FEAD
European Waste Management Association

15 March 2022, Brussels

FEAD feedback to the web-based public consultation on a "Policy framework on biobased, biodegradable, and compostable plastics"

There is currently no EU law in place applying to bio-based, biodegradable and compostable plastics in a comprehensive manner. Therefore, in the European Green Deal and new circular economy action plan, the European Commission announced a policy framework on the sourcing, labelling and use of bio-based plastics, and the use of biodegradable and compostable plastics.

The European Commission has launched a public consultation on biobased, biodegradable and compostable plastics to include the views of citizens, consumers and expert stakeholders in the preparation of an EU-wide Policy framework.

FEAD supports the aim of the initiative to establishing a clear definition and overarching principles applying to both biobased plastics (BBP) and biodegradable and compostable plastics (BDCP) considering the circular economy and waste hierarchy principles. It is important to make a clear distinction between bio-based, biodegradable and compostable plastics, recognising that some bio-based plastics are not compostable, and some compostable plastics are not bio-based, and that not all biodegradable plastics are truly and safely compostable.

FEAD agree with the Commission that without EU action, the identified environmental and market problems will worsen. Consequences for the environment will aggravate, as **the number of not fully sustainable alternatives will increase in the absence of clear and verifiable sustainability requirements**.

Bio-based plastics

Bio-based plastics also called Bio-sourced plastics are plastics made (partially) from organic materials: some are identical to fossil-based plastics, such as bio polyethylene (PE) or bio polypropylene (PP), while some are polymers intended to be compostable.

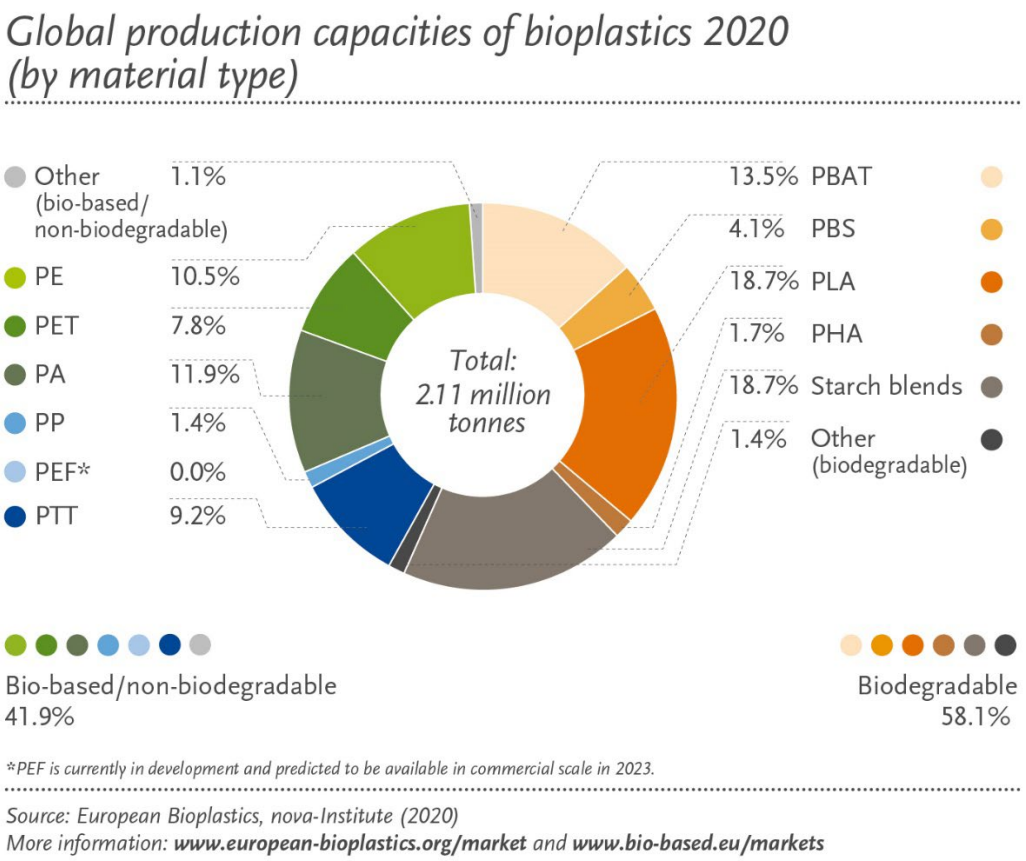
Bio-based plastics are made from renewable resources (e.g., corn, wheat, etc.) instead of fossil fuels but bio-based does not necessarily mean the product is biodegradable or compostable. As shown in the figure below, by *European-Bioplastics*[1], in 2020 the share of bio-based/non-biodegradable polymers on the total amount of 'bioplastics' produced, was 41.9%.

Bio-based non-biodegradable plastics (such as bio-PE, bio-PET and bio-PP) are recyclable by conventional recycling processes and contribute when properly managed, as recycled fossil-based plastics, to increase the amount of plastic recycling.

With this in mind, **one of the most important challenges for bio-based plastics to achieve the goals**

[1] https://www.european-bioplastics.org/bioplastics/materials/

of the circular economy is design.



In particular, to achieve this objective, for the **bio-based plastics it is essential to**:

- focus on the improvement of plastic recycling by following **design-for-recycling principles**
- set **minimum threshold of biobased content** that must be exceeded before plastics may be labelled as 'biobased'
- identify **minimum EU sustainability criteria** for the biobased content of biobased plastics
- avoid complexity and use as the only label **"recyclable"**, to achieve a proper collection and recycling management.

BBP has no EU sustainability criteria nor any appropriate standards that are supported by sound scientific testing, meaning that a variety of formulations and lack of regulations do not guarantee environmental and market performances. Sustainability criteria must consider the effect on bio diversity, land consumption and others LULUCF criteria.

A transition to a sustainable plastics system requires not only a shift to fossil-free feedstock and energy to produce the carbon-neutral building blocks for polymers used in plastics, but also an appropriate design of the polymers with both desired material properties for functionality and features facilitating their recyclability.

Alternatives to conventional fossil-based plastics could offer environmental benefits. However, this is on the condition that they have been developed in compliance with EN standards, that they are clearly bringing environmental benefits and that there is a collection and treatment infrastructure in place to manage them. Recycling of biobased plastics should therefore be favored over biodegradation, which only provides sustainable benefits in very specific applications. In respect with the waste hierarchy, recycling is even better than recovery.

Bio-based plastics should be designed for reuse and or recyclability. The only exemption could apply to bio-based plastic collection bags used for biowaste in households, that should be also designed for composting.

Biodegradable plastics

Biodegradable plastics is not a regulated term so it can be ambiguous. This term refers to plastics that are degradable through the action of naturally occurring microorganisms such as bacteria, fungi and algae. It gives the wrong idea that such material is harmless if littered. As long as the degradation is not complete, the polymer remains harmful for the environment. The kinetic of degradation depends on the environment (humidity, light, salinity, temperature, …). They can also be of petrochemical origin, such as polycaprolactone (PCL), and furthermore might contain some additives.

Biodegradable plastics (BDPs) ideally refers to a kind of plastic whose properties meet the requirements of conventional plastic they are substituting, mainly packaging, and remain unchanged during the use period, but can be chemically transformed by microbes into environmentally sound substances under specific conditions (e.g., temperature, pH, time …) at their end-of-life (EoL).

As an alternative to conventional recyclable plastics, a biodegradable solution that decomposes waste plastics into CO_2 and H_2O to return to nature seem, in theory, a good idea.

In practice, **the time of biodegradation is conditioned by the chemical structure and the environmental conditions** and the degradation rate of BDP is not significantly different from that of conventional plastics.

In the waste management system, the different plastic characteristics requires different options. According to plastic industry trends and current waste sorting technology, **the difficulty of recycling will increase, and the quality of recycling will decrease due to contamination with plastics of different characteristics ending up in the same waste stream**.

This is because current optical sorting systems in place are inadequate to distinguish between biodegradable and non-biodegradable but recyclable plastics[2]. Finding their way in the flow of conventional plastic, the quality of recycling will decrease: for example, when BDPs (e.g., PLA) and conventional plastics such as PET, and HDPE are mixed with each other during waste treatment, it will reduce the recycling quality of traditional plastics[3].

Moreover, most biodegradable plastic collected with bio-waste are **not accepted in the composting process of many Member States**, and is discarded from the composting plants to the residual waste fraction.

Therefore, the lack of a dedicated system for the treatment and recycling of biodegradable plastics and the absence of criteria to guarantee the compostability of BBPs, means these bio-alternatives are usually managed through landfill or incineration processes.

With this in mind, to achieve the goals of the circular economy**,** for the **biodegradable plastics is essential to:**

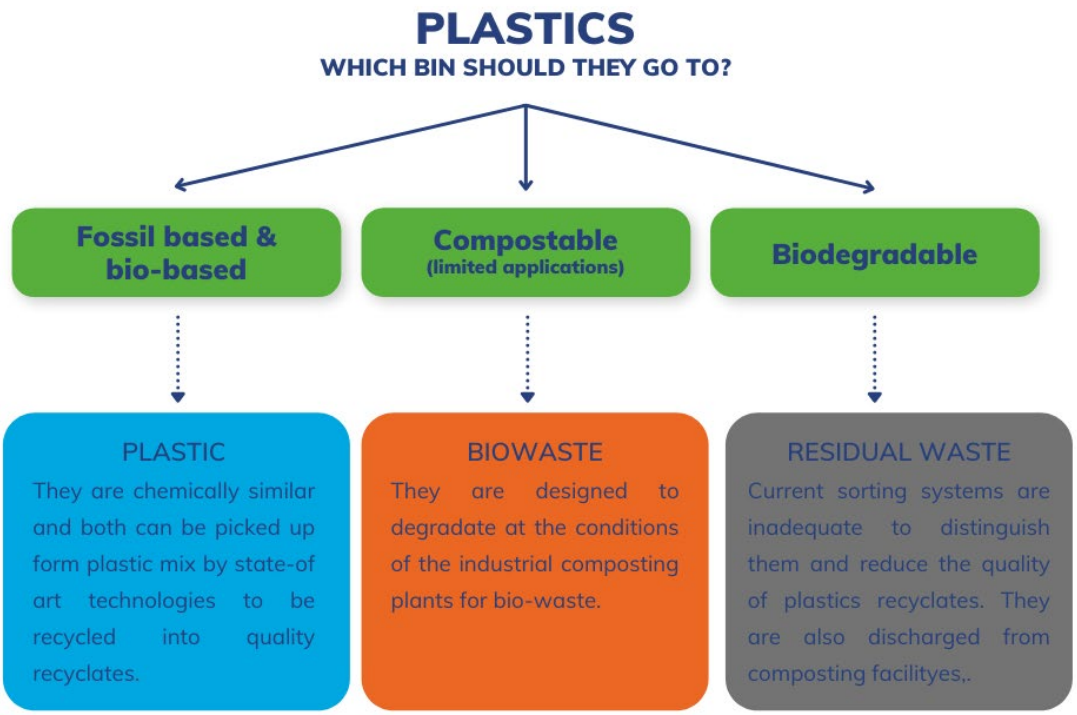
- raise awareness that BDPs (bags, containers and other materials) need to be separated from other recyclable materials
- restrict their use exclusively to products with **a high-risk plastic loss** (e.g., fireworks, fishing device, …) **and those for which loss is intrinsic to use** (e.g. dolly rope, mulch films, …)
- design and mark them as soil-degradable and/or water and marine degradable, since

[2] Rujnic-Sokele, M., Pilipovic, A. 2017. Challenges and opportunities of biodegradable plastics: A mini review. Waste Management & Research, 35(2, SI), 132-140

[3] Hopewell, J., Dvorak, R., Kosior, E., 2009. Plastics recycling: challenges and opportunities. Philos. T. R. Soc. B 364, 2115–2126

biodegradable does not mean it will break down in the natural environment.

The figure below shows a simple but very indicative diagram of the flow of the different types of plastic. In particular, as explained above, biodegradable plastics are not accepted by recycling plants, and are also discarded by the composting process, so their final destination is in the residual waste.



Compostable plastics

Compostable plastics are plastics which degrade through the process of composting, which is a controlled aerobic process. A distinction between industrial composting and home composting is necessary. Industrial composting conditions require an elevated temperature between 50 °C and 60°C[4] combined with a relatively high humidity and the presence of oxygen. EN 13432 is a product norm for packaging materials, not a waste treatment norm, and complying with it cannot be considered a guarantee of complete industrial compostability. Home composting conditions have lower and less constant temperatures, making it a slower process, depending on the type of material. The existing standard for home composting is NF T 51800.

In the waste management system, **compostable plastics only bring environmental benefits when there is a clear co-benefit: separating more bio-waste from residual waste without harming the quality of organic waste.**

Given these points there should be an assessment framework with clear criteria that assesses in which applications the use of compostable plastics is indeed beneficial to the environment.

As long as the EN13432 conditions do not always correspond to the practical conditions in the existing

[4] European bioplastics. Fact sheet: Industrial composting. November 2009. [pdf]. https://docs.european-bioplastics.org/2016/publications/fs/EUBP_fs_industrial_composting.pdf (Accessed on 13.10.2021).

industrial composting plants for bio-waste, **the European norm on industrial compostability should be revised to reach the highest environmental benefit and efficiency in the composting process**.

Moreover, at this moment there are no rules or policies looking at avoiding the use of non-biodegradable additives, which could harm the quality of compost. Even the EN 13432 standard allows for 10% non-biodegradable additives in packages. That is undesirable and potentially harmful for the quality of the compost and, subsequently, our soils. Furthermore, there are no policies regarding substances of concern, such as PFAS, that address the impact of compostable or biodegradable plastics on the quality of compost.

At the state of art, to grant efficiency and quality in the process of composting, only a few specific items should be accepted in the bio-waste flow, such as collection bags for bio-waste, teabags and coffee pads.

In some cases, paper bags are proving to be more compatible with biological treatment process than bioplastic bags, especially when anaerobic processes are involved[5].

With this in mind, to achieve the goals of the circular economy**,** for the **compostable plastics is essential to:**

- **set criteria** for their use, in order to restrict the types of plastics that can be discarded in the bio-waste and that assess in which applications the use of compostable plastics is **environmentally beneficial**
- **limit the use of compostable plastics** to products that are difficult to separate from food waste and are likely to end up with food waste
- require that the limited and sustainable applications labelled as 'compostable' are certified according to an updated and improved EN 13432.

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[5] https://journals.sagepub.com/doi/10.1177/0734242X211050181