October 2024

CIMPA POLICY BRIEF

Policy recommendations to increase the circularity of plastic films

Turning multilayer plastic waste stream into a fully circular model

CIMPA is an EU funded H2020 project aiming at developing a recycling value chain for post-industrial and post-consumer multilayer films (from food and agricultural applications). CIMPA proposes innovative solutions including a circularity strategy for new packaging designs, the development of new technologies for sorting different films, together with mechanical and physical (dissolution) recycling processes. Furthermore, decontamination and upgrading processes are required to produce quality material from waste which will be suitable to close the loop.

CIMPA brings together 13 partners from 5 countries (France, Belgium, Spain, the Netherlands and Finland), covering the whole value chain of the sorting, separation, recycling and manufacturing of multilayers materials.

By turning the multilayer plastic waste stream into a fully circular model, CIMPA innovative solutions contributes to achieve the EU's sustainability targets set under the EU Green Deal and the Circular Economy Action Plan[1] and are in line with the political guidelines for the next European Commission 2024-2029, which aims to decarbonize Europe's economy.[2]

As part of the EU's transition to a circular economy, the new Packaging and Packaging Regulation will require plastic packaging to comply with recyclability criteria and with recycled content obligations. **In this paper, CIMPA partners supports the adoption of new rules and propose key measures to foster their implementation. Moreover, measures to enhance the circularity of plastic products (including agriculture films) are proposed.**

Key points

- Boost the incorporation of recycled plastics through recycled content targets and financial incentives.
- Implementation of the recyclability criteria and improving collection are necessary to produce more and better recycled plastics.
- Sustainability criteria for recycling technologies need to be developed by following a recycling hierarchy.

[1] Circular Economy Action Plan. Available here

[2] Von der Leyen's political guidelines next European Commission 2024-2029. Available here.

1. Boosting and rewarding the use of recycled materials

In order to increase the circularity of the European plastic value chain, it is necessary to boost the incorporation of recycled materials in new products. A strong demand for recycled plastics will trigger investments to increase the recycling capacity in Europe.

CIMPA seeks the reintroduction of recycled materials into industrial processes and aims to demonstrate the reusability of recycled materials for agricultural films and food packaging. CIMPA has already launched an industrial blown-extrusion production of recycled materials, obtaining multilayer films with 30% of PE/PA recycled content for agricultural films.[3] In addition, promising results have been obtained from the physical (dissolution) and mechanical recycling of multilayer films[4].

To further expand and scale-up these initiatives, policy support is needed to boost and reward the use of recycled plastic. This can be done by 1) setting mandatory recycled content targets in products and 2) bridging the price gap with virgin plastic with financial incentives.

The introduction of **recycled content targets for plastic packaging** in the new Packaging and Packaging Waste Regulation (PPWR) is a key measure to reward recycling environmental benefits and pull the demand for recycled material. Recycled content targets will be achieved through investments in Research & Development to improve the recycling capacity in Europe. Moreover, CIMPA believes that this policy tool can be extended in other applications and products, such as agriculture plastic films

On the other side, the CIMPA consortium supports additional tools to reward the incorporation of recycled content such as a **lower VAT** for recycled plastic products or the **eco-modulation of Extended Producer Responsibility (EPR) fees** with regards to the uptake of recyclates (not only for packaging, but also for other products such as agriculture films, etc.). Financial incentives are necessary for product manufacturers to shift from using virgin to recycled plastic feedstock.

These incentives and measures require strong **mechanisms for the verification and traceability** of recycled polymers. This is essential to protect recyclers and manufacturers from unfair competition and prevent greenwashing.

2. Recyclability & collection: levers for increasing recycled content

With a view to increase the production and availability of high-quality recycled plastics, it is essential to increase the plastic waste collection rate as well as their pre-treatment and recycling processes. Thus, CIMPA partners would like to stress the importance of improving collection systems and recyclability.

[3] CIMPA result - Blown extrusion of agricultural multilayer films based on recycled materials. Available here
[4] CIMPA results - deliverables available here

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For agricultural plastics, a separate collection system at waste management facilities or, as is the case in certain municipalities, via periodic local collection could be implemented to increase collection and recycling rates. For household waste, Member States will set collection targets by 2029 (as required by the PPWR). Ambitious measures are needed to **ensure high collection rates**, taking into account the effectiveness of established national collection infrastructure and the country specific situation.

When it comes to **recyclability**, to prepare and design the next generation of 100% recyclable multilayers, CIMPA has implemented a collaborative recycling-by-design methodology. This is based on concatenated data from sorting, recyclability, decontamination and upgrading, to identify designs compatible with advanced sorting and recycling, relying on actors from the whole value chain as well as influential and important stakeholders.

Mono-material structure should be always preferred. For some applications that need specific barriers, EVOH resin should be chosen since it is compatible with mechanical recycling. However, when highly demanding properties are needed, other resins such as metal or specific PA may be used. In those particular cases, alternatives barriers such as metal oxydes (Al2O3 and SiO2) might be questioned. To keep the value of these multilayer materials, **particular recycling paths should be followed**, and new structures should be created with sustainable secondary raw material.

Accurate sorting is the first step to increase the circularity of plastic products, as it prevents contamination and upgrades the quality of sorted streams, and it allows having specific waste streams for different recycling processes. CIMPA has developed two automated sorting solutions for multilayer flexible packaging, which are described in a public report[5]. NIR advanced technology enables to distinguish different waste streams to enhance recycling:

- Mono-material flexible (with EVOH accepted)
- Simple MLs (i.e. PE/PA and PE/PET)
- Complex MLs (i.e. metalized or metal laminated polyolefin structure)

While the advanced NIR-based detection showed very good results, it cannot distinguish complex MLs between each other and neither sort food grade material. The combined sorting prototype could solve easily this issue, with average sorting yields of 94%with purity levels exceeding 80%. This is essential for close loop recycling.

In the new PPWR, Article 6 requires all packaging to be recyclable in two steps: design for recycling and recyclability at scale. A list of packaging materials, types and categories is set under Table 1 in Annex II, which are referred to in Article 6, for the design for recycling requirements. Flexible films will include category 9, 11, 13 and 18, as shown below in Table 1.

[5]CIMPA White Paper. Two automated sorting solutions for multilayer flexible packaging. Available here

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Cat. No	Predominant packaging material	Packaging type	Format (illustrative and non-exhaustive)	CIMPA recommendations
9	Plastic	PET – flexible	Films	1) Prefer monomaterial. 2) Sorting not tested within CIMPA
11	Plastic	PE – flexible	Films, including multilayer and multi-material packaging	1) Prefer monomaterial. When it is not possible, prefer EVOH as a barrier 2) Sortable with current NIR technology.
13	Plastic	PP – flexible	Films, including multilayer and multi-material packaging	3) Prefer monomaterial. When it is not possible, prefer EVOH as a barrier 4) Sortable with current NIR technology.
18	Plastic	Other flexible plastics including multi-materials – flexible	Pouches, blisters, thermoformed packaging, vacuum packaging, modified atmosphere/modified humidity packaging, including e.g. flexible intermediate bulk containers, bags, stretch films	1) When it is not possible, prefer EVOH as a barrier. 2) Sortable only with NIR+Watermarking combined

Table 1. Flexible films categories under PPWR and CIMPA recommendations

3. Recycling hierarchy for plastic films

CIMPA calls for promoting measures aiming at improving design for recycling during the packaging product's development, with preference towards sorting and recycling techniques with the lowest environmental footprint. Thus, mechanical recycling should be preferred over physical recycling (dissolution), and chemical recycling should only be used in cases where no alternative recycling path with a lower environmental footprint is available. In the CIMPA project, around 70% of simple multilayers will be recycled this way.

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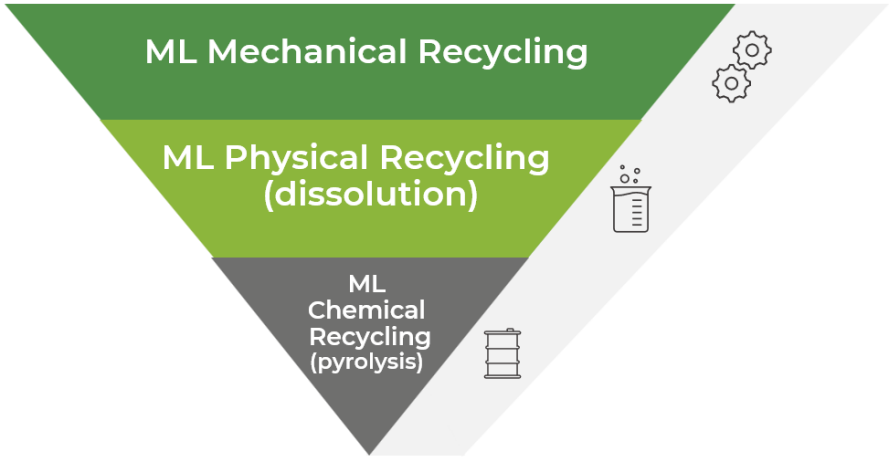

Figure 1. Recycling hierarchy for multilayers (ML)

This recycling hierarchy should be taken into account not only for the design of recyclable plastic packaging, but also for the attainment of recycled content requirements and modulation of the EPR fees.

By December 2026, the Commission shall adopt a delegated act supplementing the new PPWR with **sustainability criteria for plastic recycling technologies**. CIMPA calls the Commission to follow the proposed recycling hierarchy taking into account the environmental impact of the technology for the purposes of recycled content, in order to ensure that the overall process minimizes pollution.

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