

Impacts of allocation rules on chemical recycling

Consequences on the environment and maximum circularity of plastics

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Executive Summary

This paper provides a summary of the study "<u>Impacts of allocation rules on chemical recycling – Consequences</u> <u>on the environment and maximum circularity of plastics</u>" that calculates the impact of the different allocation rules for recycled content in plastics regarding the environment, material circularity and on the level playing field in the recycling sector.

Context

Chains of custody models are used to describe the link between a specific unit of production and the claim about the final product, which are systems built to follow the material in the different activities it undergoes. Mass balance is one of the different chains of custody currently in use to claim recycled content, which is technically required only for thermo-chemical technologies, i.e. pyrolysis and gasification.

In the study, these technologies are gathered under the concept of long-loop chemical recycling, but this concept does not reflect the position of Zero Waste Europe (ZWE), which considers these technologies as chemical recovery techniques.¹

The study focuses on the mass balance chain of custody, as it is highly debated regarding the different approaches that can be used, from stricter to more flexible rules: (1) proportional allocation, (2) polymer-only, and (3) fuel-exempt. The main difference between these three approaches lies in the allocation freedom that chemical companies have to assign recycled content among the outputs.

Main findings

The study finds that proportional allocation has the lowest impact on the level-playing field and the largest potential environmental benefits. Indeed, the attribution of recycled material to each output product is done in the same portion as what they were in the total input. Thismeans that recycled content claims cannot be transferred from one output product to another and, therefore, claims reflect the efficiency of the technology.

By imposing the same rules on all technologies, proportional allocation reduces the risk of scenarios with lower environmental benefits and reduced maximum recycling rates, in which long-loop chemical recycling dominates. In such a scenario, the CO_2 benefits of plastics recycling could be up to 9 Mtonnes lower than in a

¹ DUH, ECOS, ZWE, <u>Chemical Recycling and Recovery – Recommendation to Categorise Thermal Decomposition of Plastic Waste to</u> <u>Molecular Level Feedstock as Chemical Recovery</u>, 2021

scenario with more mechanical recycling. Although long-loop recycling is desirable in some cases (in particular for waste that cannot be mechanically recycled or in a chemical short-loop), from an environmental perspective it is undesirable that long-loop chemical recycling is becoming dominant and buys up the waste that can be mechanically recycled or in a chemical short-loop, as it is less efficient.

Other allocation rules, i.e. polymer-only and fuel-exempt models, allows for the arbitrary attribution of recycled content to parts of the production with the highest market values. This makes it easier for chemical recyclers to increase the financial benefits, while this is not possible for mechanical recyclers and short-loop chemical recyclers. This situation breaks the level-playing field between different recycling technologies.

In addition, proportional allocation is preferable as it reduces ambiguity about the recycled content in the plastic outputs of long-loop chemical recycling, which increases the transparency in the plastic recycling market. It prevents products to be marketed as having a high percentage of recycled content while, in reality, they may be composed of only a small portion of recyclates.

Our recommendations

If the European Commission decides to implement options with larger allocation freedom (polymers-only or fuel-exempt), a cap on long-loop chemical recycling should be considered to ensure chemical recycling is not discriminatorily favoured over mechanical recycling. An option could be to introduce a cap of a maximum of 12,5-25% long-loop chemical recycling.² Furthermore, the European Commission could consider to implement more norms on product groups that can meet the targets with mechanical recyclate. Current proposals for mandatory recycled content in food packaging give an incentive to direct waste plastics to long-loop chemical recycling.

ZWE advises to:

- Use proportional allocation to evenly allocate the recycled content to output products when using mass balance (instead of allocating it arbitrarily);
- Use 'batch level' mass balance to determine recycled content, so that it is clear how much recycled material is in the final product;
- Consider capping chemical recovery up to a maximum of 12,5-25% to avoid it overtaking mechanical recycling if polymers-only or fuel-exempt models are used;
- Implement regulation to ensure that mechanical remains the primary recycling option for maximum CO₂ reduction and circularity score.

² Percentages have been suggested in the Dutch transition Agenda



Zero Waste Europe (ZWE) is the European network of communities, local leaders, experts, and change agents working towards the prevention and elimination of waste in our society. We advocate for sustainable systems; for the redesign of our relationship with resources; and for a global shift towards environmental justice, accelerating a just transition towards zero waste for the benefit of people and the planet. <u>www.zerowasteeurope.eu</u>



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