Position of European Bioplastics

COFFEE CAPSULES SHOULD MANDATORILY BE COMPOSTABLE – WHY THE EUROPEAN COMMISSION GOT IT RIGHT IN THE REVISED RULES ON PACKAGING AND PACKAGING WASTE (PPWR)

Europe is currently the world's largest coffee market, accounting for 32% of global coffee consumption.[1] As such, single-serve coffee capsules have become increasingly popular with billions of them consumed yearly in the EU. Their production numbers also reflect this, having increased almost fourfold from 2018 to 2022[2], with Europe as the major player in material innovation in this field.[3] More than one hundred different types of coffee capsules are already certified 'industrially compostable' (in line with EN 13432[4]) according to well-established and independent certification schemes.[5]

Organic recycling is the most environmentally-sound end-of-life option for single-serve coffee units. Several independent studies prove that compostable coffee capsules are far more environmentally beneficial when compared to aluminium ones or those made from conventional plastics.[6, 7, 8, 9]

Firstly, and in addition to the more intensive energy production, aluminium and conventional plastic coffee capsules mainly end up incinerated and landfilled. This is despite their dedicated recycling schemes, particularly for aluminium capsules in some countries, and is reflected by poor recycling rates.[10] As for plastic capsules, using multi-materials for barrier properties, for example PP-EVOH-PP in the capsule plus an aluminium lid, makes mechanically recycling these both technically challenging and financially unattractive.[11]

Secondly, regardless of whether aluminium or conventional plastic capsules are recycled or incinerated for energy recovery, the organic content – that is the coffee – is lost. The coffee is a major part of the capsule, with the latter's usual construct comprising around 20% by weight of the packaging material and **approximately 80% of the organic material.** Losing this organic content is at odds with the fundamentals of circularity, as per the Ellen MacArthur Foundation, as it would equate to prioritising the technical (material) loop over the nutrient (organic) loop.[12] Moreover, the coffee content cannot be efficiently separated from the packaging material anyway. This adds to why this application should be closing the nutrient loop and capturing the coffee's value via composting, as it would otherwise be hampering high-quality mechanical recycling.

In fact, **capturing the capsule's majority component – the coffee – via organic recycling** (either composting or anaerobic digestion plus composting) as per the Waste Framework Directive (Art. 22) **ensures the greatest value retention from the used application.** For instance, the compost gained from organic waste containing coffee grounds has

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1 Data for 2021, taken from: International Coffee Association. Coffee Market Report. May 2022.
2 Single Serve Capsules, Global Market Overview 2022, AMI Market Reports, Published September 2022.
3 Single Serve Capsules, Global Market Overview 2022, AMI Market Reports, Published September 2022.
4 EN 13432 - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging
5 According to the databases of conformity assessment and certification bodies TÜV AUSTRIA Belgium and DIN CERTCO in February 2023.
6 See: Kooduvalli, Komal et al.: Life cycle Assessment of Compostable Coffee Pods: A US University Based Case Study. Nature Scientific Reports, (2020) 10:9158.
7 Jingxi, Li: Comparative Life Cycle Assessment of Single-Serve Coffee Packaging in Ontario, Master Thesis 2017.
8 Scharf, Andreas; Carus, Michael (nova-Institut GmbH), Golden Compound's sustainable coffee capsule. Evaluation of sus-tainability according to VDI-4605 standard, February 2019.
9 Tonelli, Anachiara et al.: Comparative Life Cycle Assessment of different packaging systems for coffee capsules. Proceedings of the International Food Operations and Processing Simulation Workshop 2018.
10 Nespresso states a global recycling rate of 30 %, see: https://nestle-nespresso.com/news/nespresso-launches-capsules-using-80-recycled-aluminium
11 The majority of materials used for capsules are multilayer and thus difficult to recycle. See: Single Serve Capsules, Global Market Overview 2022, AMI Market Reports, Published September 2022.
12 Ellen MacArthur Foundation, Circulate products and materials 2019, https://ellenmacarthurfoundation.org/circulate-products-and-materials

several benefits when used as a soil amendment, such as an improved C/N ratio.[13] Simultaneously, as this legally falls within the definition of recycling, this process counts towards the latter's quotas.

Using compostable coffee single-serve units ensures that the packaging accompanying the coffee will behave in the same manner as said organic matter, and be metabolized by naturally-existing microorganisms. **Compostable coffee capsules, certified according to the standard EN 13432, will disintegrate and biodegrade in industrial composting facilities without disturbing the compost quality, nor leaving persistent microplastic in the compost.** This has been irrefutably demonstrated in several studies and full-scale composting trials.[14, 15] In some EU Member States, such as Italy, successfully treating used compostable coffee capsules via industrial composting and anaerobic digestion is daily business.[16, 17]

The European Commission's own Impact Assessment accompanying the PPWR proposal[18] clearly recommends mandating coffee capsules to be compostable in light of detailed considerations with regards to lifecycle (LCA) assessments as well as alternative end-of-life and material options. **According to the Impact Assessment's findings[19], compostable coffee capsules significantly increase the capture of biowaste, reduce the contamination of compost with non-compostable plastics, and do not lead to increased contamination of other waste streams. Additionally, the Impact Assessment concludes that compostable coffee capsules are a preferred option from an LCA point of view.**

To reduce consumer confusion and provide peace of mind to organic recycling operators, that coffee capsules entering their facilities do not need to be sorted out nor do they leave persistent microplastics, **all single-serve units on the market should mandatorily be compostable in industrial composting in compliance with EN 13432.[20]**

Compostable coffee capsules were launched in Europe over a decade ago. Since, they have become available in large volumes, and are manufactured from different innovative materials including compostable ones. In fact, roughly 6 kilo tonnes of compostable materials were processed globally into coffee capsules in 2022, representing around 3,6% of total material use (including conventional plastics and aluminium). This share is projected to rise to more than 10% in 2027.[21]

The industry needs regulatory certainty to ensure further investments to secure and scale up production and R&D in the EU. **We therefore call on the European Parliament and Council to keep coffee capsules on the positive list for mandatorily compostable packaging applications as set out in Art. 8 of the Commission's proposal for a revised PPWR.**

About European Bioplastics

European Bioplastics (EUBP) represents the interests of more than 80 member companies throughout the European Union. With members from the entire value chain, European Bioplastics serves as both a contact platform and catalyst for advancing the objectives of the growing bioplastics industry. For further information, please visit http://european-bioplastics.org.

13 Bomfim, A.S.C.d. et al.: Spent Coffee Grounds Characterization and Reuse in Composting and Soil Amendment. Waste 2023, 1, 2-20.

14 Van der Zee, Maarten; Molenveld, Karin: The fate of (compostable) plastic products in a full scale industrial organic waste treatment facility. Wageningen University & Research, 2020.

15 Kooduvalli, Komal et al.: Life cycle Assessment of Compostable Coffee Pods: A US University Based Case Study. Nature Scientific Reports, (2020) 10:9158;

16 Several compostable coffee capsules are certified with the Italian C.I.C. label which requires, in addition to EN 13432-related tests, the passing of a full scale composting test: http://www.compostabile.com.

17 Compostable coffee capsules are as well included in the Italian Biorepack scheme, which represents a successful example on the best management for compostable packaging applications.

18 European Commission, DG Environment, "Assessment of options for reinforcing the Packaging and Packaging Directive's essential requirements and other measures to reduce the generation of packaging waste", Published in December 2021

19 Idem as above, pg. 722

20 Relevance of Biodegradable and Compostable Consumer Plastic Products and Packaging in a Circular Economy. Report for the European Commission by Eunomia Research & Consulting Ltd. March 2020

21 Single Serve Capsules, Global Market Overview 2022, AMI Market Reports, Published September 2022

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