



## Need for Biodegradable and Compostable Plastic Usage

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### DESCRIPTION

Plastic is the dominant material in modern life. They are very flexible, lightweight and can be manufactured at a relatively low cost. Currently, only about 1% of plastics and plastic products on the global market are considered to be of biological origin, compostable or biodegradable. Most plastics continue to be produced from fossil fuels in a process that contributes to increased greenhouse gas emissions throughout their value chain. Indeed, plastics pollute throughout their lifecycle from production, use and ultimate disposal. Plastic recycling rates are low and plastic spreads into the environment, such as littering, poor waste management, and product wear and tear. They can survive in the wild for many years and have the ability to enter the food chain. Plastic particle pollution presents a particular challenge in maintaining the cleanliness of compost made from separately collected bio-waste. Biodegradable, compostable and bio plastics are increasingly being promoted as a solution to some of these challenges. An increasing number of consumer products, such as plastic bags, packaging and disposable cups, are labelled as "compostable", "biodegradable" or "bio-based". Materials that is biodegradable and broken down by microorganisms into new water, carbon dioxide, mineral salts and biomass within a specified time. Whether a biodegradable or compostable plastic material will biodegrade and mixed into soil heavily on the conditions in which it was exposed during disposal. These include temperature, time and presence of microorganisms, nutrients, oxygen and humidity. Different types of biodegradable and compostable plastics are designed to biodegrade under specified conditions. Based on these conditions, they may biodegrade slowly or incompletely or fragment into micro plastics.

### Standards, labels and logos

European standards exist to evaluate the biodegradability of plastics in industrial composting plants and the biodegradability of mulch films in soil for agricultural use. Plastic materials or products that meet these standards can be certified and labelled accordingly to date; there are no European standards for

assessing biodegradability in water. Indeed, very variable freshwater and marine environmental conditions make standardization difficult. However, the International Organization for Standardization develops standards to test biodegradability in specific marine environments. Any claim of biodegradability must be specific and unambiguously linked to the conditions under which the properties apply. Certification ensures that a product conforms to an established standard or set of conditions defined by the certifier. However, actual conditions may differ from these and interfere with biodegradation. This is particular concern for home composting and biodegradability in soil and water.

### Plastics consumer behavior

The difference between "compostable in industrial compost", "compostable at home", and "biodegradable in soil/freshwater/seawater" and "bio" is not easy to understand. For example, in a survey conducted in Germany, 58% of respondents believe that all "bio plastics" are compostable. Many consumers struggle to understand environmental claims and labels and are unable to distinguish between certified and self-declared labels. Experience in biological waste collection shows that the measurement depends on the consumer behavior are applied by part of the population. To increase engagement, measures must be accompanied by personalized information and awareness campaigns. Teaching children about labels and proper waste separation can also play an important role. How to properly dispose of products made from industrially degradable plastics also depends on the local waste management system and treatment infrastructure. Therefore, repeated, focused and clear communication with consumers is needed to explain the difference between degradability and biodegradability in different environments. Additional measures, such as standard dyeing for industrial compostable bags or QR codes that provide additional information, can improve clarity. Biodegradable and compostable plastic waste management

The circular economy keeps the value of products and raw materials as much as possible in the economy. While

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compostable and compostable plastics are technically recyclable, they are not currently recycled into plastic materials. Instead, they are treated as an impurity in conventional plastic recycling when collected together. Increasing market share in the future could make the situation worse, but could also make the recycling of certain plastics biodegradable or economically compostable. However, more research, innovation and investment in plastic recycling are needed.

Although compostable plastics do not add nutritional value to compost, they do play a role in the sustainable management of biological waste. Biological waste from households and other

sources is increasingly being collected separately from other waste across Europe. The digestion or composting of industrial composting facilities produces compost that can be used as a soil amendment and fertilizer provided. Separate collection or home composting will be mandatory in all EU Member States from the end of 2023. Contamination by conventional plastics is a growing challenge for compost quality. Replacing conventional plastic with certified compostable plastic for materials that are often mixed with food waste, e.g. fruit patches or tea bags can help reduce pollution from conventional source.