# UK’s inconsistent plastic definitions threaten bio-based innovation and sustainability



A new report from BB-REG-NET has highlighted significant regulatory inconsistencies in how "plastic" is defined across UK legislation, creating challenges for manufacturers of bio-based and biodegradable materials and potentially hindering sustainable innovation. The report, titled *Plastic definitions in UK regulation: How plastic is defined in regulations and implications for bio-based and biodegradable alternatives*, reveals that major UK regulations such as the Single-Use Plastics Ban (SUPB) and the Plastic Packaging Tax (PPT), although both referencing the REACH polymer definition, apply divergent exclusions that lead to regulatory confusion and market uncertainty.

Specifically, the SUPB excludes all "natural polymers that have not been chemically modified," whereas the PPT exempts only "cellulose-based polymers that have not been chemically modified." This discrepancy means that certain materials, including starch and polyhydroxyalkanoates (PHAs), are treated inconsistently—starch is exempt from the SUPB but subject to the PPT, and PHAs, despite being naturally produced, are considered plastics under both regulations. Such inconsistency complicates compliance for manufacturers and investors developing novel bio-based alternatives derived from plant proteins, seaweed, alginates, or chitin, who face a patchwork of definitions and a lack of clarity around key terms like "chemical modification" or "natural polymers." The European Chemicals Agency (ECHA) guidance further complicates matters by indicating that industrially fermented polymers may not count as "natural" despite their structural identity to naturally occurring substances.

This regulatory ambiguity also spills over into consumer perception. Public attitudes towards plastics, increasingly negative due to environmental concerns, drive companies to seek "plastic-free" certifications, even when their materials may technically qualify as plastics under existing regulatory definitions. This dissonance between public and regulatory definitions contributes to market confusion around labelling and claims, potentially undermining consumer trust.

Experts stress that harmonisation across the regulatory landscape is crucial. The BB-REG-NET report recommends aligning definitions of plastic to ensure that materials with similar properties are treated consistently, clarifying terminology such as "natural polymers" and "chemical modification," and developing assessment protocols that accommodate emerging technologies. Aligning policy objectives with environmental outcomes rather than strictly the origins of materials could also ensure regulations better support sustainability goals.

Industry voices like Alexandra French, CEO of Xampla, underscore the need for standardised definitions, stressing that clear regulatory frameworks can foster both consumer confidence and innovation. Xampla has benefited from developing materials classified as "natural polymers" under EU REACH regulations, recognised by the SUPB and validated as "plastic-free" by the UK's National Physical Laboratory (NPL), which has pioneered methods for accurately assessing if a material is truly plastic-free.

This pursuit of clarity and consistency is echoed in wider European efforts. The European Commission recently released a framework designed to standardise definitions and promote innovation in bio-based and biodegradable plastics, underpinning the EU's broader sustainability ambitions. UK government initiatives including calls for evidence on the sustainability of bio-based and biodegradable plastics aim to complement these efforts by identifying gaps and harmonising technical standards.

Nevertheless, the lack of internationally binding definitions and standards, as highlighted by academic commentary, continues to pose significant obstacles for the bio-based plastics industry. Without coherence and clarity, regulatory grey areas risk discouraging investment and slowing the commercialisation of sustainable materials. Industry submissions to UK parliamentary committees further advocate for definitions that exclude natural polymers from plastic classifications, reinforcing the need for regulatory frameworks that stimulate, rather than stymie, bio-based innovation.

In sum, while the UK's regulatory landscape currently exhibits fragmentation that hinders the advancement of bio-based and biodegradable alternatives, ongoing efforts by research bodies, government agencies, industry innovators, and European institutions signal a growing recognition of the need for harmonised, clear, and forward-looking definitions. Bridging these gaps is essential to unlocking the full potential of sustainable materials and moving closer to a plastic-free future.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation), [[2]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation)
* Paragraph 2 – [[1]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation), [[7]](https://committees.parliament.uk/writtenevidence/110422/html/)
* Paragraph 3 – [[1]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation), [[2]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation)
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* Paragraph 5 – [[1]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation), [[4]](https://www.gov.uk/government/consultations/standards-for-biodegradable-compostable-and-bio-based-plastics-call-for-evidence)
* Paragraph 6 – [[1]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation)
* Paragraph 7 – [[3]](https://www.foodnavigator.com/Article/2022/12/01/european-commission-releases-framework-for-bio-based-biodegradable-plastic/), [[5]](https://research-and-innovation.ec.europa.eu/research-area/environment/bioeconomy/bio-based-products-and-processes/bio-based-plastics_en), [[4]](https://www.gov.uk/government/consultations/standards-for-biodegradable-compostable-and-bio-based-plastics-call-for-evidence)
* Paragraph 8 – [[6]](https://www.cambridge.org/core/journals/cambridge-prisms-plastics/article/consistently-inconsistent-the-false-promise-of-sustainable-plastics/DDBBD7336117493039F6F7189A58AC19)
* Paragraph 9 – [[7]](https://committees.parliament.uk/writtenevidence/110422/html/)
* Paragraph 10 – [[1]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation), [[2]](https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation), [[3]](https://www.foodnavigator.com/Article/2022/12/01/european-commission-releases-framework-for-bio-based-biodegradable-plastic/)

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## Bibliography

1. <https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation> - Please view link - unable to able to access data
2. <https://hub-4.com/news/inconsistent-plastic-definitions-across-uk-regulations-create-barriers-for-bio-based-innovation> - A recent report by BB-REG-NET highlights that inconsistent definitions of 'plastic' across UK regulations are creating uncertainty for bio-based and biodegradable material manufacturers, potentially hindering innovation in sustainable alternatives. The analysis reveals discrepancies between major UK regulations, such as the Single-Use Plastics Ban (SUPB) and Plastic Packaging Tax (PPT), which base their definitions on the REACH polymer definition but apply different exclusions, leading to regulatory inconsistencies. The report also addresses challenges in consumer perception, noting that negative public attitudes towards plastics are driving some companies to pursue 'plastic-free' certification even for materials that may technically qualify as plastic under regulatory definitions.
3. <https://www.foodnavigator.com/Article/2022/12/01/european-commission-releases-framework-for-bio-based-biodegradable-plastic/> - The European Commission has released a framework for bio-based and biodegradable plastics, aiming to establish clear definitions and standards to support the development of sustainable alternatives to conventional plastics. The framework addresses the need for consistent definitions and standards to promote innovation in bio-based and biodegradable plastics, aligning with the EU's broader sustainability goals. It also highlights the importance of harmonising definitions across regulations to ensure consistent treatment of materials with similar properties, thereby reducing interpretative uncertainty for manufacturers developing novel bio-based materials.
4. <https://www.gov.uk/government/consultations/standards-for-biodegradable-compostable-and-bio-based-plastics-call-for-evidence> - The UK government has initiated a call for evidence to identify gaps and provide expert advice on the overall sustainability of bio-based and biodegradable plastic products. The consultation seeks to assess whether technical standards or other related options are suitable mechanisms to add value for such products, aiming to harmonise definitions across regulations and ensure consistent treatment of materials with similar properties. This initiative aligns with the recommendations from the BB-REG-NET report to clarify terminology around 'natural polymers' and 'chemical modification' to reduce interpretative uncertainty.
5. <https://research-and-innovation.ec.europa.eu/research-area/environment/bioeconomy/bio-based-products-and-processes/bio-based-plastics_en> - The European Commission supports the development of bio-based plastics through research and innovation programmes like Horizon 2020 and Horizon Europe. These initiatives aim to transform Europe’s plastics industry by promoting the use of biological resources in plastic production, thereby supporting the transition to a sustainable and circular bioeconomy. The focus on bio-based plastics aligns with the need for harmonised definitions and standards to facilitate innovation in sustainable materials, as highlighted in the BB-REG-NET report.
6. <https://www.cambridge.org/core/journals/cambridge-prisms-plastics/article/consistently-inconsistent-the-false-promise-of-sustainable-plastics/DDBBD7336117493039F6F7189A58AC19> - An article in Cambridge Prisms: Plastics discusses the lack of standardized international frameworks to assess, measure, and properly define bioplastics, which complicates the development of sustainable alternatives to conventional plastics. The absence of a legally binding international agreement on bioplastics definitions and standards creates regulatory inconsistencies, hindering innovation in bio-based materials. This underscores the need for harmonised definitions across regulations to ensure consistent treatment of materials with similar properties, as recommended in the BB-REG-NET report.
7. <https://committees.parliament.uk/writtenevidence/110422/html/> - A submission to the UK Parliament's Environment, Food and Rural Affairs Committee highlights the importance of recognising the benefits of alternative bio-based and biodegradable materials in reducing plastics-related waste. The submission advocates for definitions of plastics that exclude natural polymers to allow for sustainable innovation of materials such as polyhydroxyalkanoates (PHA). This perspective aligns with the BB-REG-NET report's recommendation to harmonise definitions across regulations to ensure consistent treatment of materials with similar properties.