



Reducing chemical and plastic pollutions at source

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We need protective actions today, to prevent the harm being caused tomorrow.

Marine pollution is diverse, ranging from visible pollutants such as plastic to invisible sources of chemicals including flame retardants, pesticides and pharmaceuticals. We must tackle this issue at source because plastic debris and chemicals can take hundreds of years to degrade and cannot be cleaned up. Chemicals should not be thought of as separate to plastics: the presence of hazardous chemicals in products limits the ability to achieve a safe and sustainable circular economy. We need to detoxify the economy, marine pollutants are present throughout the food chain, causing harm at every level. We need less plastic, less hazardous chemicals in products and less pesticides. Regulatory action is needed across all sectors to ensure a safe and sustainable circular economy without which we pollute one of the major carbon stores and damage our food security.

Marine pollution - state of play

Pollution is one of the five main direct drivers of the current biodiversity crisis, impacting the functioning of marine ecosystems with 40% of marine mammals threatened with extinction¹. Plastic and chemical pollutants in the oceans come either directly via marine activities² such as shipping, seabed mining, fishing or leak into rivers and other waterways on land and are carried out to sea.

Production from the petrochemical industry of plastics and synthetic chemicals has grown exponentially since the 1950s with global production of plastic and chemicals reaching 359³ and 2,300⁴ million tonnes a year respectively, and this is expected to double by 2035⁴⁻⁵. Warnings about marine plastic pollution began in the 1960s⁶, yet still today an estimated 12.2 million tonnes, of which 0.95 is primary microplastics^{7,8} enter the ocean every year. Plastic ingestion reduces ocean productivity since it impacts on feeding behaviour, growth, development, reproduction and lifespan⁹ of marine wildlife, some of which has been linked to the chemicals within the plastic¹⁰.

¹ IPBES, 2019. [Global assessment report on biodiversity and ecosystem services](#)

² JRC, 2016, [Identification of marine chemical contaminants released from sea-based sources](#)

³ Plastics Europe, 2019. [Plastics – the Facts 2019](#) - data for 2018

⁴ UNEP, 2019. [Global Chemicals Outlook II](#) - data for 2017

⁵ Barra, R. et al., 2018, Plastics and the Circular Economy - A STAP Document, Global Environment Facility and UN Environment, DOI: 10.13140/RG.2.2.11515.57128

⁶ Ryan, 2015. [A Brief History of Marine Litter Research](#)

⁷ Eunomia, 2016. [Plastics in the Marine Environment](#)

⁸ Primary microplastics are defined as those which enter the ocean being less than 5mm.

⁹ Botterell et al., 2019. Bioavailability and effects of microplastics on marine zooplankton: A review

¹⁰ Takada & Karapanagioti, 2019. Hazardous Chemicals Associated with Plastics in the Marine Environment



Government policies to address the plastic crisis such as plastic tax and deposit return schemes, while helping to increase recycling, are not a solution to our waste problem. This is evidenced by our continued need to export our waste, with 13,000 tonnes exported to Malaysia between January and March 2020 alone¹¹, resulting in environmental contamination¹². However, we cannot recycle our way out of the problem, especially as recycling often equals downcycling - with plastic becoming a lower grade product most often unrecyclable itself. In order to achieve a sustainable and just circular economy, we need to consider the question of chemical additives in products (e.g. flame retardants; plasticizers; water repellents) and the impact they can have on the recycling chain with the subsequent safety of products made of recycled material rarely, if ever, considered. For example, childrens toys made from recycled electronic products contain toxic flame retardant chemicals which were present in the original product¹³.

Most synthetic chemicals and plastic debris don't degrade and will persist for decades in the environment¹⁴. Chemical pollutants affect entire generations of marine mammals by accumulating and passing to young through breastfeeding¹⁵. They impair reproduction and disrupt marine wildlife's energy balance, endocrine and immune systems, making them more vulnerable to infectious diseases¹⁶ and other stressors such as climate change¹⁷. Despite this, regulations are lagging behind. For example, the UK banned the harmful chemical group, Polychlorinated Biphenyls (PCBs) in 1981¹⁸, 20 years after their damaging impact was first reported. Now, due to their high persistence, these legacy persistent organic pollutants (POPs) are still prevalent in our seas and are putting the UK orca population at risk¹⁹. The UK orca population has failed to reproduce in 25 years²⁰ and it is thought a key cause may be the high levels of pollutants in their bodies, with one recent fatality in the group reported to contain the highest level of PCBs ever recorded²¹. Notwithstanding the lessons from the past, chemical risk management is critically slow, fails to prevent the accumulation of persistent chemicals into the marine environment and fails to address real-life exposure to a cocktail of hundreds of chemicals²².

We need reduction at source, every year of delay means an increasing pollution burden on future generations. We cannot recycle our way out of this or simply clean up our seas because the removal of plastics debris is extremely challenging and potentially unfeasible, and it is impossible when it comes to

¹¹ www.uktradeinfo.com

¹² <https://www.greenpeace.org/malaysia/publication/3349/the-recycling-myth-2-0/>

¹³ IPEN, 2017. POPs recycling contaminates children's toys with toxic flame retardants

¹⁴ CHEM Trust, 2019 [PFAS – the 'Forever Chemicals', invisible threats from persistent chemicals](#)

¹⁵ Williams et al., 2020. [Juvenile harbor porpoises in the UK are exposed to a more neurotoxic mixture of polychlorinated biphenyls than adults](#)

¹⁶ Desforges et al., 2016. [Immunotoxic effects of environmental pollutants in marine mammals](#)

¹⁷ Tartu et al., 2017. [Multiple-stressor effects in an apex predator: combined influence of pollutants and sea ice decline on lipid metabolism in polar bears](#)

¹⁸ Cousins et al., 2019. [Why is high persistence alone a major cause of concern?](#)

¹⁹ Desforges et al., 2018. Predicting global killer whale population collapse from PCB pollution

²⁰ The Independent, 2017. [Understanding the UK's last killer whales](#)

²¹ BBC, 2017. ['Shocking' levels of PCB chemicals in UK killer whale Lulu](#)

²² Kortenkamp et al., 2009. [State of the Art Report on Mixture Toxicity](#)



chemical contaminants²³. The current legislation and monitoring programs are not keeping up with the plastic production growth and rate at which new chemicals are being put on the market. Routine programs monitor a small number of already heavily regulated, or banned chemicals, rather than emerging contaminants of concern including microplastics. The highly persistent nature of most of these pollutants means we need to act quickly and early and not wait until we see population harm. The governments need to have a reduction-led strategy. For plastics we need to move from a single-use and planned obsolescence society and transition to a refillable, reusable, repairable and non-toxic society, with caps on virgin plastic production set and reported against at the national level and a clear strategy to transition into a safe and just circular economy for plastics. Hazardous chemicals should be taken into account in the whole life cycle of products. For chemicals, the future UK chemical regulation regime urgently needs to become fit for purpose. Reviewing non-essential uses of persistent chemicals would be an important first step. For example, PFAS (per- and polyfluorinated alkyl substances), a highly persistent group of chemicals are currently under EU review for a ban from non-essential uses.

What does success look like?

Reduction of marine pollution at source is most likely to be achieved by regulatory action rather than voluntary measures and behaviour changes. Monitoring should keep pace with developments from industry, and legislation needs to be regularly updated to ensure it continues to be fit for purpose, with particular attention on the ratification, transposition and implementation of international binding instruments to combat pollution

Monitoring

- **Update monitoring of plastic and chemical pollution.** The UK governments should ensure that monitoring of marine litter and contaminants is world leading and incorporates international best practices. Where the UK sits on international groups such as OSPAR, it should take an active role in ensuring that the list of contaminants is updated and expanded, including microplastics, to reflect the full range of contaminants entering the marine environment and give a true assessment of the environmental status.
- **Integrate contaminant monitoring with ecological monitoring.** The Governments should work with leading independent experts to develop methodologies to quantify the impact of pollution on marine wildlife and ecosystems.

²³ Defra, 2015. [Marine Strategy Part Three: UK programme of measures](#). *“The removal and remediation of contaminated sediments on a large scale is regarded as being technically infeasible.”*



Chemicals

- **Ensure UK chemical regulation delivers the Government's commitment to guarantee a better system than the EU's regulation REACH** (Registration, Evaluation, Authorisation and restriction of Chemicals). To secure the same high level of protection for consumers and the environment, UK REACH will need equivalent levels of resources than the European Chemicals Agency ECHA. ECHA has an annual budget of over €100million for REACH.
- **Develop an ambitious Chemical Strategy for the UK** addressing highly persistent chemicals; synthetic pesticide use; chemical mixtures and grouping of chemicals; destruction of legacy POPs' stocks and hazardous chemicals in products to detoxify the circular economy.
- **Put an efficient alert system in place.** To prevent unforeseen effects of chemical pollution on biodiversity, routine monitoring of specific contaminants should be complemented by wide screening methodologies such as semi-quantitative non-target analysis to provide an efficient alert system for emerging contaminants.

Plastics

- **Set ambitious targets under the Environment Bill to reduce resource use and waste production.** These should include sector wide targets for increasing resource productivity by raw material consumption and reducing residual waste per capita. An economy wide target for both productivity and residual waste would provide little incentive for sectors to improve their processes. For example, household waste accounts for just 13% of our total residual waste production so targets must be sector specific in order to drive required change.
- **Implement an Extended Producer Responsibility (EPR) scheme** accounting for the full costs of materials, going beyond waste to also focus on the production stage. This would incentivise the transition away from single-use materials and help scale up refillable business models. Such a scheme should include a fee structure and packaging design characteristics that rewards reuse over single-use and allocate 5% of fees to support refill and reuse models.
- **Introduce an 'all-in' deposit return scheme** that incorporates containers of all materials and all sizes and aligns with schemes in other countries, including Scotland. According to Governments own assessment²⁴ an all-in scheme would generate up to £2 billion, whilst alternative options offer a smaller sum of £240 million. An all-in scheme would also increase recycling by up to 90% and has the potential to create over 3,000 jobs.²⁵
- **Launch a £20 million reuse and refill funding stream, modelled on the plastics research and innovation fund²⁶,** to kick start the UK's reuse and refillable sector. This could be part funded by the fees from the new EPR scheme and income from the new plastic packaging tax.

²⁴Defra, 2019. [Consultation on introducing a Deposit Return Scheme in England, Wales and Northern Ireland](#)

²⁵ CPRE, 2011. [From waste to work: the potential for a deposit refund system to create jobs in the UK](#)

²⁶ <https://www.ukri.org/research/themes-and-programmes/tackling-the-plastics-problem/>



- **Support the call for a negotiating mandate to develop an international legally binding instrument to combat plastic pollution at UNEA-5 in February 2021.**