

# **Europe Biodegradable Plastics Market By Type (Starch-Based, Polylactic Acid (PLA), Polybutylene Adipate Terephthalate (PBAT), Polybutylene Succinate (PBS), Polyhydroxyalkonate (PHA), Others), By Application (Packaging, Agriculture, Consumer Goods, Others), By Region, Competition, Forecast and Opportunities, 2028**

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## **Abstracts**

The Europe Biodegradable Plastics Market, valued at USD 1.34 billion in 2022, is expected to experience robust growth in the forecast period, projecting a Compound Annual Growth Rate (CAGR) of 8.27% through 2028 and is expected to reach at USD 2.13 billion by 2028. Biodegradable plastics have the capability to undergo physical and organic decay, ultimately breaking down into carbon dioxide (CO<sub>2</sub>), biomass, and water, in accordance with European packaging standards. These materials are recoverable through composting and anaerobic digestion. Biodegradable plastics are those that naturally degrade in the environment, primarily due to the action of microorganisms present in the environment, breaking down the molecular structure of the biodegradable plastic. They are produced using microorganisms, renewable organic materials, and petrochemicals. Biodegradable plastics are environmentally friendly and non-toxic since they are produced using renewable organic substances. They are primarily manufactured using natural plant materials, including corn oil, orange peels, starch, and various plants.

The increased adoption of biodegradable plastics, driven by their eco-friendly nature, is a significant driver of the biodegradable plastics market in Europe. Biodegradable plastics have the potential to reduce carbon dioxide emissions by 30% to 70% compared to traditional synthetic plastics. Furthermore, they have no adverse effects on

the environment, as these materials are non-toxic and readily degrade. The use of biodegradable plastics results in a 42% reduction in carbon footprints. Consumers prefer bioplastic packaging materials over synthetic plastic because they can be composted with food waste. Key factors such as high biodegradability, non-toxicity, environmental friendliness, and being a direct substitute for traditional plastics are driving the adoption of biodegradable plastics in the European market.

The food and beverage industry is currently one of the largest consumers of plastic packaging. The shift from traditional plastics to biodegradable plastics is expected to provide significant opportunities for biodegradable plastic manufacturers. Leading companies like Coca Cola, Nestl?, Nike, and Ford are showing interest in the production and use of bio-based biodegradable plastic materials across various applications. Government initiatives aimed at reducing conventional plastics are expected to benefit the adoption of bioplastics. The European Union (EU) directive has proposed reducing reliance on disposable plastics by the end of 2030. Additionally, European countries have imposed value-added taxes on the recycling of plastic products, increasing their final cost. This pushes retailers and packers to promote sustainable and biodegradable packaging, thereby increasing the demand for biodegradable plastics during the forecast period.

However, despite its advantages, biodegradable plastics face a significant challenge due to their higher costs. Currently, biodegradable products are more than twice as expensive as conventional petroleum-based plastics. This cost difference is primarily attributed to high research and development costs, the expense of building polymer plants, the cost of raw materials, and limited production scale. The typical cost of regular plastic resin is approximately ?1.2/Kg, while biodegradable resin costs around ?3.1/Kg. Therefore, the high cost of biodegradable plastics currently limits their widespread adoption. Nonetheless, government pressure and proactive research and development efforts in this field are expected to introduce cost-effective biodegradable plastics in the market during the forecast period. Companies with a strong capital base and robust infrastructure are strategically positioned to implement a forward integration strategy to establish their own value chains based on biodegradable plastics. For example, PepsiCo has developed a 'green' PET bottle that is 100% bio-based and has the same molecular structure as traditional PET bottles. Biodegradable plastic bottles are expected to drive growth in the Europe biodegradable plastics market.

## Key Market Drivers

### Growing Demand for Biodegradable Plastics in the Food and Beverage Industry: The

Increasing demand for biodegradable plastics in the food and beverage industry is a significant driver of Europe's biodegradable plastics market. Consumers are increasingly making purchasing decisions based on environmental considerations, and biodegradable packaging appeals to environmentally conscious consumers. European regulations are becoming stricter regarding single-use plastics and packaging waste, creating a favorable environment for the adoption of biodegradable alternatives.

#### Increasing Demand for Biodegradable Plastics in the Agriculture Industry:

Biodegradable plastics are gradually replacing conventional plastics in agriculture due to their reduced contribution to plastic waste and pollution. Some biodegradable plastics enrich the soil with organic matter as they break down, enhancing soil structure, moisture retention, and nutrient availability, ultimately improving crop yields. These materials also address concerns about microplastic contamination in agricultural lands and water bodies. Many biodegradable plastics are derived from renewable sources, reducing dependence on fossil fuels and promoting sustainable feedstocks. The circular economy principles, which emphasize waste reduction and resource conservation, align with the use of biodegradable plastics in agriculture.

**Growing Awareness Among Consumers About the Adverse Effects of Conventional Plastics:** Consumers in developed and emerging nations are increasingly aware of the negative impacts of traditional plastics on the environment. This awareness has led to a decline in the use of petroleum and natural gas, resulting in reduced carbon emissions. Biodegradable plastics serve as alternatives to nearly all traditional plastics used in various applications. They offer innovative solutions with enhanced properties while significantly reducing emissions and providing similar characteristics and functionalities as traditional plastics. Biodegradable plastics are manufactured using renewable resources and fossil organic substances, including cellulose ester, PLA, PHA, starch derivatives, and copolyesters (PBS, PBAT, etc.). Various organizations are involved in transforming the perception of plastics through educational initiatives, communication, customer awareness campaigns, documentaries, research, and sustainability efforts. The objective is to educate consumers about plastic pollution, encourage the adoption of more sustainable solutions, and inspire individuals and businesses to take action against plastic pollution. Therefore, the shift in consumer demand based on environmental awareness, packaging convenience, and sustainable plastic production systems is supporting the growth of the Europe biodegradable plastic market.

#### Key Market Challenges

**Limited Infrastructure for Composting and Recycling:** Biodegradable plastics, especially

those derived from organic materials like cornstarch or PLA, require specific conditions for efficient decomposition. Industrial composting facilities provide the necessary environment of heat, moisture, and microbial activity, but their widespread availability in Europe is limited. Many countries lack the infrastructure to handle biodegradable plastics on a large scale, making proper disposal by consumers challenging. While some biodegradable plastics can be recycled alongside traditional plastics, the absence of standardized recycling processes hinders their seamless integration into existing recycling systems.

**Lack of Availability of Biodegradable Plastics:** Limited production capacity for biodegradable plastics currently results in supply shortages and higher costs. These materials are often derived from renewable sources like cornstarch or sugarcane, but sourcing these materials sustainably and at scale poses challenges due to competition from other industries. Proper degradation of biodegradable plastics requires specialized conditions, such as industrial composting facilities, which are not widely available in Europe. This limits the practicality of adopting biodegradable plastics. Additionally, some products labeled as 'biodegradable' may not meet the necessary standards for complete and timely degradation, undermining consumer trust in their effectiveness.

## Key Market Trends

**Growth in Technological Advancements:** Technological advancements have led to the emergence of new raw materials for biodegradable plastics, reducing reliance on fossil fuels and promoting a circular economy. Innovations in enzyme technology have resulted in the production of biodegradable plastics that degrade more rapidly in natural environments. Integration of IoT and smart packaging technologies with biodegradable plastics enhances product functionality and enables improved tracking and waste management.

## Segmental Insights

**Type Insights:** In 2022, the Biodegradable Plastics market was dominated by Polylactic Acid (PLA) and is expected to continue expanding. PLA is a biodegradable and compostable thermoplastic derived from fermentable sugars found in various sustainable sources like cornstarch, sugarcane, wheat, and tapioca roots. It is commonly used in bags, cases, and packaging. Greater environmental awareness and rising petrochemical costs have expanded its application in various sectors, including home products, textiles, electronics, hygiene products, and agriculture. PLA has also gained traction in 3D printing due to its biodegradability and efficient thermal and

mechanical properties.

**Application Insights:** In 2022, the Biodegradable Plastics market was dominated by the Packaging segment and is expected to continue expanding. The growing demand for consumer goods, increasing population, improving lifestyles, and rising disposable income drive the growth of the packaging segment. Greater demand from emerging markets, increased consumer awareness, and the growth of e-commerce platforms offer growth opportunities for this segment. Rising environmental concerns and awareness regarding recycling and packaging waste disposal have increased the demand for sustainable solutions. The need to minimize the environmental impact of packaging and adopt sustainable packaging options has encouraged market players to use biodegradable products. Biodegradable plastics are used for both rigid and flexible packaging, including bottles, cups, jars, corrugated boxes, and bags.

**Regional Insights:** Germany is the leading region in the Europe Biodegradable Plastics Market. Germany's dominance can be attributed to its commitment to sustainability, innovation, and advanced industrial and research capabilities. The country's engineering expertise enables the development and commercialization of cutting-edge bioplastics that adhere to rigorous quality and performance standards. Germany's well-established manufacturing capabilities provide a robust foundation for scaling up biodegradable plastics production. The country's industrial infrastructure facilitates streamlined production processes and efficient distribution, contributing to the availability of biodegradable plastics in the market. Additionally, Germany's circular economy initiatives align seamlessly with the principles of biodegradable plastics. The circular approach emphasizes waste reduction, material reuse, and recycling, which closely align with the objectives of utilizing biodegradable plastics.

### Key Market Players

EASTMAN CHEMICAL COMPANY

BASF SE

DOW INC.

FKUR KUNSTSTOFF GmbH

MINIMA TECHNOLOGY CO. LTD.

SOLANYL BIOPOLYMERS INC.

Mitsubishi Chemical Europe GmbH

NOVAMONT S.P.A

Danimer Scientific Inc.

Toray International Inc.

### Report Scope:

In this report, the Europe Biodegradable Plastics Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

#### Europe Biodegradable Plastics Market, By Type:

Starch-Based

Polylactic Acid (PLA)

Polybutylene Adipate Terephthalate (PBAT)

Polybutylene Succinate (PBS)

Polyhydroxyalkonate (PHA)

Others

#### Europe Biodegradable Plastics Market, By Application:

Packaging

Agriculture

Consumer Goods

Others

Europe Biodegradable Plastics Market, By Region:

Germany

United Kingdom

France

Russia

Spain

Italy

Rest of Europe

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Europe Biodegradable Plastics Market.

Available Customizations:

Europe Biodegradable Plastics Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).



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