



OAKDENE HOLLINS



close the glass loop

Study on one-way glass beverage packaging in the HORECA sector

Prepared for Close the glass loop by Oakdene Hollins

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Written by: Peter Lee, Dan Eatherley, Elena Payne and Ellen Percival

Final check by: (OH)

Approved by: (OH)

Date: 05/01/23

Contact: Peter.lee@oakdenehollins.com

Reference:

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Glossary

AGEC	<i>Loi relative à la lutte contre le gaspillage et à l'économie circulaire</i> [France's Anti-Waste and Circular Economy Law of 2020]
AIVE	<i>Associação dos Industriais de Vidro de Embalagem</i> [Portugal's Association of Packaging Glass Industries]
BV Glas	<i>Bundesverband Glasindustrie</i> [Germany's Federal Association of the Glass Industry]
CGL	Close The Glass Loop
CoReVe	<i>Consorzio Recupero Vetro</i> [Italy's Glass Recovery Consortium]
CSP	ceramic, stone and porcelain
DRS	deposit return system
EoL	end-of-life
EPR	extended producer responsibility
FCSIV	<i>Fédération des Chambres Syndicales de l'Industrie Du Verre</i> [France's Federation of Trade Union Chambers of the Glass Industry]
FERVER	The European Federation of Glass Recyclers
HORECA	hotels, restaurants, bars and cafés
MS	Member States
NABs	non alcoholic beverages
POM	Placed on Market
PRO	producer responsibility organisation

1 Executive summary

Glass recycling in Europe has shown year on year increases, standing at 79% in 2020¹. Although this can be considered quite impressive, the ambition of the glass packaging value chain is to achieve a European wide collection for recycling rate of 90% by 2030. Additionally, to ensure the full material value retention from a carbon perspective, maximizing the quality of the glass being collected and increasing the proportion of the glass sent for closed loop recycling is also a key consideration. To achieve these targets, the European glass value chain launched the [Close the Glass Loop](#) (CGL) initiative in June 2020.

Products in glass bottles and jars are usually consumed and discarded in two major points of consumption: households and hotels, cafés and restaurants (HORECA). The collection of empty one-way glass containers is therefore heavily reliant on municipal waste infrastructure and on disposal from HORECA operators. Because Hotels, Cafés and Restaurants are important markets for glass-packed products, a key challenge to meeting the Close the Glass Loop target is to increase the glass collection rate in the HORECA channel. This channel is renowned for being fragmented with limited data readily available. Therefore, the purpose of this study is to gain a greater understanding of glass usage in the HORECA channel to enable informed decisions to be made on how best to increase glass collection for recycling rates in this channel.

1.1 This study

CGL commissioned Oakdene Hollins to investigate one-way beverage² glass packaging in the HORECA channel across the EU-27MS + the UK. The two main datasets used to undertake the analysis were purchased from GlobalData and comprised of:

- Beverages Placed on Market (POM) in the HORECA channel in one-way glass by country and by product category in million units and million litres in 2019; and;
- Number of HORECA establishments by country and by establishment type (Pubs, clubs and bars, accommodation and restaurants) in 2019.

Please note: the GlobalData dataset on beverages POM included a breakdown by packaging format (refillable and one-way glass) and by channel (household and HORECA). Validation of the data received on refillables POM involved stakeholder engagement; i.e. interviews with national CGL platform members. In several cases, especially with wines and spirits, the country level estimates of refillables POM were considered overestimations by stakeholders. Therefore, throughout this report we have flagged where this is likely to impact on the accuracy of the results of our analysis.

1.2 Methodology

The country level data analysis was split into three component parts:

- Determination of absolute tonnes of one-way glass POM in the HORECA channel: This is a headline measure for the CGL initiative. This was calculated by dividing the volume of beverages POM (million litres) by the number of containers POM (million units) to derive the average size of the container (litres per unit). Using a conversion factor³ of 0.604kg/litre, the average weight of a

¹ <https://closetheglassloop.eu/europes-glass-value-chain-reaches-major-milestone/>

² In the context of this study 'beverages' comprised of beer and cider, wines and spirits, Non Alcoholic Beverages (NABs) and packaged water

³ This conversion factor was derived based on the information provided by Ecovidrio in Spain that an average beverage container is 0.29kg and 0.48 litres in size. To validate the appropriateness of this conversion factor, CITEO in France provided an estimate of 0.6kg of glass per litre.

container was calculated, and this was multiplied by the number of containers POM (million units) to derive the total or absolute weight of glass POM within each country.

- Determination of per capita glass waste arisings: This is used to normalise the results, i.e. it avoids the obvious conclusions around the bigger the country the more glass POM. It was assumed that the absolute tonnes POM, derived above, equates to the waste arisings. This was divided by the population of the country (sourced from Eurostat) to determine the annual waste (tonnes) generated per capita in each country.
- Determination of per outlet glass waste arisings: This is also used to normalise the results but also to provide a level of scale in terms of the collection systems that need to be in place both within the establishments and by the waste contractors. Using a similar methodology as for 'per capita', the absolute tonnage was divided by the number of establishments to derive the annual waste (tonnes) generated per establishment in each country.

The results of this analysis can be seen in Section 2 of this report.

Interviews with key stakeholders were undertaken, not only to validate the findings, but also to determine the barriers and enablers to increased collection for recycling in the HORECA channel at a country level. The results of which can be seen in Section 3 of this report.

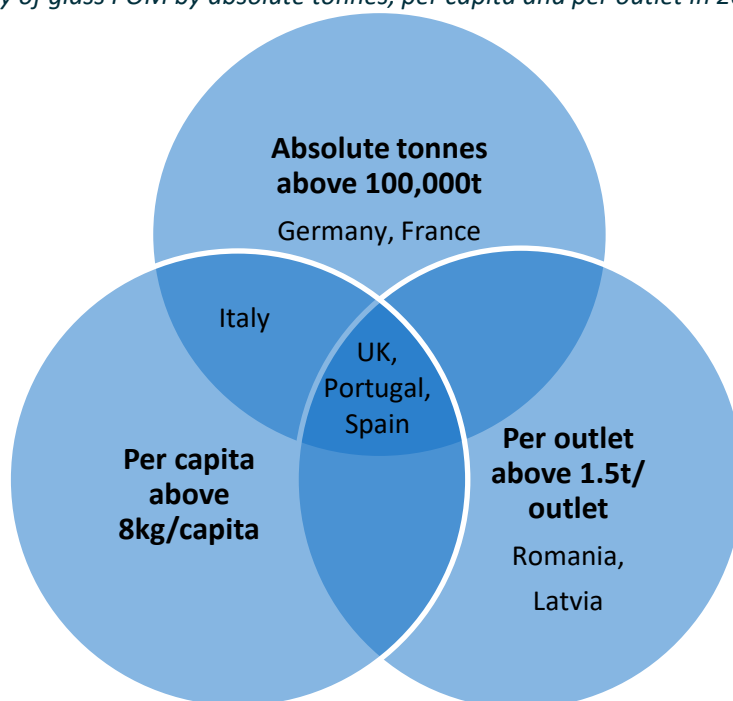
1.3 Key findings

1.3.1 Quantity of one-way glass generated in the HORECA channel

In 2019, there were 91.7 billion beverage containers placed on market (POM) in glass in the EU-27MS + the UK and one-way HORECA glass accounted for 9.6 billion units or 10%. It is estimated that over 3 million tonnes of one-way glass were POM in the HORECA channel with nearly two-thirds (65.3%) from the UK, Italy, Spain, France, Germany and Portugal.

Figure 1 shows that the UK, Portugal and Spain exceed the set thresholds of all three classifications analysed in this project, and hence, sitting in the very centre of the Venn diagram. Germany and France have high absolute tonnes but fall under the set thresholds for per capita and per outlet. Italy sits between absolute tonnes and per capita but the very high number of restaurants means that it falls under the per outlet threshold. Romania and Latvia exceed the per outlet threshold.

Figure 1: Summary of glass POM by absolute tonnes, per capita and per outlet in 2019



1.3.2 Barriers to the increased collection for recycling rates

- **Collection methods and logistics:** many countries cited the lack of tailor-made collection methods as a major barrier. It is commonplace for the same collection systems, using the same vehicles or bring banks, to be used to collect both household and HORECA waste. Since the quantity of glass from households is much higher, the collection systems are typically tailored to this channel. This lack of differentiation between the market channels of HORECA and the households prevents any form of accurate estimates to be made on the specific recycling rates within the HORECA channel.
- **Poor quality glass:** high levels of ceramic, stone and porcelain (CSP) contamination. FERVER (the European Federation of Glass recyclers) suggests that contamination levels can be as high as 12kg/tonne of glass in the HORECA channel.
- **Lack of in-house space available to store glass:** It is beneficial for establishments to maximise the front of house capacity, which results in limited space back of house to store glass.

1.3.3 Enablers to the increased collection for recycling rates

Ecovidrio in Spain, has introduced a customised collection system for HORECA, adapting the on street bring banks (the so called 'igloos') which includes a tipping arm to assist the dispensing of the glass from a wheelie bin to the igloo. This system is currently being trialled in Portugal.

To overcome the issue of space constraints, the Belgium glass recycler GRL now offers HORECA establishments in and around the Flemish city of Hasselt the option to use smaller glass boxes, each with a capacity of 30 bottles, which are emptied as part of a weekly door-to-door round operated by GRL. The nature of these boxes enables the quality of the glass to be inspected when they are emptied, and hence, the reported contamination rates are low.

Spain and Italy have undertaken staff education and training awareness programmes to minimise the contamination levels. FERVER suggests that the free provision of a bin for CSP would reduce the contamination levels of the glass.

A key recommendation from Close The Glass Loop might be a clear, simple message that could be directed to the HORECA sector – and perhaps to households more generally – that CSP contamination in glass needs to be avoided.

1.4 Conclusions

Disaggregating the performance of the HORECA and household channels, in terms of collection for recycling, is a challenge. In some countries where the quantity of one-way glass in the HORECA channel is significant, this is a major challenge. Especially, when the same collection infrastructure is used to collect glass from both channels. However, in some countries, the quantity of one-way glass in the HORECA channel is very modest, and hence, is highly unlikely to influence whether the CGL initiative meets its 90% collection for recycling target. Therefore, the solutions for increasing the collection for recycling rates need to be focused on the ‘significant few’ countries and tailored to the individual needs of those countries. For example, the on street bring banks (Igloos) which are considered best practice in Spain can not be readily rolled out to other countries where on street bring banks are not used or permitted, such as, the UK.

To conclude, it is estimated that over 3 million tonnes of one-way glass is POM in the HORECA channel in the EU-27MS+ the UK each year. This is a significant quantity of glass and anecdotally most stakeholders suggested that the collection for recycling rates in the HORECA channel is lower than that of the household channel. Therefore, a concerted effort is required to increase the collection for recycling rate to enable the CGL initiative to meet its 90% target by 2030.

1.5 Acknowledgements

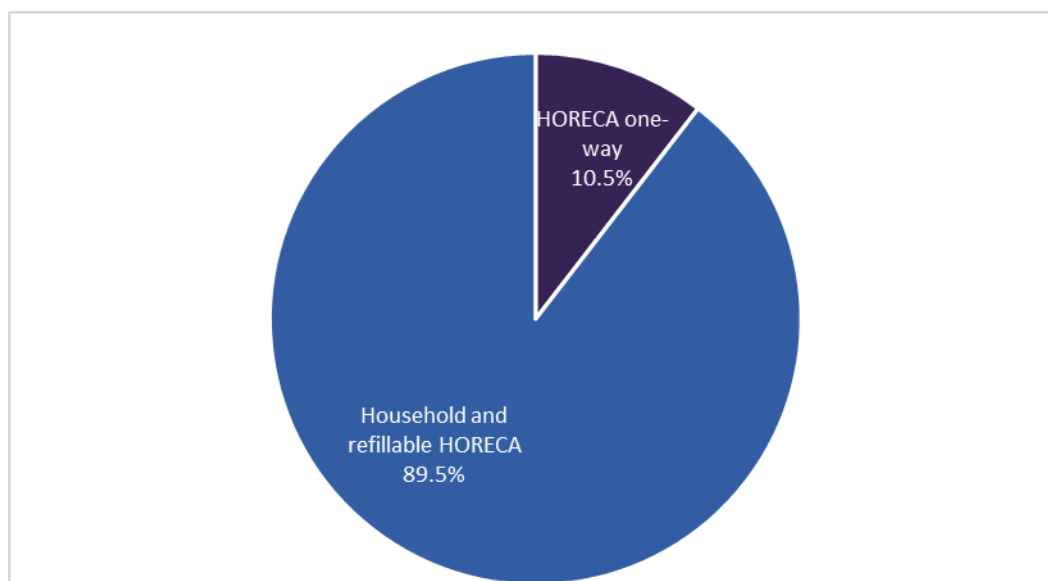
We are extremely grateful for the support of the CGL national platforms for the provision of data and guidance in the development of this report.

2 One-way glass in the HORECA channel

2.1 One-way beverage container glass POM in the HORECA channel

In 2019, there were over 91 billion (91.71 billion) beverage containers POM in glass in the EU-27MS+UK. Figure 2 shows that one-way glass beverage containers in the HORECA channel accounted for 10.5% or 9.6 billion units. Please note: this should be considered a conservative estimate due to the high estimates for refillables POM in the GlobalData dataset.

Figure 2: A breakdown of beverage units POM in the EU-27MS + the UK in 2019.



Source: GlobalData.

Table 1 and Figure 3 shows the breakdown of the 9.6 billion one-way units POM in the HORECA channel in 2019. This shows that three countries (the UK, Spain and Italy) account for nearly 6 billion units (5.99 billion) or 62.3% of the total across the whole of the EU-27MS+UK. Conversely, 11 countries (Slovak Republic, Croatia, Denmark, Latvia, Slovenia, Finland, Estonia, Cyprus, Malta, Lithuania and Luxembourg) account for 0.27 billion units or 2.8% of total one-way glass POM. Intuitively, maximising the collection for recycling rates in the countries with the highest amounts of glass POM would contribute most to the CLG target of 90% by 2030.

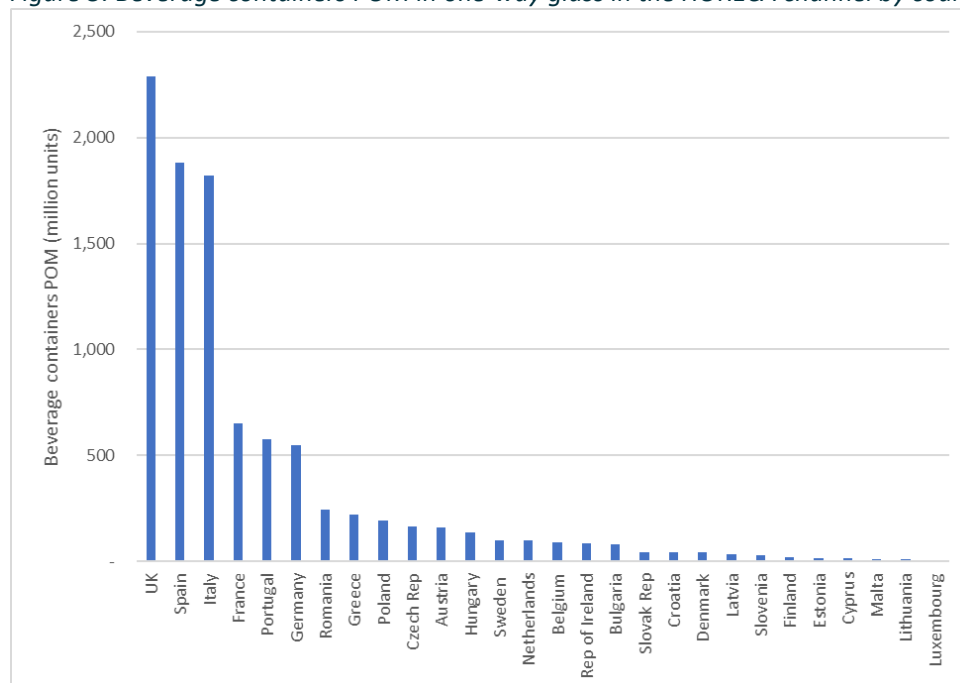
Table 1: Beverage containers POM in one-way glass in the HORECA channel by country in 2019 in million units

Country	Total POM (all channels and formats)	One-way POM in the HORECA channel	Share of total POM in one-way glass in the HORECA channel (%)
Austria	2,015.29	160.2	7.9
Belgium	2,785.00	87.8	3.2
Bulgaria	921.33	81.4	8.8
Croatia	799.76	42.6	5.3
Cyprus	129.58	13.6	10.5
Czech Rep	2,114.57	166.2	7.9
Denmark	729.61	42.5	5.8

Estonia	162.93	16.1	9.9
Finland	315.72	21.0	6.7
France	8,966.46	652.7	7.3
Germany	25,939.54	547.1	2.1
Greece	1,028.01	221.4	21.5
Hungary	1,113.50	135.6	12.2
Italy	8,825.30	1,818.4	20.6
Latvia	229.64	33.5	14.6
Lithuania	216.72	9.7	4.5
Luxembourg	193.00	4.1	2.1
Malta	88.98	12.2	13.7
Netherlands	3,323.93	98.9	3.0
Poland	6,799.43	191.1	2.8
Portugal	2,492.80	576.8	23.1
Republic of Ireland	552.34	87.0	15.8
Romania	2,478.18	245.3	9.9
Slovak	565.16	44.3	7.8
Slovenia	293.35	27.8	9.5
Spain	10,167.38	1,882.0	18.5
Sweden	761.00	99.6	13.1
UK	7,681.51	2,288.2	29.8
Total	91,690.02	9,607.0	10.5

Source: GlobalData

Figure 3: Beverage containers POM in one-way glass in the HORECA channel by country in 2019



Source: GlobalData

2.2 Weight of one-way beverage container glass POM in the HORECA channel

GlobalData could not provide the data on the weight of glass POM. Instead, the weight of glass was derived by firstly calculating the average size of beverage containers using the GlobalData data on annual POM in million units and million litres. Then the average glass container weight was calculated for each country. A standard conversion factor of 0.604kg glass /litre of product was used to provide an estimate of the tonnage of glass POM. This conversion factor was derived based on the information provided by Ecovidrio in Spain that an average beverage container is 0.29kg and 0.48 litres in size. To validate the appropriateness of this conversion factor, CITEO in France provided an estimate of 0.6kg of glass per litre.

Table 2 provides the estimated tonnes of one-way glass POM by country. One observation is that the mean container size (litres per unit) varies significantly by country (Figure 4). A key reason for this variation is the product mix in each country. For example, in the UK 1,618.6 of the 2,288.23 million units, i.e. 70.7% of one-way glass, is in the beer and cider product category with a mean size of 0.33 litres per unit (541.55 million litres / 1,618.6 million units). Whereas, in France, 501.51 of the 652.65 million units, i.e. 76.8% of one-way glass, is in the wines and spirits product category with a mean size of 0.87 litres per unit (436.52 million litres / 501.51 million units).

Table 2: Estimated tonnes of one-way glass POM in the HORECA channel by country in 2019

Country	One-way glass POM in the HORECA channel				Total glass POM in the household and HORECA channels	Share of total POM in one-way glass in the HORECA channel (%)
	M Units POM	M Litres POM	Mean container size (Litres per unit)	Estimated Tonnes of glass POM		
Austria	160.24	99.61	0.62	60,164.44	302,314	19.9
Belgium	87.83	57.18	0.65	34,536.72	325,713	10.6
Bulgaria	81.37	43.95	0.54	26,545.80	89,469	29.7
Croatia	42.57	23.58	0.55	14,242.32	81,780	17.4
Cyprus	13.58	5.54	0.41	3,346.16	18,844	17.8
Czech Rep	166.21	117.56	0.71	71,006.24	232,659	30.5
Denmark	42.45	23.19	0.55	14,006.76	190,888	7.3
Estonia	16.14	8.93	0.55	5,393.72	36,670	14.7
Finland	20.99	9.56	0.46	5,774.24	81,983	7.0
France	652.65	537.57	0.82	324,692.28	2,887,673	11.2
Germany	547.09	362.06	0.66	218,684.24	3,085,900	7.1
Greece	221.43	132.40	0.60	79,969.60	103,000	77.6
Hungary	135.59	86.93	0.64	52,505.72	163,143	32.2
Italy	1,818.44	907.66	0.50	548,226.64	2,677,830	20.5
Latvia	33.52	21.22	0.63	12,816.88	65,934	19.4
Lithuania	9.66	6.23	0.64	3,762.92	73,438	5.1
Luxembourg	4.06	1.83	0.45	1,105.32	34,764	3.2
Malta	12.20	5.80	0.48	3,503.20	13,545	25.9
Netherlands	98.92	62.68	0.63	37,858.72	508,000	7.5
Poland	191.11	134.21	0.70	81,062.84	1,359,173	6.0
Portugal	576.78	251.56	0.44	151,942.24	390,596	38.9
Republic of Ireland	86.99	40.10	0.46	4,220.40	161,144	2.6

Romania	245.32	134.47	0.55	81,219.88	350,450	23.2
Slovak Rep	44.26	27.03	0.61	16,326.12	92,143	17.7
Slovenia	27.75	15.93	0.57	9,621.72	36,511	26.4
Spain	1,882.01	881.73	0.47	532,564.92	1,492,739	35.7
Sweden	99.61	46.20	0.46	27,904.80	233,637	11.9
UK	2,288.23	950.89	0.42	574,337.56	2,419,000	23.7
Total	9,607.00	4,995.60	0.52	3,017,342.40	17,504,148	17.2

Figure 4: Mean container size by country in 2019.

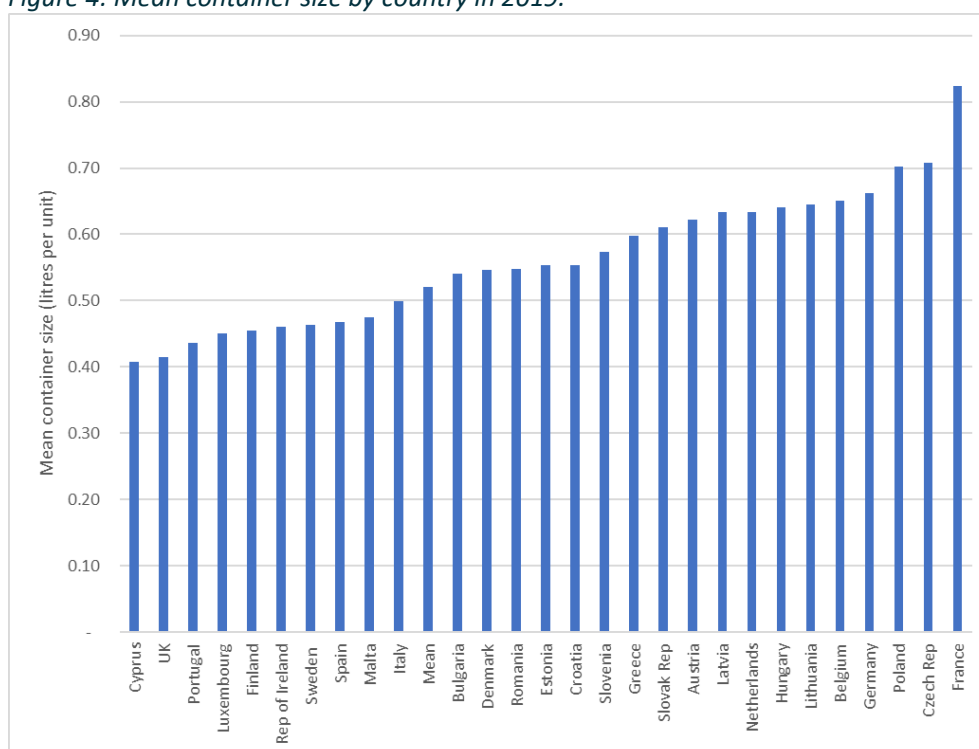


Table 3 shows the variation in the mean container size by product category with beer and cider being the smallest at an average of 0.37 litres per unit and wines and spirits the highest at 0.73 litres per unit. From a recycling perspective, the profile of the containers could have a significant impact on capture rates and the collection systems used. For example, is there a correlation between the size of the container and the motivation to recycle? Additionally, would the in-house collection system change with wines and spirits containers handled one at a time or in crates and smaller containers in transfer bins?

Table 3: Mean container size by product category

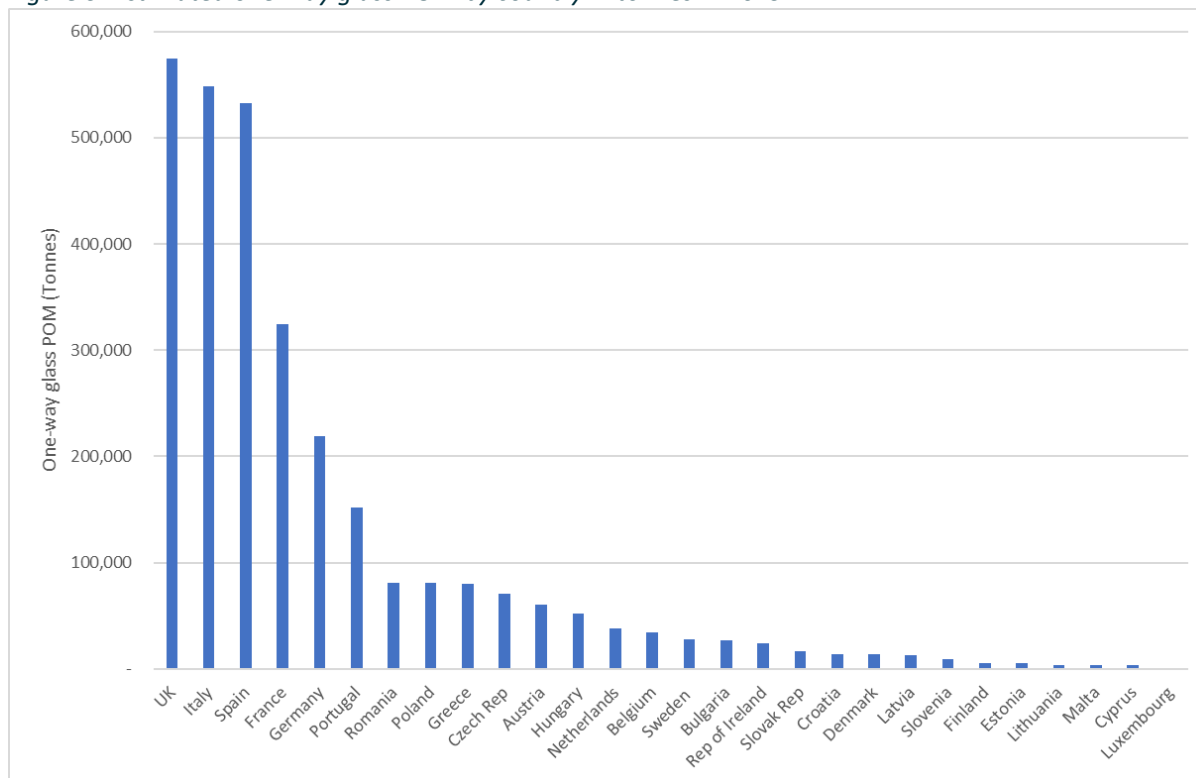
Product Category	POM (Million units)	POM (Million litres)	Mean container size (Litres per unit)
Beer and cider	4,635.4	1,711.8	0.37
Wines and spirits	3,730.6	2,705.6	0.73
NABs	812.2	380.5	0.47
Packaged water	191.1	104.8	0.55

Figure 5 shows the profile of the one-way glass POM by country. Three key points of reference:

- High tonnage countries: Of the estimated 3 million tonnes of one-way glass POM in the HORECA channel, three countries (UK, Italy and Spain) account for 1.66 million tonnes or 54.9%. This is less than the 62.3% contribution to POM unit sales shown in Figure 3 since the mean container size in all three countries is below the EU-27MS + UK, i.e. Table 2 shows the mean container size in the UK is 0.42 litres per unit, in Italy 0.50 and Spain 0.47 and the EU-27MS + UK mean is 0.52.

- Moderately high tonnage countries: France, Germany and Portugal combined account for 0.7 million tonnes of glass or 23% of total one-way glass POM.
- Low tonnage countries: The 11 countries with the lowest tonnage of one-way glass POM (Slovak Rep, Croatia, Denmark, Latvia, Slovenia, Finland, Estonia, Lithuania, Malta, Cyprus and Luxembourg) accounted for 90,000 tonnes or 3% of total glass POM, slightly higher than the 2.8% of POM units shown in Figure 3. This infers that cumulatively these 11 countries would have a slightly bigger mean container size than the EU-27MS+UK mean.

Figure 5: Estimated one-way glass POM by country in tonnes in 2019



2.3 A review of one-way glass POM (tonnes) by population

Table 4 provides a breakdown of the HORECA glass POM per capita by country. Figure 6 shows the ranking of the countries and the extreme variation from Finland 1.35 kg/capita to Portugal at 14.79 kg/capita.

Table 4: HORECA one-way glass POM per capita in 2019

Country	Tonnes of glass POM	Population (source: Eurostat)	HORECA glass POM per capita (Kg/capita)	Total glass POM per capita (Kg/capita)
Austria	60,164	8,858,775	6.79	34.13
Belgium	34,537	11,455,519	3.01	28.43
Bulgaria	26,546	7,000,039	3.79	12.78
Croatia	14,242	4,076,246	3.49	20.06
Cyprus	3,346	875,899	3.82	21.51
Czech Rep	71,006	10,649,800	6.67	21.85
Denmark	14,007	5,806,081	2.41	32.88

Estonia	5,394	1,324,820	4.07	27.68
Finland	5,774	5,517,919	1.05	14.86
France	324,692	67,290,471	4.83	42.91
Germany	218,684	83,019,213	2.63	37.17
Greece	79,970	10,724,599	7.46	9.60
Hungary	52,506	9,772,756	5.37	16.69
Italy	548,227	59,816,673	9.17	44.77
Latvia	12,817	1,919,968	6.68	34.34
Lithuania	3,763	2,794,184	1.35	26.28
Luxembourg	1,105	613,894	1.80	56.63
Malta	3,503	493,559	7.10	27.44
Netherlands	37,859	17,282,163	2.19	29.39
Poland	81,063	37,972,812	2.13	35.79
Portugal	151,942	10,276,617	14.79	38.01
Republic of Ireland	24,220	4,904,240	4.94	32.86
Romania	81,220	19,414,458	4.18	18.05
Slovak Rep	16,326	5,450,421	3.00	16.91
Slovenia	9,622	2,080,908	4.62	17.55
Spain	532,565	46,937,060	11.35	31.80
Sweden	27,905	10,230,185	2.73	22.84
UK	574,338	66,647,112	8.62	36.30

Figure 6: HORECA one-way glass POM per capita in 2019

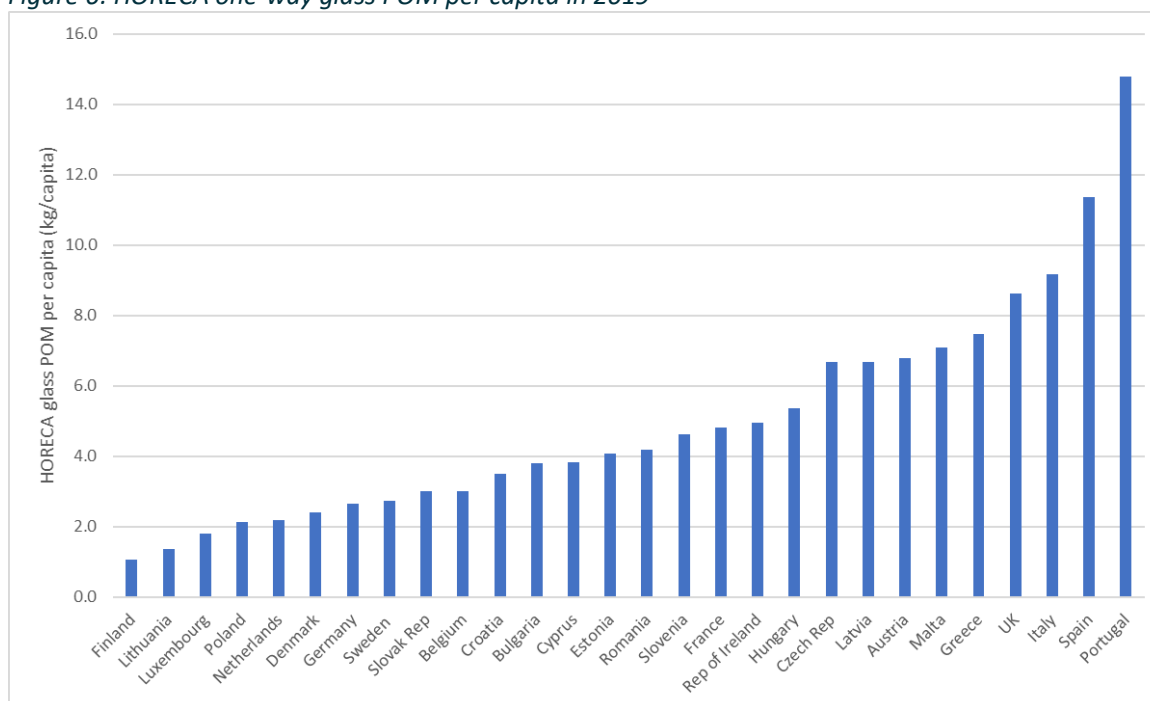
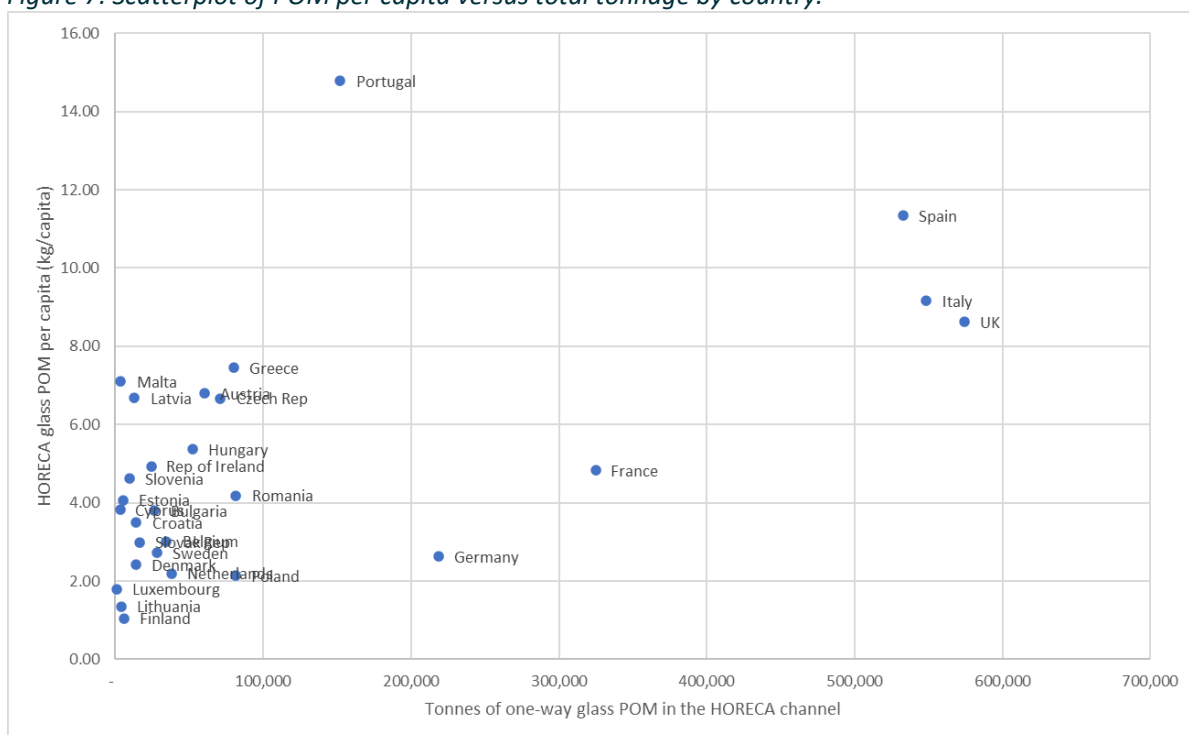


Figure 7 shows the scatterplot of POM per capita versus total tonnages POM. This shows four distinct clusters:

- Cluster 1: High per capita glass POM and high total tonnages = Spain, Italy and the UK.

- Cluster 2: High per capita glass POM and moderate total tonnages = Portugal
- Cluster 3: Moderate per capita glass POM and high total tonnages = France and Germany
- Cluster 4: Moderate to low per capita glass POM and low total tonnages = all remaining countries

Figure 7: Scatterplot of POM per capita versus total tonnage by country.



2.4 A review of one-way glass POM (tonnes) by number of establishments

The GlobalData dataset split the HORECA channel into three main establishment categories of Accommodation, Pub, Club & Bars and Restaurants. Table 5 shows the definitions for each of these 3 categories.

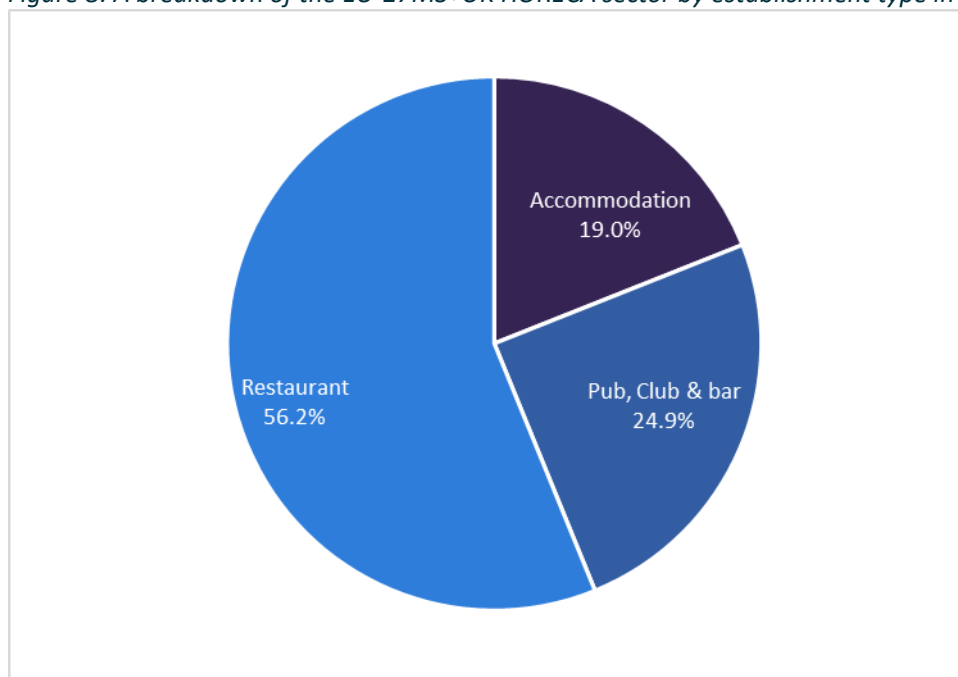
Table 5: Definitions of the three types of HORECA establishment categories

Category	Definition
Accommodation	Accommodation includes channels like Bed & Breakfast establishments, Hotels & Motels, Hostels, Holiday Parks, Caravan Parks and Guest Houses where people can stay. Outlets must have on-premise foodservice provision. Also included under 'others' are establishments such as lodges and serviced apartments.
Pubs, Clubs & Bars	Pub, clubs & bars includes outlets where the majority of sales are driven by drinks purchases. This includes Nightclubs, Private Member & Social Clubs and Pubs & Bars.
Restaurants	Restaurants includes outlets such as Coffee & Tea Shops, Full Service Restaurants, Quick Service Restaurants & Fast Food and Ice Cream Parlours (including kiosks and street side stalls which specialize in ice cream).

Source: GlobalData

In 2019, there were 2 million (2,069,100) outlets in the EU-27MS+UK HORECA sector. Figure 8 provides a breakdown of the sector by establishment type. This shows that restaurants account for more than half of all establishments (56.2%), pubs, clubs and bars nearly one quarter (24.9%) and the remaining 19% being accounted for by accommodation.

Figure 8: A breakdown of the EU-27MS+UK HORECA sector by establishment type in 2019.



Source: GlobalData

Table 6 shows that the mix of establishment types in each country varies significantly. Figure 9, Figure 10 and Figure 11 show the profiles for each establishment type and allows a level of characterisation to take place since these profiles can have a significant impact on the collection methods used, the quantity and quality of glass being collected, etc. For example, from restaurants there can be a high percentage of ceramic contamination in the form of broken plates, etc.

Table 6: Profile of establishment types (percentages) in the EU-27MS + UK in 2019

Country	Accommodation	Pub, Club & bar	Restaurant
Austria	40.8	5.7	53.4
Belgium	15.9	33.2	50.9
Bulgaria	12.3	32.6	55.1
Croatia	10.6	33.3	56.0
Cyprus	35.8	30.2	34.1
Czech Republic	12.4	11.1	76.4
Denmark	7.6	15.3	77.1
Estonia	21.1	12.9	66.0
Finland	10.7	10.4	78.8
France	24.0	9.3	66.7
Germany	18.6	19.8	61.7
Greece	34.5	28.5	37.0
Hungary	7.2	38.9	53.9
Italy	19.8	5.5	74.7
Latvia	13.9	15.0	71.1
Lithuania	13.8	18.6	67.7
Luxembourg	9.8	7.6	82.7
Malta	21.1	42.6	36.4

Netherlands	16.1	29.2	54.7
Poland	10.2	18.0	71.8
Portugal	3.5	54.5	42.0
Republic of Ireland	15.0	30.1	54.9
Romania	22.8	41.0	36.2
Slovak Republic	17.9	25.4	56.7
Slovenia	12.0	28.7	59.3
Spain	13.7	55.8	30.5
Sweden	13.6	9.6	76.7
United Kingdom	27.2	30.9	41.9

Source: GlobalData

Figure 9 shows that the percentage of the HORECA sector accounted for by restaurants, varies from Luxembourg at 82.7% to Spain at 30.5%. In 21 of the 28 countries reviewed, restaurants account for over 50% of the HORECA sector.

Figure 9: Percentage of HORECA sector in restaurants by country

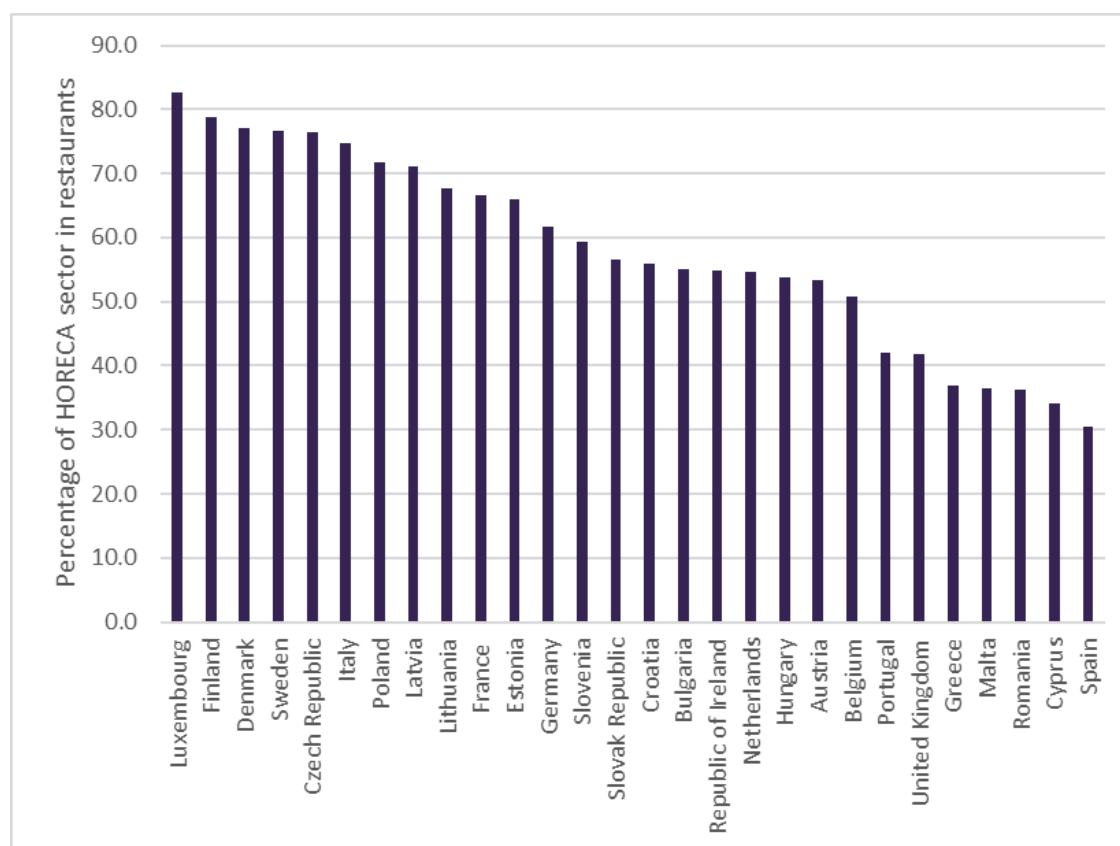


Figure 10 shows that Spain and Portugal have the highest levels of Pubs, Clubs and Bars, accounting for over 50% of the HORECA sector. Whereas, in Sweden, France, Luxembourg, Austria and Italy they account for less than 10%.

Figure 10: Percentage of HORECA sector in Pubs, Clubs and Bars by country

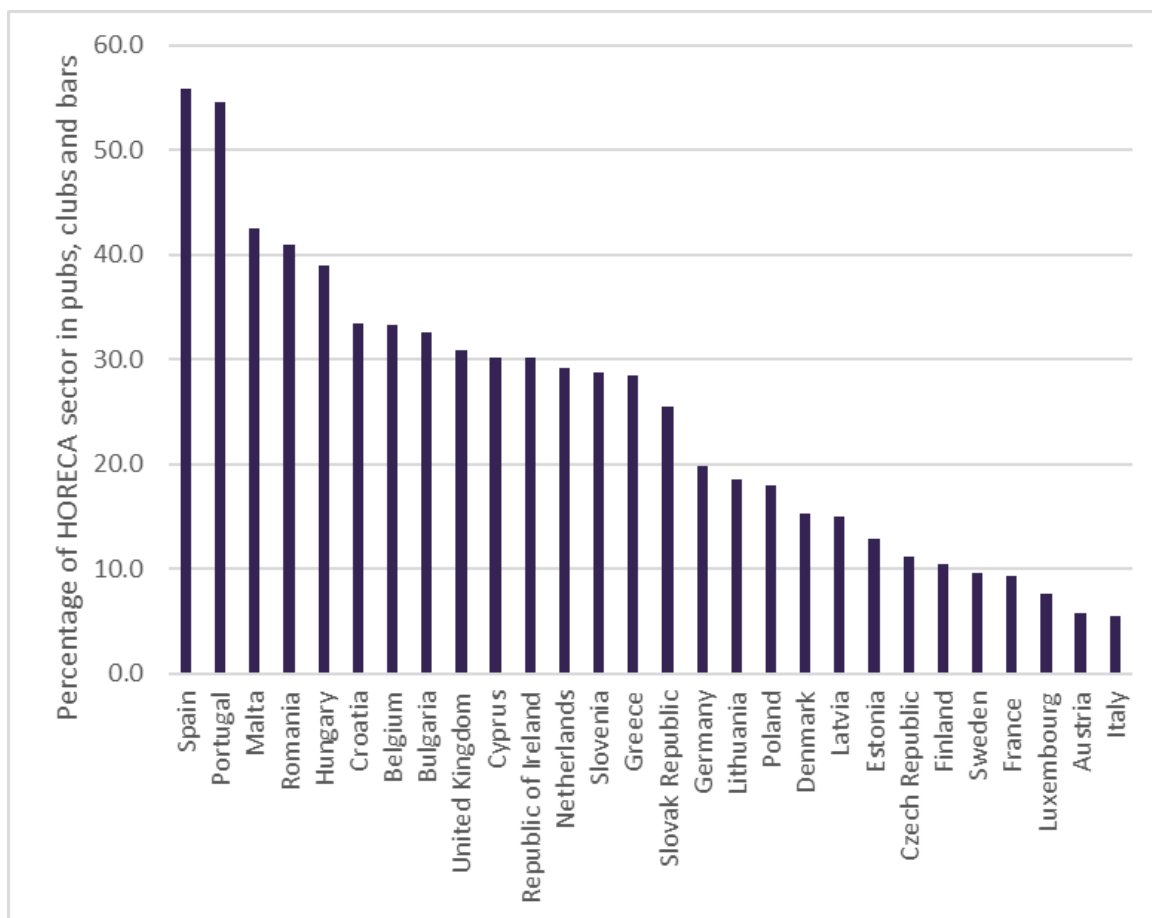
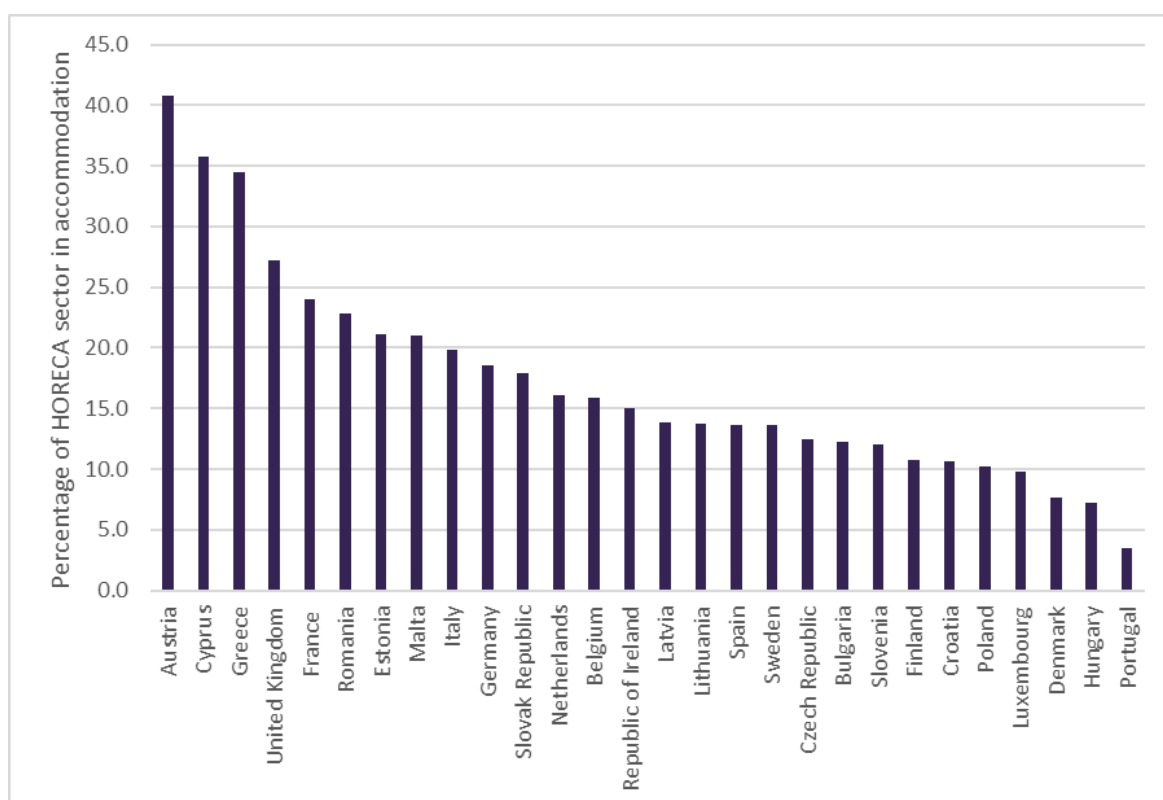


Figure 11 shows that in Austria, Cyprus and Greece accommodation accounts for more than 30% of the HORECA sector. Whereas, in Portugal, it accounts for just 3.5%.

Figure 11: Percentage of HORECA sector in accommodation by country



2.5 Glass POM per establishment

Table 7 provides a breakdown of the tonnes of glass POM per HORECA establishment. This is ranked in ascending order in Figure 12 from Luxembourg at 0.37 tonnes per outlet to the UK at 3.05 tonnes per outlet. This information could influence the glass collection systems used in terms of the size of collection containers required, the potential use of municipal bring banks and the frequency of collection.

Table 7: One-way glass POM per HORECA establishment

Country	Tonnes of glass POM	HORECA establishments (units)	HORECA glass per establishment (tonnes / outlet)
Austria	60,164	52,649	1.14
Belgium	34,537	23,969	1.44
Bulgaria	26,546	28,711	0.92
Croatia	14,242	16,414	0.87
Cyprus	3,346	7,692	0.44
Czech Rep	71,006	55,103	1.29
Denmark	14,007	16,175	0.87
Estonia	5,394	3,737	1.44
Finland	5,774	11,344	0.51
France	324,692	231,794	1.40
Germany	218,684	211,289	1.04
Greece	79,970	98,390	0.81
Hungary	52,506	47,003	1.12
Italy	548,227	425,570	1.29

Latvia	12,817	4,617	2.78
Lithuania	3,763	5,468	0.69
Luxembourg	1,105	2,950	0.37
Malta	3,503	3,097	1.13
Netherlands	37,859	42,107	0.90
Poland	81,063	77,484	1.05
Portugal	151,942	90,232	1.68
Rep of Ireland	24,220	17,228	1.41
Romania	81,220	28,765	2.82
Slovak Rep	16,326	17,419	0.94
Slovenia	9,622	9,794	0.98
Spain	532,565	320,122	1.66
Sweden	27,905	31,793	0.88
UK	574,338	188,184	3.05

Figure 12: One-way glass POM per HORECA establishment

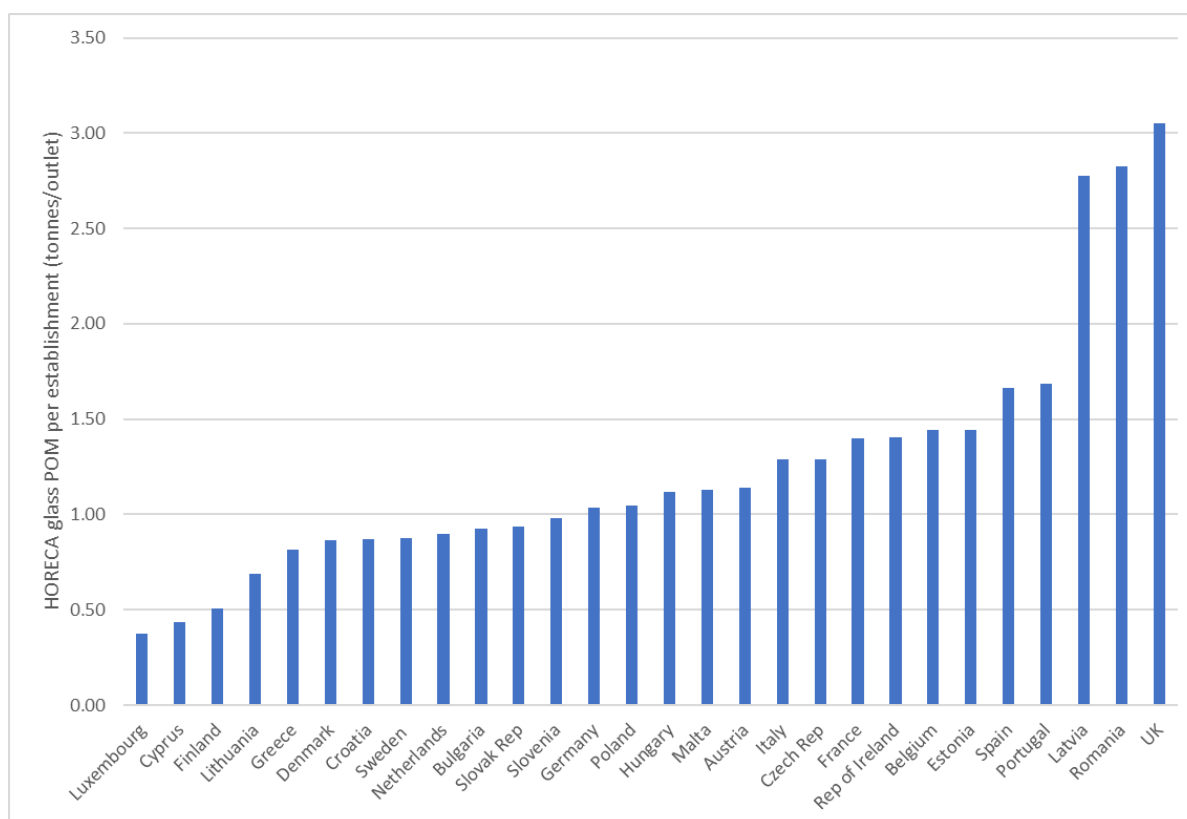


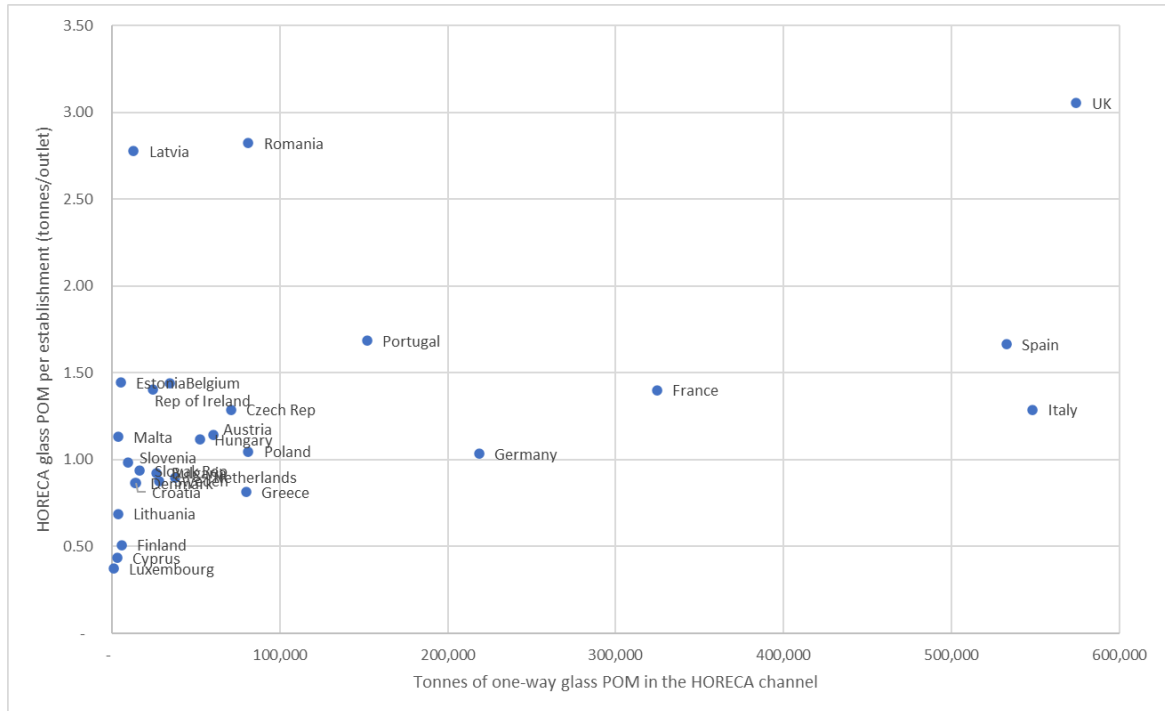
Figure 13 shows the scatterplot of glass POM per establishment versus total tonnage POM. This shows the gathering of the majority of the countries at the bottom left of the plot, but the 8 other countries are far more dispersed:

- Cluster 1: The UK represents the one country with high POM per establishment and high tonnage
- Cluster 2: Latvia and Romania have high POM per establishment but low tonnage
- Cluster 3: Spain and Italy have moderately high POM per establishment and high tonnage
- Cluster 4: France, Portugal and Germany have moderately high POM per establishment and moderately high tonnage

- Cluster 5: the remaining countries have moderate to low POM per establishment and low tonnage.

This analysis could inform the decision on whether the collection system for HORECA can be integrated into the household glass collection system, especially within the countries falling into the Cluster 5 category.

Figure 13: Scatterplot of POM per outlet versus total tonnage by country.



3 Barriers and enablers to increased recycling

This section provides a summary of the feedback received from the interviews with the national platform representatives and other key stakeholders.

3.1 Data quality

Quantifying the glass waste generated and the recycling rate within the HORECA channel is problematic. Key barriers are:

- Private waste contractors do not communicate / monitor or capture glass waste arisings or recycling rates from HORECA.
- Staff at establishments dispose of packaging in municipal bring banks and do not capture weights.
- HORECA glass is often collected with household glass and cannot be traced.
- Eurostat do not split waste generation or recycling by channel.

Countries, such as Spain and Portugal have undertaken detailed studies to quantify glass waste arisings and recycling rates.

3.2 Poor quality glass

Key challenges within the HORECA channel includes:

- Lack of staff awareness and training.
- High levels of ceramic, stone, porcelain (CSP) contamination.

FERVER reports that CSP contamination in the HORECA channel can be as high as 12 kg/tonne of glass, whereas, in northern Europe, CSP contamination is between 2 and 3 kg CSP/tonne in household glass. FERVER states that the quality issue is compounded by some municipalities collecting and transporting glass in the same vehicles used for other materials like household waste. These vehicles are designed to carry up to 10 tonnes, and to maximise loads, will compact the material to fit more on to the truck. This is fine for other materials (e.g. plastic, cardboard, metal), but with glass the effect is that the more fragile glass containers are smashed. Unfortunately crushing HORECA glass – with its high CSP content – makes it even harder for separation; the outcome is that many glass recyclers will automatically reject all HORECA glass due to it being of too poor quality.

FERVER reports that improving practice is hardest with HORECA outlets located in touristic areas with narrow streets which collection vehicles cannot access. In such cases, the staff will typically take glass to municipal bring banks, so it is impossible for glass recyclers to identify which HORECA outlets are responsible for poor quality glass. The best case scenario is where the one responsible for disposal can visit the outlet, and directly talk to the owner to improve their practice (e.g. educate them not to put CSP in the glass bin). That is what was done with HORECA businesses in Düsseldorf: They went to each pub and convinced them to use a dedicated glass bin which they would charge 5-10 euros/month to empty, rather than employees bringing their used glass to municipal bring banks.

Ecovidrio (Spain) reports that ‘awareness-raising and targeted communications’ have resulted in the quality of the collected glass being very high.

Similarly, research in Italy (the ‘Sei di Coccio’ project) on ceramics conducted by CoReVe in 2015 found that glass packaging waste from cafés and restaurants contained 2.5 times more ceramics than household waste. This prompted the “HORECA Project” in 2016, in collaboration with FIPE and Federalberghi, to inform and raise the awareness of those who operate within these public services on how to properly separate waste for collection. This campaign resulted in a 25% reduction of the presence of infusible waste in the total collected material. The analysis carried out after the campaign specifically

located the profile of businesses with a higher rate of mistakes: these are mostly small restaurants-café in the central areas of medium and large sized cities, with few employees and a high number of quick meals in the central hours of the day. CoReVe plans to dedicate specific activities to these businesses in the future.⁴

FERVER suggests that one potential solutions include limiting the glass load collected in vehicles to 5 tonnes, so compaction is not required, and providing HORECA outlets with a separate 'CSP bin' free of charge to prevent these contaminants being placed in the glass bin. Alternatively, the provision of a separate dedicated CSP bin might be effective in a HORECA outlet.

A key recommendation from Close The Glass Loop might be a clear, simple message that could be directed to the HORECA sector – and perhaps to households more generally – that CSP contamination in glass needs to be avoided.

3.3 Collection methods and logistics

The barriers to increased collection includes:

- Poor frequency and efficiency of waste collection services. In many countries waste collection services operate Monday to Friday but most glass waste is generated at the weekends.
- Lack of tailor-made collection methods
- Lack of internal storage space
- The difficulty in managing collection in peak seasons
- The complexity of managing different waste streams, such as refillable glass and one-way glass
- High cost of glass collection for the HORECA sector

GRL in Belgium reports that an important driver for HORECA businesses to avoid dealing with private collectors is the space constraints they face – which is especially true for small businesses in urban settings. For this reason, GRL now offers HORECA establishments in and around the Flemish city of Hasselt the option to use smaller glass boxes, each with a capacity of 30 bottles, which are emptied as part of a weekly door-to-door round operated by GRL. Businesses can choose to have as many boxes as they want, but typically a business will have between 2 and 10 boxes. The glass collected via GRL's box system is of high quality and mixed colours. GRL does not report significant issues with contamination by ceramics, etc. GRL notes that the glass collected this way does not have the organic waste contamination which affects 'household' glass collected via the municipal igloos. (NB. A few years ago, the space constraints issue caused some HORECA outlets to install powerful glass crushers on their sites, which led to very poor quality cullet being collected, as it made it harder for reprocessors to remove ceramics and other contaminants).

In countries such as Belgium, the high cost of glass collection is countered by the high cost of disposal of residual waste. This is also the case in the UK, where the landfill tax is in place to discourage the disposal of waste to landfill.

Ecovidrio in Spain represents current best practice:

Innovative solutions

Innovative collection solutions, include the Ecovidrio 'igloo' system which includes a tipping arm to assist the dispensing of the glass from a wheelie bin to the igloo, Figure 14.

⁴ <https://www.renewablematter.eu/articles/article/the-glass-packaging-recycling-industry>

Figure 14: the Ecodrio 'igloo' system with tipping arm.



Source: Ecodrio

Visiting outlets

There are approximately 210k HORECA establishments in Spain, and every year representatives of Ecodrio visit a significant proportion. For instance, in 2021 they visited c. 96k establishments. Ecodrio interviews HORECA businesses about their waste management practices and inspects them, in an effort to encourage them to recycle glass properly. Ecodrio returns to the same businesses to check whether they are continuing to recycle glass.

Ecodrio has direct operational control

In Spain, Ecodrio (in agreement with the municipalities) directly arranges collection of glass from 50% of the country's municipalities so, thanks to their 25 years of experience, they can ensure efficiency and cost effectiveness of the collection service, but also the quality of the cullet. This direct operational control by Ecodrio of glass collection is regarded as a key success factor for recycling HORECA glass. The remaining municipalities choose to arrange their own glass collection, and as a result the quality is poorer.

Igloos

Ecodrio operates about 215,000 'igloos' across Spain specially designed for glass collection. Two features ensure quality of the cullet, and thus a higher recycling rate:

The igloo design prevents contamination – as it is not easy for people to put non-glass waste (e.g. food waste) into the container. In regular skips, people are able to open them completely allowing contamination to be placed in them.

The glass collected via igloos is not crushed, as is usually the case with glass collected in the usual bottle banks. The non-crushed glass is easier to recycle. 50,000 of those 215,000 igloos are specially designed for the HORECA sector because they have wide mouths allowing multiple glass packages to be placed in them at once. And of those 50,000 igloos, 12,000 have a special 'Vacri' tipping arm further facilitating the process of waste glass disposal for HORECA staff.

Authors



Peter Lee PhD, Head of Operations

Peter has over 24 years of consulting experience at Oakdene Hollins, covering various topics including recycling technologies, resource management and policy impact analysis. Over this time, he has lead numerous research projects to drive uptake of circular economy practices in the glass industry.



Dan Eatherley BA MSc, Associate Consultant

Dan is an experienced consultant in the field of circular economy, and has contributed to many projects covering materials recycling, reuse and value retention. He is a highly skilled writer, with further expertise in stakeholder engagement.



Elena Payne BSc, Research Consultant

Elena specialises in data analysis and modelling at Oakdene Hollins, and has used this skillset in multiple projects under the value retention theme. She has experience in the field of quantitative and qualitative analysis, development of circularity metrics and strategic thinking.



Ellen Percival MSc, Research Consultant

Ellen has contributed to multiple projects under themes of problematic waste streams, packaging and innovation, with a strong skillset in report writing, data analysis and stakeholder engagement.

From its offices in Aylesbury and Brussels, Oakdene Hollins provides research and consulting services to clients under three main themes:

- Circular Economy
- Sustainable Products
- Innovative Technologies & Materials

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Oakdene Hollins Ltd
Ardenham Court
Oxford Road
Aylesbury
Buckinghamshire
HP19 8HT

+44(0)1296 423915
admin@oakdenehollins.com

www.oakdenehollins.com
www.remancouncil.eu
www.eu-ecolabel.uk

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