INDICATORS AND METHODS FOR MEASURING TRANSITION TO CLIMATE NEUTRAL CIRCULARITY

Task 5: Case-study group 1

Report for: DG RTD, Directorate B – Healthy Planet, Unit B1: Circular Economy & Biobased Systems

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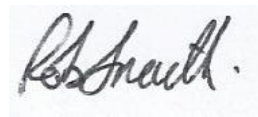T: +44 (0) 1235 753 029
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1. INTRODUCTION

The transition to a circular economy (CE) needs to occur on multiple levels, from households and individual consumers to national and cross-border ecosystems. Measuring and monitoring the development of this transition is an ambitious task and is ideally supported by indicators relevant to all steps in that process.

This case-study is one of 19 developed for a research project into "*Indicators and methods for measuring transition to climate neutral circularity, its benefits, challenges and trade-offs*". It provides a detailed summary of the development and testing programme conducted for Group 1 of the 'Packaging' sub-policy area during Task 5 of the project. The main purpose of this case-study is:

1. Provide an overview of the testing and monitoring method adopted for each indicator.
2. Outline the key results and performance of each indicator.
3. Highlight any challenges or lessons learned from the identification, planning, delivery and analysis of the relevant methodology for each indicator.

The aim of Task 5 is to take the learnings of all other Tasks thus far and develop and test the new indicators identified in Tasks 3 and 4 as having potential to enable a deeper understanding of the three facets of circularity for the five key approaches. This case-study is a direct output of Task 5.

This case-study focuses on the following 5 indicators outlined in Table 1.

Table 1. Overview of case-study group 1

URN		Indicator name	Methodology	European Union (EU)	National	City / Region	Companies	Household
				Level of implementation				
Pa1	1	A sustainable brand index for Consumer Packaged Goods	Desk-based research and consumer survey.			X		
Pa2	2	Number of legislative incentives created to encourage circularity in the European Union packaging industry	Desk-based research and stakeholder engagement.	X	X			
Pa3	3	% of weight by products designed by circular principles	Desk-based research and stakeholder engagement.		X		X	
Pa4	4	Changes in expenditure through applying the circular principle of 'reuse' in manufacturing businesses	Desk-based research, stakeholder engagement and monitoring.		X		X	
Pa5	5	Share of takeaway meals and drinks provided in reusable packaging	Desk-based research and consumer survey.		X	X		X

2. INDICATOR 1 – A SUSTAINABLE BRAND INDEX FOR CONSUMER PACKAGED GOODS.

This indicator is a sustainable brand index based on a consumer sustainability perception survey data and publicly available information from consumer goods producers. The definition of a sustainable brand is very subjective and can be varied depending on the sources used. In this indicator we have defined a sustainable brand as one "incorporating sustainable values and practices into all aspects of the brand, from sourcing and production to marketing and communications". The word "sustainable" means "meeting the needs of the present without compromising the ability of future generations to meet their needs"[1].

Consumer Packaged Goods (CPGs) are defined by Nielsen as "products that consumers purchase frequently, generally have a short lifespan and are intended to be used soon after purchase"[2]. These characteristics (frequency of purchase and lifespan) have brought increased scrutiny on the packaging practices and materials used in this product category, and specially on the sustainability implications said practices can have. For consumers, it has become increasingly necessary to understand and differentiate these practices to inform their purchase decisions.

A sustainable brand index can help both consumers and producers to take steps towards more sustainable consumption. On the one hand, consumers can make informed decisions based on the sustainability performance of brands rather than just on their perception or ambiguous communication. On the other hand, producers can assess how their brand performs against others in terms of sustainability, and the impact their performance has on consumers.

Additionally, several pieces of EU legislation have focused on environmental and sustainability issues that are highly relevant for packaging and product design, even setting performance metrics on various aspects. These include:

- The Waste Framework Directive[3]: Sets recycling targets for packaging waste.
- Single Use Plastics Directive[4]: Sets recycled content for newly produced polyethylene terephthalate (PET) bottles from 2025.
- Proposal for regulation on packaging and packaging waste[5]: Sets a target for the empty space ratio and the requirement for reusable transport packaging in some products from 2030.

Therefore, if a sustainable brand index is built including criteria related to some of the targets in these directives and regulations, it can also be relevant for tracking progress and consumer sentiment across these issues. The proposed index can integrate some aspects relevant to existing EU regulation (such as recycled content and sustainable sourcing).

The benefits of monitoring this indicator include:

- Developing a better understanding of consumer perceptions on sustainable brands.
- Developing a better understanding of regional differences associated with views on sustainable brands.
- Allowing for brands to be ranked against one another and given a score for sustainability.

Findings from the desk-based research conducted show that there are already a number of sustainable brand indexes available. For example, Sustainable Brand Index is a Swedish company which has conducted one of the largest studies in Europe on sustainable branding, measuring consumers' perception of well-known brands'

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[1] Sustainability, United Nations. (Official website for the United Nations, n.d.). https://www.un.org/en/academic-impact/sustainability. Accessed 10th April 2024.

[2] Nielsen, what is the difference between 'FMCG' and 'CPG'. (NIQ, 2022). https://nielseniq.com/global/en/insights/analysis/2022/what-is-the-difference-between-fmcg-and-cpg/. Accessed 10th April 2024.

[3] European Commission, Waste Framework Directive. (Official website of the European Commission, n.d.). https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en. Accessed 10th April 2024.

[4] EUR-Lex, Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment (Text with EEA relevance). (Official website of EUR-Lex, 2019). https://eur-lex.europa.eu/eli/dir/2019/904/oj. Accessed 10th April 2024.

[5] EUR-Lex, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC. (Official website of EUR-Lex, 2019). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0677. Accessed 10th April 2024.

sustainable image within Nordic, Baltic and Dutch markets (SB Insight, 2024). This index has measured and analysed over 1600 brands across 36 different industries on their sustainable image.

The Sustainable Brand Index methodology explains that consumer perceptions are the basis for how a sustainable brand index is developed[6]. One potential issue with perception-based indexes is that they are a tool for brands and not for consumers, as they measure what the customers think of the brand rather than what the company is actually doing in terms of sustainability. However, sustainability related issues can have levels of complexity that may be beyond the interest or understanding of average customers, and thus placing importance on their perception rather than on facts can have contradictory outcomes. An example of these complex issues comes when comparing low-emissions but single-use packaging options versus more material and energy-intensive but reusable options; the answer to what is the best option in these cases depends on many different variables which may not be captured in consumer perception.

Other indexes however, work with an evidence-based approach where the objective is to give consumers reliable information on which brands are more sustainable. The research identified, for example, the 'good on you' index, which does exactly this for fashion and apparel brands. Their methodology, as opposed to perception-driven, is based on analysis regarding public reports, third party indices, certifications, and accreditations[7]. The downside of this type of certification is that consumers may not know exactly what is being measured or accounted for in the rating of different brands, and thus may be sceptical of the results.

The proposed index aims to address the shortcomings of existing methodologies, and create a sustainability index for CPGs informed by both customer perception of sustainability criteria that is relevant to them, and factual evidence based scoring across said criteria. Additionally, some of the proposed criteria are relevant to broader EU regulation and goals to make this indicator complementary to the EU Monitoring Framework for CE.

2.1 KEY METHODOLOGY

2.1.1 Methodology

The creation and measurement of the index will follow these steps.

 a. Selection of a list of criteria to include in the sustainable index, detailed in Section 2.1.2.
 b. Use of a consumer survey to determine how relevant each of the criteria are for consumers.
 c. Construction of the scoring framework, including weightings of different criteria based on results from consumer survey and corrected for waste hierarchy priorities.
 d. Use of desk research to score brands against the selected criteria.
 e. Computation of results based on individual criteria scores and weighting.

The development of the index for this study will be focused on the theoretical development of the framework, covering steps a, b, and c.

The system boundary for the testing of step b (consumer survey to determine relevance of proposed criteria) was at a regional level within one EU Member State: The Netherlands.

The online survey was developed and disseminated alongside YouGov for consumers within the Netherlands. This survey contained three questions on consumers' perception of sustainable brands based on the defined criteria.

Desk based research was also carried out to find existing sustainable brand indices and to identify the different sustainability pledges that brands make on their websites/sustainability reports.

A simple model was produced in Microsoft Excel to build the sustainable brand index. This is a score-based ranking of an organisations' performance based on the sustainable brand criteria. Each criteria has a different weighting assigned to it and simple excel formulae are used to calculate the overall score from each of the different criteria, the weighting of each criteria is based on the survey results and the desk-based research carried out.

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[6] SB Insight, Methodology. (NIQ, n.d.). https://www.sb-insight.com/methodology#0. Accessed 10th April 2024.
[7] Good on You, How we rate fashion brands. (Good on You, n.d.) https://goodonyou.eco/how-we-rate/. Accessed 10th April 2024.

2.1.2   Criteria selection

Given that the criteria selected for the index will be subjected to a consumer survey to determine their relevance, it is crucial that the proposed aspects are clear and simple to understand, even if the assessment of those is inherently complex. For example, the concept of a recyclable material may be easy to understand for a wide consumer base, even if the assessment of it may include evaluating the local infrastructure available or the capacity to effectively recycle said material.

The criteria for the testing exercise are not an exhaustive list of sustainability aspects, but were developed based on clarity and accessibility for consumers, activities in the waste hierarchy, and relation to EU regulation targets.

- Carbon emissions: Carbon or Greenhouse Gas emissions constitute one of the most visible sustainability measures both for companies and consumers. The rise of credible emission calculation standards and their adoption with increasingly transparent and approachable communication has helped consumers make a clear link between climate change and carbon emissions.

- Waste generated: Waste, and specifically packaging waste has come to the forefront of personal sustainable choices. A number of studies have shown that some consumers have increasingly adopted the behaviour of reducing packaging waste, which has become the social norm for more consumers to follow (Jacobsen, Pedersen, & Thogerse, 2022). Therefore, it can be predicted that consumers will favour products and brands that allow them to reduce their packaging waste.

- Recyclable packaging: Complementary to the generation of waste, the result of behavioural studies has shown that consumers consistently value the recyclability of packaging materials, as they see it as a driver for reducing packaging waste. These perceptions and preferences likely come from widespread information on the benefits of recycling, which often are limited. For example, studies have shown that some consumers believe recyclability helps improving water quality (Klaiman, Ortega, & Garnache, 2016).

- Recycled content in packaging: Different targets for recycled content in products and packaging are included in existing and upcoming EU legislation. Therefore, it is important to include it in the index and start measuring the importance it has for consumers.

- Sustainable sourcing of materials: Another subject linked to current and prospective EU legislation. The inclusion of it in the index can help build awareness of the importance of considering the entire supply chain of a product when assessing its sustainability performance.

- Ability to reuse/refill packaging: Refill options have been promoted to reuse packaging instead of disposing of it (or even recycling), it is then important to understand both how consumer perception has evolved regarding refill and how producers and brands have evolved in their offerings to address this need.

2.1.3   Consumer survey to test criteria

A citizen survey containing three questions was developed. This was disseminated through YouGov and once survey results came back the data analysis began. The questions in the survey were focused on how consumers in the Netherlands perceive sustainable brands so that a sustainable brand index could be produced from their responses along with information found during the desk-based research.

Graphs and charts were made in MS Excel to demonstrate the data and then a simple sustainable brand index model was produced in Excel using SUM (+) formulae to rank brands in order of sustainability based on the survey results and the initial desk-based research carried out.

A sample size of 1,000 was achieved for the survey. The analysis in Section 2.2 shows a breakdown of this data at a regional level within the Netherlands, with the responses having been weighted to provide nationally representative figures for the Netherlands.

2.1.4   Calculations

Simple calculations were carried out in the excel model for a sustainable brand index using the SUMPRODUCT function.

2.1.5   Timeline

Table 2 shows the project timeline.

Table 2. Gantt chart for Pa1

Task	15th Jan	22nd Jan	29th Jan	5th Feb	12th Feb	19th Feb	26th Feb	4th Mar	11th Mar	18th Mar
Developed and agreed scoring and indicators for a sustainable brand index.	▒	▒	▒	▒	▒	▒	▒			
Online survey developed.	▒									
Dissemination of survey and desk-based research into sustainable brands.		▒	▒	▒						
Survey results analysis.					▒	▒				
Building sustainable brand index on Excel.							▒	▒		
Writing up case study template.									▒	▒

2.1.6   Data gaps and mitigation

Table 3. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	Consumer opinions in other countries on sustainable brands.	Thorough desk-based research was carried out on brands in multiple other countries to ensure the correct questions were asked in the survey. Existing brand pledges and sustainability reports were reviewed to find this information.	Medium
2	Input from packaging associations on sustainable brand criteria was minimal.	Existing sustainability indexes were researched and expert judgement was used to ensure the categories within the index covered all the main aspects of a sustainable brand.	High
3	Sustainability indexes are based on consumer perceptions.	Thorough desk-based research carried out on waste hierarchy and other sustainability criteria to determine weightings for sustainability index.	High

2.1.7   Quality review of analysis

Prior to work beginning, the research team presented the data collection plan to the Project Manager to review the proposed research methodology and ensure that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, the next stage was the data collection phase. Following data validation, the research team summarised findings in an excel format and presented this to the Project Manager for a review process to ensure their accuracy and relevance to the indicator being measured.

In the case of the consumer/stakeholder survey, senior members of the team put the survey through a thorough quality assurance process to ensure that the line of questioning was clear, easily followed, and was likely to help the team gain useful data.

Summary of the Quality Assurance (QA) process:

- Mid-December: QA for Pa1 data collection plan was carried out.
- January and February: Survey questions were developed and a QA on these was performed.
- Mid-February: Informal QA and check in on case study and data analysis.
- Late March: Case Study QA was carried out and amendments then made.

2.2   KEY ANALYSIS RESULTS

The results presented in this section refer to the survey which was used to test how consumer perception would determine the validity of the proposed index and the weighting of different criteria proposed for the sustainability brand index. All figures, unless otherwise stated, are from YouGov Plc. The total sample size was 1,000 adults. Fieldwork was undertaken between 28th February - 1st March 2024. The survey was carried out online. The figures have been weighted and are representative of all Netherlands adults (aged 18+). The survey results were broken down into different categories. The different age categories were 18-24, 25-34, 35-44, 45-54 and 55+. The different regions included in the survey were North, East, South and West.

2.2.1   Analysis

Question 1 was: "For the following questions, by "sustainable", we mean meeting the needs of the present without compromising the ability of future generations to meet their needs. **How important, if at all, is it to you for a brand that you shop from to be sustainable? (Please select the option that best applies)**".

Table 4 below shows that, 52% of citizen's responded that it is fairly important a brand they shop from is a sustainable brand, 24% said it was not very important, 17% said it was very important, 5% said it was not at all important and 3% said they didn't know.

Table 4. Breakdown of average survey results for Q1

Responses	Average percentage (%)	No. of citizens
Very Important	17	172.72
Fairly Important	52	518.38
Not Very Important	24	235.59
Not at all Important	5	46.24
Don't Know	3	27.07

Figure 1 and Table 5 show the responses for question 1 split by age groups. An average of 19% of the 45-54 age group responded that it was very important that a brand they shop from is sustainable. The highest scoring answer was fairly important, with 54% of 55+, 45-54 and 25-34 year olds voting for this option. The lowest scoring answer was don't know followed by not at all important, which 9% of 18-24 year olds voted for. The responses to this question show that 55+ year olds were more likely to find it very important that a brand they shop from is sustainable with 20% of them voting for this option in comparison to only 12% of 25-34 year olds.

Figure 1. Breakdown by age group of survey results for Q1
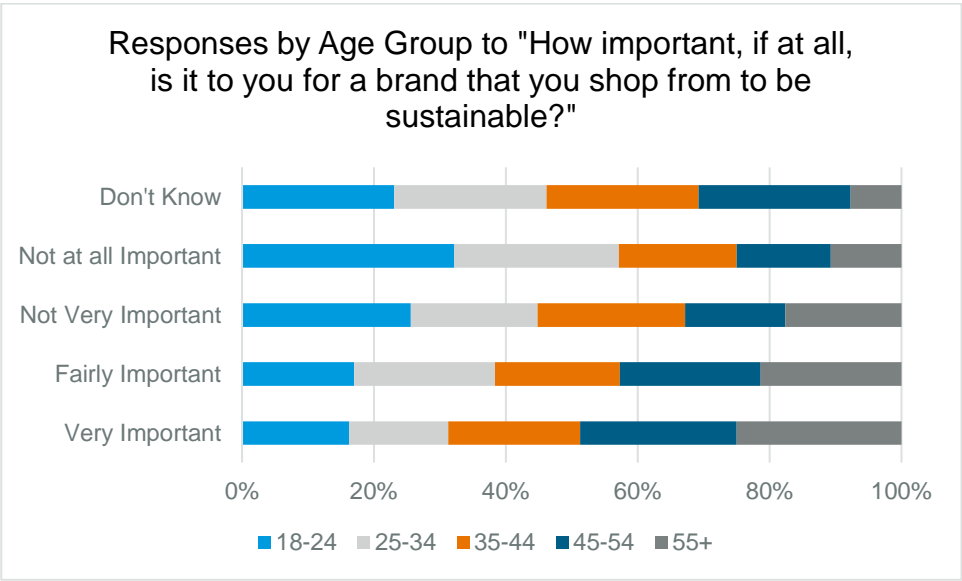
Table 5. Breakdown by age group of survey results *for "How important, if at all, is it to you for a brand that you shop from to be sustainable?".*

Response	Age (%)				
	18-24	25-34	35-44	45-54	55+
Very Important	13	12	16	19	20
Fairly Important	43	54	48	54	54
Not Very Important	32	24	28	19	22
Not at all Important	9	7	5	4	3
Don't Know	4	3	3	3	2

Table 6 below shows the average responses for question 2, which was "We are still interested in your opinion, whether or not you consider the sustainability of brands/products important when making purchases...**Which, if any, of the following sustainability factors would be useful to you to have information on when deciding whether to buy from a brand?** (Please select all that apply)".

The most popular response was for 'Recyclable Packaging' which 50% of people voted for, followed by ability to reuse/refill packaging at 47% then sustainable sourcing materials at 37%. The lowest scoring criteria was "Carbon Emissions" at 16% and "Other" at 2%.

Table 6. Breakdown of average survey results for "Which, if any, of the following sustainability factors would be useful to you to have information on when deciding whether to buy from a brand?".

Responses	Average percentage (%)
Recyclable packaging	50
Ability to reuse/refill packaging	47
Sustainable sourcing of materials	37
Recycled content in packaging	36
Waste generated	18
Carbon emissions	16
Not applicable – I wouldn't find any sustainability information useful when deciding whether or not to buy from a brand	14
Don't know	9
Other	2

Figure 2 and Table 7 below show a breakdown by age group for the responses to question 2. 55+ year olds were the highest voters of 'Ability to reuse/refill packaging' with 54% of them choosing this. They were also the highest voters for 'recyclable packaging'. 25-34 year olds found the 'sustainable sourcing of materials' more important than any of the other age categories did and they were also the highest voters for waste generated.

Figure 2. Breakdown by age group of survey results for "Which, if any, of the following sustainability factors would be useful to you to have information on when deciding whether to buy from a brand?"
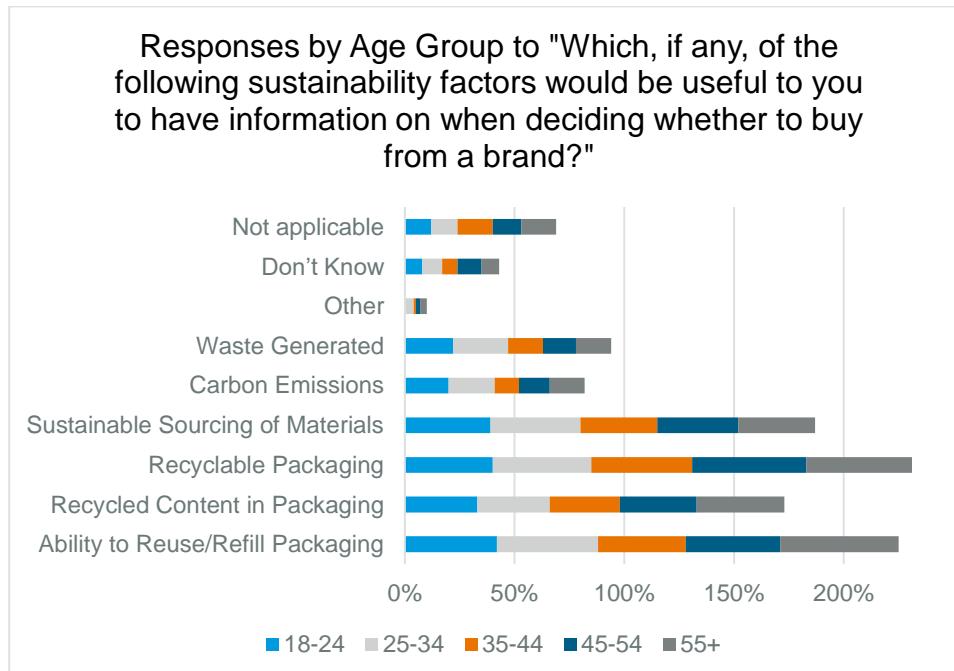
Table 7. Breakdown by age group of survey results for "Which, if any, of the following sustainability factors would be useful to you to have information on when deciding whether to buy from a brand?".

Response	Age (%)				
	18-24	25-34	35-44	45-54	55+
Ability to reuse/refill packaging	42	46	40	43	54
Recycled content in packaging	33	33	32	35	40
Recyclable packaging	40	45	46	52	55
Sustainable sourcing of materials	39	41	35	37	35
Carbon emissions	20	21	11	14	16
Waste generated	22	25	16	15	16
Other	-	4	1	2	3
Don't Know	8	9	7	11	8
Not applicable – I wouldn't find any sustainability information useful when deciding whether or not to buy from a brand	12	12	16	13	16

Table 8 below shows the average responses for question 3, which was:

"**How important, if at all, is it to you to have a brand's sustainability report available publicly on their website?** (Please select the option that best applies)".

The most frequent response for this was fairly important, which 40% of people voted for. Only 7% of people voted that it was not at all important.

Table 8. Breakdown of average survey results across "How important, if at all, is it to you to have a brand's sustainability report available publicly on their website?".

Responses	Average percentage (%)	Average no. of citizens
Very Important	22	216.81
Fairly Important	40	395.62
Not Very Important	26	259.13
Not at all Important	7	73.45
Don't Know	6	55.00

Figure 3 and Table 9 below shows a breakdown by age for the responses to question 3. 25% of 25-34 year olds voted that they found it very important for brands to have a sustainability report available on their website, in comparison to 18% of 18-24 year olds. The most common answer for not at all important was the 18-24 year old age group, in comparison to only 5% of 55+ year olds voting for this option. 45% of 55+ year olds voted fairly important for this question which was the most common age group to vote for this, in comparison to 32% of 25-43 year olds.

Figure 3. Breakdown by age group of survey results for "How important, if at all, is it to you to have a brand's sustainability report available publicly on their website?"
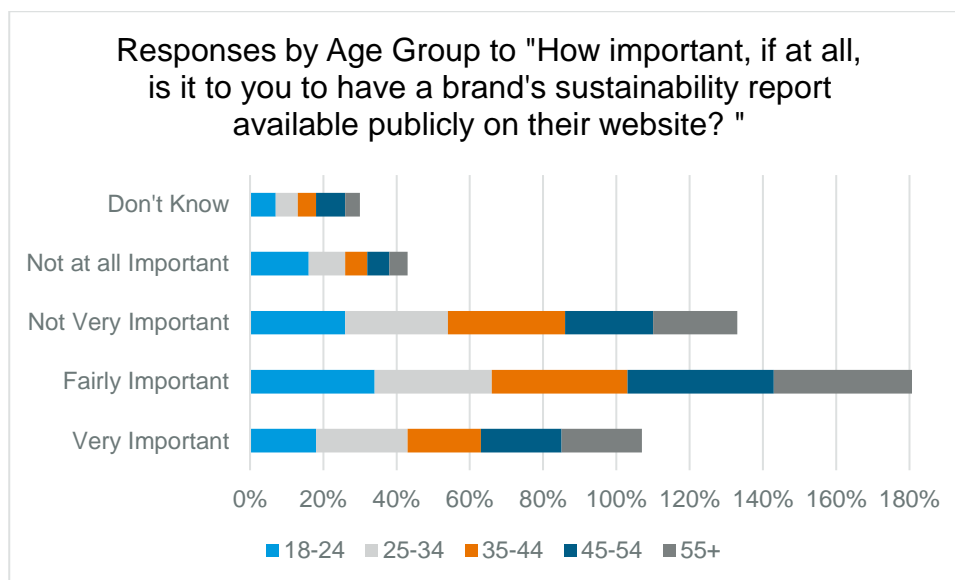

Table 9. Breakdown of survey results by age group for "How important, if at all, is it to you to have a brand's sustainability report available publicly on their website?".

Response	Age (%)				
	18-24	25-34	35-44	45-54	55+
Very Important	18	25	20	22	22
Fairly Important	34	32	37	40	45
Not Very Important	26	28	32	24	23
Not at all Important	16	10	6	6	5
Don't Know	7	6	5	8	4

Construction of the scoring framework

Figure 4 shows the proposed scoring framework for the sustainable brand index which was developed for this indicator based on the citizen's survey results and desk-based research which was carried out. The first row shows the percentage values in light blue show the weighting which has been assigned to each of the sustainability criteria. This is used to calculate the overall score and ranking of each brand. In this testing case, the weighting reflects both the importance that consumers placed on different criteria and the corrections made to it to account for public perception biases. For example, although ability to reuse/refill was the second most popular sustainability factor as responded by citizens in the survey, it was given the highest weighting, as to further reflect its importance in the waste hierarchy.

In this proposed format, each brand is evaluated on a separate row; brand names are entered into each of the cells designated for "Organisation #" and a description of the brand can be entered into column "Description". The scores from for each of the criteria would then be entered into each cell based on desk research on their actual performance in each aspect.

The score for each criterion would range from 1 to 3, 1 being poor and 3 being good. These are then computed with the according weighting for each criterion using the excel formula SUMPRODUCT applied to the weightings and the scores of each brand. The results will then be in the same scale of the scoring for the criteria, meaning from 1 to 3, with 3 being the maximum possible overall score. This is a simple approach,

which is highly dependent on data completeness and an objective way of assessing the different criteria for each evaluated brand.

In an implementation scenario, it would be necessary to determine which product categories and brands are included in the index initially, and then continue the rollout based on the acceptance and adoption of it. It can, for example, start with the top 50 performing brands by revenue of a specific subcategory of CPGs in the EU and then expand in number of brands and product subcategories.

Figure 4. Sustainable brand index for Pa1

Weighting		20%	25%	16%	12%	10%	9%	8%	100%	
Brand name	Description	Recyclable Packaging	Ability to Reuse and Refill Packaging	Sustainable Sourcing of Materials	Recycled Content in Packaging	Waste Generated	Carbon Emissions	Other	Overal Score	Rank
<Brand #1>		3	1	3	3	3	3	2	2.42	1
<Brand #2>		3	1	3	3	2	2	1	2.15	2
<Brand #3>		1	2	2	3	3	2	1	1.94	3
<Brand #4>		1	1	3	2	3	2	2	1.81	4
<Brand #5>		3	1	2	2	1	1	2	1.76	5

2.2.2   Limitations

There are some limitations with the data which should be taken into consideration if developing this indicator further. Most notably, the average consumer is not necessarily well versed in sustainability and so may not know the importance of, for example, reusing packaging vs. recycling of packaging. This can be seen in the responses to question 2, where consumers have highlighted that they think being able to recycle packaging is more important when shopping from a brand than being able to reuse or refill the packaging. However, the purpose of building an index that takes into account customers' perception on the importance of different sustainability factors intends precisely to detect areas in which further education is needed amongst the general public towards sustainability.

Focusing on the construction of the framework for the index meant that the testing phase could not accommodate the selection of a sample of brands to deploy the index itself with scoring of separate criteria and computation of results (stages d and e from the methodology). The scoring would be based on desk research from publicly available information on the brands and producers and, therefore, further data limitations would be expected to arise at these stages.

Time and resourcing restraints meant that we were only able to collect and analyse regional data within one EU member state which was the Netherlands.

YouGov (the survey disseminator) recommended that for each of the survey questions a range of different answers was offered, rather than allowing respondents to type their responses into a blank text box. This means that it was more straightforward for respondents to choose an answer, however there are limitations with this as respondents may not be able to say exactly what they want in the survey, meaning we could be missing out on more accurate information.

2.2.3   Performance

During Task 4 of the study, the original indicator was given a score of 12 in the RACER evaluation process. Following Task 5, the indicator was awarded a lower score of 11. This was a lower score than expected for the criterion 'Credibility'. This score changed as initially two countries were going to be involved in the study instead of one. Additionally, the effect that consumer perception may have on the index affects the credibility of the indicator but could potentially increase its acceptability once implemented.

Table 10 RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	2	3	2	2	12
After Task 5 (following testing)	3	2	2	2	2	11

2.3 CHALLENGES AND LESSONS LEARNED

2.3.1 Challenges

Defining the meaning of a 'sustainable brand' was an initial challenge when monitoring this indicator. A number of sources were found during the desk-based research with slightly different definitions of what a sustainable brand is, so this term can be subjective. If the Commission continues to develop this indicator, it would be useful to author a definition 'sustainable brand' to ensure consistent and targeted reporting of the indicator.

The short time frame of disseminating the citizen's survey and receiving responses from a large sample of people was another challenge faced when monitoring this indicator. A third-party organisation called YouGov was commissioned to disseminate the survey to mitigate this challenge, which was costly but saved time and resource within the team to focus on other tasks.

2.3.2 Lessons learned

There are ways in which the data obtained from the survey could be more robust. By asking a larger number of questions within the survey, more accurate information could be obtained. In the testing phase, there was a limit on the number of questions asked due to the cost of commissioning a third party to disseminate the survey and also a limit to the number of regions that could be covered.

Since this indicator was based on a citizen survey, an initial decision needed to be made on how much granularity is required in the responses. This was considered before developing the survey questions and it was decided by YouGov and the team that it would be best to have closed questions due to the short timeframe we had. The alternative would be asking the citizen's open ended questions, but this may result in less people participating due to more time being needed to answer each question. It is recommended in the future if this indicator is taken further to disseminate citizen surveys who can guarantee it will reach a pre determine response rate.

2.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.

This indicator is considered important and in need of further development which will require significant additional work. Following the testing of this indicator, it was found that its original name was fit for purpose and that no variation was needed, pending future developments.

For future research purposes, it is proposed that following steps are taken to address the existing data gaps in order to build a more robust sustainable brand index.

- Further consumer engagement in other EU member states so that values can be taken across multiple countries which will influence how each sustainability criteria is scored within the index, and therefore affecting the score of each individual brands ranking. This will also inform consumer sentiment towards different sustainability factors across different countries.

- Testing how different criteria could be evaluated with publicly available information. If information in one or some of the criteria is not available or not sufficiently clear, it may hamper the ability to correctly and objectively score those criteria.

- Additional engagement with existing sustainable brand index to identify methodologies that could be useful for this index.

- Testing a selected group of brands within a subcategory of CPGs would evidence further methodological gaps needed to create a credible index and critically compare the quantitative performance of separate brands.

- Defining a dissemination strategy for the results. Existing sustainability indexes are specifically targeted to an audience and distributed to it, be it consumers or producers, through relevant channels and with specific business models. An index promoted by the EC should be no different and clearly define its audience, the channels, and dissemination strategy to cause he expected impact.

The survey results show that the majority of people in the Netherlands find sustainability information about a brand fairly useful and this would inform their decision on whether to buy from a certain brand or not. The main findings were that the ability to recycle and reuse/refill packaging was one of the main criteria citizens in the Netherlands find important when buying from a brand. This criteria has been given a higher weighting within the sustainable brand index to reflect this response.

It may also be useful in the future if carrying out another citizen's survey that more questions are added to it including whether consumers already shop from sustainable brands and giving them the option to enter free text responses so that they can give more accurate information.

This index is suitable for further development across the EU as it would help align the initiatives of brands and consumer preferences with specific sustainability aspects that are relevant to EU legislation and in line with frameworks such as the waste hierarchy. As this index is based on a mix of consumer perception and desk research, it is not directly compatible with other indicators in the current EU Circular Economy Monitoring Framework. However, it will be useful to determine the impact of consumer perception and brand performance on related indicators such as generation of packaging waste, generation of plastic packaging waste, recycling rate of overall packaging and recycling waste of plastic packaging.

Table 11: Summary of recommendations for Pa1

Type of recommendation	Recommendation	RACER Criteria Addressed	Timeline	Key stakeholders or partners
Further testing	For finalising the methodology and do comprehensive testing of the sustainable brand index, further work is necessary to assess the validity of the criteria, determine the ease of scoring, estimate the effort and time needed for scoring, and fine tune the interpreting of results	Credibility and Robustness	Medium (1.5 – 5 years)	• **Responsible:** EC. • **Accountable:** EC. • **Consulted:** Other existing indexes that may be interested in participating on the initiative. • **Informed:** Packaging and other product associations, and consumer data and insights companies that can further communicate the information
Brand Index Development	It is recommended that this indicator is further developed by the EC expanding the system boundary to other countries and regions. This would include validating the criteria contained in the index and gathering perceptions from more member states.	Credibility and Robustness	Medium (1.5 – 5 years)	• **Responsible:** EC. • **Accountable:** EC. • **Consulted:** Other existing indexes that may be interested in participating on the initiative. • **Informed:** Packaging and other product associations, and consumer data and insights companies that can further communicate the information.

3. INDICATOR 2 - NUMBER OF LEGISLATIVE INCENTIVES CREATED TO ENCOURAGE CIRCULARITY IN THE EUROPEAN UNION PACKAGING INDUSTRY

Circularity within the packaging industry can be defined in many ways but is generally accepted as packaging designed with the CE and the waste hierarchy in mind. It involves practices such as the reduction of packaging, designing packaging for reuse, recyclability of packaging, the use of alternative or recycled materials, and implementing circular business models such as reuse/return schemes.

A legislative incentive is a motivation to engage (or not engage) in certain activities, created through laws and regulations. Legislative incentives within the packaging industry include requirements for businesses who place packaging on the market for which there will be penalties if not met (e.g. Extended Producer Responsibility (EPR), plastic packaging taxes), country-wide requirements such as reuse and recycling targets, financial mechanisms such as funding or tax breaks for circular opportunities, and schemes to support circularity (e.g. deposit return schemes).

Many EU member states have implemented legislation to encourage businesses to move away from a linear to a CE. In terms of packaging, EU directives such as the EU Packaging and Packaging Waste Directive (94/62/EC) have encouraged member states to implement legislation to control the production of packaging and packaging waste that is harmful to the environment.

This indicator identifies the number of legislative incentives created to encourage circularity in the EU packaging industry, using Germany as an example to test the indicator. There are many benefits to monitoring this indicator. For example:

- Identifying the number, and types, of legislative incentives is an important first step in understanding how they can influence the implementation of circular principles in the packaging industry.
- It will be a useful indicator of how the CE is progressing, as the implementation of additional legislative incentives indicates a positive change in CE activities by businesses and ultimately in consumer behaviours.

3.1 KEY METHODOLOGY

3.1.1 Testing method

Germany was chosen as the EU Member State to explore with this indicator as Germany has already implemented significant legislation to regulate the production, sale, and disposal of packaging and packaging waste.

3.1.2 Data collection method

Desk-based research was conducted to identify the various individual laws and regulations that have been implemented in Germany to provide incentives to encourage circularity specifically in the packaging industry.

This desk-based research was conducted via the internet and involved searching for packaging legislation that has been implemented by the German government. The following sources were used:

- Stiftung Zentrale Stelle Verpackungsregister[8]
- Bundesministerium der Justiz[9]
- Bundesgesetzblatt[10]
- EUR-Lex[11]
- FAOLEX[12]

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[8] www.verpackungsregister.org (accessed January 2024)

[9] www.bmj.de (accessed January 2024)

[10] www.recht.bund.de (accessed January 2024)

[11] eur-lex.europa.eu (accessed January 2024)

[12] www.fao.org/faolex (accessed January 2024)

Using these sources, Germany's packaging legislation was accessed and then analysed. The following data was captured from this desk-based research and entered into a Microsoft Excel matrix:

- Title of legislation
- Date of implementation
- Legislation summary
- Incentive Type

3.1.3 Timeline

Table 12 shows the project timeline.

Table 12. Gantt chart for Pa2

Week commencing	01-Jan	08-Jan	15-Jan	22-Jan	29-Jan	05-Feb	12-Feb	19-Feb	26-Feb	04-Mar	11-Mar	18-Mar	25-Mar	01-Apr
Task 1 - Desktop research of legislative incentives	■	■	■	■	■	■	■							
Task 2 - Identify and agree on stakeholders	■	■												
Task 3 - Contact stakeholders (incl. chasing)		■	■	■										
Task 4 - Write interview questions		■												
Task 5 - Conduct stakeholder interviews				■	■	■								
Task 6 - Write up interview notes							■	■						
Task 7 - Analyse themes/trends present in desktop research and interview responses									■	■				
Task 8 – Develop case study template												■	■	■
Review period			■				■						■	
Key deliverables												Initial draft case study		Initial draft case study

3.1.4 Data gaps and mitigation

Table 13. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	Potential for data to be missed in desk-based research (due to volume of legal documents, quality of translations, etc.).	• A stakeholder engagement exercise was conducted to minimise gaps in the data collected, and to confirm the data collected was correct.	High
2	Stakeholders contacted were not responsive or were not able to provide information required.	• Stakeholders were contacted again. • Stakeholders were still unresponsive, so the indicator has been measured using only desk-based research and citizen's survey.	Low

3.1.5 Quality review of analysis

This indicator has gone through a rigorous quality assurance process prior to submission to ensure a high-quality of the data and case study.

- Prior to the testing of the indicator, the proposed research methodology and data collection plan were reviewed, and necessary amendments made.
- Following data collection and write-up of the case study, the case study draft underwent a three-stage quality assurance process, where it was reviewed and amended three times prior to final approval.

3.2 KEY ANALYSIS RESULTS

3.2.1 Analysis

The data collected in Table 14 identified five legislative incentives currently in place in Germany. All of these legislative incentives, bar the deposit return scheme for beverage containers, involved fines for non-compliance. One of the incentives involved a levy placed on certain single-use plastic items and packaging placed on the market. These are all examples of negative incentives, or financial punishment. In addition, these legislative incentives are placed on the packaging producer or retailer (the first party to place the packaging on the market). The only legislative incentive encouraging circularity in the German packaging market using positive incentives is the *Deutsche Pfandsystem* (deposit return scheme), and the positive incentive is provided to consumers rather than producers.

Table 14. Legislative incentive analysis

Name (Title) of Legislation	Date of Implementation	Summary	Incentive Type
Packaging Act (VerpackG) 2019 *Verpackungsgesetz*	2019	This legislation is the implementation of the Directive (EU) 94/62/EC. VerpackG makes initial distributors/producers of retail packaging filled with goods that reach private final consumers responsible for the collection and recycling of packaging. They must register all packaging with the Central Agency Packaging Register through the LUCID portal to participate in a take-back scheme and report data.	Fines for non-compliance. Fees associated with placing certain packaging materials on the market.
German Ordinance on Single-Use Plastics *Einwegkunststoffverbotsverordnung*	2021	This legislation implements the requirements of the Directive (EU) 2019/904 for the reduction of the environmental impact of single-use plastic products. The legislation bans single-use plastic products such as cotton buds (q-tips), disposable cutlery and plates, straws, drinks stirrers, and balloon sticks. It also bans expanded polystyrene containers and beverage cups. Oxo-degradable plastic products and packaging are also included in the legislation (this material breaks down into micro-particles but will not degrade fully).	Fines for non-compliance.
German Ordinance on the characteristics and labelling of certain single-use plastic products *Einwegkunststoffkennzeichnungsverordnung (EWKKennzV)*	2021	This legislation implements Article 6 (1), (2), and (4); and Article 7 (1) and (3) of Directive (EU) 2019/904. Single-use plastic products with plastic closures and lids must be placed on the market with the lids attached to the containers during the use period of the product's lifecycle. Plastic containers (listed in Part D of the Annex) must bear a marking on the packaging or on the product itself (see 'Other Notes'). From July 2024, all single-use plastic beverage containers placed on the market must have their lids attached to the bottle/container.	Fines for non-compliance.

Disposable Plastics Fund Act *Einwegkunststofffondsgesetz (EWKFondsG)*	2023	This legislation implements requirements of the Directive (EU) 2019/904. The Disposable Plastics Fund Act applies to certain single-use plastic products such as food and beverage containers, food packaging for immediate consumption, lightweight plastic carrier bags, wet wipes, balloons, tobacco products, and fireworks. Producers of the above single-use products must register with the Federal Environment Agency and report annually on their production of these products, and are required to pay levies on their production of single-use plastic.	Taxes/levies on single-use plastic items (producers). Fines for non-compliance.
Deposit Return Scheme *Deutsche Pfandsystem*	2003	Germany has had a deposit return scheme (DRS) for beverage bottles and cans since 2003 and was the first European country to implement a DRS. When consumers purchase certain beverage products, they pay a deposit (*Pfand*), which is returned to them when they return the empty beverage container. These containers are then either reused or recycled. There are two types of containers: single-use (*Einweg*) and reusable (*Mehrweg*). *Einweg* containers are recycled and *Mehrweg* containers are cleaned and reused by the producers. Consumers can identify the different types of containers by the label on the packaging (see 'Other Notes'). Beverage containers with a deposit can be returned to various places. Many supermarkets have bottle return machines (*Pfandautomat*) where consumers can return their bottles. Liquor stores/off-licences will also accept bottles. Local convenience stores will accept bottles that they have sold. Bottles can also be donated to local bottle collectors (generally people in need who will then return the bottles and claim the deposit themselves).	Returnable deposit.

3.2.2 Limitations

The main challenge faced during the testing of this indicator was the lack of response from stakeholders within the project timeframe, and therefore an inability to confirm the details of the legislative incentives researched. Although there is a high level of confidence in the data collected, it would have been beneficial to confirm these details with an expert in the field of packaging legislation in Germany. It is important that details are not missed due to poor translations of legislation, or lack of information widely available. Ideally, stakeholders working for packaging compliance schemes in Germany would have been engaged with to find out more information about the incentives and whether packaging producers are being appropriately incentivised.

3.2.3 Performance

This indicator performed well against the RACER evaluation undertaken in Task 4 of the project. Most of the criteria have been scored the same, with only two changes to the scoring. The overall score remains the same. The two criteria that were changed are as follows:

- **Credibility:** This has been updated from a score of 3 to a score of 2. This is due to the fact that no stakeholder interviews took place to confirm the data on legislative incentives was correct. In order to ensure credibility of the data, it is recommended that stakeholder interviews/confirmation from experts take place.
- **Ease:** The score for this criterion has been updated from 2 to 3, as it was easy to access and collect data for this indicator.

Table 15: RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	3	3	2	2	13
After Task 5 (following testing)	3	3	2	3	2	13

3.3 CHALLENGES AND LESSONS LEARNED

3.3.1 Challenges

There were few challenges that arose during the testing of this indicator, but none of them had a great influence on the data. However, it is important to take these challenges in consideration for the development of the indicator, and they are listed below:

- The data for this indicator was in the form of legislation, either in PDF or web format. This legislation is very complex and there are often amendments and additional documentation to consider. There is no one source of data that lists all packaging legislation in Germany, so extended desk-based searches were required to ensure no legislation was missed. For this reason, the analysis of the data can be complicated and time-consuming. In future, it would be helpful to engage with policy experts to gather the necessary data in order to be more time efficient.
- The legislation analysed was translated from German to English using Google Translate. This is a relatively reliable translation service, but it is not guaranteed that it is always correct. To mitigate this, the legislation was researched using a Google search and multiple other English language sources were consulted to ensure the key points of the legislation had been translated correctly. In future, it would be helpful to engage with German packaging policy experts, or at the very least have German speakers analyse the legislation.
- It was not possible to conduct any stakeholder interviews in the timescales provided for the testing of this indicator. There was a lack of response from the stakeholders contacted, and one that did respond

was unavailable during the provided timeframe. In future, some flexibility may be required to ensure that stakeholder input is captured. It is also recommended that stakeholder engagement takes place early on in the data gathering process.

3.3.2 Lessons learned

The lack of response from stakeholders emphasised the need for an improvement in stakeholder engagement strategies for future testing of this indicator. Engaging with stakeholders early on in the research process is important, and additional time may be required to complete any engagement activities such as interviews, dependent on the availability of the stakeholders involved. One of the stakeholders contacted was happy to contribute to the study, but not available until after the due date of the case study. In this case, it was not possible to extend the testing period, but it may be helpful to keep this in mind if the indicator is developed further.

3.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.

The data collected identified five legislative incentives created to encourage circularity in the German packaging industry. The majority of these incentives were examples of negative incentives, most of them in the form of fines for non-compliance. The only example of a positive incentive was the deposit return scheme in place in Germany, which encourages consumers to return their beverage containers in order to recoup a deposit included in the purchase price of the beverage. Without comparison against multiple other EU member states, or further data on the effectiveness of the legislative incentives within Germany, it is not possible to draw any further conclusions.

The indicator "Number of legislative incentives created to encourage circularity in the European Union packaging industry" has the potential to be developed further as an indicator to track progress towards a CE in the EU. Following the testing of this indicator, it was found that its original name was fit for purpose and that no variation was needed, pending future developments.

Identifying the number of legislative incentives that encourage circularity in the packaging industry will provide insight into the implementation of circularity-promoting legislation across the EU, not only via the EU directives but also any specific national legislation which may go above and beyond the requirements outlined in EU directives. If this research is replicated across all EU member states, comparisons can be made, and it will be possible to identify themes across the legislative incentives identified in the study.

When developing this indicator further, it will be important to consider testing the indicator across a representative sample of member states (different sizes of economies, populations, governments, industries, waste infrastructure etc.). EU member states differ greatly in terms of their sizes and economies, and it is important to have a representative sample.

When data has been collected from multiple member states, it will be possible to identify themes within the legislative incentives (such as incentive type, for example). This will provide valuable insight into the legislative landscape of the EU, and allow for further, more in-depth, analysis. It would be interesting to ascertain whether certain types of legislative incentive are more successful than others. It may be possible to find out whether positive or negative incentives are more successful, and what type of legislative incentives will be the most effective in promoting a CE.

It would be useful to gather data on the value or quantity of fines or taxes that have been charged to companies and compare this across different member states. This would provide insight into whether the incentive is effective or not, or if companies would prefer to pay the tax or fine than adhere to legislation promoting a CE. This data could be gathered by engaging with government bodies and enforcement agencies, as well as EPR packaging compliance schemes.

This insight would be highly valuable to policy makers and may help to create policy that will engage businesses in the CE and promote circular principles. To do this, it will be necessary to develop the methodology of this indicator further and data may need to be collected over a longer time period to allow for in-depth stakeholder engagement.

It is recommended that this indicator is tested annually to identify any changes in the number of legislative incentives. An increase in the number of legislative incentives could indicate a positive step in the transition to climate neutral circularity. This could be done more efficiently with the development of a tool or software that stores lists of legislative incentives and captures changes in legislation or new legislation, such as a database.

Table 16: Summary of recommendations for indicator Pa2

Type of recommendation	Recommendation	RACER Criteria Addressed	Timeline	Key stakeholders or partners
Legislation	It should be simple for organisations to identify the legislation that has an impact on their packaging. This should be made available in the form of a basic list of packaging legislation that includes the names, implementation dates, and key details of the legislation. Companies can then seek further information themselves.	Acceptability and Ease	Medium (1.5 – 5 years)	• **Responsible:** EC • **Accountable:** EU Member States • **Consulted:** Legislative bodies • **Informed:** Manufacturers, producers

4. INDICATOR 3 – PERCENTAGE, BY WEIGHT OF PACKAGING PLACED ON THE MARKET, DESIGNED BY CIRCULAR PRINCIPLES

This indicator is the percentage by weight of packaging placed on the market which has been designed according to circular principles, with a methodology to calculate the associated environmental impacts. Designed to circular principles can have a number of different meanings, from expert judgement of the researchers and desk-based research the initial circular principles to be considered for this indicator were:

- Designed to be reused/refilled.
- Designed to be recycled.
- Compostable/Biodegradable
- Designed containing recycled content.
- Carbon emissions involved in producing/using the packaging.

Reusability is one of the most important circular principles as it is near the top of the waste hierarchy as one of the more preferred methods, in comparison to recycling which is lower on the waste hierarchy. Due to time constraints this was the only circular principle considered within the desk-based research and monitoring of the indicator; however other principles could be considered in the future such as recyclability and whether packaging is compostable/biodegradable.

This indicator relates to legislation such as the Waste Framework Directive and the Single Use Plastics Directive 2019/904 of the European Parliament. The Waste Framework Directive aims to promote the reuse of packaging and the Single Use Plastics Directive is about reducing the impact of certain plastic products on the environment. It is also relevant to EPR for packaging, which is a law in France and an increasing number of other EU member states which holds producers, importers and distributors responsible for the disposal of waste from their products and packaging. Producers pay a financial contribution to eco-organisations who manage their waste and improve recycling rates.

France has a decree no 2022-507 relating to the minimum proportion of reused packaging that needs to be placed on the market. The decree is defined from 2023-2027 and is in place in order to achieve the objectives set out by article L.541–1 of the environment code. The targets for this are 5% in 2023, 6% in 2024, 7% in 2025, 8% in 2026 and 10% in 2027. The Decree affects packaging manufacturers, producers, importers, distributers, or other marketers of products using packaging, eco organisations and organisations dealing with any reuse activities. This makes monitoring this indicator beneficial as results can show a direct correlation to progress up to 2027 going from 5% reusable packaging placed on the market to 10%.

The French Reuse Observatory[13] website states that "*Starting from 2023, any producer placing **at least 10,000 units of packaged products on the market per year** is subject to a **reuse obligation** and must make an **annual declaration of their packaging data starting in 2024**"*. The annual declaration can be made to the Reuse Observatory directly.

The benefits of monitoring this indicator are:

- Progress against various legislations such as the Waste Framework Directive, the Single Use Plastics Directive of the European Parliament and the Decree no 2022-507 in France can be monitored if the % of reusable packaging compared to packaging on the market as a whole can be identified.
- Helps to gain a better understanding of the environmental impacts associated with reusable packaging in comparison to single-use packaging.

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[13] Reuse National Observatory, 2024 Declaration of reuse of professional packaging. (ADEME, 2024). https://filieres-rep.ademe.fr/observatoire-du-reemploi-et-de-la-reutilisation/2024-declaration-reuse-professional-packaging. Accessed 24th April 2024.

4.1 KEY METHODOLOGY

4.1.1 Testing method

The system boundary for this indicator was at a national level looking at one country, France. France was chosen for this indicator as they have had a law for EPR since 1975. This law states that producers, importers and distributors may be required to contribute to the disposal of waste from their products. From 1992 France also implemented EPR for household waste and has been expanding their EPR schemes since then to form 12 mandatory schemes, soon to be 22 with 10 more being implemented from 2021-2025. Other EU member states were considered for this indicator but a decision was made to just focus on France as from doing some initial desk-based research it was very challenging to find information on quantity and % of reusable packaging for any of the other EU member states, and France appeared to have more detailed information available than the other countries.

Desk-based research was carried out to find publicly available information on the total tonnes of reusable packaging placed on the market within France and the percentage of this which is reusable packaging designed with circular principles in mind. This was done by researching one of the major packaging compliance schemes in France, Citeo and conducting stakeholder engagement with them.

The LCA (lifecycle assessment) team then developed a methodology for analysing what the associated environmental impacts for this indicator may be by doing desk-based research on LCA datasets such as Ecoinvent. The findings of the LCA research are shown in Section 4.2 with the results.

4.1.2 Data collection method

Compliance schemes in France were contacted by email to find out where any information would be available on the tonnes of reusable packaging placed on the market throughout the whole of France in all sectors, versus the total packaging placed on the market.

4.1.3 Calculations

Simple calculations were carried out to obtain the % and tonnes of reusable packaging in each of the following three categories:

- Furnishings.
- Electrical and electronic equipment.
- Textiles.

These three categories were chosen as they were the only ones with data available on total reusable packaging placed on the market.

4.1.4 Timeline

Table 17 presents the timeline for this indicator.

Table 17. Gantt chart for Pa3

Task	15th Jan	22nd Jan	29th Jan	5th Feb	12th Feb	19th Feb	26th Feb	4th Mar	11th Mar	18th Mar
Develop and agree circular principles for desk-based research and LCA analysis.	▓	▓	▓	▓	▓	▓	▓			
Desk-based research on % of reusable packaging by weight.	▓									
LCA team to conduct desk-based research		▓	▓	▓						

Task	15th Jan	22nd Jan	29th Jan	5th Feb	12th Feb	19th Feb	26th Feb	4th Mar	11th Mar	18th Mar
on the environmental impacts of this indicator.		▓	▓	▓						
Analysis of data.					▓	▓	▓	▓		
Writing up case study template.									▓	▓

4.1.5 Data gaps and mitigation

Table 18. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	Lack of information available publicly on total packaging on the market.	Packaging compliance schemes in France were contacted to find out if this information is available.	High
2	Information of reusable packaging placed on the market throughout France was very limited to certain categories.	Further desk-based research was carried out to find other sources where the total weight of packaging on the market in France would be published.	Medium
3	Potential for data to be missed in desk-based research (due to quality of translations, etc.).	Stakeholders from French Reuse Observatory website were contacted to check some of the information, however there was no response from them despite being contacted multiple times.	Low

4.1.6 Quality review of analysis

Prior to work beginning, the research team presented the data collection plan to the Project Manager to review to the proposed research methodology and ensure that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, they proceeded to the data collection phase. Following data validation, the research team summarised findings in a MS excel format and presented this to the Project Manager for a review process to ensure their accuracy and relevance to the indicator being measured.

Summary of the QA process:

- Mid-December: QA for Pa3 data collection plan was carried out.
- Mid-February: Informal QA carried out and check in on case study and data analysis.
- Late March: Case Study QA was carried out and amendments then made.

4.2 KEY ANALYSIS RESULTS

4.2.1 Analysis

From the desk-based research carried out, in 2022 the France packaging market size was valued at 97.9 billion units. This value is not available in tonnes so it would be challenging to determine what the total weight of this value would be. A rough estimate would need to be made as packaging weights vary greatly from one packaging type to another. 2022 data was available on the French Reuse Observatory website for reusable packaging placed on the market for three sectors, which are also mandatory EPR sectors.

By analysing the data from the French Reuse Observatory website, the total tonnes of primary reusable packaging placed on the market in France across the three sectors of furnishings, textiles, and electrical and

electronic equipment in **2022** was **173,604 tonnes**. These three sectors were the only ones which had information available for total reusable packaging placed on the market and data was only available for the year 2022, which made the data available very limited in terms of what could be done during the analysis. These three sectors only account for a small proportion of reusable packaging and total packaging which will have been placed on the market in France in 2022.

As can be seen from the tables below, textiles had the most reusable packaging placed on the market, followed by furnishings and electronics and electrical equipment.

Table 19. Summary of findings of reusable packaging placed on the market for three sectors

	Sector		
	Textiles	**Furnishings**	**Electronics and Electrical Equipment**
Tonnes of reusable packaging placed on the market	115,273	40,103	18,228
Percentage of reusable packaging placed on the market (%)	66.4	23.1	10.5

Textiles contributed to two thirds of the total reusable packaging placed on the market across the three sectors, which could be related to the fact that France is the third largest textile and apparel producer in Europe therefore large quantities of textile waste and produced every year.

Reusable packaging placed on the market for furniture was 40,103 tonnes or 23.1% of the total for these three sectors. France implemented a law for furniture waste where 75% of workplace furniture must be reused or recycled. This law is the only one of its kind within the EU and has been implemented since 2011, which may be the reason that reusable packaging for furnishings is being reported to the French Reuse Observatory through an EPR scheme.

Total reusable packaging placed on the market for electronics and electrical equipment was the lowest out of the three, contributing to 10.5% or 18,228 tonnes. This could be attributed to the fact that packaging for this category may be smaller in size, therefore weighing less overall than reusable packaging for furniture. Electronic and electrical equipment may also be in use longer than textiles so contribute less overall to packaging waste.

To calculate the environmental impacts associated with these types of reusable packaging, an LCA (Lifecycle Assessment) would need to be carried out following the PEF (Product Environmental Footprint) method.

The LCA team conducted research on the methodology which would be used to calculate the associated environmental impacts for this indicator. Below outlines the PEF methodology and the approach which would be taken to provide a useful mechanism for comparing single use versus reusable packaging, with the European Commission's (EC's) PEF methodology.

LCA can be used (under the right circumstances) to compare the environmental performance of one product against another. In the context of assessing the potential environmental impacts of single use packaging versus reusable packaging it is key to consider the whole life cycle of the different products in order to see where environmental differences lie across the various stages of the packaging's life. It is critical to note that packaging, and indeed any product, should only be compared using LCA when the LCA have been carried out in the same way. Comparisons can only fairly be made when the LCAs are aligned to cover the same system boundary, level of exclusions, secondary database, data quality, and perhaps most importantly, when the packaging is modelled to fulfil the same function as the one it is being compared with. For example, an LCA should be done on a specific packaging type with specific purpose (e.g. a dry-cleaning bag to protect clothing during the journey between dry cleaner and consumer over a period of X years) rather than comparing general material types with one another (e.g. low density polyethylene, LDPE, versus polypropylene), as the latter will not give a full picture.

The EC's PEF methodology[14] and related "sub-methodologies" which relate to specific product groups, known as PEF Category Rules (PEFCRs), was specifically designed to enable such benchmarking. It does this by explicitly specifying how the LCA should be carried out, reported, and finally, verified. Whilst there is not a currently valid PEFCR for packaging, carrying out an LCA which aligns with the general PEF methodology will help to ensure that a comparison of single and reusable packaging is done fairly, i.e. apples for apples. The PEF methodology also specifies the use of a Circular Footprint Formula (CFF) which attempts to allocate burdens between the system which generates waste (for example the packaging itself being disposed of) and the future system which may use this waste as a secondary material input (for example packaging with recycled content).

LCA requires a fair amount of specific data to be collected on the product under study. If considering an LDPE dry cleaning bag, for example, information on the quantities and types of raw materials that are used to make a fixed quantity of the bag is needed as well as information on ancillary materials, utilities (energy, water), wastes, and transport associated with its manufacture. This type of information will need to be collected for each life cycle stage of the bag.

In addition to the materials and production of the bag, the downstream distribution and use, and end-of-life stages need to be considered. This will firstly involve describing what processes occur in these life cycle stages. Aspects such as how long the bag will be able to serve its function for being quantified alongside respective use conditions, and what happens to the bag once it is no longer fit for purpose. In comparing a reusable product to a single use product, it will be particularly pertinent to understand how many reuses of the reusable packaging are realistic within the defined timeframe and use scenario assumed, along with any maintenance (such as cleaning) or repair (such as replacement of parts of the packaging) is required to ensure the reusable packaging is still fit for function.

Inventory data collected for these stages can then be combined with any necessary assumptions, scaled to the reference flow and functional unit, and combined with characterisation factors within an LCA model. This will generate quantified values over a range of environmental indicators representing environmental impacts such climate change, ecotoxicity, and eutrophication. The PEF methodology specifies the core indicators to be assessed which cover a range of different impacts. It is important to consider not just one indicator in order to provide a more holistic view. For example, packaging A may have a lower value for climate change than packaging B, but may be worse (have a higher value) for ecotoxicity.

To summarise, LCA can provide a useful mechanism for comparing single use versus reusable packaging, with the European Commission's PEF methodology providing helpful guidance on how to ensure that this is done in a fair and consistent manner. Whilst it may not be possible or practical to comply with this methodology, it is recommended that the practitioner of an LCA draws on several aspects of the PEF methodology to enable a fair comparison of different packaging options across a range of environmental indicators.

4.2.2 Limitations

The research team have tried to mitigate the limitations of this data as much as possible, however the following limitations are still present:

- Data obtained is only for three different sectors, furnishings, electronic and electrical equipment and textiles. This represents quite a small proportion of the entire market therefore assumptions would need to be made to calculate total reusable packaging on the market in France.

- Despite being able to find the total quantity in tonnes of reusable packaging for textiles, furnishings and electronic and electrical equipment, it was not possible to find this information for any other sectors. Despite contacting the main compliance scheme, Citeo, this information was not currently available.

- For the French data, packaging data was only available from eco-organizations on the register in accordance with the AGEC law and the decree relating to EPR sector data. This relates to the three sectors above as they are three of the mandatory EPR categories which producers need to pay or contribute to waste management for. These three sectors have been included within EPR for a number of years and this explains why there is data available for each of them.

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[14] Director-General for Environment, Recommendation on the use of Environmental Footprint methods. (Official website of the European Commission, 2021). https://environment.ec.europa.eu/publications/recommendation-use-environmental-footprint-methods_en. Accessed 24th April 2024.

4.2.3 Performance

During Task 4 of the study, the original indicator was given a score of 12 in the RACER evaluation process. Following Task 5, the indicator was awarded a lower score of 9. This was a lower score than expected for the criterion 'Relevance', 'Ease' and 'Robustness'. This changed as the information was much more challenging to obtain for this indicator than initially expected, therefore affecting the robustness and relevance. Due to a lack of resources online the ease score was also affected.

Table 20: RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	2	3	2	2	12
After Task 5 (following testing)	2	2	3	1	1	9

The relevance score decreased by 1 as the information found during the desk-based research was only relating to three sectors, meaning the data did not cover the total reusable packaging placed on the market. Ease decreased by 1 as this indicator was challenging to monitor due to lack of information online and through the stakeholder engagement carried out with France's main compliance scheme. The robustness of the indicator after testing decreased by 1, this is due to the fact that initially it was anticipated that there would be publicly available data on overall packaging placed on the market in France. This was more challenging to find than expected and Citeo or the French Reuse Observatory did not have this information, making the testing of Pa3 less robust.

4.3 CHALLENGES AND LESSONS LEARNED

4.3.1 Challenges

Challenges faced during the monitoring process were lack of available information on certain aspects of this indicator. It was very difficult to find any publicly available information on the total packaging in tonnes places on the market in France. This meant that it was even more challenging to find out what % of this would be reusable. This was mitigated as much as possible by doing thorough desk-based research and engaging with Citeo to find alternative sources which may have contained this information.

Citeo provided contact details for an employee of The Reuse Observatory, which had information on reusable packaging in three sectors in France. This employee was contacted to find out if there were any sources which had information on the total weight of packaging placed on the market for each of these sectors, but unfortunately after multiple attempts to contact them via email they did not respond. To mitigate this in the future more time could be spend on stakeholder engagement with a larger number of compliance schemes contacted.

4.3.2 Lessons learned

The research team learned that for future assessment purposes, while trying to locate the gaps in information, some of the target information that is not available would only be accessible and collated via direct contact with representatives of the packaging compliance schemes. Although the main compliance scheme in France, Citeo, was contacted they did not have the information required. Data collection was challenging for this indicator because the information does not seem to be publicly available. Next time, the research team should focus more on stakeholder engagement with a larger number of packaging compliance schemes to find out whether this information does exist.

4.4   CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.

This indicator is important as it relates to a number of legislations involving the CE and reusable packaging. However, significant work would be required to facilitate its progress and this would need to be over a long-term period (>5 years). This is because some countries are only just beginning to record EPR data for packaging. It is expected more of this information will become available in the coming years. For example in France it is becoming compulsory to register packaging if more than 10,000 units are sold by a particular organisation.

The main findings from the testing of this indicator are that in France, there is only information on weight of reusable packaging in tonnes for three main sectors which are; furnishings, electrical and electronic equipment and textiles. There is no information available of total reusable packaging placed on the market for all sectors, this is due to lack of data being collected. The data for reusable packaging within textiles, electronic and electrical equipment and furnishings is available on the Reuse Observatory website which was recommended by a contact at one of the main French Compliance schemes, Citeo.

Information on overall packaging placed on the market in France was very difficult to obtain and it was only available in units, and not by weight. An average weight of packaging could be used to estimate how many tonnes each unit would be, but this would be challenging to do as there is such as wide range of packaging on the market which differs greatly in mass; for example wooden pallets compared to flexible plastics.

Following the testing of this indicator, it was found that its original name was fit for purpose and that no variation was needed, pending future developments.

Table 21: Summary of recommendations for indicator Pa3

Type of recommendation	Recommendation	RACER Criteria Addressed	Timeline	Key stakeholders or partners
R&D	R&D could be carried out to further develop this indicator. This would be carried out over the long term, as it is expected more information on total reusable packaging placed on the market will increase over time due to countries implementing EPR. The EC could work with established and future EPR compliance schemes to harmonise data collection on reusable packaging.	Ease and Robustness	Long (> 5 years)	• **Responsible:** EC. • **Accountable:** National Governments. • **Consulted:** National Governments, packaging compliance schemes, packaging producers and sellers. • **Informed:** All stakeholders within EU reusable packaging industry.
Stakeholder Engagement	Further stakeholder engagement could be carried out to determine whether information on total packaging placed on the market is available.	Credibility and Robustness	Short (<1.5 years)	• **Responsible:** EC. • **Accountable:** National Governments. • **Consulted:** National Governments, packaging compliance schemes, packaging producers and sellers. • **Informed:** All stakeholders within EU reusable packaging industry.

5. INDICATOR 4 – CHANGES IN EXPENDITURE THROUGH APPLYING THE CIRCULAR PRINCIPLE OF 'REUSE' IN MANUFACTURING BUSINESSES

The aim of this indicator is to evaluate the impact in terms of expenditure of implementing the circular principle of 'reuse' in the manufacturing sector.

The circular principle of 'reuse' aims to minimise waste and to reduce or avoid the energy and raw material consumption needed to produce new items. By extending the functional usefulness of a material or product, manufacturing businesses can reduce the environmental impact of their operational activities as well as the costs related to sourcing raw materials and/or to waste management. They can also educate and support behavioural changes within society to ensure a true reduction in single-use items being placed on to the market, consumed, and disposed of in the current linear 'take-make-throw' model of consumption.

There are many benefits to monitoring this indicator. These include:

- By understanding the changes in expenditure through applying 'reuse' in manufacturing businesses, the EC will gain a better appreciation of the potential costs or benefits of such a model within real life settings and different industry sectors.
- Testing this indicator with manufacturing businesses allows for creative circular design solutions and provides the opportunity for future resources and items to be consumed in a more circular manner than is currently achievable.

5.1 KEY METHODOLOGY

5.1.1 Testing method

This indicator was not tested by Ricardo as it requires potential funding for participants and requires an extended period of monitoring beyond the timeframe for the testing period. Therefore, the methodology outlined in this section is a suggestion of how the indicator could be tested in future if the additional resources were available.

5.1.1.1 System boundary

The testing of this indicator will require working closely with manufacturing businesses to ascertain any changes in expenditure resulting from the implementation of circular principles. Therefore, the businesses selected to test this indicator will need to be those that have expressed an interest in implementing circular practices in the past, and where contacts already exist. A sample size of between five and ten businesses spread across the EU in the manufacturing sector should be aimed for in order to reflect the potential differences in terms of geography and sub-sectors.

Another important part in defining the system boundary of this indicator will be to define the circular principles that are going to be tested. Indeed, it is important that a clear definition will be provided, otherwise it will be difficult to reproduce the study, and results may not be reliable. The circular principle of 'reuse' (or 'reusability') was chosen for this indicator as this was likely to be different to any other common circular principles already adopted by businesses, such as 'recyclability'. Reuse is the act of using a product repeatedly to extract the maximum benefit from it. Maximising reuse reduces the pressure on virgin resources and minimises waste.

5.1.1.2 Methodology

Initial desk-based research identified that there was no data available to measure this indicator. Therefore, it is suggested that a stakeholder engagement exercise should be conducted in the form of a survey and / or interview, depending on the level of support needed by the businesses to collect the data required. The availability of data for this indicator will be dependent on the response rate received. If the response rate is poor, rigorous analysis on the results may be limited.

Following the stakeholder engagement exercise, it is suggested that a Material Flow Analysis (MFA) be conducted, depending on the type of data collected. An MFA details the flows of materials within a system boundary and allows for measurement of performance change, as well as giving the ability to compare current levels of circularity between one example of the 'system' and another.

5.1.2   Data collection method

5.1.2.1 *Stakeholder engagement*

Engaging with existing internal contacts within manufacturing businesses which have shown an interest in implementing reuse solutions would be a good initial step for a stakeholder engagement exercise. This list of stakeholders could be broadened using desk-based research to find others who have CE ambitions either via engaging with organisations which provide support or funding for business on CE projects or by looking at individual business CE targets and ambitions which have been published online. To ensure a good level of engagement to test this indicator a communication plan should be created to log all contact made with stakeholders – this should include any wording templates used for email communications, time logs for emails sent/received, or phone calls made with a summary of what was discussed, and future dates for chasing unresponsive stakeholders.

5.1.2.2 *Survey and interviews*

A data collection template should be shared with the businesses contacted to ensure that the correct data is collected, and that its consistent across the different businesses assessed. The data required to test this indicator should include both OpEx and CapEx such as the following:

- Investment costs, i.e. new equipment or machinery.
- Raw materials costs.
- Energy costs.
- Waste management costs.
- Any other costs generated or avoided by the implementation of the 'reuse' principle.

This data should be recorded for one month before to establish a 'Business as Usual' baseline to compare any changes in expenditure following the implementation of the circular principle of reuse. The implementation of circular principles may take a period of time to truly show the impact on expenditure. Therefore, the data recorded should be collected at regular intervals during and after implementation of circular principles for up to one year.

For the data to be as accurate as possible, it is expected that businesses would engage with their key internal and external stakeholders themselves, such as procurement / purchasing teams and suppliers, by sharing the data collection template mentioned above.

5.1.3   Calculations

In order to measure the changes in expenditure due to the implementation of the circular principle of 'reuse', the following calculation should be used:

Sum of expenditure after implementation – Sum of expenditure before implementation = Changes in expenditure

5.1.4   Data gaps and mitigation

Since this testing for this indicator was not carried out by the project team, the data gaps identified below in Table 22 are those which have been predict to be the most likely when testing of this indicator is undertaken.

Table 22. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	Lack of businesses volunteering to take part in the study.	• To mitigate against the possibility of a poor response rate, engagement with businesses that have expressed some commitment to circular practices, ideally where key contacts are held within the Consortium.	Low

	Description of data gap	Mitigation efforts	Level of confidence
2	Data influenced by factors such as inflation, change in raw materials costs, etc.	• Adjusted for inflation where applicable. • Analyse to consider any changes in production such as input and output.	Medium
3	Key stakeholders not engaging with the businesses' request for data.	• Follow-up with additional correspondence if stakeholders do not respond initially. • Extend timeframes of projects to allow for more time to collect data.	Medium
4	Data from key stakeholders (e.g. procurement or accounting teams) not complete or not reflecting changes in consumption due to some supplier or business functions not being updated on the reuse initiative.	• Follow-up with additional correspondence if stakeholders do not respond initially. • Extend timeframes of projects to allow for more time to collect data.	Medium
5	Difficulty extracting data from different systems in time for analysis	• Extend timeframes of projects to allow for more time to collect data.	Medium

5.1.5 Quality review of analysis

The following rigorous quality assurance process was developed to ensure accuracy of data and analysis, if this indicator had been tested:

- Prior to work beginning, the Project Director reviewed the proposed research methodology and ensured that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, they proceeded to the data collection phase.
- The Project Manager reviewed the work done.
- The Quality Assurance Manager held responsibility for the quality of the final case study output. The Project Manager assisted the Quality Assurance Manager in judging the quality of the output and suggesting ways to improve.

Since no testing was undertaken for this indicator, it is suggested that a similar quality assurance process is developed by those undertaking the task to ensure that any data outputs and analysis provide meaningful insights to the EC on whether if this indicator can support the EC's ambition of implementing circular principles across various industries and operational activities.

5.2 KEY ANALYSIS RESULTS

5.2.1 Performance

Table 23 below describes how this indicator performs against the RACER evaluation following testing and compares this performance against its original RACER assessment. The original RACER assessment for this indicator gave it a total score of 12 out of 15. This indicator has not yet been tested, but an updated RACER evaluation has been done following research and design of the proposed methodology for testing this indicator. The total score was changed at 11 out of 15.

The Relevance, Acceptability, and Credibility scores remained the same, but the score for Ease was reduced to 1. The change in the Ease score is due to the fact that the required data for this indicator is not readily available, and it may be costly to collect this data if funding and support is provided to businesses taking part in the study.

Table 23. RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	3	2	2	2	12
After Task 5 (following testing)	3	3	2	1	2	11

5.3 CHALLENGES AND LESSONS LEARNED

As this indicator was not tested, the challenges outlined in this section are those have been anticipated to be faced by those which do undertake the task of testing this indicator in future.

5.3.1 Challenges

5.3.1.1 *Stakeholder engagement*

Identifying suitable businesses to participate in the study due to the complexity of measuring this indicator can be challenging. Therefore, any stakeholder engagement exercise needs careful consideration within the planning stages of testing this indicator. Having a strong communication plan in place and a long list of existing or potential stakeholders willing to participate is key to ensuring that there will be a good level of engagement with the task and to mitigate concerns about lack of feasible data which can be analysed. .

5.3.1.2 *Data privacy*

There might be some concerns around data privacy and confidentiality. Some organisations are likely to be hesitant to share information or may require assurances regarding how their data will be used and protected. Clear protocols and policies for handling data would need to be developed to help address these concerns.

5.3.1.3 *Timescales*

For the testing of this indicator, the original aim was to collect data over a short period of time (one month before and after the implementation of the circular principle of 'reuse'). However, we recognise that influential factors such as inflation and change in raw materials costs could impact monthly data quite significantly. Therefore, we believe that the testing for this indicator should rather be conducted over a longer time period (for example one year before and after implementation). This was out of the scope of this task, however, if testing for this indicator is undertaken in future, this should be taken into consideration at initial planning stages.

5.3.2 Lessons learned

Any lessons learned during the testing of this indicator should be noted during the undertaking of each phase of work to ensure that an understanding how key tasks could be performed better if they were to be reproduced in future.

5.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is not considered for further development.

This indicator could not be tested as part of this task due to the complex nature of the tasks involved to ensure meaningful results would be reached. Whilst exploring the expenditure change due to reuse activities would be beneficial for the EC and its understanding of the impact of CE; and would allow the EC to develop clear and tangible case studies of real-life business operations where the principle of 'reuse' has been applied, there are too many variables to take into consideration, combined with the effort it would take to implement we consider this to be an unusable indicator.

For the indicator to provide meaningful results, a number of caveats would need to be put in place for the testing period, such as the type of reuse activity implemented, the business processes affected, the industry, the size of the company, and geography to name a few. With these limitations in place, it would restrict the results gathered for the indicator.

To test the indicator fully would require significant work as outlined in the methodology process, to ensure that enough granular data points were collected. To mitigate these key data challenges an extensive sample of companies would need to participate in the testing of the indicator over a significant timescale. In addition, in depth stakeholder engagement exercises would need to be undertaken to understand spend data in each case. These factors could potentially put off individual companies willing to implement reuse principles into their operational activities and therefore the results would most likely become anecdotal and provide very little insight to the broader industry sector.

If the EC chose to pursue the testing of this indicator, we would recommend providing incentives, such as funding mechanisms, for businesses to implement 'reuse' principles within their BAU activities to yield higher participation figures in testing this indicator. Indeed, to measure this indicator, businesses must be identified before implementation of the circular principle to ensure that relevant expenditure data is collected before and after implementation. Therefore, businesses could be identified for the study through funding opportunities or support offered through the EC or other organisations. In return for funding and / or CE business support, the business would agree to being included in the study and to share financial and other relevant commercial information with the EC.

Furthermore, if this indicator was to be tested, we recommend issuing technical guidance to participating businesses and support them directly during the testing of the indicator in order to reduce any hurdles they might perceive – specifically around data gaps and challenges. This would also ensure that the 'reuse' model employed will be of most benefit to them from a financial, social and environmental standpoint.

Whilst this indicator may complement the EU's CE Monitoring Framework as the changes on expenditure resulting in the implementation of the circular principle of 'reuse' is not being monitored yet, the reality of attaining enough granular data would be complex and time consuming for all involved and therefore unlikely to yield significantly meaningful results.

Table 24. Summary of recommendations for Pa4

Type of recommendation	Recommendation	RACER Criteria Addressed	Timeline	Key stakeholders or partners
Development of indicator testing methodology	Provide incentives (e.g. funding or CE support) for businesses to implement 'reuse' principles within their BAU activities to encourage participation in the testing of this indicator.	Acceptability and Ease	Medium (1.5 - 5 years)	• **Responsible:** EC • **Accountable:** EC • **Consulted:** EU Member States • **Informed:** Participating businesses
Development of indicator testing methodology	Issue technical guidance to participating businesses and support them directly during the testing of the indicator.	Ease	Medium (1.5 - 5 years)	• **Responsible:** EC • **Accountable:** EC • **Consulted:** EU Member States • **Informed:** Participating businesses

6. INDICATOR 5: SHARE OF TAKEAWAY MEALS AND DRINKS PROVIDED IN REUSABLE PACKAGING.

This indicator aims to measure the proportion of takeaway food and beverage items provided in reusable packaging, at a regional/city level. Reusable packaging refers to packaging that is designed for reuse in the same or similar application, or on another purposeful packaging use in a supply chain[15].

The benefits to monitoring this indicator include:

- A better understanding of reusable packaging uptake in the takeaway food and drink industry.
- Measuring reusable packaging offerings across different regions.
- A positive move forward from looking at recycling rates and recyclability of packaging to reuse, a principle higher up the waste hierarchy.

6.1 KEY METHODOLOGY

6.1.1 **Testing metho**d

Citizens surveys were used to measure this indicator. This methodology was selected with an aim of quantifying the behaviours of citizens across different regions/cities, allowing for analysis of the current values associated with the indicator, as well as allowing progress to be mapped over time with further consistent and systematic surveys. To ensure statistically reliable and useful outputs, the results from the survey were weighted to account for regional/city population sizes to accurately represent the Member State as a whole.

6.1.2 **Data collection method**

In order to test this indicator, the following data inputs were requested from respondents for 2023:

- Number of takeaway food/drink items purchased in a typical week.
- Proportion of purchased takeaway food/drink items supplied in reusable packaging.
- Use of personal reusable packaging when purchasing takeaway food/drink items.
- How reusable packaging was usually disposed of.

To gather the above data inputs from respondents, the team developed and disseminated a survey across citizens. Although the project team developed the line of questioning for this survey, YouGov was used as a platform to disseminate the survey to the citizens of the Netherlands. The Netherlands was selected due to having a strong record of public participation on environmental matters, as well as the fact the Netherlands has a relatively large restaurant and takeaway food industry, being valued at over €15 billion[16].

A sample size of 1,000 was received for the 'Reusable Packaging survey'. Table 25 shows the breakdown of this at a regional level. The highest rates of urbanisation can be found in the South and West of the Netherlands, with North Netherlands being the least urbanised part of the country[17]. This fact can be used to explain the difference in sample sizes across the regions.

Table 25. Breakdown of responses per region.

Region	Percentage of sample (%)
North	10
East	21

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[15] RPA, What is Reusable Packaging? (Reusable Packaging Association, n.d.) https://www.reusables.org/what-is-reusable-packaging/. Accessed March 2024.

[16] IBIS World, Restaurants & Takeaway Food Operators in Netherlands (IBIS World, 2023). https://www.ibisworld.com/netherlands/industry-statistics/restaurants-takeaway-food-operators/3420/#:~:text=The%20Restaurants%20%26%20Takeaway%20Food%20Operators,remained%20the%20same%20since%20 2019. Accessed April 2024.

[17] OECD, National Place-based Policies in the Netherlands. (OECD, 2010). https://www.oecd.org/regional/regional-policy/45901622.pdf. Accessed April 2024.

Region	Percentage of sample (%)
South	21
West	48
Total	**100**

Table 26 shows the breakdown of participants by age.

Table 26. Breakdown of responses by age group.

Age range	Percentage of sample (%)
18 – 24	10.5
25 – 34	15.8
35 – 44	14.7
45 – 54	17.8
55+	41.2
Total	**100**

6.1.3 Calculations

Calculations were not needed to investigate this indicator due to the use of the citizen's survey.

6.1.4 Timeline

Table 27 presents the timeline for this indicator.

Table 27. Gantt chart for Pa5

Legend

6.1.5 Data gaps and mitigation

During the course of testing this indicator, no data gaps were identified.

6.1.6 Quality review of analysis

To ensure robust and high-quality analysis of the data, we conducted the following QA procedure:

- Prior to work beginning, the Project Director reviewed the proposed research methodology and ensure that the data collection plan was fit for purpose. Only once the research team had addressed any comments from the review process did they proceed to the data collection phase.
- In relation to the survey development and dissemination, Project Manager reviewed the line of questioning for this indicator to ensure that it was clear, followable and able to generate reliable and

robust results. In addition to this, respondents were also required to answer each question before being able to move on to ensure data validation of the survey.

- Once the survey has closed and the results had been analysed, the Quality Assurance Manager conducted a thorough internal quality assurance process on the Excel data set which pulled together the data from the survey and subsequent calculations. Any incoming data and assumptions were clearly logged, presenting survey data, user inputs, calculations, assumptions and results.

6.2 KEY ANALYSIS RESULTS

6.2.1 Analysis

Figure 5 shows that across all regions, of those respondents that did purchase at least one takeaway food or drink item each week in 2023, 33% stated that they purchased an average of 1-2 items per week, 9% said they purchased between 3-5 items per week, 4% purchased between 6-10 items, and 3% purchased more than 10 takeaway food or drink items per week.

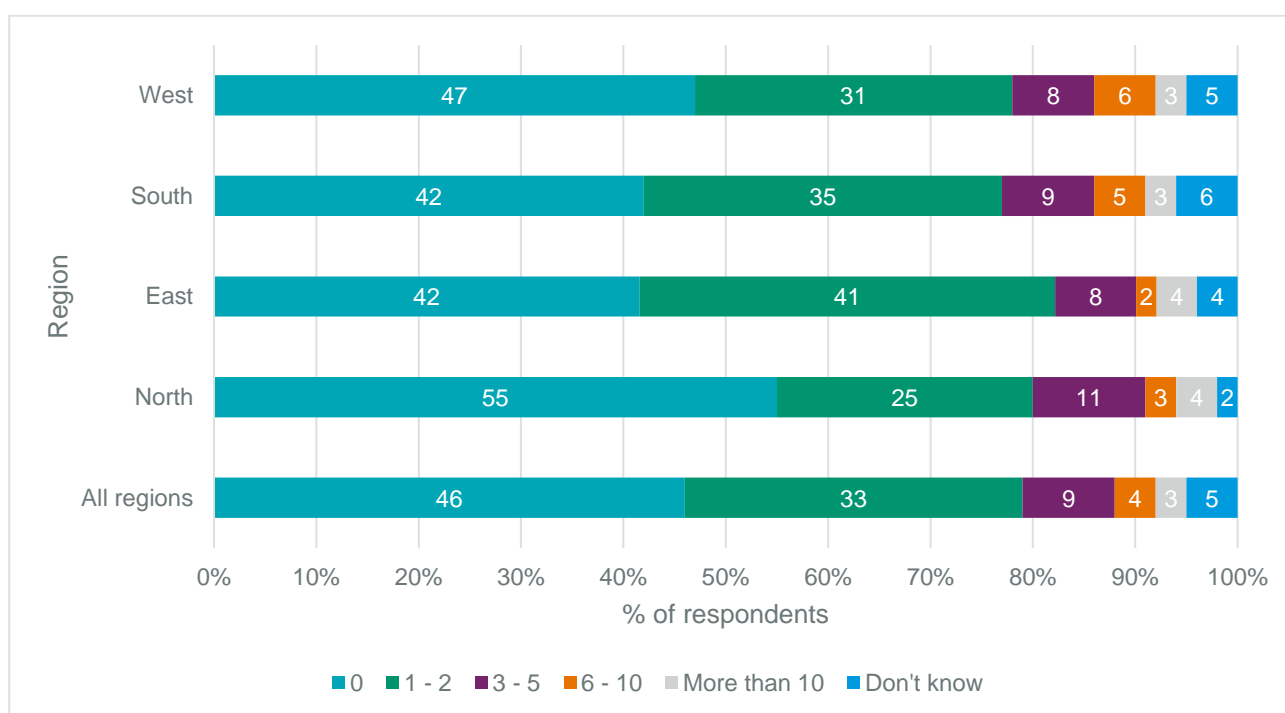Figure 5. Number of takeaway food/drink items purchased per week, per region

Figure 6 highlights that on average across all regions, the most commonly selected response from respondents when asked what proportion of takeaway food/drink items purchased in 2023 were supplied in reusable packaging was '1-25%', receiving 29% of the responses. However, whilst this was the mode response for The East, South and West regions, the mode response for the Northern region was 0%, receiving 29% of the responses, compared with '1-25%' which received 27%. Only 6% of respondents overall said that they received their takeaway food and drink items in reusable packaging '76-100%' of the time, with this figure peaking at 8% in the South region.

Figure 6. Proportion of takeaway food/drink items purchased that are supplied in reusable packaging, per region
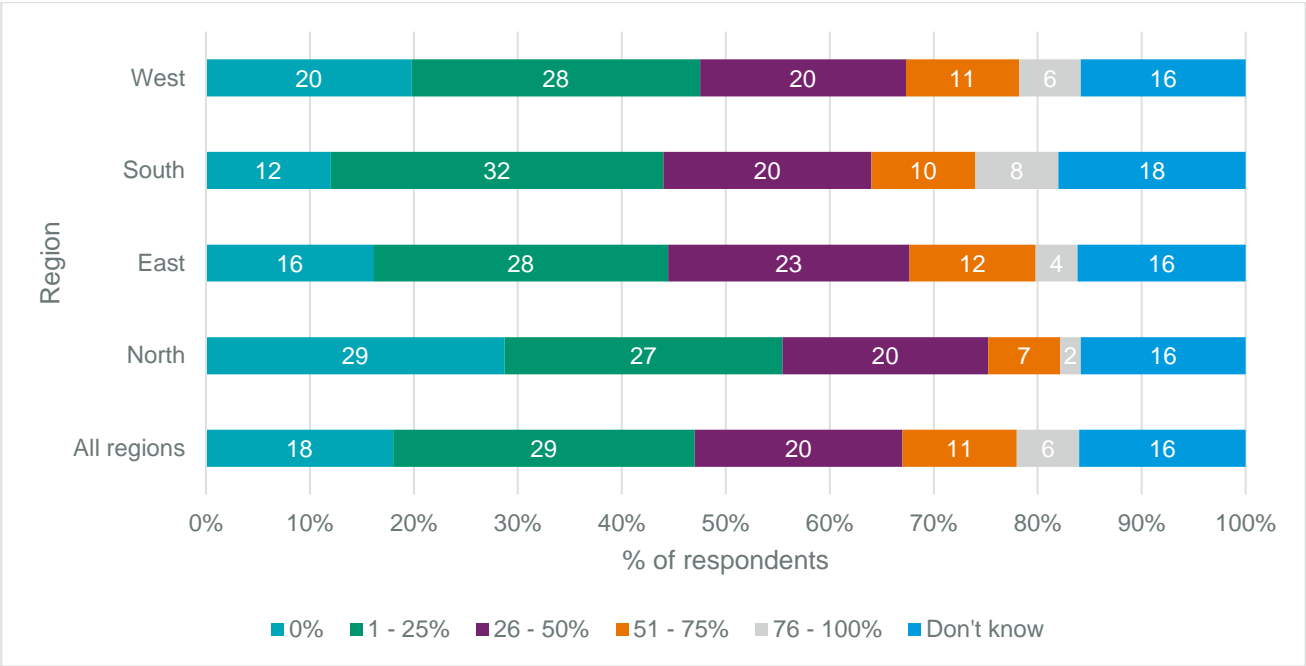

Figure 7 shows that 29% of respondents across all regions didn't use reusable containers at all, with this number reaching the highest figure at the North region (35%). Of those that did use reusable containers, only 3% of respondents said they 'always' did so, whilst 17% said they 'never' used them (this response differs from 'not applicable – I do not use any reusable containers 'as it includes those respondents that own reusable containers but never use them for takeaway food and drink items). The mode response across all respondents that did use reusable containers was 'sometimes', receiving 19% of the responses across all regions.

Figure 7. Frequency of using reusable containers (e.g. Tupperware, Keep Cup, etc.) when purchasing takeaway food/drink items, per region
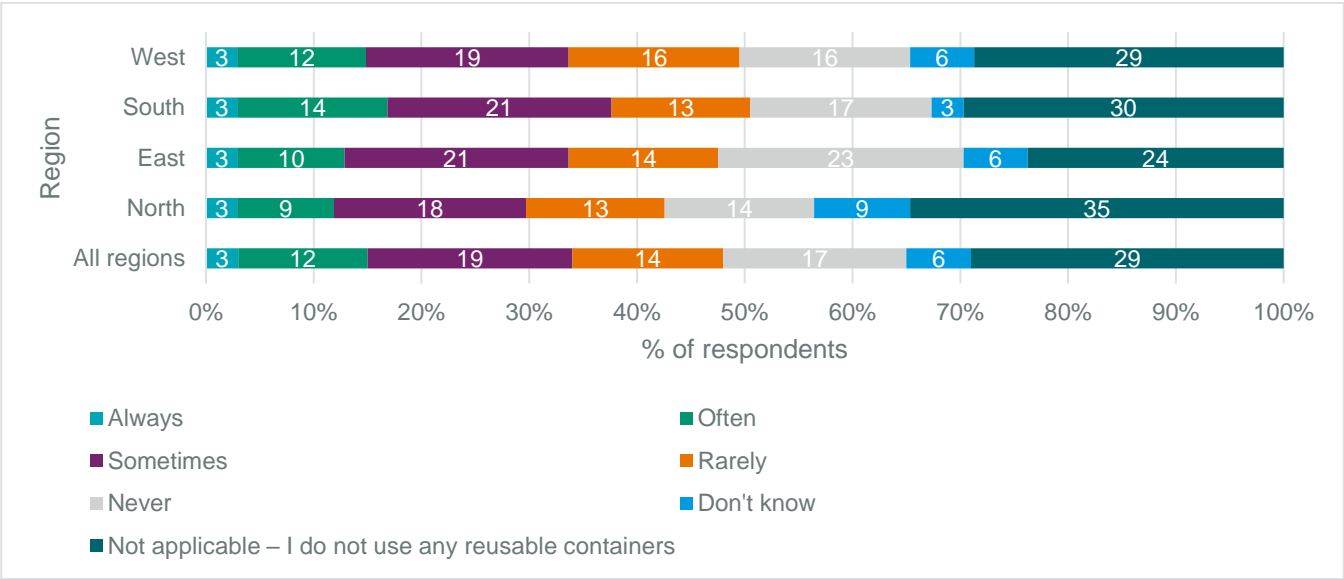
As seen in Figure 8, across all four regions, when asked how they would/do dispose of reusable takeaway packaging, respondents from all four regions were most likely to respond with 'I reuse/would reuse it' receiving 54% of the responses, this was followed by 'I recycle/would recycle it' with 35% of the responses, 'I give/would

give it back to the vendor' received 18%, and 'I put/would put it in the general waste bin' followed with 12% of the respondents selecting this option.

Figure 8. Typical disposal methods of reusable packaging, per region
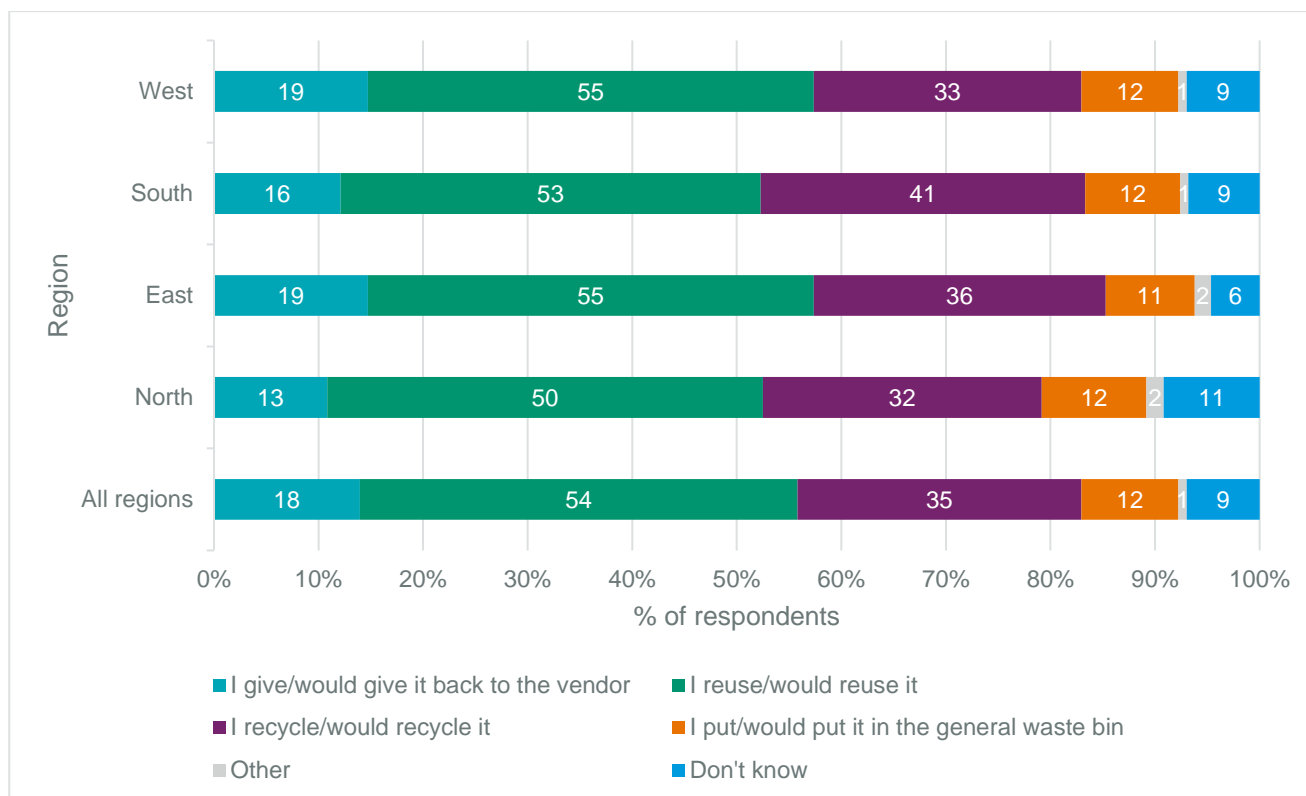
6.2.2 Limitations

The following limitations have been identified through the testing programme:

- Due to time constraints, we were only able to collect and analyse regional data within one Member State (i.e. the Netherlands). This meant that we were only able to compare results from the specific regions within the Netherlands, rather than specific regions within two or more Member States.

- After an initial review of the proposed questions for the citizens survey, it was recommended by YouGov (the survey disseminator) to offer a range of answers to respondents (i.e. options of 0%, 1-25%, etc.), rather than allowing them free reign and offering a blank text box. Due to the experience that YouGov have in carrying out this type of survey, this recommendation was followed. Whilst this likely reduced the amount of guesswork from respondents, it also likely meant that some responses received were less accurate than they could have been otherwise.

- It was also recommended by YouGov to offer options that were open to interpretation (i.e. 'sometimes', 'rarely', etc.). As these terms are equivocal in nature, they leave some element of doubt in the responses where terms or phrases can be interpreted differently by respondents to the survey.

- During the testing of the indicator, the number of times reusable packaging is reused was not considered. A study[18] found that the breakeven point between an expanded polystyrene food container and a reusable polypropylene food container was four uses, meaning the reusable polypropylene container needs to be used four times to negate the extra emissions generated during its production and justify its use. This highlights the importance of measuring the use and reuse of reusable packaging as well as its availability, something that is not currently covered in this indicator.

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[18] Gallego-Schmid et al., Environmental impacts of takeaway food containers. (Science Direct, 2019). https://www.sciencedirect.com/science/article/pii/S0959652618336230. Accessed April 2024.

6.2.3 Performance

During Task 4 of this study, the original indicator, named "Reusable products in food services" was given a score of 12 in the RACER evaluation process. Following Task 5, the indicator was again awarded a score of 12. The reduced score in the 'Credibility' criterion was due to the fact the data collection method will likely have to be amended before the indicator can be rolled out across other EU member states. The lower score in the 'Robustness' criterion was owed to the ambiguity of some response options in the citizen's survey, leaving answers open to interpretation.

The indicator scored higher in the 'Ease' criterion during Task 5 due to the relative ease of authoring and disseminating the citizen survey. However, the indicator scored lower in the 'Robustness' criterion after testing. This reduction in the score was due to the fact the indicator failed to consider the number of times reusable packaging was reused before ultimately being disposed of, meaning the indicator fails to comprehensively assess circularity in its current form.

Table 28. RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	3	2	2	2	12
After Task 5 (following testing)	3	3	2	3	1	12

6.3 CHALLENGES AND LESSONS LEARNED

6.3.1 Challenges

One challenge faced by the team was the task of disseminating the citizen's survey and in turn receiving reliable and trustworthy results from a large enough sample in a relatively small period of time. To overcome this challenge, it was decided that the project team would still have full control over the questions being asked, and a third-party organisation would be commissioned to disseminate the survey. Whilst this did overcome the challenge the team was facing; it also came at an extra cost which should not be overlooked when considering future data collection associated with this indicator.

6.3.2 Lessons learned

Lessons learned were recorded throughout the process of creating and testing this indicator, which may be applied to inform future assessments of indicators:

- For indicators which are based on data from citizen surveys, a judgement needs to be made at the early stages of testing as to what level of data granularity is required. There is a direct trade-off between the level of granularity asked for and the burden on the respondent to answer the questions. Asking for actual numbers within an open-ended question format is a more burdensome approach and could lead to missing data, however it would result in more granular data. In comparison, using numerical ranges within a closed-ended question format would provide less granular data, but would alternatively be easier/quicker for the respondent to complete, which would likely result in higher response rates. Considering this, it is recommended to disseminate citizen surveys via a platform who can guarantee reaching the pre-determined response rate.

- For indicators which rely upon survey data from citizens or households, going through a 3rd party supplier is the most effective approach to ensure high response rates. YouGov were able to guarantee a response rate of 1,000, which allowed the team to make robust and evidence-led conclusions from the data.

- When employing stakeholder/citizen surveys, it is important to consider this within the early stages of the project to allow for enough time to overcome any challenges such as lack of responses or issues disseminating the survey.

6.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.

As part of initiatives such as the EU Green Deal[19] or the Farm to Fork strategy[20], the EU is proposing a number of sizeable targets to reduce packaging waste associated with food and drink items. Whilst these targets in the past have focussed mainly on recycling rates and the recyclability of packaging, there is now a stronger emphasis on achieving targets that focus on principles higher up the waste hierarchy, including reuse. Therefore, it is essential that relevant indicators are developed to measure the success of initiatives like those previously mentioned, allowing progress to be monitored and assessed through time.

Following the testing of this indicator, it was found that its original name was fit for purpose and that no variation was needed, pending future developments.

In order to access the required data to measure this indicator, a citizen's survey was essential. Through disseminating this survey via a 3rd party, the data had good availability, robustness and directness. The approach has the potential to be easily replicated on a yearly basis, or alternatively across other products deemed of high importance.

It is recommended that significant changes to the data collection process are implemented before rolling out this indicator. Whilst valuable insights regarding the behaviour and experiences of consumers was gained via the results of the citizen's survey, it is recommended that data is also collected from takeaway food and drink vendors in future. This would allow for accurate quantitative data (e.g. specific figures relating to the use of reusable vs non-reusable containers) to be analysed and compared through time.

In order for the indicator to allow for a higher level of analysis to be carried out in future, it is also recommended that data is collected on a more granular scale. For instance, instead of collecting data across 4 regions (i.e. North, East, South, West), it may be collected at a more granular level, such as individual cities and regions. This would allow for factors such as the role urbanisation plays on the use of reusable packaging to be identified and analysed.

In the testing of this indicator, it was not specified where consumers purchased their takeaway food. If further categorisation of the data is desired, it is recommended that details of the type of businesses the food and drink were purchased from are collected. For example, consumers may have purchased takeaway food from a restaurant, takeaway food business, or from a canteen. This may be added to future questionnaires.

Adding to this granularity, it is recommended that the indicator considers the type or material of reusable packaging used in future. Whilst still all working towards reuse targets, not all reusable packaging has the same environmental impact due to factors such as the process involved in its manufacture, the lifespan of the product, and the waste options available when it reaches the end of its life. Therefore, it would be beneficial to benchmark different forms of reusable packaging, with the indicator then being able to monitor the use of more and less favourable packaging items.

Similarly, to ensure that circularity is being comprehensively assessed, it is recommended that the scope of the indicator be widened to not only measure the share of takeaway food and drink items provided in reusable packaging, but also the number of times this packaging is reused. Without this, there is a possibility that the indicator will be inaccurately reporting and potentially encouraging non-circular practices. As discussed in Section 6.2.2, the manufacture of many reusable packaging items actually has a higher environmental impact than when producing disposable alternatives, but this impact is negated when the packaging is reused a certain number of times. Therefore, by only measuring the proportion of items offered in reusable packaging and failing to consider the reuse of this packaging, the indicator in its current form does not comprehensively assess circularity.

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[19] European Commission, The European Green Deal (Official website of the European Union, n.d.) https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en. Accessed March 2024.

[20] European Commission, Farm to Fork Strategy (Official website of the European Union, n.d.) https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en. Accessed March 2024.

In order to support the implementation of this indicator, it is recommended that a long-term EU-wide target surrounding the use of reusable packaging for takeaway meals and beverages is implemented, building on the existing provisional target of final takeaway food and beverage providers offering 10% of products in a reusable packaging format by 2030[21].

To support the improvements in the performance of this indicator, it is also recommended that legislation incentivising the use of reusable takeaway food and drink packaging should be implemented. The most effective legislative implement in this case is likely to be tax incentives that would offer financial benefits to takeaway food and drink providers offering reusable packaging, and/or penalise those offering non-reusable packaging whilst suitable alternatives are available.

Finally, when implementing this indicator, it is recommended to widen the scope to also look at disposal of reusable packaging, as well as the lifespan of items, rather than just the share of food and drink items that are provided in packaging of this kind. Alternatively, these could be considered as separate indicators whose results could be used to inform the success of one another.

The implementation of this indicator would directly relate to the following macro level indicators within the new EU monitoring framework:

- **Generation of packaging waste per capita:** i.e. all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods. Increasing the use of reusable packaging will reduce the generation of food and drink packaging waste.

- **Generation of plastic packaging waste per capita:** i.e. all plastic products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods. Increasing the use of reusable packaging will reduce the generation of plastic food and drink packaging waste.

This indicator would also indirectly support improvements in the following macro level indicators:

- **Material footprint**: i.e. a quantification of the demand for material extractions triggered by consumption and investment by households, governments and businesses across the EU. Encouraging reuse of takeaway food and drink packaging is likely to reduce the amount of virgin materials required to produce new packaging.

- **Total waste generation per capita**: i.e. the total waste generated in a country (including major mineral wastes), divided by the average population of the country. Encouraging reuse of takeaway food and drink packaging will increase the lifespan of these packaging products, in turn reducing the amount of waste generated.

- **Generation of municipal waste per capita:** i.e. the waste collected by or on behalf of municipal authorities and disposed of through the waste management system. Encouraging reuse of takeaway food and drink packaging will increase the lifespan of these packaging products, in turn reducing the amount of waste generated.

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[21] European Parliament, Deal on new rules for more sustainable packaging in the EU. (European Parliament News, 2024). https://www.europarl.europa.eu/news/en/press-room/20240301IPR18595/deal-on-new-rules-for-more-sustainable-packaging-in-the-eu#:~:text=Encouraging%20reuse%20and%20refill%20options%20for%20consumers&text=Final%20distributors%20of%20beverages%20and,reusable%20packaging%20format%20by%202030. Accessed April 2024.

Table 29: Summary of recommendations for indicator Pa5.

Type of recommendation	Recommendation	RACER Criteria Addressed	Timeline	Key stakeholders or partners
Legislation	Incentives encouraging the use of reusable packaging within the takeaway food and beverage industry.	Acceptance and Ease	Medium (1.5 – 5 years)	• **Responsible:** EC • **Accountable:** National Governments. • **Consulted:** National Governments, takeaway food and beverage providers, citizens. • **Informed:** All stakeholders within EU takeaway food and beverage industry.
R&D	Assess widening the scope of this indicator or using it in conjunction with other indicators to compound the effectiveness.	Robustness	Medium (1.5 – 5 years)	• **Responsible:** EC • **Accountable:** EC • **Consulted:** National Governments, takeaway food and beverage providers, citizens. • **Informed:** All stakeholders within EU takeaway food and beverage industry.
Data collection	Collect data from takeaway food and drink vendors. This will allow for accurate quantitative data to be analysed and compared over time.	Credibility and Robustness	Medium (1.5 – 5 years)	• **Responsible:** EC • **Accountable:** EC • **Consulted:** Food and beverage vendors. • **Informed:** Food and beverage vendors.

Type of recommendation	Recommendation	RACER Criteria Addressed	Timeline	Key stakeholders or partners
Data collection	Data should be collected on a more granular scale, allowing for individual cities and regions to be compared within the same Member State.	Robustness	Medium (1.5 – 5 years)	• **Responsible:** EC • **Accountable:** EC • **Consulted:** Food and beverage vendors, citizens. • **Informed:** Food and beverage vendors, citizens.
Data collection and benchmarking	A benchmarking exercise should be undertaken to identify more and less favourable forms of reusable packaging. The scope of the indicator should then be expanded to collect data on the type of reusable packaging in use.	Robustness	Medium (1.5 – 5 years)	• **Responsible:** EC • **Accountable:** EC • **Consulted:** Packaging suppliers, food and beverage vendors, citizens. • **Informed:** Food and beverage vendors, citizens.
Scope change	The scope of the indicator should be widened to also account for the number of times reusable packaging is being reused.	Robustness	Medium (1.5 – 5 years)	**Responsible:** EC **Accountable:** EC **Consulted:** Packaging suppliers, food and beverage vendors, citizens. **Informed:** Food and beverage vendors, citizens.

7. APPENDIX

7.1 RACER MATRIX

Criterion	Description	1 (Poor)	2 (Neutral)	3 (Good)
Relevance	Refers to whether the indicator is closely linked to the objectives to be reached.	Does not support a better understanding of true circularity.	Supports a better understanding of true circularity.	Highly supportive towards gaining a better understanding of true circularity.
		Supports no value-added circular opportunities.	Supports lower value-added opportunities (i.e. metrics related to waste generation, recycling, waste management, etc.)	Supports higher value-added opportunities (i.e. all R-strategies above remanufacturing) and wider systemic change (e.g. indicators that encourage PSS or circular design).
		Not linked to the project objectives and/or European policy objectives (existing or upcoming).	Linked to the project objectives, but not to European policy objectives (existing and/or upcoming).	Fully aligned with project objectives and European policy objectives (existing and/or upcoming).
Acceptance	Refers to whether the indicator is perceived and used by key stakeholders (such as policymakers, civil society, and industry).	Poorly accepted by key stakeholders, e.g. due to the use of confidential data.	Relatively accepted by key stakeholders as the benefits of measuring are clear.	Key stakeholders are motived to report this indicator, due to mandatory legislative requirements (current or upcoming), potential commercial benefit or being in the public interest.
Credibility	Refers to whether the indicator is transparent, trustworthy and easy to interpret.	No defined methodology associated with this indicator and/or interpretation of the indicator is ambiguous.	Methodologies have been proposed or currently existing, but not for this particular indicator (e.g. in a research article).	There is an EU defined methodology.
		Difficult to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are not familiar with).	Moderately easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are aware of but are not confident in practical use).	Easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders already use and are confident in applying).
Ease	Refers to the easiness of measuring and monitoring the indicator.	No defined methodology associated with this indicator and/or interpretation of the indicator is ambiguous.	Methodologies have been proposed or currently existing, but not for this particular indicator (e.g. in a research article).	There is an EU defined methodology.
		Difficult to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are not familiar with).	Moderately easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are aware of but are not confident in practical use).	Easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders already use and are confident in applying).
Robustness	Refers to whether data is biased and comprehensively assesses circularity.	No consistent methodology and dataset are available.	A consistent methodology and dataset available.	A consistent methodology and dataset available.
			A composite/aggregated indicator (based on multiples dimensions).	A one-dimensional indicator.
			A proxy indicator.	

7.2   INDICATOR 1 – SCRIPT FOR 'SUSTAINABLE PACKAGING' SURVEY

See MS Word document 'DGRTD_Pa1_Reusable Packaging Survey Outline_V01.00' provided alongside this report.

7.3   INDICATOR 5 – SCRIPT FOR 'SUSTAINABLE PACKAGING' SURVEY

See MS Word document 'DGRTD_Pa5_Reusable Packaging Survey Outline_V01.00' provided alongside this report.

8. BIBLIOGRAPHY

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