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Position on sustainability criteria for recycling technologies under PPWR Delegated Act (Article 7(9))

Executive summary

The Packaging and Packaging Waste Regulation (PPWR) foresees, notably under Articles 6 and 7, the development of sustainability criteria for recycling technologies as one of several mechanisms contributing to the achievement of its objectives.

Cefic considers it essential that these sustainability criteria are designed to be technology-neutral and aligned with the PPWR definition of high-quality recycling (Recital 30 and Article 3(41)), ensuring that all recycling technologies, including chemical recycling technologies, are assessed based on what they deliver in practice.

In particular, sustainability criteria should:

- Be based on a combined input- and end-use oriented approach, reflecting both the characteristics of the waste stream and the end-use based requirements for quality, functionality and performance of outputs placed on the market, with the objective to substitute virgin-based materials in high-quality applications;
- Ensure technological neutrality, avoiding implicit preferences or exclusions across recycling pathways;
- Recognise the complementary roles of recycling technologies across different waste streams, including the contribution of chemical recycling in treating complex wastes that cannot effectively be recycled otherwise and would be directed to incineration or landfill;
- Incorporate broader circularity and resource efficiency indicators, beyond climate metrics alone, with performance primarily assessed against the virgin materials being substituted in line with PPWR high-quality recycling objectives, while also recognising, where relevant, the avoidance of incineration and landfill for complex waste streams;
- Last but not the least, remain flexible and innovation-friendly, reflecting the nascent stage of chemical recycling, where limited data availability and evolving technologies make rigid or prescriptive criteria premature. Criteria should therefore support industrial integration, scale-up, and continuous improvement.

Poorly designed criteria risk distorting investment signals, excluding technologies needed to treat complex waste streams, and undermining the PPWR's objectives on increasing the use of recycled content, waste reduction and improving recycling quality.

Cefic remains committed to supporting the Commission in developing a robust, future-proof regulatory framework that enables all recycling technologies to contribute to the EU's circular economy and climate objectives.

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1. Sustainability criteria as an enabler of PPWR objectives

Sustainability criteria should support the PPWR's objectives by ensuring that recycling is performed in an environmentally sound manner, in line with Recital 48, and delivers high-quality outputs, as defined in Recital 30 and Article 3(41), where recycled materials are of equivalent quality to virgin materials. These principles should serve as central reference points in the design of sustainability criteria, ensuring both high standards of recycling processes and the quality of resulting materials placed on the market. Well-designed criteria can support the PPWR's objectives by promoting resource efficiency, enabling high-quality outputs, and supporting the treatment of a broad range of waste streams. To be effective, they must remain technology-neutral and recognise the complementary roles of different recycling pathways, particularly for plastic waste streams that today cannot be mechanically recycled.

However, overly strict or narrowly defined criteria risk undermining these objectives. They can distort technology choices, discourage investment and innovation, and exclude solutions that are necessary to deliver high-quality outputs from challenging waste streams.

This is especially critical in the EU context, where recycling installations already operate under stringent environmental and climate regulations. Adding further layers of requirements risks weakening the competitiveness of EU recyclers and increasing the likelihood of carbon leakage.

Finally, to ensure a level playing field, equivalent standards must apply to imports. Recyclates from third countries should only be placed on the EU market where they meet standards equivalent to those applicable within the Union, in line with Article 7(8b) PPWR.

2. Designing technology-neutral, input- and end-use-based sustainability criteria

Sustainability criteria should be designed as a combined input- and output-based framework, ensuring alignment between the characteristics of the waste stream and the quality and performance of materials placed on the market. Cefic strongly supports a technology-neutral approach, whereby recycling technologies are assessed based on what they deliver rather than how they operate.

In line with Recital 48 of the PPWR, recycling should be performed in an environmentally sound manner, ensuring high-quality processes and outputs. This requires assessing both the management of waste inputs and the quality and functionality of outputs (end-use) across the entire value chain—from collection and pre-processing to final material use—across all recycling pathways.

I. Input-based

Sustainability criteria should be based on the characteristics of the waste input, reflecting the composition and quality of the waste stream rather than relying on generic assumptions about technologies. As highlighted in the JRC's 2023 assessment[1], the nature of the input determines which recycling pathways are technically feasible and environmentally relevant. Criteria should therefore distinguish between waste suitable for established mechanical recycling and more complex fractions—such as mixed or multi-layer plastics—which can be treated by chemical recycling and would otherwise be directed to incineration or landfill.

[1] JRC technical report, Environmental and economic assessment of plastic waste recycling, 2023

II. End-use-based

An end-use approach focuses on the quality, functionality, and environmental performance of the recycled materials placed back on the market, in line with Recital 30 and Article 3(41) of the PPWR, which define high-quality recycling as producing materials of equivalent quality to virgin materials. It recognises that different technologies are designed to address different waste streams and that their sustainability performance should be in relation to their intended role and end-use of their outputs within the circular economy. Such an approach is better aligned with the PPWR's emphasis on recycled content, material quality, and market uptake.

In this context, sustainability should also reflect the extent to which recycled outputs can substitute virgin materials in final applications and the associated sustainability benefits of such substitution. Outputs that achieve full equivalence in quality and functionality should be recognised as enabling one-to-one substitution, contributing to sustainability objectives such as reduced greenhouse gas emissions, lower reliance on virgin resources, and avoidance of landfill or incineration.

For example, an output-based assessment could evaluate chemically recycled polymers—such as plastics—based on their suitability to displace virgin fossil-based products in high-quality applications, their compliance with product legislation, and their associated life-cycle environmental performance. Under such an approach, different recycling technologies could be assessed on a comparable basis, even where they process different waste streams or operate at different points in the value chain, provided that the resulting outputs meet defined functional and sustainability performance criteria.

III. Technology neutral

Technology neutrality also implies that sustainability criteria should be applicable across recycling pathways without embedding implicit preferences for specific technologies. Criteria should be sufficiently flexible to accommodate innovation, integration with existing industrial assets, and improvements over time, while still providing a robust basis for regulatory oversight and comparability.

3. Avoiding unintended exclusion through restrictive sustainability criteria

Given the PPWR's ambition to increase recycling rates and recycled content across all packaging types, excluding technologies capable of handling today's most challenging waste streams would undermine both environmental and economic objectives.

Cefic is concerned that sustainability criteria based on narrow or overly restrictive assumptions could unintentionally exclude chemical recycling technologies from contributing to PPWR objectives. This risk is particularly acute where criteria fail to recognise that different technologies are designed to produce high-quality outputs from different input streams, in-line with the PPWR definition of high-quality recycling.

Chemical recycling encompasses a range of technologies that convert plastic waste into secondary raw material intermediates such as agglomerates, pellets, oils, gases and monomers, or other chemical feedstocks, which are subsequently processed into high-quality recyclates. These pathways are structurally different from mechanical recycling and operate at different points in the value chain. Applying assessment logic developed for mechanical recycling by analogy can therefore lead to mischaracterisation of performance and functionality.

4. Going beyond climate impact: resource efficiency, circularity and high-quality applications

Sustainability criteria should encompass a broader set of indicators reflecting resource efficiency and circularity across the full recycling pathway.

While climate impact is an important component of sustainability assessment, it should not be the sole determinant. Recycling technologies contribute to the PPWR's objectives in multiple ways, including by reducing dependence on virgin raw materials, enabling the circulation of carbon within the economy, and recovering value from waste streams that would otherwise be incinerated or landfilled.

A broader and more balanced set of indicators to reflect resource efficiency and sustainability of the entire recycling pathway would include:

- Compatibility with high-quality applications, reflecting the ability of recycled outputs to meet performance requirements and substitute virgin materials in line with the PPWR definition of high-quality recycling (Recital 30 and Article 3(41)).
- The ability to process complex waste streams: such as mixed or multi-layer plastics that are not suitable for mechanical recycling. This reflects the capacity of other technologies, such as chemical recycling technologies, to address real-world waste streams and to divert materials from incineration or landfill, thereby increasing overall recycling rates and system efficiency.
- Material recovery efficiency.
- Contributions to circular material use through both closed- and open-loop and upcycling recycling pathways, recognizing that circularity is not limited to polymer-to-polymer recycling. Some technologies enable the transformation of plastics waste into recyclates that re-enter the economy with equal or higher functional value, thereby supporting broader circular flows and reducing reliance on virgin fossil-based inputs.

A multi-dimensional assessment framework is therefore needed to capture these different contributions and trade-offs across recycling pathways. This helps ensure that technologies are assessed fairly, based on their overall contribution to circularity and resource efficiency, rather than being disadvantaged for optimising different sustainability dimensions.

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