

The Ellen MacArthur Foundation's Plastics Initiative

2023 Recycling Rate Survey results summary

1. Context

1.1 The Global Commitment, Plastics Pact Network and recyclability

The Global Commitment is led by the Ellen MacArthur Foundation ('the Foundation') in collaboration with the UN Environment Programme, and unites over 500 [businesses, governments, and other organisations](#) from around the world.

The Plastics Pact Network is a global network of national and regional Plastics Pacts, driving action towards a common vision of a circular economy, where plastic never becomes waste. There are currently twelve [Plastics Pacts](#) across the five continents, collectively representing over 550 organisations. Led by a local organisation, each Plastics Pact brings together businesses, policymakers, and NGOs within a country or region to build a circular economy for plastics. The Plastics Pact network enables co-ordinated action and vital knowledge exchange between Pacts from different countries, and leading organisations globally.

Both the Global Commitment and the Plastics Pact Network work towards the common vision and a set of 2025 targets to address plastic waste and pollution at its source.

A key target is the commitment to make 100% of plastic packaging reusable, recyclable or compostable by 2025. It was adopted by all Global Commitment signatories responsible for putting plastic packaging onto the market and Plastics Pacts in the global network. This commitment is underpinned by a specific definition of 'recyclable packaging' which states that:

"A packaging or packaging component is recyclable if its successful post-consumer collection, sorting, and recycling is proven to work in practice and at scale."

In clearly going beyond mere 'technical recyclability', this definition is important to achieve real-world progress.

The test and threshold to assess if the recyclability of a packaging design is proven 'in practice and at scale' for the **Global Commitment** is: does that packaging achieve a 30% post-consumer recycling rate in multiple regions, collectively representing at least 400 million inhabitants? An alternative test, especially relevant for more local organisations, is to check if a 30% post-consumer recycling rate is achieved in all the markets where their packaging is sold.

The test and threshold to assess if the recyclability of a packaging design is proven 'in practice and at scale' for **Plastics Pacts** is to assess both: does that packaging achieve a 30% post-consumer recycling rate in multiple regions, collectively representing at least 400 million inhabitants, and is a 30% post-consumer recycling rate achieved in the Pact market(s)?¹ If the threshold is met either globally or locally then it can be concluded for the purposes of the Plastics Pact reporting that a 'system for recycling' exists for that plastic packaging category.

Making the recycling system effective is a shared responsibility of a wide range of stakeholders, from design through to sorting and recycling. Therefore, the definition does not ask signatories to commit to the recycling of all their plastic packaging being proven to work in every market where their products are sold. It does, however, ask for clear proof points that recycling is happening in practice and at scale,

showing replicability, indicating that the design of the packaging (which is entirely within the producer's control) is not a barrier to making recycling work in practice.¹

1.2 The objectives of the Recycling Rate Survey

The Survey has been designed to help in the assessment of whether the recyclability of a given category of plastic packaging is proven 'in practice and at scale' by gathering and collating data on recycling rates by packaging category across a broad range of geographies. In doing so, it aims to go some way to filling the data gap on plastic recycling rates globally, and to driving alignment of assessments of recyclability across the Global Commitment signatory group and Plastic Pacts in the network.

More practically, the survey outputs, as presented in this document, aim to help signatories to the Global Commitment and Plastic Pacts members assess (through step 1 of the recyclability assessment tool) and report on the proportion of their packaging that is recyclable by indicating for a list of common plastic packaging categories, for which categories survey contributors indicated that they reach a 30% recycling rate across regions covering at least 400 million inhabitants.

Beyond that, through the public release of the full survey outputs we hope for the Recycling Rate Survey to serve as a first step towards better data availability and transparency overall, contributing to the development of a more comprehensive, global, open source database over time.

2. The 2023 Recycling Rate Survey

2.1 Changes in comparison with the 2022 Recycling Rate Survey

The Ellen MacArthur Foundation is continuously challenging itself to provide the highest quality of data in the most transparent way. This year we wanted to conduct a deep dive on PET thermoforms and PP other rigids. These categories were chosen as they were the closest to the 30% threshold in the previous years and so have the higher potential to become recyclable in practice and at scale by 2025. Therefore, instead of re-running the survey, we conducted desk research and reviewed in-depth proprietary studies of 2-3 organisations, with main focus on these packaging categories.

2.2 Going Forward

As with last year, the Ellen MacArthur Foundation is committed to publish annually data on packaging recyclability. We are working closely with independent organisations, gathering and collecting consistent data across a wide number of geographies worldwide, with the objective to develop a unified methodology for global recyclability assessment.

- In the short term, it will help hundreds of businesses in the Global Commitment and Plastics Pacts Network with assessing and reporting progress on recyclability in a consistent way.
- Beyond that, through public release of the output, we aim for this exercise to serve as a step towards better data availability and transparency overall, contributing to the development of a more comprehensive, global, open source database over time.

2.3 Recycling Rate Survey output

The Recycling Rate Survey output for 2023 remains unchanged from that of 2022. This year's desk based research and review of proprietary datasets resulted in a recyclability assessment that is the same as last year. Our focussed research on categories PET thermoforms and PP other rigids, as with previous

¹ More information on the definition of 'recyclable' and other definitions used in the Global Commitment is available on the Ellen MacArthur Foundation website [here](#). Plastic Pact lead organisations can find more information on this on the Resource Hub for Pacts members.

years, did not find sufficient evidence of a 'system for recycling' existing in practice and at scale (i.e. 30% recycling rate for at least 400 million inhabitants). The proprietary nature of the datasets we have accessed are confidential.

As with previous years, if a signatory considers a packaging type recyclable in practice and at scale, we provide the opportunity to submit evidence demonstrating these claims for that packaging type (please see the [reporting guidelines](#) for information about which evidence should be provided). Below are the methodology and results of last year's survey.

In 2022, 33 organisations contributed to the survey, a number of whom provided responses for multiple geographies. As a result, between one and three responses were received for each of the 48 geographies covered. The responses provided 684 data points on recycling rates for different categories of plastic packaging across a broad range of geographies. These included 45 countries, 2 supra-national regions and 1 sub-national region, together covering over five billion inhabitants.

Table 1 provides a summary of the output of the survey. It indicates for which categories of plastic packaging the survey results indicated that a system for recycling exists in practice and at scale, i.e. for which of these the survey found evidence that a 30% recycling rate for one or more regions, collectively covering at least 400 million inhabitants is being met.

- For each packaging category, the table indicates in which geographies survey contributors indicated (by unanimous or majority view in the case of multiple responses being received for that geography) that, in their view or based on data available to them, the rate of recycling of the packaging category is 30% or higher.²
- If the total population covered by these countries exceeds 400 million, it has been indicated in the table that for that packaging category a system for recycling is considered to exist in practice and at scale.

There were 25 instances (out of 684 packaging category-geography combinations in total) where a packaging category for a given geography received a 'mixed response' - that is, where there were only two contributors, and one respondent offered a view in favour of a 30% recycling rate being met while the other offered a view against.³ For more information about mixed responses, see Appendix III.

In addition to the tables referenced above, two additional resources are provided:

- A consolidated list of sources referenced by contributors in support of their responses is provided in Appendix IV of this document
- The [full survey output](#), including individual responses by country and packaging category, estimates of recycling rates and sources provided, is available for download in spreadsheet format separately

2.4 Disclaimer

This paper has been prepared and produced by the Ellen MacArthur Foundation (the "Foundation"). The Foundation has exercised care in the preparation of the paper, and it has used information it believes to be reliable. However, the Foundation makes no representations and provides no warranties to any party in relation to any of the content of the paper (including as to the accuracy, completeness, and suitability for any purpose of any of that content). The Foundation (and its related people and entities and their

² Countries were listed where there was a single response for that packaging category indicating a 30% or higher recycling rate (with none opposing that view), or in the case of multiple responses where there was a unanimous or majority view that the 30% rate is being achieved.

³ These geographies are not included for the relevant packaging category and population totals in the summary table, but are presented in a separate table in Appendix III

employees and representatives) shall not be liable to any party for any claims or losses of any kind arising in connection with, or as a result of, use of or reliance on information contained in this paper.

Table 1: Summary of output (unchanged from 2022)

Packaging category	Evidence found that a 'system for recycling' exist in practice and at scale today ⁴	Countries/Regions where responses provide evidence for a 30% recycling rate being achieved ⁵	Total population for which survey responses provide evidence of a 30% recycling rate being achieved ⁶
PET bottles	Yes	Regions: EU+3 Countries: Argentina; Australia; Austria; Belgium; Bolivia; Brazil; Bulgaria; Canada; China; Costa Rica; Cyprus; Czech Republic; Denmark; Ecuador; El Salvador; France; Germany; Guatemala; India; Indonesia; Italy; Japan; Mexico; Netherlands; New Zealand; Norway; Panama; Paraguay; Peru; Poland; Portugal; Russia; South Africa; Spain; Sweden; Switzerland; United Kingdom	4.6 billion
PET Thermoforms	No	Countries: Australia; Canada; New Zealand	68 million
Other PET rigid	No	Countries: Canada, Portugal	48 million
HDPE Bottle	Yes	Regions: EU+3 Countries: Australia; Belgium; Bulgaria; Canada; Cyprus; France; Germany; Greece; India; Italy; Netherlands; New Zealand; Philippines; Poland; Portugal; Russia; South Africa; Spain; Sweden; United Kingdom	2.3 billion
HDPE Other rigids	Yes ⁷	Countries: Belgium; Bulgaria; Canada; Cyprus; Germany; Italy; Netherlands; New Zealand; South Africa; Spain; Sweden	340 million
PP Bottle	Yes	Regions: EU+3 Countries: Bulgaria; Cyprus; Germany; Italy; Netherlands; Poland; Russia; Spain; Sweden; United Kingdom	675 million
PP other rigid	No		0
PE Tubes	No	Country: Portugal	10 million
PS rigid	No		0
EPS rigid ⁸	No	Country: Japan	126 million
PVC rigid	No	Country: Australia	25 million

⁴ The question 'Does a system for recycling exist in practice and at scale today?' is answered 'yes' for a specific packaging category if for this category the recycling rate is indicated as reaching 30% or higher in geographies together covering more than 400 mln inhabitants on the basis of the data in the third and fourth columns of the table.

⁵ For 13 geographies, more than one contribution was received. For more details, see the [full output table](#).

⁶ This is an aggregate number based on the countries' population estimates from [Worldometer](#). For the purpose of population calculations 'Europe' is taken as the European Union, Norway, Switzerland and the United Kingdom.

⁷ The packaging 'HDPE other rigid' is displayed as having evidence of a 'system for recycling' as the total population for which survey responses provide evidence of a 30% recycling rate being achieved is within a reasonable range of the 400 million threshold. In addition, there have been mixed responses received for this packaging category (i.e. contributors providing conflicting opinions), which, if included, would pass the 400 million threshold. For more information about these mixed responses see Appendix III.

⁸This category includes EPS and XPS such as for takeaway and retail food packaging as well as packaging peanuts. EPS packaging used for insulation (e.g. fish boxes), or for the protection of large items (e.g. white goods or furniture) are not considered in scope for this assessment.

>A4 mono-material PE flexibles in B2B context	Yes	Regions: EU+3 Countries: Austria; Belgium; Bulgaria; Cyprus; France; Germany; Greece; Italy; Netherlands; Poland; Portugal; South Africa; Spain; Sweden; United Kingdom	588 million
>A4 mono-material PE flexibles in B2C context	No	Country: South Africa	59 million
Other >A4 flexibles	No		0
<A4 PE flexibles	No		0
<A4 PP flexibles	No		0
<A4 multimaterial flexibles	No		0
Other <A4 mono-material flexibles	No		0

2.5 Notes on Table 1

Please keep in mind that:

- While this table presents information on recycling rates for common plastic packaging categories across a wide range of geographies, we are aware that data is still lacking for a number of geographies. Notable gaps in country-level data (based on the number of inhabitants) in this survey include for instance Pakistan, Nigeria, Bangladesh, Ethiopia, and Egypt.
- Some responses covered only a minority of plastic packaging categories for the relevant geography (e.g. China).
- If your organisation only puts packaging on the market in one or a few countries, and if you have evidence that a 30% post-consumer recycling rate is achieved for a given packaging category in all those markets, your assessment of recyclability of your packaging may be different.

2.6 Additional notes to interpret the table (based on frequently asked questions)

The table is aimed at reporting progress to date and as such it is a point-in-time assessment of today's situation. In other words, the table does not:

- make any judgement on recyclability in the future (what is not recycled in practice and at scale today could be in the future)
- make any judgement on what is the most appropriate way forward (scale up recycling system, innovate recycling technology, change packaging design, eliminate, substitute, ...)
- claim that, if a system for recycling exists in practice and at scale for a certain category, that all packaging in that category is recycled, or that this category is recycled in all countries globally
- claim that, if no system for recycling exists in practice and at scale for a certain category, that no single packaging in that category is recycled.

This analysis at 'packaging category'-level is step one of a two-step process (outlined in Appendix II of the Global Commitment Reporting Guidelines document provided to all Global Commitment signatories⁹ and in Appendix III of the Plastics Initiative, Plastics Pact Vision and Definitions document provided to Plastics Pact lead organisations) and should always be seen in that context. For those categories that have a system for recycling in place in practice and at scale, step two of the assessment looks at how any specific packaging design (considering labels, glues, inks, caps, additives, etc.) fits into that system.

⁹The 2023 Global Commitment Reporting Guidelines will be provided to signatories in April.

Appendices

Appendix I: Contributors to the 2022 Recycling Rate Survey

Note: This table excludes three contributors who elected to contribute anonymously.

Contributors	Geographies for which responses were provided
ADEME, CITEO, Elipso	France
ABRELPE	Brazil
Altstoff Recycling Austria AG	Austria
Australian Packaging Covenant Organisation (ANZPAC Plastics Pact)	Australia, Fiji, New Zealand, Samoa, Solomon Islands, Tonga and Vanuatu
Canada Plastics Pact	Canada
CEMPRE Colombia	Colombia
CEMPRE - Compromisso Empresarial para a Reciclagem (Brasil)	Brazil
CRRA (China National Resource Recycling Association)	China
Fost Plus	Belgium
Fundacion Avina, Inter-American Development Bank	Argentina, Bolivia, Chile, Paraguay, Peru, Ecuador, Colombia, Brazil, Panama, Costa Rica, Guatemala, El Salvador, Mexico
Fundación Chile	Chile
Ghana National Plastic Action Partnership (GH-NPAP)	Ghana
Green Dot Norway	Norway
GreenCape with data verified by Plastics South Africa	South Africa
PETCORE Europe	Europe
Plastic Change	Denmark, Copenhagen
Polish Plastics Pact	Poland
Smart Waste Portugal	Portugal
SUEZ	Belgium, France, Germany, Greece, Netherlands, Portugal
Sustainable Inclusive Business Kenya	Kenya
SYSTEMIQ Indonesia	Indonesia
The University of Tokyo	Japan
TOMRA Sorting GmbH	Austria, Belgium, Bulgaria, Cyprus, Germany, Greece, Italy, Netherlands, Norway, Poland, Russia, Spain, Sweden, Switzerland, United States
World Wildlife Fund US	United States
WRAP UK	United Kingdom
WWF Philippines	Philippines
WWF-Turkey	Turkey

Appendix II: List of packaging categories

	Packaging category	Examples (non exhaustive)
Rigid / 3D	PET bottles	
	PET thermoforms	Trays, cups, blisters, etc.
	Other PET rigid	Jars, etc.
	HDPE bottle	
	HDPE other rigid	Pots, trays, cups, jars, etc.
	PP bottle	
	PP other rigid	Pots, tubs, trays, cups, jars, etc.
	PE tubes	
	PS rigid	Pots, trays, etc.
	EPS rigid	Takeaway & retail packaging, packaging peanuts, etc ¹⁰ .
	PVC rigid	Blisters, bottles, trays, etc.
	Flexible / 2D	>A4 mono-material PE in B2B
>A4 mono-material PE in B2C		Wrap around bottles, wrap around toilet paper, etc.
Other >A4 flexibles		
<A4 flexibles, PE		Pouches, sachets, wrappers, small bags, etc.
<A4 flexibles, PP		Pouches, sachets, wrappers, small bags, etc.
<A4 flexibles, multimaterial		Pouches, sachets, wrappers, small bags, etc.
Other <A4 flexibles, mono-material		wrappers, small bags, etc.

¹⁰This category includes EPS and XPS such as for takeaway and retail food packaging as well as packaging peanuts. EPS packaging used for insulation (e.g. fish boxes) , or for the protection of large items (e.g. white goods or furniture) are not considered in scope for this assessment.

Appendix III: Mixed responses

We have provided below a list of countries where we received ‘mixed responses’ (i.e. two contributors, each providing conflicting opinions) on whether the respective packaging category meets the 30% recycling rate threshold.

With the exception of ‘HDPE other rigids’ (see footnote 9, page 5), adding the countries with mixed opinions does not change the indication on whether the 400 million threshold is met.

Packaging category	Country	Population
PET bottles	Chile	19,116,201
	Colombia	50,882,891
	Greece	10,423,054
HDPE Bottle	United States	331,002,651
HDPE Other rigids	Austria	9,006,398
	France	65,273,511
	Norway	5,421,241
PP Bottle	Belgium	11,589,623
	France	65,273,511
	Greece	10,423,054
	Norway	5,421,241
PP other rigid	Germany	83,783,942
	Netherlands	17,134,872
	Norway	5,421,241
PS rigid	Greece	10,423,054
EPS rigid	Austria	9,006,398
	Greece	10,423,054
>A4 mono-material PE flexibles in B2B context	Norway	5,421,241
	United States	331,002,651
>A4 mono-material PE flexibles in B2C context	Austria	9,006,398
	Belgium	11,589,623
	Greece	10,423,054
	Norway	5,421,241
Other >A4 flexibles	Belgium	11,589,623
<A4 PE flexibles	Norway	5,421,241

Appendix IV: Consolidated list of sources referenced by respondents in support of their responses

1. ABIPET, 2019: CENSO ABIPET 2019
2. ABIPLAST, 2019: <http://www.abiplast.org.br>
3. ABIPLAST/ MAXIQUIM, 2020: PICPLASTIC REPORT 2020, <http://www.picplast.com.br/>
4. ANIR, 2020: Estudio del material disponible país y el reciclado de los productos prioritarios en Chile, <https://www.anir.cl/documentos-y-publicaciones/>
5. ARA: Circular Plastics 2030
6. ARC: <https://a-r-c.dk/>
7. ASIPLA, 2020: ESTADÍSTICAS INDUSTRIA DEL PLÁSTICO INFORME 2020, <https://www.asipla.cl/wp-content/uploads/2021/09/Informe-Estadistico-Ano-2020-Resumen-Ejecutivo.pdf>
8. Blue Environment, 2021: ANZPAC Baseline Recyclability Assessment 2020
9. Canada Plastics Pact (with a variety of authors), 2021: Foundational Research and Study on Canadian Plastic Packaging Flows, <https://plasticspact.ca/wp-content/uploads/2021/10/PPP-Foundational-Research-on-Canadian-Plastics-Packaging-Flows-May-2021-final.pdf>
10. CEMPRE, 2021: Red Reciclo, <https://redreciclo.com/>
11. Citeo annual report
12. Council for PET Bottle Recycling Japan, 2019: <https://www.petbottle-rec.gr.jp/data/transition.html>
13. EKO-KOM, www.ekokom.cz
14. EUMEPS, 2020: Rapport d'activité Citeo et Adelphe, <https://bo.citeo.com/sites/default/files/2021-07/CITEO-Rapport-activite-2020.pdf>
15. Eunomia, 2020: PET Market in Europe: State of Play
16. Eunomia, 2020: PE Film Market in Europe: State of Play
17. Eunomia, 2021: HDPE/PP Market in Europe: State of Play
18. Eurostat, 2019: Packaging waste statistics, https://ec.europa.eu/eurostat/databrowser/view/ENV_WASPACR_custom_2016242/default/table?lang=en
19. Eunomia, 2018: Plastic Packaging Waste Flows in Kenya 2018, <https://www.eunomia.co.uk/reports-tools/plastic-packaging-waste-flows-in-kenya/>
20. Fost Plus, 2021: Dataset
21. IUCN, 2020: NATIONAL GUIDANCE FOR PLASTIC POLLUTION HOTSPOTTING AND SHAPING ACTION, https://plastic hotspotting.lifecycleinitiative.org/wp-content/uploads/2020/12/kenya_final_report_2020.pdf
22. Japan Containers and Packaging Recycling Association, 2019: <https://www.jcpra.or.jp/english/tabid/612/index.php>
23. Jürgen Priesters/László Székely, TOMRA, 2020
24. Kenya Association of Manufacturers, 2019: Kenya Plastic Action Plan, https://kam.co.ke/kam/wp-content/uploads/2019/12/KPAP_Document-pages.pdf
25. Kjell Frederiksen, MEPEX, 2015
26. Latitud R, 2019: Analisis de circularidad y reciclaje de envases en America Latina
27. Latitud R, 2020: Análisis del reciclaje y la circularidad de envases en América Latina, https://latitudr.org/conocimiento_abierto/analisis-del-reciclaje-y-la-circularidad-de-envases-en-america-latina/
28. Miezah, K., Obiri-Danso, K., Kádár, Z., Fei-Baffoe, B., and Mensah, M. Y. (2015): Municipal solid waste characterization and quantification as a measure towards effective waste management in Ghana. *Waste management*, 46, 15-27.
29. Ministry of Environment Japan, 2019: https://www.env.go.jp/recycle/yoki/dd_3_docdata/docdata_02.html
30. PiPro SEA 2018

31. Pretorius, A, 2021: Plastics SA South African Recycling Survey Recycling Survey 2020
32. Pretorius, A, 2022: Plastics SA (Report on request for this survey)
33. Recoup, 2019: UK Household Plastics Collection Survey 2019
34. Rekopol Organizacja Odzysku Opakowań, 2020
35. Seureca, 2020: Strategic Roadmap for Better Plastics Management in Accra
36. SUEZ internal study
37. SYSTEMIQ/WEF, 2020: NPAP Indonesia report
38. Terje Skovly, ROAF, 2017
39. The Association of Plastic Recyclers & American Chemistry Council, 2019: U.S. Postconsumer Plastic Recycling Data Report, <https://circularityinaction.com/2019PlasticRecyclingData>
40. Troutman H, 2020: Ghana Country Environmental Analysis: plastic waste pollution
41. US EPA, 2018: Advancing Sustainable Materials Management: 2018 Tables and Figures, https://www.epa.gov/sites/production/files/2020-11/documents/2018_tables_and_figures_fnl_508.pdf
42. US EPA, 2018: Facts and Figures about Materials, Waste and Recycling, <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/plastics-material-specific-data>
43. Valpak, 2019: PackFlow Covid-19 Phase I: Plastic, <https://www.valpak.co.uk/more/material-flow-reports>
44. Van Eygen, E., Laner, D., Fellner, J., 2018: Circular economy of plastic packaging: Current practice and perspectives in Austria. *Waste Management*, 72 , 55-64.