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Recycling as reindustrialisation: building the UK's circular plastics industry

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Recycling as reindustrialisation: building the UK s circular plastics industry

Key findings for the UK Government

Chair's introduction

The publication of The Sustainable Plastics Policy Commission: Key Findings for the UK government in March 2024 helped open an important conversation between government, academia and leaders across the plastics sector. That report set out practical policy recommendations aimed at helping the UK respond more effectively to the plastics challenge while recognising the economic importance of plastics and the need for realistic, system-wide solutions. It showed that progress depends not on a single intervention, but on better coordination across policy, industry, research and infrastructure.

That earlier commission was shaped through consultation with specialists, analysis of relevant industry evidence and careful discussion among our panel of commissioners. Throughout, it was guided by a core principle of the Birmingham Plastics Network: that solutions to the plastics problem must be interdisciplinary and must consider the whole plastics value chain, from design and production through to use, collection, sorting, recycling and reprocessing. This broad perspective is essential in a sector where environmental, technical, economic and regulatory questions are closely connected.

The response to that report reinforced the value of this approach. Feedback from plastics producers, recyclers, consumer-facing businesses, policymakers and researchers alike underlined the need for a more holistic understanding of the barriers facing the sector. Stakeholders consistently highlighted that the challenges are too complex and too interdependent to be addressed in isolation. Questions of cost, infrastructure, material quality, market demand, regulation and public confidence all interact, and effective policy must reflect that reality.

This commission builds on the success of the 2024 report by examining in greater depth the challenges and opportunities surrounding UK plastics recycling. In particular, it focuses on how the UK can strengthen domestic recycling and reprocessing capacity, improve policy certainty and create the conditions for long-term investment. The aim is not simply to describe the current landscape, but to identify a focused and practical set of recommendations that can support a more circular, resilient and productive plastics recycling and reprocessing system in the UK.

To produce recommendations that are both ambitious and realistic, the commission drew on the expertise of our panel and the evidence of a wide range of witnesses able to speak to different points across the plastics lifecycle. This combination of perspectives has been instrumental. It has allowed us to refine clear recommendations from a sector that is often complex, fragmented and fast-changing. We are also grateful to the stakeholders, especially DEFRA and WRAP, who engaged with the project and helped test its assumptions against current industry and policy realities.

The context for this work remains fluid. Domestic policy changes, international market shifts and new regulatory developments all have the potential to reshape the conditions in which UK plastics recycling operates. Yet that same uncertainty also creates an opportunity. At a time when the system is still evolving, there is real scope to make meaningful changes that strengthen UK capability, reduce avoidable waste, improve resource security and support long-term economic and environmental benefit. It is in that spirit that this report has been produced.

Professor Andrew Dove

List of commissioners:

Professor Sally Beken, Founder and Lead of the UK Circular Plastics Network at Innovate UK Business Connect

Professor Antoine Buchard, Professor of Sustainable Polymer Chemistry, University of York

Aleksandra Čavoški, Professor of Environmental Law, University of Birmingham

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Chapter 1: Rethinking plastics reprocessing

Plastics recycling is increasingly a question of manufacturing capability and industrial competitiveness as well as waste management, making recycling infrastructure strategically important to the UK's industrial future. This report sets out how the UK's ability to collect, process, and repurpose plastic domestically will have important implications for industrial resilience, resource security, and economic growth. As policies drive global demand for recycled materials and international markets become more competitive, recycling infrastructure will become increasingly necessary to underpin manufacturing, support skilled employment, and strengthen supply chain resilience.

The UK has a significant opportunity to build a competitive circular plastics economy through a coordinated industrial strategy that treats plastic waste management as national infrastructure. Drawing on evidence from across industry, government and academia, this report examines the current state of the UK's recycling infrastructure, the role of mechanical and advanced recycling technologies, the challenges created by fragmented policy, and the reforms needed to create stronger markets for recycled materials. It concludes with recommendations to strengthen domestic recycling capacity, improve policy coherence, and position the UK to become a leader in circular plastics manufacturing.

Key messages

- **The UK is collecting more plastic than it can currently process.** As collections increase, there is a risk of incinerating or landfilling significantly more plastic unless sorting and reprocessing capacity expands at the same pace. Although the UK has the technology and expertise to build a competitive domestic industry, high energy and labour costs, weak demand for recycled materials, and regulatory uncertainty are holding back investment.
- **Overseas markets for plastic waste may not remain available indefinitely.** As international markets, particularly the EU, become more competitive and restrictions on waste exports increase, the UK risks losing access to processing capacity and recycled materials unless it develops sufficient domestic capability. Exports will remain an important and legitimate part of the system, but the UK should decrease its dependence on exporting waste and importing recycled content, given the volatility of the market.
- **Plastic recycling should be treated as strategic industrial infrastructure.** Building domestic reprocessing capacity could retain economic value, strengthen manufacturing supply chains, create jobs, catalyse technological innovation, and reduce reliance on imported recycled materials.
- **No single recycling technology can solve the plastics challenge.** Mechanical recycling is generally more cost-effective and energy-efficient. Advanced recycling can complement it by providing routes for difficult, contaminated or complex waste streams. Both depend on better sorting and consistent, high-quality inputs.
- **The UK needs a more coherent strategy for the circular plastics economy.** Responsibility is currently spread across government departments, regulators, local authorities and industry. A joined-up long-term strategy should align policy, regulation, investment, infrastructure and markets, providing the certainty needed for businesses to invest over the long lifetimes of recycling facilities.
- **A successful strategy will depend on higher quality data, stronger traceability and effective enforcement.** Greater visibility of material flows, standardised approaches to measuring recycled content, and strengthened oversight of PRNs, PERNs and recycled content claims are essential to protect legitimate businesses, tackle fraud and give investors confidence in the market.

About this project

The Birmingham Plastics Network (BPN) is an interdisciplinary network of more than 60 researchers at the University of Birmingham, bringing together expertise from across the sciences, social sciences, humanities and creative disciplines to address the global plastics waste challenge. The BPN is committed to collaborative, interdisciplinary approaches to plastics policy, bringing together researchers, policymakers, industry and other stakeholders to examine complex challenges from multiple perspectives.

Building on the work of the BPN's previous Policy Commission report,[1] we have consolidated the evidence base on plastics reprocessing and recycling in the UK, while identifying the policy and investment conditions needed to strengthen the domestic recycling system. The report has been developed with the aim of supporting informed decision-making across government, industry and wider society. We would like to express thanks to Giles Connolly and Lydia Buffery, the Project Managers for the Birmingham Plastics Network, and Kathryn Miles, Research Strategy and Development Partner, for their vital role in the delivery of the Policy Commission. We are also grateful for the hard work of Type Ventures and Think Creative in the production of this report.

Chapter 2: Growth opportunities for the UK

The UK generates more plastic waste than it can currently recycle domestically, and its recycling infrastructure capacity is declining. Households throw away an estimated 82 billion pieces of plastic packaging every year.[2] The UK government reports that between 51% and 53.7% of plastic packaging is recycled.[3]

The recycling sector has moved from operating below capacity to operating at, and in some cases beyond it, with stakeholders reporting around 350,000 tonnes of domestic recycling capacity lost over the past five years in response to high industrial electricity and labour costs, regulatory uncertainty, and inconsistent demand for recycled materials.[4] At the same time, plastic collections from households are increasing, rising by 15,000 tonnes since 2023 and likely to rise further with incoming legislation like the next phase of Simpler Recycling.[5]

This has tilted the balance towards export as the destination for plastic. The UK could continue along these lines, collecting plastic waste, exporting it for reprocessing, and purchasing recycled material back from international markets while allowing domestic infrastructure to decline further. High energy and labour costs in the UK also disincentivise processing plastic at home. But this also exports economic value, manufacturing activity, skilled jobs, and investment opportunities, increases dependence on volatile supply chains, and creates problems for engaging citizens in separating plastic for recycling if they fear it will be improperly managed abroad. It leaves the UK vulnerable to a changing global market, trade restrictions, and fluctuations in recycled material availability and pricing. Global conflicts affecting supply chains and changing trade dynamics between countries have shown just how fragile the market can be. As other countries, including China, increase investment in domestic recycling and circular manufacturing capacity, and regions like the EU restrict imports of plastic waste, the case for domestic reprocessing is therefore a case for reindustrialisation.

Investing in sovereign reprocessing capacity requires greater upfront investment, but it has the potential to offer wider economic returns through job creation, industrial resilience, innovation, regional investment, and increased security of supply for recycled feedstocks. Viewed through an industrial strategy lens, the return on investment extends into supporting UK manufacturing, reducing import dependence, and strengthening the country's position within emerging circular economy markets.

PCR vs PIR

The report will focus primarily on post-consumer recycling (PCR), rather than post-industrial recycling (PIR). Packaging is a major source of post-consumer plastic waste and an important source of recycled material for use across other sectors, making it a key area of existing plastics legislation, but it is important to note that it represents only part of the wider plastic waste stream. Broadening the focus of recycling policy beyond packaging could unlock additional sources of feedstock, increase overall recycling rates and support the supply of recycled plastics to sectors such as construction, automotive and consumer goods.

Defining the circular economy

A circular economy for plastics means moving away from a linear model of "take-make-waste" towards a system in which plastics are designed to be kept in productive use for as long as possible through reuse, recycling and other forms of recovery. This is a policy goal across the UK – the Circular Economy Taskforce is co-creating a circular economy growth plan for England,[6] while Scotland is already implementing a strategy[7] and Wales' Circular Living approach to recycling has achieved the second highest recycling rate in the world[8] – and is set to become a guiding principle in Europe upon the adoption of the EU Circular Economy Act.[9] The objective is not to eliminate plastics, which continue to provide important benefits across packaging, healthcare, construction and manufacturing, but to ensure that they are designed, managed and recovered in ways that minimise resource use, waste and environmental impacts.

The economic opportunity is significant. Circular economy activities already employ an estimated 121-142 million people globally, representing over 5% of the world's workforce, across recycling, repair, remanufacturing, reuse, and waste management.[10] In the UK, the circular economy has been estimated to have the potential to create around 550,000 additional jobs while increasing the UK's Gross Value Added by £82 billion by 2030.[11]

Recycling is already one of the UK's largest sources of green employment. The waste sector employs approximately 158,000 people in green jobs, accounting for around 23% of the UK's green workforce, with green waste management jobs having grown by 56.7% since 2015.[12] Expanding domestic recycling capacity would help retain economic value that is currently lost through exporting waste and importing recycled materials, all while creating skilled employment across chemical engineering, process engineering, materials science, equipment manufacturing, logistics and plant operations. Additionally, UK recycling produces jobs in a geographically balanced way across the country, rather than being concentrated in London. The reprocessing sector offers the potential to revitalise historic manufacturing towns and former chemical industry hubs; this could make a significant difference in communities where unemployment is high.

Plastic products will continue to play an important role in modern packaging systems; the goal is ensuring that plastics are designed, collected, sorted, recycled, and managed effectively at end of life. Plastic recycling helps support emissions reduction targets by saving between 30-80% of the carbon emissions generated by virgin plastic processing and manufacturing.[13] A circular economy for recycling does not mean that every tonne of plastic must be recycled in the UK; exports can remain an efficient part of a functioning system when overseas facilities have a genuine comparative advantage and material is recycled to appropriate standards. But the UK should avoid becoming structurally dependent on exporting its waste while importing the recycled materials it needs. Building resilient domestic recycling and reprocessing capacity would give the UK greater control over a critical material, retain more economic value domestically, strengthen industrial resilience and ensure that plastic remains a resource rather than simply becoming a waste liability.

A national strategy for investment

The UK needs a more integrated, long-term strategy that aligns existing policies, reduces regulatory contradictions, and provides a clear direction for the recycling and circular economy sector. Recycling should be recognised as strategic national infrastructure that underpins industrial growth, reindustrialisation, resource security, and economic competitiveness, supported through a coordinated infrastructure strategy. Greater UK plastic reprocessing capacity would reduce reliance on imported raw materials, improve supply chain resilience and retain valuable secondary materials within the domestic economy. This is increasingly important for sectors such as automotive, healthcare, aerospace and defence, where secure access to materials is becoming a strategic priority.

The number of jobs created by a new plastics reprocessing facility can vary widely. A facility with 30 kt capacity creates around 30 jobs, while facilities over 80 kt can create at least 130 jobs, going as high as 350 jobs for a combined MRF and Mechanical Biological Treatment (MBT) plant, according to industry estimates.

Recent investments illustrate this potential. Clean Planet Energy's proposed network of ten advanced recycling plants is expected to create more than 750 permanent jobs, alongside thousands more during the construction and operation phases.[14] Veolia's expansion of its recycling complex in Shropshire is projected to create 130 additional jobs, adding to a workforce of over 500,[15] while Enviroo's PET recycling facility in Cheshire is expected to generate 80 permanent jobs and 83 construction jobs.[16] Scaled nationally, this would lead to thousands of permanent, high-quality jobs. Internationally, advanced recycling investments are driving job creation even further: Eastman's molecular recycling facility in France is expected to create 350 direct and 1,500 indirect jobs,[17] while five industrial pyrolysis plants supported by the European Investment Bank and Santander in Spain are projected to create more than 300 jobs.[18] These jobs range from pickers on the production lines to highly skilled scientific roles, such as chemists and chemical engineers.

A comprehensive national recycling infrastructure strategy could therefore advance multiple national priorities simultaneously: strengthening resource security, unlocking private investment, supporting UK manufacturing and reindustrialisation, creating skilled jobs, and accelerating the transition to a competitive circular economy.

Key actions

- Treat recycling as strategic industrial infrastructure, recognising its potential contribution to manufacturing, green jobs, and security of supply.
- Expand domestic sorting and reprocessing capacity in line with rising collections, prioritising materials where the UK has the greatest capacity gap.
- Address the cost disadvantage facing UK recyclers, particularly high energy and labour costs, to improve their competitiveness with imported recyclate.
- Explore the potential for a national recycling infrastructure model through a public-private partnership, with the state retaining strategic control while the private sector manages operations.

Chapter 3: The state of the infrastructure

Capacity concerns

The UK's plastic packaging reprocessing sector is in a period of decline. It has lost over 200 kt of capacity since November 2024,[19] with the closure of plants including Viridor Avonmouth, Viridor Rochester, and Biffa Sunderland. An estimated 22% of capacity was lost between 2023 and 2025.[20] Stakeholders report that recycling facilities have been facing a new threat in recent years, as already struggling plants are damaged by battery-derived fires, largely attributed to vapes in the plastic waste stream. There is scope for scaling up some large new facilities – Enviroo (in Cheshire, 35 kt capacity),[21] Jayplas (in Swansea and Tredegar, 100 kt capacity),[22] and Veolia (in Shropshire, 80 kt capacity)[23] – which could make a significant contribution by 2027, as long as their operations remain commercially viable.

As things stand, however, it is estimated that the current maximum capacity for plastic packaging only covers 40% of annual plastic packaging placed on market (POM), and current operational capacity only covers 23%.[24] Reprocessing 100% of plastic packaging POM domestically would require 2,122 kt of capacity, significantly more than the current maximum capacity of 875 kt. Additionally, current operational capacity is around 583 kt[25], well short of maximum capacity. An all-plastics assessment, going beyond packaging, estimates total maximum capacity at 890 kt.[26] Without any increase, 60% of the UK's plastic packaging will still need to be exported for reprocessing, otherwise it will go to incineration or landfill.[27] Current operational capacity for food-grade plastic packaging is 167 kt,[28] only 17% of what is needed.

Capacity measure	Current capacity (kt/year)	Share of POM covered
Required for 100% domestic reprocessing	2,122	100%
Current maximum capacity	875	~40%
Current operational capacity	583	~23%

The domestic cost dilemma

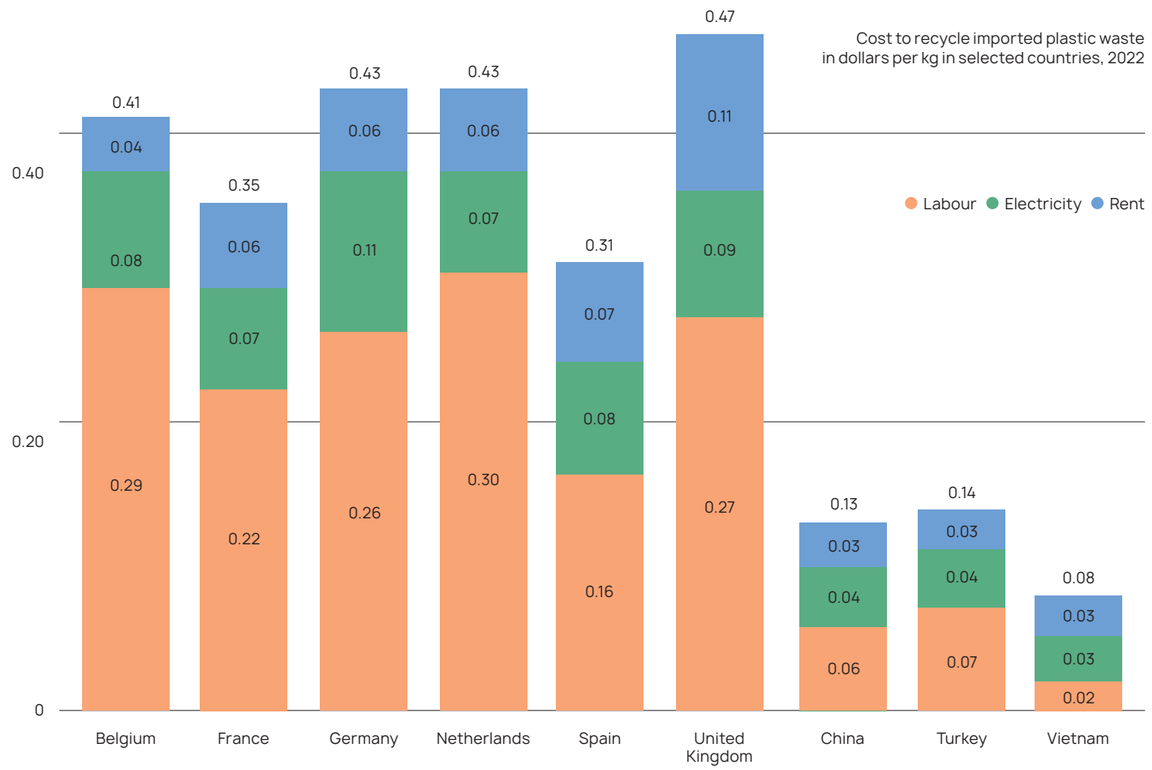
UK-based recycling stakeholders report that energy and labour are among the largest operating costs, putting domestic recycling at a structural disadvantage against producers and recyclers operating in lower-cost markets. The UK has some of the highest energy prices in Europe; in 2023, industrial energy costs were twice as expensive as in Germany, Italy, and France, and 4x more expensive than in the United States.[30] By contrast, China has some of the lowest energy prices in the world, 50% below the United States.[31] Energy-intensive recycling processes are particularly exposed to differences in electricity prices. UK labour costs are also substantially higher than in competing markets. This makes it difficult for UK recyclers to compete on price with material processed abroad in regions such as Southeast Asia, where operating costs can be considerably lower (waste sorters in Indonesia earn as little as £1.50 a day).[32] China also retains advantages in areas such as scale and supply chain integration, even as its labour-cost advantage has narrowed.[33]

UK recycled plastic therefore competes not only with virgin plastic, but also with imported recycled material produced with a significantly different cost base. Imported material may benefit from lower energy and labour costs, cheaper access to feedstock and, in some markets, weaker regulatory and enforcement requirements. This can allow imported material to undercut domestically recycled plastic,[34] even where UK recyclers are operating to higher environmental and regulatory standards. The additional cost of transportation to third-party countries does not outweigh the disparity in energy costs.

Domestic recycling is therefore being squeezed from both sides, by low-cost virgin polymer and by cheaper imported recycled material. Where recycled content claims are inaccurate or fraudulent, the problem is compounded further, as non-compliant material can enter the market at an artificially low cost.

Figure 1: **Cost comparison of recycling OPEX across countries**

OPEX costs to recycle plastics in EU are three times higher than in Asia



Source: Li, Ward, Lin, et al., Nature Communications.[29]

Mechanical recycling dominates

Of the 106 plastic reprocessing plants currently operating in the UK, mechanical recycling is the only technology at commercial scale.[35] It is a relatively mature and commercially established way of recovering value from plastic waste, particularly where the incoming material is clean and well-sorted. Mechanical recycling is highlighted for its environmental benefits: using mechanically recycled polymers in plastic product manufacturing delivers GHG savings between 147-1493 kg CO_2e/tonne of recycled polymer, relative to using virgin material.[36] Mechanically recycling plastic waste instead of sending it to incineration or landfill delivers GHG savings of 1140-3573 kg CO_2e/tonne of waste. These savings account for both the replacement of emissions from virgin production and the avoidance of emissions from incineration and landfill. In one analysis from the UK, approximately 1.7 tCO_2e per tonne may be avoided when plastic is recycled rather than sent to Energy from Waste (EfW), meaning that expanded UK recycling could potentially avoid up to 143 MtCO_2e by 2060.[37]

Mechanical recycling can also produce recycled polymers at a lower cost than more technologically complex alternatives, while making use of established collection, sorting and processing infrastructure. These plants can increasingly process more challenging materials, including – in some cases – post-consumer polypropylene for food-grade applications. However, it is important to distinguish between conventional mechanical recycling and more sophisticated forms of mechanical recycling. Basic mechanical recycling can be used to produce products with lower-grade applications such as refuse sacks at an affordable rate, but food-grade or cosmetic-grade recycled content remains particularly challenging to achieve through basic processes, and requires much more complex washing, sorting, and separation technologies, including improved de-inking, solvent-based washing systems, and other advanced cleaning processes that can improve the quality of post-consumer recyclates. Once these advanced cleaning and sorting technologies are added, mechanical recycling of these materials becomes far less affordable.

Opportunities exist for mechanically recycled polymers in construction materials, automotive applications, fibres and textiles, horticultural products, and non-food packaging. These applications can provide viable, but small, markets for recycled material without requiring the exceptionally high purity needed for direct food-contact applications. However, these broader "open-loop" applications have not been the focus of current policy, which prioritises turning packaging into more packaging to reduce the 2.3 million tonnes of plastic packaging waste produced every year.[38] For instance, one recycled plastic bench made in the UK weighs 60 kg[39] – the entire annual waste stream could produce almost 38 million benches every year. Products such as benches, street furniture and construction products can provide valuable markets for recycled plastic and contribute to sustaining demand, but they cannot absorb the volume of material generated by packaging. Globally, 158.04 Mt of plastic packaging was used in 2022, compared to 72.05 Mt of plastic in building and construction, 32.02 Mt in automotive, 28.02 Mt in electrical and electronics, 28.01 Mt in household and textile, 16.01 Mt in agriculture, and 48.03 Mt in others.[40]

Additionally, the most in-demand materials in many sectors are not found in consumer packaging waste streams: PVC makes up nearly 52% of plastics in the construction sector (over 900 kt), but a negligible proportion of consumer packaging waste (4 kt).[41,42] There is some overlap across sectors, but the gap remains significant, and cross-sector recycling cannot be the solution for over 2 Mt of packaging waste.

Advanced recycling complements

Advanced recycling is an umbrella term for a range of technologies that go beyond conventional mechanical recycling. While most advanced recycling technologies are forms of chemical recycling, which breaks polymers down into their constituent chemical building blocks, the terms are not synonymous: advanced recycling can also include physical or biological processes, such as dissolution and enzymatic recycling. The term currently encompasses a broad range of different technological approaches, including chemical recycling methods such as pyrolysis, depolymerisation, and solvent-based recycling, and other methods. These technologies differ substantially in their feedstocks, processes, outputs and levels of technological readiness and should not be treated as a single, uniform technology in policy frameworks.

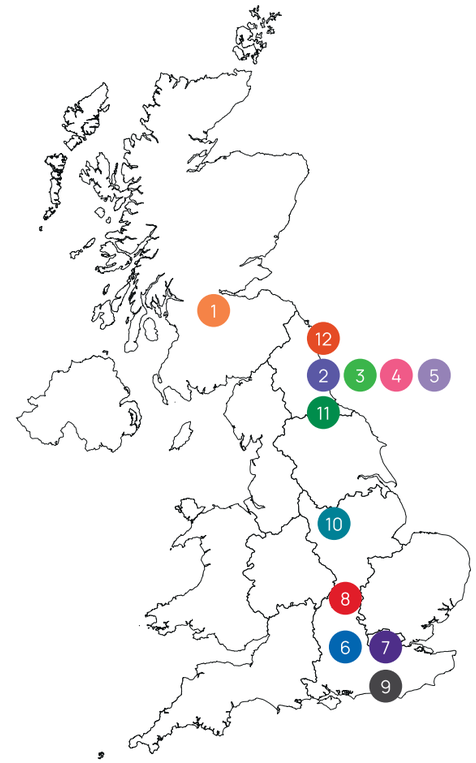
Advanced recycling can open up higher-value applications than conventional mechanical recycling, particularly where recycled material must meet stringent purity requirements. Chemical processes such as pyrolysis and gasification break plastics down into chemical building blocks such as monomers, which can then be used as feedstock alongside virgin material to produce new polymers. Mass-balance approaches then allow recycled feedstocks to be incorporated into existing virgin production processes and the resulting recycled content to be attributed to products.

Advanced recycling is particularly useful for plastic waste streams that are difficult or uneconomic to process mechanically, including some films, mixed plastics, contaminated waste streams and complex multilayer packaging. Whereas conventional mechanical recycling can cause some polymers to lose properties through repeated processing, certain chemical recycling processes can break polymers down into molecules that can subsequently be used in virgin plastic manufacturing lines. The technology also offers a potential solution for materials that currently have few viable end-of-life options in the UK; packaging types such as PET films and multilayer plastics are not yet recycled at scale because the necessary advanced recycling infrastructure remains limited.

Advanced recycling technologies are being explored across the UK, but the sector remains at an early stage of development. There are currently 12 advanced recycling plants in development across the UK, including laboratory-scale initiatives, pilot plants, and commercial plants. It is too early to determine which will deliver environmental and economic benefits at commercial scale and make up significant recycling capacity.

It is important that policy distinguishes between the different technologies encompassed by the term "advanced recycling". There are a number of distinct advanced recycling approaches being developed or used in the UK, and most mono-material plastics can potentially be processed through at least one advanced recycling methodology. However, the fact that a polymer is technically recyclable through a particular technology does not mean that the process is commercially viable, environmentally preferable or available at sufficient scale. The various technologies operate in fundamentally different ways and produce different types of outputs. They also vary considerably in their technological maturity, energy requirements, feedstock tolerance, costs and environmental impacts.

Figure 2: **Advanced recycling developments**



1. ReVentas - Pilot Plant, Edinburgh
2. Mura Technologies - Commercial plant in commissioning, Redcar
3. Stuff4life - Building a commercial demonstator plant - Redcar
4. Clean Planet Energy - Building a commercial plant - Teeside
5. Worn Again - Pilot Plant, Redcar
6. Itero Pilot Plan, Heathrow
7. PlasticEnergy - HQ London
8. Deeptech Recycling, Oxford
9. QMRE Ltd - Plant, Hoo Rochester
10. Amcor and Greenback Recycling Technologies - module unit for commisioning and pilot, Heanor
11. Endolys - Building a commercial plant, Darlington
12. TCP Circular - Building a commercial Plant, Sunderland

Source: British Plastics Federation (BPF) website, as of August 2026.[43]

Treating advanced recycling as a single category therefore risks obscuring important differences between technologies. Policy frameworks should instead assess and recognise individual technologies according to what they can process, what outputs they produce, their environmental performance and their technological readiness, rather than addressing advanced recycling as one category. This would allow promising technologies to develop without assuming that all forms of advanced recycling offer the same benefits or face the same challenges.

Dissolution recycling

Dissolution recycling is a polymer recovery technology that uses solvent-based physical separation processes to remove dyes and additives and purify specific polymers with no chemical reaction.[44] This offers a promising intermediate pathway between mechanical and chemical recycling. Existing dissolution recycling plants and projects in Europe include Fraunhofer-Creacycle in Freising, Germany, which recycles PVC, PS, and multilayer plastics; Polyloop in Génissieux, France, which recycles PVC; and Trinseo in Terneuzen, Netherlands, which recycles End-of-Life Vehicle (ELV) plastics at scale, and has enabled the production of automotive interior components containing 30% and 50% recycled content.[45] [46]

Scottish advanced recycling company ReVentas is scheduled to open the UK's first dissolution recycling plant in Livingston in 2027.[47] As a participant in the pan-European consortium HG2030 – Circular Packaging, the company is working to demonstrate the feasibility of dissolution recycling to turn coloured and contaminated PP waste into food-grade packaging.[48] If successful, a relatively small number of strategically located dissolution recycling facilities across the UK could process diverse waste streams and serve multiple markets.

Enzymatic recycling

Clarifying the definition of advanced recycling will require separate recognition of promising pathways such as enzymatic recycling, which relies on biological processes rather than chemical depolymerisation or thermal systems. Enzymatic processes typically operate under milder conditions, can offer greater selectivity, and may tolerate more contaminated feedstocks. Like other depolymerisation technologies, they have the potential to produce virgin-quality monomers suitable for high-performance applications.

Europe already has a number of promising enzymatic recycling initiatives, including the Circular Bio-based Europe-funded ENZYCLE[49] consortium and Spain's OCEANZYME[50] initiative. In the UK, Carbios and FCC Environment are aiming to establish the country's first enzymatic recycling plant, complementing Carbios' industrial-scale plant under development in France.[51] Further promising research is underway; researchers at the University of Portsmouth have demonstrated a pathway to make future enzymatic recycling of PET cheaper than producing virgin plastic, reducing operating costs by 74% compared to previous enzymatic recycling techniques.[52]

The sector also faces significant economic challenges. Advanced recycling remains substantially more expensive than producing virgin plastics: globally, it is estimated at around £1,200-1,600 ($ 1,600-2,200)/tonne for commercial-scale chemical recycling, compared to around £900-1,200 (USD 1,200-1,600)/tonne for virgin PE/PET, reflecting 2026 production costs as well as high energy requirements and long investment payback periods.[53] Investor confidence is further constrained by uncertainty over future policy support and demand for recycled outputs. Demand is impacted by the high cost of advanced recycling outputs; recycled polymers produced through pyrolysis are 1.4 to 3.7 times more expensive than virgin equivalents.[54]

Building advanced recycling facilities requires significant upfront investment. A European Commission report estimates that capital expenditure (CAPEX) for pyrolysis facilities ranges from €1,000 to more than €10,000 per tonne of annual installed capacity, while operating expenditure, excluding feedstock costs, is centred at around €300 per tonne, and found no clear evidence of economies of scale in current investment costs.[55] The report also cites studies suggesting that a 20 kt/year capacity is the minimum size for a cost-effective pyrolysis plant, while another estimates around 50 kt/year as the scale required for chemical recycling to be economically viable. This would imply initial investment of at least €20-50 million for facilities at these scales, although actual costs can be substantially higher; current plans for pyrolysis plants suggest a trend towards 120 kt/year as the typical capacity for the near future.

A further constraint on the development of advanced recycling is the limited availability of domestic markets and downstream infrastructure for its outputs. Technologies such as pyrolysis and gasification produce intermediate products, including pyrolysis oils and syngas, which generally need to be further processed before they can become feedstocks for new plastics. However, the UK and Europe have limited remaining cracker capacity to process these outputs at scale as facilities increasingly shut down,[56] so they will likely need to be exported before being reimported as recycled content.

For these reasons, advanced recycling should be viewed as complementary to, rather than a replacement for, mechanical recycling. According to one estimate, mechanical recycling has a 7% lower climate change impact than chemical recycling,[57] and a European Commission study found that mechanical recycling generally performs better than chemical recycling in most environmental impact categories.[58] In life cycle assessments, mechanical recycling has superior outcomes regarding global warming potential, depletion of abiotic resources, acidification, eutrophication, photochemical oxidation formation, particulate matter formation, and freshwater ecotoxicity.[59] A 2019 study in Denmark found that simple mechanical recycling outperforms both advanced mechanical recycling and chemical recycling on global warming potential and cost savings.[60] At the same time, the European Commission study notes that a lack of data on the characteristics of the waste inputs to recycling has been a key limitation for research.[61]

There is also a risk that advanced recycling facilities could compete for high-quality feedstocks that are better suited to mechanical recycling. At its current technological level, advanced recycling should be targeted at materials that mechanical systems cannot process effectively, including mixed-material waste, plastic films, and residues from mechanical recycling. This complementary approach would maximise material recovery while ensuring that each recycling technology is used where it delivers the greatest environmental and economic benefit. In the study above, all the assessed recycling technologies perform environmentally better than energy recovery.[62]

The need for sorting

Recycling efficiency depends heavily on feedstock quality, and therefore on sorting. In the UK, contamination of plastic waste remains a significant challenge to recycling outcomes. Higher contamination levels increase recycling costs, reduce the ability to manufacture food-grade recycled plastics, and weaken the competitiveness of UK recyclers relative to their European counterparts. This is partly a consequence of mixed household waste collection systems and the historical absence of a Deposit Return Scheme (DRS), which in several European countries has enabled cleaner and more consistent material streams. Germany's DRS has achieved return rates of 96%;[63] Norway's reached 92%;[64] and Lithuania raised return rates from 34% to 92% by introducing a DRS.[65] In Europe, DRS is seen as crucial to reaching the EU's goal of 90% return rates for beverage bottles by 2030.[66] The launch of the UK's DRS in 2027 is expected to contribute to reducing contamination rates among high-value recyclable plastics.[67] If the 90% collection target is achieved, an estimated 274 kt of PET beverage bottles could be collected by 2030, rising to 380 kt by 2040.[68]

However, sorting improvements will be needed for other types of plastics. Chemical processes still require clean feedstocks, and contaminants such as metals, stones, and grit can damage equipment and reduce process efficiency. As a result, much of the material currently collected in the UK requires additional sorting and pre-treatment before it is suitable for advanced recycling, emphasising the need for resilient sorting infrastructure.

Primary sorting refers to separating a mixed waste stream into broad material categories, while secondary sorting further purifies those streams to meet the specifications required for reprocessing and end markets, such as separating clear PET from coloured PET, removing PVC, labels and other polymers, or separating different grades of material. Primary sorting at MRFs is largely manageable with current capacities, although the quality produced by these systems needs to improve; there is a significant shortfall in secondary sorting capacity, which takes place at plastic recovery facilities (PRFs) to produce better quality feedstock for reprocessors.[69] Additionally, there is a shortfall in capacity to sort plastic packaging; approximately 1,150 kt of packaging is collected, but only 700 kt of domestic sorting capacity is focused on packaging.[70]

Improving the quality of material produced by sorting systems will require both technological and systemic advances. Emerging technologies such as artificial intelligence-based sorting systems, advanced optical and near-infrared sorting equipment, digital product passports, and integrated smart MRFs can significantly improve the identification and separation of recyclable materials.

These technologies offer the potential to increase recovery rates and improve the quality of recycled outputs. However, the principal barriers to improved recycling performance are not solely technical. Economic viability, infrastructure capacity, investment requirements, and end-market demand remain equally important to scale up sorting to the necessary degree.

A diverse technology mix

Expanding recycling's contribution to a circular plastics economy will require a portfolio of complementary technologies supported by policy. Mechanical recycling should remain the preferred option when possible, while advanced recycling technologies should be targeted at plastics that are difficult or uneconomic to recycle mechanically.[71] If the appropriate mix of mechanical and advanced recycling was achieved, the UK could achieve a scenario where the vast majority of plastic is recycled domestically, with only 1% going to landfill and very little exported.[72]

The UK has a strong base of research, innovation, and pilot-scale technologies but continues to face challenges in commercial deployment. First-of-a-kind recycling facilities require substantial upfront capital, are difficult to finance through conventional debt markets, and are widely perceived by investors as high-risk projects. Addressing these barriers is likely to require a combination of government-backed finance, capital grants, infrastructure funding, risk-sharing mechanisms, and long-term policy certainty to attract private investment.

Key actions

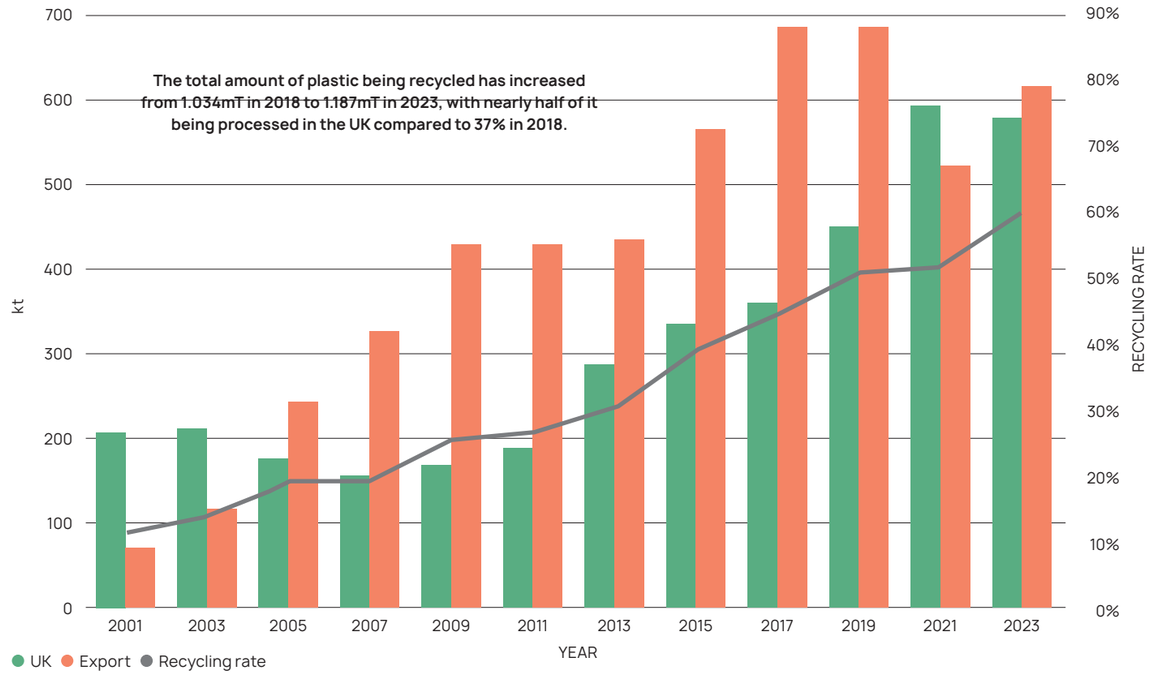
- Develop clear definitions and regulatory classifications for individual advanced recycling pathways rather than treating all technologies as a single category.
- Promote investment in innovative sorting infrastructure and technologies to increase yields and make more material economically viable for mechanical recycling.
- Protect high-quality feedstock from being diverted to less appropriate treatment routes where mechanical recycling is feasible.
- Promote thorough technoeconomic analysis earlier in the innovation stage to identify realistic pathways for early-stage technologies to scale.
- Create dedicated funding mechanisms for scaling recycling facilities, including grants, government-backed loans, and risk-sharing mechanisms, drawing on international best practice from countries such as the Netherlands, France and Australia.

The role of exports

Exports are likely to remain an important part of the UK's plastics recycling system, particularly in the near term. According to the UN Comtrade database, almost £150 million ($200 million) in value of Waste and Scrap Plastics was exported from the UK in 2025.[73] Exporting plastic waste is not inherently problematic: where another country has a comparative advantage in sorting or reprocessing particular materials, exporting them for legitimate recycling can be economically and environmentally rational. It may be more efficient to send a material to an established overseas facility than to build expensive domestic capacity for a relatively small or specialised waste stream. The objective should therefore not necessarily be to eliminate exports, but to ensure that exported plastics are actually recycled to an appropriate standard and that the UK retains sufficient domestic capacity to capture value from materials for which there is a viable UK market.

As collection systems expand, the UK is likely to become primarily a supplier of recyclable feedstock unless investment in domestic sorting and recycling infrastructure keeps pace. Without sufficient processing capacity, additional material collected from households is likely either to be exported or diverted to energy recovery. This is particularly relevant for materials such as plastic films, for which the UK's domestic recycling capacity remains limited compared with other European countries.

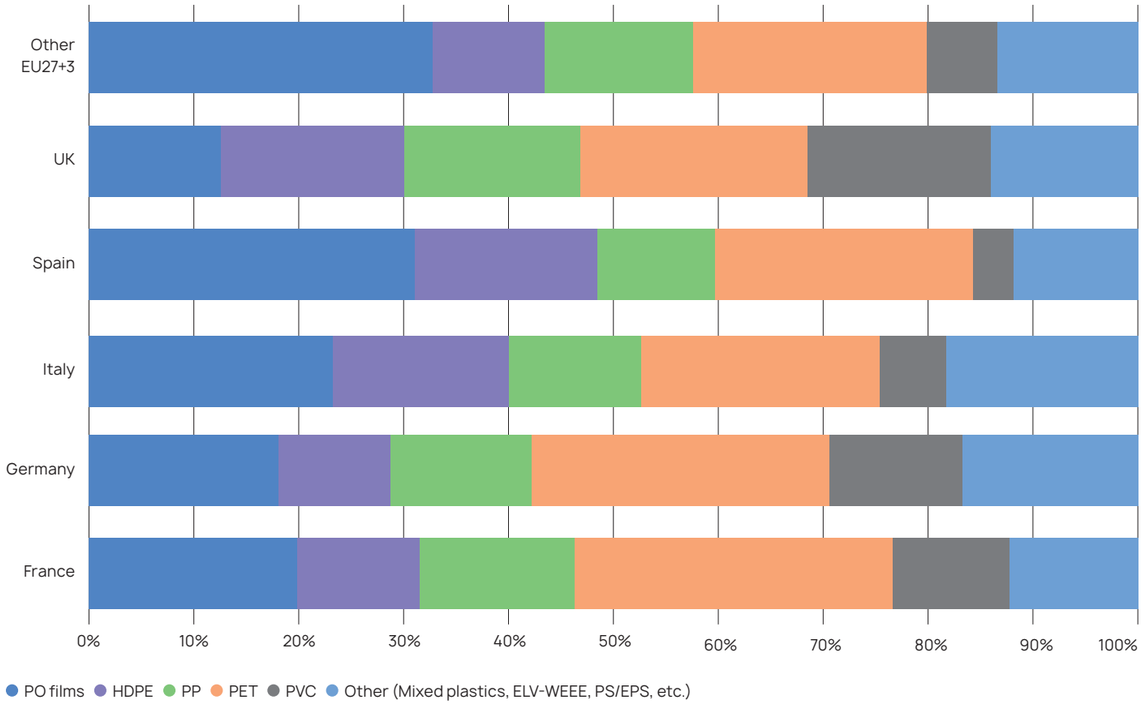
Figure 3: **The tonnage of plastic packaging recycled domestically or exported for recycling, compared to the national recycling rate. (2023)**



Source: WRAP,[74] data from Valpak Packflow report, 2023.[75]

Although domestic recycling surpassed exports for the first time in 2021, there was a slight increase in exports in 2023; 51% of the overall plastic packaging declared as recycled was exported, up from 46% the previous year.[76] Additionally, 22% of the exported plastic went to non-OECD countries, which raises concerns about traceability and alignment on recycled content claims. As recycling capacity has declined consistently since 2023, stakeholders believe exports are likely to have increased further. A container of plastic waste is exported from the UK every 15 minutes; the resources required to verify all of it simply do not exist.

Figure 4: **UK recycling capacity distribution compared to European countries**



Source: Plastics Recyclers Europe.[77]

As Figure 4 shows, the UK's film recycling capacity is particularly low in comparison with Europe's, emphasising the continued need for exports. While exports can play an important role in a circular economy, the greater concern is what happens after material leaves the UK. Poorly controlled exports can result in the loss of valuable materials, as well as undermining confidence in recycling claims and shifting the environmental costs of waste management to countries with less capacity to manage it safely. If exported material is incorrectly classified or unsuitable for the receiving facility, it may be landfilled, incinerated, or otherwise mismanaged rather than recycled.

This represents not only a loss of material, but also environmental consequences for communities in receiving countries. In particular, the UK exporting plastic waste to developing countries is a serious concern for plastic circularity. Such exports rose by 84% between 2024 and 2025, largely to Malaysia and Indonesia – 20% of the UK's exports went directly to non-OECD countries, an increase from 11% in 2024.[78] As these countries have fewer resources and lower enforcement capacity, large quantities of exported waste end up burnt or landfilled, creating health risks for communities, overwhelming domestic recycling systems, and undercutting local recycling, as well as preventing plastic material from being recycled.[79] Additionally, the transport emissions required to export plastic add to the overall climate impact of the operation.

Many countries rely on imported waste to sustain their domestic recycling systems, but this requires robust oversight and traceability to make sure this provides genuine environmental and long term economic benefits. In order to improve transparency in waste exports, the EU's Waste Shipment Regulation will increase monitoring and assessment of exports to OECD countries and impose a temporary ban on exports of waste to non-OECD countries starting from November 2026 if countries cannot verify that they are appropriately recycling the material.[80] This will reduce the mismanagement of waste in developing countries and increase the amount of material that can be recycled back into a circular economy. The UK should pursue a similar policy: maintain access to international markets where they offer a genuine comparative advantage, while strengthening traceability, enforcement and minimum treatment standards. This should be complemented by investing in domestic capacity where exports represent a persistent loss of material value or expose the UK to unnecessary strategic dependence on overseas processing.

Misalignment with Europe

The European market remains central to the UK recycling sector. Limited domestic recycling infrastructure means many recycled outputs rely on European processing capacity and end markets. However, this relationship cannot be assumed to remain unchanged. The European plastics and recycling industries are themselves under significant competitive pressure, and are feeling the impact of volatile virgin polymer prices and competition from lower-cost imports. Europe's share of global plastic production has collapsed from 22% in 2006 to 12% in 2024, while China alone produced 13.4 Mt of circular plastics in 2024, compared to 8.4 Mt in all of Europe.[81] Recycling facilities are closing at an alarming rate, with nearly one million tonnes of capacity lost in Europe between 2023 and the end of 2025.[82]

The key difference is that the EU is increasingly treating this decline as an issue of industrial competitiveness and strategic autonomy, and is developing policies to strengthen its domestic circular economy. The Packaging and Packaging Waste Regulation (PPWR), together with broader industrial policies that prioritise European recycling capacity, is expected to increase demand for recycled plastics within the EU while discouraging exports of valuable secondary materials.

This matters for the UK because Europe is likely to become a more self-reliant and strategically managed market for recycled plastics, rather than an indefinitely available outlet for UK material. In 2021, 70% of the UK's exported plastic value was through exports to the European continent, but "Made in Europe" regulations are likely to materially diminish European demand for UK plastics.[83] The planned restrictions on plastic waste exports from the EU from late 2026 could also restrict UK companies' access to European recycled content – European plastic made up 65% of import value to the UK in 2021, and this demand is likely to reduce significantly.[84] The UK therefore cannot base its long-term plastics strategy on continued access to European infrastructure or assume that European markets will absorb UK waste as they have in the past.

This is not a case for closing the UK market to international trade, but a reminder that the UK should not become structurally dependent on exporting plastic waste while importing the recycled material needed by its manufacturers. The experience of European industry demonstrates that even a more developed recycling market is vulnerable when domestic industry becomes uncompetitive. The strategic response should therefore be to build sufficient domestic capacity to give the UK greater control over its own material flows, while maintaining access to international markets where they provide genuine economic and environmental benefits.

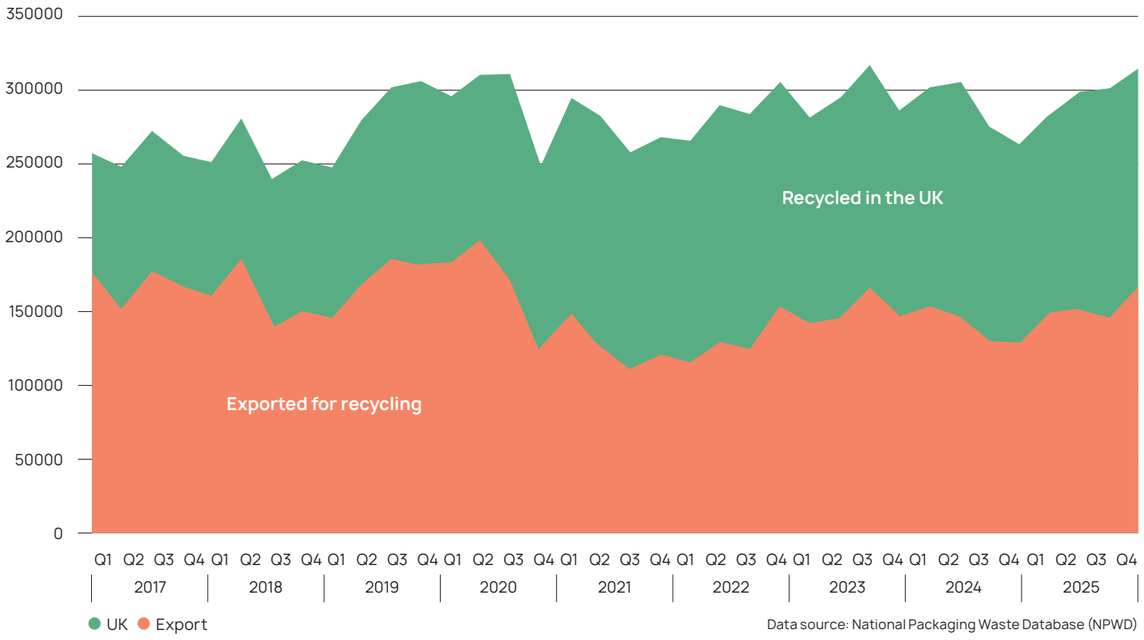
The UK's competitive position is particularly exposed to high energy and operating costs. European recyclers are already reporting that energy costs (despite being lower than the UK's), weak demand and cheap imports are undermining investment and forcing facilities to operate below capacity.[85] If the UK wants to avoid falling further behind, it should match the EU's policy ambition in treating recycling as an industrial and strategic priority. The EU and the UK had both agreed to include EfW in their respective Emissions Trading Schemes (ETS), which would disincentivise waste incineration, but the UK's decision to delay its inclusion beyond 2028 complicates the intended link between the policies.[86]

Differences in regulatory standards also create practical barriers to trade. Countries apply different contamination thresholds and quality requirements, meaning materials regarded as contaminated in one jurisdiction may be accepted and processed in another. Greater international harmonisation of quality standards would reduce unnecessary barriers and improve the efficiency of cross-border recycling markets. At the same time, stronger traceability, verification and enforcement are needed to ensure that recycled-content claims can be trusted, particularly as the UK becomes increasingly exposed to competition from lower-cost imported recyclates.

Packaging Export Recovery Notes (PERNs)

Packaging Export Recovery Notes (PERNs), alongside Packaging Recovery Notes (PRNs), remain an essential mechanism for enabling plastic recycling exports as long as domestic recycling capacity continues to fall short. They are part of the UK's Extended Producer Responsibility regulation, funding the recycling of plastics by imposing fees on producers placing large amount of plastics packaging on the market. In 2025, Packaging PRNs were claimed against 623,717 tonnes of plastic packaging recycled in the UK, with a value of £82 million, and PERNs were claimed against 583,099 tonnes of plastic exported for recycling, with a value of £97 million.[87] PERN revenue supports the costs of sorting, processing, transport, compliance, and reporting throughout the recycling supply chain. In this context, exports should not be viewed as a policy failure but as a necessary component of the current system, provided exported material is recycled to appropriate environmental standards.

Figure 5: **Quarterly plastic PRN/PERN generation, Total vs UK (2017-2025)**



Data source: National Packaging Waste Database (NPWD)

Source: RECOUP, Plastic Packaging PRN/PERN Update, 2025.

However, unlike other recyclable materials, plastics do not have a standardised sampling methodology for determining packaging content. As a result, different exporters can legitimately report different packaging percentages for similar loads, creating inconsistency and opportunities for over-claiming PERNs. PERN calculations include the weight of any contamination or non-target material that is present before the recycling process.[88]

In Packaging Recovery Note (PRN) calculations, by contrast, the material is measured after all contamination or non-target material has been removed and material yield losses in the recycling processes have taken place, meaning the same amount of recyclable material is valued less when recycled domestically than if it were exported. Adjusting PRN and PERN values would require research to produce accurate estimates of the material yield losses of recycling abroad; doing so could make domestic recycling more economically attractive relative to exporting. Ecosurety has proposed mandating that 50% of the total target must be met domestically, with this to gradually increase to 75% over five years as domestic infrastructure grows.[89] Alongside this adjustment, there is a need to develop standardised sampling and inspection protocols to improve transparency, consistency, and confidence in the system. One way to do this would be to mandate that only washed, processed flake is allowed to be exported. As many recycling facilities operate below capacity, PRN and PERN calculations do not accurately represent current recycling capacity.

The PERN system has become more robust over the past decade. Exporters are now required to demonstrate that material reaches the final recycling facility, supported by comprehensive documentation, monthly reporting, and improved audit requirements, providing greater transparency than previous arrangements that only recorded the destination country. Sustaining this transparency and ensuring the PERN system is supported by robust data is crucial to allow exports to continue in a sustainable way that does not cost the UK valuable materials and revenue. A single, consistent criterion for issuing PRNs and PERNs would help ensure greater certainty for reprocessors and exporters.

Key actions

- Preserve exports as a legitimate part of the recycling system where overseas facilities offer a genuine economic or environmental advantage.
- Maintain stable, consistent PRN values to support domestic reprocessing and stimulate investment in UK recycling capacity; a minimum and maximum annual PRN value could help reduce volatility.
- Separate PRN and PERN compliance obligations to limit reliance on exports and provide greater certainty for domestic recyclers.
- Strengthen verification, auditing and sampling requirements, supported by publicly accessible data on recycling outcomes.
- Require exported plastic waste to undergo greater pre-processing before export to retain more value within the UK.

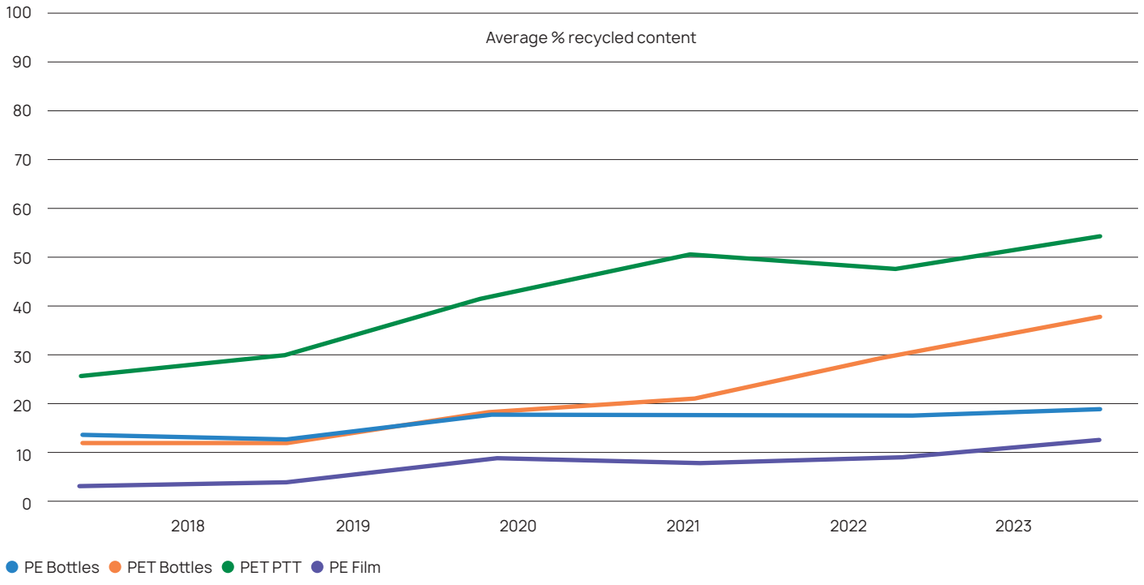
Valuing plastic materials

Plastic as an asset

As recyclability improves, more types of plastic are now able to be transformed into valuable materials. PET bottles are now 100% recyclable and have a well-established bottle-to-bottle recycling market, representing one of the most successful examples of plastic circularity;[90] Danone's use of 100% recycled PET plastic in its Evian and Volvic water bottles will cut nearly 7,000 tonnes of virgin plastic and save over 10,000 tonnes CO_2e per year. HDPE milk bottles can also be recycled back into food-grade application, particularly in the UK. Pots, tubs, and trays have reached 95% recyclability, up from 81% in 2018, an increase driven by the removal of nondetectable pigments and multi-material components.[91] Overall, 71.6% of plastic packaging is now reusable or recyclable.[92] Thanks to better reporting and monitoring, the amount of packaging classified as "unknown" or "other" has reduced by 49%,[93] giving us clearer insight into material use and recyclability. Plastic packaging has reached an average of 28% recycled content.[94] This number's proximity to the 30% required for the PPT suggests that the average producer is focused on that target, but not aiming higher.

All mono-material plastics are capable of being recycled both chemically and mechanically. Clean, well-sorted, and homogeneous streams are generally preferred for mechanical recycling; they are widely used in packaging and the volumes are sufficient to warrant a business case. Other materials such as PS and EPS are regularly mechanically recycled, but volumes are lower, so the necessary infrastructure is less well developed.

Figure 6: **Average recycled content for key plastic formats in the UK (2023)**



Source: WRAP[95]

The challenges of difficult-to-recycle materials

Markets for plastics such as coloured HDPE, polypropylene food packaging, and plastic films are much less developed. HDPE, PET and PP can be recycled into food-grade products, but the process is often not commercially viable. Film remains particularly difficult to recycle because collection systems and end markets are poorly developed. The postponing of plastic film collection under Simpler Recycling until April 2030 could mean these systems will remain underdeveloped, without sufficient government support during the delay period. In 2026, an estimated 770 kt of film is placed on the market annually. There is 145 kt capacity for sorting, and 139 kt for reprocessing. With planned capacity, this could rise to 290 kt, although this estimate includes facilities in very early stages of development.[96]

Figure 7: **Consumer plastic packaging by format and polymer (2022, in k tonnes)**

	HDPE	LDPE	PE	PET	PP	PS	PVC	OTHER	Grand total	%
Bottle	148	1	1	338	4	0	0	0	**493**	39%
Film	9	79	41	31	98	0	1	78	**336**	27%
Other	9	4	6	23	44	13	1	9	**109**	9%
Pots, tubs and trays (PTTs)	1	0	1	218	92	12	0	4	**329**	26%
Grand total	**168**	**84**	**49**	**610**	**237**	**26**	**3**	**91**	**1267**	
%	13%	7%	4%	48%	19%	2.2%	0.2%	7%		

Source: WRAP.[97]

Figure 8: **Material types that UK local authorities collect kerbside and send to a MRF (2025/26, 124 local respondents surveyed)**

Material type	%
Plastic bottles (e.g. bottles containing beverages and cleaning liquids)	97%
Cans and tins (aluminium and steel)	97%
Plastic: non-bottle rigids (e.g. pots, tubs, and trays [PTT])	94%
Other metal packaging (e.g. aerosols, foil trays)	88%
Glass (e.g. bottles and jars)	85%
Card (e.g. card packaging). Excludes cartons	83%
Paper (e.g. newspapers, magazines)	82%
Cartons/fibre based composites (e.g. Tetra Pak)	68%
Plastic film	32%
Minor streams (e.g. batteries, textiles and small WEEE)	14%
Other	2%

Source: WRAP.[98]

A continued cost barrier

Despite improved recycling rates and increased production, recycled polymers continue to cost 10-20% more than virgin plastic, and potentially significantly more for food-grade recycled material.[105] In the UK, where industrial energy costs are significantly more expensive than in Europe, the United States, and China, the gap would likely be worse; stakeholders estimate that European-produced recycled material typically costs 80-85% of the UK price, while recyclate from the Global South can cost as little as 35% of the UK price.

While consumers express interest in products made from recycled materials, there is a gap between intention and behaviour, and they are broadly unwilling to pay a premium.[106] As a result, adoption of recycled content is limited to brands that are willing to invest for reputational or long-term sustainability reasons.

The plastic film problem

63% of food and drink packaging is soft plastic film, which remains difficult to process at scale in the UK.[99] While increases in collection rates under Simpler Recycling will ensure a larger supply of feedstock, there are serious concerns about the viability of potential pathways for this feedstock. Stakeholders note that significant film recycling capacity has already closed and the infrastructure to process collected film does not yet exist. While over 200 kt of new capacity is expected to be online by 2027, as previously stated – and 12 advanced recycling facilities are in development – there are concerns among stakeholders that delaying film collection until 2030 will slow the investment necessary to scale up these facilities. Plastic films represent 27% of consumer plastic packaging in the UK, but only 67% of film packaging is recyclable.[100] Handling, sorting and recycling plastic film costs approximately £148 to £360 per tonne, depending on the collection system;[101] the alternative costs are £138-£365 per tonne for EfW, £169-£357 per tonne for other treatment, and £151-£227 per tonne for landfill, which is the most affordable option.[102]

Increased collection of difficult-to-recycle plastics without corresponding investment in sorting and reprocessing infrastructure risks increasing incineration and landfill rates; this will impose further costs on local authorities once EfW is included in the Emissions Trading Scheme (ETS). However, now that the inclusion of EfW in the ETS has been postponed, there is further uncertainty. Findings from industry trials suggest that England's mandated kerbside collection of film under Simpler Recycling could contribute 5% to the UK's recycling rates.[103] The FlexCollect trials found that plastic films can achieve 82% target material capture with low contamination, with recovery rates of 80% into new flakes and pellets.[104] To ensure the value of this material is preserved within the UK economy and not lost to overseas markets, investment in sorting and processing infrastructure must be scaled up rapidly – and must not be held back by the delay in Simpler Recycling film collection.

Packaging design

Packaging design decisions are often driven primarily by marketing requirements, with recyclability a secondary factor. Sustainability teams frequently have limited influence within organisations and are often overridden by commercial priorities. A lack of consideration of recycling at the design phase results in products being placed on the market that are technically difficult or economically impossible to recycle within existing UK infrastructure. There are major disconnects between packaging designers, brand owners, recyclers, manufacturers, and consumers. For this reason, the term "recyclable" is often misunderstood by the public: many packaging products are recyclable in theory but are not practically recyclable at scale in the UK, creating confusion for citizens about what is happening to their waste. This may be due to insufficient domestic recycling or sorting infrastructure, limited end-market demand for recycled materials, incompatibility with existing collection systems, or the use of mixed and difficult-to-separate materials.

Material quality

Improving feedstock quality is a critical priority. Poor collection systems, contamination, and inconsistent sorting reduce recycling efficiency and increase costs. Recycled plastics can achieve high performance, but only with better sorting, washing, odour removal, decontamination, and analytical testing; actual recyclability depends on format, colour, additives, labels, adhesives, barriers and contamination. Higher-quality processing means higher operational cost, more capital investment, and more complex infrastructure. The use of lower-quality recycled materials for lower-end applications can complement applications like food-grade packaging and cosmetics packaging, but there is a limit to these applications; a circular economy will require solutions that produce high-quality recycled materials.

Manufacturers also face operational challenges when incorporating recycled plastics into their products. These can include performance variability, colour inconsistency, lower processing efficiency, and additional regulatory compliance burdens, specifically in the medical, food, and cosmetics sectors. There is also a reputational dimension: where packaging is integral to product quality and safety, any failure of the packaging can be perceived as a failure of the product itself. This can make manufacturers more cautious about using recycled materials, particularly where performance is less predictable. Businesses may also require additional testing, traceability systems, and documentation to satisfy legal and customer requirements. Traceable, verifiable recycled content supply chains are therefore essential, whether domestic or international.

Key actions

- Strengthen design-for-recycling requirements so packaging design considers material choice, colour, additives, labels, adhesives and barriers, rather than recyclability being assessed only in theory.
- Establish an industry platform or regulatory forum to facilitate information sharing between packaging designers, manufacturers, recyclers and policymakers.
- Build confidence in recycled plastics among manufacturers. Develop stronger traceability, verification, testing and quality standards so businesses can incorporate recycled material without compromising performance, safety or product reputation.

Chapter 4: Navigating the regulatory landscape

Regulatory complexity is a major barrier to the wider use of recycled-content plastics. Businesses incorporating recycled content must navigate multiple, overlapping requirements covering food-contact regulations, the Plastic Packaging Tax (PPT), pEPR reporting and, for products placed on the EU market, the requirements of the EU Packaging and Packaging Waste Regulation (PPWR). These frameworks operate through different rules, reporting requirements and verification processes, creating a significant administrative burden.

According to stakeholders, brands have found that the fragmentation of reporting requirements is itself becoming a barrier. Companies are often required to provide similar information to different bodies through separate systems, rather than through a centralised reporting framework; for instance, the PPT requires businesses to track and demonstrate recycled-content levels for tax purposes alongside their obligations under pEPR and other regulatory regimes. Differences in sampling methodologies, waste-composition reporting and approaches to verifying recycled-content claims can undermine transparency and make it difficult for businesses to compare materials on a like-for-like basis. Standardised methodologies for life-cycle assessments (LCAs), recycled-content verification and mass-balance accounting would provide greater certainty and enable meaningful comparison of recycled-content performance across materials and technologies.

Analysing the Plastic Packaging Tax

The stated aims of the Plastic Packaging Tax (PPT) are to provide an economic incentive to use recycled material in plastic packaging, stimulate demand for higher levels of recycled content, and encourage investment in UK recycling infrastructure. There is evidence that it has influenced behaviour towards the first two objectives. Stakeholders report that average recycled content in plastic packaging increased during the tax's first two years while tax revenues declined, suggesting that businesses were responding to the incentive by incorporating more recycled material rather than simply paying the tax. However, the PPT has been less successful in creating the conditions for sustained investment in domestic recycling capacity, and several structural limitations are becoming increasingly apparent.

The most significant is the tax's 30% recycled-content threshold. Once a business reaches the threshold, there is little additional financial incentive to increase recycled content further, creating a "cliff edge" in which the economic value of moving from, for example, 30% to 40% recycled content is limited. This constrains demand for additional recycled material and weakens the market signal needed to support investment in new collection, sorting and reprocessing capacity. A more effective system would provide progressively stronger incentives for businesses to increase recycled content beyond the minimum threshold, rather than treating 30% as the effective end point.

The PPT is also vulnerable to fluctuations in the relative price of virgin and recycled plastic. When virgin polymer prices fall, the premium for recycled material increases, making it more commercially attractive for businesses to pay the PPT rather than absorb the additional cost of using recycled content. The tax therefore does not create a sufficiently stable demand signal to underpin long-term investment: its effectiveness can rise and fall with global commodity markets. This is particularly problematic when the UK is already facing a shortage of domestic recycled material. There is insufficient UK-produced recycled content to meet demand at the 30% threshold, while domestically produced recyclate can be more expensive than imported alternatives. As long as virgin plastic remains significantly cheaper, the PPT alone is unlikely to provide a strong enough incentive to reverse the decline in UK recycling infrastructure.

PPT revenue fell by 3% to £259 million in 2024–25, and the volume of plastic packaging relieved or exempt from the tax reached 1.59 million tonnes, more than 300,000 tonnes above the first year of the tax.[107] This suggests that businesses are increasingly adapting their packaging and recycled-content practices to avoid the tax, but it does not necessarily mean that equivalent volumes of genuine, high-quality recycled material are being produced domestically. In particular, there are growing concerns about the integrity of recycled-content claims, especially where businesses rely on imported material. Incorporating 30% recycled content into UK-produced packaging can add a substantial cost, depending on the polymer and application. For stretch film, for example, RECOUP estimates the additional cost at several hundred pounds per tonne, with a double-digit percentage increase in production costs.[108] Fraudulent or inadequately verified material can therefore provide a significant competitive advantage over genuine recycled content.

This also creates a counterintuitive risk for legitimate businesses. Manufacturers have reported a lack of confidence in some overseas recycled-content claims;[109] as a precaution, some therefore purchase material declaring 50% recycled content to provide a margin of assurance that they will meet the PPT's 30% requirement. This can mean paying a premium for material that may contain substantially less genuine recycled content than claimed. This phenomenon risks undermining confidence in the recycled-material market and reducing the effectiveness of the PPT as an incentive for genuine circularity.

Rethinking pEPR

Under the pEPR system, producers are responsible for covering the costs of collecting, sorting and managing household packaging waste through disposal fees, while continuing to support recycling through the PRN system. In the longer term, pEPR is intended to reduce unnecessary packaging, improve packaging design and increase recycling rates by making producers financially responsible for the end-of-life impacts of their products. A central mechanism is eco-modulation, whereby disposal fees are linked to the recyclability of packaging. Packaging is assessed using the Recyclability Assessment Methodology (RAM) and assigned a recyclability rating, with more recyclable packaging expected to incur lower fees.

However, questions remain over whether the current design of pEPR provides the right incentives to accelerate the transition to a circular plastics economy. The scheme also places greater emphasis on recyclability than on the incorporation of recycled content. Producers can be rewarded for designing packaging that is easier to recycle, but there are currently limited incentives within pEPR itself to use recycled polymers in new packaging. The PPT is intended to support recycled-content use, but this creates a potential overlap: producers may effectively face two policy mechanisms targeting the same outcome, while PPT revenues are not directly channelled back into the recycling industry. This risks improving the theoretical recyclability of packaging without supporting demand for recycled polymers.

For the time being, consumers are accustomed to purchasing a huge number of variations and formulations of plastics containing multiple materials, inks, labels, and additives, posing an obstacle to basic mechanical recycling and complicating the overall business case for recycling. Design-for-recycling (DfR) is especially crucial to improve recycling outcomes for plastic film; only 67% of film packaging is currently recyclable, but transitioning to mono-material films (PE, PET, or PP) would raise this above 90%.[110] RAM is often mistakenly used to make DfR decisions for plastics, but it is not intended to be a DfR guideline. RAM also does not consider broader lifecycle impacts such as carbon intensity, food waste prevention, transport efficiency, and product protection performance. When combined with weight-based pEPR fee structures, this may unintentionally discourage the use of easily recyclable materials such as glass, while favouring lightweight packaging formats that may be more difficult to recycle. In another example, the removal of high-value PET bottles from kerbside collection through DRS could reduce revenues for local authorities that currently rely on these materials to support recycling operations and enforcement.

pEPR should therefore evolve beyond a waste-management funding mechanism into a market-shaping policy that simultaneously incentivises better packaging design, greater use of recycled content and investment in domestic recycling infrastructure. Achieving this will require continued refinement of eco-modulation, greater transparency over how pEPR revenues are allocated to address ongoing stakeholder concerns, and closer alignment with the EU regulatory framework. The UK could learn from emerging approaches elsewhere in Europe. In countries such as France and Belgium, eco-modulation is being used to reward packaging that incorporates recycled content, while the Netherlands has introduced lower EPR fees for certain packaging containing chemically recycled plastics. These approaches seek to strengthen both the supply of recyclable packaging and the demand for recycled materials, creating stronger market signals for investment across the recycling value chain.

Deposit Return Scheme done right

The introduction of the UK DRS in 2027 is expected to deliver several significant benefits. By collecting beverage containers separately from mixed household recycling, DRS is expected to generate cleaner, less contaminated material streams, improving the quality and value of collected materials. Higher-quality feedstocks will support greater production of recycled plastics suitable for food-contact applications and strengthen the competitiveness of domestic recycling operators. Improved material quality may also help reduce processing costs and increase confidence among manufacturers seeking to incorporate recycled content into their products.

While these benefits are promising, there are some implementation challenges that will need to be carefully managed. The removal of high-value PET bottles and metal cans from kerbside recycling is expected to reduce the volume and value of materials handled by MRFs. This has created uncertainty over future feedstock availability and revenue streams, and some operators have reported delaying investment in new infrastructure (such as sorting equipment) until the impacts of DRS on material flows become clearer.[111]

Currently, the UK has capacity to create 85 kt of food-grade rPET pellets per year. An additional 35 kt/year is likely to come online by the end of 2028, and total capacity will reach 120 kt/year by 2030 without further investment. This is insufficient to process bottles collected through the DRS, which will require an extra 154 kt/year by 2030, and a further 106 kt/year by 2040. Enviroo estimates that this will require an additional 15 recycling plants and an investment of over £750 million.[112]

Without increased investment, the high-quality PET collected by DRS will be exported as the demand for food-grade recycled plastics increases when it is mandated under PPWR and the Single-Use Plastics Directive. As long as the UK lacks a recycled content mandate matching the EU's, it runs the risk of losing the most valuable materials to overseas recyclers. The quality difference between DRS and kerbside bales is evident in their value on the market: bales originating from DRS collections are worth 40% more than those generated from kerbside collections.[113]

Aligning with the EU

The EU PPWR will have significant implications for the UK plastics value chain.[114] It introduces a more interventionist regulatory approach: while the PPT allows producers to continue placing packaging on the market by paying the tax if recycled-content thresholds are not met, the PPWR establishes mandatory product requirements for market access. The regulation's phased implementation is likely to influence the UK market even where no equivalent domestic requirements exist. Furthermore, these mandatory recycled-content targets are expected to increase demand and competition for high-quality recycled content, of which there is less supply in the UK due to the lack of advanced recycling infrastructure in comparison with Europe.

The PPWR is also expected to reshape markets for recycled plastics. Its provisions, alongside policies such as the Industrial Accelerator Act, uplift EU recyclers and increasingly favour recycled content sourced and processed within Europe.[115] European recyclers have additionally called for a "Made in Europe" rule for recycled content, which will first be trialled in the context of PET from drink containers.[116] If made permanent, this policy could shrink end markets for UK recyclers, as recycled content produced from UK-sourced waste may no longer contribute towards EU compliance targets. Domestic markets must be stimulated to ensure demand for UK products can be sustained if EU demand shrinks.

Figure 9: **Mandatory recycled content targets under PPWR**

By 1st January 2030	By 1st January 2040
30% for single-use plastic beverage bottles	65% for single-use plastic beverage bottles
30% for contact-sensitive packaging made from PET, with exceptions	50% for contact-sensitive packaging made from PET, with exceptions
10% for other contact-sensitive plastic packaging (non-PET), with exceptions	25% for other contact-sensitive plastic packaging (non-PET), with exceptions
35% for all other plastic packaging	65% for all other plastic packaging

Source: Ecosurety,[117] data from European Commission.[118]

These developments reinforce the importance of avoiding an isolated approach to UK plastics policy. Decisions taken in the EU will continue to shape incentives and markets in the UK. The EU has a range of initiatives under the Circular Economy Action Plan to transition to a more circular economic model;[119] the UK so far lacks an equivalent strategy, with the UK Circular Economy Taskforce developing its own initiatives.[120] Where appropriate, aligning UK policy with the direction of EU directives, specifically the PPWR, would help reduce compliance burdens for businesses operating across borders, support investment certainty, and minimise the risk of the UK becoming increasingly disconnected from its largest export market for recycled plastics. EU policies impact Northern Ireland due to cross-border trade agreements, as well as the significant proportion of UK businesses that export to the EU.

Overall, policy is moving in a broadly consistent direction. As PPWR recycled-content requirements are generally more ambitious than the UK's current 30% threshold, UK businesses supplying the EU market are already preparing to meet higher standards to comply with PPWR. Further improving UK-EU regulatory alignment, including on issues such as mass-balance accounting, end-of-waste criteria, recognition of recycled feedstocks, and trade arrangements, would reduce barriers and support market integration.

Key actions

- **Create a coherent regulatory framework:** Align PPT, pEPR, DRS and recycling policies so that they work together to increase recycling, recycled-content use and investment.
- **Strengthen demand for recycled content:** Reform the PPT beyond its 30% threshold and use pEPR to incentivise higher recycled-content use, creating a stronger and more predictable market signal.
- **Improve market integrity and regulatory consistency:** Standardise recycled-content verification, mass-balance accounting, sampling and reporting, and strengthen oversight of recycled-content claims.
- **Align with European markets:** Where appropriate, align UK requirements and technical standards with the EU PPWR to reduce compliance burdens, support trade and maintain access to European markets.

Chapter 5: Improving policy certainty

Developing large-scale recycling infrastructure requires substantial long-term investment. However, investors will only commit capital where they see regulatory certainty, stable policy frameworks, clear definitions, and credible long-term demand signals for recycled materials. At present, the UK policy environment does not provide the level of certainty required to support investment at scale. Reported barriers are reported to include lengthy Environment Agency (EA) permitting processes, limited regulatory familiarity with emerging technologies, and broader administrative obstacles that can significantly slow project development and increase investment risk.

Lack of government ownership

Responsibility for circular economy policy is fragmented across government departments, regulators, local authorities, NGOs, industry coalitions, compliance schemes, and brands. Businesses are therefore struggling to interpret which policy signals should drive investment and operational decisions. The UK needs a more integrated overarching strategy capable of aligning existing policies, reducing contradictions, and providing a clear long-term direction for the sector.

There are key concerns about the lack of strategic ownership and long-term policy continuity within government. Frequent policy changes and shifting priorities create uncertainty for investors, who require confidence that regulatory frameworks will remain in place over the lifetime of major infrastructure projects. The delay to the introduction of flexible plastic film collections under Simpler Recycling is a clear example: investment has already been made in processing capacity, but delays in collection could leave facilities without sufficient feedstock and undermine the commercial viability of those investments. The reduced prominence of the Circular Economy Taskforce has also been identified by stakeholders as an example of the challenges of maintaining a consistent, long-term policy direction.

Consumer confusion remains widespread because of inconsistent recycling labels, varying collection systems, and the gap between materials that are theoretically recyclable and those that are actually recycled in practice.[121] The labels used under the RAM are similar to those used in European EPR systems, but have entirely different meanings, creating significant problems for businesses operating across borders. Variations in bin colours, accepted materials, and collection arrangements mean that neighbouring councils can have entirely different recycling requirements; Simpler Recycling has been introduced with the intention of removing confusion on the range of accepted materials.

Addressing these challenges will require coordinated action across government, local authorities, industry, investors, and the financial sector. While all stakeholders have a role to play, industry behaviour is ultimately shaped by policy signals. Businesses are already responding to the current regulatory environment and are unlikely to significantly change their investment or operational decisions without policy changes.

Better oversight

A lack of reliable, accessible data is a major barrier to effective policymaking. Existing information on material flows is fragmented across multiple reporting systems, with inconsistent sampling methodologies, differing waste composition datasets, and limited visibility of waste movements throughout the recycling value chain. Although there is more data on packaging, there is a significant lack of comparable information for other plastic applications, making it difficult to build a comprehensive picture of

the UK's recycling system. Much of the available evidence relies on fragmented public sources, limiting the ability to assess current capacity and identify investment opportunities.

Improving data quality and transparency should therefore be a priority. Digital Waste Tracking (DWT) will be essential to provide end-to-end visibility of materials moving through the system.[122] Existing regulatory reporting platforms contain valuable information but are not designed to easily trace materials from collection through sorting, reprocessing and final use. A fully implemented digital waste tracking system could significantly improve traceability, reduce reporting inconsistencies, and provide policymakers and investors with a clearer understanding of domestic material flows.

Greater transparency around recycling capacity, material quality, recycled content, and end markets would improve market intelligence, support investment decisions, and enable more effective monitoring of policy outcomes. One particular focus should be strengthening the verification of imported recycled content, where limited transparency continues to undermine confidence in recycled content claims; accurate data would help clarify the price differential between domestic and imported recycled content.

Fraud fears

Stronger enforcement is essential to protect the integrity of the recycling system from fraud, which is a significant and growing issue across both domestic recycling and export markets. Exact numbers are unknown, but stakeholders believe fraudulent reporting has increased since 2020, estimating that losses may run into the tens of millions of pounds. Particular vulnerabilities exist within the PRN and PERN systems, where criminals can reportedly import low-quality material, blend it with UK waste, and falsely declare the resulting exports as entirely UK-sourced in order to generate compliance evidence. The potential for fraudulent recycled content claims is also an issue for accurate implementation of the PPT. In one example cited by RECOUP, stretch film claims a high proportion of recycled content yet has been marketed as having 300% stretchability, a level of performance that is only achievable with 100% virgin material.[123]

In 2025, the Environment Agency arrested 13 individuals in connection with PERN and PRN fraud in England, obtained restraint orders over assets valued more than £3 million, and secured £400,000 with account freezing orders.[124] These crimes likely disrupted nearly 280,000 tonnes of packaging waste with an estimated PRN value of £32 million. The number of suspensions and cancellations increased by 32% compared with 2024 as a result of increased scrutiny of reprocessing and export operators.

However, the Environment Agency has limited ability and expertise to invalidate fraudulent PRNs and PERNs if they have been mistakenly issued; agencies such as HMRC, the National Crime Agency and the Serious Fraud Office should play a greater role in investigating organised fraud and supporting enforcement action where appropriate. Environmental regulators tend to lack specialist knowledge of plastics recycling processes and may need to rely on industry operators to explain complex operations.

Overall, there is a need for a combination of better data, greater transparency, and more robust enforcement. This includes accelerating the implementation of digital waste tracking, creating shared databases for industry with high-quality data, and equipping enforcement agencies with the resources, technical expertise and powers needed to detect and prosecute fraud effectively.

Certainty for local authorities

There are specific challenges facing local authorities, who often lack the resources and specialised expertise required to keep up with the needs of the recycling landscape. While they are increasingly expected to collect films and flexibles, domestic recycling outlets and sorting facilities are often unavailable. The delay to film collection under Simpler Recycling until 2030 risks holding back the development of viable end markets for recycled films and, in turn, delaying investment in domestic film processing infrastructure. The resulting increase in plastic sent to EfW may then pose a reputational risk for local authorities and risks undermining public trust in the recycling system. Local authorities have spent years encouraging residents to recycle in good faith; if collected materials are not recycled, public trust and recycling compliance could be damaged.

Existing waste contracts are another source of concern. Many established contracts with MRFs specify which materials can be accepted, meaning that introducing new materials may require contract variations, infrastructure upgrades, or revised market arrangements. 64% of the 124 respondents for the WRAP Gate Fee report (25-26) stated that their contracts are due to end by the end of 2027, but when accounting for potential contract extensions, this number falls to 40%.[125] Some contracts, particularly PFI agreements established in the early 2000s, were designed around the technologies and market conditions of that time, making adaptation both complex and costly. The financial burden of adaptation will ultimately fall on local authorities. More collaborative approaches, such as shared waste services, waste partnerships, joint waste authorities, and local authority-owned waste companies, are necessary.

Chapter 6: Financing the infrastructure gap

Advanced recycling facilities require massive investment. Clean Planet Energy's Sleaford pyrolysis plant is expected to cost £35 million,[126] while Endolys' pyrolysis plant for plastic film recycling in Tees Valley required an initial £60 million in funding for the first phase of the project which is expected to rise to £125 million.[127] [128] These costs reflect the need to refine outputs and ensure that feedstocks are properly sorted and prepared. Improved sorting and preparation infrastructure is therefore equally important, and nearly as costly.

Advanced facilities of this sort in Europe include Områ in Norway (€50 million, or £42 million) and Site Zero in Sweden (SEK 1 billion, or £77.5 million). [129] [130] Områ uses AI and sensor capabilities to sort plastic waste into ten polymer types, producing feedstocks for both mechanical and chemical recycling and enabling the sorting of food-grade plastics at 95% purity levels.[131] Site Zero sorts plastic into twelve different types, recycling 95% of all packaging received – a clear upgrade from the plant formerly located on the same site, which sorted plastic into five types and only recycled 47% of packaging.[132] Innovative technology can be crucial: also in Norway, Infinitum's Skurve sorting plant uses vision spectroscopy to separate bottles by colour and achieve above 99% purity for clear PET collected from DRS, which must be rigorously separated from other polymers.[133]

To finance advanced recycling projects at the necessary scale and sustain them for long enough that they deliver economic benefits, the UK is likely to require a combination of equity and debt financing, where institutional investors, including pension funds, could potentially play a role. There is currently a funding gap for mid-stage recycling technologies, even when there is a strong business case in the future. Stakeholders noted that one of the major gaps in the UK is the lack of project development funding; before projects reach Final Investment Decision (FID), substantial expenditure is required on project development, permitting, and design work. New recycling facilities frequently face operational challenges during their early years, including inconsistent feedstock quality, equipment performance issues, and higher-than-expected operating costs. Large companies are generally better placed to absorb these risks, but smaller operators are more vulnerable to failure. As a result, the challenge is not only financing new facilities but creating stable market conditions that allow emerging businesses to survive and scale.

Model funding mechanisms

Several international models can serve as examples of effective support for innovation and industrial development. The Netherlands has a strong ecosystem of public investment institutions and innovation funding mechanisms, like Invest-NL, which invested in the Circular Plastics Fund of Infinity Recycling to contribute to scaling up advanced recycling companies like Pryme. [134] [135] In Germany, regional development banks and innovation agencies provide long-term support to emerging technologies. The SPRIND model funds multiple early-stage companies through staged investment rounds, allowing successful technologies[136] – such as aevoloop, which has developed affordable recycled polymer molecules to compete with conventional virgin plastics – to access increasingly larger pools of capital.[137] A similar model would enable the UK to focus on scaling solutions that have already been proven, creating the policy, investment, and market conditions necessary for widespread deployment.

A comprehensive circular economy roadmap must set out long-term policy objectives and responsibilities across the value chain. Greater policy certainty would help unlock investment and provide confidence for both infrastructure developers and brand owners. While some early recycling investments were supported through voluntary commitments from major brands, there is growing recognition that voluntary action alone is unlikely to deliver the scale of investment required, and many now support mandatory requirements that create a level playing field across the market.

Upgrading the PPT to a recycled content mandate

A recycled content mandate would provide a more reliable market signal than the PPT by decoupling demand for recycled plastic from fluctuations in virgin polymer prices. The EU's recycled content mandate under PPWR, for one, is likely to encourage recycling significantly more than the current PPT.[138] Another option would be to reform the PPT by linking the tax rate to virgin polymer prices, so that the tax rises when virgin plastic becomes cheaper. This could preserve the relative price advantage of recycled material across market cycles. However, such a mechanism would introduce additional complexity and could undermine the policy certainty that businesses need to make long-term investment decisions. Unless there is a clear and predictable methodology for adjusting the rate, the tax would require continual refinement in response to changes in global polymer markets. This risks making the system more difficult for businesses to understand and plan around.

There is also a debate about whether the PPT rate itself should increase. A sharp increase could raise the value of avoiding the tax but at the same time increase incentives for fraud and misreporting, as well as leading to knock-on costs for consumers. A more gradual increase could provide a stronger incentive that allows the market and enforcement system to adapt, while linking it to the price of virgin plastic would ensure recycled content is always more affordable. The RECOUP/Ecosurety white paper recommends progressively increasing the rate towards £500 per tonne, alongside the introduction of a certification scheme for mechanically recycled content.[139] A similar certification framework for chemically recycled content, using mass-balance accounting, is expected to come into force from April 2027.

More fundamentally, the scope of the PPT is too narrow to drive economy-wide demand for recycled plastics. Because it applies only to plastic packaging, it does little to stimulate demand for recycled content in sectors such as automotive, construction, agriculture, consumer goods, or electronics, where demand could support a wider set of use cases for domestically produced recycled content. Increasing demand for recycled content is better achieved through eco-modulated pEPR fees; pEPR could create stronger and more consistent demand for recycled materials in conjunction with a recycled content mandate.

Driving demand

Increasing demand for recycled plastics is the single most important factor in strengthening the recycling sector. Predictable, long-term demand underpins business confidence, attracts investment in recycling infrastructure, supports job creation, and strengthens end markets for secondary materials. Above all, investors need confidence that demand for recycled content will continue to grow over the lifetime of recycling assets, enabling capital investment in new facilities, technologies, and infrastructure. Amid policy uncertainty, maintaining a clear and consistent commitment to circular economy objectives will be essential to growing the industry.

The price differential between virgin and recycled plastics remains a major barrier to increasing recycled content. Policies that narrow this gap, either by increasing the cost of virgin plastics or improving the competitiveness of recycled materials, would strengthen demand – although they would have an inflationary effect on plastic packaging in the short term. Improving material quality through better collection systems and reduced contamination is equally important, as higher-quality recyclates are easier and less costly for manufacturers to use.

To strengthen recycling outcomes and make manufacturing easier, better design-for-recycling standards are needed across plastic packaging, vehicles, electronics, and other products. Claims of recyclability should also be assessed against real-world conditions rather than theoretical recyclability. Packaging should only be labelled as recyclable where there is evidence of effective collection, sorting capability, established recycling markets, and sufficient domestic infrastructure to process the material at scale.

Industry also has a role in strengthening demand. Large fast-moving consumer goods companies can provide greater certainty for recyclers through long-term purchasing agreements, investment, and collaborative financing models, helping smaller businesses scale and invest with confidence.

New sources of demand are also emerging. The EU PPWR is expected to increase demand for recycled plastics, particularly from advanced recycling, while sustainability commitments in sectors such as healthcare and sustainable aviation fuels (SAF) could create additional markets for recycled feedstocks. Public procurement also represents a significant untapped opportunity. More ambitious domestic procurement requirements could create stable domestic demand and support UK recyclers. Although the sector continues to face wider economic pressures, stronger regulatory signals and targeted public support for first-of-a-kind projects and proven technologies would improve investor confidence and accelerate growth.

Conclusion

The UK has an opportunity to turn its plastics challenge into an industrial opportunity. But this will require a shift from treating recycling primarily as waste management towards recognising it as strategic infrastructure for manufacturing, resource security, and reindustrialisation. The direction of travel is increasingly clear: collections are rising while domestic capacity remains insufficient, investment is constrained, and international markets cannot be relied upon indefinitely. The UK therefore needs a coherent long-term strategy that creates demand for recycled materials, de-risks investment, strengthens sorting and reprocessing capacity, and establishes a complementary mix of recycling technologies.

This should be underpinned by better data, traceability and enforcement, while maintaining exports where they provide a genuine advantage. Done effectively, a stronger domestic recycling industry would strengthen manufacturing supply chains, create skilled jobs, and improve the UK's resilience in increasingly competitive global markets. Recycling policy should therefore be evaluated as part of the UK's wider industrial strategy.

Recommendations for government

Establish a coordinated UK circular plastics strategy

- Develop a single, coherent policy framework that aligns producer responsibility, taxation, recycling incentives and waste regulation.
- This should bring together pEPR, the Plastic Packaging Tax and PRNs, while providing a clear long-term roadmap for recycled-content requirements, domestic recycling capacity, waste exports and regulatory reform.
- The UK should align with the EU PPWR where practical to reduce compliance burdens and avoid creating competitive disadvantages for UK businesses, while ensuring domestic reprocessors can compete as European markets increasingly prioritise domestic recycling and recycled content.

Create a dedicated oversight body to implement this strategy

- Establish a Recycling Responsibility Organisation alongside the Producer Responsibility Organisation and PackUK to provide strategic coordination across the recycling value chain.
- Its role should be to strengthen collaboration between producers, local authorities, collectors, sorters and reprocessors, and ensure that decisions on packaging design, collection, sorting, recycling and end markets are considered as part of a single material loop.

Support a reliable market for recycled plastic

- Strengthen long-term demand for recycled materials through recycled-content requirements, reforming the Plastic Packaging Tax, and aligning UK requirements with emerging EU rules.
- This will encourage the use of recycled plastic across a wider range of sectors, reducing reliance on volatile markets and giving investors greater confidence that recycled material will have a viable end market.

Strengthen the integrity and competitiveness of the recycling system

- Improve data, traceability, reporting and enforcement across the plastics value chain to ensure that material classified as recycled is genuinely recycled and that businesses operate on a level playing field.
- At the same time, the UK should anticipate growing international competition for recyclable feedstocks and increasing requirements for domestic recycling, ensuring that its policies support a competitive domestic reprocessing industry in a scenario where exports are limited.

Appendix: BPN Policy Commission Witness List

We would like to thank all the witnesses who contributed to this report. Alphabetically by forename, witnesses include:

Adrian Da Costa, Global Business Development Director, ExxonMobil

Arzu Sandikci PhD, CEO and Co-Founder, Rhea's Factory

Emmeline Aves, Commercial Manager, ReVentas

Fabrizio Di Gregorio, Technical Director, Plastics Recyclers Europe

Gareth Rollings, Head of Waste, West Sussex County Council and Chair of LARAC

Dr Geoff Brighty, Head of Sustainability and R&D, Mura Technology Ltd

Greg Paradowski, Technical and Operations Director, Sherbourne

Griff Palmer, Economist, WRAP

James McLeary, Managing Director, Biffa

Jean-Loup Masson, Chief Advisor, Alliance to End Plastic Waste

Jude Allan, Managing Director, OPRL

Judit Guerra-Falcon, Senior Manager- Technical Affairs and Circular Economy, Plastics Europe

Justin Guest, Co-Founder, Archipelago Ventures

Lara Steinhobel, Head of Policy, Plastic Energy

Liliia Akatova, Policy Analyst, LSE

Mark Garrett, Managing Director, Clearpoint Recycling

Mark Roberts, Director of Materials Innovation, Amcor

Mia McLachlan, Plastics Recycling & Sustainability Analyst, ICIS

Omar Davidson, Senior Policy Manager, Veolia

Patrick Brighty, Head of Recycling Policy, ESA

Rachael McEvoy, Senior Affairs Manager - Environment, CTPA

Richard Akkermans, R&D Packaging Senior Leader, Mondelez

Roger Baynham, Chairman of Recycling Group, BPF

Sarah Sanpher-McDowell, Operations Director, Clearpoint Recycling

Teresa Domenech Aparisi, Associate Professor in Industrial Ecology and the Circular Economy, UCL

Thomas Merry, Commercialisation and Innovation Manager, SUEZ

Wendy Barratt, County Waste Manager, Devon County Council

Zoë Austin, Policy & Advisory Committee Member, NAWDO

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