

A PLASTIC PLANET

ROAD MAP TO A PLASTIC FREE FUTURE

The Reuse, Refill and Replace Revolution

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October 2023

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Foreword by Barry Gardiner MP

A century ago, plastic was a miracle. Humankind had created a lightweight material so durable it could last for a thousand years. It has transformed our lives, becoming the go-to cheap wrapping for food, the predominant part of clothing, and a ubiquitous part of all the gadgets we use.

Today, plastic is a menace. A material as long-lasting as diamonds has been mass produced to such an extent that it is as cheap as (or cheaper than) paper. The result is a mismatch of material to purpose, with this ‘forever material’ deployed for throwaway applications.

Meanwhile, though the first plastics were made from plant cellulose, the predominant feedstock today is petrochemicals: oil. In fact, as the world seeks to move to renewable energy, plastic is the last gasp of the fossil fuel industry.

The result is a toxic cocktail of greenhouse gas emissions when plastic is produced and subsequent leakage of plastics (and the chemicals which are fundamental to their make-up) into the environment at the end of a product’s life.

Meanwhile, evidence from the United Nations Environment Programme released this year shows that chemicals are released from plastic along its entire life cycle, not just during the extraction of raw materials and manufacture of plastic products, but also during their use.

Women and children are particularly susceptible to these toxic chemicals, with exposure having potentially long-lasting adverse effects during foetal development and the same substances have been shown to affect fertility in males.¹

Over the past decade, governments in the UK and the European Union have made strides to curtail some uses of plastic. Plastic straws and cotton buds – once ubiquitous – have disappeared. In October, the UK will do away with plastic plates, trays, bowls, cutlery and balloon sticks too.

Yet the starting point for ministers is still that plastic should be permitted, except where it isn’t. This paper starts from a different premise, recognising plastic as a ‘forever material’ which should usually be deployed only where its purpose is to be permanent and the chemicals within it are safe.

A critical and radical contribution to the debate, sets out a vision of the future that is ambitious, business friendly and (crucially) plastic free. The paper shows how a government determined to lead the world on plastics could use legislation already on the statute book to do so.

Labour is committed to a fairer, greener future. This roadmap to a plastic free Britain – leading not following – is a timely blueprint for how to get there.

¹ UN Environment Programme, [Chemicals in Plastics](#), 2023, p. 5

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About A Plastic Planet and PlasticFree

A Plastic Planet is a global solutions organisation driven by a single goal – to ignite and inspire the world to turn off the plastic tap.

We work with governments and the United Nations to change minds. And we work with business to change outcomes. Our approach is unique, recognising that a plastic free future requires ministers and global policy makers to mandate change, then catalysing business to deliver it.

Our twin track approach in action is the Sack the Sachet campaign. We highlight the urgency of banning the 1 trillion highly polluting, unrecyclable plastic sachets whilst also working collaboratively with Unilever and Kraft Heinz, helping them switch to plastic free alternatives.

In January 2023, we launched **PlasticFree**, the world's first material and system solutions platform, to empower the creative industry and their CPG clients to rethink everything from the beginning of the design phase. Everything is designed, and if we design differently, we can eradicate plastic pollution at source.

PlasticFree is the result of two years of research, design, and development- building on all our experience and expert advisors to create an education platform that ignites, inspires, and inform, connecting innovators with future customers, proving change is possible with thousands of case studies, rich with editorial features featuring our 50 icon-strong Creative and Science Council. This extraordinary Council includes Thomas Heatherwick; Sir David Chipperfield; Sir David King, Professor Hugh Montgomery, Solitaire Townsend; Tom Dixon; Shaway Yeh, and Skylar Tibbits of MIT.

A Plastic Planet sits on the Stewardship Council for Ocean Plastic Leadership Network's Global Plastic Treaty Dialogues, bringing stakeholders together to help the negotiations of the UN Global Plastics Treaty that is being negotiated by the 190 member states through 2024.

One of the most important considerations in the UN Global Plastics Treaty is, for course, the impact on human health. Together with Plastic Soup Foundation, A Plastic Planet have founded the Plastic Health Council, representing the most expert scientists and doctors who have dedicated decades to researching the impact of micro, nano-plastics and the chemicals used within plastic on human health. The Plastic Health Council gives this global stage to these eminent scientists to ensure the UN process results in a robust and effective Treaty that protects the unborn and future generations.

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Executive Summary

The challenge: replacing single-use plastic for good

Humans are the only species on the planet who produce waste. There is no waste in nature. Everything becomes the fuel, the nutrient for the next cycle of growth, even our own bodies. The future depends on us understanding how to work with nature, not against her.

Not only do we waste, but we take too much. Every year we use up 2 planet's worth of natural resource, stealing from our children's future and calling it GDP. In the last 6 years, we have used more resources than in the entire 20th century. Our single-use society, enabled by plastic, is highly destructive.

This paper asks you to imagine a post-plastic world of abundance and innovation. A world that reduces our excessive need for natural resources, where real circularity is achieved, harmonised with nature. Weaning ourselves from plastic will catalyse investment and innovation, creating new safe materials and better systems that eradicate single-use.

Our strategy creates a path of certainty for industry, who are currently treading water, waiting for clear guidance and policy from our Government. Clarity that empowers them to collaborate and invest in the new economy, embracing innovation and systemic change we all crave.

The recycling fallacy

In the last 25 years, kerbside recycling has become commonplace, and most people 'do' their recycling by default.

But despite *actual* UK plastic recycling rates, they remain woefully low at around 10%. With plastic-based textiles, the numbers are even lower as only 1% of all clothing is recycled.

Meanwhile new "chemical recycling" techniques are highly carbon intensive, with only 1 to 14 percent of the plastic sent through such processes retained as plastic, according to research by the US National Renewable Energy Laboratory (NREL).² Meanwhile, research by Zero Waste Europe shows that carbon emissions from these processes are up to nine times greater than those from mechanical recycling³.

In short, recycling has become an alibi for "business as usual" – feeding a pretence that the planet can withstand ongoing production of plastic if only there were a recycling system at scale. Big consumer brands continue to deflect responsibility on to consumers, despite the fact the infrastructure doesn't exist. The plastic recycling narrative is a convenient placebo pill we have been fed by Big Oil for decades.

But there is a better way ahead. *Designing single-use plastic out* of our lives altogether, and creating a business framework that ensures the products and packaging of tomorrow be genuinely useful again and again and again and again. Circularity is waste-less. This is the new economy we must strive for.

² [ACS Sustainable Chem. Eng.](#) 2023, 11, 3, 965–9787, quoted in "Advanced" Recycling of Plastic Using High Heat and Chemicals Is Costly and Environmentally Problematic, A New Government Study Find' in [Inside Climate News](#), 19 January 2023

³ [Climate impact of pyrolysis of waste plastic packaging in comparison with reuse and mechanical recycling](#), Oeko-Institut, Zero Waste Europe, page 17,

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A long-term target

This paper makes one central recommendation from which all its other recommendations flow – for **government to use the Environment Act to set a long-term environmental target of stopping the production and import of plastic into the United Kingdom. Full stop.**

Long-term targets – according to the legislation – must be achieved over a term of, at minimum, 15 years. So, while the ambition is radical, our intended means of delivery is pragmatic and simple.

A decade long programme of plastic bans

To support the long-term target, we ask government to commit to **banning more and more applications for plastic over the coming decade**, starting with the most obvious problem plastics and making progress towards eliminating the rest. **We set out a plan for new plastic bans to come into force every single year for a decade from now, in advance of that target** (see table on page 10)

By 2038, we want to see the United Kingdom use the least plastic of any developed country in the world, cutting demand and therefore cutting production.

Catalysing new materials and systems

Systems

For too long, there has been an assumption that a gamut of single-use plastics is ‘necessary’ or ‘unavoidable’. We seek to challenge that assumption at every turn, because the “take, make, waste” model is simply not sustainable.

But there is another way. 40% of all plastic is used for packaging. We can all see now that to use a material that lasts for centuries for a fleeting moment to wrap something makes little sense. This paper sets out a practical route map to making **permanent packaging** the norm.

In partnership with *Reposit*, we are developing a universal returnable packaging platform. Instead of time-consuming refill systems that tend to be tokenistic for major brands, Reposit introduces ‘packaging as a service’, with standardised packaging formats, leased by competitive brands and retailers, with a centralised cooperative managing all logistics for collection, washing and redistribution to the brands for refilling.

Shoppers still enjoy the convenience of buying their favourite brands prefilled. The ‘empties’ can be returned to thousands of drop-offs- stores, coffee shops etc. They are rewarded for the smallest behaviour shift whilst the brands enjoy the immediate ESG benefit for minimal investment.

To catalyse that transition and to ‘normalise’ reusables, we recommend three policy initiatives on the part of government:

- Introducing a legislative requirement for large supermarkets (over 3,000 square feet as defined in the Sunday Trading Act 1994) to devote 25% or more of their floorspace returnable / refillable systems by 2026.
- Introducing a legislative requirement for all supermarkets and big business with more than 250 employees to an annual report of their primary, secondary and tertiary plastic packaging use throughout their supply chains.
- Regulating to reform the Deposit Return Scheme from its inception in 2025, requiring industry to print serialised QR codes on every label. Technology exists through companies such as Polytag, to overprint these simply on to packaging. Such regulation would enable ‘digital DRS’ where items are collected at the kerbside and returned for reuse.

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Materials

Where permanent packaging and refill genuinely is not a practical solution, single-use plastics should still cease. Examples include where “single serve” items are required such as at large events, or where some protection is needed around products such as dishwasher tablets and laundry pods-

Nine out of every ten cosmetic products contain forever polluting microplastics according to Plastic Soup Foundation⁴, following analysis of 7,704 cosmetic and care products of the most popular brands of the four biggest cosmetic producers in Europe. Fragrance encapsulation in laundry liquids and shower gels is another hidden use of plastic.

UK innovators such as Xampla and Notpla are bringing to market solutions to these challenges, by replacing plastic with natural *nutrient* materials such as seaweed and plant protein, that slip easily into nature’s toxin-free circularity, with no waste, ever.

Such innovation needs further support from the UK government in the following ways:

- Explicit recognition in the Extended Producer Responsibility (EPR) and plastic packaging tax systems, so that innovative, natural nutrient materials are distinguished from polluting plastic
- A clear trajectory of regulation (as set out above) which forces industry’s hand to invest in these new solutions, and speed up the scale at which they can be deployed
- New standards to delineate these, new, natural materials – which are completely plastic free – from traditional ‘compostable’ plastics. Whilst both types of material meet the BS EN 13432 standard, only these innovative materials can be returned to nature without industrial composting infrastructure.
- Priority from UK Research and Innovation (UKRI) for grants to test new applications such as mulch and seed coatings (to prevent soil pollution from traditional plastic) and natural microcapsules to replace microplastics and nanoplastics used in liquid formulations such as in laundry products

Taxation to cut use of virgin plastics

It is already evident from Treasury figures showing that the Plastic Packaging Tax has incurred double the tax revenues anticipated, that businesses would rather pay the tax than change their material. It is simply considered a cost of doing business versus a stimulus to reduce virgin plastic.

We recommend taxation to cut the use of virgin plastics in packaging from next year. To that end, we call for an immediate and thorough going review of the Plastic Packaging Tax to start now examining:

- the rate, currently set too low at £210.80 per tonne
- the threshold for a product to be considered ‘recycled’, currently too low at 30%
- the audit process for returns under the tax
- the scope of the tax, including:
 - the position of nutrient materials which replace plastics
 - how the tax can be used to encourage a transition away from single use to permanent packaging, and
 - how the tax might be broadened to discourage plastic use (and catalyse a transition to alternatives) in fashion, healthcare, electronics and construction
- the method of measuring recycled content and the problems of a ‘mass balance’ approach

⁴ Beat the Microbead, Plastic Soup Foundation, <https://www.beatthemicrobead.org/>

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Our recommendations to that review are set out in Section 4, including an increase to the rate of tax to £500 per tonne and an exemption threshold of 50% mechanically recycled content.

Meeting toxic fashion head on

In one generation, the fashion industry has become one of the world's most depletive, pollutive, exploitative industries. Longevity and hard-wearing qualities have been side-lined and now the average number of times a garment is worn before being discarded is 7, according to Barnados.⁵

Use of natural materials such as cotton and wool have remained static whilst plastic derivatives such as polyester have escalated to giddy levels:

- 70% of clothes are derived from mostly fossil-based synthetics.⁶ This results in half a million tonnes of plastic microfibres being released into the ocean every year from our laundry machines – the equivalent of three billion polyester shirts.⁷
- Over 35% of all ocean micro-plastics derive from textiles.⁸
- 5.6 million metric tons of synthetic microfibres have entered the environment as a result of simply washing our clothes since 1950. 22 million tonnes of microfibres will enter our oceans. Vast quantities are also exported to developing countries.

A Plastic Planet therefore calls for:

- an immediate consultation on an Extended Producer Responsibility system for the fashion industry, to be implemented under the Environment Act, penalising plastic content for its unsustainability and pollutive impact.
- A “Digital Passport” system for fashion items, akin to that pioneered in packaging by “R-Cycle”⁹. The European Union’s call for proposals on digital passports, aimed at demonstrating their potential in up to two supply chains is an opportunity for the industry.¹⁰
- The UK to set a new standard with a labelling system which:
 - only marks as sustainable products which are truly biodegradable at the end of life
 - accounts for the plastic content of clothes
 - accounts for the impact of extracting fossil fuels to make polyester, and conversely allows for the reduced impact of using natural fibres
 - recognises and incentivises sustainable agricultural practices
 - recognises the socio-economic impact of different fibre production and manufacturing processes

International action

Plastic is solid climate crisis, with its true impact from extraction to pollution or incineration rarely fully calculated. If the global plastic industry were a country, it would be the fifth biggest emitter of GHGs in the world. Only China, the United States, India and Russia create more GHGs than the plastics giants.

Meanwhile, just as the tide of plastic pollution continues to rise, covering our shores, streets, parks and peaks, so does the evidence of a pernicious impact on human health that plastic inflicts. The result of accumulated toxic chemicals from plastic is becoming clearer, with the problem linked by the

⁵ See study quoted in ‘Women ditch clothes they’ve worn just seven times’ in [Daily Mail](#), 10 June 2015

⁶ Changing Markets Foundation, [Synthetics Anonymous](#), June 2021

⁷ United Nations Environment Programme, [Fashion’s tiny hidden secret](#), 13 March 2019

⁸ Institute of Mechanical Engineers, [Engineering Out Fashion Waste](#), September 2018

⁹ [R-Cycle](#) provides a data infrastructure for the operation of digital product passports (DPP) for plastic products. A DPP is a system for collecting, aggregating and providing data on a product along its life cycle.

¹⁰ EU Digital Europe Programme, [Call for Proposals: Digital Product Passport](#), 11 May 2023

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UN Environment Programme to leukaemia and childhood cancers, autism, infertility, still births, diabetes and ADHD¹¹. A recent study showed 8 in 10 of those tested to have plastic in their blood¹².

The Global Treaty announced at UNEA 5.2 in Nairobi is an excellent start in delivering change. This unique Treaty will include 3 key points:

- The full lifecycle of plastic
- Plastic, chemicals, microplastics and nanoplastics impact on human health.
- The Treaty will be legally binding, unlike the Paris Agreement.

Many countries are already hosting National Action Plan Dialogues to contribute to the UNEA Plastic Treaty process.

By taking the measures this paper sets out domestically, the UK can place itself at the forefront of driving this process, leading the charge for legally binding worldwide commitments to reducing plastic production at source.

¹¹ UN Environment Programme, [Chemicals in Plastics](#), 2023

¹² Leslie, H. A., Van Velzen, M. J., Brandsma, S. H., Vethaak, A. D., Garcia-Vallejo, J. J., & Lamoree, M. H. (2022). Discovery and quantification of plastic particle pollution in human blood. *Environment international*, 163, 107199

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Section 1: A long-term target

In its Environmental Improvement Plan published this year, the government [set out plans](#) to

- work with business to implement packaging extended producer responsibility from 2024 so that polluters pay to recycle packaging
- introduce a deposit return scheme for plastic and metal drinks containers from October 2025 to drive higher recycling rates
- implement consistent recycling between different councils to boost recycling rates
- ban the supply of single-use plastics like plastic plates and cutlery from October 2023. We will also explore options further, including with stakeholders, for the potential for technological innovation in the production of coffee cups, and behavioural science in how they are used

Yet its long-term target, set under the Environment Act 2021, is only to *“halve the waste per person that is sent to residual treatment by 2042”*.

Since the UK produces more plastic waste per capita than any country outside the United States, both short- and long-term targets represent a real poverty of ambition, and an indulgence in the fallacy that higher recycling rates will make plastic a sustainable material.

They will not. To that end, this paper makes one central recommendation from which all its other recommendations flow – for **government to use the Environment Act to set a long-term environmental target of stopping the production and import of plastic into the United Kingdom.**

Long-term targets – according to the legislation – must be achieved over a term of, at minimum, 15 years. So whilst the ambition is radical, our intended means of delivery (set out in the rest of this paper) is pragmatic and simple.

By cutting demand for plastic through bans, catalysing the growth of alternative materials and systems, and taxing virgin plastic production more effectively, the United Kingdom can meet that long-term target.

Halting the decline of Britain’s reputation in the world, this can be an area on which the United Kingdom leads.

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Section 2: A decade long programme of plastic bans

Single-use plastics ban have the potential to cut plastic pollution at source. However, to achieve the necessary impact, these bans need to extend urgently beyond plastic straws, drinks stirrers, and plastic cotton buds.

The Government has already made moves in this space, having recently held a consultation, the inclusion of the below is set to be implemented from October 2023:

- Single-use plastic plates, trays, and bowls
- Cutlery and balloon sticks
- Expanded and extruded polystyrene cups and food and beverage containers

The Government also called for evidence on the impact of other highly polluting items but following lengthy consultation processes these have been omitted from proposed bans, including:

- Wet wipes
- Single-use plastic sachets
- Tobacco filters
- Single-use plastic cups

Whilst each step along the road of plastic bans is a welcome one, progress is tortuously slow. The focus is squarely on the takeaway food industry, leaving other highly polluting sectors such as beauty and fashion unchecked.

We know bans work. The 2021 ban on plastic straws has ‘bedded in’ without any notable difficulty, and a market in less polluting paper straws has developed instead. Therein lies a prime example of legislation moving the market.

We therefore propose a decade long programme of introducing further bans on plastic applications as part of the concerted move to elimination of plastic production and imports to the United Kingdom in 15 years’ time.

New systems and materials to replace plastic

In this paper A Plastic Planet urges a far more radical approach to banning unnecessary single use plastics, replacing them with new reusable packaging systems, and with nutrient materials. Such alternatives can come from regenerative feed stocks including plant proteins, rice husk, hemp, flax and miscanthus. Existing materials that have significant recycling infrastructures already in place – metal, glass and pulp – are also good replacements, with full life cycle impact assessments evaluated.

A vast array of alternative materials can be found on the PlasticFree platform, and we cover both materials and systems in Section 3 of this paper.

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When?	What?	Why?	How will these products be replaced?
October 2023	Single-use plastic plates, trays, bowls, cutlery, balloon sticks, and certain types of polystyrene cups and food containers	The government has already committed to this ban, which must go ahead as planned.	<p>There is a vast range of natural bio-based materials available to replace conventional single use plastic packaging and other single use items.</p> <p>Returnables, introduced by Reposit and Club Zero are also good replacements, reducing the use of natural resources for such a transient purpose.</p>
March 2024	Single use disposable vapes/electronic cigarettes	<p>Over 1.3 million disposable vapes being thrown away in the UK every single week.</p> <p>A study from recycling campaigners Material Focus¹³ said the number of disposable vapes that end up in landfills each year is enough to fill 22 football pitches.</p> <p>That's 1.4 million square feet of land, or enough space for 14,000 kilowatts' worth of solar panels — which could power 4,000 homes per year.¹⁴</p> <p>59,650 tonnes of CO2 is released in the production of disposable vapes, from the 167.5 million sold in the UK each year.¹⁵ That's the same amount of CO2 released by roughly 375,795 people in the UK annually.</p>	<p>The industry must be forced to reduce its plastic footprint and remove plastic from its products. Disposable vaping devices are complex and unrecyclable in any waste stream. They are sold as 'future landfill'.</p> <p>An immediate ban on these single use items would be the catalyst for innovation and a move towards biomaterials that avoid the use of conventional plastics.</p>

¹³ One million single use vapes thrown away every week contributing to the growing e-waste challenge in the UK, Materials Focus, 15 July 2022, <https://www.materialfocus.org.uk/press-releases/one-million-single-use-vapes-thrown-away-every-week-contributing-to-the-growing-e-waste-challenge-in-the-uk/>

¹⁴ Are Disposable Vapes Bad For The Environment?, The Eco Experts, 20 December 2022, <https://www.theecoexperts.co.uk/blog/disposable-vapes>

¹⁵ Are Disposable Vapes Bad For The Environment?, The Eco Experts, 20 December 2022, <https://www.theecoexperts.co.uk/blog/disposable-vapes>

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		<p>Globally, around 1.9 million tonnes of CO2 is released in the production of disposable vapes, or 0.3% of the Amazon Rainforest's annual capacity for absorbing carbon emissions.¹⁶</p> <p>Furthermore, these items are difficult to recycle in conventional waste management facilities due to their electronic components and potential fire risk.</p>	
October 2024	Plastic wrappings around all fruit and vegetables	<p>Such wrappings account for 10,300 tonnes of plastic per year and 100,000 tonnes of food waste per year, in the UK alone according to WRAP.</p> <p>Their February 2022 report exposed significant potential to reduce food waste by enabling people to buy only what they need and to reduce plastic packaging by increasing the amount of fresh produce items sold loose.</p> <p>The research showed that if all apples, bananas and potatoes were sold loose, 60,000 tonnes of food waste could be saved by enabling people to buy what they need, and plastic packaging use reduced by 8,800 tonnes per year. Combined, this is a saving of more than 80,000 tonnes of CO2e.¹⁷</p>	<p>There is no replacement needed to wrap the produce itself.</p> <p>Innovations such as APEEL, using plant extracts to create natural protective coatings, ensure the water content of the produce is maintained. Barcodes are lasered on. No packaging is needed.</p> <p>Any packaging needed for transportation purposes could be provided by paper based materials and other plastic alternative materials.</p> <p>France has already shown the way on this, banning supermarkets and other shops from selling cucumbers wrapped in</p>

¹⁶ Are Disposable Vapes Bad For The Environment?, The Eco Experts, 20 December 2022, <https://www.theecoexperts.co.uk/blog/disposable-vapes>

¹⁷ Pathway to selling more uncut fresh fruit and vegetables loose, WRAP, March 2023, [https://wrap.org.uk/sites/default/files/2023-03/UK PlasticsPact PathwaytoLoose 0.pdf](https://wrap.org.uk/sites/default/files/2023-03/UK%20PlasticsPact%20PathwaytoLoose%20.pdf)

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			plastic, and peppers, courgettes, aubergines and leeks in plastic packaging. A total of 30 types of fruit and vegetables were banned from having any plastic wrapping, including bananas, pears, lemons, oranges and kiwis. ¹⁸
March 2025	Plastic (PET or PVC) thermoformed 'clam packs' used for example, to package torches, razors, batteries, and other electronic, household and personal care products and thermoformed inserts used in gift packaging such as Easter eggs	The global thermoformed plastics market was estimated at US\$ 12.38 billion in 2020, is expected to register a compound annual growth rate of 3.9% from 2021 to 2028.	Card / moulded fibre / clever construction that protects without the use of plastic casings. Such blister packs are already available at viable scale.
October 2025	Single-use plastic sachets and all plastic carrier bags including "bags for life"	<p>The government has already called for evidence on such a ban and should now proceed with introducing it.</p> <p>Almost 1 trillion plastic sachets are produced each year and 1 million bags a minute.</p> <p>In the UK alone, 564 million single-use bags are used each year in the UK, despite the single-use plastic bag tax, according to DEFRA figures. In addition, Greenpeace has found that 1.58 billion</p>	<p>Strong paper bags or EN13432-certified compostable bags designed to double as food waste liners, as introduced by the Co-op and Aldi.</p> <p>In the longer term, new materials such as those being developed by Sway, Xampla and Notpla will simplify the 'end of life' for bags. These technologies can already replace many single-serve sachets.</p>

¹⁸ Angelique Chrisafis, '[That's a wrap: French plastic packaging ban for fruit and veg begins](#)', in *The Guardian*, 31 Dec 2021

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		<p>'bags for life' were sold in 2018/19, representing 57 per household per year.</p> <p>Other European countries have successfully moved away from all plastic carrier bags, with France banning the single use carrier bag in 2016.</p> <p>Over 70 countries globally have outright plastic bag bans.</p>	<p>The substantially increased cost of bags at supermarkets will encourage a further shift toward reuse.</p>
March 2026	Washing machines without plastic filters	<p>As the global middle class grows, the number of washing machines in the world will increase from 2 billion to 5 billion, according to the Plastic Soup Foundation.</p> <p>France is the first country in the world to take legislative steps in the fight against plastic microfibre pollution, by insisting that all new machines are fitted with microfibre filters by January 2025. The UK should follow suit.</p>	<p>There are many filter systems already available. A Slovenian start-up PlanetCare, has developed a washing machine filter that stops 90% of microfibres from entering the waterways and can be retrofitted to every type of washing machine. The company's managing director Mojca Zupan says that the legislative change in France will see the country avoid 500 tons of microfibres in five years.</p>
October 2026	Single use plastic pots, tubs and trays in food produce	<p>WRAP figures confirm that these forms of packaging do not prevent food waste. Meanwhile since they are almost always food contaminated, they are unlikely to be effectively recycled.</p>	<p>To be replaced with reusables and/or fibre, metal, glass</p>
March 2027	Single-use plastic bottles / flexible plastic pouches in personal and home care	<p>The beauty industry produces 120 billion units of packaging around the world every year according to Inside Packaging. Meanwhile, a further 29 billion plastic containers are used globally every year just in homecare, according to Ocean Saver research.</p>	<p>New formulations of concentrates, powders and solids. Permanent standardised packaging, ie metal bottles, used across competitive brands and retailers with a centralised collection, washing, and redistribution umbrella</p>

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			<p>cooperative handling all logistics. The REPOSIT Project, supported by WRAP, UK Plastics Pact and UKRI, is already workshopping this solution with many CPGs and retailers.</p> <p>Smaller scale solutions are refillable alternatives with Prefill option.</p>
October 2027	Agricultural plastics (mulch)	<p>It is estimated that 12.5 million tonnes of plastic products are used in agricultural production annually, with less than a quarter being recycled. According to the Food and Agriculture Organisation of the United Nations, most “agricultural plastics are single-use products” and “the majority become waste within a twelve month period”.¹⁹</p>	<p>Soil biodegradable films conforming to BS EN 17033 but also tested by health scientists to prove that the residual matter is completely harmless to the organisms that comprise our vital biomass.</p>
October 2028	Single-use plastic bottles for beverages	<p>According to Water UK, the UK uses 7.7 billion a year for water alone, with the average person in the UK now using 150 plastic water bottles each year – more than three a week. Reuters research shows that 481.6 billion plastic bottles were used worldwide in a single year – 1 million bottles per minute. Just one brand, Coca Cola, produce 120 billion plastic bottles each year.</p> <p>By introducing simple technology, it will be possible to transition to truly sustainable, carbon and resource light 21st century answer to a 20th century pernicious pollution disaster.</p>	<p>There are now many excellent water filtration systems available for either domestic or commercial uses – see Bluewater. These filtration systems can produce water without the microplastics and toxic chemicals that are currently found in plastic drink bottles.</p> <p>Returnable alternatives, including refillable water bottles to which consumers add “just add water” concentrates in tablet form or contained</p>

¹⁹ Assessment of agricultural plastics and their sustainability: A call for action, *Food and Agriculture Organisation*, Rome, 2021, [Assessment of agricultural plastics and their sustainability: A call for action \(fao.org\)](https://www.fao.org/publications/assessment-of-agricultural-plastics-and-their-sustainability-a-call-for-action)

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		<p>Only a ban will catalyse innovation and investment in alternatives to PET.</p>	<p>within soluble, natural films such as those produced by Xampla.</p> <p>The German standardised water bottle system, which has seen the country's Deposit Return Schemes yield a collection rate of 95% for PET bottles shows what can be achieved by smart regulation. Likewise, Canada has had a standard beer bottle for 70 years. Any brand can take these back, wash them and reuse them.²⁰</p> <p>When single-use is unavoidable, fibre bottles made from pulp derived from paper, hemp, miscanthus etc – without fully biodegradable liners – not plastic or bioplastic. Aluminium cans are also highly recycled and the aluminium bottles are good for refill.</p>
October 2029	Export of discarded fashion	<p>Overall, some 67% of materials made into clothing derive from virgin plastic. This clothing is then often exported to the Global South in vast quantities.</p> <p>Sheng Lu Fashion estimates that over 300 million items of damaged or unsellable clothing made of synthetic or plastic fibres are exported to Kenya each year. These end up dumped, landfilled, or burned, exacerbating the plastic pollution crisis.²¹</p>	<p>A ban on exports to both OECD and non-OECD countries should be implemented to prevent textile waste being shipped by proxy to the Global South. This should be coupled with an increase in domestic textiles waste management capacity.</p>

²⁰ Dave Keating, '[Germany's pioneering bottle deposit scheme has lessons for the EU](#)' in *Euractiv*, 7 June 2021

²¹ Sheng Lu, '[Used clothing trade debate continues in Kenya](#)', on shenglufashion.com, 26 February 2023

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		EU countries alone are dumping 37 million items of junk plastic clothing in Kenya every year that are too dirty or damaged to be reused, creating serious health and environmental problems for vulnerable communities, an investigation of trade data and conditions on-the-ground has found. ²² See Section 5 for more on fashion.	
October 2030	Seed coatings	The degradation of microplastic seed film-coating fragments in soil ²³ contribute to reduction in soil quality and further increase the environmental and human health risk presented by micro/nanoplastics and component chemicals.	Natural alternatives are readily available to be scaled across the agricultural market to replace the use of plastic seed coatings.
October 2031	Flame retardants	<p>The quantity of plastics in structures has increased drastically.</p> <p>Fire retardants leach out of the polymeric matrix as they age, which exposes water, air, and the environment to these toxic gases.</p> <p>Recycling or incineration of products with toxic flame retardants can go as far as contaminating the communities where the recycling plants are located, if left uncontrolled.</p>	<p>Sustainable FRs are produced from green or biodegradable chemicals or waste with the sole aim of minimising the environmental footprints and effect on human life while simultaneously improving the fire performance of materials²⁵.</p> <p>Many innovative bio-based fire retardants produced from phytic acid, protein, chitin as well as biomass waste such as eggshells,</p>

²² 37 million junk plastic clothes dumped in Africa - investigation, Changing Markets, 16 February 2023, <http://changingmarkets.org/wp-content/uploads/2023/02/CM-Trashion-PR-EU.pdf>

²³ Degradation of microplastic seed film-coating fragments in soil, Chemosphere Volume 226, July 2019, Pages 645-650, <https://www.sciencedirect.com/science/article/abs/pii/S0045653519306071>

²⁵ Zhang Y, Song P, Liu Y, Editorial: Sustainable Flame Retardants and Polymeric Materials Front Mater, 2021 <https://www.frontiersin.org/articles/10.3389/fmats.2021.778652/full>

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		In the event recycling is successful, the pollutants could alter the properties of the recycled products resulting in the production of low-quality goods. Such dangerous chemicals had an annual production estimated to be approximately 180,000 tonnes globally ²⁴ .	rice husk, oyster shell powder have also been developed ²⁶ .
October 2032	Paint	Research from the Institute for Polymer Research ²⁷ shows that plastic components within acrylic paints can degrade over time, releasing harmful Volatile Organic Compounds (VOCs). These are highly soluble vapours that can pollute the air and irritate humans and wildlife. Further studies note that acrylic paints can contribute to wider plastic waste, energy expenditure, and water pollution ²⁸ .	Starch, cellulose, casein, and gum water based paints are all natural alternatives available to acrylic paints. The Organic & Natural Paint Co, Frenchic, Earthborn Paints, Lick and Coat are all examples of plastic free paint brands already on the market and demonstrate both the consumer appetite and scalability of plastic free paint products.
October 2033	Built environment	According to Tom Smethurst at the Royal Institute of Chartered Surveyors, meta-analysis published by the American Chemical Society ²⁹ identified more than 2,000 additives used in	Regulation now will catalyse innovation in this sector for a decade's time.

²⁴ Rhoda Afriyie Mensah et al, A review of sustainable and environment-friendly flame retardants used in plastics, *Polymer Testing* Volume 108, April 2022,

<https://www.sciencedirect.com/science/article/pii/S0142941822000393#sec2>

²⁶ Rhoda Afriyie Mensah et al, A review of sustainable and environment-friendly flame retardants used in plastics, *Polymer Testing* Volume 108, April 2022,

<https://www.sciencedirect.com/science/article/pii/S0142941822000393#sec2>

²⁷ A Iscen et al, Acrylic Paints: An Atomistic View of Polymer Structure and Effects of Environmental Pollutants, *J Phys Chem B*, 2021,

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8488938/>

²⁸ Annarita Paiano et al, Sustainable options for paints through a life cycle assessment method, *Journal of Cleaner Production* Volume 295, 1 May 2021,

<https://www.sciencedirect.com/science/article/abs/pii/S0959652621006843?via%3Dihub>

²⁹ Helene Wiesinger, Zhanyun Wa*, and Stefanie Hellweg, [Deep Dive into Plastic Monomers, Additives, and Processing Aids](#), in *Environ. Sci. Technol.* 2021, 55, 13, 9339–9351

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		<p>construction industry plastics, of which 25% were classified as EU substances of concern due to their persistence, bioaccumulation or toxicity.</p> <p>Similarly, a further study found up to 88% of chemicals in everyday plastic products, including common construction finishes, leach out into the environment during use.³⁰</p>	
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³⁰ Tom Smethurst, [‘Why we must limit use of construction plastics’](#), in *Built Environment Journal*, 18 May 2023

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Preparing for bans through the use of charges

Where government identifies a practical barrier to immediate bans, we recommend the use of clearly noticeable charges (**levelled under Section 55 of the Environment Act** to reduce demand and set the stage for complete removal of such products from the market.

In setting these charges, it is essential for Defra to bear in mind that nominal charges do not work – for example, the experience of Starbucks is that a 5p charge for a single-use cup does not discourage their use, nor is a 25p incentive to bring a refillable cup to the store.

Charges must make a significant difference to the price of a product, and should be seen as an interim measure before phasing plastics out altogether.

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Section 3: Catalysing new materials and systems

3A: Systems

For too long, there has been an assumption that a gamut of single-use plastics is ‘necessary’ or ‘unavoidable’. We seek to challenge that assumption at every turn, because the “take, make, waste” model is simply not sustainable.

Research by Visa and Oxford Economics indicates that more than half the growth in global consumption over the next decade will come from the growing middle class around the world. By 2030, this projected growth in consumer spending will add the equivalent value to the world economy of a second United States.³¹

In that light, the already-developed world has to lead the way in pioneering new systems that will prevent this exponential economic growth resulting in uncontrolled damage to the planet. As things stand, plastic production is set to double by 2040³², inexorably increasing both GHG emissions and pollution.

But there is another way. Here we set out a practical route map to making **permanent packaging** the norm. Since recycling plastics is an inherently flawed model, this sharp focus on re-use is a prerequisite for a truly circular economy.

In partnership with *Reposit* – which has been funded by a £3m UKRI grant – we envisage a universal, professionally refillable, reusable packaging platform. The transition will provide continued shopper convenience, by enabling consumers to “take and run” with pre-filled packaging, while ending the culture of waste by incentivising the return of packaging to stores for professional cleaning and reuse.

In this instance, the consumer can buy washing-up liquid in a durable, metal container, and then bring it back to store once it is used up. The cost of the packaging will be credited back to the shopper on return, enabling them to buy a new bottle of washing up liquid, while the old bottle is returned to base for refilling. The same bottle will be used again and again.

By its nature, setting up such a system will require buy-in from companies who consider themselves competitors. To stick with the example above, it requires agreement on standardised packaging for washing up liquid, with consumers then choosing between what is inside the bottle not what the bottle itself looks like.

The transition is akin to agreements which have already had to be made in the electric vehicle industry, where the competing manufacturers could see that a standard infrastructure would be needed for charging irrespective of the car concerned. Had Toyota developed a bespoke charging mechanism for its vehicles, and Tesla another, and Ford another, owners of all three brands would find themselves unable to locate an appropriate charging point.

Conversely, for permanent packaging to work, there needs to be a shared infrastructure across the different retailers and across the different brands. We do not underestimate the shift that this requires in thinking, and in marketing, for the brands concerned but shared investment in the model will help manage the risk of transition from the existing single-use model and will eventually mean shared dividends for all involved.

³¹ Visa, [Global middle class consumption study](#), 2023

³² International Standards Organisation, [Rethinking the future of plastics](#), 31 March 2022

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To catalyse the transition, we recommend that government regulates to see single-use applications ‘designed-out’ of the packaging market wherever possible. A **prefill revolution** could be brought about by:

- Introducing a legislative requirement for large supermarkets (over 3,000 square feet as defined in the Sunday Trading Act 1994) to devote 25% or more of their floorspace to reusable / refillable systems by 2026.
- Introducing a legislative requirement for all supermarkets and big business with more than 250 employees to an annual report of their primary, secondary and tertiary plastic packaging use throughout their supply chains.
- Investment from UKRI in new digital labelling technology which will permit consumers to pay a deposit on packaging for “pre-filled” items, returning them to store not for ‘recycling’ but for genuine reuse.

In so doing, the government would effectively mandate retailers to offer essential products such as rice, pasta and grains, cereals, dried fruit snacks and coffee, as well as for washing detergents, shower gels, shampoos and other consumables in refillables.

Meanwhile similar schemes should also use reusable packaging in the takeaway market, as the Club Zerø scheme presently does.

To make such deposits on permanent packaging work effectively, government must regulate to reform the Deposit Return Scheme from its inception in 2025, requiring industry to print serialised QR codes on every label. Technology exists through companies such as Polytag, to overprint these simply on to existing packaging.

Under such a scheme – already devised by REPOSIT – a particular bottle or jar can be scanned and allocated to a particular consumer. The consumer then pays a deposit for the packaging, and if they reuse or take it back to one of thousands of drop off points, they will receive a deposit credit.

This enables shoppers to buy the items they need when they need them (without remembering to bring packaging) but places a burden of responsibility on consumers not to throw highly durable materials away.

In time, we will see the emergence of “smart bins” within households which would enable kerbside collection of permanent packaging from householders, prior to its return for washing and reuse by any manufacturer or retailer.

Such digital technologies are the start for what should become a development of the government’s Deposit Return Scheme. So-called “smart” or digital DRS would see consumers rewarded for separated, kerbside recycling rather than relying on them to bring containers back to stores. Such a system would rely on digital labelling and scanning both at the point of sale and the point of collection.

3B: Materials

Where permanent packaging and refill genuinely is not a practical solution, continued deployment of single-use plastics should still cease. Examples include where “single serve” items are required such as at large events, or where some protection is needed around products such as dishwasher tablets and laundry pods to stop them sticking together in storage and transit.

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Additionally, hidden micro- and nano-plastics which encapsulate – for example – fragrance within laundry liquids, fabric softeners and shower gels, are among the most insidious and difficult to replace.

Nine out of every ten cosmetic products contain forever polluting microplastics according to Plastic Soup Foundation³³, following analysis of 7,704 cosmetic and care products of the most popular brands of the four biggest cosmetic producers in Europe. Fragrance encapsulation in laundry liquids and shower gels is another hidden use of plastic. (This paragraph is from Page 7. It is mostly repeat. Not sure if you want to keep it in). SEE ABOVE & BELOW

Nine out of every ten cosmetic products contain forever polluting microplastics according to Plastic Soup Foundation³⁴, following analysis of 7,704 cosmetic and care products of the most popular brands of the four biggest cosmetic producers in Europe. This is an industry wide problem that is yet to be effectively addressed.

UK innovators such as Xampla and Notpla are bringing to market **new materials** which can meet those challenges without resorting to polluting plastic, and the grain of European regulation is supportive of developing the technology.

Specifically, the European Union defines single use plastic as materials consisting of a polymer to which additives or other substances may have been added, and which can function as a main structural component of final products, with the exception of natural polymers that have not been chemically modified.³⁵

Xampla and Notpla's materials come under that exception. Their products are *nutrient* materials which can slip easily into nature's never-ending toxin-free circle of *growth creating nutrients creating growth creating nutrients*, with no waste, ever.

Yet such innovation needs further support from the UK government in the following ways:

- Explicit recognition in the Extended Producer Responsibility (EPR) and plastic packaging tax systems, so that innovative, natural materials are distinguished from polluting plastic
- A clear trajectory of regulation (as we set out above) which forces industry's hand to invest in these new solutions, and speed up the scale at which they can be deployed
- New standards to delineate these new, natural materials from traditional 'compostable plastics'. While both types of material meet the BS EN 13432 standard, only these innovative materials can be returned to nature without industrial composting infrastructure
- Priority from UK Research and Innovation (UKRI) for grants to test new applications such as seed coatings (to prevent soil pollution from traditional plastic) and natural microcapsules to replace microplastics and nanoplastics used in liquid formulations such as in laundry and personal care products.

³³ Beat the Microbead, Plastic Soup Foundation, <https://www.beatthemicrobead.org/>

³⁴ Beat the Microbead, Plastic Soup Foundation, <https://www.beatthemicrobead.org/>

³⁵ See Article 11, [Directive \(EU\) 2019/904 of the European Parliament and of the Council](#), "The Single Use Plastics Directive", 5 June 2019

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Why the BS EN 13432 standard needs reform

Before the present trend toward chemical recycling, there were moves in the plastics world toward replacing traditional plastic (especially flexible films) with so-called ‘compostable’ plastic, which – if properly certified and processed to the right standards – can be disposed of in industrial composting.

However, in the absence of clear labelling and proper co-ordination between government and industry about how to regulate and process these materials, confusion on the subject has flourished. There is a misconception, for example, that compostable materials are necessarily “bio-based”, and conversely a confusion that bio-based materials are, of their nature, compostable.

In fact, the opposite is true. The recognised standard for compostable materials – BS13432 – encompasses synthetic, fossil-fuel based resins which can be industrially compostable. Meanwhile bio-based materials may have been so substantially altered by chemical processes as to render them unlikely to compost.

In any case, the BS13432 standard permits materials to take up to 12 weeks to break down – somewhat longer than most of the composting processes into which the materials go are set up to last.

Shorter retention times, as short as a few days, are common in high-rate anaerobic digestion systems, where the focus is primarily on the production of biogas. And even in low-rate anaerobic digestion systems that prioritise the degradation of complex organic compounds, the retention time may be only a few weeks.

Meanwhile, Defra has set its face against these materials and is doing nothing to encourage local authorities to collect and compost them alongside food waste.

In that light, it is becoming clear that a new standard is needed that recognises the power of *nutrient materials* such as those made by UK innovators Xampla and Notpla.

Based on plant proteins and other sustainable plant feedstocks, these materials – unlike the traditional compostables in the market – are not chemically ‘cross-linked’ in any way, meaning they can break down just like plants from which they are made.

At the end-of-life, these materials behave more like food than plastic, principally because those materials are *not* plastic at all.

An international standard for such nutrient materials would both help to boost the industry, and assist packaging buyers and consumers in recognising the difference between traditional compostables and these, quite different, innovative materials.

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Transparency: sunlight as the best disinfectant

UK supermarkets use some 114 billion pieces of throwaway plastic packaging each year, which equates to 653,000 tonnes of plastic waste, the equivalent of almost 3,000 747 jumbo jets. While almost all of this waste will end up polluting the natural environment, leading supermarkets in the UK do not provide detailed data on the amount of plastic they use.

In September 2020, supermarket chain Iceland called on the retail sector to join it in improving transparency on plastics use. Working with campaign groups including Friends of the Earth, Greenpeace, A Plastic Planet and Surfers Against Sewage, Iceland called on the Government to use the Environment Bill to enforce mandatory reporting on plastic packaging and plastic pollution reduction targets. There is now the opportunity to do so through regulations, making such a requirement a feature of an amended Environmental Improvement Plan under Section 8 of the Act.

Iceland argues that without transparent reporting, and Government enforced reduction targets, we will not be able to judge whether business actions are delivering real progress in tackling plastic pollution. Iceland went on to call for retailers and other businesses to commit to publishing their total plastic packaging transparently, including both own label and branded products. Iceland announced that it had a plastic footprint of more than 32,000 tonnes in 2019.

As with so many elements of the A Plastic Planet roadmap, this step would recognise that voluntary agreements alone are insufficient: only by being compelled to transparency will the larger supermarkets publish their plastic footprint and clean up their act. Indeed, according to the Pew Charitable Trusts/SystemIQ report *Breaking the Plastic Wave* released this year, voluntary agreements will see a maximum of 7% reduction in the forecast trebling growth of ocean pollution by 2040. This is clearly inadequate, and as such, reporting requirements with legal force are needed.

We recommend that food retailers and other businesses which employ more than 250 people go beyond the requirements of the current voluntary agreement with WRAP, (where applicable) and make a mandatory annual report of their primary, secondary and tertiary plastic packaging use throughout their supply chains. This, too, will drive the shift to permanent packaging.

In addition to replacing single-use plastics with natural alternatives, our strategy is to design single-use applications out of the packaging market wherever possible.

3C: Reforming DRS from Day One

The introduction of a Deposit Return Scheme across all four nations of the UK has been a lengthy and disjointed process. In turn, the utility of such a scheme is diminishing especially when considering the pace at which innovation in alternative materials are being upscaled and refill systems being introduced. England is set to introduce a DRS scheme which might have looked innovative in 2015 some ten years late.

Reform to current DRS proposals should include:

- Smart (also known as Digital) DRS digital technology
- Inclusion of all polluting materials
- Variable deposits
- An expedited process of implementation

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Introduction of a smart DRS scheme across the United Kingdom to support the systems change we describe in Section 3A, bringing about a total shift towards a refill and prefill mode of consumerism.

There is time for the government to introduce such technology at the outset of the Deposit Return Scheme in England since the whole project has been delayed until the end of 2025 in any event.

By giving notice now, government could regulate to ensure business prepares for serialised labelling of their products to replace traditional barcode technology. Companies such as the not-for-profit GS1UK are already trialling such innovation with Ocado, showing how consumers could ‘check their packaging in’ to kerbside recycling, and to get back a deposit for doing so.³⁶

Through such a system individual consumers can have particular pieces of packaging ‘attached’ to an account with each piece counted out and counted back in. This is the key to a truly circular economy in packaging where the default is to reuse items, not to put them through complex (and often carbon intensive) recycling systems.

The Welsh government – which is pressing ahead with a DRS scheme – has already begun feasibility studies on how digital DRS could complement – and, in time, succeed – traditional schemes.³⁷ A Plastic Planet believes that all four nations of the UK should implement Digital DRS from the outset, rather than spend time and money on introducing schemes which will be obsolescent from the start.

Serialised bar code technology will anyway assist with the implementation of Extended Producer Responsibility, which will require that items are traceable. It makes sense to implement these changes together.

³⁶ See [Polytag and Ocado](#) on GS1UK.org

³⁷ Welsh Government and Resources Futures, [Digital DRS Feasibility Study](#): Phase 1, January 2022

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Section 4: Taxation to cut the production and importation of virgin plastics

The Plastic Packaging Tax came into force on 1 April 2022 and is charged at a rate of £200 per tonne.

A business must register for the Plastic Packaging Tax if it:

- expects to import into the UK or manufacture in the UK 10 tonnes or more of finished plastic packaging components in the next 30 days
- has imported into the UK or manufactured in the UK 10 tonnes or more of finished plastic packaging components since 1 April 2022 — this will change on 31 March 2023, when they will need to look back over the last 12 months on the last day of the month

An estimated 20,000 businesses across a broad range of sectors are affected. Businesses that fall within the regime submit quarterly returns to HMRC detailing weights of plastic packaging components imported into the UK, manufactured in the UK, containing 30% or more recycled content, and/or exempt, amongst other things.

It is already evident from Treasury figures showing that the Plastic Packaging Tax has incurred double the tax revenues anticipated, that businesses would rather pay the tax than change their material. It is simply considered a cost of doing business versus a stimulus to reduce virgin plastic.

In correspondence with A Plastic Planet, Exchequer Secretary to the Treasury, Gareth Davies MP, says the Government will keep the rate and 30 per cent threshold under review, to ensure the tax remains effective in increasing demand for and use of recycled plastic in packaging.

We therefore recommend that such reviews are expedited, with a view to instituting a reformed and strengthened taxation to cut the use of virgin plastics in packaging from next year. A thorough going review of the Plastic Packaging Tax should examine:

- the rate, currently set too low at £210.80 per tonne³⁸
- the threshold for a product to be considered ‘recycled’, currently too low at 30%
- the audit process for returns under the tax
- the scope of the tax, including:
 - the position of nutrient materials which replace plastics
 - how the tax can be used to encourage a transition to permanent packaging, and
 - how the tax might be broadened to discourage plastic use (and catalyse a transition to alternatives) in fashion, healthcare, electronics and construction
- the method of measuring recycled content and the problems of a ‘mass balance’ approach

Our initial views on what such a review should conclude are as follows:

- Taxation Rate

The tax is currently set at a level that is too low for the producers of plastic materials to see real effect. The tax is instead seen as a cost of business that can be easily overcome and enables a ‘business as usual’ mentality. A Plastic Planet propose that the tax be increased to £500 per tonne.

³⁸ The initial rate was £200 per tonne but this has been increased to £210.82 for the 2023/24 financial year, reflecting inflation.

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- Taxation threshold

To require only 30% recycled content for a product to be exempt – and then to brook the possibility of a ‘mass balance’ approach where this threshold could be achieved by simply having carbon intensive, chemically recycled feedstocks, making up 30% of a production line (not of any one product) – demonstrates a real poverty of ambition for the tax. A Plastic Planet proposes a threshold of 50% mechanically recycled content.

- Audit

This tax does not fall under an independent auditing body and therefore it operates under a system of producers declaring their contributions from scrutiny.

HM Treasury says “HMRC will use enforcement and inspection powers currently used to administer other taxes to ensure compliance with the tax” and that “the Government has introduced criminal offences for manufacturers and importers who are fraudulently evading the tax.”³⁹

However, A Plastic Planet has seen little evidence of such enforcement, still less of prosecutions. To help the enforcement regime bed in, we recommend that one tenth of returns under the Plastic Packaging Tax should – automatically – be independently audited each year for the next three years.

- **Ringfenced plastic tax fund**

In the Plastic Waste Inquiry (November 2022), the House of Commons EFRA Select Committee recommended that revenue from the Plastic Packaging Tax should be reinvested alongside income from EPR measures into recycling infrastructure and promising areas of future research.

In correspondence with A Plastic Planet, the government rejects that proposal claiming “widespread hypothecation of tax revenues undermines the Government’s ability to flexibly manage the public finances.”⁴⁰ We urge ministers to reconsider, since the purpose of plastics taxation is not to make an overall contribution to the public finances but to reduce the country’s reliance on virgin plastic, and catalyse the market in alternatives materials and system.

- **Revised Scope**

The tax in its current form groups compostable and biodegradable packaging products – even the newest and most innovative nutrient materials – within the scope of the tax – because, by their nature, they do not come from ‘recycled’ feedstocks.

Consequently, new polymer materials that act as a vehicle to transition away from single-use plastics are hindered from delivering on their full potential in supporting the transition.

This logic is flawed and rooted in a fundamental misunderstanding of the process of biodegradability and composting.

There is meanwhile a case for reviewing the scope more broadly with a view to encouraging the transition to permanent packaging, and – separately – to discouraging the use of virgin plastics not in fashion, healthcare, construction and electronics.

³⁹ Gareth Davies MP (Exchequer Secretary to the Treasury), letter to Sian Sutherland, 14 June 2023

⁴⁰ Gareth Davies MP (Exchequer Secretary to the Treasury), letter to Sian Sutherland, 14 June 2023

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- **Chemical recycling and a mass balance approach**

A secondary issue is the inclusion of materials recycled through chemical methods.

The government has launched a consultation on whether to allow a “mass balance approach” for calculating the proportion of recycled content in chemically recycled plastics for the purposes of the tax.

In correspondence with A Plastic Planet, the Minister, Gareth Davies MP told us the Government “believes [chemical recycling] can complement mechanical recycling by processing types of plastic which are difficult to recycle using mechanical methods and by producing a high-grade recycled plastic, which can be used in regulated applications such as food packaging.”⁴¹

In its announcement, HM Treasury said a “mass balance approach” for PPT is a way to calculate the recycled content in packaging made from chemically recycled plastic, so it can contribute to the 30% recycled content threshold above which no tax is due.

However, A Plastic Planet believes this change would have a further, perverse effect, since chemical recycling – through methods such as pyrolysis – is highly carbon intensive.

Meanwhile, the processes are not proven to be a safe means of producing – in particular – food contact materials. The UN Environment Programme recently concluded:

While many chemicals in plastics are destroyed to a large extent in some of these [chemical recycling] processes, many others may persist (e.g., metals) or form problematic degradation products, posing environmental and health concerns and technical challenges.

For example, pyrolysis of plastics waste containing halogenated flame retardants or halogenated plastic results in degradation products such as highly toxic halogenated dioxins and furans and acidic gases, which can cause corrosion of the facilities and impact the quality of final pyrolysis product.

While a lot has been learned, the fate and impacts of many other individual chemicals in plastics and their degradation products during the chemical recycling processes are largely yet to be understood.⁴²

A Plastic Planet proposes the scope of the Plastic Packaging Tax should be redefined such that “recycled content” expressly excludes chemically recycled feedstocks as a means to avoid the tax.

⁴¹ Gareth Davies MP (Exchequer Secretary to the Treasury), letter to Sian Sutherland, 14 June 2023

⁴² UN Environment Programme, [Chemicals in Plastics](#), 2023, p. 13

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Section 5: Meeting fast fashion head on

Plastic is too often thought of as a problem confined to packaging alone. Overall, some 67% of materials made into clothing derive mostly fossil-based synthetics⁴³, resulting in half a million tonnes of plastic microfibrils being released into the ocean every year from our laundry machines – the equivalent of three billion polyester shirts.

Meanwhile 5.6 million metric tons of synthetic microfibrils have entered the environment as a result of simply washing our clothes since 1950. And some 22 million tonnes of microfibrils will enter our oceans. Vast quantities are also exported to developing countries.

EU countries alone are dumping 37 million items of junk plastic clothing in Kenya every year that are too dirty or damaged to be reused, creating serious health and environmental problems for vulnerable communities, an investigation of trade data and conditions on-the-ground has found.⁴⁴

The biggest second-hand clothing market in West Africa is the Kantmanto market in Accra, Ghana. Every week 15 million items of clothing from Western countries arrive there. 40% of it is immediately considered waste and is burned or landfilled.

Failing to tackle plastic use in ‘fast fashion’ will see the UK lose ground in turning off the tap. But currently there is no accountability for fashion brands to inspire a shift away from plastic in the fashion industry, while customers are unaware of the impact of the clothes and accessories they are buying.

A Plastic Planet believes the government should extend the principle of Extended Producer Responsibility already enshrined in legislation for the fashion as well as packaging industries.

Section 51 and Schedule 5 of the Environment Act 2021, permit government to make regulations “requiring the payment of sums in respect of the costs of disposing of products and materials.” These provisions seems sufficiently broad that clothing could become a regulated product or material under the Act.

Clear labelling system

Polling carried out by A Plastic Planet found 72 percent of the public are not aware of the amount of plastic used to make clothing. Some 66 percent were not aware of fashion’s impact on the planet.

As a first step to driving the plastic out of fashion, there needs to be more transparency for consumers so they can hold brands to account, while ensuring they can make an informed decision on whether to buy an item of clothing based on its environmental impact. The public agrees too.

Some 82 percent of respondents to our poll believed the Government should make it mandatory for all clothing brands to introduce a label which clearly shows if plastic is present in clothing and accessories.

By making this clear, fashion brands will be made far more accountable to shoppers, who in turn will apply pressure for plastic free change by voting with their wallets. Meanwhile, this represents an opportunity for the United Kingdom to lead the world and out-green the European Union, whose Product Environmental Footprint (PEF) model is fundamentally flawed. The UK could set a new standard with a labelling system which:

⁴³ Changing Markets Foundation, *Synthetics Anonymous*, June 2021

⁴⁴ 37 million junk plastic clothes dumped in Africa - investigation, Changing Markets, 16 February 2023, <http://changingmarkets.org/wp-content/uploads/2023/02/CM-Trashion-PR-EU.pdf>

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- only marks as sustainable products which are truly biodegradable at the end of life
- accounts for the microplastic content of clothes
- accounts for the impact of extracting fossil fuels to make polyester, and conversely allows for the reduced impact of using natural fibres
- recognises and incentivises sustainable agricultural practices
- recognises the socio-economic impact of different fibre production and manufacturing processes

A new government consultation on labelling in fashion could and should draw on the campaigning work undertaken by Make the Label Count, who have exposed the weakness of the European Union system in this area.

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Section 6: International Action

With a UN Global Plastics Treaty already in train, there has never been a more urgent time for the UK to show leadership on cutting plastic at source by taking steps to reduce production.

The *Breaking the Plastic Wave* report states that plastic production is on course to treble by 2040. Plastic is Big Oil's Plan B. Global recycling rates have stalled. Chemical recycling has a 10% yield and is hugely energy intensive. Recycling has been the fig leaf of plastic consumption for too long.

By taking the opportunity to shift towards reduction, refills and replacements at home, the UK government can show global leadership in turning off the plastic tap – setting the standards for Europe, and relieving the developing world of the blight of plastic pollution.

The risk of a Treaty being agreed that neither protects human health, the environment or provides the much-needed clarity to international businesses is high. The United Kingdom must be a progressive force on the international stage to ensure the Global Plastics Treaty is an effective vehicle for change.

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Appendix: Bringing our plan about in practice

A Plastic Planet recognises that with two years' legislative time having been devoted to the Environment Act, new measures in the fight against plastic production and pollution must (for the time being) be achievable without further primary legislation. However, the tools of change for everything in this roadmap are already available to government to:

- Institute new bans on single-use plastic and levy charges on single-use plastic as an interim measure
- Broaden Extended Producer Responsibility to the fashion industry
- Set legally binding targets to reduce plastic production
- Set milestones towards those long-term targets as part of Environmental Improvement Plans
- Improve the efficacy of the plastics packaging tax by reviewing definitions of 'recycled'

Section 140, Environmental Protection Act 1990

- Permits the Secretary of State to make regulations prohibiting or restricting the import, use, supply and storage of "any specified substance or article if he considers it appropriate to do so for the purpose of preventing the substance or article from causing pollution of the environment or harm to human health or to the health of animals or plants."
- A very wide power already used to implement the Environmental Protection (Plastic Straws, Cotton Buds and Stirrers) (England) Regulations 2020
- New Environmental Protection Regulations can add or subtract items subject to the affirmative resolution of both Houses

Sections 1 and 8 Environment Act 2021

- Creates very wide powers to set long-term targets in relation to any matter relating to the natural environment or people's enjoyment of the natural environment.
- A priority area set out for long-term targets under the Act is resource efficiency and waste reduction, creating scope for targets on:
 - expanding refill systems in supermarkets
 - removing plastic from clothing
- Regulations must set a date by which a long-term target is to be achieved, no less than 15 years in the future (2037).
- However, there is nothing to stop HMG from laying out milestones during that 15-year period by means of an update to the "25 year plan" published in 2018, and designated as an environmental improvement plan under Section 8 of the Act.

Section 51, Environment Act 2021

- ● Regulations under this section of the Environment Act (and Schedule 5) can make provision for "requiring the payment of sums in respect of the costs of disposing of products and materials" and "securing that those involved in manufacturing, processing, distributing or supplying products or materials meet, or contribute to, the disposal costs of the products or materials".
- ● Though these provisions were intended for the packaging industry, they could be broadened in a further set of regulations for the fashion industry, ensuring that the global cost of collecting and transporting products or materials for disposal and sorting or

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treating those products, is paid for by the fast fashion producers – not the developing world.

Section 55, Environment Act 2021

- Regulations under the Environment Act can make provision for “charging by sellers of goods or services for items specified”.
- A wide power which could be used to reduce consumption of items in preparation for bans under Section 140 of the EPA 1990.
- Charges levied under this provision of the Environment Act must make a significant difference to the price of a product, and should be seen as an interim measure before phasing plastics out altogether.

Section 49, Finance Act 2021

The world-first plastic packaging tax was introduced in April 2022, but the government is exposing itself to a political risk by leaving it to the HMRC Commissioners to determine what constitutes “sufficient evidence” of recycled content.

Section 49(8) of the Finance Act 2021 can be used to make regulations which would reform the tax following the review recommended in this document.