton packaging	Fashion textiles, gift items	Recycling, biodegradable materials
Bamboo packaging	Food products, gift items	Biodegradable materials, recycling
Corn/starch packaging	Food, cosmetics, medical products	Biodegradable materials, recycling

Source: compiled based on (Eng, 2015)

Implementation of eco-friendly packaging in Ukraine requires joint efforts of producers, consumers and the government. The introduction of more effective environmental standards and support for innovative packaging approaches can be key factors in ensuring sustainable and environmentally balanced development in Ukraine (Lazebnyk, 2019). The adoption and development of such a law represents a great potential for our research, helping to understand the impact of eco-friendly packaging on consumption and production, and contributing to the creation of a more sustainable and environmentally friendly society.

The quality and material of packaging are of great importance for providing environmentally friendly solutions (Ishida, 2012). Different types of eco-packaging can differ in their level of environmental friendliness, which is an important factor in choosing the best packaging for products. The first step on the path to sustainability is to replace traditional plastic materials with environmentally friendly alternatives. The degree of sustainability of eco-packaging can vary depending on the materials used to make it (Table 6).

The systematic introduction of eco-packaging with a "high" and "very high" sustainability rating can have a positive impact on environmental protection and reduce environmental impact (Fedorchenko, 2023). These innovative solutions can contribute to the development of sustainable production and consumption, as well as stimulate environmental innovation in the packaging industry. This expanded table provides a more detailed overview of the sustainability of different types of packaging. With increasing environmental awareness and the drive for sustainable development, businesses and consumers are opting for eco-packaging with high and very high levels of sustainability. The use of biodegradable materials and materials grown from renewable sources can significantly reduce the negative environmental impact of packaging materials (Shkoda, 2022). Promoting the use of packaging with a high degree of environmental friendliness can encourage the conservation of natural resources and help reduce the amount of waste that ends up in landfills. This approach contributes to the development of an environmental culture, which is becoming increasingly important in modern society. The expanded table provides more information for producers and consumers, helping them to make more informed choices when it comes to packaging and promoting an ecological balance in production and consumption.

Table 6

The degree of environmental friendliness by type of packaging and regulation of their use in Ukraine

Type of packaging	Degree of environmental friendliness	Description of the degree of environmental friendliness	Examples	Regulation in Ukraine
Paper packaging	Medium	Made from recycled paper waste or renewable wood sources.	Paper bags, cardboard boxes.	Supporting the recycling of paper packaging and increasing the share of recycling.

Cardboard packaging	High	Made from recycled cardboard or renewable materials.	Cardboard boxes, packaging made of renewable wood.	Supporting the recycling of cardboard packaging and reducing the use of chemicals.
Traditional plastic	Low	Made from non-renewable oil resources.	Plastic bottles, bags, drink cups, etc.	Legislative initiatives are aimed at limiting the use of single-use plastic and supporting alternative environmentally friendly materials.
Glass packaging	High	It can be recycled many times without loss of quality.	Glass bottles, jars, containers.	Developing glass packaging collection and recycling programmes and spreading awareness of its benefits.
Biodegradable plastic	High	Made from special materials that decompose in nature.	Biodegradable plastic bags, containers made of organic material.	Development of standards and certifications for biodegradable materials, support for manufacturers of biodegradable packaging.
Bamboo packaging	Very high	Made from a fast-growing material, it does not require chemical fertilisers or pesticides.	Bamboo packaging, bamboo products.	Promoting the development of bamboo packaging production and raising awareness of its benefits.
Corn starch packaging	Very high	Biodegradable, made from old corn starch waste or corn plants.	Corn containers, packaging made from corn starch materials.	Supporting the recycling of corn bales and developing production using recycled materials.

Source: compiled based on (Lazebnyk, 2019)

In this context, market research and the search for cost-effective and environmentally friendly alternatives to paper tableware can help ensure sustainable production and consumption by Ukrainian companies, contributing to environmental safety and the conservation of natural resources. Such an approach can strike a balance between environmental and economic requirements, which is an important aspect for

the sustainable development of the national economy. It is possible to look at the eco-friendly packaging market in dynamics. To better understand the eco- friendly packaging market and its dynamics, let's look at information on imports and domestic production of eco-friendly packaging in Ukraine (Figure 3).

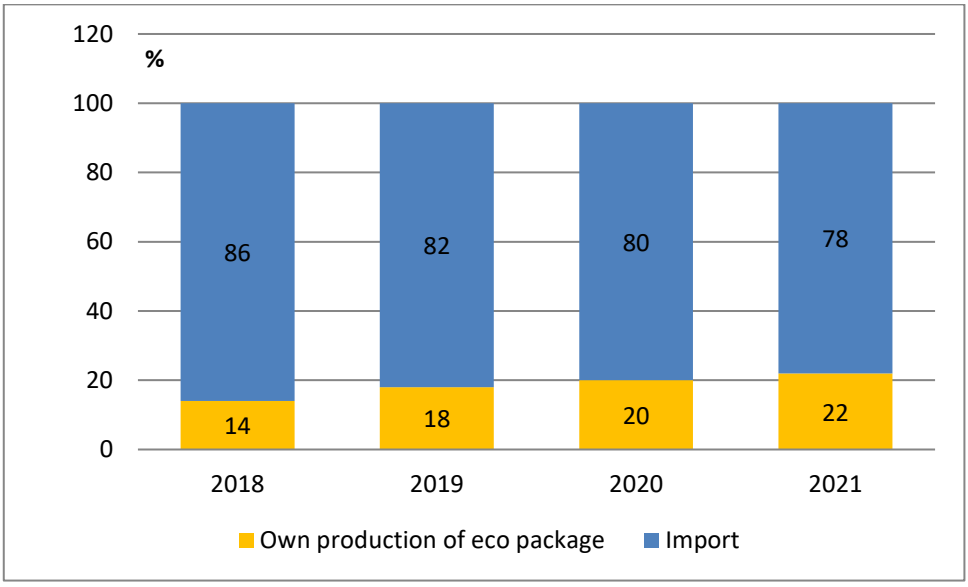


Figure 3. Imports and domestic production of eco-friendly packaging
Source: calculated according to the State Statistics Service of Ukraine

In the future, the Ukrainian eco-friendly packaging market is expected to further growth in domestic production and an increase in imports of eco-friendly packaging. The introduction of stricter environmental standards, support from the government, and growing consumer awareness of the environmental impact of packaging materials will drive demand for eco-friendly solutions. As a result, companies will increase the production of eco-friendly packaging and adopt new technologies.

7. Discussion

The exploration of eco-packaging technologies, regulatory initiatives, and consumer behavior trends sheds light on the landscape of sustainable packaging. Due to the progress in fostering sustainability, there are emerging opportunities for future studies in the above mentioned context. In particular, there is increasing importance in recognition of eco-packaging technologies as pivotal in mitigating environmental harm. For example, technologies such as 3D printing, utilization of nanoparticles, biodegradable and recycled materials are promising in minimizing waste and reducing pollution. However, there are different opinions regarding the inclusion of PET technology within eco-friendly packaging categories. On the one hand, there is growing potential of their consideration as a driver for alternative eco-packaging technologies. On the other hand, some attention is also paid to possible negative long-term environmental

impact of PET technology use. This is why, there is a primary need for further examination and standardization in defining eco-packaging technologies.

Regulatory initiatives play an important role in shaping the sustainability landscape, considering variety of approaches globally. For instance, the US Plastic Waste Reduction and Recycling Act is an example of activity to reduce plastic waste and promote research into recycling technologies. However, disparities in regulatory frameworks between the European Union and the United States of America, pose challenges for common global action. Therefore, there is increasing importance of appropriate researches for avoiding regulatory gaps and fostering international collaboration for effective environmental protection measures.

Consumer behavior trends show a growing demand for sustainable packaging solutions, driven by heightened environmental awareness and concerns. The COVID-19 pandemic caused further increase of sustainability trends in their purchasing decisions. Despite the attractiveness of traditional plastic packaging due to its convenience and affordability, there is a notable inclination towards eco-friendly alternatives. This presents both opportunities and challenges for manufacturers in the context of balancing sustainability with product quality and safety.

8. Conclusion

In conclusion, the current research provides the overview of global trends in regulation, consumption and production of ecological packaging. In particular, the three levels of regulation, consumption and production are considered, namely: the trends and normative basis that acts globally, peculiarities of ecological packaging development and regulation in Europe, prospects of Ukrainian ecological packaging market development.

Thus, in light of the light of above-mentioned trends, it is possible to make the following conclusions on the topic:

- the global analysis of the eco-friendly packaging markets takes into account macroeconomic indicators and specifics of each region. The activities of key players in this area help to understand their role in shaping the market and their impact on consumer trends.
- standardization of eco-packaging technologies, alignment of regulatory frameworks and continued engagement with consumers are essential for realizing a more sustainable future. In particular, the eco-packaging industry can lead the transition towards a greener, more environmentally conscious paradigm in case of embracing innovation and collaboration.
- the diagnostics of the development of companies in the field of eco-friendly packaging in the EU has revealed the main trends and challenges faced by companies. Due to the high level of competition in this area, companies must look for innovative solutions and strategies. It is also important to set high standards for the quality and environmental responsibility of packaging. An analysis of regional markets has shown that each region has its own characteristics and needs. In the European Union, for example, companies specializing in sustainable packaging are in the early stages of development and need to improve their strategies and processes. High competition in this

sector poses a challenge to companies, requiring them to develop innovative solutions. However, the development of this sector can become an important addition to the economy and ensure the sustainability and growth of enterprises.

- the analysis of environmental initiatives in Ukraine identifies important steps in shaping the strategic direction of the development of sustainable packaging in the country. This analysis serves as a basis for understanding current trends and challenges. It is also important to emphasize the need for effective legislative regulation in the field of packaging materials.
- the main challenges for fostering sustainable packaging industry include the lack of consumer awareness in advantages of eco packaging use, doubts on cost-effectiveness of innovative solutions and technological limitation faced by the companies.

Thus, there is an increasing need in constantly development of both theoretical researches and practical activity, aiming to balance the potential profitability with sustainability issues.

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