Global Beverage Recycling Dataset

Final Report (V5)
International Aluminium Institute

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Introduction

Project Overview

Project aim:

The main objective of this work was for Eunomia to update previous work carried out in 2017 to establish the collected for recycling rate and the recycling rate for three different beverage packaging formats globally for the Global Beverage Can Circularity Alliance (GBCCA).

Background:

While GBCCA has access to data sources for Europe, the USA, Japan and (for some materials) Brazil, there is a substantial list of more challenging countries (35 for each packaging material) that it asked Eunomia to gather. GBCCA and Eunomia entered into a contract to undertake this work in 2025, and to repeat it again in 2026 and 2027. This report is for the **2025** study and the results represent 90% of the global market for aluminium cans, 88% for PET bottles and 84% for glass bottles.

The GBCCA is interested in understanding the global recycling rate changes over time since it has stated a recycling goal for Used Beverage Cans of 80% by 2030 and close to 100% by 2050. Knowing the recycling rates for different beverage containers in different countries is important to GBCCA as it allows them to understand how aluminium compares to other beverage container materials in terms of performance and change over time. GBCCA also use this information to develop strategies on how to promote the environmental benefits of aluminium, alongside ensuring that recycling performance continues to improve.

Reference Documents

The recycling rates identified in this study are reported in detail in the associated excel output:

Eunomia_IAI Global Recycling Rates Final V2.0

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Project Scope

Eunomia assessed and calculated a global **“collected for recycling rate”** and **“recycling rate”** for three types of beverage containers, as shown below.

If data was available, both rates were reported for a country. Where only the collected for recycling rate was available, the recycling rate was calculated and reported using loss rates.

Beverage containers in scope:



PET beverage bottles



Glass beverage bottles



Aluminium cans

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Recycling Definitions (1/2)

Collected for Recycling Rate

- Refers to the tonnage of the relevant material that is **sent to a reprocessor** as a proportion of the total material placed on the market
- Material sent to a reprocessor was assumed to be sent either directly or indirectly as follows:
    - Material can either be received into a deposit scheme or captured through a recycling collection system. The latter includes both material collected as a single material stream, or material captured in comingled (mixed recyclable material) streams.
    - Material collected through deposit systems or single stream collections is likely to be sent directly to reprocessors, whereas material collected through comingled streams is typically sent to MRFs/sorting facilities before it is sent to reprocessors.
- In some instances, it was not clear if the reported 'recovery rate' or 'recycling rate' was referring to a collection rate or a recycling rate. In these cases, rates were assumed to be the **collected for recycling** rate.
- Data from the informal sector is included in the rates. For some countries, the informal sector is responsible for all or most recycling activities.

Recycling Definitions (2/2)

Recycling Rate

- Refers to the tonnage of **recycling process output**** as a proportion of the total material placed on the market.
- As many countries, including those in the EU, have moved towards reporting recycling rate as the amount of material output from the final recycling process, **process loss assumptions** were applied to arrive at the final recycled material figure**.
- Loss rates for each material by country profile were based on secondary research, as well as the expert opinion of our technical team.
- The aim was to identify the rates shown in the adjacent calculations. It is noted that it was not always possible to identify what exactly the recycling figure in the source was referring to, or where exactly in the recycling value chain the figure was taken from.

Recycling rate calculations used for this study



PET beverage bottle recycling % = PET flake produced / PET beverage bottles POM*



Glass beverage bottle recycling % = Recycled glass cullet produced / Glass beverage bottles POM



Aluminium beverage can recycling % = Aluminium sent to remelter** / Aluminium beverage cans POM

**POM = Put on Market (Sold)*

** Some cans are de-lacquered in separate facilities before being sent to the furnace, while others are processed in facilities that combine both steps.

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Methodology

Overview of Approach

1. Data & Country Selection

- A range of data sources for the project were established.
- A list of 35 countries were selected in discussion with GBCCA for research, aiming to cover more than 80% of global put on market for each material type.

2. Country Research

- Individual countries were researched to determine the 'collected for recycling' and 'recycling' rates for each beverage format.

3. Loss Rates Applied

- Where only a collected for recycling rate was available, assumptions and available data were used to calculate loss rates between collection and recycling rates and applied to each country. This approach allowed the 'collected for recycling' and the 'recycling' rates to be calculated and presented for each country.

4. Global Rates Calculated

- Global collected for and recycling rates were calculated based on the sum of tonnages collected for recycling or recycled for all countries in scope, divided by the tonnage of material put on the market for those countries.

5. Regional Averages

- For countries where no data was found, regional averages were used to fill in the data gaps to estimate the impact of using these averages on the global rates. The impact was minimal; therefore, these results are reported in the appendix rather in than the main body of the report.

Placed on Market Data Selection

Key POM Data Sources

GBCCA supplied the **Material Placed on Market** and **Material Sent to Recycling** data for Aluminium (Europe*, US, Japan and Brazil) and for PET (Europe* and US) and Glass (Europe* and US). Eunomia integrated this data into the analysis to calculate the global recycling rate for each of the three materials.

Reloop provided Eunomia with **tonnes Placed On Market data** for each of the three materials for the other countries in scope of the project. Metal beverage container figures provided included steel, therefore an adjustment was made to estimate aluminium-only figures.

Eunomia Research

Eunomia's research identified several alternative POM figures. In most cases these were not used due to the quality or age of the source. However, for South Africa glass POM tonnages, Reloop figures provided were higher than expected (60 kg/capita equivalent), therefore, the alternative value was used instead.

Alongside this, the POM figure reported for China from Reloop was lower than expected, therefore an alternative value was used.

***Europe:**

- PET & Glass = EU27+Norway, Switzerland, UK
- Aluminium = EU27+Norway, Switzerland, UK, Iceland

Country Selection

The **countries** selected for this study were chosen to achieve more than **80% market coverage** for each beverage format in terms of the tonnes of the format 'put on market' annually (corresponding to sold annually).

The subsequent steps were followed to establish the countries:

- Reloop provided POM* data.
- POM data was sorted from highest to lowest POM for each beverage format.
- Countries were selected in order of POM, starting with the highest, until 80% POM coverage was reached for each beverage format.
- The lists of countries for each beverage format were then combined.
- In cases where a country appeared in only one or two lists, additional data was sought for all three beverage formats.

The final countries in scope of the project and their and market shares are shown in the table opposite.

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**POM = Put on Market (Sold)*

Countries Selected:

Region	Country	Global POM (tonnes)		
		Aluminium	Glass	PET
East Asia and Pacific	Australia	0.95%	1.27%	0.44%
	Cambodia	0.70%	0.19%	0.14%
	China	21.45%	24.58%	20.40%
	Indonesia	0.26%	0.21%	1.60%
	Japan	5.62%	1.78%	3.48%
	Malaysia	0.32%	0.10%	0.25%
	Philippines	0.15%	2.96%	0.81%
	South Korea	1.19%	0.88%	0.89%
	Taiwan	0.38%	0.21%	0.49%
	Thailand	0.50%	2.31%	1.71%
	Vietnam	2.81%	1.29%	0.78%
Europe and Central Asia	Europe	13.93%	13.15%	17.94%
	Kazakhstan	0.23%	0.30%	0.44%
	Russia	2.21%	2.83%	2.13%
	Turkiye	0.47%	0.96%	1.23%
Latin America and Caribbean	Argentina	0.31%	1.60%	1.14%
	Brazil	7.10%	5.75%	2.54%
	Chile	0.36%	0.62%	0.38%
	Colombia	0.16%	1.94%	0.69%
	Mexico	3.37%	5.19%	4.18%
	Peru	0.08%	1.07%	0.49%
Middle East and North Africa	Algeria	0.15%	0.33%	0.83%
	Egypt	0.67%	0.23%	0.58%
	Iran	0.43%	0.21%	0.60%
	Iraq	0.53%	0.08%	1.03%
	Israel	0.23%	0.19%	0.21%
	Saudi Arabia	1.14%	0.22%	0.95%
	UAE	0.17%	0.10%	0.36%
North America	Canada	2.09%	0.86%	1.03%
	United States	25.04%	8.48%	15.57%
South Asia	India	0.52%	4.82%	5.41%
	Pakistan	0.07%	0.55%	0.91%
Sub-Saharan Africa	Ethiopia	0.16%	0.99%	0.08%
	Nigeria	0.36%	1.79%	1.19%
	South Africa	1.30%	0.57%	0.73%
Total		95.41%	88.65%	91.62%

Note the countries and materials in this table were in scope of the project, but data was not found for all countries and formats shown here. Please see excel for further details.

Country Research – Data Sources

Data Sources

For figures researched by Eunomia, all data sources were documented in the accompanying excel to ensure a traceable record is available for future project iterations in 2026 and 2027. The **most up-to-date, reliable data** was reported, noting that this varied for different countries. Data was primarily sourced from:

a. Published governmental or producer organisation datasets
b. Academic sources
c. Personal communication with experts
d. Calculated by Eunomia where no credible recycling data is available for a country

Data Selection Criteria

For some countries, multiple sources of data and rates were found. In these instances, a figure was selected for reporting based on the RAG score as per next slide.

Informal Sector Data

Data from the informal sector's contribution to recycling figures was included, as many countries in scope of the project have large contributions from the informal recycling sector. Where no other data was found on separate recycling collections, it was assumed that the informal sector accounted for all recycling.

Country Research - Data Source RAG Rating

The following RAG rating was applied to indicate the level of data **quality** for each country.

RAG rating	Credibility of Data Source	Year of Data	Materials Included Defined	Type of Rate Defined
Red*	Data from dubious source/original data source cannot be found	Data over 5 years old	Data source does not define what materials are included	Data source does not define the type of rate. Where the rate was not defined it was assumed to be a collection rate
Amber	Data from academic literature or similar source	Data between 3-5 years old	Data source defines to some degree the materials included in the rate E.g., states plastic bottles but doesn't specify if this is PET only or all plastic bottles	Data source defines to some degree the type of rate E.g., states the rate is collection rate but does not specify if this is from DRS only or all systems
Green	Data from government or similar source	Data within the last 3 years	Data source clearly defines materials included in value	Data source clearly defines type of rate (I.e., collection, separated or recycled rate) and the point of the recycling value chain at which the measurement was determined

*Red data was only used when no other data sources were available. It is noted that much of the data found for the project was rated Red due to a lack of reliable data in many of the in-scope countries. The full breakdown of the rating of each countries data can be found in the associated excel workbook.

Country Research – Tonnes Collected or Recycled

Data on the **tonnes collected or recycled** was needed to calculate the global rate. These figures were extracted from the source where available.

Where not available, or where the tonnes collected or recycled reported in the source exceeded the POM figure, the below methods were employed to estimate the tonnes collected or recycled.

In instances where the collected for recycling or recycling **rate was available** for a country, method 1 was employed ahead of method to estimate the **tonnes**.

Method 1

Tonnes POM (Reloop) * Collected or Recycling Rate from Source **=** **Tonnes Collected or Recycled**

For countries where the collected for recycling or recycling **rates were not available**, the **tonnes** were determined using method 2.

Method 2

Tonnes Collected or Recycled **calculated using Municipal Solid Waste (MSW) composition and generation.** The below formula shows an example for PET bottles:

1. % of MSW that is PET bottles * Tonnes MSW generated **=** **Tonnes of PET bottles in MSW**
2. Tonnes POM (Reloop) - Tonnes of PET bottles in MSW **=** **Tonnes Collected or Recycled PET bottles**



Loss Rate Methodology

For countries where only the **collected** for recycling rates were found, **loss rates** were applied to the collection rates to calculate the countries associated **recycling** rates. Two methods of calculation loss rates were considered as per below. Method 1 was deemed too simplistic; therefore **Method 2 was used.**

Method 1: Applying average loss rates ✗

- Average loss rates for each material were calculated from countries where loss rates were available. These were predominantly European countries and US.
- The average loss rate was applied to all other countries.

Method 2: Appling loss rates based on the predominant collection system ✓

- From the data available, average loss rates for each material were calculated for:
  - Countries which predominantly collect the material in a separate stream, and
  - Countries who predominantly collect the material in a mixed stream i.e. sorting through a MRF is required.
- Research was conducted into each countries predominant collection system for each material. The loss rate relevant to the countries collection system was then applied. The loss rates are available in the associated excel workbook.
- Most countries were deemed to have predominantly separate collections, either through DRS, separate kerbside collections, or through informal collections.

Loss Rates Applied

For countries where only the **collected** for recycling rates were found, **loss rates** were applied to the collection rates to calculate the countries associated **recycling** rates.

Loss rates were determined based on previous Eunomia studies, including interviews with processors, and waste flow analyses.

The below loss rates were applied as per Method 2 in the previous slide.

Loss Rates[1]

Loss Rates	Separate collections	Mixed collections
Aluminium[2]	0%[3]	4%
Glass[4]	4%	21%
PET[2]	19%	29%

Assumptions on Collection Types

Assumptions on Collection Types	Proportion of Tonnes Separately Collected[5]	Proportion of Tonnes Collected Mixed
Aluminium	84%	16%
Glass	89%	11%
PET	86%	14%

[1]Loss rates used are not country specific and carry a degree of uncertainty.
[2]Aluminum loss rates are based on input to remelter, an additional loss would need to be applied to estimate outputs from remelter. There are also losses when PET flake is transformed into pellet.
[3]Assumed to be 0% as the loss rate is 'very low' as per CRI, but an exact figure was not available.
[4]Loss rates for glass based on Zero Waste Europe, How Circular is Glass
[5]Separately collected materials include those collected by DRS, separate kerbside collections, or by informal waste pickers

Global Rates Calculation

Global collected for recycling and recycling rates were calculated for each beverage format based on the in-scope country level data that was found through research and the assumptions described in the previous slides, using the following calculations:

Collected for Recycling Rate

$$\frac{\text{Sum of In-scope Countries Tonnes Collected for Recycling}}{\text{Sum of In-scope Countries POM Tonnes}} = \textbf{Global Collected for Recycling Rate (\%)}$$

Recycling Rate

$$\frac{\text{Sum of In-scope Countries Tonnes Recycled}}{\text{Sum of In-scope Countries POM Tonnes}} = \textbf{Global Recycling Rate (\%)}$$

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Results

POM Coverage per Material

- The global POM for each material based on the countries in scope of the project are shown below.
- For each material, the in scope countries accounted for more than 84% of the global market.

Beverage Container Format	% Global POM (based on countries with available data)
Aluminium cans	90.3%
Glass bottles	84.1%
PET bottles	87.7%

Recommended to report to 0 d.p. when publishing data

Global Collected for Recycling and Recycling Rates

- The rates calculated from countries in scope of the project are as follows:

Beverage Container Format	Collected for Recycling Rates (%)	Recycling Rates (%)
Aluminium cans	75.6%	74.8%
Glass bottles	44.5%	41.9%
PET bottles	61.3%	47.0%

Recommended to report rates to 0 d.p. when publishing data

- Aluminium beverage containers had the highest collected for recycling and recycling rates out of the beverage formats assessed.
- PET bottles have the greatest difference between collection and recycling, due to large loss rates applied to the collected for recycling figures. Please note that loss rates were assumed based on the few data points that were available, as described in Loss Rates.

Calculated Global Loss Rates

- The global loss rates for each material based on the countries in scope of the project are shown below.

Beverage Container Format	Loss rate from Collected for Recycling Tonnages to Recycled Tonnages
Aluminium cans	1.0%*
Glass bottles	5.8%
PET bottles	23.4%

Recommended to report to 0 d.p. when publishing data
**Only includes sorting losses, does not include losses from contamination, delacquering, or remelting*

Data Quality Results

Results per country

Number of countries with RAG rating per beverage format.

RAG rating	Aluminium	Glass	PET bottles
Red	11	18	19
Amber	5	4	4
Green	6	3	6
No data found	13	10	6

Country	Aluminium	Glass	PET bottles
Algeria	No data found	Red	No data found
Argentina	Red	No data found	Red
Australia	Amber	Amber	Amber
Brazil	Amber	Amber	Amber
Cambodia	Green	No data found	No data found
Canada	Red	Red	Green
Chile	Red	Red	Red
China	Red	Red	Red
Colombia	No data found	Amber	Red
Egypt	Red	No data found	Red
Ethiopia	No data found	No data found	Red
Europe	Amber	Green	Green
India	Red	Red	Green
Indonesia	No data found	No data found	Red
Iran	No data found	No data found	No data found
Iraq	No data found	No data found	No data found
Israel	Red	Red	Red
Japan	Green	Green	Green
Kazakhstan	No data found	No data found	Red
Malaysia	No data found	Red	Red
Mexico	Amber	Amber	Amber
Nigeria	No data found	Red	Red
Pakistan	No data found	No data found	Red
Peru	No data found	Red	Red
Philippines	No data found	Red	Red
Russia	No data found	Red	Red
Saudi Arabia	Red	No data found	No data found
South Africa	Amber	Red	Amber
South Korea	Green	Green	Green
Taiwan	Red	Red	Red
Thailand	Green	Red	Red
Türkiye	Red	Red	Red
UAE	Green	Red	No data found
US	Green	Red	Green
Vietnam	Red	Red	Red

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Conclusion

Summary

- Aluminium beverage cans had the highest global collected for recycling and recycling rates of the three container types analysed.
- PET bottles have the largest losses between collection and recycling. This is due to high loss rates during the sorting and recycling processes applied to the collected for recycling data.
- Collection and recycling rates for 35 countries (includes Europe as 'one country') were researched. 22 countries reported rates for aluminium cans, 25 reported rates for glass bottles, and 29 reported rates for PET bottles.
- Data quality for many of the countries researched was red (the lowest level as per the RAG rating defined in this study).
- Using regional averages to fill data gaps did not have a substantial impact on the overall global recycling rates calculated.

Appendix: Regional Averages

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Data Gap Filling - Regional Averages

For countries where neither the collected for recycling rate or the recycling rate could be found, regional averages were used to fill data gaps. The regional averages were calculated as follows:

- Countries with available data were grouped into regions to align with the World Bank's regions.
- The regional averages were then calculated for each region using the available data.
- It is noted that some regional averages were based on data from a small number of countries as shown in the table below. In some instances, only one country in a region had data.
- For this reason, and because the use of the regional averages only slightly increased global POM estimate as shown on the subsequent slide, the regional averages were not reported within the project results.

Region	Number of countries with data (used to estimate regional average)		
	Aluminium	Glass	PET
Middle East and North Africa	4	3	2
Latin America and Caribbean	4	5	6
East Asia and Pacific	8	9	10
North America	2	2	2
Sub-Saharan Africa	1	2	3
South Asia	1	1	2
Europe and Central Asia	2 (includes Europe as one 'country')	3 (includes Europe as one 'country')	4 (includes Europe as one 'country')

POM Coverage per Material

- The global POM for each material based on the countries in scope of the project are shown below.
- For each material, the in scope countries with available data on collection and/or recycling rates accounted for more than 84% of the global market.
- **Using regional averages increased this coverage** to a minimum of 88% of the global market.
- Because the regional averages only slightly increased % global POM estimate, the regional averages were not reported within the project results.

Beverage Container Format	% Global POM (based on countries with available data)	% Global POM (based on countries with available data and regional averages)
Aluminium cans	90.3%	95.4%
Glass bottles	84.1%	88.7%
PET bottles	87.7%	91.6%

Recommended to report rates to 0 d.p. when publishing data

Global Collected for Recycling and Recycling Rates

- The rates calculated from countries in scope of the project where data **was** available and countries where and **regional averages** were also used are shown below.
- The use of regional averages had little impact on the global collected for recycling and recycling rates.

Beverage Container Format	Collected for Recycling Rates (%)	Recycling Rates (%)
Aluminium cans	75.5%	74.7%
Glass bottles	44.0%	41.5%
PET bottles	60.8%	46.7%

Recommended to report rates to 0 d.p. when publishing data

Appendix: EU Recycling Calculation Point



EU Recycling Calculation Point

The EU Commission states that:

For the purposes of calculating and verifying attainment of the targets set in points (a) to (e) of Article 6(1) of Directive 94/62/EC, the weight of recovered or recycled packaging waste shall be the input of packaging waste to an effective recovery or recycling process. If the output of the sorting plant is sent to effective recycling or recovery processes without significant losses, it is acceptable to consider this output to be the weight of the recovered or recycled packaging waste.

*The amount of recycled packaging waste shall be the amount of waste at the **calculation point**. The amount of packaging waste entering the recycling operation shall include targeted materials. It may include non-targeted materials only to the extent that their presence is permissible for the specific recycling operation.*

The calculation points applicable to certain packaging waste materials and certain recycling operations are specified in Annex II.

Annex II. Calculation points referred to in Article 6c(1)(a):

Packaging Material	EU Calculation Point	Eunomia Calculation Point used in this study
Glass	Sorted glass that does not undergo further processing before entering a glass furnace or the production of filtration media, abrasive materials, glass fibre insulation and construction materials.	Recycled glass cullet produced.
Metals	Sorted metal that does not undergo further processing before entering a metal smelter or furnace.	Aluminium sent to remelter. Some cans are de-lacquered in separate facilities before being sent to the furnace, while others are processed in facilities that combine both steps.
Plastics	Plastic separated by polymers that does not undergo further processing before entering pelletisation, extrusion, or moulding operations; Plastic flakes that do not undergo further processing before their use in a final product.	PET flake produced.

EU Calculation Point Source: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02005D0270-20190426

About Eunomia

Eunomia is an independent sustainability consultancy driven by a genuine passion to make a positive change to the clients we work with and the communities they operate in. Founded in 2001, we have been pioneers in the sector - early advocates for helping NGOs as well as leading public and private sector organisations in the UK and overseas to adapt their approach and adopt more sustainable processes.

Our consultants are experts in the field, deeply immersed in the subject with the technical knowledge and skill to offer clients innovative, clear and practical recommendations. We are committed to finding solutions to better protect the planet, while supporting the wider aims and needs of our clients.

Each client is treated as an individual, with consultants taking the time to understand their objectives and how best we can support them. This personal service ensures a strong relationship is forged, based on honest and regular communication. It also ensures if these objectives change, there is the flexibility to adapt.

As an established leading independent consultancy, clients can have complete confidence that consultants will offer evidence-led solutions based on robust, impartial thinking that offer both pragmatic and positive outcomes.