

Position Paper

Plastics Europe's position on the role of bio-based feedstocks in the Plastics Transition

The European Union has set ambitious targets to boost circularity, climate neutrality, and competitiveness across the EU. In line with such ambition, increasing the share of bio-based feedstocks in plastics production provides an additional pathway to lower value-chain emissions and support progress towards climate and circularity goals.

To operationalise this vision, we recommend the European Commission to:

- Implement mechanisms to establish lead-markets for plastics from bio-based feedstocks such as dedicated and well-designed targets, public procurement measures and ecomodulated mechanisms such as EPR incentives .
- Ensure targets for plastics from bio-based feedstocks do not compete with recycled content targets.
- Recognise bio-attributed plastics role in the transition.
- Build upon sustainability criteria established under the Renewable Energy Directive.
- Take stock of existing voluntary sustainability certification schemes.
- Adopt accounting rules for biogenic carbon that better reflect the role of biomass in reducing GHG emissions (-1/+1 accounting).

Clear value recognition in the lead markets is central to building viable supply chains and stimulating investment in sustainable bio-based solutions.

The recommendations in this position paper will support upcoming legislation defining the legislative framework of plastics derived from bio-based feedstock, such as the Circular Economy Act and the Biotech Act II, as well as sector specific legislation such as the Packaging and Packaging Waste Regulation (PPWR), Construction Products Regulation (CPR) and End of Life Vehicles Regulations (ELVR).

1. Clear definitions and recognition of the role of different technologies

Plastics derived from bio-based feedstocks encompass a wide range of polymer types produced through different chemical pathways – they may have a direct fossil based equivalent or be developed from entirely new alternative building blocks. This full range of options is needed to reach maximum impact at minimum cost via economy of scale. Moreover, the plastics transition will also require different chain of custody methods and therefore, to support transparency, the Commission should adopt clear definitions for plastic derived from bio-based feedstocks:

- Bio-based plastics - those for which the share of bio-based content can be measured via established radiocarbon methods (e.g. EN 16640 C14 tracing). These may be fully or partially bio-based.
- Bio-attributed plastics - Plastics with attributed bio-based content. The determination of bio-based content can be done via feedstock attribution - i.e. allocation of the characteristics of a feedstock (in this case biobased), which is added at the beginning of the production process, to the end-product. Mass balance is one well-known chain of custody approach which can be used to trace the flow of materials through the value chain resulting in associated claims for that allocation.

While Plastics Europe acknowledges the important role of biodegradable and compostable plastics in certain applications, this paper will focus exclusively on the role of bio-based feedstocks in the plastics transition.

2. Sustainability criteria

Plastics Europe fully supports a harmonised and feedstock-neutral approach that allows for all feedstock respecting sustainability criteria to be used for plastics production. Sustainability criteria for bio-based feedstocks will be required under different frameworks, and **these should be aligned with Article 29 (2-7) of the Renewable Energy Directive (RED)**. **Many feedstocks** - such as bioethanol, bio methanol, bio propane, and bio naphtha - **are already covered under the RED when used as biofuels**. These same feedstocks can also be used as inputs for chemical products, meaning they compete across sectors. Aligning sustainability criteria with Article 29 (2-7) would therefore ensure consistency, legal certainty, and a level playing field, as also argued in a recent [position paper by CEFIC](#).

Plastics Europe supports requiring **robust life cycle assessments** to demonstrate that products made partly or fully from bio-based feedstocks deliver GHG emissions lower than their conventional reference product. These life-cycle GHG emissions should be calculated and third-party verified as outlined in the EU Taxonomy Delegated Regulation (EU) 2021/2139, activity 3.17 (c). Given the wide diversity of products and applications, setting a minimum GHG reduction threshold now would be premature. The EU Taxonomy approach offers a viable framework, with further criteria to be defined in product specific legislation, where GHG performance can be assessed at the final application level.

2.1 Third party certification

The EU already has a network of voluntary schemes recognised by the European Commission under a sustainability framework that covers the production of fuels and energy from agricultural as well as forest biomass and organic waste. Variants of these certifications adapted to the chemicals and materials industries, have been adopted by many industry players both to guarantee the sustainable origin of the biomass used and for chain of custody/traceability purposes. Building on these voluntary schemes for certification required under European regulations will increase speed, efficiency, and robustness of implementation.

3. Market creation measures

As highlighted in the EU Bioeconomy Strategy, assessing a broad range of factors is essential when considering the use of biomass. These include biomass quality, feedstock type (primary vs. secondary), biomass availability over time, alternative ways to supply the same service considering sustainability, environmental impacts and circularity, infrastructure and processing capacity, as well as economic consequences. The latter must include cost impacts on consumers and societal affordability to avoid disproportionate impacts on lower-income households.

The development of markets for plastics from bio-based feedstocks will not happen without a supportive regulatory framework. In the following, we will discuss Plastics Europe's views on the most relevant market-creation mechanisms that we have identified, namely targets, and public procurement, as well as the role of eco-modulated mechanisms such as EPR schemes to support these developments.

3.1 Market creation via targets for plastics made from bio-based feedstocks

The current demand for bio-based and bio-attributed plastics [corresponds to approximately 600kt](#) which is slightly above 1% of the total plastics produced in Europe. This is why market creation measures are so important. Binding targets have proven effective in driving demand and economies of scale for more sustainable alternatives. Plastics Europe sees targets for plastics made from bio-based feedstocks as a necessary precondition for the further development of this technology. However, in order to achieve the full benefit and avoid negative consequences, we strongly recommend the following:

- **Targets for recycled and biomass content must not compete** - both recycled and bio-based feedstocks are needed to meet European circularity and wider sustainability goals and should not compete with each other. Targets for recycled and biomass content should be set in a way that ultimately enables an increased share of both recycled and bio-based feedstocks. This will help industry gain clarity in their investment plans in new technologies and foster their further development. Therefore, in line with [Plastics Europe's roadmap](#), we advocate for the establishment of a separate target that includes plastics made from bio-based feedstock, wherever appropriate and after consultation of the full value chain. These mandates could be introduced in sector specific legislation. Building on the extensive stakeholder consultations, existing assessments and [literature from the Joint Research Centre](#) (JRC) amongst many others reports, we believe the European Commission has a solid information base to quickly produce a robust impact assessment.
- **Predictable growth** - steady and predictable progression of targets over time is necessary, as large leaps after several years with constant targets foster boom-and-bust cycles and may therefore be detrimental to the development of this important lever.
- **Both bio-based and bio-attributed products must count towards the targets** - the mass balance method – with proper guardrails in place to avoid potential issues such as double counting – must also be recognised for biomass in European legislation. Mass balance is a chain-of-custody approach that allows selectively attributing the content (here: the biomass

content) to particular products, i.e, concentrating them on part of the output. This is especially relevant to allow already existing plants, traditionally fed by conventional feedstock, to co-process multiple inputs (i.e. fossil, recycled, bio-based and CCU).

3.2 Market creation measures via public procurement

Targeted applications could be incentivised via the revision of the public procurement criteria. Public tenders can play a relevant role in derisking early-stage investments by securing a minimum level of demand for plastics made from bio-based feedstocks. Overall, embedding additional criteria into tenders other than the most convenient offer - such as minimum requirements for bio-derived content or lifecycle carbon footprint - governments will support the market uptake and the investment in low carbon solutions, including bio-attributed ones. Similar initiatives in Europe could include the evaluation of bio-based content in public contracts, preference for products holding ecolabeling schemes (which, in parallel, should be harmonised) and procurement quotas for certified bio-based products.

3.3 Rewarding plastics from bio-based feedstocks via ecomodulated mechanisms such as EPR schemes

These mechanisms to create markets can be supported by ecomodulated mechanisms such as EPR schemes. In packaging, for example, it is stated in the PPWR that by January 2028, economic operators placing products on the EU market will pay EPR fees that are modulated based on recyclability performance grades (A, B, or C), and **Member States will be given the option to include additional modulation for recycled content**. As mentioned in our Position Paper [Recommendations for a Harmonised and Implementable EU-wide EPR Framework](#), “an EU-wide set of EPR requirements should include product-specific criteria for eco-modulation, including [...] rewards for the use of secondary raw materials [...] and also other circular plastics (bio-based, bio-attributed and carbon capture and utilization (CCU)). While promoting the use of diverse circular feedstocks is essential for Europe’s transition to a circular economy, any targets for bio-based and CCU feedstocks should remain separate from those set for recycled plastics”.

4. Biogenic carbon accounting

The development of the plastics from bio-based feedstocks market in Europe needs to start with necessary adaptations being made to the methodology for both the Product Environmental Footprint (**PEF**) and the Organisation Environmental Footprint (**OEF**). These methodologies are currently built on the so-called 0/0 approach where both the uptake of CO₂ from the atmosphere during biomass growth as well as the emissions (via combustion or decomposition) are considered to cancel each other (a simplification used for biofuels where End-of-Life is always combustion).

Generally, LCA methodologies, including PEF and OEF, **were not originally designed with biogenic carbon complexities in mind**. The accounting of biogenic carbon must be translated into LCA methodologies in a transparent manner and **the -1/+1 approach** (where CO₂ uptake from the atmosphere (-1) as well as emissions at the end of life (+1) are explicitly modelled) is the most appropriate. The use of the -1/+1 approach explicitly shows the difference between bio-based and fossil materials at the cradle-to-gate stage and allows the users to complement this information with

their respective End-of-Life scenario to cover the full life cycle. It also incentivises recycling as the absence of End-of-Life emissions preserves the initial benefit of CO₂ uptake. Moreover, it has the advantage that no changes to the calculation methodology for fossil materials are needed.

Closing remarks

While recognising the current economic and geopolitical headwinds, Plastics Europe members remain fully committed to the Plastics Transition Roadmap. The roadmap acknowledges that there is no single solution and that achieving climate neutrality and circularity will require a diversified mix of feedstocks, including recycled, bio-based, and carbon-captured alternatives. Realising this transition depends on an enabling policy framework that effectively addresses the challenges outlined in this paper.

In this context, we stand ready to work in close partnership with the European Commission to co-develop coherent and forward-looking frameworks that unlock low-carbon, circular, and competitive bio-based plastics value chains in Europe.

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