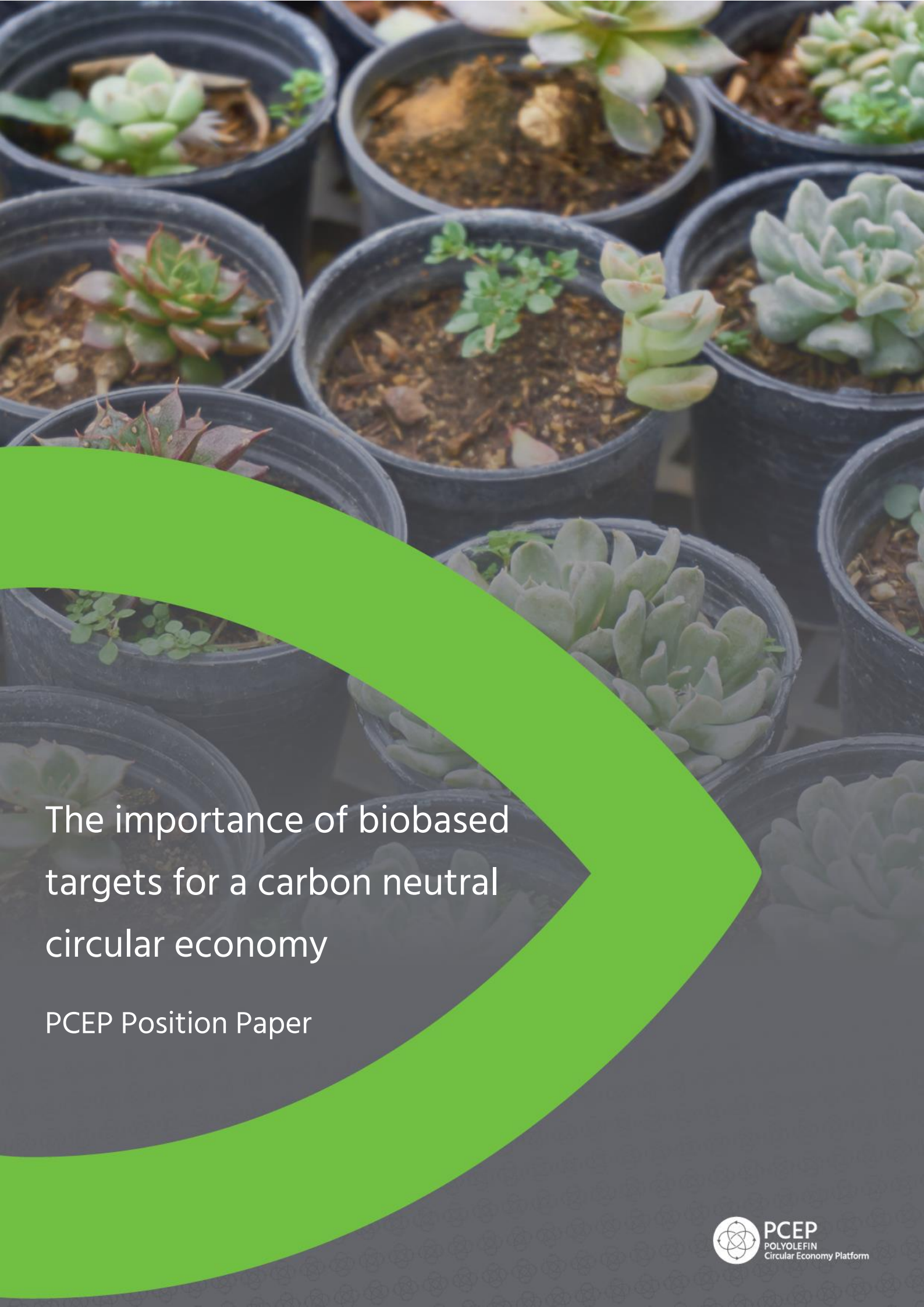

The importance of biobased targets for a carbon neutral circular economy

PCEP Position Paper

PCEP
POLYOLEFIN
Circular Economy Platform

The importance of biobased targets for a carbon neutral circular economy

Introduction

PCEP (the Polyolefin Circular Economy Platform), PCEP brings together actors from across the polyolefin value chain, united in our common mission to drive the transition to a circular economy for polyolefins - the most commonly used family of plastics. 71.4% of plastics packaging in Europe is made of polyolefins, accounting for 71% of collected plastic waste. This collected material goes on to be transformed into 84.7% of post-consumer recycled polyolefins, used today in European products across building and construction, packaging, agriculture, automotive, electronics, and other sectors.

PCEP supports the EU Green Deal objectives to achieve a climate neutral and circular economy by 2050. As extensively reported by different industry and government stakeholders[1,2,3,4,5] the use of all alternative sources of virgin fossil carbon, including bio-based feedstocks, is crucial in our journey to reach a net-zero circular economy. Therefore, the EU should promote the availability and production of sustainably sourced biobased feedstock, which enable the carbon footprint reduction of polyolefins[2]. The uptake of such feedstock should be incentivised when this helps replace fossil feedstock.

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[1] European Commission (2022) Directorate-General for Environment, *Bio-based plastic: sustainable sourcing and content: final report*, Publications Office of the European Union, available: https://data.europa.eu/doi/10.2779/668096

[2] CE Delft (2023) Sustainability of biobased plastics Analysis focusing on CO2 for policies: https://cedelft.eu/publications/sustainability-of-biobased-plastics-analysis-focusing-on-co2-for-policies/

[3] SystemiQ (2022) *ReShaping Plastics, Pathways to a circular climate neutral plastics system in Europe*, available: https://plasticseurope.org/changingplasticsforgood/reshaping-plastics/

[4] Ellen MacArthur Foundation (2016) *The New Plastics Economy: Rethinking the future of plastics*, available: https://ellenmacarthurfoundation.org/the-new-plastics-economy-rethinking-the-future-of-plastics

[5] Renewable Carbon Initiative (2023) *Compilation of supply and demand of fossil and renewable carbon on a global and European level*, available: RCI Carbon Flows Report: Compilation of supply and demand of fossil and renewable carbon on a global and European level (PDF) | Renewable Carbon Publications (renewable-carbon.eu)

Why biobased feedstock?

We consider biobased feedstock, derived from biomass, as an important part of the overall transition towards sustainable carbon for producing polyolefins, together with recycled, and carbon capture polyolefins. Bio-based plastics are generally considered to have three main benefits:

1. **Fulfilling demand for virgin feedstock with alternatives from renewable sources.**
2. **Enabling the industry's decoupling from fossil resources.**
3. **Ensuring a significant carbon footprint reduction due to the carbon sequestration and storage during its life cycle.**

Polyolefins obtained from bio-based feedstock are needed to achieve plastics full sustainable potential

When looking into the topic of making the plastics economy more circular and carbon neutral, there are some points that are becoming clearer to those working on this issue, and those are:

- There is no silver bullet – following the waste management hierarchy (i.e. reduce, reuse, recycle etc) is necessary and important but not enough to reach the highest level of sustainability possible.
- Because of a certain level of losses, inefficiencies, and demand from all goods, there will always be need for virgin plastics.
- There are mature technologies readily available to replace finite fossil feedstock with biobased feedstock into the existing circular infrastructure for polyolefins. That means a perfect fit to the circular economy as products can be designed to be reusable, recyclable **and renewable**.

Enabling independence from fossil resources

Considering that recycling alone will not address all demand for plastics, other sustainable raw material alternatives to the current fossil feedstock in use need to be developed. For polyolefins, the current alternatives for circular carbon are bio- and CO_2-

based feedstock. There are many visions and roadmaps being proposed and all point towards a lower dependence, or total decoupling, from fossil fuels. In the Net Zero System Change Scenario of both the Reshaping Plastics report from SYSTEMIQ[3] and The Plastics Transition[6] roadmap, biomass is used to fulfill ~14% of the 2050 plastics demand.

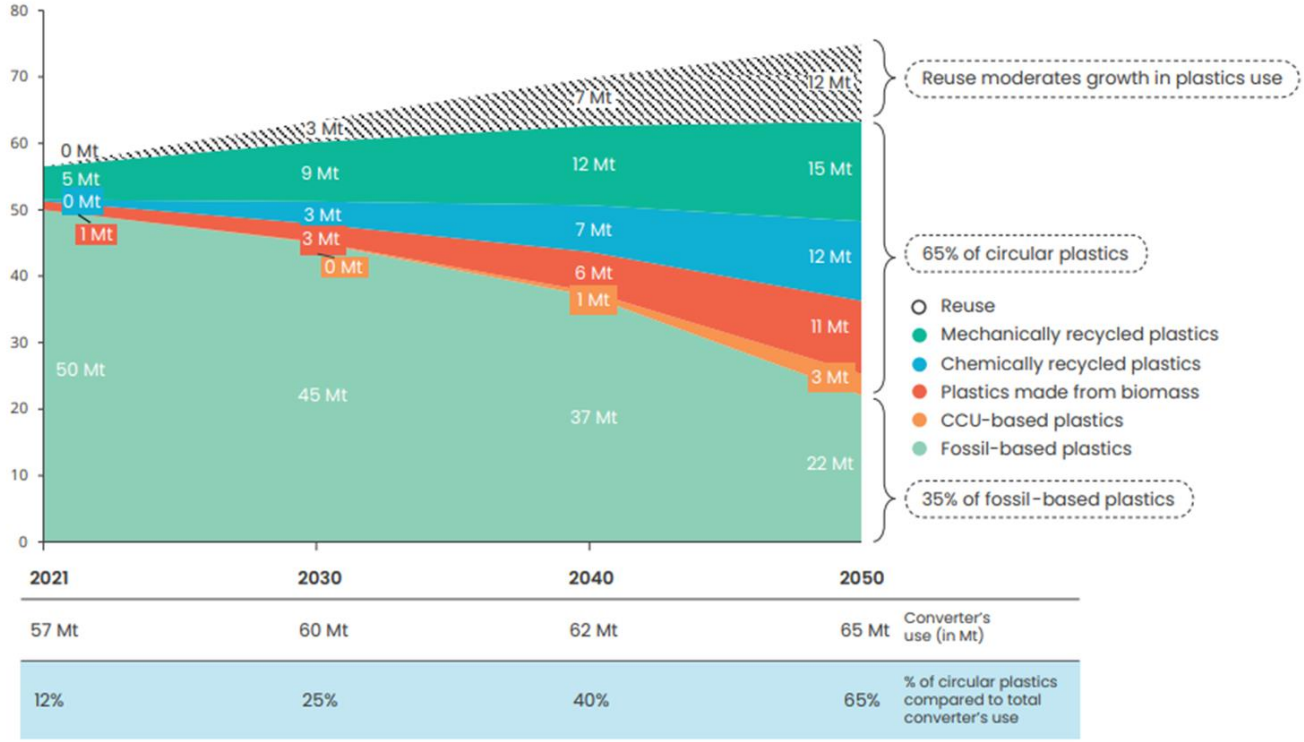

Figure one: The Plastics Transition roadmap *shows 14% of plastic demand in 2050 derived from biomass.*

In order to give a rapid boost to feedstock diversification, it is crucial to incentivise the use of more biobased feedstock in the traditional processes also by leveraging existing infrastructures and industrial facilities that are characterized by highly complex production processes and supply chain. In this context, the co-feeding of biobased and traditional feedstock is a ready-to-use opportunity that can be particularly relevant in the early stages in which renewable raw material may be available in limited quantities. The Mass Balance approach[7] is suitable to track the flow of biobased feedstock (mixed with the traditional one) through complex value chains and to attribute the bio-characteristics to a selected range of products, while guaranteeing full transparency and accountability.

[6] https://plasticseurope.org/wp-content/uploads/2023/10/PlasticsEurope_Report_24.10.pdf

[7] According to ISO 22095:2020, **Mass balance** is a "chain of Custody model 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.".

Carbon footprint reduction based on the carbon sequestration and storage during life cycle[2]

If virgin feedstock comes from fossil sources, this will contribute to the accumulation of carbon in the atmosphere either in the short term (currently over 40% of polyolefins in the EU are incinerated), or in the mid to long term, as eventually, the fate of the polymer waste is to end up as CO_2. On the other hand, the use of bio-based feedstock has a temporary carbon storage effect during the period that it is most urgently needed, which is now and in the upcoming decades. This is not well reflected in the European Commission's preferred life cycle assessment methodology also known as the Product Environmental Footprint (PEF) methodology as discussed in many position papers[8]. Nonetheless, bio-based plastics provide an immediate alternative if one considers the CO_2 removal effect from photosynthesis, thus reducing the climate impact of plastics.

Recommendations to policymakers

The European Commission's Communication on Sustainable Carbon Cycles[9], mentions that *"At least 20% of the carbon used in the chemical and plastic products should be from sustainable non-fossil sources by 2030"*. PCEP welcomes this holistic approach that embraces all sustainable carbon sources. More specific approaches which enable the long-term decoupling of polyolefins from fossil resources should be developed within forthcoming EU product legislation. For example, in the context of the revision of Packaging and Packaging Waste, End-of-life Vehicles, Construction Products and priority products under Ecodesign for Sustainable Products, we believe that the use of biobased feedstock to produce polyolefins should be considered alongside, and complimentary to, the use of recycled feedstock.

To this end, to complement the recycled content targets under discussion in sectorial legislation (e.g., packaging and automotive), PCEP supports the need for additional separate bio-based/ content targets, acknowledging the contribution of bio-based feedstock to the EU's sustainability goals and supporting their development.

[8] https://cefic.org/app/uploads/2022/09/Cefic-position-on-PEF-Product-Environmental-Footprint-Towards-an-accurate-accounting-for-carbon-from-biomass-in-the-Product-Environmental-Footprint-PEF.pdf

[9] https://climate.ec.europa.eu/system/files/2021-12/com_2021_800_en_0.pdf

When defining such a target, we call on policymakers to take into consideration the following recommendations:

1. **The target should not only reflect the current usage level but, more importantly, the policy objectives, the development potential, and support sustainably sourced bio-based polyolefins[10] scale-up**, based on a robust impact assessment considering all applications.

2. **The use of biobased feedstock must demonstrate clear sustainability benefits, but associated requirements should not hinder unduly its development**:

   - Polyolefins made from bio-based feedstock should demonstrate a reduced carbon footprint, compared with fossil-based equivalent products, based on third-party verified LCA methodologies that allow biogenic carbon accounting and thus, a levelled playing field between biobased and fossil raw materials. Furthermore, a recognition in LCA methodology standards of mass balance is essential to ensure a fair level play field of bio-based plastics vs fossil ones as this is not yet the case.
   - Bio-based feedstock used to produce polyolefins should comply with relevant EU sustainability criteria which must urgently be defined to ensure a sustainable scale-up of bio-based materials.
   - Voluntary certifications[11], European standards and the applicable criteria laid out on article 29 of the Renewable Energy Directive for biofuels[12] should be the references used by legislators when defining legally binding sustainability criteria for bio-based feedstock.

3. In addition to 'segregated' or 'controlled blending' chain-of-custody models, 'mass-balance chain of custody' should also be legally recognized to enable bio-based polyolefins to count towards the mandatory, complementary bio-based targets we are calling for.

[10] This includes the mass balance chain of custody model.
[11] Examples include: ISCC+, RSB, FSC and Bonsucro.
[12] Official Journal of the European Union (2018) *Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast)*, available https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001

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4. **Claims and labels on bio-based content at product level should be regulated and clear in order to ensure transparency and avoid greenwashing**. Recommendations already exist under the aforementioned certification schemes, and these certification schemes should be compliant with the Substantiating Green Claims Directive[13]. Existing standards such as EN 16848 and EN 16935 should be used as references.

[13] European Commission (2023*) Proposal for a Directive of the European Parliament and of the Council on Substantiation and Communication of explicit environmental claims (Green Claims Directive)*, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A0166%3AFIN

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