UNIVERSITY OF PORTSMOUTH
GLOBAL PLASTICS POLICY CENTRE

POLICY BRIEF

Urgent need for UK policy on microplastics

Microplastics are everywhere, accumulating, and are harmful to the environment, with clear evidence for potential to cause negative effects on hundreds of species, including emerging evidence of harmful effects on humans. Despite growing evidence of harm and international momentum, the UK lacks a roadmap to address a significant reduction in microplastics pollution across the plastics value chain and is falling behind international leaders. **A clear and coordinated policy direction is needed, including targets and timelines to measure progress against.**

Microplastics are everywhere and will accumulate indefinitely without action

Microplastics (≤5 mm in size) contaminate air, water, soil, food, and living organisms. They have been detected in processed samples from the human body and over 1,300 species across food webs [1,2]. Microplastics persist in the environment and risk disrupting key Earth systems that support economic growth [3]. Efforts to remove them have limited impact [4]. Up to 40 million tonnes of microplastics leak into the environment annually, expected to double by 2040 without urgent and effective action [2]. The UK government must integrate microplastics into national policies on climate, biodiversity, and resource management to achieve coherent governance and effectively reduce pollution risks [5].

In collaboration with:

PML Plymouth Marine Laboratory
UWE Bristol University of the West of England
PRIFYSGOL BANGOR UNIVERSITY
UNIVERSITY OF PLYMOUTH Marine Institute
University of Exeter Global Systems Institute
Lancaster Environment Centre | Lancaster University

Microplastics are harmful to human health and the environment

There is increasing evidence that microplastics can harm **human health:**

- Plastics and their fragments contain at least 4,000 chemicals of concern, such as endocrine disruptors and carcinogens, which can leach into food, water, and the human body [6].
- Microplastics are detected in human organs and systems, including blood vessels, the brain, lungs, and placentas, indicating concerns of exposure through ingestion and inhalation [7,8].
- Laboratory studies suggest that microplastics exposure may lead to problems such as cellular and tissue damage, disruption of the gut microbiome, and immune or inflammatory responses [9,10,5].

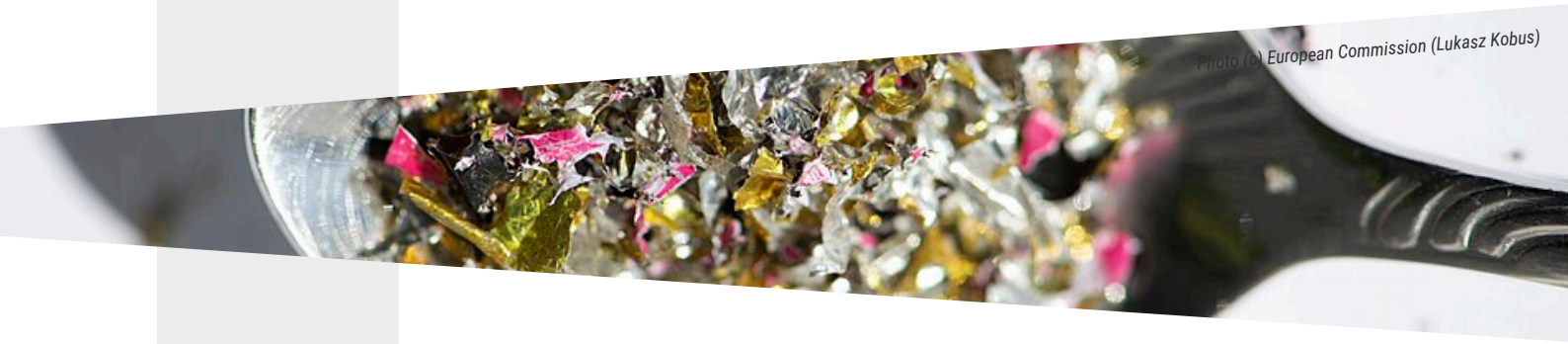


Photo (c) European Commission (Lukasz Kobus)

There is strong evidence that microplastics are harmful to **ecosystems and the environment:**

- Microplastics impact water and soil quality through common agricultural practices in the UK, such as mulching, sewage sludge fertiliser, wastewater for irrigation, and contaminated compost [11,5].
- Microplastics are estimated to reduce global food production by hindering plant photosynthesis and soil health [12,13].
- Higher concentrations of microplastics in coastal and ocean ecosystems can disrupt their role as carbon sinks, and potentially contribute to climate change [14].

Microplastic pollution is a transboundary human health and environmental threat, driven by global production and distribution of plastics, food and air contamination, and lifecycle emissions, **requiring coordinated action across governments.** The potential for harm to human health, economic growth, and food security warrants **urgent precautionary policy action** and further investigation.


Photo (c) Emina Mamaca

Existing UK policy and regulation need strengthening to reduce microplastic accumulation

- Microplastics have been identified as a concern in UK government strategies such as the *Plan for Water*, the *River Basin Management Plan*, and the *25 Year Environment Plan*; however, none have set microplastic reduction targets.
- The UK has invested £60 million in the Smart Sustainable Plastic Packaging programme, supporting innovations to cut plastic packaging – a key source of microplastics.
- The UK government has funded and collaborated on research into tyre wear particles, wastewater treatment, and methods for microplastics monitoring in air and water; however, this is only a narrow segment of the broader microplastics landscape, and **research outcomes have not systematically been integrated into policy or regulation.**
- There is **no comprehensive policy framework** for primary microplastics (e.g. pre-production pellets), secondary microplastics (e.g. from tyres, paint and textiles), or upstream sources [5].
- The microbeads ban in rinse-off cosmetics addresses less than 5% of microplastics in the environment in the UK [15]. The UK has no other microplastics legislation.
- There are **no regulatory limits** for microplastic concentrations in industrial discharges, wastewater, sewage sludge, or to air.
- In cases where the government considers evidence insufficient – such as its decision not to mandate microfibre filters on new washing machines – no alternative measures to limit fibre emissions have been proposed, despite increasing concern about their accumulation in the environment.
- Lessons should be learned from other highly persistent contaminants, such as PFAS and forever chemicals, where delayed action has resulted in reactive and expensive interventions, confusion for industry, and significant public concern.
- **The UK is falling behind the EU and USA** which have already set microplastic reduction targets and limits in wastewater and drinking water. The lack of UK policy is driving uncertainty for industry and the public, and may complicate regulatory alignment with trading partners and regional frameworks [16,17].

A clear and coordinated UK policy direction with targets is needed

Opportunities to address microplastics in new policy, such as the circular economy, are being missed. The UK should lead by example with a **comprehensive, coordinated policy approach.** Urgent action is needed to:

Establish a clear policy framework or roadmap

Expand regulations beyond microbeads to cover primary and secondary microplastics. Introduce design-for-environment standards to reduce microplastic shedding from transport, textiles, and packaging.

Set measurable targets and timelines

Introduce time-bound targets to reduce microplastic emissions into the environment, including from key sources such as textiles, tyres, and wastewater. Targets should be accompanied by monitoring requirements to track microplastic levels in humans and the environment and evaluate policy efficacy [5].

Further **no-regret measures** with clear public and environmental benefits can be advanced:

Develop measurable targets to reduce primary plastic production and use

Reducing the volume of plastic placed on the market—particularly single-use products—can significantly limit the generation of secondary microplastics. Simplifying product design and improving material labelling can support downstream management and reduce fragmentation. Plastic alternatives, including bio-based and biodegradable plastics, must be comprehensively evaluated for safety and sustainability alongside the impacts of the materials they aim to replace.

Invest in research to tackle evidence gaps

Fund research to establish safe exposure thresholds and identify key sources and pathways, including in neglected areas such as soil and air quality. Evaluating the efficacy of interventions prior to implementation will be of critical importance to avoid the risk of unintended consequences [18]. Collaborate with research institutions, industry, and regulators to generate policy-relevant evidence.

Adopt a sector-specific approach

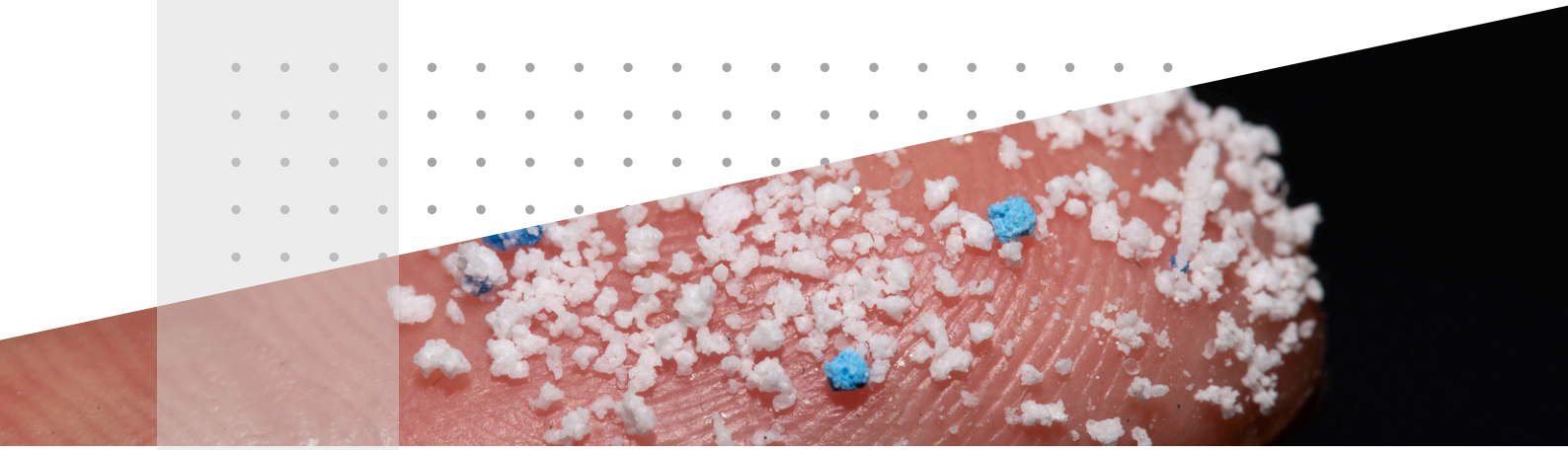
Target high-emission sectors, including transport, textiles, paint and packaging, accelerating research into tailored regulatory measures and more circular, sustainable practices [19,20,21].

Adopt and advocate for international best practices

Coordinate with global initiatives to future-proof UK regulations, ensuring consistency with international measures [22]. This would also help minimise trade and compliance challenges for UK businesses operating across international markets.

The time for policy action on microplastics is now

Microplastic pollution is an escalating threat with potentially irreversible consequences. **Without decisive action, the UK's environment, public health, and global leadership in environmental decision making will be compromised.** Implementing a robust, forward-looking microplastic policy framework is urgent and essential to protect future generations and the economy.



About the Global Plastics Policy Centre

Based at the University of Portsmouth, the Global Plastics Policy Centre is an independent knowledge broker that facilitates effective plastics policy-making in government and the private sector. The Centre provides evidence-based guidance at the interface of government, businesses, citizens, and researchers, including supporting the process to develop a legally binding instrument to end plastic pollution. This policy brief was developed in collaboration with the Microplastics Research Group of the University. For more information or queries please contact globalplastics@port.ac.uk

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Cite this policy brief

March, A., Northen, S., Couceiro, F., Fletcher, S., Courtene-Jones, W., Williams, B; Thompson R.C., Cusworth, S.C. Galloway, T.S., Lewis, C., Cole, M., Stevens, C., & Lindeque, P.K. (2025). *Urgent need for UK policy on microplastics | Policy Brief*. Global Plastics Policy Centre, University of Portsmouth, UK.

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