Plastic PackFlow 2025 – Methodology Review

A review of the methodology used to quantify plastic packaging placed on the market in 2024

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April 2026

Plastic PackFlow 2025 – Methodology Review: Project Remit

This project seeks to estimate packaging POM and review/update methodologies used to calculate these figures, observe changes in packaging flow trends, and assess the UK's compliance position in 2024.

This has been achieved by:

- Assessing the various methodologies used to calculate POM,
- Calculating UK packaging POM (placed on the market by industry sector in 2024.
- Using relevant data sources and industry insight to estimate by packaging material type on:
    - The total amount of material that is likely to be placed on the market (POM) by sector; and
    - The changes to the level of obligated tonnage

Scenarios, assumptions, and data sources have been agreed with the steering committee made up of key industry stakeholders representing individual materials and sectors.

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Executive Summary

Introduction

The *Plastic PackFlow 2025 – Methodology Review* has been produced to assess the methodologies used to calculate the plastic packaging placed on the market (POM) figures as well as provide industry, Governments, and other stakeholders with evidence to better understand packaging materials flows.

The *Plastic PackFlow 2025 – Methodology Review* project has been split into two main sections:

Methodology

- A review of methodologies to estimate plastic packaging POM to account for changes in regulation and to increase their robustness.

Plastic Packaging POM

- This updates the baseline year to 2024 for estimates of packaging POM (from 2022 in the previous flow reports[1]).

To support Defra and Governments in their packaging policy work and assist other industry stakeholders, this report focuses on generating robust estimates of UK plastic packaging placed on the market[2].

Data robustness assessments have been conducted and robustness scores are provided where appropriate throughout the report, using a Red-Amber-Green classification[3].

Plastic Packaging POM

The plastic packaging POM estimate for 2024 is summarised in Table 1, broken down by consumer and non-consumer sectors.

Table 1: Plastic Packaging POM by Sector, 2024 (k tonnes)

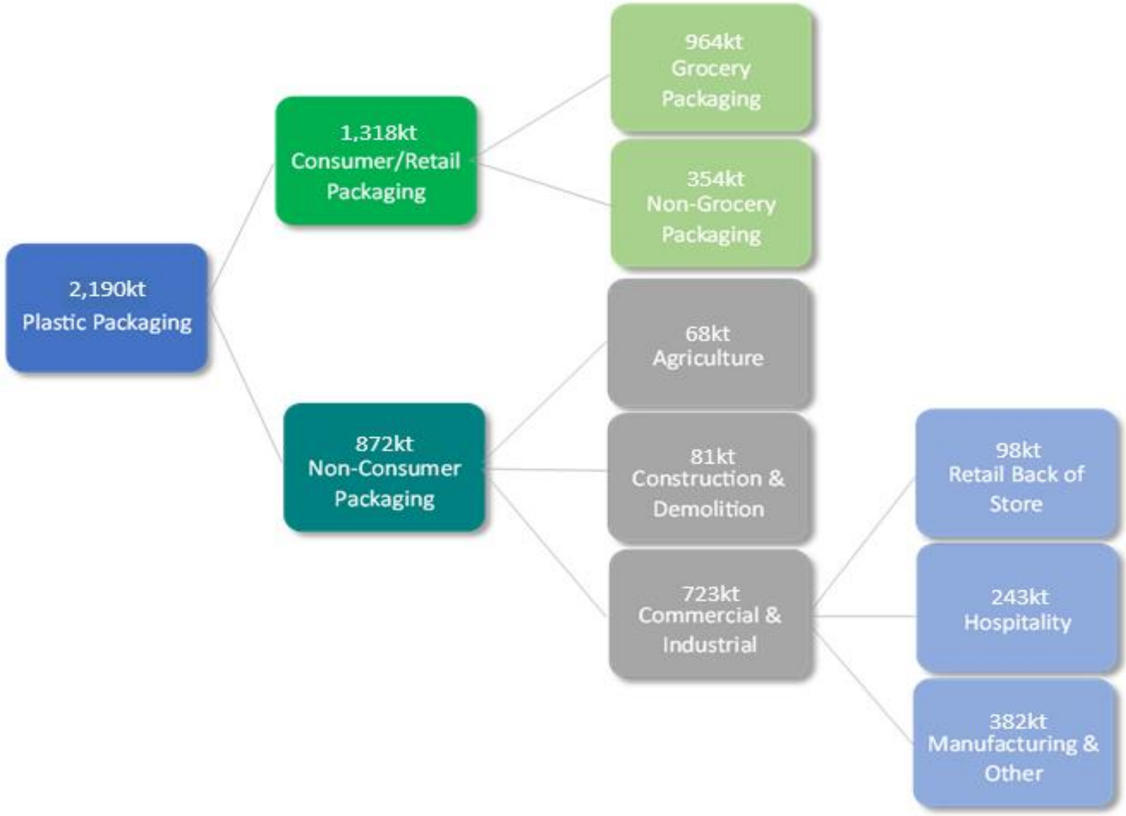
	Plastic Packaging POM in 2024 (k tonnes)	Data Robustness Score[3]
Consumer	1,318	Green
Non-Consumer	872	Green
Total Plastic Packaging	**2,190**	**Green**

The total plastic packaging figure for 2024 represents a potential increase of 108k tonnes[4] from the estimated 2022 flow figure of 2,082k tonnes. The increase in plastic packaging POM has likely been influenced by a change in consumer purchasing habits, population growth and a shift in packaging material use.

A further breakdown of plastic packaging POM in these sectors is shown in Figure 1[5].

[1] *The previous packaging materials flow reports can be found at PackFlow - UK Packaging Data & Recycling*
[2] *Plastic packaging placed on the market means all household and non-household plastic packaging used around products sold and transported within the UK.*
[3] *Data Robustness Score is based on a Red-Amber-Green classification. These classifications are determined using a qualitative robustness assessment and are not the outputs of a statistical calculation. Further details of the Data Robustness Assessment can be found in Section 2.6 and Appendix I.*
[4] *108k tonnes is an increase of 5.2%.*
[5] *Figures may not total due to rounding.*

Figure 1: Plastic Packaging POM by Sector, 2024



The plastic POM figure is built up using a variety of components, based on the key sectors for plastic packaging, including:

- Plastic packaging around food/drinks/other groceries, including body care/clothing/DIY products etc., as sold by supermarkets and other non-grocery retailers, sourced from Valpak's EPIC database[6];
- Plastic packaging around food/drink as consumed in the hospitality sector, sourced from Valpak's EPIC database;
- Plastic packaging discarded by retailers back-of-store (predominantly case and pallet wrap), obtained by back of store collection data provided to Valpak for the purposes of this study;
- Plastic packaging used by the construction industry, based on secondary research sources, using updated methodologies than those used within previous PackFlow projects;
- Plastic packaging used in the manufacturing industry, using the UK government's statistics on waste[7] and the UK Manufacturing Index[8]; an update on the methodologies used in previous pack flow reports; and
- Plastic packaging used in the agricultural sector, based on the 2010 DEFRA report on Non-Packaging Agricultural Plastic sold in the UK[9] and the UN FAO report that cited 2019 APE Europe data[10].

[6] *The database is based on information collected direct from suppliers as well as information sourced internally, meaning that it holds a wide coverage of information across multiple product ranges. Product specific data collection is completed through site visits, supplier mailings and weighing in-house (purchasing product and collecting used product from staff). All data goes through a comprehensive checking process on receipt and is stored in Valpak's database - Environmental Product Information Centre (EPIC).*
[7] https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste#waste-from-commercial-and-industrial-ci-activities
[8] *https://commonslibrary.parliament.uk/research-briefings/sn05206/*
[9] *Summary of responses to consultation on proposals on non-packaging agricultural plastics published - GOV.UK*
[10] *Statistics - APE Europe*

The total plastic POM estimate was cross-checked and found to be 41k tonnes higher than data reported by obligated companies under the Packaging Extended Producer Responsibility (pEPR)[11] data submissions.

This suggests that non-obligated companies (handling fewer than 25 tonnes of packaging or with lower than £1 million turnover), illegal imports and non-compliant organisations account for 2% of plastic packaging in the UK. Due to the regulatory and reporting changes this has decreased from the 10% unreported POM identified in 2022. This total could also be affected by the introduction of a new system and data reporting uncertainties and may be subject to change as the system matures.

It is important to stress that reported tonnages on the Report Packaging Data (RPD) portal are themselves open to the possibility of a degree of error due to the recent changes in reporting and subsequent errors when completing the new submission forms. The RPD data however, should be viewed as being the best available as there is a legal obligation for companies to submit data that is as accurate as reasonably possible, which is then audited by the regulating body. This data is used by policy makers and their agencies.

Polymer/ Format Composition of Plastic POM

The estimated composition of consumer plastic packaging POM in the UK in 2024 is shown in Table 2. The category 'Other' includes elements of packaging such as caps & lids, toothpaste tubes, egg boxes, blister packs and clothing hangers.

Table 2: Consumer Plastic Packaging by Format and Polymer, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Grand Total	
Bottle	123	0	5	9	181	4	1	0	**322**	24%
Film	9	103	70	92	32	145	0	1	**453**	34%
Other rigid	63	9	13	26	78	108	4	3	**305**	23%
PTT	2	0	3	0	163	66	3	0	**238**	18%
Grand Total	**198**	**113**	**91**	**127**	**455**	**323**	**8**	**4**	**1,318**	
	15%	9%	7%	10%	34%	24%	1%	0%		

To provide a breakdown by format and polymer of consumer plastic packaging, supermarket packaging composition (both grocery and non-grocery product types) was used as a proxy for grocery packaging, but only the non-grocery categories of supermarket packaging (around toys, electrical, clothing, etc.) were used as a proxy for non-grocery packaging. In addition to non-grocery items, a certain quantity of drinks are sold through non-grocery retailers and so allowances have been made for these non-grocery drinks sales in the non-grocery composition. This broadly follows the same methodology as the PackFlow Refresh 2023[12].

There are fewer data sources to estimate non-consumer POM than consumer POM and the levels of uncertainty around the data are greater. This is especially true of format and polymer composition data and therefore the splits in the below summary table should be regarded as indicative, with a high level of uncertainty.

[11] *Extended producer responsibility for packaging - GOV.UK*
[12] *www.packflow.co*

Table 3: Summary of Indicative Total Non-consumer POM Composition, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Total	
Bottle	221	0	2	2	75	1	0	0	**301**	*35%*
Film	7	220	8	79	4	67	0	0	**385**	*44%*
Other	22	0	1	3	2	17	0	0	**44**	*5%*
PTT	24	0	0	0	16	77	22	0	**140**	*16%*
Total	**274**	**221**	**11**	**84**	**97**	**162**	**23**	**1**	**872**	
	31%	*25%*	*1%*	*10%*	*11%*	*19%*	*3%*	*0%*		

Although this non-consumer POM composition is indicative, the formats are relatively consistent with those identified for 2022 in the PackFlow Refresh 2023 report. The largest increase is within film packaging with an increase from 34% in 2022 to 44% in 2024. This increase has most likely come from the increases in the estimates of plastic packaging used in the Agriculture sector (note that a more up to date data source has been identified and used).

Due to the quantity of packaging data available in Valpak's EPIC database, further analysis was undertaken on consumer POM as part of the PackFlow project. This included an assessment by polymer type of the various packaging formats (bottles, film, pots/tubs/trays) and of consumer drinks packaging.

Since Deposit Return Schemes (DRS) are being developed (at various stages) in Scotland, England, Wales and Northern Ireland, it was considered of interest to present the plastic primary packaging data relating to the drinks market.

The total drinks POM is shown within Table 4.

Table 4: Plastic Drinks Packaging POM, 2024 (k tonnes)

	HDPE	PET	Other[13]	Total
Consumer	83.4	208.6	28.1	**320.2**
Non-Consumer	19.7	49.1	5.5	**74.3**
Total	**103.1**	**257.7**	**33.6**	**394.5**

The DRS applies to drinks that come in containers between the sizes of 150ml-3L[14]. For plastics, only PET drinks containers are included within the DRS[15]. This is shown in Table 5 below.

[13] *Includes LDPE & PP.*
[14] https://www.gov.uk/guidance/deposit-return-scheme-drinks-producer-and-retailer-responsibilities
[15] https://www.gov.uk/government/publications/deposit-return-scheme-for-drinks-containers-policy-statement/deposit-return-scheme-for-drinks-containers-policy-statement

Table 5: Plastic Drinks Packaging POM in Scope of the DRS, 2024 (k tonnes)[16]

Drinks	Consumer	Non-consumer	Total
PET	202.2	48.8	**251.1**

The analysis indicates that in 2024 there was 394.5k tonnes of plastic drinks packaging placed onto the UK market[17]. Of the 394.5k tonnes POM, 202.2k tonnes PET is within the scope of the DRS under specifications published at the time of conducting the PackFlow 2024 report.

Conclusions: POM

The project's estimate of UK plastic packaging POM for 2024 is 2,190k tonnes (green RAG rating[3]), an increase of 108k tonnes[18] from the previous figure of 2,082k tonnes for 2023[19].

The POM figure is the most robust estimate that can be derived using a variety of the most authoritative methods, including industry estimates, Valpak data and publicly available data.

Plastic packaging POM in the consumer sector is estimated to be 1,318k tonnes (green RAG rating[3]) in 2024.

This is based on primary data alongside reliable market share data. No other method is used for deriving consumer data as this method is considered the most robust available and is accepted by industry as such.

Plastic packaging POM in the non-consumer sector is estimated to be 872k tonnes (green RAG rating[3]) in 2024.

For film, this method is based on a combination of primary collections data and secondary research. For rigids, this is based on the findings of the WRAP/ Valpak report into rigid packaging in the C&I sector, and on secondary research.

This increase in plastic packaging could be down to a number of factors, such as an increase in population and the cost-of-living crisis.

The increase in inflation has impacted the cost of goods for purchases across the grocery and non-grocery sectors, leading to consumers altering their purchasing habits to include items at a lower price point[20]. These items are more likely to be packed in plastic than other materials, contributing to the increase in plastic packaging POM.

Plastic drinks packaging is estimated to account for 394.5k tonnes of the total POM in 2024. 202.2k tonnes PET comes under the scope of the DRS.

Recommendations for Further Work

EPR Reporting improvements

This report recognises that as EPR is a relatively recent introduction, there will inevitably be some margins for error during the implementation phase, and expects that as time progresses, improvements will be made to more accurately record the tonnage of packaging reported by obligated producers.

Quantification of Stretch wrap

It is currently difficult to accurately calculate the amount of stretch wrap used in transit packaging. This report recommends further work to quantify films used for delivery/transport packaging.

[16] *Totals may not sum due to rounding.*
[17] *Bottled drinks only, including all caps and labels.*
[18] *108k tonnes is an increase of 5.2%.*
[19] *PackFlow Refresh 2023 Plastic - Packflow*
[20] *Competition, choice and rising prices in groceries*

C&I plastic packaging film/rigids

The estimate of C&I film and rigid uses the same indicative percentage splits as in previous PackFlow reports. The film proportion appears low in comparison to the rigids figure. This report recommends further work in this area to improve data accuracy.

Agricultural Films

Despite a significant overhaul to the methodology used to determine the updated agricultural packaging tonnage, significant data gaps still exist within the UK, with most other reported tonnages relying on data which is over 20 years old. This report also recommends clarification on the definition of agricultural packaging vs non-packaging films, for example with bale wrap, silage wrap and poly-tunnels, etc.

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Appendix I: Data Robustness Assessment

Glossary

ACP – Advisory Committee on Packaging

bn – billion

BPF – British Plastics Federation

C&D – Construction and demolition

C&I – Commercial and Industrial

DEFRA – Department for Environment, Food & Rural Affairs

DRS – Deposit Return Scheme

EA – Environment Agency

EfW – Energy from Waste

EPIC – Environmental Product Information Centre

FPA – Foodservice Packaging Association

HDPE – High-density Polyethylene

HWRC – Household waste recycling centre

kt – Thousand tonnes

LA – Local authority

LDPE – Low-density polyethylene

MRF – Materials Recovery Facility

NPWD – National Packaging Waste Database

ONS – Office of National Statistics

PE – Polyethylene

PERN – Packaging Export Recovery Note

PET – Poly ethylene terephthalate

POM – Placed on the market

PP – Polypropylene

Primary Packaging – Any packaging that the customer will take home, remove and throw away e.g. plastic bottle

PRN – Packaging Recovery Note

PS – Polystyrene

PTT – Pots, Tubs and Trays

PVC – Polyvinyl Chloride

RAG – Red/Amber/Green rating to denote levels of confidence.

RECOUP – Recycling of Used Plastics Ltd

RPD – Reported Packaging Data

Secondary Packaging – Inner packaging used to transport or display goods to/in store, usually cardboard boxes or shelf-ready packaging

SEPA – Scottish Environment Protection Agency

Transit/Tertiary Packaging – Any transit packaging e.g. pallets, shrink wrap, staples or strapping

WRAP – Waste and Resources Action Programme

Acknowledgements

Valpak Limited would like to thank the following organisations for their contributions to the plastic PackFlow project:

- The Advisory Committee on Packaging (ACP)
- The British Plastic Federation (BPF)
- Berry Plastics (Amcor)
- Flexographic Industries Association
- Natural Resources Wales
- The Packaging Federation
- Plastics Europe
- Recycling of Used Plastics Ltd (RECOUP)
- The Recycling Association
- The Scottish Environment Protection Agency (SEPA)
- The Scottish Government
- Wastepack
- The Waste and Resources Action Programme (WRAP)
- Zero Waste Scotland (ZWS).
- Eurokey
- Incpen
- 360 Environmental Ltd

1. Introduction

1.1. Background

The Plastic PackFlow 2025 – Methodology Review report has been produced to provide industry, governments, and other stakeholders with evidence to better understand the impact that regulatory changes have had on the flow of plastic packaging within the UK market.

Since the publishing of The PackFlow Refresh 2023 Plastic report[21] there have been significant regulatory reforms within the UK with the implementation of Packaging Extended Producer Responsibility (pEPR)[22]. These regulations reformed the way in which packaging producers report their data as well as placing responsibility on producers to cover the full lifecycle cost of packaging waste, e.g., collection, recycling, and disposal if they are the brand owner, importer of unbranded, or online retailer selling into the UK. The thresholds for obligated organisations were lowered from a turnover of >£2 million and >50 tonnes of packaging handled to >£1 million and >25 tonnes of packaging handled, subsequently making many more organisations obligated to report on their packaging.

In terms of reporting, large organisations are required to submit their packaging data biannually (small producers annually) via the Report Packaging Data (RPD) portal. Previously obligated producers were only required to make an annual submission.

There have also been significant changes to how packaging data is reported, whereby producers are required to report on their own branded packaging and any unbranded packaging that is imported into the UK. Previously, obligated organisations reported on the total amount of packaging handled across the various stages of the packaging supply chain, e.g., import, raw material, conversion, packing/filling, and selling.

These changes in reporting have meant that the historical methodology for calculating the flow of plastic packaging within the UK market has needed to be adapted.

The EPR Plastic PackFlow 2025 outlines any changes made to the methodology used in previous PackFlow reports, as well as updating the baseline year to 2024 for estimates of plastic packaging material placed on the market (POM) (from 2023, 2019 & 2017)[23].

To support Governments and other industry stakeholders in their packaging policy work and assist other industry stakeholders, this report focuses on generating robust estimates of UK plastic packaging placed on the market (POM) that are as accurate as is reasonably possible.

1.2. Objectives

The EPR Plastic PackFlow 2025 project for plastic packaging has the following key objectives:

- Provide updated (and cross-checked) baseline estimates of plastic packaging placed on the UK market in 2024, by packaging format, polymer type, sector and source:
  - Format (bottles, PTTs, film, etc.);
  - Polymer type (PET, HDPE, PP, PS, etc.);
  - Sector (consumer, non-consumer); and
  - Source (handled by obligated producers who are registered, non-obligated producers, or free riders).
- Identify scheme administrator submissions
- Outline any updates to the methodology necessary to adapt to the regulatory changes.

[21] *PackFlow Refresh 2023 Plastic - Packflow*
[22] *Extended producer responsibility for packaging - GOV.UK*
[23] *The previous packaging material flows can be found at: PackFlow - UK Packaging Data & Recycling*

2. Methodology

As discussed within the introduction, due to regulatory changes, the methodology for calculating the plastic packaging POM has been adapted to accommodate these changes. Various methodologies were explored at each stage of the project; this section of the report shall review the various methodologies investigated and provide justifications for the methodologies used.

Other methodologies have been considered and discounted, such as waste composition analysis. Whilst this approach is valid, it has several significant limitations, relying on accurate data for:

- The composition of household waste;
- Waste arisings from local authorities; and
- Waste arisings and composition from commerce and industry.

The justification of the use of POM data over alternatives is provided in full in section 2.1.1 of Plastic PackFlow 2025[24]. An overview of how the POM tonnage is calculated for this project is provided below.

2.1. POM Methodology - Overview

The estimated plastic packaging POM was calculated using a bottom-up approach that referenced a variety of data sources on plastic packaging products placed on the market, combined with data gathering and industry estimates. The results of this method have been cross-checked against an assessment of the plastic packaging POM reported on the National Packaging Waste Database (NPWD) by obligated producers. The baseline year for data calculation is 2024.

2.2. POM Method (Bottom-Up Approach)

This approach built up the POM figure using a variety of components, based on the key sectors for plastic packaging, including:

- Plastic packaging around food/drinks/other groceries, including body care/clothing/DIY products, etc., as sold by supermarkets and other non-grocery retailers, sourced from the Environment Agency and Valpak's EPIC database[25];
- Plastic packaging around food/drink as consumed in the hospitality sector, sourced from Valpak's EPIC database[25];
- Plastic packaging discarded by retailers back of store, has been calculated using data provided by plastics recyclers, who provided data on the quantities and type of waste (predominantly plastic film from case and pallet wrap) collected back of store for their retail customers. These figures have then been scaled to represent the tonnage POM in 2024 using market share information.
- Plastic packaging used by the construction industry, based on secondary research sources, such as the CuSP[26], Alliance for Sustainable Building Projects (ASBP) ZAP projects[27], BRE Smartwaste Portal and CITB[28] research analysing the spend within the construction centre and amount of plastic packaging POM in the UK. This methodology has been updated from the methodology used within the previous PackFlow reports.

[24] https://packflow.co/blog/packflow-report/uk-plasticflow-2025-packaging-recycling-report/

[25] *The database is based on information collected direct from suppliers as well as information sourced internally, meaning that it holds a wide coverage of information across multiple product ranges. Product specific data collection is completed through site visits, supplier mailings and weighing in-house (purchasing product and collecting used product from staff). All data goes through a comprehensive checking process on receipt and is stored in Valpak's bespoke software Environmental Product Information Centre (EPIC).*

[26] New research reveals soaring rates of plastic waste from UK construction • CuSP

[27] Vital toolkit published to reduce avoidable packaging waste in the construction industry – The Alliance for Sustainable Building Products

[28] csn-uk-full-report-final.pdf

- The methodology to update the plastic packaging used in the 'manufacturing and other' industry has been updated from previous PackFlow reports. The POM calculated in Plastic Flow 2025 has come from the UK governments waste statistics of waste arising within the C&I sector for 2023[29]. These figures were then scaled to represent the tonnage POM in 2024 by applying the change in the UK Manufacturing Index between 2023 and 2024.

- Plastic packaging used in the agricultural sector has been based on multiple methodologies using data reported within the Non-Packaging Agricultural Plastic (NPAP) report[30], the UK Food & Agri Organisation (FAO)[31] and APE Europe[32]. The methodology used has been updated from the methods used in previous PackFlow reports.

2.3. POM Cross-check (EA Obligated Tonnage)

With the introduction of Extended Producer Responsibility, RPD pEPR Reported Packaging Data has now replaced the previous NPWD data in which packaging submissions were split according to Raw Material Manufacturing, Conversion, Packing/Filling, and Selling totals. Therefore, the prior POM cross-check methodology, which used Net Pack/Fill[33] is no longer possible.

The switch to the new EPR reporting system has had a major impact in how packaging data is reported. The new system has switched from a shared producer responsibility to a single point of compliance. In theory, more packaging should now be getting fully reported as only one company now reports the packaging it handled.

Therefore, by looking at the total figures reported for household and non-household items, the total amount of obligated packaging going onto the UK market can be identified. However, some packaging is no longer reported, like exported packaging. It is also now more difficult to observe major activity changes between current and previous compliance years as only the total tables are now reported.

These reporting changes have meant that the previous PackFlow methodology can no longer be used, whereby the total packaging tonnage POM was quantified by calculating the net Pack/Fill. The calculation that was applied is laid out below for reference:

Net Pack/ Fill	=	Packing/Filling Table 1 - pack/filling	+	Imports Table 3A - imported for selling	+	Imports Table 3B - packaging removed from around imports	-	Exports Table 2A + Table 2B – pack/filling

This calculation effectively reported the total amount of packaging around packed products supplied by both filling companies in the UK and importers of goods in packaging and minimised risk of the same packaging being counted more than once within the flow figures.

Another major change has been the removal of SME Allocation Method under the new reporting system. Obligated companies with turnover > £5 million and < £2 million turnover and handling less than 50 tonnes of obligated packaging had the option to base their obligation on the predominant material of packaging supplied and receive a fixed obligation with reduced administration fees. The obligation requirements for small companies has now reduced to those with a turnover >£1 million and handling >25 tonnes of obligated packaging. Companies in the new small producer category are now required to register and provide data on an annual basis, meaning that more packaging should now be captured within reporting.

Valpak's calculations now use the pEPR Reported Packaging Data for 2024 submissions to reflect obligated packaging POM in 2024. At the time of analysis, the latest available report (2nd June 2025) was downloaded and used to determine obligated tonnage.

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[29] UK statistics on waste - GOV.UK
[30] Summary of responses to consultation on proposals on non-packaging agricultural plastics published - GOV.UK
[31] openknowledge.fao.org/server/api/core/bitstreams/d1b18314-562a-48bc-83d6-90610cdd6257/content
[32] Assessment of agricultural plastics and their sustainability: A call for action
[33] *The prior calculation used for Net Pack/Fill is included in Appendix II for reference.*

The difference between reported packaging data and Valpak's calculated POM total tonnage is typically an indicator for the amount of packaging that goes un-registered, either due to not meeting the packaging submission threshold (non-obligation or "*de-minimis*") or due to not reporting obligated tonnages (free-riding).

The 2024 sales year is the first full set of packaging data available under the new reporting system that is suitable for this project's analysis. It is expected that the introduction of EPR will lead to the reduction of the total *de-minimis*, however, during this relatively early implementation phase of the new packaging submission system, it is expected that reported packaging data will likely include inaccuracies such as double-counting of packaging handled.

As companies get more used to reporting requirements, data accuracy should be expected to improve.

2.4. Consumer Plastic POM Methodology

2.4.1. Consumer (Grocery) POM

In order to estimate the amount of plastic packaging placed onto the market in the retail grocery sector, data from Valpak's Environmental Product Information Centre (EPIC) database was extracted, which included packaging weights and annual product sales for all relevant products packaged in plastic. To ensure the assessed data was representative of the general market, data was taken from a selection of Valpak's supermarket clients, forming a cross-section of grocery retailers in the UK. Using market share information from Kantar World Panel for these supermarkets, totalling approximately 62% of the grocery retail market by value in 2024, the extracted client data was then scaled up to 100% for an estimate of the total UK grocery retail market.

This methodology improves on previous years, when in 2022 the supermarket data made up 46% of the grocery retail market, and in 2019 the data made up 43% of the grocery retail market. Scaling up from this subset of data to the total market assumes that our sample is representative of other retailers not included in the dataset.

2.4.2. Consumer (Non-Grocery) POM

In order to scale the non-grocery retail sector to represent the UK retail sector, including grocery retail, the Office of National Statistics (ONS) retail figures were used[34]. The ONS retail figures show the proportion of grocery spend to total UK retail spend as 43% in 2024.

Scaling the plastic tonnage POM within the UK non-grocery retail market using the ONS spend and the grocery retail market tonnage is not considered robust, since it is likely that plastic packaging usage in the grocery and non-grocery sectors is very different in terms of polymer and format.

Instead, the non-grocery retail sector total was determined using the total packaging tonnage from sales and purchases data of Valpak clients in the non-grocery retail sector (excluding petrol retailers from the sample) along with their reported turnover and ONS retail sales data.

The analysis involved the following key stages:

- Calculation of non-grocery packaging POM (tonnes) per billion-pound retail sales by:
    - Identification of non-grocery retail members within Valpak's membership and extraction of tonnage handled, detailing per business:
        - Retail sales data (turnover); and
        - Total (non-grocery) packaging POM
    - Calculation of the tones per billion-pound spend of the Valpak membership sample by dividing the total plastic tonnes POM by the sum of reported turnovers.
    - Calculating the total non-grocery tonnage POM by multiplying the total non-grocery retail spend (excluding automotive fuel) from ONS retail spend figures by the tons per billion pounds from the Valpak Sample.
    - To account for back-of-store packaging, back-of-store waste (transit packaging) has been deducted from the non-grocery retail POM. The back-of-store tonnage is represented within the non-consumer sector calculation.

[34] Retail Sales Index - Office for National Statistics

To avoid double-counting for those members that sell products predominantly through concession stores, only the turnover and packaging associated with sales through their own stores have been taken into account for this calculation. This has been calculated by comparing the total amount of packaging handled with their previous tonnage declared within their 2024 packaging submission under the old Producer Responsibility Obligations (Packaging Waste) Regulations 2007.

This is an amended version of the methodology used within the previous pack flow reports due to the changes in EPR packaging reporting. Previously, the total non-grocery packaging POM was calculated using the 2022 packaging submissions of Valpak compliance members in the non-grocery retail sector. Due to changes in reporting, this tonnage is now calculated using sales/purchase data for Valpak data service customers and the associated packaging weights that are held within Valpak's EPIC database.

2.4.3. Consumer Plastic Packaging Composition Breakdown

To provide a breakdown by format and polymer of consumer plastic packaging, supermarket packaging composition was used as a proxy for grocery packaging, but only the non-grocery categories of supermarket packaging (around toys, electrical, clothing, etc.) were used as a proxy for non-grocery packaging. This follows the same methodology as Plastic Flow 2023.

In addition to non-grocery items, a certain quantity of drinks are sold through non-grocery retailers, although far less than is sold than through supermarket groceries. For example, drinks are sold in shops such as Boots, Poundland and WHSmith, and milk is also sold direct to consumers from farms and through doorstep delivery[35]. Allowances have been made for these non-grocery drinks sales in the non-grocery composition. For further details on drinks composition, please see section 3.8.1.

2.5. Non-Consumer POM Methodology

2.5.1. Hospitality/Wholesale

Hospitality plastic packaging is plastic packaging that is primarily 'household-type' but is consumed in pubs, cafés, hospitals etc. It includes primary, secondary, and tertiary packaging found at wholesale back of store in associated distribution centres. The household-type packaging is generally similar in type to that consumed at home but may not be collected by a local authority for recycling or disposal, and includes some non-household type packaging such as large tubs and buckets used for items such as oils and sauces.

Previous PackFlow estimates for the quantity of plastic packaging (film and rigid) used in the wholesale & hospitality sector were calculated using Valpak EPIC data from clients in the Foodservice & Catering sector[36] (including Delivered Foodservice and Cash & Carry). Market share information for the companies in the sample was then used to scale the resulting tonnage to the total Foodservice & Catering sector. Wholesale sector market values[37] were then used to scale the Foodservice & Catering sector tonnage to the entire Wholesale & Hospitality sector.

More recently, the methodology has been amended slightly to reflect updated market share information pertaining to relevant companies within the sample. In 2019, stakeholder feedback indicated that the Foodservice & Catering sector made up approximately 85% of the wholesale & hospitality industry, so this percentage has been used.

Coffee Shops

Most coffee shops buy milk cartons and pouches direct from suppliers, and as a result the packaging associated with them will not be accounted for within the other wholesale calculations. To determine how much plastic was used in coffee shops, first the number of takeaway coffee cups placed onto the market in 2024 was obtained from Valpak internal data. The proportion of coffees sold in sit-in vs takeaway settings[38] was used to extrapolate the takeaway cups figure to coffees sold for consumption sitting in a coffee shop. The most commonly

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[35] *Milk supplied through these routes is outside of traditional grocery and non-grocery retail and therefore would not be captured by the grocery calculations or non-grocery calculations and must instead be calculated separately.*
[36] *Valpak's EPIC database holds sales data and packaging weights information for clients signed up for the fully managed service.*
[37] *https://retailanalysis.igd.com/presentations/presentation-viewer/t/uk-grocery--foodservice-wholesaling-2019-sector-performance--statistics/i/9027*
[38] *https://www.statista.com/statistics/586162/coffee-shop-and-sandwich-bar-usage-in-the-uk-sit-in-or-take-away/*

consumed coffee type[39] was used to calculate the average coffee size and from this, the average amount of milk per coffee was determined. The total number of coffees sold (both in-store and takeaway) was combined with the average milk per coffee to determine the total volume of milk used in litres.

To establish how much milk is sold in plastic, evidence from Dairy UK[40] was used which stated that 88% of milk consumed in the UK is sold in plastic. A 2020 Eunomia report[41] assessed businesses that sold hot drinks and found 20% used lower packaging milk options. Therefore, an 80%/20% split was assumed for milk sold in plastic HDPE bottles vs 20% in LDPE pouches. This was used to calculate the amount of milk sold in bottles vs pouches. Finally, the average weight of a 2L milk bottle and a LDPE milk pouch was obtained using Valpak EPIC data. The total milk sold was multiplied by the appropriate packaging weights to determine how much plastic was associated with milk sales in coffee shops.

2.5.2. Retail Back-of-Store

The methodology for calculating the plastic packaging disposed of back of store has been updated from previous PackFlow reports. Previously, data was derived from surveying retailers, with data collected representing 18% of the grocery retail market. For this report, initial data was gathered from waste management providers, who provided Valpak with the quantities and breakdown of waste collected from the back of store for their customers, representing 57% of the total grocery market[42]. For some organisations, those operators who responded do not manage 100% of their back-of-store waste or data sets were unavailable, so the market share percentages were adjusted to account only for the packaging data collected/supplied. Taking this into account, the supermarket market share represented within the sample equated to 47%.

The tonnage collected was then scaled using market shares to represent the total UK grocery sector.

To calculate the packaging generated back of store within the non-grocery sector, Valpak were provided with the tonnage and packaging composition for the back-of-store waste collected at a number of non-grocery retail stores. Tonnage was scaled to represent the total UK non-grocery market by first finding the UK turnover for each retailer. The tonnes per £billion spend for these organisations was then calculated by dividing the total tonnage collected by their turnover. To scale to the total UK non-grocery sector, the tonnes per £billion turnover was multiplied by the UK non-grocery spend[43].

This was deemed a more accurate methodology due to the increase in sample size used compared to previous pack flow reports.

2.5.3. Construction and Demolition

The methodology for determining the amount of plastic packaging in the C&D sector has been updated since 2022 to provide a range rather than a single definitive number due to the limited availability of data in this sector. The lower range boundary is determined using a new methodology, whereas the higher range boundary uses an updated version of the 2022 methodology.

The lower range boundary was attained using multiple secondary sources, most notably the CuSP's research into the rising rates of plastic waste in UK construction from 2004 to 2018. The report finds that UK construction produced 98,000 tonnes of plastic waste in 2018[44]. Of this plastic waste, 64% can be assumed to be packaging according to the Alliance for Sustainable Building Product's 2023 ZAP project , putting the total amount of plastic packaging waste in 2018 at 62.7k tonnes. Total construction sector spending was used as a proxy for sector growth to scale this figure to the relevant year. Spending increased by 16% from 2018 to 2024, according to the CITB (from £166 billion to £192 billion), setting the total amount of plastic packaging waste in 2024 to 72.5k tonnes.

The lower range boundary was sense-checked using CuSP's data to determine that an average 0.04t of plastic packaging are generated for every £100k spend. When applied to 2024's total spending figure, this results in 76.8k tonnes of plastic packaging. An average of the two totals sets the lower boundary at 74.7k tonnes.

[39] https://www.bluecoffeebox.com/blogs/learn-blue-coffee/the-uks-most-popular-coffees
[40] https://commiittees.parliament.uk/writtenevidence/102479/pdf/
[41] https://www.citytosea.org.uk/wp-content/uploads/2020/11/Food-To-Go-Report.-City-to-Sea.-2020.pdf
[42] Grocery Market Share
[43] Retail Sales Index - Office for National Statistics
[44] New research reveals soaring rates of plastic waste from UK construction • CuSP

The higher range boundary was determined based on a 2014 review of the BRE Smartwaste Portal, showing that 0.3 tonnes of packaging are generated per £100k spend in the construction sector. When applied to the 2024 spend figure mentioned above, this results in 576k tonnes of packaging. An internal survey of UK construction companies found that an estimated 15% of packaging used in the sector is plastic, which puts total plastic packaging in 2024 at 86.4k tonnes. This figure was sense-checked by scaling 2022's total figure using the 3% spending increase from 2022 to 2024 (from £186 billion to £192 billion), resulting in 86.7k tonnes. An average of the two totals sets the higher boundary at 86.6k tonnes.

The total amount of plastic packaging in the C&D sector in 2024 ranges from 74.7k tonnes to 86.6k tonnes, with an average of 80.6k tonnes, or 4% lower than in 2022.

2.5.4. Agriculture

Estimates of packaging tonnages used in agriculture vary widely. This appears to be for a number of reasons: firstly, most estimates of agricultural plastics tend to focus on Non-packaging agricultural plastic (NPAP) such as silage wrap, mulch films, polytunnel plastic and the like[45]. Secondly, many sources rely on old data, such as the survey responses generated by the Agricultural Waste Plastics Collection and Recovery Programme in 2006[46], at a time when burning of agricultural plastics was made illegal in England and Wales in 2006[47]. As a result, figures are either out-dated or calculated using NPAP tonnages as a proxy.

With this in mind, multiple different tonnage estimates were derived for agricultural packaging placed onto the market in the UK. The methodologies considered are detailed as follows:

Methodology 1

The first method used a 2010 DEFRA report[48] on Non-Packaging Agricultural Plastic sold in the UK, based on a summary of responses from businesses, trade associations and local authorities. This report states that 45,000 tonnes of NPAP were sold in the UK. In 2021, UN Food & Agricultural Organisation (FAO) report[49] (citing 2019 APE Europe data[45]) stated that the proportion of NPAP used in Europe is 41% of total, and packaging plastic is 59% of total. Therefore, the 45,000 tonnes of NPAP can be used to determine a total agricultural packaging plastic figure of 64.7k tonnes.

This methodology assumes that the UK is representative of the 41%/59% split across Europe.

Methodology 2

A second methodology used the UN FAO report (citing 2019 APE Europe data[45]) which stated that 710 k tonnes NPAP were used in agriculture across the whole of Europe. Using the figure from the same report that NPAP is 41% of all agricultural plastics, this gives a total agricultural packaging plastic figure of 1,021 k tonnes for the whole of Europe. A 2017 infographic from France's Ministry of Agriculture & Food Sovereignty[50] says the UK is approximately 7% of European agricultural production (based on billions of Euros spend in 2016). Scaling the total European agricultural packaging plastic down to the UK by 7% gives a total agricultural packaging plastic figure of 71.5k tonnes.

This methodology assumes that spend in Euros is reflective of plastic packaging usage in agriculture.

Methodology 3

In an effort to find the most up-to-date sources on agricultural plastics, a 2023 report from the Environmental Investigation Agency (EIA) was considered[51], which stated that 135,500 tonnes of agricultural plastic waste are produced each year in the UK, citing a CIWM webpage[52] providing a figure of 32,000 tonnes plastic packaging waste. Upon further investigation, the CIWM figures appear to be referring to the same 2006 Agricultural Waste Plastics[46] figures discussed earlier, therefore this methodology was discounted in favour of more up-to-date sources.

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[45] Statistics - APE Europe
[46] [ARCHIVED CONTENT] Agricultural Waste Plastics Collection and Recovery Programme
[47] The Waste Management (England and Wales) Regulations 2006
[48] Summary of responses to consultation on proposals on non-packaging agricultural plastics published - GOV.UK
[49] Assessment of agricultural plastics and their sustainability: A call for action
[50] Infographics - The European union, the world's largest agricultural producer | Ministère de l'Agriculture, de l'Agro-alimentaire et de la Souveraineté alimentaire
[51] EIA_report_0208.qxd
[52] https://www.ciwm.co.uk/ciwm/knowledge/agricultural-waste.aspx

Final Estimate

Methods 1 and 2 were chosen to calculate the estimated total tonnage for agricultural plastic packaging. Taking the average of Method 1 (64.7 k tonnes) and Method 2 (71.5 k tonnes) gives an estimated total POM of 68.1 k tonnes.

Due to the scarce nature of robust data on agricultural plastic packaging, the estimated total is not associated with a particular year, but is considered to be the most up-to-date estimate based on the available data.

2.5.5. Manufacturing and Other

The manufacturing sector includes the following sub-sectors[53]:

- Food, drink & tobacco;
- Textiles/wood/paper/publishing;
- Power and utilities;
- Chemicals/non-metallic minerals manufacturing;
- Metals manufacturing;
- Machinery & equipment (other manufacturing);
- Transport & storage; and
- Other Services.

The rigid packaging element of C&I Manufacturing and Other was the focus of a dedicated project undertaken by WRAP and Valpak in 2015. Manufacturing industry's plastic packaging usage is notoriously difficult to quantify, and the Plastic Flow 2014 project failed to provide a robust estimate for the sector.

To calculate the waste generation change within the industry, the UK government's UK statistics on waste have been used[54] to provide an update on the manufacturing and other tonnage. In PackFlow 2022, UK industry waste figures were used to calculate a likely change over time to project forwards from previous PackFlow estimates. For this iteration, the methodology was updated in an attempt to provide a more robust calculation.

The UK government provides waste statistics for the C&I sector for the UK[54], however these data points are only available up to 2020. Additionally, figures exist for England only up to 2023. Therefore, in years where data was available for both England and the UK, the average percentage for England's waste arisings as a proportion of the UK was calculated (83%). This percentage was used to estimate the UK waste arisings for 2021-2023, where data was only available for England but not the whole UK. The UK C&I waste arisings for 2023 were used as a proxy for total waste generated by the manufacturing industry. In PackFlow 2017, it was estimated that 0.96% of manufacturing waste is plastic packaging. This was applied to the total UK waste arisings to obtain an estimate for 2023. To obtain a final waste estimate for 2024, the UK Manufacturing Index[55] was used to determine the industry's growth from 2023 to 2024. Applying this percentage (1.0073%) gives an estimated 381.6k tonnes plastic packaging placed onto the market in 2024.

UK manufacturing statistics[56] show minimal change in manufacturing output in recent years, and so the material split estimated in Pack Flow 2019 and 2022 report have been assumed to be still relevant. Previously, members of the steering group felt that any increase in plastic packaging usage would be largely offset by downgauging. The rigid- and flexible- plastic split is therefore estimated at 272k tonnes and 109k tonnes respectively.

[53] *Commercial and Industrial Waste Survey 2009: Final Report. Defra, 2010.*
[54] *https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste*
[55] *https://commonslibrary.parliament.uk/research-briefings/sn05206/*
[56] *https://commonslibrary.parliament.uk/research-briefings/sn01942/*

2.6. Data Robustness Check (Qualitative Error Margins)

A Red-Amber-Green (RAG) framework was developed to provide an indication of the relative robustness of each methodology used for calculating the total plastic packaging POM. The RAG ratings are intended to support the interpretation of the data methodologies rather than serve as a statistical measure of confidence.

Each methodology was assessed against a defined set of qualitative questions related to the robustness and completeness of the data sets used, as well as the degree of stakeholder agreement around the findings. To promote consistency and standardise the categorisation process across this analysis, questions were assigned numerical scores. These scores were aggregated to generate a maximum score of 36. The scoring range of 0 to 36 was divided equally to provide the RAG classifications.

Further details of the Robustness assessment method can be found in Appendix I.

Table 6: Relating Robustness Scores to Indicative Margins of Error

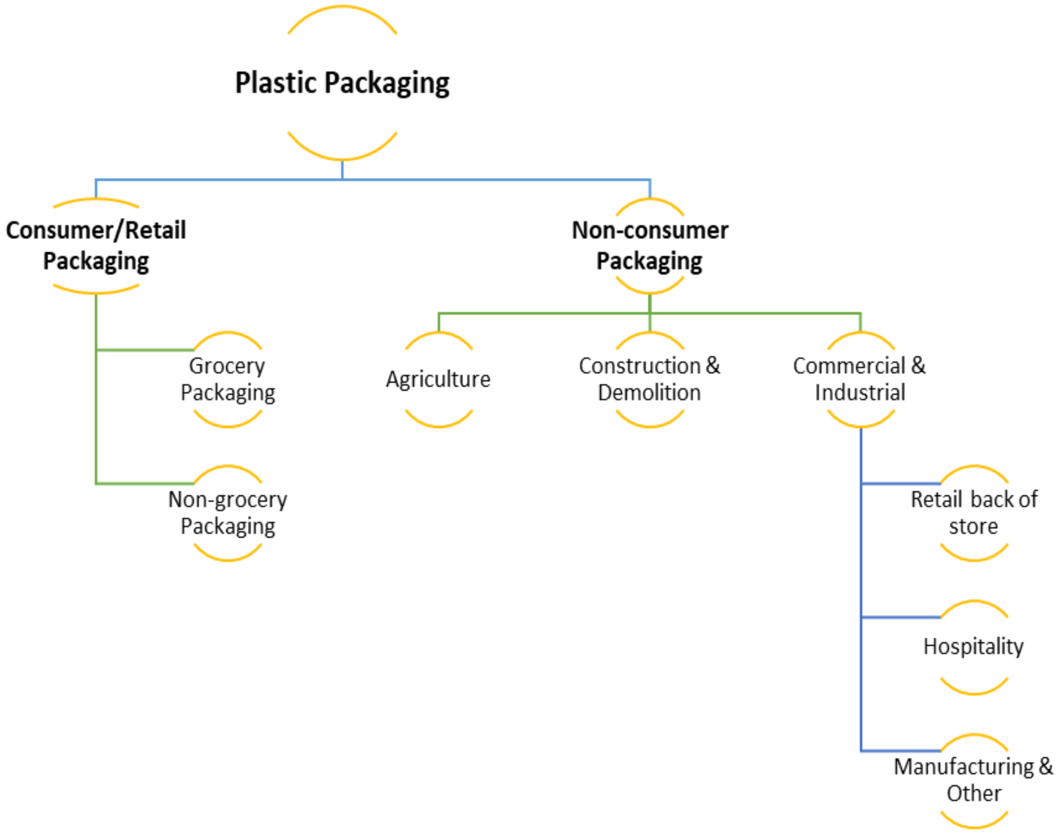
RAG Rating	Score Threshold
Green	25-36
Amber	13-24
Red	0-12

3. Plastic Packaging POM

3.1. Introduction

This section of the report provides an explanation of the method used to review the total plastic packaging POM in the UK in 2024. This method splits the POM into different elements and builds a picture from the bottom to the top. The key elements are shown in Figure 2.

Figure 2: Plastic Packaging POM - Sector Breakdown



Packaging is considered plastic if plastic is the predominant material by weight in a composite[57].

3.2. Consumer POM

3.2.1. Grocery Retail

The plastic packaging in the grocery retail sector was estimated to be 964k tonnes in 2024. This represents a 3% increase on the consumer grocery retail figures identified for 2022 of 938k tonnes using the same methodology. This increase is broadly in line with inflation and population increase, however it should be noted that there may be minor influences caused by differences in selection of supermarket clients for the 2024 data subset which may have a different plastic packaging composition than the supermarkets chosen in previous years.

[57] The EA definitions of composite and multi-layered packaging are defined in, the 'Agreed position and technical interpretations – producer responsibility for packaging'. Composite packaging is: 'multi-layered sheets of dissimilar materials which are bonded together and cannot be separated by hand', such as laminated paperboard, whereas multi-material packaging is: 'packages constructed of assembled components of different material', such as a blister pack made from cardboard and plastic and can be separated by hand. Within the technical interpretations guidance, the packaging weight for laminate packaging 'should be recorded under the predominant material by weight', compared to multi-material packaging weights, which should be recorded separately, by the different component materials.

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In previous years, Environment Agency aggregated data has been used to sense-check the total tonnage POM for the grocery retail sector. In the two previous Packflow years (2022 and 2019), the EA data was used for the total POM figure due to the EA having a higher market coverage. However, due to the EA aggregated data no longer being available post-implementation of EPR, the EPIC data was used to determine the figure. The EPIC and EA data have generally been closely aligned and prior to Packflow 2019, EPIC has been used, due to a greater confidence in the quality of the data, greater detail of plastic packaging composition and its representation of the full grocery market. Therefore, the 2024 calculation reflects approved methodology from previous years, and the increased market share coverage of the EPIC data subset is thought to constitute an improvement on previous methodologies.

The final grocery retail plastic packaging POM estimate for 2024 of 964k tonnes was therefore used.

Appendix I provides a detailed assessment of relative levels of confidence in the data.

3.2.2. Non-grocery Retail

The plastic packaging POM within the non-grocery retail sector was estimated to be 354k tonnes in 2024. This is an increase of 7% on the consumer non-grocery retail figures calculated in 2022 with 329k tonnes.

As stated earlier within this report, the methodology for calculating the consumer non-grocery tonnage has been amended due to the changes in the EPR packaging reporting, with the tonnages now being calculated using sales/purchases data for Valpak members and Valpak's packaging database.

Appendix I provides a detailed assessment of relative levels of confidence in the data.

3.2.3. Consumer Total POM - Summary

In summary the following key steps were taken to estimate total consumer retail plastic packaging POM (consumer grocery retail + consumer non-grocery retail) in 2024:

Table 7: Total Consumer Plastic Packaging POM in 2024 Split by Grocery and Non-Grocery Retail

Total grocery plastic packaging flow in 2024 (see section 3.2.1)	964kt
Total non-grocery plastic packaging flow in 2024 (see section 3.2.2)	354kt
Total	1,318kt

Therefore, total retail plastic packaging flow in 2024 was estimated at 1,318k tonnes (green RAG rating[3]). This is a 4% increase on the 2022 estimate for consumer plastic packaging POM of 1,267k tonnes. This increase in plastic packaging could be down to a number of factors, such as an increase in population and the cost-of-living crisis. The increase in inflation has impacted the cost of goods for purchases across the grocery and non-grocery sectors, leading to consumers altering their purchasing habits to include items at a lower price point[58]. These items tend to be more likely to be packed within plastic packaging, contributing to the increase in plastic packaging POM.

3.3. Consumer Plastic Packaging Composition

The estimated composition of consumer plastic packaging in the UK is shown in Table 8.

[58] Competition, choice and rising prices in groceries

Table 8: Consumer Plastic Packaging by Format and Polymer, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Grand Total	
Bottle	123	0	5	9	181	4	1	0	**322**	*24%*
Film	9	103	70	92	32	145	0	1	**453**	*34%*
Other rigid	63	9	13	26	78	108	4	3	**305**	*23%*
PTT	2	0	3	0	163	66	3	0	**238**	*18%*
Total	**198**	**113**	**91**	**127**	**455**	**323**	**8**	**4**	**1,318**	
	15%	*9%*	*7%*	*10%*	*34%*	*24%*	*1%*	*0%*		

The category 'Other' includes elements of packaging such as caps & lids, toothpaste tubes, dispensers, blister packs and clothing hangers.

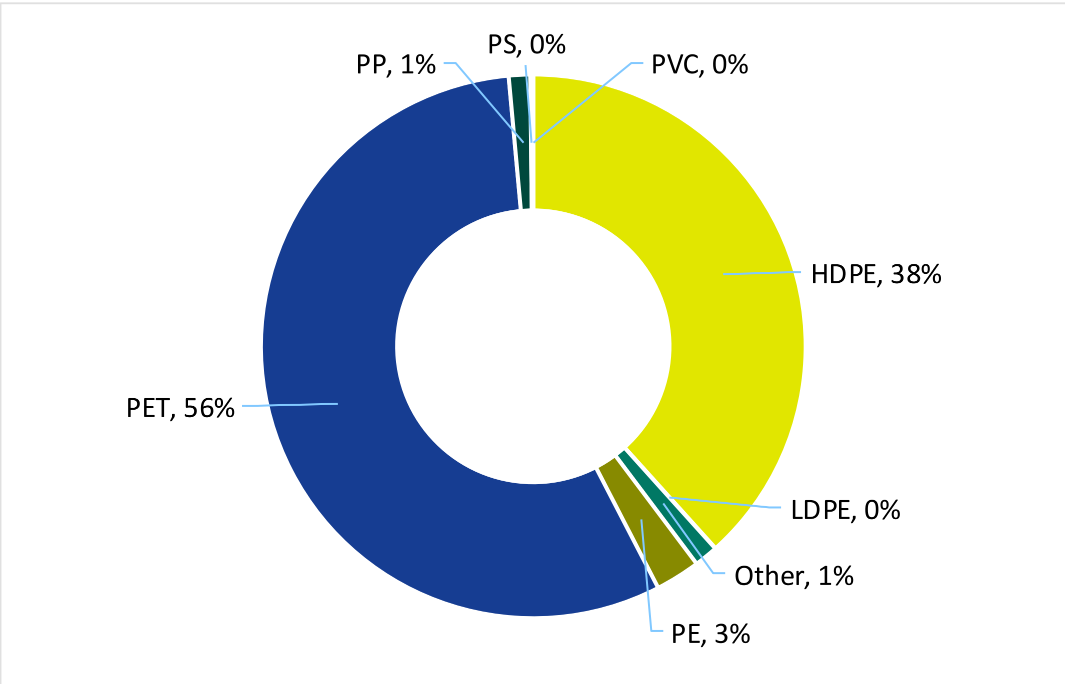
The estimated 2024 format splits differ from those estimated within the PackFlow 2024 project. The largest variances have come from bottles that have had a 15% increase and other rigid that have had a decrease of 14%. The polymer splits are comparable to those identified in 2024, with less than a 6% difference in each polymer aside from PET, which has seen an increase of 14%.

3.4. Consumer Plastic POM – Composition Breakdown

This section of the report breaks down the polymer splits within the consumer sector for each packaging type.

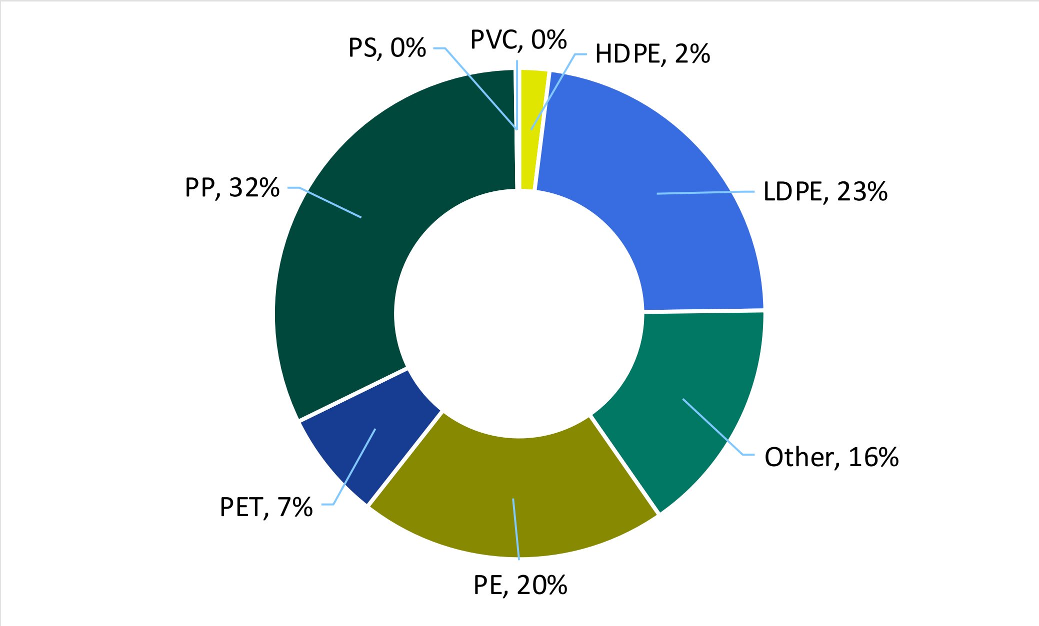
After interrogating and analysing data from Valpak's EPIC database, it is estimated that over half (56%) of bottles are made of PET by weight. The second most popular polymer is HDPE, constituting around 38% of bottles in the UK. Figure 3 shows the full polymer breakdown of plastic bottles sold within the consumer sector.

Figure 3: Consumer Bottle Polymer Split by Weight, 2024



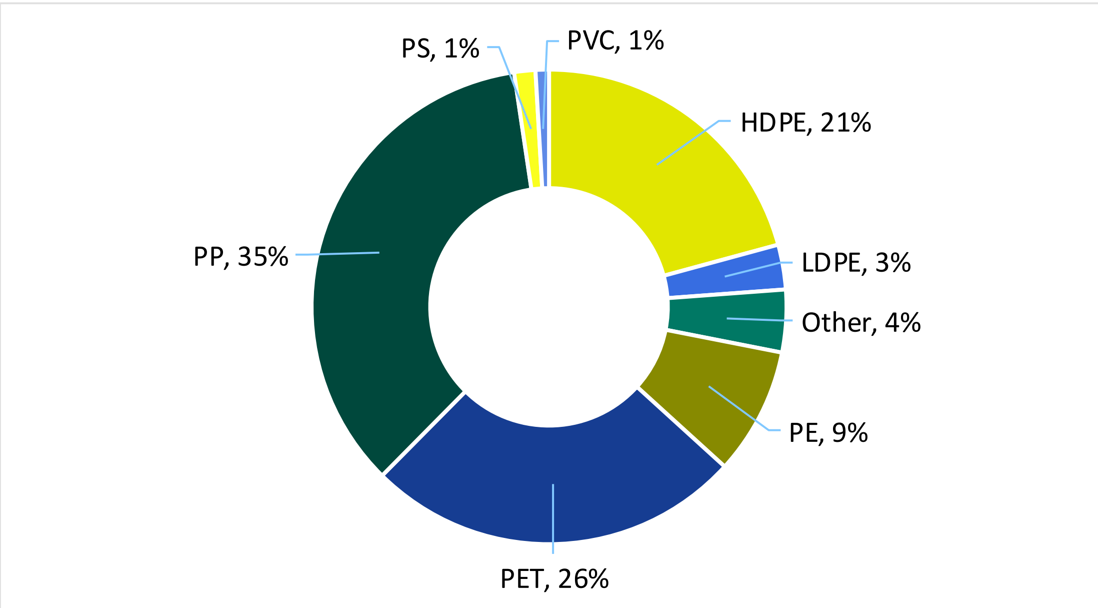
Within film, the most predominant polymer is PP at 32% by weight, closely followed by LDPE at 23%. The full polymer breakdown of film sold within the consumer sector is shown in Figure 4 below.

Figure 4: Consumer Film Polymer Split by Weight, 2024



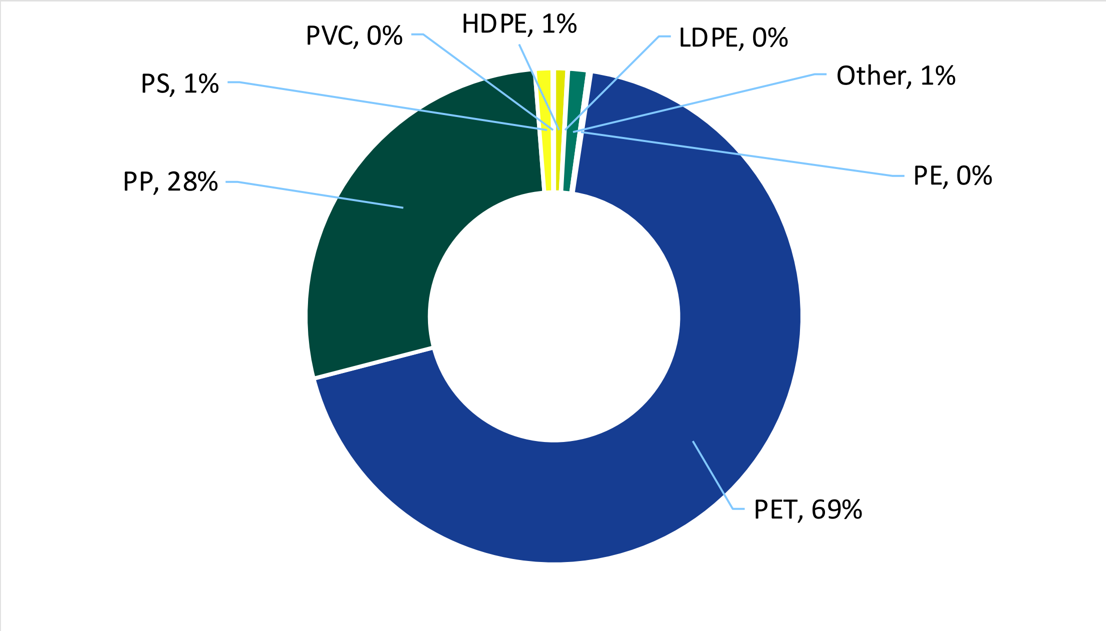
The other rigid category is made up of tubes, caps, dispensers/nozzles and the like. The predominant polymer types for this category is PP with 35% by weight, PET at 26%, closely followed by HDPE at 21%.

Figure 5: Consumer Other Rigid Polymer Split by Weight, 2024



It is estimated that over two thirds (69%) of PTTs are made of PET by weight. The second most popular polymer is PP, constituting around 28% of PTTs in the UK[59].

Figure 6: Consumer Pots, Tubs & Trays Polymer Split by Weight, 2024



Further interrogation of the database showed that over 25% of PET used in PTT is used to package fruit and vegetables. Fresh fruit/vegetables, fresh meat/fish, chilled ready meals, yoghurt pots, and cooked meat packaging account for just over half (51.4%) of all PTT applications. A full breakdown of the top 20 PTT product types is shown in Figure 7 below.

PET PTTs are considered 'less recyclable' because they are more brittle than bottle grade PET[60] even though PTTs are readily collected in the UK (~89% of LAs collect PTTs[61], an increase from ~88% in 2022[62]).

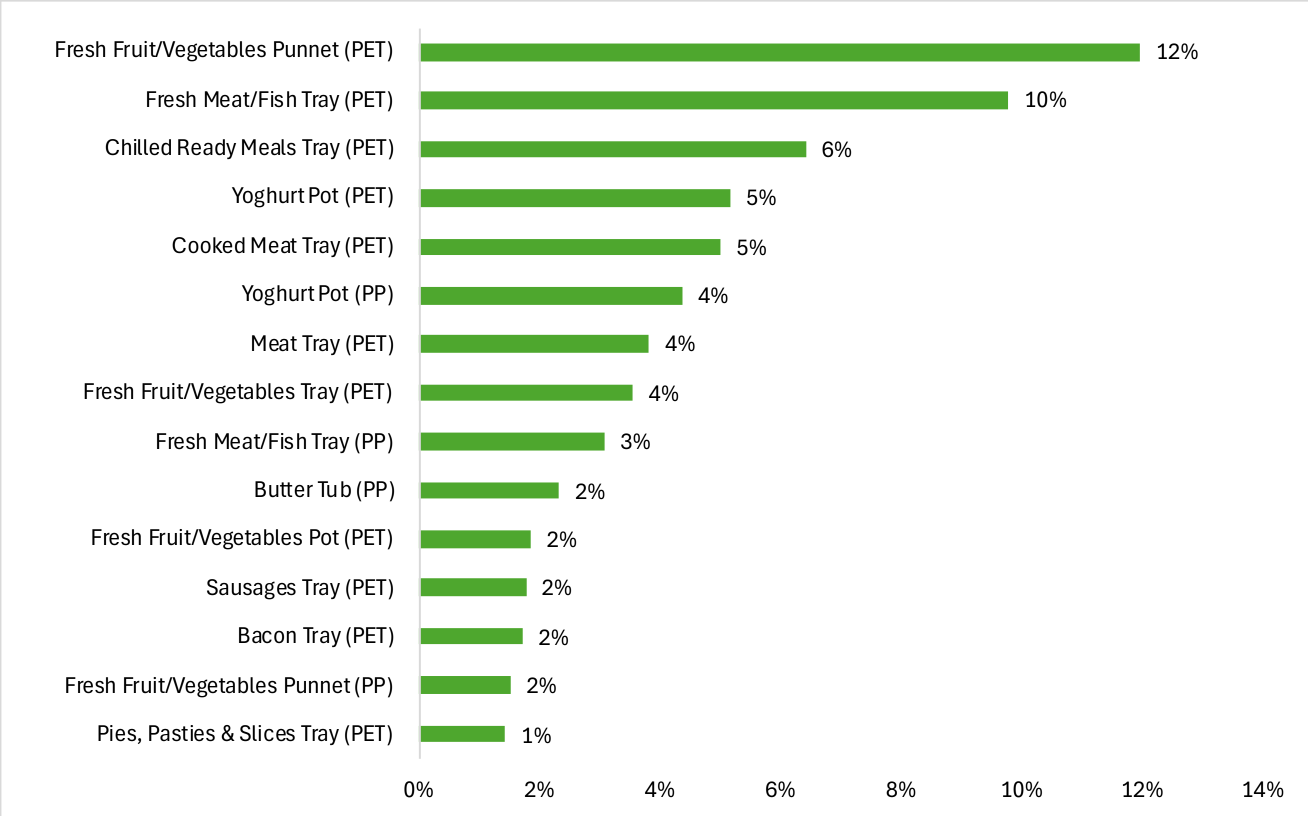
[59] *Polymer composition of PTTs as given in this analysis vary slightly from those provided in the overall POM composition table. This is due to the film element of PTTs (closures, lids, etc) being included as part of PTTs in this analysis, but being included within the film category of the overall POM composition table. Including the film element of PTTs in this analysis allowed for comparison with previous work undertaken.*

[60] *https://www.letsrecycle.com/news/latest-news/ptt-plastic-going-to-efw-recoup-claims/ and RECOUP Local Authority Plastics End Market Analysis (May 2019)*

[61] *RECOUP UK Household Plastics Collection Survey 2024*

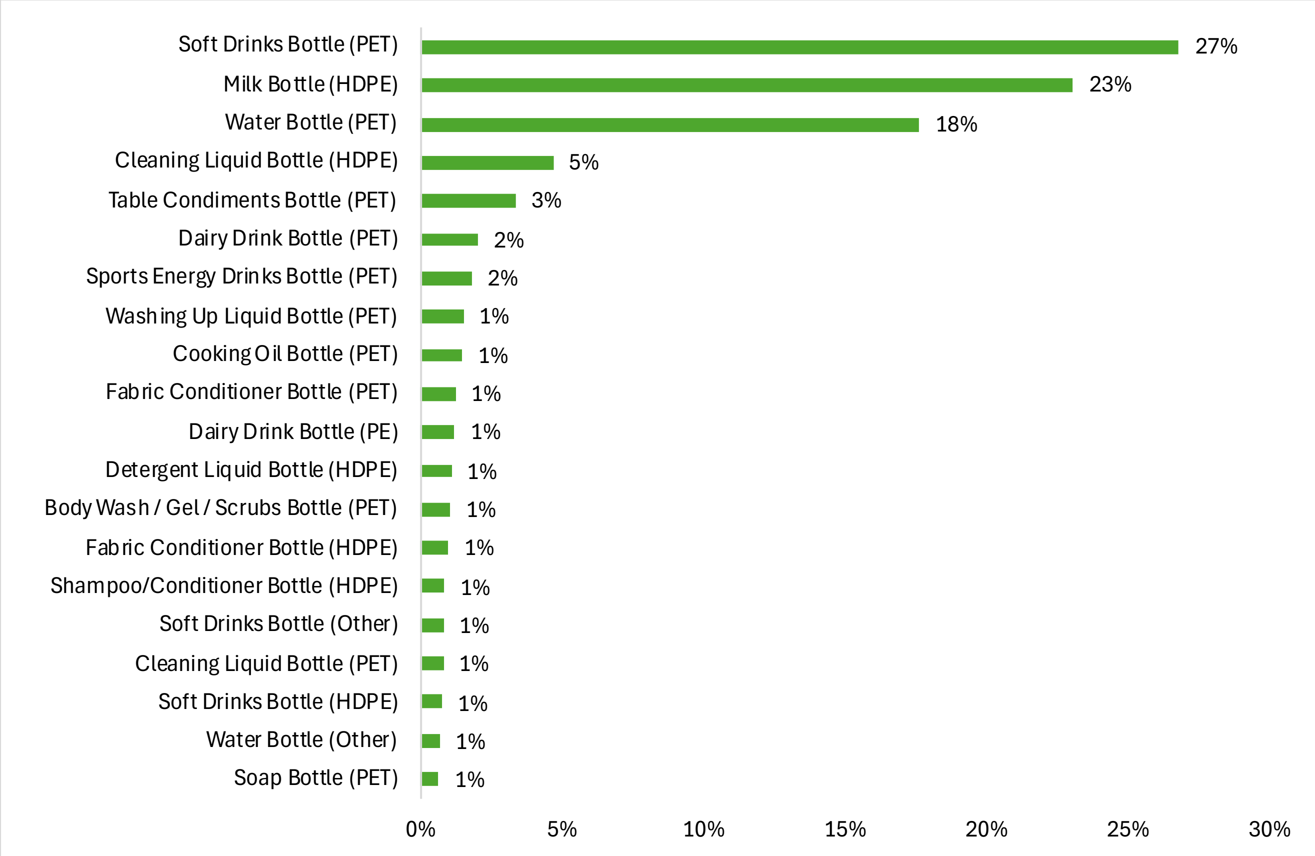
[62] *RECOUP UK Household Plastics Collection Survey 2022*

Figure 7: Key PTT Applications by Total Sales Weight, 2024 (%)



The same analysis was also performed on products packaged in plastic bottles. The largest proportion of plastic bottles sold (by weight) were for soft drinks and milk, with these two products alone responsible for over 50% of plastic bottle packaging. Additionally, PET water bottles made up 18% of all plastic bottles. The remaining top product types were cleaning liquid bottles (HDPE, 5%), table condiments (PET, 3%) and other household bottles such as sports drinks, detergents, and cleaning products. A full breakdown of the top 20 products is shown in Figure 8 below.

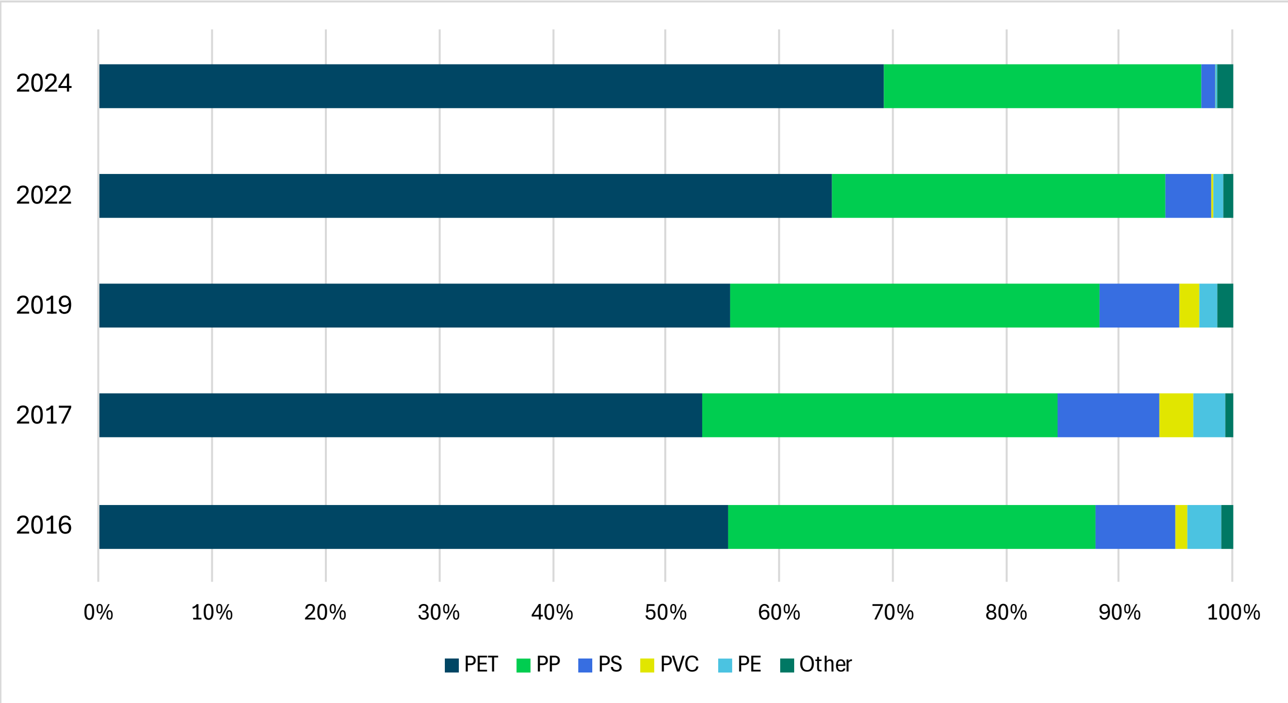
Figure 8: Key Plastic Bottle Applications by Total Sales Weight, 2024 (%)



3.4.1. Consumer PTTs – Polymer Switching Trends

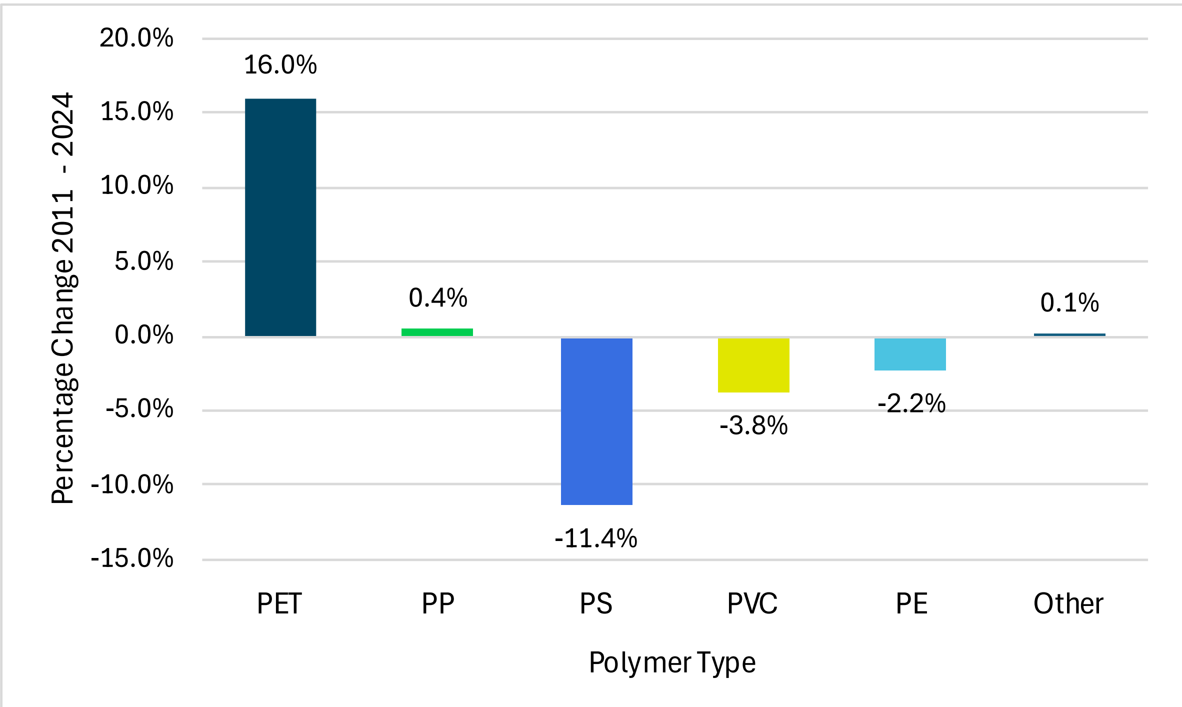
When comparing 2024 EPIC data to the previous four PackFlow snapshots (2016, 2017, 2019 & 2022), there is a reducing proportion of PS and PVC used in PTTs by weight. There is no data for 2018, 2020 and 2021 due to PackFlow typically being updated bi-annually. Additionally, PTT polymer usage within 2020 and 2021 was not seen as essential to this specific project.

Figure 9: PTT Polymer Split Snapshots, most recent packflow reports



Over the past several years, PTT have overwhelmingly moved towards the 'more typically recyclable' polymers, namely PET and PP. The prevalence of PVC and PS has decreased significantly since 2019.

Figure 10: Change in PTT Polymer Usage, 2011-2024



It is difficult to say from our dataset whether these changes represent switching from one polymer type to another, as factors such as light weighting may also have had an impact. Despite this, voluntary initiatives such as the UK Plastics Pact are likely have influenced polymer switching out of PS and PVC[63] in to polymers that are more likely to be recycled such as PET.

3.5. Consumer Grocery POM by Product Category

It was considered of interest to identify the plastic primary packaging POM used for key product categories. Valpak used part of its EPIC database, covering 62% of the UK grocery market, and assessed product categories by percentage of grocery sales[64]. The data presented in Figure 11 covers all plastic primary packaging attributed to each of the identified categories sold via the grocery market[65].

[63] *https://www.wrap.org.uk/content/eliminating-problem-plastics PS and PVC packaging are included in the list of eight problem plastics to be eliminated by the end of 2020, to feed into the UK Plastics Pact 2025 targets.*

[64] *Data included in the chart relates to the grocery market only, not total sales made to consumers or those made through the hospitality sector for example.*

[65] *This is a selection of categories of interest and does not account for all plastic primary packaging handled by the sector.*

Figure 11: Grocery Plastic Packaging POM by Category across All Formats, 2024 (percentage of total)

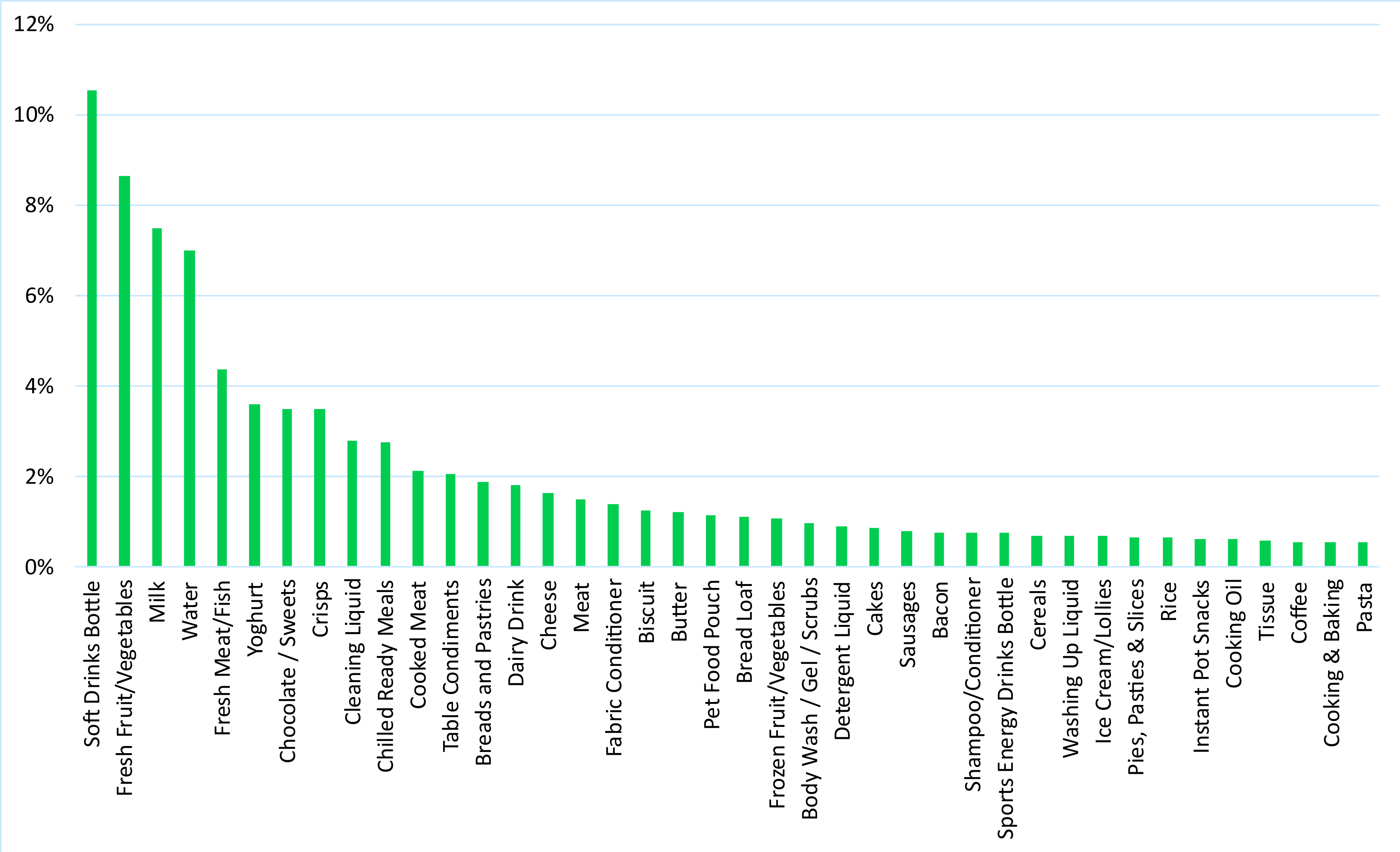


Figure 11 indicates that drink products (soft drinks, bottled water and milk) are among the largest contributors (26% in total) to plastic primary packaging POM by weight within the grocery sector, with fruit and vegetables and fresh meat packaging also significant contributors to the total tonnage (9% and 4%, respectively).

3.6. Non-Consumer POM

In order to avoid duplication between consumer and non-consumer packaging (i.e. including packaging within the non-consumer sector that has already been included in the consumer sector) non-consumer waste production is assessed using the bottom-up method[66].

The non-consumer sector is broken down into sub-sectors:

- Construction and demolition (C&D);
- Agricultural; and
- Commercial and Industrial (C&I).

3.6.1. Construction & Demolition

The project estimate for the construction sector is 81k tonnes (amber RAG rating). The film/rigid split identified in the WRAP/ Valpak 2011 plastics packaging composition study[67] has been applied to provide an indicative film (72k tonnes) and rigid (8k tonnes) packaging split. It is also possible to derive an indicative polymer split from the compositional study, as illustrated below:

Table 9: Indicative Composition of Plastic Packaging in C&D, 2024 (k tonnes)

Polymer	Format	% of Arisings	Approximate Tonnage	Film	Rigids
PE	Film	86%	69	69	-
PP	Pots	10%	8	-	8
HDPE	Pots & Bags	4%	3	3	-
Total			**81**	**72**	**8**

Appendix I provides a detailed assessment of relative levels of confidence in the data.

3.6.2. Agriculture

The film/rigid split identified within the Environment Agency's Agricultural Waste Survey (2003)[68] has been applied to provide an indicative film (52k tonnes) and rigid (16k tonnes) packaging split. It is also possible to derive an indicative polymer split from the compositional study, as illustrated below.

[66] *It is assumed that waste production is equal to POM in this case. An example would be where retailer sales is included within consumer but retail back of store waste within the non-consumer sector. The justification for assessing the POM in this way is included in section 1 of this report.*
[67] *http://www.wrap.org.uk/sites/files/wrap/Plastics%20Composition%202011%20Report.pdf*
[68] *https://webarchive.nationalarchives.gov.uk/ukgwa/20110407094734mp_/http://www.agwasteplastics.org.uk/media_files/Programme_docs/trial_6-7_web_summary.pdf*

Table 10: Indicative Composition of Plastic Packaging in Agriculture, 2024 (k tonnes)

Polymer	Format	% of Arisings	Approximate Tonnage	Film	Rigids
PP	Film	76.4%	52	52	-
HDPE	Bottles	11.9%	8	-	8
HDPE	PTT	11.8%	8	-	8
Total			**68**	**52**	**16**

Appendix I provides a detailed assessment of relative levels of confidence in the data.

3.6.3. Commercial & Industrial

For the purposes of this work, the commercial and industrial sectors were broken down into three key sub-sectors:

- Retail back of store
- Hospitality
- Manufacturing & other

Retail Back of Store

Valpak have assumed that the format of back of store packaging has remained similar as that inventoried within previous packflow reports. Therefore the packaging type and material compositions have been used. This resulted in 1k tonnes rigids and 92k tonnes film in 2024. In order to provide an indicative breakdown by polymer type, Valpak/Verde internal knowledge was used, resulting in a polymer split of 90% LDPE, 5% PP and 5% HDPE. For rigids, a simple 50:50 split was applied between the two most likely polymers of PET and PP[69] and so the same format and polymer splits have been assumed for 2024. The indicative composition of plastic packaging in the Retail BoS sector is shown below.

Table 11: Indicative Composition of Plastic Packaging in Retail BoS, 2024 (k tonnes)[70]

	HDPE	LDPE	PP	PET	Total
Bottle	-	-	-	-	-
Film	-	87	5	-	92
Other	5	-	-	-	5
Rigids	-	-	<1	<1	1
Total	5	87	5	<1	98

Appendix I provides a detailed assessment of relative levels of confidence in the data.

[69] *No further data was available to provide a split between PP and PET, therefore 50:50 was used.*

[70] *Totals may not sum due to rounding.*

Hospitality

Tonnage POM within the hospitality sector has been calculated at 243k tonnes, representing an 18% increase from 205k tonnes in 2022. 58k tonnes of this total was film and 184k tonnes was rigid packaging. This represents a change from the 2022 estimates (51k tonnes and 155k tonnes respectively).

It was also noted from the data that 83% of the plastic packaging identified for the sector was primary or consumer packaging and 17% was secondary/tertiary packaging. The proportion of primary packaging has increased from 77% in 2022. The table below illustrates the film and rigid tonnages, broken down by polymer as per Valpak's EPIC hospitality dataset.

Table 12: Indicative Composition of Plastic Packaging in Hospitality, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Total
Bottle	34	0	2	2	73	1	0	0	112
Film	4	23	8	10	4	10	0	0	59
Other	16	0	1	3	2	9	0	0	31
PTT	0	0	0	0	7	30	2	0	41
Total	**55**	**24**	**11**	**14**	**86**	**49**	**3**	**1**	**243**

To calculate the total plastic tonnage POM within the hospitality market, an analysis was made into the packaging handled within Coffee stores. This tonnage has been included within the totals shown in Table 13, but has also been broken down within the table below for visibility.

Table 13: Indicative Composition of Plastic Packaging in Hospitality Coffee Shops, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Total
Bottle	11	-	-	-	-	-	-	-	**11**
Film	-	-	-	-	-	0.9	-	-	**0.9**
Other	0.3	-	-	-	-	-	-	-	**0.3**
PTT	-	-	-	-	-	-	-	-	**-**
Total	**11.3**					**0.9**			**12**

The largest tonnage comes from HDPE milk bottles at 11k tonnes. PP film (0.9k tonnes) is predominantly film milk pouches, while the remaining 0.3k tonnes is made up of HDPE milk bottle caps.

Appendix I provides a detailed assessment of relative levels of confidence in the data.

Manufacturing & Other

The non-consumer tonnage was calculated as 382k tonnes, which is a 0.02% change from the 382k tonnes calculated for the 2022 PackFlow. An exact change in tonnage is not shown due to rounding.

A breakdown of POM plastic packaging within the manufacturing sector is shown in the table below.

Table 14: Indicative Composition of Plastic Packaging in Manufacturing, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Total
Bottle	179	-	-	-	2	-	-	-	**181**
Film	-	109	-	-	-	-	-	-	**109**
Other Rigid	-	-	-	-	-	-	-	-	**-**
PTT	15	-	-	-	8	48	20	-	**91**
Total	**195**	**109**	**-**	**-**	**10**	**48**	**20**	**-**	**382**

Appendix I provides a detailed assessment of relative levels of confidence in the data.

3.6.4. Total Non-consumer POM

A summary of the sectoral estimates for non-consumer POM in 2024 are provided in the table below. The final total non-consumer POM estimate is 872k tonnes (green RAG rating). Section 2.6 of this report outlines the method used to establish the margin of error on a total derived from tonnages with differing margins of error.

Table 15: Summary of Non-consumer Plastic Packaging POM by Sector, 2024 (k tonnes)

Sector	Film	Rigid	Total	Error Margin
C&D	72	8	81	Amber
Agriculture	52	16	68	Green
C&I Retail BoS	93	5	98	Green
C&I Hospitality	59	184	243	Green
C&I Manufacturing + Other	109	272	382	Green
Total	**385**	**485**	**872**	**Green**

This estimate is 7% (57k tonnes) lower than that of 2022 non-consumer plastic packaging POM estimate (815k tonnes). Although the overall non-consumer tonnage has increased slightly, there have been larger fluctuations within the non-consumer sectors due to changes in the methodology used to calculate the total POM.

The tonnage for agriculture has increased by 27k tonnes, equating to a 67% increase from the 41k tonnes estimated in 2022. For C&D, this tonnage has decreased by 4% to 81k tonnes. The overall estimate for C&I hospitality, which is made up of retail back of store, hospitality/wholesale, and manufacturing and other, has increased from 690k tonnes in 2022 to 723k tonnes in 2023 (5% increase).

3.7. Summary of Indicative Non-consumer POM Composition

Summing the indicative non-consumer sectors' compositions gives the indicative total non-consumer POM composition shown in Table 16.

Table 16: Summary of Indicative Non-consumer POM Composition, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Total	
Bottle	221	0	2	2	75	1	0	0	**301**	*35%*
Film	7	220	8	79	4	67	0	0	**385**	*44%*
Other	22	0	1	3	2	17	0	0	**44**	*5%*
PTT	24	0	0	0	16	77	22	0	**140**	*16%*
Total	**274**	**221**	**11**	**84**	**97**	**162**	**23**	**1**	**872**	
	31%	*25%*	*1%*	*10%*	*11%*	*19%*	*3%*	*0%*		

Although this non-consumer POM composition is indicative, the formats are relatively consistent with those identified for 2022 in the PackFlow Refresh 2023 report. The largest increase is within film packaging with an increase of 10% from 34% in 2022 to 44% in 2024. This increase has most likely come from the increases seen within the estimate of POM within the Agriculture sector.

Some polymer types have seen larger fluctuations. For example, the estimate of the total proportion of non-consumer plastic POM that is PET has decreased from 33% to 11% (22% decrease), HDPE has increased from 20% to 31% (11% increase) and LDPE has increased from 15% to 25% (10% increase).

These changes in polymer may be due to changes in the methodologies used from the previous packflow, material switching from one polymer to another, adaptations in methodology, and the continued improvements made on the EPIC database, allowing for increased accuracy - it is possible that much of this is driven by improved data insight within the non-consumer sector when compared with what was available in previous studies.

3.8. Plastic Packaging POM by Format and Polymer

The combined consumer and non-consumer plastic packaging POM by format and polymer type are summarised in Table 17.

Table 17: Total UK Plastic Packaging POM Composition, 2024 (k tonnes)

	HDPE	LDPE	Other	PE	PET	PP	PS	PVC	Total	
Bottle	345	0	6	10	256	5	1	0	**623**	*28%*
Film	16	324	78	171	36	212	0	1	**838**	*38%*
Other rigid	85	10	14	29	80	124	5	3	**350**	*16%*
PTT	26	0	3	1	179	144	25	1	**379**	*17%*
Total	**472**	**334**	**102**	**211**	**551**	**485**	**31**	**5**	**2,190**	
	22%	*15%*	*5%*	*10%*	*25%*	*22%*	*1%*	*0%*		

The 2024 total plastic packaging POM is estimated at 2,190k tonnes with film accounting for 38% when aggregated across household and non-household (commercial) applications. The remaining 62% is mainly rigids, however the consumer ‘Other’ category contains packaging such as toothpaste tubes, assorted dispensers, lids, actuators and the like. Consumer accounts for 60% of plastic packaging POM and non-consumer 40%. The 2024 total plastic packaging POM estimate of 2,190k tonnes is higher than the 2022 estimate of 2,082k tonnes, an increase of 5%.

There is a good degree of confidence in the estimates for the consumer sector, with a green RAG rating. There is lower level of confidence in the estimates for the non-consumer sector however it remains as a green RAG rating for the total non-consumer figure. This is due to the fact that many of the estimates have been derived from single sources (often with small data sets). Appendix I provides a detailed assessment of relative levels of confidence in the data.

3.8.1. Drinks Packaging POM

As a Deposit Return Scheme (DRS) in Scotland, England, Wales and Northern Ireland is being introduced from 1st October 2027, it was considered of interest to present the plastic primary packaging data relating to the drinks market. This data has been derived from the following sources:

- Consumer:
    - Single-use drinks packaging sold via the grocery market within scope of the DRS has been determined using Valpak’s EPIC database. Drinks between 150 mL and 3L, packaged in PET, have been identified and the total tonnage scaled up to represent the UK. Some further drinks packaging was identified as sold via non-grocery retailers and this has also been estimated using Valpak’s database and included.
    - 11k tonnes of HDPE has been included to represent sales of milk through a traditional milkman and 0.4k tonnes through direct sales from farmers to consumers[71], which would not otherwise have been included using only Valpak’s EPIC database.
    - For soft drinks, data relating to the full market in litres[72] was used to estimate the proportion sold via non-grocery channels, which was estimated to be approximately 68k tonnes[73].
- Non-Consumer:
    - Drinks packaging sold via the hospitality sector was estimated using Valpak’s EPIC database relating to 38% of the Foodservice & Catering (wholesale) industry and scaled up to represent the UK.
    - Additionally, it was identified that in some cases this sector purchases milk direct from dairies and soft drinks via distributors rather than from the foodservice sector. As such, data relating to disposable coffee cup usage was used to estimate consumption of milk purchased directly and scaled to represent the UK[74]. This equated to around 12k tonnes of milk packaging.

Table 18: Plastic Drinks Packaging POM, 2024 (k tonnes)[75]

	HDPE	PET	Other[76]	Total
Consumer	83.4	208.6	28.1	**320.2**
Non-Consumer	19.6	49.1	5.5	**74.3**

[71] *Determined from the amount of milk delivered direct to doorstep, as stated by DairyUK https://www.dairyuk.org/the-uk-dairy-industry/#consumption*
[72] *BSDA 2025 UK Soft Drinks Report https://www.britishsoftdrinks.com/media/nbnlowyc/bsda-annual-report-2025.pdf*
[73] *The total soft drinks market in litres was compared to that covered by the data held by Valpak for the retail and hospitality sector and the difference assumed to be that sold directly via distributors or via non-grocery channels (68k tonnes) and was added onto the total.*
[74] *Assessment of Disposable Cups Placed on the Market 2012-2024, Valpak*
[75] *Totals may not sum exactly due to rounding.*
[76] *Includes LDPE & PP.*

Total	**103.1**	**257.7**	**33.6**	**394.5**

Since the previous PackFlow reports in 2022, there have been several methodology changes which may influence the total number of drinks POM. Changes have occurred with the range of data extracted from Valpak's EPIC database pertaining to retail members, as well as to how unknown polymers are re-assigned according to known polymer tonnages. As a result, the tonnage for PET drinks in the consumer retail sector was determined to be 140k tonnes, lower than in previous years. This was perceived to be slightly too low, and so alternative data sources were assessed to cover any beverages which may not have been directly included in the EPIC dataset.

Drinks POM Cross-Check

Since the introduction of pEPR and the new Reported Packaging Data (RPD), the tonnage of drinks POM are now reported by producers and can be used as a cross-check[77]. RPD reported that 267k tonnes drinks were placed onto the market at the time of data extraction. This is comparable to the total for PET drinks POM of 258k tonnes. However, this latter figure does not include non-PET elements of drinks such as HDPE lids.

In previous years, the BSDA annual reports[7272] on the volume of soft drinks sold in plastic have been included in the methodology to allow a sense-check. Following from previous years, the total volume (in Millions of litres) of drinks sold in PET was used for comparison. The average sizes of PET beverage containers were obtained from within EPIC data, and this was combined with the average weight of each size of beverage container and the BSDA drinks volume. From this, an estimated 209k tonnes PET drinks were sold in the consumer sector. Thus, it was assumed that the difference between this figure and the 140k tonnes from the grocery retail figure must account for drinks sold in the non-grocery sector, which totals just over 68k tonnes PET. As mentioned in Section 2.4.3, this includes all beverages sold in PET bottles within non-grocery retailers such as WHSmith/TGJones, Boots, Poundland, or similar, in settings such as the high-street or in airports.

The total tonnage for PET drinks bottles in the consumer sector was calculated as 209k tonnes, a 5.9% decrease from 2022. Aside from the change in methodology, a number of potential reasons exist as to why there has been fewer drinks sold in plastic bottles, such as light-weighting, material switching and consumers opting to purchase larger formats. The use of reusable bottles is increasing as well, especially for water. It was noted that the high PRN price for plastic in 2022 (relative to the early years of the PRN system) may have stimulated companies to improve the accuracy of their packaging weights in order to minimise costs.

The final analysis indicates that in 2024 there was 394k tonnes of plastic drinks packaging placed onto the UK market[78].

Drinks in scope of DRS

The DRS applies to drinks that come in containers between the sizes of 150ml-3L. PET is the only plastic polymer in scope of the DRS, with other materials including aluminium or steel[79].

Using EPIC data for the consumer sector, PET bottles within scope of the DRS were flagged to determine the likely tonnage POM within scope of the DRS. It is estimated that 202k tonnes of drinks are sold to consumers in plastic bottles that are within the scope of the DRS. A breakdown of the drinks packaging in scope of the DRS can be found in Table 19.

Table 19: Plastic Drinks Packaging POM in Scope of the DRS, 2024 (k tonnes)

Drinks	Consumer	Non-consumer	**Total**
PET	202.2	48.9	**251.1**

[77] *Data extracted from RPD on 2nd June 2025, the same date as used for the Total POM cross-check.*
[78] *Bottled drinks only, including all caps and labels.*
[79] *https://www.gov.uk/guidance/deposit-return-scheme-drinks-producer-and-retailer-responsibilities*

3.9. POM Cross-check

This section of the report is used as a cross-check of the total plastic POM in the UK in 2024, based on the data stored on RPD, as reported by obligated organisations.

This method is not used to estimate total flow as it does not include non-obligated businesses or those not reporting in the system as described below, but to provide a sense check on the total flow and allow for non-obligated flow to be estimated.

With the introduction of Extended Producer Responsibility the prior POM cross-check methodology which used Net Pack/Fill[80] is no longer possible. Due to the new system switching from a shared producer responsibility to a single point of compliance, more packaging being POM should now be reported. Additionally, the packaging handled by unobligated companies should be reported by obligated companies higher up the supply chain, theoretically meaning that the total figures reported of household and non-household items can be used to identify the total amount of obligated packaging going onto UK market. It is important to note that due the significant and recent changes in how businesses now need to report their packaging data, it is likely that errors (such as omissions or double-counting) are present within the submitted data to NPWD.

The total plastic tonnage reported on NPWD is 2,149k tonnes[81]. Valpak's estimate of 2,190k tonnes of plastic POM means that there is a 2% difference from the total POM tonnage and that reported on NPWD equating to 41 k tonnes. These 41k tonnes are made up of unobligated packaging, illegal imports and organisations that are obligated but non-compliant.

[80] The prior calculation used for Net Pack/Fill is included in Appendix II for reference.
[81] Based on RPD data update for 2nd June 2025.

4. Summary of Plastic Packaging POM

This project's estimate of plastic packaging POM in 2024 is 2,190k tonnes (green RAG rating).

This is made up of a combination of top-down (non-consumer total film) and bottom-up (consumer, non-consumer rigid packaging and non-consumer film sector breakdown) methods. It has been cross-checked with reported obligated data on NPWD.

The estimate of plastic packaging POM in the consumer sector is 1,318k tonnes (green RAG rating) in 2024.

This method is based on primary data alongside reliable market share data. No other method is used to derive consumer data as this method is considered the most robust there is available and is accepted by industry as such.

The estimate of plastic packaging POM in the non-consumer sector is 872k tonnes (green RAG rating) in 2024.

For film, this method is based on a combination of primary (collection) data and secondary research. For rigids, this is based Valpak data for the wholesale sector and secondary research.

Table 20: Plastic Packaging POM by Sector and Format, 2024 (k tonnes)

	Total	Rigid (Bottles/PTTs)	Flexible (Film)	Other
Consumer	**1,318**	560	453	305
Non-consumer	**872**	442	385	44
Total	**2,190**	1,002	838	350

The total POM estimate was found to be 41k tonnes higher than data reported by obligated companies under the Extended Producer Responsibility for Packaging Waste. This suggests that non-obligated companies (handling fewer than 25 tonnes of packaging or with lower than £1 million turnover), illegal imports and non-compliant organisations account for 2% of plastic packaging in the UK. Due to the regulatory and reporting changes this has decreased from the 10% unreported POM identified in 2022.

It is important to stress that the reported tonnages on the Report Packaging Data (RPD) portal are themselves open to the possibility of a degree of error due to the recent changes in reporting and subsequent errors when completing the submission forms. The RPD data however, is widely recognised as being the best available as there is a legal obligation for companies to submit data that is as accurate as reasonably possible, which is then audited by the regulating body. This data is used by policy makers and their agencies.

This report recommends further work to improve the data accuracy of the C&I sector as well as clarifying the definition of what is classified as agricultural film for a packaging application, for example bale wrap, and what is not e.g., silage wrap/poly tunnels.

Appendix I:

Data Robustness Assessment

A Red-Amber-Green (RAG) framework was developed to provide an indication of the relative robustness of each methodology used for calculating the total plastic packaging POM. The RAG ratings are intended to support the interpretation of the data methodologies rather than serve as a statistical measure of confidence.

Each methodology was assessed against a defined set of qualitative questions related to the robustness and completeness of the data sets used, as well as the degree of stakeholder agreement around the findings. To promote consistency and standardise the categorisation process across this analysis, questions were assigned numerical scores. These scores were aggregated to generate a maximum score of 36. The scoring range of 0 to 36 was divided equally to provide the RAG classifications.

The RAG ratings should be interpreted as indicative assessments of robustness rather than measures of statistical reliability. Within the appendix, error bars have been provided to offer stakeholders an understanding of potential variability within totals calculated, intended to inform potential decision making rather than as scientifically derived margins of error.

Table 21: Data Robustness Assessment Results - Summary

Tab	Data & Source	RAG Rating			Error Margin	
		Evidence (Robustness and completeness, max 27):	Degree of agreement around the findings (max 9):	Total & RAG Rating	Robustness (%)	Error Margin (+/-)
1	EPIC Data Base	24	9	33	92%	6%
2	Turnover & Packaging Handled Data	21	6	27	75%	18%
3	The White Paper Dairy UK 2019 & Valpak internal data on Coffee Cups sold 2024 & Statista Sit-In vs Take Away 2024 & Eunomia 2020 Food To Go Report 2020	17	6	23	64%	24%
4	Collections data from EuroKey 2024	21	7	28	78%	15%
5	Valpak Hospitality EPIC Data	22	6	28	78%	15%
6	CuSP's research analysisng the EU Commission Data & Alliance for Sustainable Building Products 2023 ZAP & UK Gov. Construction Sector Spend	18	6	24	67%	21%
7	BRE Smartwaste Portal, 2014 & Internal research by the Green Construction Board, 2020	15	6	21	58%	27%
8	UK Statistics on Waste 2020 & UK Manufacturing Index 2024 & Packflow 2017	18	9	27	75%	18%
9	DEFRA report on Non-Packaging Agricultural Plastic sold in the UK 2010 & UN Food & Agricultural Organisation 2021	19	6	25	69%	21%
10	UN FAO report & France's Ministry of Agriculture & Food Sovereignty	19	6	25	69%	21%
11	RPD Producer Data 2024 (2025 submission)	26	9	35	97%	3%

Table 22: Consumer POM Grocery – EPIC Database

Data
EPIC Data Base
Source
Valpak Data
Data Used In:
Consumer Grocery

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	Yes	3
Does the data provide complete coverage?	Yes with some reservations	2
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	Yes with some reservations	2
Is the methodology/calculation reasonably free from concerns?	Yes with some reservations	2
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes	3
Total		**24**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	Yes	3
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**9**

Table 23: Consumer POM Retail – Turnover & Packaging Handled Data

Data
Turnover & Packaging Handled Data
Source
Valpak
Data Used In:
Consumer Non-grocery

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	Yes	3
Does the data provide complete coverage?	Yes with some reservations	2
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	Yes	3
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	More yes than no, but equivocal	1
Total		**21**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	No	0
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**6**

Table 24: Non-Consumer Hospitality Coffee - The White Paper Dairy UK 2019 & Valpak internal data on Coffee Cups sold 2024 & Statista Sit-In vs Take Away 2024 & Eunomia 2020 Food To Go Report 2020

Data Used In:
The White Paper Dairy UK 2019 & Valpak internal data on Coffee Cups sold 2024 & Statista Sit-In vs Take Away 2024 & Eunomia 2020 Food To Go Report 2020
Source
Dairy UK & Valpak & Statista & Eunomia
Data Used In:
Drinks calculations

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	Yes with some reservations	2
Does the data provide complete coverage?	Yes with some reservations	2
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	More yes than no, but equivocal	1
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	No	0
Total		**17**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	No	0
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**6**

Table 25: Non-Consumer Back of Store - Collections data from Retail Back of Store 2024

Data
Collections data from EuroKey 2024
Source
Valpak
Data Used In:
C&I Back of Store

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	Yes	3
Does the data provide complete coverage?	Yes with some reservations	2
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	Yes with some reservations	2
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes with some reservations	2
Total		**21**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	More yes than no, but equivocal	1
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**7**

Table 26: Non-Consumer Hospitality - Valpak Hospitality EPIC Data

Data
Valpak Hospitality EPIC Data
Source
Valpak
Data Used In:
Hospitality

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	Yes	3
Does the data provide complete coverage?	Yes with some reservations	2
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	Yes	3
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes with some reservations	2
Total		**22**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	No	0
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**6**

Table 27: Non-Consumer Construction & Demolition - CuSP's research analysisng the EU Commission Data & Alliance for Sustainable Building Products 2023 ZAP & UK Gov. Construction Sector Spend

Data
CuSP's research analysisng the EU Commission Data & Alliance for Sustainable Building Products 2023 ZAP & UK Gov. Construction Sector Spend
Source
CUSP & Alliance for Sustainable Building Products & UK Government
Data Used In:
C&D

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	Yes with some reservations	2
Does the data provide complete coverage?	More yes than no, but equivocal	1
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	Yes	3
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	No	0
Total		**18**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	No	0
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**6**

Table 28: Non-Consumer Construction & Demolition - BRE Smartwaste Portal, 2014 & Internal research by the Green Construction Board, 2020

Data
BRE Smartwaste Portal, 2014 & Internal research by the Green Construction Board, 2020
Source
BRE Smartwaste Portal & Green Construction Board
Data Used In:
C&D

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	More yes than no, but equivocal	1
Does the data provide complete coverage?	More yes than no, but equivocal	1
Has the data been sourced from credible, up-to-date sources?	More yes than no, but equivocal	1
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes with some reservations	2
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	Yes with some reservations	2
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes with some reservations	2
Total		**15**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	No	0
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**6**

Table 29: Non-Consumer Manufacturing - UK Statistics on Waste 2020 & UK Manufacturing Index 2024 & Packflow 2017

Data
UK Statistics on Waste 2020 & UK Manufacturing Index 2024 & Packflow 2017
Source
DEFRA & UK Manufacturing Index 2024 & PackFlow 2017
Data Used In:
C&I Manufacturing

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	Yes with some reservations	2
Does the data provide complete coverage?	Yes with some reservations	2
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes with some reservations	2
Have the findings been independently peer-reviewed?	More yes than no, but equivocal	1
Is the methodology/calculation reasonably free from concerns?	Yes with some reservations	2
Have the methodology/calculations been independently checked (internally or externally)?	No	0
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes	3
Total		**18**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	Yes	3
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**9**

Table 30: Non-Consumer Agriculture – DEFRA report on Non-Packaging Agricultural Plastic sold in the UK 2010 & UN Food & Agricultural Organisation 2021

Data
DEFRA report on Non-Packaging Agricultural Plastic sold in the UK 2010 & UN Food & Agricultural Organisation 2021
Source
DEFRA & UN
Data Used In:
Agriculture

Evidence (Robustness and completeness, max 27):	Scoring (Max 27)	
Does the data cover the correct time-frame?	More yes than no, but equivocal	1
Does the data provide complete coverage?	Yes	3
Has the data been sourced from credible, up-to-date sources?	More yes than no, but equivocal	1
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	Yes with some reservations	2
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes	3
Total		**19**

Degree of agreement around the findings (max 9):	Scoring (Max 09)	
Does more than one data source confirm the findings (within +/- 5%)?	No	0
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**6**

Table 31: Non-Consumer Agriculture - UN FAO Report & France's Ministry of Agriculture & Food Sovereignty

Data
APE Europe data 2019 & France's Ministry of Agriculture & Food Sovereignty InfoGraphic (2017)
Source
UN FAO report & France's Ministry of Agriculture & Food Sovereignty
Data Used In:
Agriculture

Evidence (Robustness and completeness, max 27):	**Scoring (Max 27)**	
Does the data cover the correct time-frame?	Yes with some reservations	2
Does the data provide complete coverage?	Yes with some reservations	2
Has the data been sourced from credible, up-to-date sources?	Yes with some reservations	2
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	No	0
Is the methodology/calculation reasonably free from concerns?	Yes with some reservations	2
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes with some reservations	2
Total		**19**

Degree of agreement around the findings (max 9):	**Scoring (Max 09)**	
Does more than one data source confirm the findings (within +/- 5%)?	No	0
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**6**

Table 32: RPD Producer Data 2024

Data
RPD Producer Data 2024 (2025 submission)
Source
RPD Producer Data 2024
Data Used In:
POM crosscheck & unobligated tonnage

Evidence (Robustness and completeness, max 27):	**Scoring (Max 27)**	
Does the data cover the correct time-frame?	Yes	3
Does the data provide complete coverage?	Yes	3
Has the data been sourced from credible, up-to-date sources?	Yes	3
Is the underlying data reasonably free from concerns (e.g. official data from the ONS)?	Yes	3
Have the findings been independently peer-reviewed?	Yes with some reservations	2
Is the methodology/calculation reasonably free from concerns?	Yes	3
Have the methodology/calculations been independently checked (internally or externally)?	Yes	3
Is the quantitative evidence well rooted in a wider qualitative understanding of the issue?	Yes	3
Have the findings been sense-checked against credible alternative sources (incl. inconclusively)?	Yes	3
Total		**26**

Degree of agreement around the findings (max 9):	**Scoring (Max 09)**	
Does more than one data source confirm the findings (within +/- 5%)?	Yes	3
Do the key stakeholders/experts actively agree with the findings?	Yes	3
Has feedback from the key stakeholders been incorporated in the reporting of findings?	Yes	3
Total		**9**