

Chemical Recycling: Delivering recycled content to meet the EU's circular economy ambitions – the Single Use Plastics Directive Implementing Act and the Packaging and Packaging Waste Directive revision

The chemical industry is committed to boosting the circular economy by delivering recycled content which is urgently needed to strengthen the EU's strategic autonomy in raw materials and meet climate targets. This requires a clear and enabling EU legislative framework which increases the recycled content of materials in a cost-efficient and transparent manner with limited environmental impacts¹, while taking into account the complexity of chemical processes. **The use of a third-party certified mass balance chain of custody method, with a fuel-use exempt model, is seen as indispensable** to meeting the EU's climate and circularity targets in time by leveraging Europe's existing industrial infrastructure. The framework should ensure a harmonised and predictable approach across the many pieces of EU legislation that address recycled content.

Background: rapid scale-up of chemical and mechanical recycling capacity is needed to deliver on the EU's circular economy

While 53.9 million tonnes of plastic is produced yearly in Europe, approximately 84% of which does not currently find its way back into new products². Instead, substantial amounts of plastic remain being landfilled, incinerated, or exported. The European ambition to transition from a linear economy towards a sustainable circular economy calls for an array of complementary recycling options and business models. Chemical recycling can play its part in valorising end-of-life plastic waste streams, enabling the production of new chemicals including plastics. It will be very difficult to meet ambitious recycling targets without significant and rapid scale-up of both mechanical and chemical recycling technologies³.

Recycled content requirements for plastic products already exist in EU policy and proposals under the European Green Deal are expected to establish additional targets in the coming years. The Plastics Strategy and the Circular Economy Action Plan underline the importance of recycled content requirements. They help cut the EU's greenhouse gas emissions and dependence on imported fossil materials while driving and increasing the demand for secondary raw materials, creating a well-functioning EU market for secondary raw materials, and bringing green growth and jobs.

To ensure that the EU's policy framework promotes an efficient and effective deployment of chemical recycling, it is key that a mass balance credit method is recognised to allow chemical recycling to contribute

¹ Cefic and Quantis (2020). Chemical Recycling: Greenhouse gas emission reduction potential of an emerging waste management route. [Available online](#)

² Plastics Europe. The Circular Economy for Plastics – a European overview, 2022 edition. [Available online](#); extrapolated from 2019 available figures, geographical scope: EU+3 (Norway, Switzerland, United Kingdom)

³ Examples include: SystemIQ (2022). Planet Positive Chemicals – Pathways for the chemical industry to enable a sustainable global economy. [Available online](#); Delft CE (2022). Monitoring chemical recycling – How to include chemical recycling in plastic recycling monitoring? [Available online](#)

to recycled content targets in EU legislation, including in the SUPD⁴ and the revision of the PPWD⁵.

Mass balance is the key enabler

One of the main barriers to scale-up chemical recycling technologies is uncertainty about the method for calculating the recycled content of plastics. Without rapid resolution of the issue, the EU's chemical industry may not be able to deliver recycled content to meet the EU's climate and circular economy targets in time. Meanwhile, the chemical industry is now at the start of the circular transition and is currently investing in chemical recycling capabilities. Major investments of commercial scale have already been announced, covering different chemical recycling technologies. However, for these to proceed to fruition, a clear mass balance method as outlined below is required.

In the case of chemical recycling, mass balance is needed to allow for a smooth and rapid transition to leverage recycled feedstocks in existing infrastructure, together with the virgin fossil sourced feedstock. As the two different feedstocks cannot be physically separated once they are co-fed into the complex large-scale installations, the mass balance methodology is required to accurately calculate and verify the amount of recycled content allocated to products.

It is important to be able to leverage existing infrastructure to allow co-feeding of the recycled feedstock, replacing part of the fossil-sourced feedstock. This is also because it would be counterproductive to build an entirely new stand-alone infrastructure for producing plastics solely from recycled waste since it would take years to construct new manufacturing plants with billions in costs and high climate footprint.

Mass balance is one of the well-known and widely used "chain of custody" models, as defined in ISO standard 22095⁶. It is already successfully deployed in other sectors, such as biofuels, fairtrade cacao and coffee.

To deliver the recycled content for the European Green Deal, the mass balance method should be based on the following pillars:

- *Third-party certification*
Cefic sees credible **third-party certification schemes and their standards as indispensable** to guarantee the correct and transparent use of appropriate chain-of-custody methods along the value chains, avoid double booking, substantiate the claims and provide credible and transparent information to the market and consumers.
- *Allocation models*
Cefic supports the 'fuel use exempt' model as a way forward for how the recycled content can be assigned to the outcome products. It should allow a credit-based mass balance method using actual conversion factors to correct for process losses and outputs consumed as fuel.

Restrictive models, such as **proportional and polymer-only, would hamper the acceleration of the circular economy**, as they would lead to low amounts of recycled content for technologies and processes with several outputs. These recycled contents would initially be too low to create any

⁴ The upcoming Commission Implementing Decision laying down rules for the application of Directive (EU) 2019/904 as regards the calculation, verification and reporting of data on recycled plastic content in single-use plastic beverage bottles

⁵ The upcoming revision of the European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste ([EurLex](#)) ([Have your say portal](#))

⁶ Mass balance is defined by ISO standard 22095:2020 as a system in which "materials or products with a set of specified characteristics are mixed according to defined criteria with materials or products without that set of characteristics"

meaningful effect, eventually diminishing market demand and technology progress. This is expected to slow down the uptake of chemical recycling which is needed to drive circularity further. The study of Eunomia⁷ shows that these models are also expected to significantly increase costs.

- *Restricted credit transfer*

Cefic supports that **restricted credit transfer is only used under very specific conditions**: same product, same parent company and within specified geography. This avoids unnecessary transport of intermediate products along the value chain and associated environmental impacts.

Establishing a mass balance method under these conditions will help ensure that recycled feedstock progressively replaces more and more fossil-based virgin materials in the production of plastics and a broad range of chemicals and products in Europe.

Circular economy to take a broad scope

The development of a circular economy for plastics requires more waste to be collected and directed towards recycling regardless of waste origin. Cefic supports that all waste should be considered as source of recycled content, beyond only post-consumer waste, to include also pre-consumer waste and to incentivise investment in technologies that would bring more recycled feedstock to the economy.

Ensuring a harmonised and predictable approach for the calculation of recycled content

As recycled content requirements are established and implemented, it will be impossible to meet targets without significant and rapid scale-up of both mechanical and chemical recycling capacities.

The recycled content requirements in EU legislation will be adopted and applied at different times. It raises uncertainty because it is not possible to anticipate whether the method for calculating the recycled content of plastic packaging will be the same as for calculating the recycled content in, for example, construction materials made from plastics. This highlights the challenges of a piecemeal approach.

To help provide clarity, the European Commission could use additional tools in its toolbox such as issuing a Recommendation, Guideline or Communication on calculating recycled content for any plastic item.

For more information about chemical recycling, please consult [Cefic's position paper on chemical recycling](#) (April 2022).

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About Cefic:
Cefic, the European Chemical Industry Council, founded in 1972, is the voice of large, medium and small chemical companies across Europe, which provide 1.1 million jobs and account for 15% of world chemicals production.

⁷ European Commission DG ENV and Eunomia (2022). Study to develop options for rules on recycled plastic content for the implementing act related to single-use plastic bottles under Directive (EU) 2019/904. [Available online](#)