Note to Reviewers

DRAFT | *This is an ongoing piece of work and content is subject to change.*

PA Consulting and Defra have been developing the Recyclability Assessment Methodology (RAM) which is intended for use by Producers to assess the recyclability of their packaging for the purpose of packaging Extended Producer Responsibility. The project has undertaken extensive stakeholder engagement with a broad array of industry representatives, and this document is the result of that collaborative process so before responding to the **feedback survey** please review the guidance below.

The project has sought to work closely with industry in producing this first draft and we seek to share this in the spirit of collaboration, so as you may expect this is a first iteration and we look forward to receiving your feedback which will inform how the methodology is further developed and improved. We ask that where you are able to, you provide actionable feedback with clear suggestions for improvement, although we caution that not all suggestions may be suitable for inclusion.

PA is firmly committed to maintaining the privacy and security of personal data of its employees, its clients and of other parties with which PA interacts. PA takes its responsibilities in respect of personal data extremely seriously and seeks to ensure that personal data processed by PA is done in accordance with applicable privacy and data protection laws. Please note that by completing this form, you consent to PA sharing your responses with Defra.

This is the first of two opportunities to provide feedback on the working version of the Recycling Assessment Methodology, and the second opportunity will be publicised in due course via Defra's EPR email newsletter.

Thank you for taking the time to provide your feedback and we look forward to receiving your response.

Please direct any questions to RAM-EPR@defra.gov.uk

RAM Guidance

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Section 1: Background Information

1.1 About this publication

The Recyclability Assessment Methodology (RAM) will form an important part of the Packaging Extended Producer Responsibility (pEPR) scheme providing the means for liable producers to assess their packaging to determine its modulation category.

The methodology will:

- help determine packaging recyclability based on current collection, sortation and reprocessing capabilities across the UK; and
- inform liable producers of the appropriate EPR fee modulation category for their packaging components, using a three-tiered system: Red, Amber, or Green.

The Red, Amber, or Green output will reflect the recyclability of that packaging component in accordance with the RAM. This output will be used to inform the level of fee modulation that will be applicable to that item of packaging. Incentivising the use of more recyclable packaging in this way is intended to influence packaging design to drive increased recycling performance across the UK, and improved environmental outcomes.

Liable producers must apply this RAM to categorize and report their liable packaging from January 2025. The guidance will be reviewed and updated where appropriate on an annual basis, in line with reporting schedules. This is to allow it to adapt to evolving market conditions and regulatory changes.

This document outlines:

- how recyclability is assessed at each stage of the packaging waste lifecycle;
- the structure of the decision tree used to generate RAM outcomes, with guiding questions; and
- supplementary technical information to help answer the guiding questions within the decision tree.

This document is being published on behalf of the UK Government, the Department for Agriculture, Environment and Rural Affairs (DAERA) in England, Northern Ireland, the Scottish Government, and the Welsh Government. It covers the methodology for the recyclability

assessments – hereinafter referred to as the RAM – and supplementary guidance intended for use by liable producers and / or third-party assessors. Guidance should be used in conjunction with the decision tree flow diagram in Figure 1 (see also Appendix 4.1).

The main body of this document is Section 3: Material Guidance. Liable producers are required to review only the subsection relevant to their specific material type.

Any questions should be directed to RAM-EPR@defra.gov.uk.

1.2 Scope

Which producers are in scope

Contents of this section to follow subject to the final SI.

What counts as an assessment

Contents of this section to follow subject to the final SI.

What counts as a specified material

Contents of this section to follow subject to the final SI. The material categories are as follows:

(a) Aluminium;
(b) Fibre-based composite materials;
(c) Glass;
(d) Paper or Board;
(e) Plastic;
(f) Steel;
(g) Wood; or
(h) Other materials

What counts as packaging in scope

Contents of this section to follow subject to the final SI.

What are the reporting implications of the RAM?

Contents of this section to follow subject to the final SI.

1.3 Principles

The Recycling Assessment Methodology (RAM) has been developed with five core principles in mind, outlined below. By anchoring the RAM in these principles, we aim to create an accurate and relevant assessment, while ensuring alignment with credible industry standards to encourage widespread adoption and uptake.

1) **Designed to Evolve** – RAM should be designed for continuous improvement via the annual review process described above, enabling it to adapt to evolving market conditions and regulatory changes
2) **Consistent and Compatible** - Where possible, the RAM should align with existing EU standards and be applicable across UK nations
3) **Accurate, Transparent & Trustworthy** – The RAM should encourage a shift towards sustainable packaging practices by evidencing the impacts of packaging choices and, where appropriate, product considerations.
4) **Developed collaboratively** – The RAM allows for iterative improvements based on inputs and feedback from EPR users and community
5) **Accessible & easy to use -** The RAM should be freely available to the EPR community to develop its own tools and services. It should serve to reduce complexity where possible while supporting variable data inputs that may have diverse outcomes

There will be a Technical Advisory Committee (TAC) which oversees the annual review of the RAM in line with reporting schedules, to ensure it reflects any changes in policy, infrastructure and technical capability. This group will take requests throughout the year relating to any new materials and technologies that the producer feels should be considered recyclable, but do not obtain this output in the RAM. If the producer can provide sufficient evidence, then an exception may be made. These reviews can be completed at any point in the year, but the overall methodology will only be updated annually in line with reporting.

1.4 Definitions

Definitions are aligned to The Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 2024. Where additional definitions are given, references are provided.

Alternatives fibres: For the purposes of this document refers to anything other than cellulosic wood fibres such as bagasse, palm, fibre, rice straw, wheat straw, barley straw, oat straw, grass straw, flax, hemp, and bamboo[1]

Board: A generic term for paper with relatively high rigidity (ISO 4046-3:2016). Board is characterised by good folding properties, stiffness, and scoring ability.[2]

Component: For the purposes of this assessment, component refers to the different parts of a whole packaging unit that are separable by hand without the need for tools or excessive force.

Fibre-based composite: A packaging material which is made of paperboard or paper fibres and a single or multiple layers of other materials, to form a single unit or component of packaging that cannot be separated by hand without the need for tools or excessive force.

Household Packaging: Has the meaning given in Regulation 8 of The Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 2024.

Non-paper-fibre content: For the purposes of this document refers to anything other than cellulosic wood fibres that are included in the composition of either Paper and Board or Fibre-Based Composites

Packaging: All products made of any materials of any nature to be used for the containment, protection, handling, delivery, and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer, including non-returnable items used for the same purposes.

Packaging Materials: Materials used in the manufacture of packaging and includes raw materials and processed materials prior to the conversion into packaging.

Paper: Paper consists mainly of natural fibres and can possibly contain other ingredients such as filling material, starch, coating colour including binder, as well as additives typically used in the paper industry such as wet-strength agents, sizing agents and bound water [3].

[1] CPI Design for Recyclability Guidelines 4th Edition
[2] 4evergreen Fibre-Based Packaging Recyclability Evaluation Protocol
[3] 4evergreen Circularity by Design Guidelines

Plastics (Films / Flexibles): Plastics classified as "flexible" refer to items that can easily be shaped and moulded to fit the product contents. Common examples of flexible plastic packaging include bread bags, snack wrappers, netted produce bags, zipper-lock pouches, and sachets.

Plastics (Rigids): Plastics classified as "rigid" in packaging refer to items that maintain a defined shape and structural integrity under normal conditions of use. These materials are typically stiff and durable, offering protection and support for a wide range of products. Common examples of rigid plastics in packaging include bottles, pots, tubs, trays, tubes, caps, and closures.

Predominant Material: Where a whole unit of packaging or a packaging component is comprised of two or more materials, the predominant material is the one that is greatest by weight.

Primary Packaging: Packaging conceived so as to constitute a sales unit to the final user or consumer at the point of purchase.[4]

Recycling: Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.[5]

Reprocessor: Carries out the activity of recycling, that is converting a waste into a product, material or substance that is no longer classified as a waste.

Shipment Packaging: Which is packaging in addition to primary packaging on items which are sold online or by mail order which are either delivered direct to the purchaser or collected by the purchaser from a shop or other collection point after they have been purchased.[6]

Whole Unit: A whole unit of packaging can be made up of one or multiple components that are combined together to create the complete item of packaging.

[4] Producer Responsibility Obligations Regulations 2024
[5] Article 3(15) of the Waste Directive
[6] Producer Responsibility Obligations Regulations 2024

1.5 Exemptions

Packaging is exempt for the purposes of these regulations where the packaging is reused, other than reused packaging imported into the United Kingdom; any packaging exported from the United Kingdom by the producer; packaging which is a deposit item for the purposes of a relevant deposit scheme. In line with the regulations, medical packaging is also exempt.

1.6 Problematic Packaging Items and Materials

Some items of packaging will automatically fall into the 'RED' category if any of the statements below apply. This

(a) The packaging has integrated electrical componentry and/or batteries that would be classed as Electrical and Electronic Equipment (EEE) *for example, boxes that include LED lights*

(b) Component is made of plastic containing Carbon Black pigment

(c) Component is made of PVC (including non-PVC with PVC components)

(d) Component is made of Polystyrene HIPS, expanded & extruded

(e) Component is made of Compostable and degradable, including bio- or oxo-degradable

(f) Component is made of Non-polyolefin foamed plastics e.g. non-PP and non-PE

(g) Component is made of paper or board and has double sided lamination

Section 2: Methodology

This version of the Recycling Assessment Methodology (RAM) has been developed collaboratively with representatives of the industry from across every stage of the packaging value chain. The methodology is based on definitions, thresholds and principles that are, wherever possible, aligned to existing best practice and therefore are considered appropriate at the time of publishing.

Given the considerable pace of innovation in this industry, the RAM will be reviewed and updated on an annual basis by the appointed Technical Advisory Committee (TAC), to ensure it is reflective of advances in technical recyclability and scaled collection, sorting, and reprocessing infrastructure.

2.1 Stages of Recyclability

This methodology is focused on evaluating recyclability, encompassing the full range of requirements across the packaging end-of-life stages. It ensures that a packaging component can be effectively reprocessed and reintegrated into new product and packaging applications. By considering factors such as collection, sorting, and reprocessing capabilities, the methodology aims to support a circular packaging economy, where materials are recaptured and recycled rather than disposed while also addressing the practical challenges faced across the value chain.

The end-of-life stages providing the foundational structure for the methodology include:

Classification which defines the state and composition of the item that ends up in the waste stream. This includes considerations such as whether, in cases where there are multiple materials and/or components comprising a whole packaging unit, the different components can be separated by the consumer without the need for tools or excessive force or are typically discarded separately from other packaging components prior to disposal.

> (a) Where an item of packaging consists of two or more components which are made of different each component is to be treated separately, unless paragraph (b) applies;
>
> (b) Where an item of packaging referred to in paragraph (a) is a drink container and the component which is predominant by weight (“the predominant component”) is made of specified material other than glass, the whole of the drink container is to be treated as made of the same material as the predominant component;

(c) Where an individual component of an item of packaging, or the whole item of packaging if it does not consist of different components, is composed of a combination of specified materials, that component or item is to be treated as made of the material which is predominant by weight, unless paragraph (d) applies;

(d) Where a component or item of packaging referred to in paragraph (c) is composed of a combination of specified materials in equal proportions by weight, each of those materials is to be treated separately.

Where the material of a whole unit or packaging component is not able to be defined, that component is to be treated as 'Other materials' packaging category.

An example of the above could be a glass wine bottle with a metal screw top lid and paper label. In this instance, the paper label is not easily separable by hand without the need for tools or excessive force from the bottle, therefore the two should be processed together in the RAM, with the glass bottle being the predominant material by weight. The metal screw cap can be easily separated and should be processed separately in the RAM. When running these components through the RAM, both the bottle (with label) and the cap would a achieve two separate classifications.

1) **Collection** is the main route to recycling for a given product and refers to one of the three options below. More detail of what is and is not accepted for each material type is included within the guidance in Section 3. There are three main routes to recyclability:

   (i) **Kerbside Collection:** *Packaging materials and components must be widely collected at kerbside by at least 75% of Local Authorities (LAs) across the UK.* To be considered collected at scale, a packaging type must reach or exceed a 75% collection rate, as determined by WRAP's Local Authority data.

   (ii) **Limited Collection (via kerbside):** *Material and component types must be collected at kerbside by at least 50% of Local Authorities across the UK to qualify for a limited collection.* Certain packaging materials and packaging types are collected by a substantial number of local authorities across the UK but fall short of meeting the 75% threshold for widely accessible collection at kerbside. Packaging that meets a lower 50% threshold qualify for limited collection, reflecting the viable pathways that still exist for sorting and processing these materials.

   (iii) **Take-back schemes**: *Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population*

across the UK. Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that they have communicated with the take back provider and confirmed the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include the factors below[7]

(a) Be Accessible to at least 75% of the UK population

(b) Not conflict with Local Authority kerbside collections

(c) Not be restricted to one brand or product

(d) Not require a purchase to be made before an item can be recycled

(e) Have full transparency that the collected material is recycled

A full description of these factors is included in Appendix 4.3.

2) **Sortation** refers to the process of capturing and diverting packaging waste into appropriate waste streams for further reprocessing. In some local authorities, this separation occurs more extensively at the kerbside by consumers (e.g. source separated versus comingled collection systems). However, for the purposes of this methodology, the focus is on the ability to sort waste at scale within Material Recycling Facilities (MRFs). Packaging specifications and design choices, such as size, density, and colour, play a key role in ensuring Waste Managers can efficiently identify and sort packaging waste.

3) **Reprocessing** is the technical process of creating recyclate from each of the packaging waste streams. Each material type requires specific reprocessing technologies, and contaminants can disrupt the process or lower the quality of the recycled materials. The tolerance for contaminants varies by material and process, with different items and substances prohibited in each reprocessing method.

4) **Application** refers to the end-use of reprocessed packaging waste, ensuring it is suitable for an appropriate use which replaces virgin materials. According to guiding Regulations, recycling is defined as any recovery process in which waste materials are reprocessed into products, materials, or substances, whether for their original purpose or other uses. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.[8]

[7] OPRL Take Back Scheme Protocol for a “Recycle” Designation
[8] Article 3(15) of the Waste Directive

2.2 Structure

The overall RAM structure is as shown in Figure 1 below. A full size version is available in Appendix 4.1. As the Key indicates, this document should contain all the necessary information to complete the RAM including additional definitions, specifications and lists of accepted criteria are included in the supporting guidance which is organised by material. This guidance must be reviewed in order to complete the assessment.

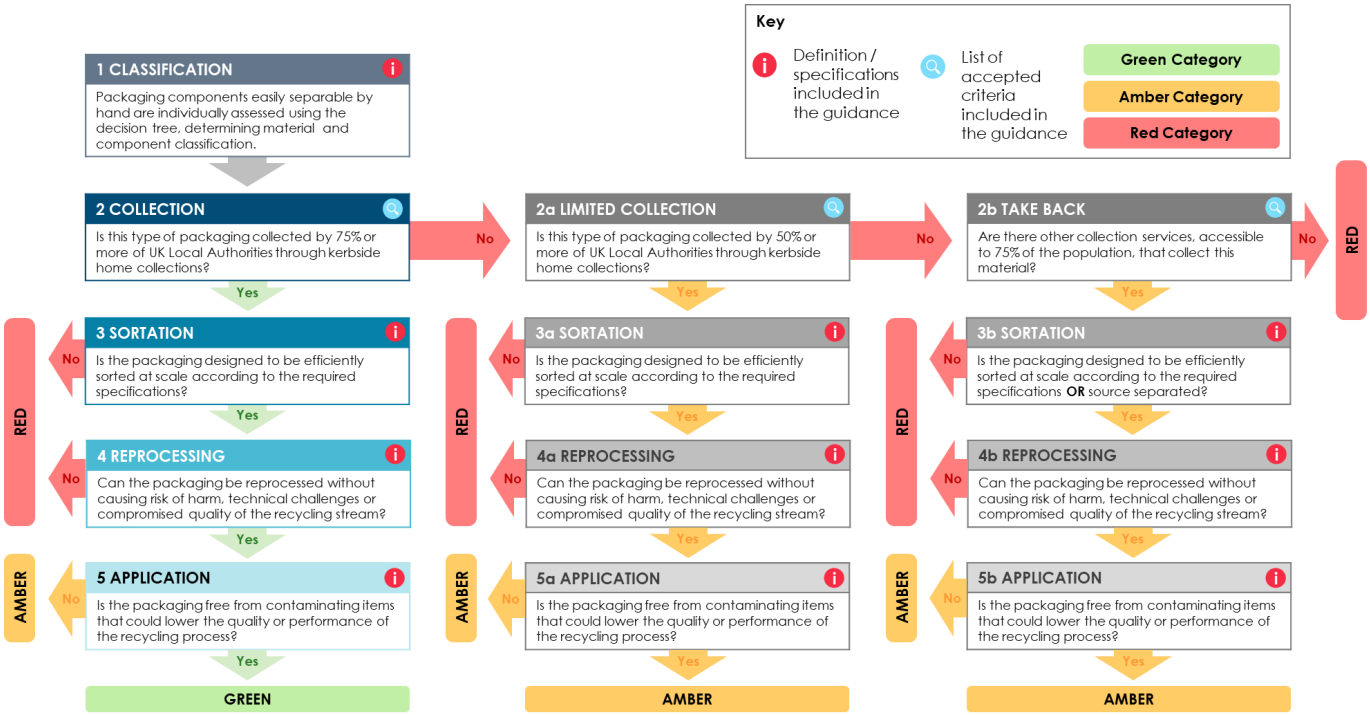


Figure 1: RAM Structure *(see Appendix 4.1 for full size version)*

Liable producers should navigate the RAM decision tree by progressing through the boxes labelled in order (1, 2, 3, etc.) to ultimately determine the appropriate Red, Amber, or Green category for their packaging.

Each step in the tree will guide users through specific questions related to recyclability. This document also includes guidance by material type to help users understand the requirements needed to satisfactorily answer the questions at each stage of the decision tree. By following this structured approach, users can accurately assess their packaging's recyclability and classify it accordingly.

2.3 RAM Outputs

The RAM will provide packaging liable producers with a Red, Amber, or Green (RAG) output reflecting the recyclability of packaging. This output will be used to inform the level of fee modulation that will be applicable to that item of packaging. The categories can broadly be summaries as including:

- **Red:** packaging components classified as Red face challenges in the being recycled at scale, they may comprise wholly or in part or materials, substances, inks, coatings, or additives that deemed problematic for the waste management systems to handle.
- **Amber:** packaging components classified as Amber are recyclable, but may have limited or inconsistent infrastructure support, or contain items that are detrimental to the recycling process but do not prevent it entirely. These components may require specialised collection and/or reprocessing systems to ensure packaging waste is recycled.
- **Green:** packaging components classified as Green are consider widely recyclable within the UK's existing systems.

By aligning fee modulation with recyclability, the RAM encourages liable producers to use packaging that is easier to recycle across the various stages, helping to reduce environmental impacts and improve recycling performance.

Section 3: Material Guidance

3.1 Paper / Board

Classification

Paper and Board components should consist mainly of natural fibres with other filling materials, starch, coatings, colourants, binding materials, wet-strength agents and sizing agents included in their composition. Common examples of paper / board in packaging include cardboard (e.g. boxes, sleeves), corrugated cardboard (e.g. shipping packaging), paperboard (e.g. cereal boxes, tissues boxes) and moulded fibre (e.g. egg boxes). Fibre-based composites with <15% non-paper-fibre content are included in the **paper and board** recycling stream in line with the Separation of Waste regulations[9].

It is the responsibility of the producer to prove that alternatives to cellulosic wood fibres are appropriate for use in papermaking and can be recycled within the existing scaled infrastructure.

Collection

Collection	Material and component type must be widely collected at kerbside by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling at kerbside based on collected dated Local Authority data produced by WRAP. The table below provides examples of paper and board packaging types collected across the UK, it should not be considered exhaustive. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Table 1: UK Local Authority Collections for Paper & Board by Packaging Items

Item	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Cardboard Sleeves	360	**94%**	295	11	32	22
Cereal Boxes	360	**94%**	295	11	32	22
Corrugated Cardboard	357	**93%**	294	11	31	21

[9] Producer Responsibility Obligations Regulations 2024

Egg Boxes	353	**92%**	290	11	31	21
Toilet Roll Tubes	358	**94%**	294	11	31	22
Shredded	270	**71%**	217	5	31	17
Window Envelopes	335	**88%**	275	8	31	21
Fruit and Vegetable Punnets	358	**94%**	294	11	31	22

Source: *WRAP Local Authority (LA) Portal – February 2024*

Exemptions to the paper and board **collections** in England include[10] :

a) fibre-based composite where the non-paper fibre content is more than 15% by weight.
b) fibre-based composite which has layers of plastic on both sides (double-sided lamination),
c) fibre-based composite cups,
d) paper and board to which glitter has been adhered,
e) paper and board to which foil has been adhered, where the non-paper fibre content is more than 15% by weight,
f) greaseproof, siliconised or waxed paper,
g) stickers,
h) padded polyethylene lined envelopes (unless easily separated by hand, without the need for tools or excessive force),

Item a) would fall under the Fiber Based Composite category and therefore should be assessed under Section 3.2. **Items b) to h)** would therefore not pass this stage of the assessment.

Limited Collection	Material and component types must be collected at kerbside by at least 50% of Local Authorities to qualify for a limited collection

Certain materials and packaging types are collected by a substantial number of local authorities across the UK but do not meet the 75% threshold for widely accessible collection. Packaging that meets a lower 50% threshold qualify for limited collection, reflecting the viable pathways that still exist for sorting and processing these materials.

[10] The Separation of Waste (England) Regulations 2024

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold of 75% of the population has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

Sortation

In comingled collections, to be considered recyclable, the paper / board must be easily sorted into the paper and cardboard waste streams with high efficiency meaning it can be identified by mechanical sorting (ballistic separators and screens) and optical sorting or Near Infra-Red (NIR).

To ensure packaging is suitable for large-scale sorting, it must adhere to the following:[11]

Size and Shape	Components **must be at least 40mm in at least two dimensions.**

Small components, measuring less than 40mm by 40mm, if not attached to a larger item, are likely to enter the residue stream during the screening process, passing through the trommel sieving drums. They therefore cannot be classed as recyclable and will likely be diverted to waste residue.

Where a packaging component falls below the size thresholds, it may still pass this stage of the assessment if dedicated take-back schemes exist to capture the smaller materials. It is the responsibility of the producer to prove these components are being collected and then arrive appropriately at the reprocessing stage.

Labelling	*No label or sleeve specifications defined*

Paper and Board are largely sorted using screens and ballistic separators with light 2D paper fractions being separated from 3D rigid cardboard and labels and sleeves have minimal impact on the component's ability to be sorted into paper and board grades.

[11] CERTIFY– CIRCPACK Guidance (Veolia)

Density and Mass	*No density or mass specifications defined*

Paper and Board are largely sorted using screens and ballistic separators and therefore density and mass have minimal impact on the component's ability to be sorted into paper and board grades.

Inks and Coatings	Components should not contain carbon black pigment

Paper and board packaging components that pass through screens and ballistic separation are directed to optical sorting, where Near-Infrared (NIR) technology is used. Carbon black pigments and inks, which absorb light, can interfere with NIR sorting. While this issue is common with rigid plastics, it also affects paper and board in the 3D waste stream. Since these systems rely on NIR reflection, packaging components with carbon black pigments are difficult to detect, leading to challenges in accurate sorting.

Reprocessing

Paper / Board packaging components typically consists of papermaking fibres along with other elements like fillers, starch, coatings, binding agents, and various additive, which are generally managed for processing through standard paper mills. However, non-fibre content elements like barriers, inks, varnishes, and adhesives can hinder the recycling process. These materials may degrade paper quality and recycling performance and efficiencies.

To be entered into the Paper / Board waste recycling stream, a paper / board component must not contain more than 15% non-paper-fibre content. If the non-paper-fibre content exceeds 15% by weight, the packaging should be assessed in the fibre-based composite waste stream (see Section 3.2).

The tables below detail the factors that would affect the quality of paper recyclate. If a component contains any of the properties listed below, it does **not** pass the reprocessing stage of the assessment.

Material, Substances &	(a) Urea/ Formaldehyde (b) Urea/Melamine (c) Glass or Carbon fibres

Adhesives [12] [13]	

Laminations[14]	(a) Two-sided lamination, unless peelable laminates are used with clear consumer guidance for removal of the contaminant

Inks, Varnishes & Coatings [15] [16]	(a) Any sources of toxic (including toxic to reproduction), mutagenic, cancerogenic, endocrine disrupting chemicals (b) Thermoplastics (two sides coated) (c) Dipping of paper in molten wax (two sided) (d) Per- and polyfluoroalkyl substances (PFAs) (e) Plasticised inks

Residue	(a) Any packaging that is likely to retain product residue which cannot be easily removed by the consumer without the needs for tools or excessive force such as food attached to the surface.

While some specialist facilities are able to remove 3D residues, it is not expected that a standard paper mill is able to handle hard to remove residue such as baked on food. Surface staining such as small oil marks that do not fully soak the paper, or crumbs can be tolerated.

Application

In order to pass through this section and be classified as GREEN in the RAM output, an item of Paper or Board packaging must be able to be reprocessed in a standard paper mill. While it may still be recyclable at a specialist facility, it cannot include any of the following:

Material, Substances & Adhesives [17]	(a) In excessive of 5% non-paper-fibre content[18] (b) Polyamidoamine epichlorohydrin (PAAE) (c) Non-wood-based fibres[19] (d) Other siliconizing agents

[12] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging
[13] CPI Design for Recyclability Guidelines 4th Edition
[14] CPI Design for Recyclability Guidelines 4th Edition
[15] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging
[16] CPI Design for Recyclability Guidelines 4th Edition
[17] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging
[18] Based on consultation with CPI
[19] This may include alternative fibres such as bagasse, palm, fibre, rice straw, wheat straw, barley straw, oat straw, grass straw, flax, hemp, and bamboo where recyclability needs further investigation

Inks & Coatings [20]	(a) Adhesive lamination of PET, mPET, PET/PE (b) Lamination with Aluminium containing film (e.g. Alu/PE or PET/ Alu/PE) (c) Wax dispersion (e.g. microcrystalline waxes) (d) Direct metallisation (e) Transfer metallisation (f) UV cured varnishes

Whilst these contaminating items do not prevent recyclability, they lower the quality of reprocessing output and therefore end market applications.

[20] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging

3.2 Fibre Based Composites

Classification

Fibre based composites are a packaging material which is made of paperboard or paper fibres, with a layer of plastic, and which may also have layers of other materials, to form a single unit that cannot be separated by hand.

Fibre-based composites with <15% non-paper-fibre content are included in the **paper and board** recycling stream. Fibre-based composites that are aseptic and refrigerated, such as food and drink containers, may be collected alongside plastics but should be assessed against the criteria outlined in this section (3.2). This is in line with the pEPR definition[21].

It is the responsibility of the producer to prove that alternatives to cellulosic wood fibres are appropriate for use in papermaking and can be recycled within the existing scaled infrastructure.

Collection

Collection	Material and component type must be widely collected at kerbside by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority data produced by WRAP. The table below provides examples of fibre-based composite packaging types collected across the UK, it should not be considered exhaustive. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Table 2: UK Local Authority Collections for Fibre Based Composites

Item	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Food and Drink Cartons*	239	**63%**	184	11	28	16
* *Includes sandwich boxes, food boxes, drinks cartons, etc.*						

Source: *WRAP Local Authority (LA) Portal – February 2024*

[21] Producer Responsibility Obligations Regulations 2024

Limited Collection	Material and component types must be collected at kerbside by at least 50% of Local Authorities to qualify for a limited collection

Certain materials and packaging types are collected by a substantial number of local authorities across the UK but do not meet the 75% threshold for widely accessible collection. Packaging that meets a lower 50% threshold qualify for limited collection, reflecting the viable pathways that still exist for sorting and processing these materials.

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

Sortation

To be considered recyclable, the fibre-based composite packaging must first be easily sorted by mechanical sorting (ballistic separators and screens) and optical sorting known as Near Infra-Red (NIR). The process for diverting fibre-based composite packaging, like beverage cartons, can vary and may involve manual interventions to separate the packaging waste from the 3D rigid stream.

To ensure packaging is suitable for large-scale sorting, it must adhere to the following: [22]

Size and Shape	Components **must at least 40mm in at least two dimensions.**

If this is not the case, items that can be easily attached by hand to another component within the packaging unit to meet the dimension thresholds should also be considered as compliant with sorting requirements. For instance, a standard bottle cap, would not meet the size requirements as a standalone component. However, if consumers are advised to attach it to a larger component

[22] CERTIFY– CIRCPACK guidance (Veolia)

of the same material type that does meet these specifications, it can pass through the sorting process, including screening and sieving drums, designed to filter out small items and fines.

Where a packaging component falls below the size thresholds, it may still pass this stage of the assessment if dedicated take-back schemes exist to capture the smaller materials. It is the responsibility of the producer to prove these components are being collected and then arrive appropriately at the reprocessing stage.

Labelling	*No label or sleeve specifications defined*

Fibre based composites are largely sorted using screens and ballistic separators with light 2D fractions being separated from 3D rigids. Labels and sleeves have minimal impact on the component's ability to be sorted.

Density and Mass	*No density or mass specifications defined*

Fibre based composites are largely sorted using screens and ballistic separators and therefore density and mass have minimal impact on the component's ability to be sorted and diverted into the correct waste stream.

Inks and Coatings	Components should not contain carbon black pigment

Fibre based composites components that pass through screens and ballistic separation are directed to optical sorting, where Near-Infrared (NIR) technology is used. Carbon black pigments and inks, which absorb light, can interfere with NIR sorting. While this issue is common with rigid plastics, it also affects other material types in the 3D rigid waste stream. Since these systems rely on NIR reflection, packaging components with carbon black pigments are difficult to detect, leading to challenges in accurate sorting.

Reprocessing

Packaging components classified as fibre-based composites that contain more than 15% non-paper fibre content are considered problematic and not recyclable in standard paper mills. The high level of non-fibre materials, such as plastic layers, coatings, and barriers, disrupts standard recycling processes, making these items unsuitable for regular paper / board recycling streams.

While these materials can be effectively reprocessed at specialised facilities equipped to handle such contaminants, they must first go through collection and sortation to separate them from other paper or board materials sent for reprocessing standard mills. This separation is required to ensure that the fibre-based elements can still contribute to the recycling process, while the non-paper fibre components are processed appropriately in specialist facilities.

The tables below detail the factors which would affect the quality of fibre recyclate. If a component contains any of the properties listed below, then it does not pass the reprocessing stage of the assessment.

Material and Adhesives [23]	(a) Urea/ Formaldehyde (b) Urea/Melamine (c) Plastic material with a density in a range of 0.95 to 1.15 g/cm³, e.g., the same density as fibres and similar to water.

Inks, Barriers & Coatings [24]	(a) Any sources of toxic (including toxic to reproduction), mutagenic, cancerogenic, endocrine disrupting chemicals (b) Thermoplastics (two sides coated) (c) Dipping of paper in molten wax (two sides) (d) Lamination using adhesive that is not water soluble (e) Plasticised inks

Residue	(a) Any packaging that is likely to retain product residue which cannot be easily removed by the consumer without the needs for tools or excessive force such as food attached to the surface.

While some specialist facilities may have the capability to 3D residues, the presence of such residues is still regarded as a hindrance to the reprocessing of materials and can significantly impact recycling performance. This is in line with BS EN 643:2014 which applies to any paper material exports.

Application

In order to pass through this section and be classified as GREEN in the RAM output, an item of Fibre-Based Composite packaging cannot include any of the following:

[23] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging
[24] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging

Material, Substances & Adhesives [25]	(a) Polyamidoamine epichlorohydrin (PAAE) (b) Other siliconizing agents

Inks, Barriers & Coatings [26]	(a) Adhesive lamination of PET, mPET, PET/PE (c) Wax dispersion (e.g. microcrystalline waxes) (d) Direct metallisation (e) Transfer metallisation

Whilst these contaminating items do not prevent recyclability, they lower the quality of reprocessing output and therefore end market applications.

[25] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging
[26] 4evergreen Circularity By Design Guideline For Fibre-Based Packaging

3.3 Plastic (Flexibles)

Classification

Plastics classified as "flexible" refer to items that can easily be shaped and moulded to fit the product contents. Common examples of flexible plastic packaging include bread bags, snack wrappers, netted produce bags, zipper-lock pouches, and sachets.

Plastic films can be made from various types of plastic polymers, including polyethylene (PE), polypropylene (PP), and polyvinyl chloride (PVC) and typically include a combination of materials to form multi-layered flexible packaging. Plastic films are valued for their lightweight, moisture resistance, and ability to be printed on for labelling.

Collection

Collection	Material and component type must be widely collected at kerbside by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority data produced by WRAP. The table below provides examples of flexible plastic packaging types collected across the UK, it should not be considered exhaustive. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Table 3: UK Local Authority Collections for Plastic (Flexibles)

Item	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Crisp Packets	7	**2%**	5	0	2	0
Carrier Bags	50	**13%**	42	0	4	4
Clingfilm	52	**14%**	43	0	4	5
Films and Food Bags	34	**9%**	28	0	3	3
Other Pouches	19	**5%**	16	0	2	1

Source: *WRAP Local Authority (LA) Portal – February 2024*

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

If not included in Table 3 and no appropriate take back scheme is available, an item is not collected at a sufficiently wide scale and therefore does not pass this stage of the assessment.

Sortation

Given flexible plastics are currently predominantly collected via take back, it is expected that the providers of a scheme will bale collected material which can be sorted using Near Infra-Red (NIR) into different polymers and colours.

To ensure packaging is suitable for large-scale sorting, it must adhere to the following: [27]

Inks & Coatings.[28]	Components should not contain carbon black pigment

Carbon black pigments, especially those that absorb light, can disrupt automated sorting systems that use Near-Infrared (NIR) spectroscopy to identify plastic types. These systems rely on NIR reflection, making it difficult to detect plastics with carbon black pigment, which hinders accurate sorting.

Reprocessing

Polyolefin plastic film packaging and plastic bags which contain a minimum of 90% by weight of mono-polyethylene, mono-polypropylene, or a combination of both that still equates to at least 90% of the total composition by weight, can be considered for processing.[29] Any packaging components below this threshold do not pass this stage of the assessment.

[27]RECOUP: Recyclability by Design (2024)
[28]RECOUP: Recyclability by Design (2024)
[29] The Separation of Waste Regulations (2024)

The tables below detail other factors which would affect reprocessing. If a component contains any of the properties listed below, then it does not pass the reprocessing stage of the assessment.[30]

Material Composition	(a) PET layers / Non-PE and non-PP foamed polymer layers (b) PVC layers (c) Biodegradable and compostable materials[31] (d) Paper (e) Aluminium foil

Density	A component does **not** pass this stage of the assessment if its density is greater than 1g/cm3

Additives & Fillers	(a) SVHCs (b) Oxo-degradability additives (c) Foamed thermoplastic non-polyolefin elastomers

Barriers, Inks & Coatings	(a) PVC binders (b) EVOH (c) PA monolayer blends as barriers or coatings (d) Metalised film

Residue	(a) Any packaging that is likely to retain product residue which cannot be easily removed by the consumer without the needs for tools or excessive force such as food attached to the surface.

Application

According to recycling application specifications outlined in Section 2.1 and Article 3(15) of the Waste Directive, recycling applications does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

[30] *CEFlex Designing for a Circular Economy*
[31] Includes any degradable material including Oxy-biodegradable

Liable producers may need to provide evidence of the traceability of recycled plastic films to ensure that these materials are reprocessed into products, materials or substances whether for the original or other purposes, complying with the definition of Recycling in Section 1.4.

3.4 Plastic (Rigids)

Classification

Plastics classified as "rigid" in packaging refer to items that maintain a defined shape and structural integrity under normal conditions of use. These materials are typically stiff and durable, offering protection and support for a wide range of products. Common examples of rigid plastics in packaging include bottles, pots, tubs, trays, tubes, caps, and closures. The rigid structure of the packaging makes it ideal for providing strength, stability, and shape retention, ensuring the protection and integrity of the packaged contents.

Rigid plastic packaging can consist of multiple components made from different materials. For instance, a polyethylene terephthalate (PET) plastic bottle may have three separate parts: the bottle, label, and cap. When packaging contains two or more components of different materials, each part should be treated separately, provided they can be easily separated by hand without the need for tools or excessive force. If separation by hand isn't feasible, the component should be processed based on the predominant material by weight, following the RAM.

Collection

The table below provides a list of rigid plastic packaging types that are widely collected for recycling by local authorities, councils, and unitary authorities across the United Kingdom. For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority Date produced by WRAP.

The table below provides examples of rigid plastic packaging types collected across the UK, it should not be considered exhaustive. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Table 5: UK Local Authority Collections for Plastic (Rigids)

Item	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Fruit and Vegetable Punnets	358	**94%**	294	11	31	22
Detergent and Household Cleaner Bottles	360	**94%**	295	11	32	22

Drinks Bottles	360	**94%**	295	11	32	22
Milk Bottles	360	**94%**	295	11	32	22
Toiletries and Shampoo Bottles	360	**94%**	295	11	32	22
Black Plastic	94	**25%**	68	8	10	8
Plant Pots	31	**8%**	27	2	1	1
Food Pots and Tubs	310	**81%**	248	11	29	22
Margarine Tubs	316	**83%**	254	11	29	22

Source: *WRAP Local Authority (LA) Portal – February 2024*

Limited Collection	Material and component types must be collected at kerbside by at least 50% of Local Authorities to qualify for a limited collection

Certain materials and packaging types are collected by a substantial number of local authorities across the UK but do not meet the 75% threshold for widely accessible collection. Packaging that meets a lower 50% threshold qualify for limited collection, reflecting the viable pathways that still exist for sorting and processing these materials.

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

Sortation

Through the sorting process, plastics rigids packaging undergoes several stages to ensure it is directed into the appropriate waste stream. The design and specifications of the packaging play a critical role in how efficiently it moves through these stages. Factors such as size, shape,

material type, and the presence of labels, inks or coatings can impact the accuracy of sortation, affecting recyclability and overall system efficiency.

To ensure packaging is suitable for large-scale sorting, it must adhere to the following: [32]

Size and Shape.	Components **must at least 40mm in at least two dimensions.**

If this is not the case, items that can be easily attached by hand to another component within the packaging unit to meet the dimension thresholds should also be considered as compliant with sorting requirements. For instance, a standard bottle cap, would not meet the size requirements as a standalone component. However, if consumers are advised to attach it to a larger component of the same material type that does meet these specifications, it can pass through the sorting process, including screening and sieving drums, designed to filter out small items and fines.

Where a packaging component falls below the size thresholds, it may still pass this stage of the assessment if dedicated take-back schemes exist to capture the smaller materials. It is the responsibility of the producer to prove these components are being collected and then arrive appropriately at the reprocessing stage.

Labels and Sleeves.	Label or sleeve should not cover more than **60% of the surface area** of the component.

Any larger than this will prevent the item of packaging from being identified by modern automated Near Infrared (NIR) sorting equipment and it therefore risks being mis-sorted or rejected and sent to landfill. Where possible, labels that do not cover more than 40% of the surface area are preferable.

Inks & Coatings.	Components should not contain carbon black pigment **or** excessive foil decoration.

Colour affects the mechanical recycling process in two key ways: First, highly pigmented plastic has a significantly lower economic value compared to non-pigmented plastic. Second, dark-coloured plastics, especially those that absorb light, can disrupt automated sorting systems that use Near-Infrared (NIR) spectroscopy to identify plastic types. These systems rely on NIR

[32]RECOUP: Recyclability by Design (2024)

reflection, making it difficult to detect plastics with carbon black pigment, which hinders accurate sorting. Where there is excessive foil coverage, this can reflect the NIR spectroscopy causing the component to be rejected or mis-sorted.

Reprocessing

Reprocessing rigid plastics involves several critical steps to ensure that materials are effectively recovered whilst limiting contamination and problematic items that can hinder the process and degrade the quality of the recycled materials. Certain materials can raise challenges during reprocessing. They not only act as contaminants for other rigid plastics collected and sorted at scale but can also release acidic compounds during the extrusion process, which can be harmful to the recycling system. The following materials are not acceptable.

(a) PVC (including non-PVC with PVC components)
(b) Polystyrene (including but not limited to HIPS, expanded & extruded)
(c) Plastic films (these fall under section 3.3)
(f) Compostable and degradable plastics[33]
(d) Non-polyolefin foamed plastics e.g. non-PP and non-PE.

The list below details other factors which would affect reprocessing. Different polymers require distinct processing techniques and considerations for dealing with contaminants, making it crucial to address the specific challenges associated with each type of polymer therefore specific guidance is given under each polymer heading[34].

If a component contains any of the properties listed below, then it does not pass the reprocessing stage of the assessment.

Polyethylene terephthalate (PET)

Material, Barriers & Coatings	(a) Non-NIR detectable colours e.g. containing Carbon Black (b) EVOH / PA monolayer blends as barriers or coatings (c) Nanocomposite additives (d) Biodegradable and compostable materials[35]

[33] Includes any degradable material including Oxy-biodegradable
[34] RECOUP Recyclability by Design with the BPF
[35] Includes any degradable material including Oxy-biodegradable

Caps & Seals	(a) Caps comprised of Steel / Aluminium / Silicone with a density >=1g/cm3 (b) Seals comprised of PVC / Aluminium / Silicone with a density >=1g/cm3

Labels & Adhesives	(a) Direct printing (b) Labels or sleeves that are PET / PVC / Metalised / PS with a density > 1g/cm^3 / PET-G (c) Adhesives which are not removable in water (d) Inks that bleed and dye-wash solution

Residue	(a) Any packaging that is likely to retain product residue which cannot be easily removed by the consumer without the needs for tools or excessive force such as food attached to the surface.

High-density polyethylene (HDPE) and Polypropylene (PP):

Materials, Barriers & Coatings	(a) Non-NIR detectable colours e.g. containing Carbon Black (b) PVDC barriers or coatings (c) Additives that increase the density of HDPE above 0.995 g/cm^3 including Talc, $CaCO_3$ and other fillers

Caps & Seals	(a) Caps comprised of Steel / Aluminium / PS / PVC / Thermosets (b) Seals comprised of PVC / Silicone

Labels & Adhesives	(a) Labels or sleeves comprised of PVC / Aluminium / Metallised PET / PS (b) Adhesives which are not removable in water (c) Inks that bleed and dye-wash solution

Residue	(a) Any packaging that is likely to retain product residue which cannot be easily removed by the consumer without the needs for tools or excessive force such as food attached to the surface.

Application

According to application specifications outlined in Section 2.1, Plastic Rigids component of the correct packaging type and material (e.g. polymer) can widely be recycled making it ideal for full recovery and reprocessing into new products, which fits the directive's emphasis on material recycling over energy recovery or waste disposal. Therefore, if a packaging component has reached this stage, it can be expected to be used in an appropriate application unless any of the following apply:

Polyethylene terephthalate (PET)

Material, Barriers & Coatings	(a) Dark colours including dark blue / dark green / brown (b) External coatings or PA – 3 layers (c) UV stabilisers / AA blockers (d) Oxygen scavenger additives

Caps & Seals	(a) Seals comprised of Silicone with a density <1g/cm3

Labels & Adhesives	(a) Paper labels covering over 60% of the surface area

High-density polyethylene (HDPE), Polypropylene (PP) or Polystyrene (PS):

Materials, Barriers & Coatings	(a) Opaque / Heavy colours / Light-blue / Light-green / Light tints (b) PA barrier coatings including MXD6 (c) Clarifier

Caps & Seals	(a) Seals comprised of Aluminium

Labels & Adhesives	(a) Paper labels covering over 60% of the surface area (b) In Mould label (c) Water soluble adhesives up to 80°C

3.5 Steel

Classification

Steel is a ferrous metal, frequently used in beverage, food, health and beauty applications as rigid containers. It is selected for its ability to withstand extreme temperatures and pressure, as well as food preservation qualities such as being lightproof and oxygen tight. Examples of uses in household packaging include containers for human and pet foods, aerosols, personal care products and decorative cans.

Collection

Collection	Material and component type must be widely collected at kerbside by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority data produced by WRAP. The table below provides examples of steel packaging types collected across the UK, it should not be considered exhaustive and other examples of acceptable materials include rigid steel containers and closures. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Table 11: UK Local Authority Collections for Steel

Item	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Aerosols	**340**	**89%**	276	11	31	22
Drinks Cans	**360**	**94%**	295	11	32	22
Food Tins	**360**	**94%**	295	11	32	22
Lids from Glass Jars	**266**	**70%**	212	8	26	20

Source: *WRAP Local Authority (LA) Portal – February 2024*

Limited Collection	Material and component types must be collected at kerbside by at least 50% of Local Authorities to qualify for a limited collection

Certain materials and packaging types are collected by a substantial number of local authorities across the UK but do not meet the 75% threshold for widely accessible collection. Packaging that meets a lower 50% threshold qualify for limited collection, reflecting the viable pathways that still exist for sorting and processing these materials.

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

Sortation

Through the sorting process, steel and other ferrous metals are recovered and diverted into the appropriate waste stream using magnets. The design and specifications of the packaging should ensure that components are easy to identify and separate during the process.

To ensure packaging is suitable for large-scale sorting, it must adhere to the following: [36]

Size and Shape	*No size or shape specifications defined*

Small metal components, measuring less than 40mm by 40mm, if not attached to a larger item, are likely to enter the residue stream during the screening process, passing through the trommel sieving drums. A further sortation step may be employed to recover ferrous metals from the residue stream, or they may be retrieved later from incinerator bottom ash recovery. In both cases, ferrous metals of all sizes are typically recaptured at various stages of the process, regardless of their size.

Density and Mass	*No density or mass specifications defined*

[36] Conversations with waste management industry

Once ferrous metals reach the magnetic separation stage, mass becomes less important, as the magnetic force attracts ferrous metals regardless of their density or mass. The magnetic properties of ferrous metals, including steel, are the key factor in sorting, making density and mass largely irrelevant for the final separation.

Labels and Sleeves	*No label or sleeve specifications defined*

Since steels are predominantly captured through magnetic separation, labels and sleeves have limited influence during the sortation stages even if covering a large proportion of the face material.

Inks and Coatings	*No inks or coatings specifications defined*

Since steels are predominantly captured through magnetic separation, inks and coatings have limited influence during the sortation stages even if covering a large proportion of the face material.

Reprocessing

After metal packaging is sorted and baled, it is sent to recyclers for processing, where recycled material is typically blended with virgin metal. The steel reprocessing infrastructure in the UK is well equipped to handle contaminants that can reasonably be expected to appear in an item of packaging, therefore if a component has made it to this stage of the assessment it will pass the reprocessing stage.

Application

According to application specifications outlined in Section 2.1 Steel components can widely be recycled without losing their properties, making it ideal for full recovery and reprocessing into new products, which fits the directive's emphasis on material recycling over energy recovery or waste disposal. Therefore, if a packaging component has reached this stage, it can be expected to be used in an appropriate application.

3.6 Aluminium

Classification

Aluminium is a non-ferrous metal which has broad applications across the packaging sector. It is selected for its product preservation qualities such as being lightproof and oxygen tight, whilst also being lightweight and malleable. As a rigid container, aluminium can be used in food and beverage cans and aerosols, but it also has applications in semi-rigid packaging like foil trays, closing systems and tubes, and flexibles like crisp packets, laminated foils and blister packs.

Collection

Collection	Material and component type must be widely collected by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority data produced by WRAP. The table below provides examples of aluminium packaging types collected across the UK, it should not be considered exhaustive and other examples of acceptable materials include aluminium tubes, bottles, rigid containers and closures. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Table 12: UK Local Authority Collections for Aluminium

Item	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Aerosols	**340**	**89%**	276	11	31	22
Drinks Cans	**360**	**94%**	295	11	32	22
Foil	**301**	**79%**	242	8	29	22
Foil Trays	**299**	**78%**	239	10	29	21

Source: *WRAP Local Authority (LA) Portal – February 2024*

Sortation

Through the sorting process, aluminium and other non-ferrous metals are recovered and diverted into the appropriate waste stream using eddy currents. The design and specifications of the packaging should ensure that components are easy to identify and separate during the process.

To ensure packaging is suitable for large-scale sorting, it must adhere to the following: [37]

Size and Shape	*No size or shape specifications defined*

Non-ferrous (or non-magnetic) metals including Aluminium are sorted using an Eddy Current where the component is at least 40mm in at least two dimensions. Where the component is smaller than this, the material falls into residual waste but can be retrieved through bottom ash recovery. In both instances, the component passes the sortation stage. There are therefore no size or shape requirements that would inhibit sortation.

Density and Mass	*No density or mass specifications defined*

The eddy current used is not impeded by differences in density or mass and therefore all aluminium used in packaging would be suitable for this process and no specific requirements are in place.

Labelling	*No label or sleeve specifications defined*

Labels and sleeves have limited influence on the effectiveness of eddy current sortation, even if covering a large proportion of the face material therefore no labelling specifications are defined for the sortation stage.

Inks & Coatings	*No inks or coatings specifications defined*

Inks and coatings have limited influence on the effectiveness of eddy current sortation, even if covering a large proportion of the face material therefore no labelling specifications are defined for the sortation stage.

Reprocessing

After metal packaging is sorted and baled, it is sent to recyclers for processing, where Aluminium is re-introduced to the original production process and is melted at ~750°C as a raw material. The

[37] Conversations with waste management industry

aluminium reprocessing infrastructure in the UK is well equipped to handle any contaminants that can reasonably be expected to appear in an item of packaging, therefore if a component has made it to this stage of the assessment it will pass the reprocessing stage.

Application

According to application specifications outlined in Section 2.1 Aluminium components can widely be recycled without losing their properties, making it ideal for full recovery and reprocessing into new products, which fits the directive's emphasis on material recycling over energy recovery or waste disposal. Therefore, if a packaging component has reached this stage, it can be expected to be used in an appropriate application.

3.7 Glass

Classification

Glass packaging predominantly comprises of sand, soda, ash and limestone. It is frequently used for its ability withstand vacuum and high-pressure sealing, and non-porous composition which prevents food and beverage spoiling whilst also being transparent. It does not corrode or deteriorate in quality so is particularly useful for products with a long shelf life.

Collection

Collection	Material and component type must be widely collected by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority data produced by WRAP. The table below provides examples of glass packaging types collected across the UK, it should not be considered exhaustive. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Table x: UK Local Authority Collections for Glass

Item	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Bottles and Jars	**322**	**84%**	268	11	21	22

Source: *WRAP Local Authority (LA) Portal – February 2024*

Limited Collection	Material and component types must be collected at kerbside by at least 50% of Local Authorities to qualify for a limited collection

Certain materials and packaging types are collected by a substantial number of local authorities across the UK but do not meet the 75% threshold for widely accessible collection. Packaging that meets a lower 50% threshold qualify for limited collection, reflecting the viable pathways that still exist for sorting and processing these materials.

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

Sortation

In comingled collection systems, glass is primarily sorted by size and weight through mechanical screening, such as trommels. Larger glass pieces are directed into the appropriate recycling streams, while smaller fragments, referred to as "glass fines," often fall into residue streams and may be lost or used for lower-grade applications. Glass may also undergo optical sorting to separate it by colour or remove contaminants like ceramics or stones.

To ensure that packaging is designed for large-scale sorting, it must adhere to the following: [38]

Size and Shape	*No size or shape specifications defined*

Glass is sorted using LED optical sortation equipment or is crushed by rotating trommels during the initial sortation process and there are therefore no size or shape specifications defined.

Density and Mass	*No density or mass specifications defined*

Density and Mass have minimal impact on the optical sortation process and there are therefore no specifications defined.

Labels, Sleeves, Caps and Closures	*No label, sleeve, cap or closure specifications defined*

Most glass is crushed by rotating trommels during the initial sorting process, which typically removes most labels, sleeves, caps and closures so specific guidelines for these items are not defined. However, labels and sleeves that remain attached to the glass packaging will continue through processing and be considered contaminants in glass reprocessing.

[38] Conversations with waste management industry

Inks and Coatings	*No inks or coatings specifications defined*

Optical sortation equipment is able to detect all known forms of glass used in packaging and therefore no inks or coatings specifications are defined.

Reprocessing

After glass is sorted, typically by colour, it is sent to glass manufacturers for reprocessing. Due to the initial crushing process and subsequent high melting temperatures used in glass production, reprocessing infrastructure in the UK is well equipped to handle any contaminants that can reasonably be expected to appear in an item of packaging, therefore if a component has made it to this stage of the assessment it will pass the reprocessing stage.

Application

According to application specifications outlined in Section 2.1 Glass components can widely be recycled without losing their properties, making it ideal for full recovery and reprocessing into new products, which fits the directive's emphasis on material recycling over energy recovery or waste disposal. Therefore, if a packaging component has reached this stage, it can be expected to be used in an appropriate application.

3.8 Wood

Classification

Wood has limited applications in Household, primary packaging but is used in decorative and novel components and food trays where there is another material, such as fibre / paper sleeve for food contact. These materials are typically stiff and durable and used for their aesthetic qualities or to provide protection during shipping.

Collection

Collection	Material and component type must be widely collected by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority data produced by WRAP.

No wood packaging types meet these criteria. Other types of packaging are listed under the other material sections and in Appendix 4.2.

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

If not included in Table 3 and no appropriate take back scheme is available, an item is not collected at a sufficiently wide scale and therefore does not pass this stage of the assessment.

Sortation

Given wood packaging is not eligible for household collection, there is subsequently no sufficiently scaled process for the sortation of wood packaging components. A wooden packaging component is not considered to be viable for sortation streams.

Reprocessing

While wood is technically capable of being reprocessed, it is not practically reprocessed at scale within the household packaging recycling infrastructure as a result of it not being collected and / or sorted at a sufficient scale.

Application

At present, no item of packaging is expected to meet this stage of the recyclability assessment and therefore no criteria for appropriate applications are defined.

3.9 Other

Classification

If a producer is uncertain about which category their packaging falls into, or unable to assign one of the categories outlined, the packaging will, be default, be classified as 'Other'.

Collection

Collection	Material and component type must be widely collected by at least 75% of Local Authorities (LAs)

For a packaging type to be considered as being collected at scale, it must meet or exceed a 75% collection threshold. This means that at least 75% of local authorities across the UK must actively collect these items for recycling based on collected dated Local Authority data produced by WRAP.

No known packaging types classified as 'Other' meet these criteria. All eligible types of packaging are listed under the other material sections and in Appendix 4.2.

Take-back	Material and component type must be collected through dedicated take-back schemes and accessible by at least 75% of the population

Dedicated take-back schemes offer a way to recapture materials that are not included in kerbside collections. Liable producers must provide evidence to demonstrate that the accessibility threshold has been met, ensuring these collection schemes are broadly available to the population. Criteria for assessing accessibility should include factors such as geographical coverage, ease of use for consumers, and availability to underserved or rural areas and communities.

If not included in Table 3 and no appropriate take back scheme is available, an item is not collected at a sufficiently wide scale and therefore does not pass this stage of the assessment.

Sortation

Given no packaging classified as 'Other' is currently eligible for household collection, there is subsequently no sufficiently scaled process for the sortation of packaging components that do not

sit within one of the material categories identified. A packaging component classified as ‘Other’ is therefore not considered to be viable for sortation streams.

If a producer feels this description does not apply to their product, they may raise their exemption request with the technical advisory committee.

Reprocessing

While an alternate material may be technically capable of being reprocessed, they are not practically reprocessed at scale within the household packaging recycling infrastructure as a result of not being collected and / or sorted at a sufficient scale.

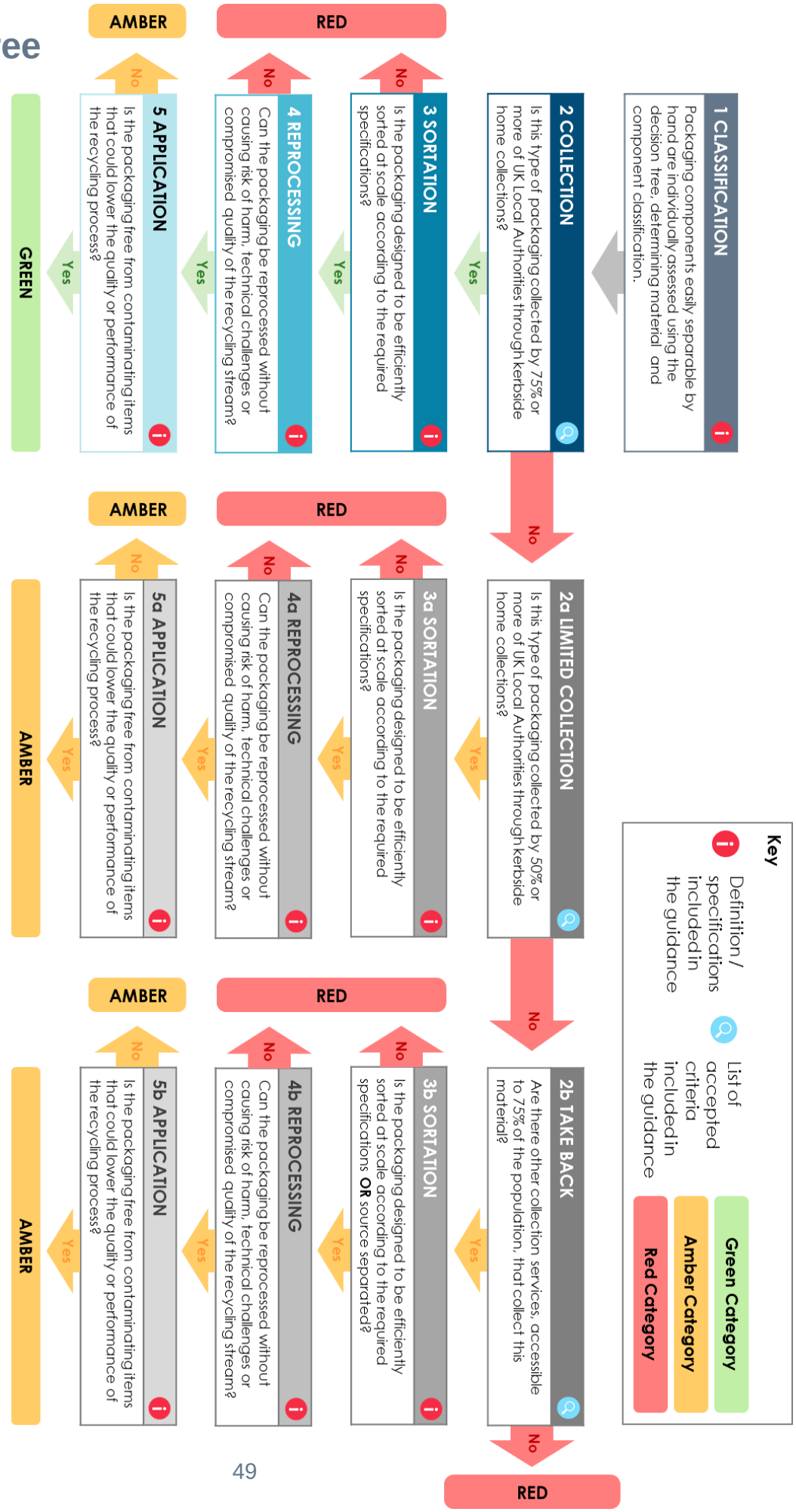
If a producer feels this description does not apply to their product, they may raise their exemption request with the technical advisory committee.

Application

At present, no item of packaging is expected to meet this stage of the recyclability assessment and therefore no criteria for appropriate applications are defined.

Section 4: Appendix

4.1 Decision Tree



4.2 Local Authority Collections

Number of UK local authorities that collect different items of packaging for recycling, as reported on the WRAP LA Portal on 6 February 2024 and provided to Defra by WRAP

Item	Material Category	UK	% of LAs that collect this item	England	Northern Ireland	Scotland	Wales
Foil	Aluminium	301	79%	242	8	29	22
Foil Trays	Aluminium	299	78%	239	10	29	21
Aerosols	Aluminium Steel	340	89%	276	11	31	22
Drinks Cans	Aluminium Steel	360	94%	295	11	32	22
Food Tins	Steel	360	94%	295	11	32	22
Lids from Glass Jars	Steel	266	70%	212	8	26	20
Food and Drink Cartons	Fibre-based composites	239	63%	184	11	28	16
Bottles and Jars	Glass	322	84%	268	11	21	22
Cardboard Sleeves	Paper or board Fibre-based composite	360	94%	295	11	32	22
Cereal Boxes	Paper or board	360	94%	295	11	32	22
Corrugated Cardboard	Paper or board	357	93%	294	11	31	21
Egg Boxes	Paper or board	353	92%	290	11	31	21
Toilet Roll Tubes	Paper or board	358	94%	294	11	31	22
Brown Envelopes	Paper or board	341	89%	278	11	32	20
Shredded	Paper or board	270	71%	217	5	31	17
Window Envelopes	Paper or board	335	88%	275	8	31	21
Fruit and Vegetable Punnets	Paper or Board Plastic	358	94%	294	11	31	22
Crisp Packets	Plastic	7	2%	5	0	2	0
Detergent and Household Cleaner Bottles	Plastic	360	94%	295	11	32	22
Drinks Bottles	Plastic	360	94%	295	11	32	22
Milk Bottles	Plastic	360	94%	295	11	32	22
Toiletries and Shampoo Bottles	Plastic	360	94%	295	11	32	22
Black Plastic	Plastic	94	25%	68	8	10	8
Carrier Bags	Plastic	50	13%	42	0	4	4
Clingfilm	Plastic	52	14%	43	0	4	5
Expanded Polystyrene Packaging	Plastic	3	1%	2	0	0	1
Films and Food Bags	Plastic	34	9%	28	0	3	3
Other Pouches	Plastic	19	5%	16	0	2	1
Plant Pots	Plastic	31	8%	27	2	1	1
Food Pots and Tubs	Plastic	310	81%	248	11	29	22
Margarine Tubs	Plastic	316	83%	254	11	29	22
Trays	Plastic	308	81%	246	11	29	22
Yoghurt Pots	Plastic	318	83%	256	11	29	22
-	Wood	0	0%	0	0	0	0
-	Other	0	0%	0	0	0	0

No local authority reports collecting any items that would be classified as wood packaging or ‘other’ packaging (e.g. textiles, cork, bagasse). These rows have been manually added because only collected items are reported on the LA Portal.

4.3 Take-Back Protocol

This protocol is aligned to the OPRL Takeback Protocol to ensure consistency with existing industry labelling standards and practices.

Accessibility: Collection points must be available to at least 75% of the population. This must be proven by a robust methodology that accounts for travel distance and the range of transport options available, for example ‘drive time’ to the collection point. Collection points must also be clearly signposted and inclusive of those with disabilities. They should be accessible throughout normal business hours.

A reliable method for assessing accessibility involves calculating the population within a specified "drivetime" to a store or collection point. Drivetimes determine how far one can travel within a set time frame from a designated location, taking into account the existing road network and varying speeds.

To avoid double counting populations in overlapping geographic areas, it’s important to implement a deduplication method for the catchment areas surrounding each collection point. If a geographic area falls within the drivetime catchments of multiple collection points, the most frequently used collection point should be selected to prevent population overlap.

For example, a 10-minute drivetime at 30 mph corresponds to a distance of 5 miles, while 5 minutes at the same speed equals 2.5 miles. Alternatively, walking time or public transport travel time can also be factored into the assessment.

No conflict with kerbside collections: Collection schemes should not actively compete with kerbside collections or encourage consumers to use their system in place of kerbside collections.

No brand restrictions: Schemes must accept packaging from other brands that have a similar format.

No purchase necessary: Customers cannot be required to provide proof or purchase to use the service.

Traceability: The scheme must provide a defined end market for the reprocessed material and evidence must be made available upon request that confirms the tons of material reprocessed. Contaminating materials must also be accounted for in this data request.

4.4 Thank you to contributors

The project has undertaken extensive stakeholder engagement with a broad array of industry representatives, and we would like to thank all those who have been involved. It is the valuable insights that industry has provided that have enabled this RAM process and we look forward to continuing.

The Packaging Federation
Food and Drink Federation
British Retail Consortium
WRAP
Alupro
Metal Packaging Manufactures Association
BAMA
OPRL
Confederation of Paper Industries (CPI)
ACE UK
BPIF - printing & labels
Colpac
BPIF - cartons
BCF (inks, coatings & solvents)
British Plastics Federation (BPF)
Berry Group (BPI)
Foodservice Packaging Association
Recoup
British Glass
INCPEN
Ecosurety
Sonoco
Valpak
Biffa
Veolia
Suez
Environmental Services Association
The Packaging Scheme Forum (PSF)