



RECOUP

UK Plastic Packaging Sorting & Reprocessing Infrastructure

**2022
Update**

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Researched and written by:

Tom McBeth, Policy & Infrastructure Project Manager
Steve Morgan, Head of Policy & Infrastructure

RECYcling of Used Plastics Limited (RECOUP)
1 Metro Centre, Welbeck Way, Woodston, Peterborough, UK, PE2 7UH
t: +44 (0)1733 390021 e: enquiry@recoup.org w: www.recoup.org
Registered Charity No: 1072029 & Company Registration No: 02435729

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FOREWORD

To embrace and build circular economy models, and to meet future environmental targets and demands, commitment and investment is needed to help manage plastic packaging after it has been used. There is an opportunity to change perceptions and to see plastic as a valuable resource rather than waste and the use of recycled plastics in manufactured products is central to this. This is not only the case for household plastic packaging, but non-consumer plastic packaging as well.

In recent years, the UK Government has publicly addressed various environmental concerns and sought to build solid, underpinning foundations for a plastic circular economy in the UK. This has included proposals for multiple policies and legislations that aim to reduce the use of items that are deemed unnecessary plastics in order to prevent litter and leakage of materials into the environment, and to increase capture and recycling rates. Since the release of the 25-Year Environmental Plan in 2018¹, policies introduced, proposed, and consulted on, include the following^{2 3 4 5 6 7 8 9 10 11 12}:

- HMRC's UK Plastic Packaging Tax**
a £200 per tonne tax placed on plastic packaging sold on the UK market that does not include 30% recycled content. This was introduced in April 2022.
- Extended Producer Responsibility**
the reform of the current producer responsibility system in the UK.
- Introducing a Deposit Return Scheme**
in Scotland from August 2023, and in England, Wales and Northern Ireland at a later date.
- Single-Use Plastics**
Proposed banning and restricting the use of single-use plastics independently in each England, Wales and Northern Ireland. Scotland introduced a ban from 12 August 2022.
- Consistency in Household and Business Recycling in England**
introducing set standards and materials to be collected for recycling by English local authorities.
- The Green Claims Code**
Competition and Markets Authority (CMA), guidance for businesses making environmental claims when promoting or selling their goods and services.

Additionally, the European Commission (EC) and the Basel Convention¹³ have introduced policies and changes that will inevitably impact the UK in terms of the import and export of packaging and waste. It will also affect the material types and formats that are placed on the UK market, and therefore what is ultimately placed into waste streams.

To inform and provide context to industry, this report outlines the status of the infrastructure in the UK. The previous version of this *Plastic Packaging Sorting & Reprocessing Infrastructure* report¹⁴ focused solely on the sorting and reprocessing of household plastic packaging.

Household, or consumer, plastic packaging is that which is sold by retailers and food service providers to consumers and is then collected as recycling or waste from kerbside and other schemes. This report updates the data around sorting and reprocessing infrastructure for both household, and non-consumer packaging, including plastic packaging from the commercial, industrial and hospitality sectors.

This report uses various scenarios which consider the current demand for recyclates, recycling capacities, and political and legislative impacts to assess the UK's current and future abilities to treat its own waste and recycling domestically, whilst working towards meeting changing recycling targets. This includes policy developments and the context behind recycled content targets considering potential changes in legislation. The data in this report highlights the changing attitudes towards the export of plastic packaging for recycling, as well as further infrastructure considerations such as non-consumer plastic packaging and the use of Deposit Return Schemes (DRS) across the UK.

The UK has long been reliant on export markets to manage its plastic packaging waste. However, changes in attitudes and policies see the UK moving towards a more domestic model of managing its waste. This creates an increased demand for capacity and infrastructure in the UK, especially if the UK is to meet the ambitious recycling targets set out in the current Extended Producer Responsibility (EPR) proposals.

RECOUP continues to engage with its members, stakeholders, the Department for Environment, Food & Rural Affairs (Defra), the Environment Agency (EA), SEPA (Scottish Environment Protection Agency), NRW (Natural Resources Wales), DAERA (Department of Agriculture, Environment and Rural Affairs in Northern Ireland), and other industry groups, both in the UK and in Europe, to develop data and intelligence around the plastics recycling infrastructure as the UK moves to build and embed its new structure and systems.

Following the release of this report in October 2022, RECOUP will continue to update the scenarios based on new information around policy developments and new targets.

EXECUTIVE SUMMARY

This UK Plastic Packaging Sorting & Reprocessing Infrastructure report has researched and analysed the UK's capacity for sorting and reprocessing plastic packaging from both household and non-consumer sources. This highlights the UK's ability to sort both household and non-consumer plastic packaging from other materials into separate plastic streams, and to reprocess it into raw materials and products.

This research in this report has found that there is a clear bottleneck in the UK's recycling infrastructure for plastic recycling, and significant increases are required for reprocessing plastic packaging in the UK. Unless resolving this bottleneck is given the necessary priority and investment, and ultimately, ownership, the UK will not be able to claim it has a world-leading recycling system.

This report has found that whilst the sorting of plastic packaging is largely manageable with current capacities, there is a need for investment in reprocessing infrastructure to produce the necessary recyclate for current volumes placed on the UK market to contain 30% recycled content, the threshold for both the Plastic Packaging Tax and WRAP's Plastic Pact. This is particularly true of plastic types that require additional steps and greater infrastructure, such as food-grade plastic packaging and hard to recycle plastics, like films and flexibles.

Upcoming policy changes to the likes of EPR, consistent collections in England, and the introduction of Deposit Return Schemes (DRS) are likely to cause significant shifts in volumes, materials, and formats in kerbside recycling, and therefore waste streams and sorting facilities. Implementation of DRS will see a reduction in PET drinks bottles in the kerbside waste stream, as well as to metals and glass, whilst consistent collections will increase other materials such as plastic films and flexibles. EPR will bring about changes in the funding structure for the collection and handling of these post-consumer materials. It will also bring about a change and increase in volumes and demand. EPR will bring about revised recycling targets that will incentivise the collection of more difficult to process packaging, specifically that which is not in-scope of DRS such as plastic pots, tubs and trays and plastic films and flexibles.

At present, there is a big discrepancy between the collection and recycling of high-value and high-quality plastics and formats, such as food grade PET and HDPE, and low value and hard to recycle household plastics, such as films and flexibles. In order to progress recycling rates, the UK needs a three-point focus to transform its capability to recycle its plastic packaging. These are:

- Plastic films and flexibles.
- Non-bottle PET.
- Food-grade plastic packaging.

Quality is important. With a renewed global focus on quality and contamination of waste plastics, particularly when discussing export for recycling, quality and efficiency of sorting material is more important than ever. Policy from the European Union and the Basel Convention, in particular, have begun to tighten requirements and limits of allowable contamination, and reduce non-OECD countries as an option for export.

There are challenging commercial conditions and fine profit margins in the reprocessing sector, along with volatile markets for material value, so financial investment is needed to build technological solutions and operational business cases for this sector to make them commercially viable. This has been pressured further in recent years due to the various global impacts that have taken place, including the Covid-19 pandemic, the political impact of the UK leaving the European Union, and the cost-of-living crisis which has caused spiralling energy and operational costs for sorting and reprocessing facilities.

Similarly, the evolution of chemical (non-mechanical) recycling as a large scale commercial option is still not a reality. Although there has been a shift in acknowledgement of it as a solution, with the slow development of policy recognising outputs as recycled content.

Whilst recycling infrastructure is sufficient for non-consumer packaging, clarification is needed to understand recycling rates for items and materials such as retailer back-of-store plastic film. These materials that are managed in commercial environments are much harder to measure overall, and infrastructure does not compensate, and cannot be interchanged to mitigate the shortfall in reprocessing for household packaging.

In conclusion, the UK requires significant investment in its current infrastructure to ensure that it can manage the revised waste streams in the coming years, and to sufficient quality. This is particularly true of food-grade plastic packaging, and household-like packaging overall. The systemic and fiscal changes in managing waste, in particular plastic waste, are an ongoing global challenge, and the future of the circular economy for plastic packaging depends on new and unique combinations to how the UK manages its waste whilst achieving the best possible environmental outcomes.

Plastic Packaging Placed on the Market

For 2022, RECOUP estimates that 2,266kt of plastic packaging was placed on the market (POM) in the UK. This was made up of 1,432kt household and 834kt non-consumer packaging.

The 1,432kt household fraction is made up of 635kt bottles, 297kt pots, tubs and trays, and 308kt plastic films and flexibles.



The remaining 192kt is an 'other' fraction comprised of



miscellaneous, mostly plastic items such as loose bottle tops. The 845kt non-consumer packaging fraction is made up of 334kt bottles, 138kt pots, tubs and trays, and 350kt plastic films and flexibles. The remaining 11kt is an 'other' fraction comprised of miscellaneous, mostly rigid plastic items.

Recycling Rates and Export

In recent years, there has been a public and political shift in attitudes towards the export of plastic waste. This has been an international issue, with historically high-volume markets including China, Malaysia and Turkey having made significant policy changes which have sought to limit the import of waste into those countries.

This shift in opinion is at least in part due to documentaries and global news coverage which has brought the issues of plastic waste into the public eye. This includes increased coverage of issues around the use of developing countries and cheap labour for sorting material, incidences of waste crime and repatriation of waste, and other ethical and legal issues. The knock-on effect has already been seen, with exports to China and other Asian countries having reduced significantly since 2017, whilst Turkey has seen a decline since the beginning of 2021.

Overall, the UK's exported material has reduced from 65% to less than 50% over recent years, and of that the material exported has increasingly gone to European Union member states, and away from developing countries. Whilst the UK is unlikely to see a blanket ban on material export, the changes in attitudes and policy create an increased need for the UK to become sufficient in managing its own waste domestically, particularly if it is to meet the ambitious recycling targets set out as part of the Extended Producer Responsibility (EPR) proposals.



In 2021, the Environment Agency (UK) reported 1,112kt of plastic packaging was declared as recycled from all sectors in the UK. 53% (593kt) of this material was recycled domestically, whilst 47% was exported (519kt), a notable drop on previous years. Turkey remained the main export destination in 2021, and into 2022.

Sorting Facilities

There are 123 material sorting facilities, Material Reclamation Facilities (MRFs), in the UK. These facilities have a total annual sorting capacity of 1.7mt to 2.1mt for household and non-household plastic packaging in the UK. The throughput would be 900kt to 1.1mt of plastic packaging per year.

There are 7 dedicated plastic sorting facilities, Plastic Reclamation Facilities (PRFs), in the UK, with an additional annual capacity of around 335kt.

PRFs play a significant role in ensuring high quality secondary plastics are sorted but there are cost implications to refine the sorting after the material has been processed by a MRF. PRFs have an important role in sorting material directly (i.e. without a MRF) from source separated collection schemes (two or multi-stream) where different materials are collected separately, and also from a Deposit Return Scheme (DRS), when it is introduced across the UK.

Volumes and composition of feedstock at sorting sites can vary considerably, and so an industry average plastic composition has been applied based on discussions and data provided by the waste management companies. Whilst the higher figure shows sufficient capacity for sorting material, there is considerable variation in the capacity and actual throughput for these sites. This is due to variations in feedstock volumes and quality, yield losses, and economic factors such as viable end markets and operational reasons.

Reprocessing Facilities

There are over 400 plastic reprocessors in the UK.

94 of these handle both household and non-consumer plastic packaging for reprocessing, and are accredited by the Environment Agency (EA).

16 of these sites are reprocessors that primarily handle household plastic packaging. These have a capacity of 456kt, and an operational throughput of 288kt. Of this, there is a 102kt capacity (70kt rPET and 32kt rHDPE) for food-grade packaging reprocessing.

78 of these sites are reprocessors that mainly handle non-consumer plastic packaging. These have a capacity of 515kt, and an operational throughput of 347kt.

The remaining reprocessors, in excess of 300, handle materials that are either outside the scope of packaging in this report, do not produce flake or pellet, or do not provide clear information on their operations and volumes.

Data around reprocessing sites is often subject to commercial sensitivities. Also, similar to sorting sites, feedstock volumes and quality, yield losses and economic factors vary, mean that the potential capacity for reprocessing plastics in the UK are higher than the actual volumes that are reprocessed each year.

Chemical / Non-Mechanical Recycling Facilities

At present, there are currently 12 Chemical Recycling (non-mechanical) pilot plants in the UK, though none operate as a large-scale operation. However, with new developments under construction, and interest in the sector growing, this is likely to change in the future.

Scenarios

As part of this report, six scenarios have been produced to compare the UK's infrastructure capacities to process plastic packaging. This is benchmarked against the 30% recycled content requirement set by HMRC's Plastic Packaging Tax, and if the export market was restricted or not available as an outlet for the UK.

It is important to consider that when looking at the current available capacity as a whole, there are considerable variations in polymers and formats which have different rates of recyclability. The likes of PET and HDPE drinks bottles have greater infrastructure and value in the UK at present, compared to harder to recycle and low value materials such as PET trays and plastic films and flexibles. Whilst sorting is broadly more capable in its ability to target material, infrastructure to reprocess different plastic types is not interchangeable. For example, infrastructure to reprocess PET cannot be used to

reprocess other polymers. As such, whilst overall capacities may appear high, the UK's capacity to handle certain materials remains proportionately low.

- Scenario 1: 30% recycled content for all household plastic packaging placed on the market

There is currently 1,432,000t of household plastic packaging placed on the market (POM) in the UK annually, with a current reprocessing for facilities that primarily handle these materials of 288,000t.

When considering the 30% recycled content target set by the Plastic Packaging Tax, this leaves a shortfall in the UK's infrastructure to reprocess sufficient volumes of its own waste domestically.

A capacity increase of 0.5x is required in order to be able to produce 30% recycled content for all the UK's household plastic packaging POM annually, and a **4x increase** in capacity to reprocess all of this material.

- Scenario 2: 30% recycled content for all plastic packaging placed on the market

There is currently 2,226,000t of plastic packaging, from both household and non-consumer sources, placed on the UK market annually, with a current reprocessing capacity for these materials of 635,000t.

When considering the 30% recycled content benchmark of the Plastic Packaging Tax, this leaves a shortfall in the UK's own infrastructure to reprocess sufficient volumes of its own waste domestically.

An increase of 5% is required in order to be able to produce 30% recycled content for all the UK's plastic packaging POM annually.

The UK would require **a 2.5x increase** on the current capacity to reprocess all household packaging placed on the UK market.

- Scenario 3: 30% recycled content for all household-like plastic packaging placed on the market

There is currently 1,652,000t of consumer and household-like plastic packaging placed on the UK market annually, with a current reprocessing capacity for these materials of 288,000t. This leaves a significant shortfall in the UK's own infrastructure to meet the 30% recycle content targets.

An increase of over 0.7x is required in order to be able to produce 30% recycled content for all the UK's household-like plastic packaging POM annually.

The UK would require **a 5x increase** on the current capacity to reprocess all household-like plastic packaging placed on the UK market.

- **Scenario 4: 30% recycled content for all rigid household plastic packaging placed on the market**

There is currently 931,000t of rigid consumer plastic packaging placed on the UK market annually, with a current reprocessing capacity for these materials of 288,000t.

This leaves a shortfall in the UK's own infrastructure, with **an increase of 3%** required in order to be able to produce 30% recycled content for all the UK's rigid plastic packaging POM annually.

The UK would require **a 3x increase** on the current capacity to reprocess all rigid plastic packaging placed on the UK market.

- **Scenario 5: 30% recycled content for all food-grade rigid household plastic packaging placed on the market**

There is 976,000t of food-grade consumer plastic packaging placed on the UK market annually, with a current reprocessing capacity of 102,000t to handle this material.

An increase of almost double is required in order to be able to produce 30% recycled content for all the UK's food-grade rigid plastic packaging POM annually.

The UK would require **almost 9x increase** on the current capacity to reprocess all food-grade plastic packaging placed on the UK market.

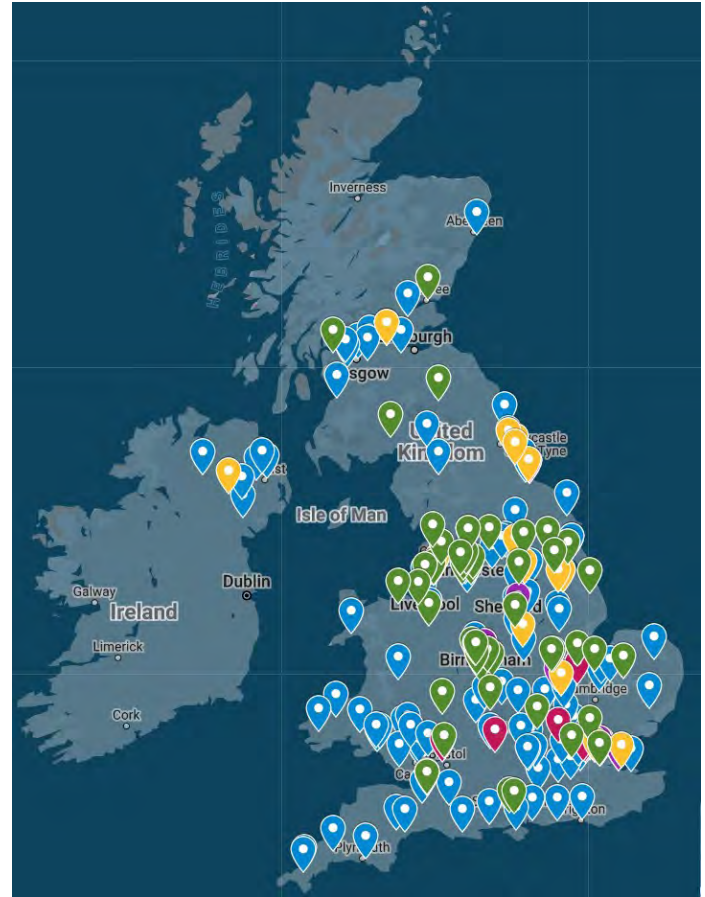
- **Scenario 6: Infrastructure required for sorting of plastic packaging placed on the UK market if export markets were not available as an outlet for recycling**

The UK's current capacity for sorting plastic packaging at Material Reclamation Facilities (MRFs) is 1.7mt to 2.1mt but has a lower throughput of 900kt to 1.1mt per year. Additionally, there is around 355kt sorting capacity at Plastic Reclamation Facilities (PRFs) though there may be some overlap with material handled by MRFs that sort to lesser quality standards.

Based on the current capacities and throughputs, the UK has sufficient capacity to sort the 2,266kt of plastic packaging POM annually, and its throughput largely covers that which is declared as recycled. Considerations need to be made for varying feedstocks and economic drivers for the sorting of different formats and materials, as these sites handle packaging beyond just plastics. However, there is a continued emphasis on the need for quality of sorting. This is something that has seen improvement in recent years, but will continue to be an area of focus going forward if the UK is to produce material capable of being either reprocessed or exported.

Furthermore, sorting facilities are currently focused on high value plastics and other materials. In order to achieve recycling targets going forward, and also to account for changing in waste stream feedstock as a result of DRS and consistent collection legislation, sorting facilities will need to separate volumes of previously undesirable material and formats, such as films and flexibles.

The UK would need **an increase of between 5% and 25% of its sorting capacity**, and as much as double its current actual throughput, in order to be able to sort all plastic packaging placed on the UK market annually. Beyond sorting, the UK has a shortfall of 1,631,000t in capacity to be able to reprocess all of its POM plastics.



*A map of infrastructure in the UK.
Blue - MRF; Purple - PRF; Red - Chemical / Non-Mechanical Recycling; Yellow - Reprocessor (Household); Green - Reprocessor (Commercial & Industrial)*

METHODOLOGY & DATA

In producing this report, set criteria has been defined in terms of infrastructure, including the capacities and throughputs for these sites. This data is complicated by the limited information available from sites handling commercial and industrial (C&I) material, which is subject to greater commercial sensitivities.

Sorting Facilities

For sorting facilities, both Material Reclamation Facilities (MRFs) and Plastic Reclamation Facilities (PRFs), sites were considered in-scope of the dataset if they operate on a commercial scale and sort plastic waste from either household or non-consumer sources. Where data is unavailable, industry averages have been applied for the likes of the volume of plastics in dry mixed recycling (DMR) feedstock. This is using a combination of existing data and that provided by waste management company partners.

Reprocessing Facilities

In the previous version of this *Plastics Sorting & Reprocessing Infrastructure report*¹⁴, only household packaging facilities were identified and analysed. The inclusion of facilities handling non-consumer material increases the number and volumes of sites considerably, with broad figures ranging from as few as 16 household packaging facilities, to over 400 that handle any types of plastics from any source. To identify the sites that handle plastic packaging, the reprocessing facilities in this report focus solely on those which are accredited by the Environment Agency (EA), SEPA (Scottish Environment Protection Agency), NRW (Natural Resources Wales) or DAERA (Department of Agriculture, Environment and Rural Affairs in Northern Ireland). This information has also been complemented by information from Waste Data Flow (WDF) and the EA's National Packaging Waste Database (NPWD).

Capacities and throughputs have been identified through a combination of primary desk-based research, and through the information that has been provided by the facilities themselves. In instances where data is missing, industry averages have been applied, as well as assumptions based on nameplate capacities and EA accreditation criteria.

Placed on the Market Data

To understand the volumes and tonnages of plastic placed on the UK market each year, and therefore the amount placed into the waste and recycling streams, this report uses estimates calculated by Valpak for its Placed on the Market (POM) figures in its PackFlow 2025¹⁵ and Covid-19 Impact¹⁶ reports. Using these figures as a baseline, and by applying primary data received from RECOUP members and waste management companies, this report estimates year-on-year increases on the Valpak data for 2019 to reflect market data for 2022.

Note that whilst the figures are advised by industry information and we believe them to be the most robust and accurate representation of the market, there are still fluctuations at any given time based on supply and demand, and other market factors. This is particularly relevant in the context of the Covid-19 pandemic, which caused significant and widespread disruption and changes to supply and demand in the plastic packaging market. This resulted in unforeseen increases and decreases in packaging demand for different applications – for example, significant drops in 'on the go' packaging due to the increase in citizens working from home.

As well as the impact of the pandemic, other market factors have been at play for several years. Trends that have seen volumes of plastic packaging fluctuate in recent years have also included the industry's shift towards light-weighting of packaging, a general decrease in commercial packaging, environmental and legislative factors, and the increased interest and efforts in alternative packaging including compostable, biodegradable and reusable packaging types.

The updated POM figures estimate that 2,266kt of plastic packaging will be placed on the UK market in 2022. This is made up of 1,432kt consumer and 834kt non-consumer packaging.

2,266,000 tonnes

of commercial and industrial plastic packaging placed on the market in the UK in 2022.

1,432,000 tonnes

of Household / Consumer Packaging

834,000 tonnes

of Commercial & Industrial Packaging

Household Placed on the Market Data

Of the 1,432kt of household plastic packaging POM, 635kt is plastic bottles, 297kt plastic pots, tubs, and trays (PTT) and 308kt plastic films and flexibles.

There is also an 'other' fraction, made of 192kt, which is a combination of miscellaneous packaging. This includes a variety of items that have not traditionally been categorised in the bottle, PTT, or film formats (for example, loose bottle tops and trigger spray/pumps). More research is needed to fully understand the composition of this category.

These formats are then broken down into the following polymers.

	HDPE	LDPE	PE	PET	PP	PS	PVC	Other	Total
Bottle	271kt	0	2k	344kt	17kt	0	0	1kt	635kt
Film	16kt	102kt	17kt	43kt	79kt	4kt	3kt	46kt	308kt
Other	43kt	21kt	3kt	44kt	76kt	2kt	1kt	2kt	192kt
PTT	5kt	0	3kt	162kt	91kt	28kt	3kt	4kt	297kt
Total	334kt	124kt	24kt	593kt	264kt	35kt	7kt	52kt	1,432kt

These figures are rounded up or down to the nearest thousand tonnes (kt).

Commercial and Industrial Placed on the Market Data

Of the 834kt of non-consumer plastic packaging POM, this is made up of 334kt bottles, 138kt PTT and 350kt of films and flexibles. The 'other' fraction makes up the remaining 11kt.

These formats are then broken down into the following polymers.

	HDPE	LDPE	PE	PET	PP	PS	PVC	Other	Total
Bottle	236kt	-	-	98kt	-	-	-	-	334kt
Film	8kt	226kt	90kt	1kt	20kt	1kt	-	6kt	350kt
Other	7kt	-	-	-	3kt	-	-	-	11kt
PTT	33kt	1kt	1kt	11kt	69kt	23kt	1kt	-	138kt
Total	283kt	227kt	91kt	109kt	93kt	23kt	1kt	7kt	834kt

These figures are rounded up or down to the nearest kt.

The reduction in non-consumer plastic packaging since 2019 can be applied proportionately, giving the following POM figures by sector for 2022.

Sector	Tonnes
Agriculture	37kt
Construction and Demolition	75kt
Retail Back of Store	99kt
Hospitality	218kt
Manufacturing and Other	396kt

These figures are rounded up or down to the nearest thousand tonnes, and do not necessarily reflect the various impacts on different sectors as a result of the Covid-19 pandemic.

Additionally to household packaging, a fraction of the non-consumer fraction is known to be 'household-like' packaging. This is estimated to be around 90% of the hospitality sector's plastic packaging. This amounts to nearly 200kt additional household-like material POM, on top of the 1,432kt total household packaging¹⁷.

Export

The UK relies heavily on export as a solution for meeting its recycling targets for all packaging types, with as much as 65% of the country's plastic packaging exported for recycling in previous years. Various drivers have decreased this, including policy and legislation and public and government perceptions, with 47% of plastic packaging exported for recycling in 2021. Data in this report relating to the volumes and export destinations are based on a combination of National Packaging Waste Database¹⁸ data for the UK, and that supplied by the Environment Agency (EA) for exports from England.

	Q1	Q2	Q3	Q4	2021 Total
Total Tonnes	297kt	285kt	260kt	269kt	1,112kt
UK Tonnes	145kt	156kt	146kt	146kt	593kt
% of Total Recycled in the UK	49%	55%	56%	54%	53%

Plastic Packaging Recycling Targets

In late 2020, Defra published the packaging waste recycling targets for businesses obligated by producer responsibility for packaging in 2022. These are targets placed on the producer value chain from the polymer and packaging producers through to the retailers or businesses that use over 50 tonnes of plastic packaging annually, or have more than £2million turnover each year. The UK targets for recycling currently stand at 61% (business target) in 2022, with an overall recycling target for all obligated and non-obligated businesses of 51.5%. In 2021, the UK had a recycling rate of around 51.1%.

	2021 Business targets	Overall recycling rate	2022 Business targets	Overall recycling rate
Paper	79.0%	67.8%	83.0%	71.5%
Glass	81.0%	69.1%	82.0%	70.8%
Aluminium	66.0%	56.0%	69.0%	58.0%
Steel	86.0%	77.3%	87.0%	77.6%
Plastic	59.0%	49.8%	61.0%	51.5%
Wood	35.0%	36.3%	35.0%	36.9%
Overall Recycling	76.0%	66.3%	77.0%	67.6%

Current recycling targets for the UK (2021 and 2022)¹⁹

With the proposed introduction of Extended Producer Responsibility (EPR), these recycling targets are due to be revised. As of September 2022, the most recent proposal sets the UK recycling target for plastic at 51% for 2024. However, this does not include packaging which is in-scope of Deposit Return Schemes (DRS), PET bottles between 50ml and 3l.

	Targets for 2024		Targets for 2030	
	Proposed in consultation	Final proposed targets	Proposed in consultation	Final proposed targets
Plastic	41%	51%	56%	62%
Wood	38%	To be confirmed	39%	To be confirmed
Aluminium	30%	45%	30%	50%
Steel	85%	82%	92%	85%
Paper/ Card	76%	80%	85%	89%
Glass	71%	75%	81%	83%
Glass re-melt	N/A	74%	N/A	80%
Overall recycling rate	63%	68%	81%	76%

Revised targets as proposed in the EPR consultation²⁰

The implementation date for both EPR and DRS is still to be finalised, except for DRS in Scotland, which is due to begin in August 2023. It also remains to be seen how this overlap is managed with respect to the recycling targets for plastics.

Based on EA data for 2021, the UK recycled 1,112kt of its plastic packaging. Of this, 53% was recycled in the UK, and 47% was exported. This is an overall recycling rate of around 51.1%²¹

	Recycled	Placed on the Market	Recycling Rate
2012	640	2550	25.1%
2013	710	2260	31.4%
2014	842	2220	37.9%
2015	891	2260	39.4%
2016	1015	2260	44.9%
2017	1044	2260	46.2%
2018	1034	2260	45.8%
2019	1141	2290	49.8%
2020	1175	2092	56.2%
2021	1112	2174	51.1%

in kt (,000t)

Packaging Recovery Notes (PRN) and Packaging Export Recovery Notes (PERN)

The UK currently uses a system of Packaging Recovery Notes (PRN) and Packaging Export Recovery Notes (PERN) as its producer responsibility system for manufacturers and businesses that use more than 50 tonnes of plastic packaging and have a turnover of more than £2million annually.

PRN Packaging Recovery Note **PERN** Packaging Export Recovery Note

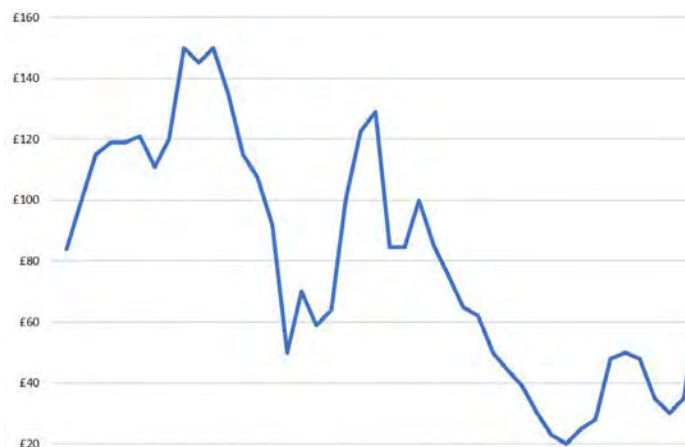
The mechanisms used in the UK to show evidence a packaging producer has met its obligations to fund the recovery and recycling of packaging waste - a requirement of the European Directive on Packaging and Packaging Waste.

The system is seen to **disadvantage UK recyclers** because:

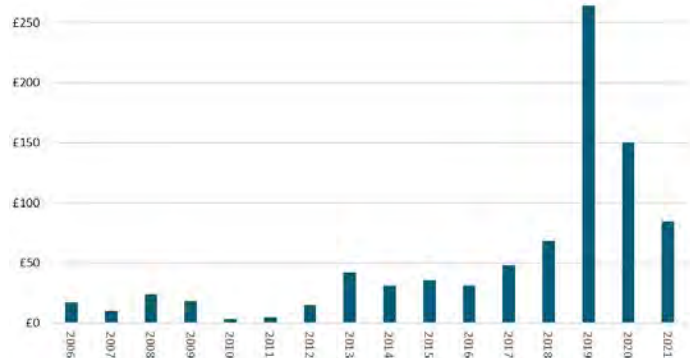
The PERN can be claimed against the **total weight of the material** including contamination and non-target material.

If it is recycled in the UK contaminated and non-target material has to be removed and a PRN is only issued when plastics are reprocessed into flake or pellet for use as a raw material in new products.

This current responsibility system operates as a free market, with prices of PRN/PERNs fluctuating based on demand which is largely driven by the UK's drive toward meeting its recycling rate. This means that depending on various market conditions the price per tonne can vary considerably. This has been acutely evident in the last few years due to the changing export market conditions and the impact of the Covid-19 pandemic.



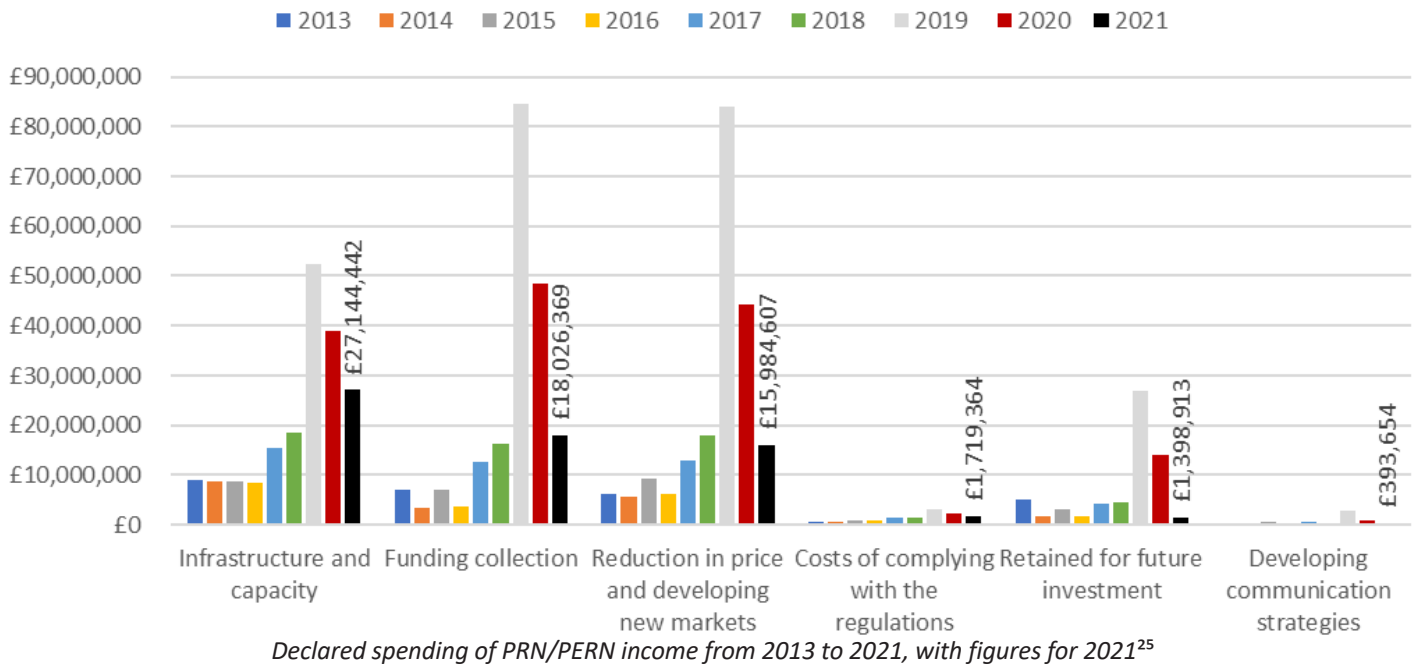
PRN prices through 2021 – Data from Let's Recycle²³



PRN Prices from 2006 to 2021 – Data from Let's Recycle²⁴

The money raised through these PRN/PERNs should then be reinvested into various areas for recycling, including infrastructure and capacity, funding of collection schemes, reduction in prices and developing new markets, costs of complying with the regulations, and developing communication strategies. The amount raised through the producer responsibility scheme between 2013 and 2021 totalled more than £670m for plastic packaging.





Plastic Prices

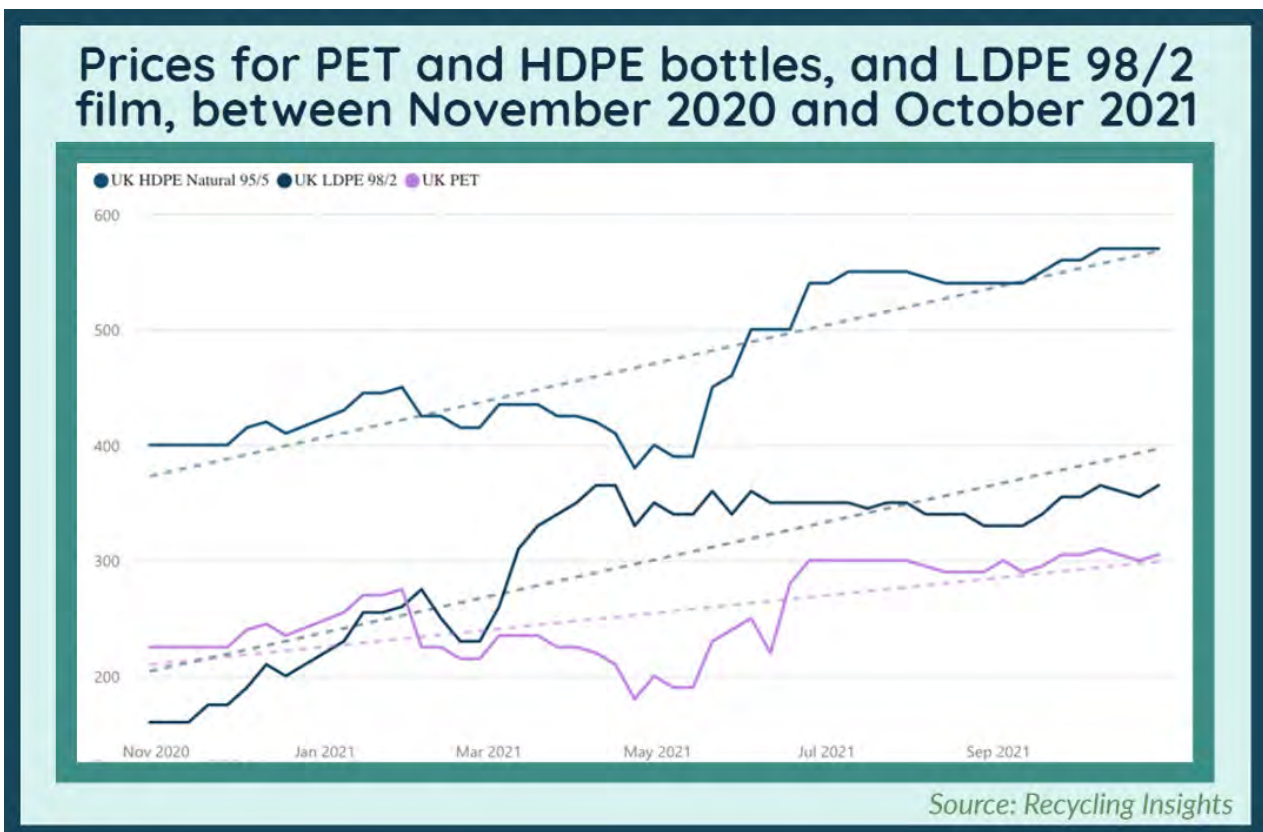
Plastic prices have long played a key part in the incentivisation of investing in recycling infrastructure in the UK and abroad.

Combined with the need for the UK to meet recycling targets, as well as EU and other international markets fluctuating due to the same demands, plastic prices are often indicative of the demand and performance of recycling in any given country.

Due to the various impacts in recent years of the likes of the Covid-19 pandemic, increase in fuel, energy, and operational and logistical costs, as well as the development of policy and legislation to incentivise recycling, plastic prices have increased significantly.

Despite the planned revision to the current producer responsibility system, EPR, due to be introduced in the next few years, it has been announced in 2022 that the existing PRN/PERN system will remain in force for the foreseeable future²⁶.

For the purposes of this report, plastic prices have been assessed and averaged from multiple sources. Whilst the figures may not be exactly accurate, the following graphs shows the significant trends and fluctuations in the market.



PET, HDPE and LDPE Plastic Prices (November 2020 to October 2021)²⁷

PLASTIC PACKAGING

RECOUP is a charity and leading authority providing expertise and guidance across the plastics recycling value chain. Built on a network of valued members, collaboration is central to our activities, and we are committed to securing sustainable, circular, and practical solutions for plastic resources, in the UK and worldwide.



Summary of the polymer codes and their respective numbers

Household Plastic Packaging Formats

Household plastic packaging is packaging that is used by consumers around the home, or away from homes. This type of packaging is generally broken down into the following categories:

- Rigid Plastic Packaging

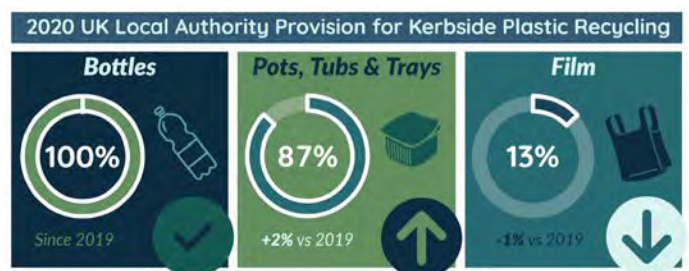
Plastic bottles are drinks and non-drinks containers that are usually made from PET or HDPE. The 2021 RECOUP UK Household Plastics Collection Survey report found that, in 2020, all 379 UK local authorities collect plastic bottles for recycling at kerbside. For post-consumer drinks bottles, there was a collection rate of around 75% for PET bottles and around 78% for HDPE bottles. Post-consumer non-drinks bottles were lower at around 45%²⁸.

Plastic pots, tubs, and trays (PTT), for example ready meal trays and yoghurt pots, are made of a variety of polymers and are often subject to higher contamination rates due to their use. They also often contain a greater mixture of other materials and polymers, such as flexible plastic lids or paper sleeves or labels. The 2021 RECOUP UK Household Plastics Collection Survey report found that, in 2020, the collection rate for post-consumer PTT was around 36%. Of the 379 local authorities in the UK in 2021, 87% collected PTT for recycling at kerbside²⁹.

- Films and Flexible Plastic Packaging

Films and flexible plastics are used in a wide variety of applications for both food and non-food applications (e.g., crisp packets, bread bags, single-use plastic bags etc.). Polymers vary but are often PE or PP, though a significant fraction is a combination of polymers or materials. For example, crisp packets may be PP but often contain a thin metallised layer inside. Collection and recycling rates for these types of material in post-consumer streams are low due to the proportionately high levels of contamination and complexities of processing these materials. However, recycling rates are higher in commercial and industrial environments. This is particularly evident in retailer systems where ‘front of store’ schemes collect plastic films and flexibles from the consumer³⁰. However, front-of-store collections are often co-mingled with back-of-store films. These back-of-store films are much cleaner and of higher quality, such as those used as transport packaging or for storage. This mix is then sorted or recycled, rather than trying to recycle the consumer films separately.

The 2021 RECOUP UK Household Plastics Collection Survey report found that, in 2020, it was estimated that the collection rate for films and flexibles for recycling at kerbside was 8%, with 13% of the 379 UK local authorities collecting it³¹.



Local Authority service provision rates in 2020 for plastic bottles, PTT and films and flexibles.

- Other Plastic Packaging

As well as these formats, there is a fraction of unidentified ‘other’ plastics. These are often small items and attachments to other recycled items, such as loose bottle lids, labels, and plastic film tops of trays. More research is needed to fully understand the composition of this fraction.

- **Food Grade Plastic Packaging**

Each of the plastic packaging formats is subject to restrictions as to how they can be used, and as such different requirements must be met for different uses, especially in terms of food-grade (or food contact) packaging. To meet food-grade standards, recycled and virgin plastics must meet certain criteria³², including: *The National Materials and Articles in Contact with Food Regulations 2012* for England³³, Wales³⁴, Scotland³⁵ and Northern Ireland³⁶, and their subsequent amendments including enforcement provisions for existing directly applicable European legislation on materials and articles intended to come into contact with food; *EU Regulation 1935/2004 on Materials and Articles Intended to Come into Contact with Food*³⁷; *EU Regulation 2023/2006 on Good Manufacturing Practice for Materials and Articles Intended to Come into Contact with Food*³⁸; *EU Regulation 10/2011 on Plastic Materials and Articles Intended to Come into Contact with Food*³⁹; and, *EU Regulation 2022/1616 on recycled plastic materials and articles intended to come into contact with foods*⁴⁰, which repealed *EU Regulation 282/2008 on Recycled Plastic Materials and Articles Intended to Come into Contact with Foods*⁴¹ on 15 September 2022.

This creates an additional challenge when it comes to supply and demand, requiring certain levels of recycling and processing to ensure they meet the applicable legislative standards. As such, costs and availability are affected, and economics come into play as to how viable recycled content in food-grade is in comparison to virgin polymer, particularly when also considering the perceived differences in quality.

Furthermore, with the introduction of legislation such as HMRC's UK Plastic Packaging Tax, availability of this material is further impacted by non-food grade applications using food-grade standard material to meet the 30% threshold, leaving less material for food-grade applications, and thus increasing its cost further.

There are no processes in the UK which are currently producing flake usable for food grade products and thus none of this material in its basic form can be considered food approved. However, it may be converted from non-food grade material to food contact approved products using washed flake, pellet (PET) or compound (HDPE and PP) as feedstock. To reprocess post-use packaging to make food grade material, The European Food Safety Authority (EFSA) states 95% (PET) or 99% (PP and HDPE) of the feedstock must come from food contact products.

The variable use of flake for food grade and non-food grade packaging makes it challenging to estimate a robust split between the two. This in turn creates a question of how audits and reports can reliably inform whether, or at what stage flake has gone into food or non-food grade packaging.

The UK has a food-grade plastic packaging reprocessing capacity of around 102,000t per year.

It is estimated that there are 102,000t of plastic reprocessing capacity to produce food grade flake and pellet that can be used in food grade plastic packaging, in the UK. Food grade considerations and outline estimates for each polymer are:

- **Food Grade rPET.** The main operational rPET recycling facilities in the UK are all 'hot wash' facilities producing flake that can be used for food grade packaging. This is when the flakes are melt processed in the appropriate manner to produce pellets or directly to packaging. There is an estimated 70,000 tonnes capacity in the UK to manufacture food grade PET plastic packaging.

- **Natural rHDPE.** Significant market developments have happened in recent years with both Biffa Polymers and Veolia London increasing their natural HDPE (milk) bottle recycling capacities. They both produce food grade flake and pellet. There is an estimated 32,000 tonnes capacity in the UK to manufacture food grade HDPE plastic packaging.

- **rPP.** EFSA requires 99% of the recycled feedstock to come from food contact products. This is not currently possible because of the mixed composition of food and non-food grade PP packaging feedstock processed at both MRFs and PRFs. PP packaging contains products for a range of non-food grade products such as cleaning, DIY, and medical products, and at present it is not possible, in current mechanical recycling systems, to sort these from food grade products and thus manufacture flake or compound from 99% food grade feedstock.

Separate collections of food grade PP are not practical, feasible or scalable as part of current collections schemes in the UK. To deliver food grade PP new technology developments are needed to create food grade recycled content with the primary term referred to being chemical recycling. This covers a range of technologies that changes the chemical structure of post-use plastics by taking the polymer material back to a shorter molecular chain length, or even converted back to the original monomer to then use as feedstock to produce new 'virgin-like' raw materials or chemicals.

Non-Household Plastic Packaging

Non-household packaging is a much broader range of materials and formats that differ from those consumed by the general public in households or on the go. Broad categories of this material include agricultural, construction and demolition, retailer back-of-store, hospitality, manufacturing, and other environments.

In most cases, commercial packaging differs significantly in its use, quality, and in levels of contamination, dependent on the industry, especially in comparison to post-consumer material. For example, retailer back-of-store film is known to be widely recycled due to its high quality and low levels of contamination. By comparison, kerbside and post-consumer plastic films and flexibles, which are largely captured by residual and non-circular waste streams, are not as widely recycled.

RECYCLING INFRASTRUCTURE

The UK's infrastructure for recycling collected material is largely broken down into sorting and reprocessing facilities. Identifying these sites, as well as their capacities is essential in understanding the position the UK is in to manage its own plastic recycling domestically.

Sorting Facilities

There are two distinct types of sorting facilities in the recycling industry, and these are Material Reclamation Facilities (MRF) and Plastic Reclamation Facilities (PRF).

- Material Reclamation Facilities

MRFs are sites which receive and separate household dry mixed recycling (DMR). The mixed material is fed into the system and separated into streams using magnetic, ballistic, and near infra-red (NIR) technology. Each fraction is baled and prepared for shipment to either a PRF, reprocessor, or for export.

RECOUP estimates that there are 123 MRFs in the UK that have the capability to sort mixed plastic packaging from other material streams. It should be noted that this does not differentiate between plastic packaging formats or colours, and it is assumed that the majority of these MRFs will be focused on sorting rigid polymers.



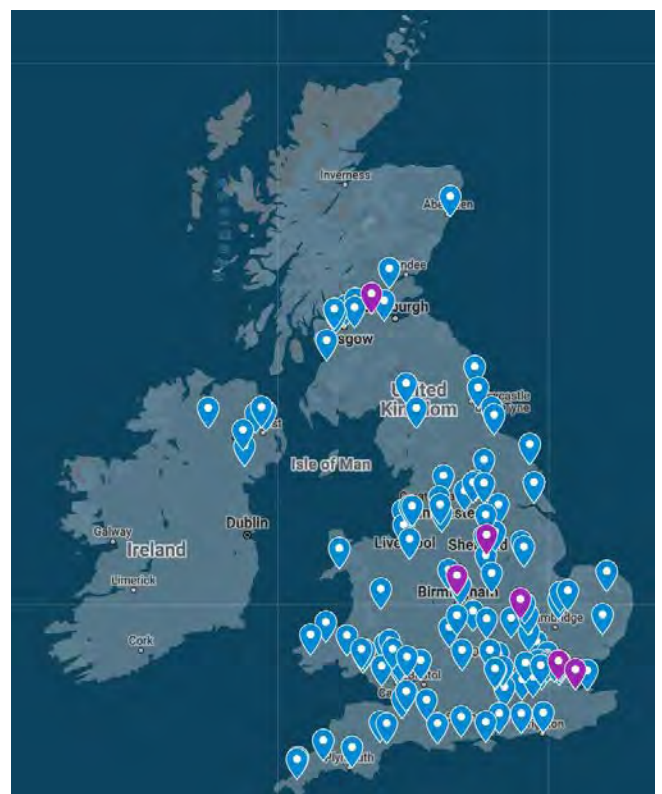
MRFs will accept and sort multiple material types, which means it is not possible to measure an exact and consistent quantity of plastics within the stream. However, by using an average plastic fraction based on various primary data sources, it can be estimated that the UK has an annual sorting capacity of around 1.7mt to 2.1mt of plastic packaging from household and some non-household sources each year. After factoring in commercial drivers, actual throughput, and material yield losses, this amounts to between 900kt and 1.1mt of plastic packaging being sorted in the UK, annually.

- Plastic Reclamation Facilities

PRFs receive baled plastic from a MRF where it is subject to further sorting to increase the quality of the material. PRFs generally consist of many NIRs and colour sorters with paper and metal removal systems that take mixed plastics from MRFs for further processing.

As of 2022, it is understood that several MRFs can achieve similar quality standards to that of a PRF and would therefore bypass this process. As such, whilst these PRFs may provide additional capacity for the sorting and quality improvement of recycled plastics, the UK's capacity to recycle is not dependent on these sites alone.

There are 7 PRFs in the UK that sort plastic packaging. The estimated PRF operational sorting capacity is approximately 355k tonnes each year. However, due to these facilities processing other materials, the total permitted capacity for plastics cannot be estimated.



A map of the UK's sorting infrastructure. Blue = MRFs; Purple = PRFs

Plastic Reprocessing Facilities

Reprocessing is the point at which plastics, often pre-sorted to remove any final impurities, are shredded, and washed to remove items including labels, adhesives, dirt, and other contaminants and non-plastic fractions. Polymer types are separated accordingly. The resulting regrind or flake may then be sold at this point, or it may be melted and converted into a pellet.

As with MRFs and PRFs, measuring the capacity to reprocess plastic packaging is never exact, so the difference between estimated operational output and reported capacity is an important distinction. In addition to this, there is a significant difference between these two figures due to the quality of input material (feedstock) and natural material yield losses through the washing and flaking processes.

Other considerations include the differences between the nameplate, or advertised capacity, and the actual operational throughput that a site sees. This may be due to external reasons, such as market factors at any given time, contamination and yield losses varying, or a desire for the site(s) to attract feedstock.

The UK has more than 400 reprocessors that handle plastic packaging in some form or another and at various volumes. To break this down, this report has looked at the sites which wash and flake plastics from 1) household plastic packaging, 2) non-consumer plastic packaging, and sites that are accredited by the Environment Agency (EA). This gives a total of 94 sites that handle plastic packaging (both household and non-consumer), with a total capacity of around 970kt, and an estimated actual throughput of 635kt per year.



- Consumer Plastic Packaging Reprocessors

There are 16 reprocessors in the UK that manufacture washed flake derived from household plastic packaging. The reported UK plastic reprocessing capacity for these is estimated to be approximately 455k tonnes, with an estimated current actual operational throughput of 288k tonnes.

Of this, there is around 102kt capacity for reprocessing food-grade plastic packaging, around 70kt rPET and 32kt rHDPE.

- Non-Household Plastic Packaging Reprocessors

In the UK there are 78 reprocessors which specifically handle non-household plastic packaging and that are accredited to do so by the EA.

Due to commercial sensitivities and the greater economic factors that impact throughput, it is a challenge to get exact tonnage data relating to the capacities of these sites. However, these sites have an estimated capacity of approximately 515k tonnes, with an actual throughput of around 347kt tonnes.



A map of the UK's reprocessing infrastructure. Yellow = household; Green = commercial

Planned and Proposed Infrastructure

As of 2022, several sites and facilities have been proposed, are at the planning permission, or testing stage of operation. Due to various commercial sensitivities, it is likely that more are planned but that further information is not yet widely available.

As of the release of this report in September 2022, several factors and considerations are likely to impact upcoming facilities. Most notably, the current increase in energy costs is affecting all businesses in the UK, and internationally, particularly those that are energy intensive such as sorting, reprocessing and chemical recycling facilities. As of September 2022, political discussions are ongoing around possible limitations on energy costs, but there is yet to be any intervention and, as such, it is not currently possible to predict the long-term impact on the UK's recycling infrastructure.

In addition to this are impacts from other logistical challenges and increases in demands for recycled content due to policy changes across Europe in particular, as well as increased lead time for the securing and installation of equipment for these sites. It has been reported that expected delays can be up to two years, and for some specialist equipment (e.g., for deinking) it can be as long as three.

Chemical / Non-Mechanical Recycling

Chemical recycling (or non-mechanical recycling) is “the set of technologies that allows breaking down waste plastics and other polymers from different waste streams into their basic components to transform them into valuable secondary raw materials, including monomers and oligomers which are used as starting point to produce new chemicals and circular polymers.

These new products have the same characteristics as the ones coming from virgin materials and are a good opportunity for the manufacturing of products requiring high performance and high-quality standards. Currently, mixed, or potentially contaminated plastic waste is landfilled or incinerated, as it cannot be mechanically recycled. Chemical recycling becomes a solution for this type of waste.

Chemical recycling does not replace but complements mechanical recycling by introducing new possibilities for plastic waste management.”⁴²



Map of chemical recyclers in the UK

Chemical recycling is not seen as a ‘one-size-fits-all model’ for plastics recycling and is instead seen as complementary to current mechanical recycling processes by targeting ‘hard to recycle’ items. As with mechanical recycling processes, the correct feedstock is required, all be it with different target materials and contaminants. Whilst dry organic material may not be an issue, contaminants can include PET, PVC, nylon, water and wet material, and some non-plastics. The volume of the output is directly linked to the quality of the feedstock.



The status of chemical recycling with regards to policy is still being debated. Whilst it is classified as recycling, there are concerns around the practical elements of legislation that enable it to be counted as recycled content. Similar discussions are taking place in the EU.

As part of the Plastic Packaging Tax, HMRC has acknowledged that chemical recycling can be used as recycled content in plastic packaging. Although, with ‘mass balance’ as a means of measuring the recycled content and use of existing certification schemes not being permitted, there are practical limitations to providing required evidence.

Mass balance “is an application of conservation of mass to the analysis of physical systems. By accounting for material entering and leaving a system, mass flows can be identified which might have been unknown, or difficult to measure without this technique.”⁴³



Comparison of chemical recycling processes and how mass balance can measure an otherwise unknown output⁴⁴

Not allowing mass balance as a form of measuring chemically recycled output has effectively made it impossible to evidence or accurately claim recycled content, and therefore unusable towards the Plastic Packaging Tax. In 2022, existing certification schemes were explored in a report done by RECOUP and the BPF on Recycled Content Verification Systems⁴⁵ across the world.

Chemical / Non-Mechanical Recycling

There are currently 12 pilot facilities in the UK, none operating on a commercial scale.

As of late summer 2022, there are no commercial-scale chemical recycling facilities in the UK, though there are 12 sites known to be operating on, at least, a trial scale. There is further infrastructure being developed in Europe and North America, but it is believed that the demand for these outweighs the capacity, due to its ability to produce food-grade recycle.

New developments in the sector are under construction, and interest and investment continues to grow.

EXPORT MARKETS

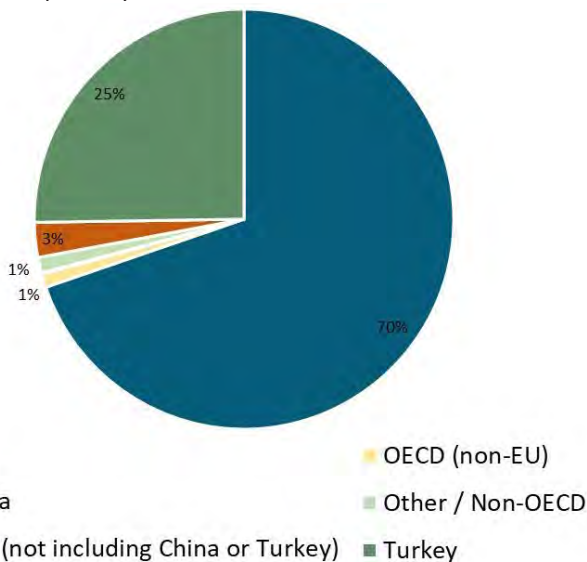
The UK has long relied on export markets to meet its recycling targets, particularly for ‘hard to recycle’ plastics and those which the UK lacks infrastructure to handle such as household films and flexibles.

Whilst quantities exported for recycling cannot be broken down definitively into formats and plastic types, it can be reasonably assumed that some of these plastics are more likely to be the higher contaminated post-consumer plastics that require additional steps to handle. These are most commonly plastic films and flexibles, hard plastics (e.g. children’s toys), and polystyrene, among others.

Focusing on plastic packaging, as of 2022, the UK still heavily relies on the exporting of its plastic packaging to help achieve its recycling targets. However, this has decreased in recent years from highs of around 65% pre-Covid, to around 47% in 2021⁴⁶. This reduction is possibly as a result of improved recycling infrastructure in the UK, greater legislative controls, and a stronger desire to process material in the UK.

There will need to be a more robust approach to export markets to continue this change towards domestic recycling. This is because the infrastructure to handle this material, particularly plastics which have not historically been widely recycled in the UK, will need time and investment to develop infrastructure for. In addition to this, removing viable and ethical export markets in the meantime would likely see volumes of materials not recycled, and could have significant impacts on the UK’s recycling rates.

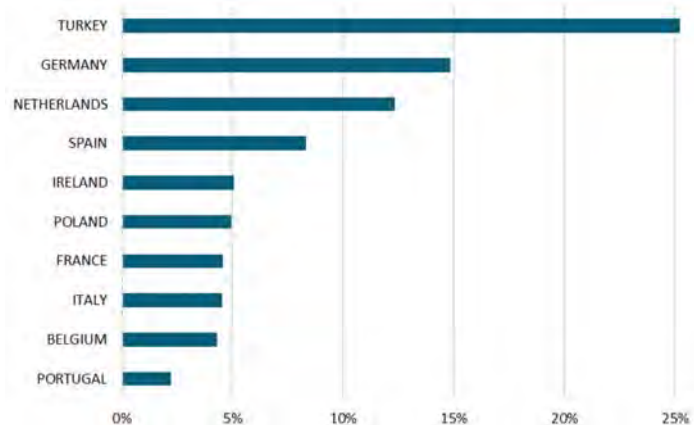
The graph below shows how the UK has moved away from non-OECD destinations in the last few years. Please note that the ‘Asia’ categories do not include China or Turkey. Instead, these are listed separately.



Receiving countries by their type for English exports in 2021⁴⁸

The National Packaging Waste Database (NPWD) reports the quantities of plastic packaging recycled within the UK and what is exported for recycling. For 2021, NPWD reported preliminary figures of 1,112kt of plastic packaging declared as recycled from all sectors. Plastic packaging collected from households accounts for around half of the UK’s total recycled plastics.

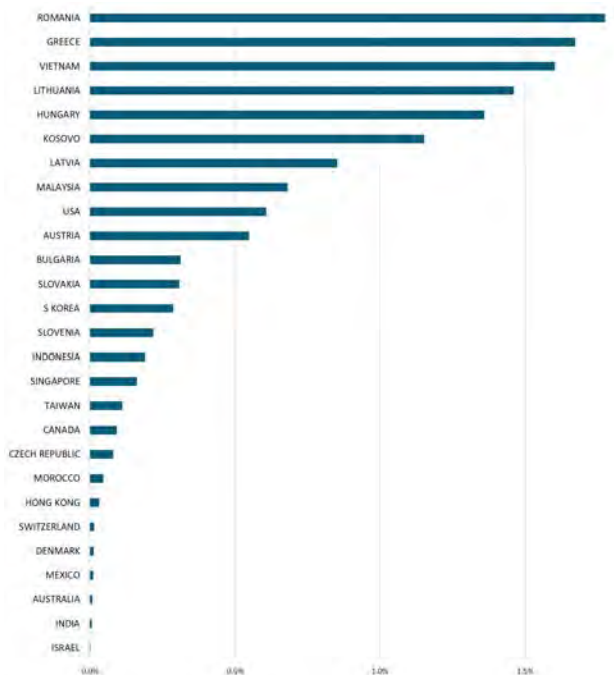
In 2021, 47% (around 519kt) of the UK’s total recycled plastic was exported and 53% (593kt) was recycled domestically. Of this, just short of 70% was exported to EU member states, and just over 25% went to Turkey. Less than 4% of this material went to non-OECD countries.



Top 10 destinations for plastic exported from England in 2021⁴⁹

These changes have been particularly evident since 2017 when China banned plastic waste imports and caused a significant shift in the market. Since then, material being sent to other countries, most notably Malaysia and Turkey, and both have moved towards restricting waste imports themselves. None-the-less, Turkey remained the main export destination from England in 2021, and remains to be in 2022, all-be-it proportionately lower than previous years.

In terms of policy and regulation, a significant consideration has been changes made to the Basel Convention. The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes. After leaving the EU, the UK is now being treated in the same way as any other Organisation for Economic Co-operation and Development (OECD) country that intends to export waste to any EU country.



Other destinations for plastic exported from England in 2021⁴⁹

After 1 January 2021, to strengthen controls for the export of waste plastics, there were new arrangements for the movement of plastic waste. These were ratified by the UK Government and have been implemented across the EU through the relevant Waste Shipments Regulations. Exporters moving material from the UK into the EU Member States are required to follow EU customs guidelines and EU Waste Shipment Regulations⁵¹. This now means that acceptable contamination levels are lower (2% rather than 6% for imports to EU member states, and non-OECD, or developing countries are no longer a viable destination).

The reform of the Packaging Producer Responsibility System consultation no longer proposes that waste that has met an agreed end of waste protocol should be allowed to be exported for recycling. This is an area that should be monitored closely going forward, as this changing would have significant implications for what packaging waste the UK can export, and therefore the need for available UK infrastructure to process this material.

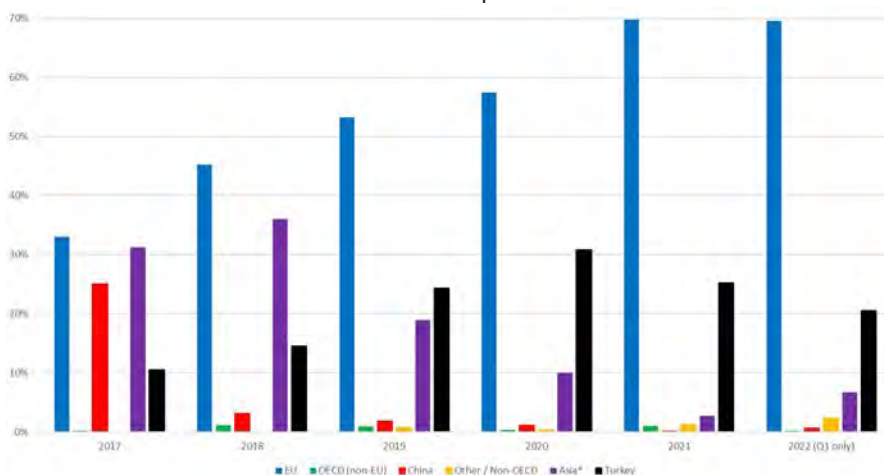
The changes meant that only plastics which are destined for recycling operations, consist of almost exclusively one type of plastic, and are almost entirely free from contamination, can continue to be exported as 'Green List' waste. Mixtures of Polypropylene (PP), Polyethylene (PE) and Polyethylene Terephthalate (PET) could continue to be exported under 'Green List' controls on the provision that they are destined for separate recycling. All other international movements of plastics require 'prior informed consent' (PIC) from the competent authorities of dispatch, transit, and destination.

The financial incentives created by the packaging producer obligation system and the use of Packaging Recovery Notes (PRN) and Packaging Export Recovery Notes (PERN) have historically made it more attractive to use export markets to recycle material. This is despite the additional challenges of verifying and auditing outcomes of material that has been exported. It is understood that changes brought about by EPR will not address this in the short-to-medium term and the current PRN/PERN system will remain, mainly to help fund the reprocessing sector.

Shipments need to be approved before export through a notification application that requires specifics on all aspects of the waste, including its origin, treatment, and journey from the producer to its destination. The timescale for gaining approval for waste shipments could take months depending on the application. However, this timescale is shorter for 'Green List' waste than material that requires notifications, such as mixed waste and hazardous materials.

For material that is not captured under 'Green List' controls, there are also notification fees, contracts written by the sender for the importer, third-party insurance and additional notification controls. The complexities of shipping material abroad are designed to ensure no material is lost, littered, and possibly to ensure shipment of waste is used only as a last resort.

Whilst an outright ban on export is unlikely, scenarios later in this report include estimates of what the UK plastic packaging infrastructure needs to process if export was no longer an option.



A graph showing how the UK has moved away from non-OECD destinations and China since 2017, towards EU destinations⁴⁷

POLICY & LEGISLATION

In the past few years, the world has seen a shift in focus in respect of waste and resources, attitudes towards the environment, and the use, treatment, and disposal of plastics. As a result of this, the UK and a number of international governments have seen legislative and policy changes and proposals introduced with a renewed focus on the environment.

UK

On 10 November 2021, the Environment Bill was passed in parliament, making the Environment Act legislation UK law. This has allowed the introduction of various waste reforms through Extended Producer Responsibility (EPR), Deposit Return Schemes (DRS), consistent recycling collections in England, and single-use plastic bans, among other policy changes. A new independent Office for Environmental Protection (OEP) will enforce the changes and hold public bodies to account, with any changes being driven by the new legally binding environmental targets. The following outlines the main policy areas and considerations.

HMRC's UK Plastic Packaging Tax (£200 per tonne for plastic packaging that does not include 30% recycled content)

In April 2022, HMRC introduced the UK Plastic Packaging Tax⁵⁴. This is a tax on plastic packaging manufactured in or imported into the UK to be sold on the UK market. The tax will apply to packaging which is predominantly plastic and is set at £200 per tonne for packaging with less than 30% recycled content.

The UK Government stated the key aim was to provide an economic incentive to use recycled material in plastic packaging, greater demand for this material and thus stimulate increased levels of recycling of plastic packaging waste.

The European and eventually global transition for the use of tax or financial incentives to use recycled content in plastic packaging will only drive the collective demand and costs to purchase this material higher. It is also safe to assume that tax or legislative interventions to incentivise recycled content will migrate to other packaging materials and non-packaging items over time, other than just single-use plastics.

As of September 2022, the number of companies registered for the tax was lower than anticipated, and HMRC continues to provide information and guidance for businesses. This includes a toolkit of what they need to do to register for, and their obligation towards the Plastic Packaging Tax⁵⁵.

The tax creates many opportunities and drivers to increasing demand for recycled plastics, with barriers such as the inclusion and evidencing of chemically recycled material through the mass balance approach currently being discussed, potentially making this a viable source of recycled material.

The reform of the Packaging Producer Responsibility System (Extended Producer Responsibility / EPR)

Extended Producer Responsibility (EPR) for packaging is an evolution of the current producer responsibility system that is being consulted on by the Department for Environment, Food and Rural Affairs (Defra)³.

This policy aims to move the obligation and responsibility of the cost of managing packaging waste on to the manufacturer, covering the full net cost of the waste management of those items. This will include additional fees to cover the cost of clean-up of commonly littered packaging items and will move the cost of managing littered packaging from local authorities to producers.

- Implementation Timeline

Implementation of regulations under EPR are currently expected to be introduced in 2024, with mandatory data reporting on producer packaging outputs commencing in 2023.

Modulated fees, or fees that change based on the recyclability of an item, are expected to be implemented from 2025 and will be set based on the data collected. However, it is important to note that these timescales may be affected by the UK going through numerous political changes including a new Prime Minister in September 2022, and a General Election due in 2024. There are further political processes involved in the implementation of EPR, such as the creation of a Statutory Agreement and subjugation to the parliamentary process³.

The main points of the EPR policy changes in the Summary of Consultation Responses and Government Response to the 2021 EPR consultation³ include:

- EPR payments will go towards supporting the collection of additional materials such as plastic films and flexibles.
- Modulated fees based on recyclability will be introduced from 2025.
- The current PRN system will continue, at least until 2024.
- Payments for commercially collected packaging waste will be considered.
- The threshold for producer recycling obligations will be maintained.
- All compostable and biodegradable material will be required to have a 'Do Not Recycle' label.
- A Scheme Administrator (SA) will be appointed, who will manage the scheme, including calculating EPR payments to distributing EPR funds to Local Authorities.
- The EPR scheme will be reviewed after two years of its operation.
- Introduction of Deposit Return Schemes (DRS) in Scotland (from August 2023)³, and England, Wales, and Northern Ireland, at a later date³.

- **Proposed Recycling Targets**

Proposals in the EPR consultation include ambitious recycling targets for 2024 (51%) and 2030 (62%) that do not include material collected through a DRS. The final proposed targets released in the response to the consultation display the most up-to-date targets to be introduced from 2024

With kerbside collections of plastic films and flexibles to commence in 2027, the targets for 2030 include expected collections of this material. They also include additional recycling collection requirements, such as a mandatory fibre cup take-back scheme, expected to commence from 2025.

To meet increased recycling targets, there will not only need to be an increase in collections of material, but also an increase in the available infrastructure needed to process such large quantities of material. While the UK possesses the necessary capacity to sort collected material, there are currently not enough processing facilities available in the UK to recycle the material expected to be collected. This is particularly true for materials such as flexible film and fibre cups.

Table 1: Recycling targets for packaging in scope of EPR regulations

	Targets for 2024		Targets for 2030	
	Proposed in consultation	Final proposed targets	Proposed in consultation	Final proposed targets
Plastic	41%	51%	56%	62%
Wood	38%	To be confirmed	39%	To be confirmed
Aluminium	30%	45%	30%	50%
Steel	85%	82%	92%	85%
Paper/ Card	76%	80%	85%	89%
Glass	71%	75%	81%	83%
Glass re-melt	N/A	74%	N/A	80%
Overall recycling rate	63%	68%	81%	76%

Recycling rates proposed in the EPR consultation⁵⁶

- **Maintaining the PRN / PERN System**

In March 2021, as part of the original EPR consultation, it was stated that the PRN system would be replaced by direct payments to recycling reprocessors⁵⁷. However, this option has been delayed and the PRN system will remain to ensure that EPR can be implemented by 2024. This is partially addressed by the consultation on Reforms to the Packaging Waste Recycling Note (PRN) and Packaging Waste Export Recycling Note (PERN) System and Operator Approval, conducted by Defra in mid-2022, the outcome of which is still pending⁵⁸.

It is unclear how the income from PRN payments in its current guise will fund the infrastructure needed to process the expected recycling rates under EPR. This is particularly concerning as the expected collection rates for kerbside flexible films alone would require significant infrastructure investment to increase reprocessing capacity.

Greater transparency in the PRN/PERN system is needed, as are adjustments to reporting requirements to reduce volatility in the recycling markets. RECOUP believes the proposals do not go far enough to maximise the environmental and commercial opportunities that exist within the system and to develop the plastic packaging reprocessing infrastructure needed in the UK.

Currently, there are financial incentives created by the packaging producer obligation system to export material for recycling. This is due to the value of the material being weighed at the point of export, whilst material recycled domestically is based on the weight later on in the process, after yield losses and contaminants are removed. This has historically made it more attractive to use export markets rather than recycle domestically. This is despite the additional challenges of verifying and auditing outcomes of material that has been exported.

The commercial advantage of the PERN to export plastic packaging for recycling and to develop the reprocessing infrastructure in the UK must be addressed. This is a major policy change that needs to be made. This would not only level the playing field for UK recyclers to develop the UK plastic packaging recycling infrastructure, but also to give an incentive to recycle the material in the UK. This will maximise the benefits from the commercial value and 'green jobs' employment opportunities in the UK.

An auditing and enforcement function around the revenues generated from the PRN/PERN system is needed. This requires transparency around revenues generated by the PRN/PERN system, ensuring an auditing and enforcement function is integral to the system to provide the evidence to verify what is reported in the PRN/PERN revenue categories.

- **Proposed Payments of EPR**

Under the proposed EPR scheme, funds are generated through payments on packaging placed in the market. Those that are obligated to pay under EPR are the manufacturer of the packaging placed on the UK market, and importers. However, the dispersal of fees can vary depending on the size and scale of the producer or importer.

It is proposed that producers that record an annual turnover of over £2 million or place over 50 tonnes of packaging on the market will be required to meet two types of payments under EPR. The first will be fees calculated to cover the cost of clean-up of packaging placed on the market by that producer. The second will be the continued purchase of PRNs and PERNs, which may also include an increased purchase requirement under EPR. Future calculations may also include the clean-up on litter in some devolved nations.

Small-scale producers with an annual turnover between £1 and £2 million and place 25 to 50 tonnes of packaging placed on the market will be required to submit data on their packaging but will not face any EPR fees or PRN obligations. Those with an annual turnover under £1 million and have less than 25 tonnes of packaging placed on the market, will have no obligations under EPR. However, producers that sell unfilled packaging to these businesses that fall below the £1 million mark will be required to meet all EPR and PRN data reporting and payment obligations.

Funds raised under the EPR scheme are intended to move the full net cost of managing public waste from local authorities to producers and to help increase the recycling rate for packaging across authorities. Currently, the types of recycling material accepted for kerbside collections vary from council to council⁵⁹. EPR Payments made by producers and importers will go directly to a local authority where, with guidance, it will be up to the local authority to determine how they will work to improve their collection rate. Payments to local authorities will be allocated depending on the recycling rate, with the better the recycling rate, the higher the payment received by the authority, once other area specific factors have been considered.

If an authority completes more than what is considered an “efficient and effective” performance, they will receive extra funds from the EPR scheme to cover the cost of the additional performance fees.

In addition to payments to local authorities, producers might also be required to pay for the cost of clean-up for ‘commonly littered items.’ These are items of packaging that are likely to end up in public waste. Producers might also pay for the communications aimed at preventing littering, and the cost of managing packaging that could end up in public bins. Payments for litter are currently not included in England and Northern Ireland. Therefore, the Scottish and Welsh governments are leading in developing detailed proposals on how these payments will work.

- **Changes for Material Sorting Facilities**

Following the implementation of EPR, regulations for existing material sorting facilities will be amended. Sorting facilities, referred to as ‘First Points of Consolidation’ (FPOCs) under EPR, are facilities that receive and handle packaging waste and report packaging data for EPR purposes. Under EPR, FPOCs will be required to receive an accreditation and report data on packaging collected, managed, and handled. Accreditation processes are not expected to take place during the initial implementation of EPR in 2024.

Although FPOCs will be required to record and submit data, they will not be required to give proof of recycling from reprocessors or exporters and will not have a minimum quality output for the material.

There is a strong intention under EPR to increase sampling and data reporting requirements for FPOCs. However, without a minimum quality output for material, it is uncertain how UK FPOCs will be incentivised to process the projected recycling targets at a high-quality level.

- **Compliance**

To ensure compliance with proposed regulations under EPR, the new OEP will monitor enforcement activities concerning producers, compliance schemes, reprocessors, and exporters. There will also be a ‘Technical Liaison Group’ put in place that will support dialogue between all the parties involved in EPR and generate feedback on the functioning of regulations.

Consistency in Household and Business Recycling in England

A consultation on Consistency in Household and Business Recycling in England⁷¹ took place in 2021, aiming to increase the quantity and quality of the packaging collected for recycling. This is to be achieved by having a core set of items collected for recycling regardless of where you live or travel to within England.

Devolved Governments have strategies and targets which are reflected in different policy objectives and support for increasing recycling. The Scottish Government and the Convention of Scottish Local Authorities (COSLA) have a Household Recycling Charter which is currently being reviewed as a Roadmap to 2025⁷². Wales has an overarching waste strategy document, Towards Zero Waste⁷³, and its established Collections Blueprint as part of its Municipal Sector Plan⁷⁴, and Northern Ireland had a waste management strategy, Delivering Resource Efficiency, with a view to a new strategy being released in 2023⁷⁵.

Introducing a Deposit Return Scheme (DRS) in England, Wales and Northern Ireland - and separately in Scotland

There is still momentum for a DRS to be used across the UK to increase recycling rates and reduce the littering of a variety of drinks containers. However, its introduction has seen considerable delays over the past few years. The UK Government’s consultation on introducing a DRS in England, Wales and Northern Ireland⁶⁰ is without a definitive timeline regarding its implementation. Scotland are intending to implement a DRS independent of the rest of the UK, with August 2023 as the ‘go-live’ date for the scheme⁶¹. The Republic of Ireland is also due a soft launch of its own DRS in the next couple of years⁶².

Whilst exact criteria are still to be finalised, it is expected that the fee for deposits will be set at 20p (20¢ in the Republic of Ireland), and that there could potentially be some variation in the target material, with different devolved nations taking different positions on what containers in-scope. For plastic, however, it is widely expected that PET drinks bottles between 50ml and 3 litres in size will be within the scope of all schemes.

The use of a ‘Digital DRS’ (DDRS) is currently being assessed. A DDRS is where consumers can claim their deposit at home by scanning their drinks containers on their smart phones when placing them for recycling. This would be in addition to using Reverse Vending Machines (RVMs) when away from home, as is used in a traditional return to retail DRS scheme. The Resource Futures report that explores the economic impact of a DDRS found it could offer significant savings over a traditional ‘return to retail’ scheme. In summer 2021, the UK’s first DDRS pilot was delivered in Conwy, Wales⁶³, and there are other pilot projects testing this system, either being delivered or planned for the near future.



Use of Single-Use Plastic (SUP) items in England, Scotland, Wales and Northern Ireland

In line with Article 5 of the EU Single-Use Plastics Directive (EU) 2019/904⁶⁴, there is an ongoing process to reduce marine litter coming from the most common SUP items. This covers a broad range of items, including plastic cotton buds, cutlery, plates, beverage stirrers, straws and balloon sticks, EPS (expanded polystyrene) food containers and EPS cups. Exemptions will be enforced where products are deemed necessary, but any measures taken to restrict certain items should take fully into account the environmental and socio-economic impacts of doing so. This can be done through robust independent Life Cycle Analyses (LCA) and environmental impact assessments.

RECOUP feels that these policies must be introduced without incentivising alternative packaging formats and materials which may be less sustainable, have a greater carbon impact through its life cycle, or continue to be an issue when it comes to littering. These policy introductions should also be done holistically with others, to compliment the range of measures that could also be used to decrease littering and increase the amount of post-consumer plastic waste entering the recycling stream.

In 2022, several consultations continued to take place around the banning of single-use plastic items in England⁶⁵, Wales⁶⁶, and Northern Ireland⁶⁷. At the start of 2022, Northern Ireland was obligated to adopt the EU Single-Use Plastic Directive as part of the Northern Ireland Protocol⁶⁸, whilst Scotland introduced its own single-use plastic ban on 12 August 2022⁶⁹.

Item	England	Northern Ireland	Wales	Scotland	EU
Plastic drink stirrers	Existing ban on supply (from October 2020)	No proposals	Proposed ban (no date set)	Ban on supply and manufacture to come into force from 1 June 2022	Existing restriction on supply in Member States (from July 2021)
Plastic stemmed cotton buds	Existing ban on supply (from October 2020)	No proposals	Proposed ban (no date set)	Existing ban on supply (from October 2019)	Existing restriction on supply in Member States (from July 2021)
Plastic drinking straws	Existing ban on supply (from October 2020)	No proposals	Proposed ban (no date set)	Ban on supply to come into force from 1 June 2022	Existing restriction on supply in Member States (from July 2021)
Disposable plastic plates	Proposed ban on supply (no date set)	No proposals	Proposed ban (no date set)	Ban on supply and manufacture to come into force from 1 June 2022	Existing restriction on supply in Member States (from July 2021)
Single-use plastic cutlery	Proposed ban on supply (no date set)	No proposals	Proposed ban (no date set)	Ban on supply and manufacture to come into force from 1 June 2022	Existing restriction on supply in Member States (from July 2021)
Balloon sticks	Proposed ban on supply (no date set)	No proposals	Proposed ban (no date set)	Ban on supply to come into force from 1 June 2022	Existing restriction on supply in Member States (from July 2021)
Expanded polystyrene containers (eg. takeaway food and drink containers)	Proposed ban on supply (no date set)	Proposals being consulted on to either: ban, introduce a levy on, or introduce voluntary	Proposed ban (no date set)	Ban on supply and manufacture to come into force from 1 June 2022	Existing restriction on supply in Member States (from July 2021)
Oxo-degradable products (a material where there is ongoing debate and research about how quickly and effectively it degrades to become harmless)	No final decision taken; research ongoing	No proposals	Proposed ban (no date set)	No final decision taken; research ongoing	Existing restriction on supply in Member States (from July 2021)

Differences in Single-Use Plastic legislation⁷⁰

WRAP UK Plastic Pact

The UK Plastic Pact⁵² is a scheme led by WRAP (Waste and Resources Action Programme) and is made up of retailers, packaging companies and producers, as well as Government and non-government organisations (NGOs) that are seeking solutions to generate a plastic circular economy. A Roadmap to 2025⁵³ outlined the ambitions, targets, challenges, and actions required to meet them.

The UK Plastic Pact aims, by 2025, are:

- Eliminate problematic or unnecessary single-use packaging.
- 100% of plastic packaging to be reusable, recyclable, or compostable.
- 70% of plastic packaging is effectively recycled or composted.
- 30% average recycled content in plastic packaging.

Integrated into the Government's legislative changes, this provides a target and incentivisation structure to work towards. RECOUP is working alongside WRAP to provide strategic, practical, and collaborative support to try and ensure the collective RECOUP and Pact members work intelligently and logically.

This will help to not only meet collective aims, but also avoid negative, unintended consequences centred around moving away from plastic as a material of environmental choice. It will also help in avoiding alternative packaging and material choices that could ultimately increase carbon emissions and be an even greater recycling challenge for the UK.

Competition and Markets Authority (CMA) on businesses making environmental claims to promote or sell their goods and services

In 2021, the Competition and Markets Authority (CMA) consulted to investigate how businesses are making environmental claims to promote or sell their goods and services and whether consumers are being misled, the results of which resulted in guidance being issued in September 2021⁷⁶. This guidance includes:

- Six core principles environmental claims must be made around.
- Examples of when environmental claims are misleading.
- What Consumer Protection Law requires businesses to do.
- What if businesses don't comply with this law (the CMA has powers to tackle practices that hinders consumers' decision-making, including taking businesses to court).

This covers both business-to-consumer claims as well as business-to-business claims, to ensure that both can make informed purchasing decisions.

RECOUP strongly believes environmental claims should be founded on objective data and evidence in order to deliver the

best environmental outcomes. A level playing field is needed for those businesses making well-founded and evidence-based environmental claims to ensure that claims are not made to gain a commercially competitive advantage, without evidence to back these claims up.

European and International Policy

Having left the European Union (EU), the UK can now make its own policy decisions around how it manages waste and recycling. However, the likes of the EU's Waste Framework Directive⁷⁷, Circular Economy Action Plan⁷⁸, and the European Green Deal⁷⁹, continue to impact and influence UK policy.

Additionally, changes to the EU's Waste Shipment Regulations⁸⁰ are affecting the movement of waste between EU and OECD countries⁸¹. Additionally, the allowable rates of contamination were changed, reducing existing contamination tolerances from 6% to 2%, whilst also allowing for EU countries to set their own lower rates, if agreed. Since leaving the EU and not being part of the European Economic Area (EEA), the UK now falls under OECD (Organisation for Economic Co-operation and Development) status and is therefore subject to the lower tolerance of 2% contamination on its waste exported to EU member states.



Basel Convention

On 1 January 2021, changes were made to the Basel Convention⁸² coding and controls for the export of waste plastics. These changes mean that only plastics that are destined for recycling operations, consist of almost exclusively one type of plastic, and are almost entirely free from contamination, can continue to be exported as 'Green List' waste. Mixtures of PP, PE and PET can also continue to be exported under 'Green List' controls on the proviso that they are destined for separate recycling. All other plastic exports must receive specific consent for export before any shipment through a pre-notification process.

In order to maintain export as a viable option with these conditions, exported waste would no longer be able to go to non-OECD countries, and contamination levels would need to be reduced, ensuring greater quality of material and sorting prior to any leaving the UK.

SCENARIOS

With UK recycling targets increasing year-on-year, and Extended Producer Responsibility (EPR) set to push these further, as well as the likes of WRAP's Plastic Pact and HMRC's Plastic Packaging Tax driving incentive to use recycled content in packaging, six scenarios have been developed to assess the UK's current infrastructure capacities and potential to manage its own waste domestically.

The following scenarios use a 30% benchmark as a required amount of recycled content, a figure which is based off the targets consistently set across industry through the likes of the Plastic Packaging Tax and WRAP's Plastic Pact⁸³, and if the export market was restrict or not available as an outlet for the UK. The capacity requirements for domestic recycling are subject to fluctuation and change, especially as a result of varying feedstocks and material quality. For example, EPR targets propose a recycling rate of 51% for in-scope material, but this will change the proportions of material types and formats that are sorted from these waste streams. This could include the removal of drinks containers and the addition of plastic films and flexibles.

Note that these scenarios may highlight an excess of capacity in some cases. These are based on ideal market conditions and can not account for variables such as feedstock quality and yield losses, or commercial drivers at any given time.

Scenario 1 All Household Plastic Packaging

There is approximately 142kt shortfall in UK reprocessing capacity to produce 30% recycled content for all household plastic packaging placed on the UK market.

This scenario looks at the infrastructure required for the UK to produce 30% recycled content for all its household plastic packaging placed on the market.

There is currently 1,432,000t of household plastic packaging placed on the market (POM) in the UK annually, with a current reprocessing for facilities that primarily handle these materials of 288,000t.

When considering the 30% recycled content target set by the Plastic Packaging Tax, this leaves a shortfall in the UK's infrastructure to reprocess sufficient volumes of its own waste domestically.

A capacity increase of 0.5x is required in order to be able to produce 30% recycled content for all the UK's household plastic packaging POM annually, and a **4x increase** in capacity to reprocess all of this material.



Scenario 2 All Plastic Packaging

There is approximately 33kt shortfall in reprocessing capacity in the UK to provide 30% recycled content in all plastic packaging placed on the UK market.

This scenario looks at the infrastructure required for the UK to produce 30% recycled content for all its plastic packaging placed on the market.

There is currently 2,226,000t of plastic packaging, from both household and non-consumer sources, placed on the UK market annually, with a current reprocessing capacity for these materials of 635,000t.

When considering the 30% recycled content benchmark of the Plastic Packaging Tax, this leaves a shortfall in the UK's own infrastructure to reprocess sufficient volumes of its own waste domestically.

An increase of 5% is required in order to be able to produce 30% recycled content for all the UK's plastic packaging POM annually.

The UK would require a **2.5x increase** on the current capacity to reprocess all household packaging placed on the UK market.



It is important to consider that when looking at the current available capacity as a whole, there are considerable variations in polymers and formats which have different rates of recyclability. The likes of PET and HDPE drinks bottles have greater infrastructure and value in the UK at present, compared to harder to recycle and low value materials such as PET trays and plastic films and flexibles. Whilst sorting is broadly more capable in its ability to target material, infrastructure to reprocess different plastic types is not interchangeable. For example, infrastructure to reprocess PET cannot be used to reprocess other polymers. As such, whilst overall capacities may appear high, the UK's capacity to handle certain materials remains proportionately low.

Scenario 3 Household-like Plastic Packaging

There is approximately 208kt shortfall in UK reprocessing capacity to produce 30% recycled content for all household-like plastic packaging placed on the UK market.

This scenario looks at the infrastructure required for the UK to produce 30% recycled content for all its household-like plastic packaging placed on the market.

There is currently 1,652,000t of consumer and household-like plastic packaging placed on the UK market annually, with a current reprocessing capacity at sites that primarily handle these materials of 288,000t. This leaves a significant shortfall in the UK's own infrastructure to meet the 30% recycle content targets.

An increase of over 0.7x is required in order to be able to produce 30% recycled content for all the UK's household-like plastic packaging POM annually.

The UK would require a **5x increase** on the current capacity to reprocess all household-like plastic packaging placed on the UK market.



Household-like packaging is calculated from the household plastic packaging fraction, as well as the plastic bottles and other similar packaging types within the hospitality sector from the non-consumer tonnage.

Scenario 4 Rigid Plastic Packaging

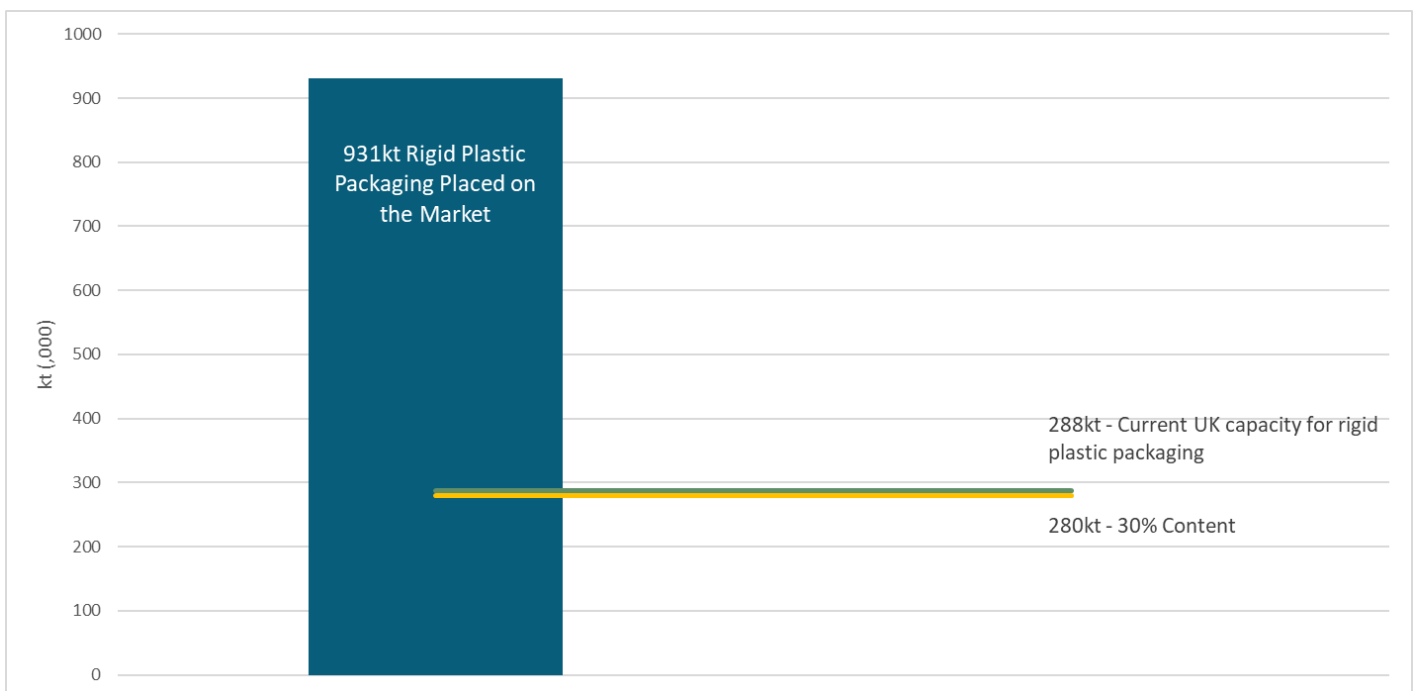
The UK has broadly sufficient reprocessing capacity to produce 30% recycled content for all rigid plastic packaging placed on the UK market.

This scenario looks at the infrastructure required for the UK to produce 30% recycled content for all its rigid plastic packaging placed on the market.

There is currently 931,000t of rigid consumer plastic packaging placed on the UK market annually, with a current reprocessing capacity for facilities that primarily handle these materials of 288,000t.

This leaves a shortfall in the UK's own infrastructure, with **an increase of 3%** required in order to be able to produce 30% recycled content for all the UK's rigid plastic packaging POM annually.

The UK would require a **3x increase** on the current capacity to reprocess all rigid plastic packaging placed on the UK market.



It is important to consider that when looking at the current available capacity as a whole, there are considerable variations in polymers and formats which have different rates of recyclability. The likes of PET and HDPE drinks bottles have greater infrastructure and value in the UK at present, compared to harder to recycle and low value materials such as PET trays and plastic films and flexibles. Whilst sorting is broadly more capable in its ability to target material, infrastructure to reprocess different plastic types is not interchangeable. For example, infrastructure to reprocess PET cannot be used to reprocess other polymers. As such, whilst overall capacities may appear high, the UK's capacity to handle certain materials remains proportionately low.

Scenario 5 Food-Grade Rigid Plastic Packaging

There is approximately 191kt shortfall in UK reprocessing capacity to produce 30% recycled content for food-grade rigid plastic packaging placed on the UK market.

This scenario looks at the infrastructure required for the UK to produce 30% recycled content for all its food-grade rigid plastic packaging placed on the market.

There is 976,000t of food-grade consumer plastic packaging placed on the UK market annually, with a current reprocessing capacity at facilities that primarily handle these materials of 102,000t.

An increase of almost 3x is required in order to be able to produce 30% recycled content for all the UK's food-grade rigid plastic packaging POM annually.

The UK would require almost 9x increase on the current capacity to reprocess all food-grade plastic packaging placed on the UK market.



Scenario 6

All Plastic Packaging (without an export market).

There is approximately 1,631kt capacity shortfall to sort all collected UK plastic packaging without an export market, with a further reprocessing shortfall for this same material.

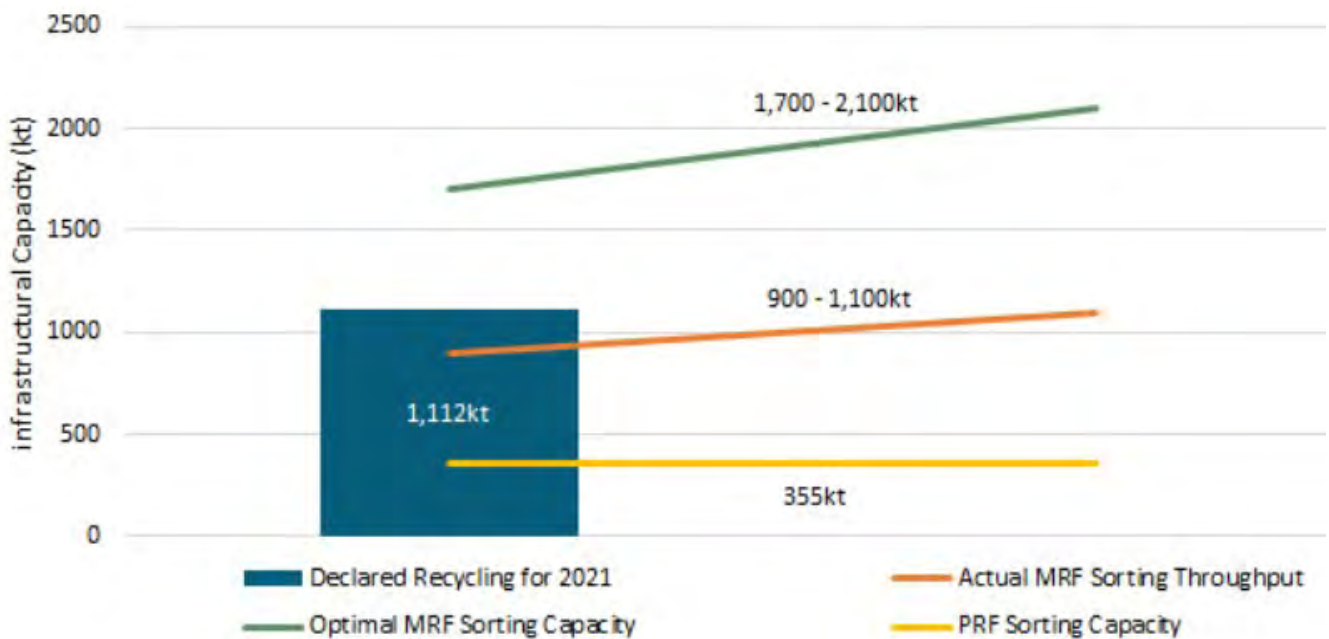
This scenario looks at the infrastructure required for the UK to process all of its rigid plastic packaging placed on the market, without an export market.

The UK's current capacity for sorting plastic packaging at Material Reclamation Facilities (MRFs) is 1.7mt to 2.1mt but has a lower throughput of 900kt to 1.1mt per year. Additionally, there is around 355kt sorting capacity at Plastic Reclamation Facilities (PRFs) though there may be some overlap with material handled by MRFs that sort to lesser quality standards.

Based on the current capacities and throughputs, the UK has sufficient capacity to sort the 2,266kt of plastic packaging POM annually, and its throughput largely covers that which is declared as recycled. Considerations need to be made for varying feedstocks and economic drivers for the sorting of different formats and materials, as these sites handle packaging beyond just plastics. However, there is a continued emphasis on the need for quality of sorting. This is something that has seen improvement in recent years, but will continue to be an area of focus going forward if the UK is to produce material capable of being either reprocessed or exported.

Furthermore, sorting facilities are currently focused on high value plastics and other materials. In order to achieve recycling targets going forward, and also to account for changing in waste stream feedstock as a result of DRS and consistent collection legislation, sorting facilities will need to separate volumes of previously undesirable material and formats, such as films and flexibles.

The UK would need **an increase of between 5% and 25% of its sorting capacity**, and as much as double its current actual sorting throughput, in order to be able to sort all plastic packaging placed on the UK market annually. Beyond sorting, the UK has a shortfall of 1,631,000t in capacity to be able to reprocess all of its plastic packaging.



ACRONYMS AND ABBREVIATIONS

- *C&I - Commercial and Industrial*
- *COSLA - Convention of Scottish Local Authorities*
- *CMA - Competition and Markets Authority*
- *DAERA - Department of Agriculture, Environment and Rural Affairs*
- *DDRS - Digital Deposit Return Scheme*
- *DEFRA - Department for Environment, Food and Rural Affairs*
- *DMR - Dry Mixed Recycling*
- *DRS - Deposit Return Scheme*
- *EA - Environment Agency*
- *EC - European Commission*
- *EEA - European Economic Area*
- *EFSA - European Food Safety Authority*
- *EPR - Extended Producer Responsibility*
- *EPS - Expanded Polystyrene*
- *EU - European Union*
- *FPOC - First Point of Contact*
- *HDPE - High-density polyethylene*
- *HMRC - His Majesty's Revenue and Customs*
- *IWS - International Waste Shipments*
- *kt - Thousand Tonnes (x,000t)*
- *LCA - Life Cycle Analysis*
- *LDPE - Low-density polyethylene*
- *MRF - Material Reclamation Facility*
- *mt - Million Tonnes (x,000,000t)*
- *NGO - Non-Government Organisation*
- *NIR - Near Infrared*
- *NPWD - National Packaging Waste Database*
- *NRW - Natural Resources Wales*
- *OECD - Organisation for Economic Co-operation and Development*
- *OEP - Office for Environmental Protection*
- *PERN - Packaging Export Recovery Note*
- *PE - Polyethylene*
- *PET - Polyethylene terephthalate*
- *PIC - Prior Informed Consent*
- *POM - Placed on the Market*
- *PP - Polypropylene*
- *PRF - Plastic Reclamation Facility*
- *PRN - Packaging Recovery Note*
- *PS - Polystyrene*
- *PTT - Pots, Tubs and Trays*
- *PVC - Polyvinyl chloride*
- *RMV - Reverse Vending Machine*
- *SA - Scheme Administrator*
- *SEPA - Scottish Environment Protection Agency*
- *SUP - Single Use Plastic*
- *UK - United Kingdom (England, Scotland, Wales and Northern Ireland)*
- *WDF - Waste Data Flow*

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UK Plastic Packaging Sorting & Reprocessing Infrastructure 2022

1 Metro Centre
Welbeck Way
Woodston
Peterborough
PE2 7UH

T | 01733 390021

E | enquiry@recoup.org

W | www.recoup.org

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Registered in England & Wales number: 02435729
VAT registration number: 546 5837 10
Registered Charity Number: 1072029
RECYcling Of Used Plastics (RECOUP) Limited