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GLOBAL TOURISM PLASTICS INITIATIVE

PLASTICS MEASUREMENT METHODOLOGY FOR ACCOMMODATION PROVIDERS

ELLEN MACARTHUR FOUNDATION

Sustainable Hospitality Alliance

Plastics Measurement Methodology for Accommodation Providers
ISBN (printed version): 978-92-844-2387-3
ISBN (electronic version): 978-92-844-2388-0
DOI: 10.18111/9789284423880

Published by the World Tourism Organization (UNWTO)
First published: 2022

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Citation:
Global Tourism Plastics Initiative (2022), Plastics Measurement Methodology for Accommodation Providers, UNWTO, Madrid,
DOI: https://doi.org/10.18111/9789284423880.

ACKNOWLEDGEMENTS

Publication coordinated by: Svitlana Mikhalyeva, 10YFP Secretariat, United Nations Environment Programme (UNEP) and Virginia Fernández-Trapa, Sustainable Development of Tourism, World Tourism Organization (UNWTO) in collaboration with Claire Whitely and Anna Dacam, Sustainable Hospitality Alliance.

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Financial support:

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The Global Tourism Plastics Initiative (GTPI) would like to thank the following stakeholders who reviewed and provided feedback on the methodology:

Hugh Felton, ABTA
Virginie Delenne, Accor
Delphine Stroh, Accor
Silvina Miguel, Alila Villas Uluwatu
Annemiek van Gijn, All for Nature Travel
Alexandra Coffey, Arabella Hospitality
Apolónia Rodrigues, Associação Dark Sky
David Randle, Blue Community
Wendy Bagnasco, Caesars Entertainment
Sibylle Riedmiller, Chumbe Island Coral Park Ltd
Ben Taylor, Chumbe Island Coral Park Ltd
Nia Klatte, Considerate Group
Florian Duprat, Club Med
Philippos Drousiotis, Cyprus Sustainable Tourism Organisation
Mael Arribas, Ellen MacArthur Foundation
Juliette Goulet, Ellen MacArthur Foundation
Caitrin O'Brien, Four Seasons
Carlos Cordido, Golden Frog Colombia
Gabriel Tan, GUAVA Amenities
Emilia Prodea, Hostelling International
Fernando Castillo, Hurama Resorts
Patricia Dueñas, Iberostar
Megan Morikawa, Iberostar
Christian de Boer, Jaya House River Park
Danai Antonaki, PHĀEA Resorts
Piet Van Zyl, Positive Impact Forever
Jeff Parfrey, Pousada Serra Verde
Didier Perez, PT PIPA
Sven Wiltink, Radisson Hotel Group
Sunita KC, Scandic Hotels
Jennifer Klar, Six Senses Hotels Resorts Spas
Masaru Takayama, Shunyoso Cultural Asset Preservation Society
Marcus Cotton, Tiger Mountain Pokhara Lodge
Ishwar K Basnet, Tiger Mountain Pokhara Lodge
Jo Hendrickx, Travel Without Plastic
Andreas Vermöhlen, TUI Group
Robert Skews, Turama Pacific Travel Group
Thina Chatzigianni, Urban Yoga House Hostel & Retreat
Helena Rey, UNEP
Dirk Glaesser, UNWTO
Roxana Ashtari, UNWTO
Giorgio Bagordo, WWF

With special thanks to **Eric Ricaurte** and the Greenview team for their technical support

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INTRODUCTION

OVERVIEW

Plastic pollution results in an estimated damage of US$13 billion each year to marine ecosystems and has an evident impact on our natural systems that are essential in supporting travel and tourism (UNEP, 2021). To align and enhance the travel and tourism sector's efforts in fighting plastic pollution and transition to a circular economy for plastics, the Global Tourism Plastics Initiative (GTPI) was launched by United Nations Environment Programme (UNEP) and World Tourism Organization (UNWTO) in collaboration with the Ellen MacArthur Foundation (EMF).

GTPI invites companies from across the travel and tourism industry to endorse a "common vision of a circular economy for plastics, where plastics never become waste, as provided by the EMF's New Plastics Economy initiative."

Upon becoming a signatory to the GTPI, accommodation providers commit to:

1. Take action to eliminate problematic or unnecessary plastic packaging and/or items by 2025;
2. Take action to move from single-use to reuse models or reusable alternatives by 2025;
3. Engage the value chain to move towards 100% of plastic packaging to be reusable, recyclable, or compostable by 2025;
4. Take action to increase the amount of recycled content across all plastic packaging and items used by 2025.

In addition, they commit to "report annually and publicly on progress towards meeting these commitments, as well as on estimates of annual weights of plastics use".

This methodology has been developed to support GTPI signatories, as well as other accommodation providers who are not signatories, in the reporting of annual estimates of plastics use by setting out a common approach for:

- Defining the different types of plastics to be included in the measurement
- The metrics to be used
- How to define organisational boundaries and scope
- Extrapolating to fill data gaps

It is intended to be used by hotel operators or owners at company level, although the guidance set out can also be applied at single property level.

This first version of the GTPI Plastics Measurement Methodology for Accommodation Providers has been developed within the framework of partnership agreement between UNEP and Sustainable Hospitality Alliance, with financial support of the French Government and in collaboration with UNWTO and EMF. Technical assistance was provided by Greenview within the framework of its collaboration with the Sustainable Hospitality Alliance and with contributions from GTPI signatories and Advisory Group members as well as members of the Sustainable Hospitality Alliance. Updates and improvements to the methodology will be made as more data becomes available and following feedback from those using it.

THE CHALLENGES OF MEASURING PLASTIC USAGE

Plastics are cheap, lightweight, durable and adaptable – this makes them pervasive across things we use directly or packaging that are indirectly consumed. The ubiquitous nature of plastics makes measuring the amount of plastic items and packaging across the operations of accommodation providers a challenging endeavour. For example:

1. Attempting to capture every single plastic item on a property is a difficult task, both in terms of time required and feasibility of data capture.
2. Unit weights for each plastic item or packaging often vary widely among properties and even within a property (i.e. a property may purchase 5 different types and sizes of plastic cups across restaurants, guest rooms, spa, fitness, and outsourced amenities such as watersports).

As such, there is a need to identify the priority common plastic items and packaging which accommodation providers can begin to measure and report on, and at the same time develop industry wide consolidated data on average usage intensities and unit weights to support estimations in the absence of full data. This methodology aims to fulfil these needs.

Unless otherwise stated, definitions used in this methodology align with those set out in the EMF's New Plastics Economy Global Commitment ('Global Commitment'), of which GTPI is a sectoral interface. The 'Global Commitment' unites more than 500 businesses, governments and other organisations behind a common vision and targets to address plastic waste and pollution at its source.

HOW TO USE THE METHODOLOGY

This methodology has been designed for use by companies in the accommodation sector which are signatories of the GTPI. However, it will be relevant for those whichare not signatories but want to track their usage of plastic on an annual basis. The benefit of this methodology, which has been developed with input from industry experts, is that it sets out a common framework for defining and prioritizing plastics to report, common metrics to be used and a common approach to dealing with data collection challenges and gaps. As such, those which use it will ensure that their data allows for robust year on year comparison as well as internal and external benchmarking.

Users should first of all familiarise themselves with the key elements of the methodology so that they can put in place the appropriate systems at property and corporate level to collect data. The GTPI Plastics Calculation Tools can then be used to input data and facilitate calculations and reporting.

HOW THE METHODOLOGY WAS DEVELOPED

The methodology development process included three main components: literature review; accommodation sector survey; and stakeholder consultations and reviews.

First, a literature review was conducted to assess existing methodologies and recommendations to measure plastic footprint or the weight of plastic items and packaging in operations, on their relevance and applicability to the accommodation and tourism sectors. For a list of sources reviewed please see Appendix C.

Second, a survey tailored to accommodation sector GTPI signatories and other industry practitioners with established plastic reduction programs was conducted to quantitatively analyse the prevalence of each of the potential sources of plastic among a common list, and establish a prioritised short list of plastic items and packaging. Signatories and practitioners were also invited to contribute previously compiled data and specifications on plastic alternatives to support the research and development of industry coefficients. For an overview of the survey results, see Appendix B.

Following these inputs, two rounds of consultation across GTPI signatories and Sustainable Hospitality Alliance members took place. At each stage, feedback was obtained and revisions incorporated to produce this final version of the methodology[1].

1 Please see Acknowledgements for further details of consultees

1 SETTING BOUNDARIES AND METRICS

The 'boundaries' represent the basic definitions which underpin what is included or excluded in a dataset. To ensure transparency and consistency across signatories and provide robust year on year comparisons both within and between signatory companies, this methodology sets out standard boundaries to be applied to the data collected and reported. This includes:

1. **Temporal boundary:** the timeframe that the data will cover, both in terms of amount of time (i.e. number of months) and the period (start to end date) to which the data relates.
2. **Organisational boundary:** the scope of the organisation's activities or operations which is to be included in the data.
3. **Plastic boundary:** the different types of plastic items and packaging that are included in the data.

The 'metrics' represent the units of measurement which are used for reporting. Again, consistency is fundamental for comparison and tracking purposes. A good understanding of the metrics required is needed at the outset of the process to ensure that relevant data is collected to support calculations. The methodology identifies **mandatory metrics**, which are required for GTPI reporting purposes, and **additional metrics**, which individual companies may wish to collect for their own internal reporting purposes.

The approach below should be followed by signatories of the GTPI. If a company elects to define its plastics reporting boundaries differently, the approach should be complementary wherever possible and clear rationale should be provided for the divergence.

1.1. Temporal Boundary

GTPI requires signatories to report annual weights of plastic items and packaging used, as such the following approach is recommended:

1. Reporting should be for a 12-month period
2. Where possible reporting should reflect a calendar year, i.e. January to December, but if a company has a reporting period in place which runs across calendar years (e.g. June to June) this will also be accepted
3. Reporting should relate to the period immediately past (e.g. reporting in 2022 should cover data from 2021, etc.)

Where a property is operational only on a seasonal basis, data should be collected for all open months within the overall time boundary and non-operational months noted accordingly. Intensity metrics (see Section 1.4) should be calculated based on months operational.

1.2. Organisational Boundary

GTPI signatories are expected to report on the operations of their whole company.

If, upon signing GTPI, it is agreed with a company that some operations or parts of the organisation are out of scope of GTPI commitments (i.e. franchises, spa facilities or F&B which are separately managed, can be potentially excluded out of scope of GTPI commitments), **the company should report on the scope agreed at the moment of signature. In general, GTPI does not require data from franchised properties**.

Where it is not possible to report on that boundary in the first year, the signatory should state clearly the percentage of properties included in the boundary and why the reporting boundary differs.

Where possible, estimations may be used so that reporting can cover the full company boundary and where this is not the case, companies should commit to reporting against the full boundary within one year.

Where a major change in the organisation takes place, for example through an acquisition, reporting may follow the existing boundary in the first year of the change while appropriate systems are established, and in the following year the changed boundary should be incorporated.

1.3. Plastic Boundary

GTPI requires that signatories report on annual total weight of plastic in operations. This includes all plastic items and packaging, regardless of whether produced, purchased or used.

That said, given the significant challenges in measuring and calculating plastics usage highlighted in the introduction, and supported by the findings of the survey, this methodology provides a clear definition of the boundary of plastics to be considered for reporting to GTPI which, as an initiative, asks signatories to 'take action to eliminate problematic or unnecessary plastic packaging and/or items'.

GTPI provides the following definition of 'problematic or unnecessary plastic packaging, plastic packaging components and items' (Please refer to the GTPI website for the full definitions):

1. It is not reusable, recyclable or compostable.
2. It contains, or its manufacturing requires, hazardous chemicals that pose a significant risk to human health or the environment (applying the precautionary principle).
3. It can be avoided (or replaced by a reuse model) while maintaining utility.
4. It hinders or disrupts the recyclability or compostability of other items.
5. It has a high likelihood of being littered or ending up in the natural environment.

Based in this guidance and aligned with requirements set out by the EMF the recommended plastics boundary for this methodology is set out in Table 1.

Further guidance on specific plastic items is provided in the following chapter.

Table 1: Plastics Reporting Boundary for Accommodation Providers

Plastic Packaging/ Item	Include / Exclude	Rationale
Conventional plastics	**INCLUDE** (unless fall into any other exclusion categories below)	This refers to fossil-fuel based plastics which are nonbiodegradable. Under this category is included plastics that are a mix of conventional plastics and other forms of plastics (e.g. biodegradable, compostable, etc.) Some of the common names that conventional plastic can be identified by include but are not limited to the following: • Polyethylene Terephthalate (PET or PETE) • High-Density Polyethylene (HDPE) • Polyvinyl Chloride (PVC) • Low-Density Polyethylene (LDPE) • Polypropylene (PP) • Polystyrene (PS) • Expanded Polystyrene (EPS) • Polyurethane (PU)
Bio-based and biodegradable plastics	**INCLUDE**	Bio-based plastics refer to plastics that are from renewable biomass (e.g. plants, micro-organisms, etc.) while biodegradable plastics refer to those that are intended to biodegrade over time, regardless of origin (fossil fuel or biomass). The term 'biodegradable' should not be confused with 'compostable'. 'Biodegradable' means that the plastic can break down into naturally occurring substances but does not offer any information on how quickly and under what conditions it can biodegrade.
Compostable plastics	**INCLUDE**[2]	Compostable plastics refer to plastics that undergo a managed process to break down into naturally occurring substances that do not contribute to plastic pollution. It is important to note that compostable here requires fulfilment of GTPI's requirements of (1) compliance with relevant international compostability standards (e.g. ISO 18606, ISO 14021, EN13432, ASTM D-6400 and AS4736); and (2) proven successful post-consumer collection, (sorting), and composting in practice and at scale. There are generally two main levels of compostability for compostable plastics – home- and industrial-compostable. Both home- and industrial-compostable plastics are included in plastic reporting but separate reporting metrics will be used to identify the proportion they make up within the total weight of your plastics. They are separately tracked as the risk of pollution in the environment differs. Both require controlled conditions to break down but the impact of leakage into the environment is greater for industrial-compostable plastics which require much higher temperatures to break down. The likelihood of composting in practice is also lower for industrial-compostable plastics as industrial composting facilities are less readily available in all parts of the world.

2 Where compostable plastics are used, they should be reported as such in order to support further research and monitoring on their use.

Plastic Packaging/ Item	Include / Exclude	Rationale
Oxo-degradable plastics	**INCLUDE**	This refers to plastic materials with additives that, through oxidation, result in the breakup of plastic material into micro-fragments or chemical decomposition. These additives are also known as pro-oxidant additives. Examples include AddiFlex, d2w, Reverte, etc.
Recycled plastics	**INCLUDE**	Recycled plastics are scrap or waste plastics that have been reprocessed.
Hygiene-related plastics as part of preventive Covid-19 measures/ instruments	**INCLUDE**	This refers to disposable plastic items and packaging which the accommodation provider has control over[3], such as those introduced as a hygiene measure (e.g. plastic wrapping around TV remotes and replacement of reusable cups by single-use plastic cups). Such items are not exempted as their use can be significant and much can be avoided via a holistic approach that emphasises on sanitization and procedures. Personal Protection Equipment (PPE) items that are mandated by regulatory requirements can be excluded from reporting scope.
Beverage cardboard cartons	**EXCLUDE**	Beverage cardboard cartons (also known as Tetra Paks) are made of a composite material containing largely cardboard, followed by aluminium and plastic. This is excluded as plastic packaging and items for which the main structure is not plastic (i.e. less than 50% of the weight is made of plastic) are not included as part of the reporting scope, in line with the Global Commitment.
Paper cups/ containers with plastic lining	**EXCLUDE**	Paper is naturally compostable but it is often lined with plastic in takeaway items such as cups and containers to provide waterproof properties. This is excluded as plastic packaging and items for which the main structure is not plastic (i.e. less than 50% of the weight is made of plastic) are not included as part of the reporting scope, in line with the Global Commitment.
Plastic FF&Es (Furnitures, Fixtures & Equipment)	**EXCLUDE**	This refers to plastic items such as computers, kitchen equipment, chairs and tables, etc. which may be made of plastic or have plastic components. These are excluded due to their durability.

3 Further guidance is provided in Appendix D.

1.4. Reporting Metrics

There is a variety of different metrics which may be used to measure plastics usage. For consistency in comparison, this methodology sets out three types of metrics which should be considered:

1. **Mandatory:** namely the metrics required by GTPI to ensure comparable and consistent reporting across companies and year on year.
2. **Requested:** metric(s) which are not required but requested to inform further work.
3. **Additional:** other metrics which may be used by companies or properties depending on their internal or local requirements.

MANDATORY METRICS

As stated above, GTPI signatories commit to reporting annual weights of plastic items and packaging used. As such, signatories should report the following:

- Annual total weight of plastics (metric tonnes)

As reporting companies will vary significantly in terms of size and scope, the following intensity metric is also required. This will allow for benchmarking and provide further insights on year-on-year progress:

- Weight of plastics per guest night[4] (metric tonnes)

Where reporting is in the second or subsequent year, year-on-year progress should also be reported using:

- Absolute difference in total annual weight in plastics used between years (metric tonnes)
- Percentage difference in total annual weight in plastics used between years (%)
- Percentage difference in plastics intensity (weight per guest night) between years (%)
- Weight of plastic eliminated[5] since baseline year[6] (metric tonnes)

These mandatory metrics must be included into the annual report to GTPI, and whenever possible publicly disclosed.

Tracking and reporting against the above metrics offer insights into the overall weight of plastic that needs to be addressed and enables progress in plastic reduction efforts to be monitored year over year.

4 A guest night is equivalent to a guest spending one night at an establishment. Both payable and complimentary stays are included.

5 Subtract annual weight for plastics for current year from annual weight of plastics for baseline year.

6 Default baseline year should be 2021, but companies may select another year if relevant and state their reasoning.

ENCOURAGED METRIC

In addition, where compostable plastics are used and effectively composted, signatories are encouraged to provide the following metric. Data collected will be used to inform further work on the topic:

- **Percentage of home-compostable plastics out of annual weight of plastics purchased/used.**
- **Percentage of industrial-compostable plastics out of annual weight of plastics purchased/used.**

ADDITIONAL METRICS

Additional metrics that may be used for internal tracking and communications may include, for e.g.:

- **Annual weight (metric tonnes) per square metre or square foot:** Enables like-for-like comparison across accommodations with different floor area or for a property with changes in floor area over the years. Floor area to be used here is Gross Floor Area[7].
- **Annual weight (metric tonnes) per occupied room:** Enables like-for-like comparison, similar to annual weight (metric tonnes) per guest night.
- **Cost of plastics:** As a proxy indicator of plastic weight in operations since quantity of plastic increases with spending on plastic items.
- **Cost per guest night:** Enables like-for-like comparison across accommodations and for an accommodation across different years.
- **Cost per square metre or square foot:** Enables like-for-like comparison across accommodations and for an accommodation across different years.
- **Cost per occupied room:** Enables like-for-like comparison across accommodations and for an accommodation across different years.

7 Definition of gross floor area is contained in Appendix E.

2 PRIORITIZING AND PHASING COMMON PLASTIC ITEMS AND PACKAGING FOR REPORTING

Given the large number of potential plastic items and packaging in use in hotel operations, GTPI recognises that reporting on the full boundary from Year 1 may be a challenge. GTPI also recognises that within this broad list of plastics, some are more significant in terms of the quantity used and / or the negative impact on the environment. As such, this methodology sets out an approach to guide how different plastics should be prioritised in terms of data collection and reporting, and allows for a phased approach to measurement and reporting.

2.1. Prioritisation

The plastic items and packaging have been analysed and grouped into three categories, according to the following criteria (for more details see Appendix F):

- **Industry prevalence/awareness:** This is based on survey response on items and packaging tracked by the hospitality industry from survey respondents that included hotel operators, properties and industry practitioners.
- **Industry action:** This is based on survey response on items and packaging that are being eliminated by the hospitality industry from survey respondents that included hotel operators and properties.
- **Property's level of control:** This refers to the level of control that properties have over the presence of a plastic item or packaging. For instance, packaging from third-party suppliers or PPE mandated by regulatory requirements are out of a property's direct operational control.
- **Risk of littering:** This is based on the top litter items according to information available from plastic audits, including the top 10 most common single-use plastic items found on European beaches5, top 20 plastic items found in the US6 and single-use plastic products that are used and disposed of across the Travel & Tourism value chain[8].
- **Typical usage intensity:** Usage intensity metric used is number of pieces of plastic item or packaging used per guest night, and calculated using data provided by hotel operators and properties.
- **Typical unit weight:** For each plastic item or packaging, the median of all unit weights available was calculated. The unit weights were gathered from properties and calculated using data gathered from desktop research as well as from hotel operators and properties.

8 United Nations Environment Programme and World Travel & Tourism Council (2021). Rethinking Single-Use Plastic Products in Travel & Tourism - Impacts, Management Practices and Recommendations. Nairobi. https://wedocs.unep.org/bitstream/handle/20.500.11822/36324/RSUP.pdf

Category I:	**Industry prevalence/awareness:** Over 40% of survey respondents responded that the item or packaging is being tracked by the hospitality industry in plastic reduction efforts. **Industry action:** Over 35% of survey respondents responded that the item or packaging is being eliminated by the hospitality industry in plastic reduction efforts. **Property's level of control:** Hotel generally has high level of control over the plastic item or packaging as it is intentionally purchased. **Risk of littering:** The plastic item or packaging is generally at very high/high risk of being littered. **Typical usage intensity/Typical unit weight:** The plastic item or packaging generally has high usage intensity and/or unit weight.
Category II:	**Industry prevalence/awareness:** Between 30%-40% of survey respondents responded that the item or packaging is being tracked by the hospitality industry in plastic reduction efforts. **Industry action:** Over 30% of survey respondents responded that the item or packaging is being eliminated by the hospitality industry in plastic reduction efforts. An exceptional case is made for cling film which is significantly used by properties and is important to track despite the challenges involved in taking action. **Property's level of control:** The property generally has moderate level of control over the plastic item or packaging as the plastic component may not be intentionally purchased but happen to come along as packaging (e.g. sachets or sweet wrapper). **Risk of littering:** The plastic item or packaging is generally at high risk of being littered. **Typical usage intensity/Typical unit weight:** The usage intensity and unit weight of the plastic item or packaging ranges from low to high.
Category III:	This category captures all remaining plastic items and packaging[9] that are commonly used by properties and are relevant to the reporting boundaries of GTPI. Please refer below for the checklist of remaining common plastic items and packaging found in operations within the hospitality industry.

9 Where these items are not made out of plastic, they do not need to be accounted under this methodology.

2.2. Priority Items/Packaging by Category

The following tables show the plastic items and packaging according to their category as set out in the previous section.

CATEGORY I

No.	Plastic Item/Packaging	Area	Definition
1	**Garbage bags**	Rooms Bathrooms Food and drink services Service areas Back-of-house areas	This refers to all garbage bags used across a property's operations, from the small bin liners in bathrooms and guest rooms to the large garbage bags where all waste collected across the property eventually ends up in.
2	**Mini toiletry bottles**	Bathrooms	This refers to the small bottles for wet amenities such as shower gel, shampoo, conditioner and body lotion. They typically contain an amount that is sufficient for less than three or four uses. In 2019, California, USA, introduced a legislation to ban mini toiletry bottles which have a capacity under 170g (6 ounces)10.
3	**Packaging around dry room amenities**	Bathrooms Rooms	This refers to the single-use plastic packaging around dry room amenities such as toothbrush, solid soap bar, vanity kit, shaving kit, bathrobes, slippers, shoe shines, sewing kit, drinking cups, etc.
4	**Stirrers**	Food and drink services Service areas	This refers to the single-use plastic stirrers served with beverages.
5	**Straws**	Food and drink services	This refers to single-use plastic straws.
6	**Takeaway containers**	Food and drink services	This refers to the single-use plastic containers that are used to contain food and offered to guests, typically for takeaways but also for other instances such as in-room dining. For reporting purposes, this excludes containers that are non-plastic (e.g. paper) with a plastic lining.
7	**Takeaway cups**	Food and drink services Service areas	This refers to the single-use plastic cups made of plastic, including EPS. For reporting purposes, this excludes containers that are non-plastic (e.g. paper) with a plastic lining.
8	**Takeaway cup lids**	Food and drink services Service areas	This refers to the single-use cup lids made of plastic.
9	**Takeaway cutleries**	Food and drink services Service areas	This refers to single-use plastic cutleries such as plastic knives, forks and spoons. This does not include any additional plastic packaging that may be used to wrap around the cutleries, and that should be separately accounted, if used.

10 AB-1162 Lodging establishments: personal care products: small plastic bottles. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB1162

10	**Toothbrushes**	Bathrooms	This refers to the toothbrush with plastic handles and bristles. This excludes the plastic packaging (usually a thin clear plastic) that wraps around the toothbrush, which should be included under the item 'Packaging around dry room amenities'. Toothbrushes with non-plastic handles do not need to be included, even if the bristles are still in plastic. This is because market solutions for non-plastic bristles are not readily available currently.
11	**Water bottles (below 750ml)**	Rooms Food and drink services Service areas Back-of-house areas	This refers to single-use plastic bottles served to guests, typically less than 750ml. They generally contain mineral or purified water. Water bottles or containers that are 750ml and above should be tracked as a separate item category since they generally serve a different purpose, ie not directly offered to guests.

CATEGORY II

No.	Plastic Item/Packaging	Area	Definition
1	**Bags and packaging for chips and sweets**	Rooms Food and drink services	This refers to the various snack items served in guest room minibars and other food and drink services. They commonly include, but are not limited to, plastic packaging for chips, nuts, sweets, and chocolate bars. The material used is typically LDPE, PP, multi-material laminated films (such as snack bags and foil pouches).
2	**Cling film**	Kitchens	This refers to the plastic film used to seal food items. This is a common item that is used significantly in kitchens. The material used is typically PVC.
3	**Disposable plastic plates**	Food and drink services Service areas	This refers to the single-use plastic plates that are typically used for serving food in meetings and events. These are typically made of plastic, including EPS. For reporting purposes, this excludes plates that are non-plastic (e.g. paper) with a plastic lining.
4	**Laundry bags (for collection)**	Rooms	This refers to the single-use plastic bags that are used to collect dirty laundry from the guest rooms. They are typically made of HDPE, LDPE or LLDPE.
5	**Plastic beverage bottles (below 750ml)**	Rooms Food and drink services	This refers to the various single-use plastic bottles that is served directly to the guests (typically less than 750ml) that is filled with tonic water, soda, juice, and other beverages. They are usually made of PET. Bulk bottles for beverages and syrups that are 750ml and above should be tracked as a separate item category since they generally serve a different purpose, i.e. not directly offered to guests.
6	**Sachets or packets for single-serve condiments**	Rooms Food and drink services	This refers to the plastic wrapping around single serve condiments such as jam, tomato sauce and coffee creamers.
7	**Takeaway bags**	Food and drink services Service areas	This refers to the plastic bags that are used for takeaway items. They are typically made of HDPE, LDPE or linear LDPE (LLDPE).

8	**Takeaway condiment containers**	Food and drink services Service areas	This refers to the single-use mini plastic containers (including lids) for condiments such as chili or tomato sauce. These are sometimes termed as souffle cups. For reporting purposes, these plastic containers exclude containers that are non-plastic (eg paper) with a plastic lining.
9	**Toothpaste**	Rooms	This refers to the single-use disposable toothpaste tubes. The tube is typically made of a combination of HDPE and a thin layer of aluminium, and the cap made of PP.

CATEGORY III

No.	Area	Item
1	**All areas**	Plastic bags (assorted)
2	**Bathrooms**	Cotton ear buds
3	**Bathrooms**	Disposable bath salt packaging/ containers
4	**Bathrooms**	Hygiene products (e.g. tampon, etc.)
5	**Bathrooms**	Hygiene ribbons around toilets
6	**Bathrooms**	Loofahs
7	**Bathrooms**	Mouthwash bottles
8	**Bathrooms**	Sanitary bags
9	**Bathrooms**	Shavers
10	**Bathrooms**	Shaving cream
11	**Bathrooms**	Shower caps
12	**Cleaning**	Containers for cleaning products
13	**Cleaning**	Detergent bottles
14	**Cleaning**	Spray bottles
15	**Cleaning**	Wet wipes (for back-of-house cleaning)
16	**Food and drink services**	Assorted bakery packaging (e.g. cake boxes, plastic cookie bag)
17	**Food and drink services**	Cocktail picks
18	**Food and drink services**	Toothpicks
19	**Food and drink services**	Wet wipes (for F&B)
20	**Food and drink services**	Yoghurt cups and similar
21	**Food and drink services Rooms**	Coffee capsules
22	**Food and drink services Rooms**	Packaging for tea bags
23	**Kitchens**	Disposable aprons
24	**Kitchens**	Disposable baking transfer sheets
25	**Kitchens**	Disposable hair nets
26	**Kitchens**	Disposable moulds for baking
27	**Kitchens**	Disposable net bags (e.g. for vegetables)
28	**Kitchens**	Disposable piping bags / pastry sleeves
29	**Kitchens**	Disposable sponges
30	**Kitchens**	Packaging of food (Secondary packaging, e.g. shrink wrap)
31	**Kitchens**	Plastic beverage bottles (750ml and above)
32	**Kitchens**	Plastic syrup bottles/juice concentrates
33	**Kitchens**	Tasting spoons
34	**Kitchens**	Vacuum bags (for food / sous vide cooking)
35	**Kitchens**	Water bottles (750ml and above)
36	**Kitchens Cleaning**	Disposable gloves

No.	Area	Item
37	Logistics	Packaging materials (foam peanuts, raffia string, etc.)
38	Logistics	Pallet wraps
39	Logistics	Polystyrene ice boxes
40	Others	Balloons and balloon holders
41	Others	Other plastic decorations
42	Rooms	Combs
43	Rooms	Disposable ashtrays
44	Rooms	Disposable corkscrews
45	Rooms	Disposable shirt collar and pant clips
46	Rooms	Disposable shoe shines
47	Rooms	Disposable shoehorns
48	Rooms	Disposable slippers
49	Rooms	Door hangers
50	Rooms	Garment covers (for delivery)
51	Rooms	Glass covers
52	Rooms	Hair brushes
53	Rooms	Keycards
54	Rooms	Newspaper holder bags
55	Rooms	Packaging around clean linen and towel
56	Rooms	Packaging around glasses/cups
57	Rooms	Packaging around slippers
58	Rooms	Sewing kit
59	Rooms	Turndown gifts
60	Rooms	Vanity kit
61	Service Areas	All-inclusive wrist bands
62	Service Areas	Disposable swim caps
63	Service Areas	Disposable undergarments
64	Service Areas	Packaging around corporate gifts (e.g. pens)
65	Service Areas	Sunscreen bottles
66	Service Areas	Umbrella cover
67	Hygiene-related	Disposable face masks
68	Hygiene-related	Disposable face shields
69	Hygiene-related	Plastic wrapping around high-touch surfaces
70	Hygiene-related	Plastic wrapping around dishes and cutleries for dine-in or room services
71	Hygiene-related	Disposable gowns
72	Hygiene-related	Disposable shoe covers
73	Hygiene-related	Disposable medical caps
74	Hygiene-related	Mini hand sanitiser bottles

2.3. Phasing of Reporting of Items/Packaging

Signatories commit to reporting by 2025, an estimation of the total annual weight of plastics used. Based on the categorization above the following approach can be taken to progress towards achieving this commitment.

STEP 1: Identify all items across each category which are in use in the property

STEP 2: Using the priority areas identified under Menu of Commitments[11] when the company signed up to GTPI, prioritise those items which fall into the priority areas

STEP 3: Use the guidance below to ascertain the phasing for reporting against each item in use in the property

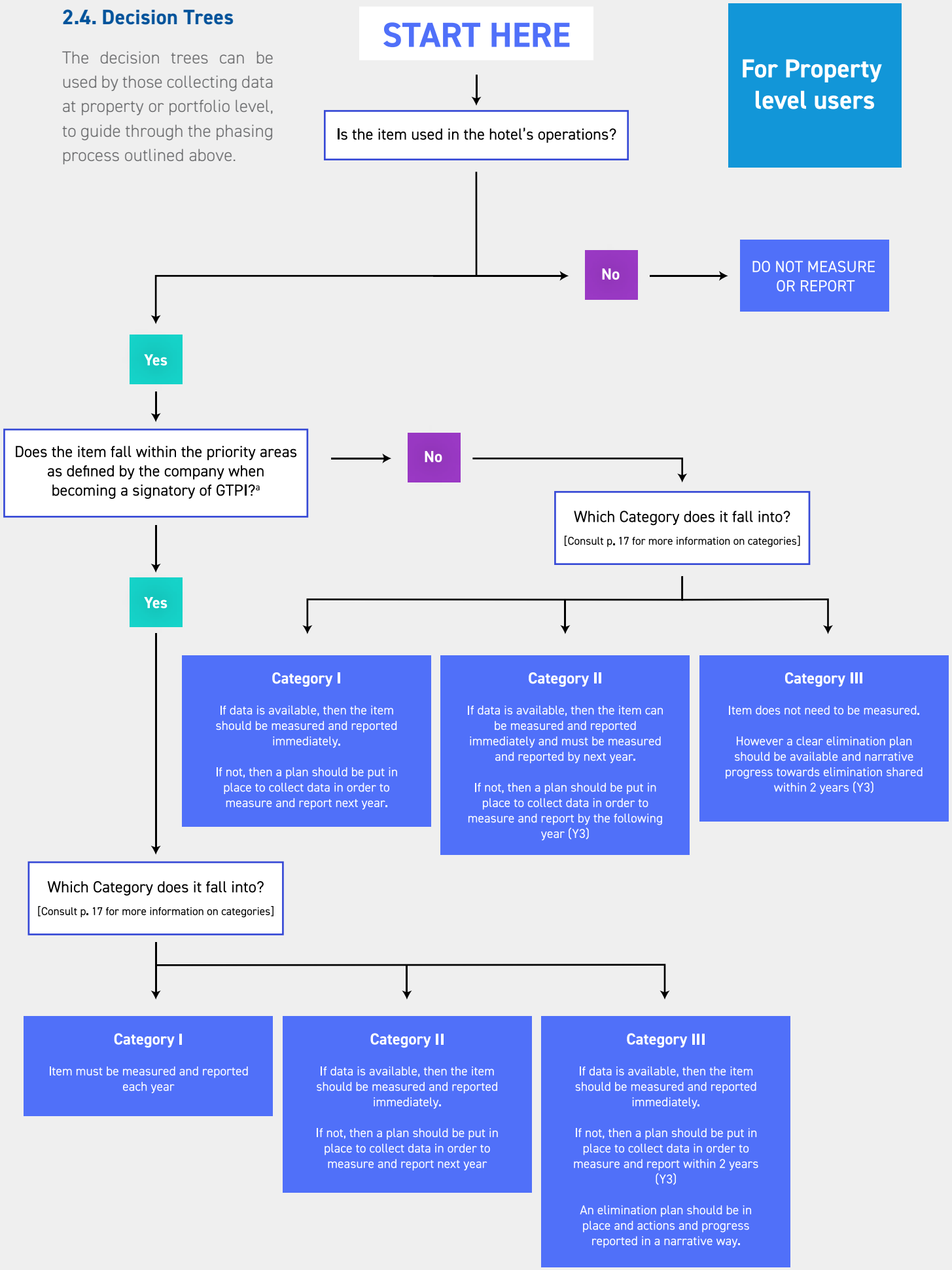
	Year 1	Year 2	Year 3
Category I	Report data for all Category I items which fall within your priority areas, using extrapolations where necessary Put a plan in place to identify data collection requirements and other issues in order to be able to report against all Category I items used by Year 2	Report for all identified Category I items, using extrapolations where necessary	Report for all identified Category I items, using extrapolations where necessary
Category II	Where data is readily available, report data for those Category II items which fall within identified priority areas Put a plan in place to collect data / estimations for remaining priority area items by Year 2	Report data for all Category II items which fall within the priority areas, using extrapolations where necessary Put a plan in place to identify data collection requirements and other issues in order to be able to report against all Category II items used by Year 3	Report for all identified Category II items, using extrapolations where necessary
Category III	Identify items which are in use and in priority areas Where data is available for 'priority area' items it can be reported if desired. Where not a plan should be in place to report by Year 3. Plans should be made to eliminate all items and progress should be noted annually[12].	Where data is available for 'priority area' items it can be reported if desired. Where not a plan should be in place to report by Year 3. For all Category III items which are in operations elimination progress should be noted.	Report for all 'priority area' items For all Category III items which are in operations, elimination progress should be noted.

11 Refer to GTPI Accommodation Providers Signatory Pack's Section 2: Commitment of the signatory and Appendix VI – Menu of Commitments for Accommodation Businesses; Signatory Pack can be downloaded here: https://www.oneplanetnetwork.org/programmes/sustainable-tourism/global-tourism-plastics-initiative/join/accommodation-providers Commitments made by signatories can be consulted here: https://www.oneplanetnetwork.org/programmes/sustainable-tourism/global-tourism-plastics-initiative/signatories

12 This could include number of properties from which item has been eliminated, reduction in costs related to purchase of items, replacement of items with alternatives etc

2.4. Decision Trees

The decision trees can be used by those collecting data at property or portfolio level, to guide through the phasing process outlined above.



a Commitments made by signatories can be consulted here: https://www.oneplanetnetwork.org/programmes/sustainable-tourism/global-tourism-plastics-initiative/signatories

START HERE

For Property level users

Is the item used in any of the hotels in your portfolio?

- **No** → DO NOT REPORT
- **Yes** →

Does the item fall within the priority areas as defined by the company when becoming a signatory of GTPI?[a]

- **No** →

Which Category does it fall into?

[Consult p. 17 for more information on categories]

- **Category I**
  - Usage must be reported from Y2
  - If good data is available in Y1 then it should be reported.
  - If not then a plan should be in place to improve data for Y2 and by Y2 it must be reported, using estimations / extrapolation if necessary.
  - Plan should be in place to improve data by Y3 if estimations / extrapolations are used
- **Category II**
  - Usage must be reported from Y3
  - If good data is available, it can be reported in Y1 if desired but should be in Y2.
  - If good data is not available a plan should improve data for Y3 and by Y3 it must be reported, using estimations / extrapolations if necessary.
- **Category III**
  - Usage does not need to be reported but a clear elimination plan should be availabe and narrative progress towards elimination shared from Y2.

- **Yes** →

Which Category does it fall into?

[Consult p. 17 for more information on categories]

- **Category I**
  - Usage must be reported from Y1
  - Report item in Year 1 onwards
  - If good data not available in Y1 then use estimations/ extrapolation and devise plan to improve data for Y2 onwards
- **Category II**
  - Usage must be reported from Y2
  - If good data is available in Y1 then it should be reported.
  - If not, then a plan should be in place to improve data for Y2 and by Y2 it must be reported, using estimations / extrapolations if necessary.
  - Plan should be in place to improve data by Y3 if estimations / extrapolations are used
- **Category III**
  - Usage must be reported from Y3
  - Can be reported in Y1 and Y2 if good data is available, but must be reported in Y3 using extrapolations / estimations as necessary.
  - A clear elimination plan dhould be available and narrative progress towards elimination reported from Y1.

a Commitments made by signatories can be consulted here: https://www.oneplanetnetwork.org/programmes/sustainable-tourism/global-tourism-plastics-initiative/signatories

3 DATA COLLECTION & ESTIMATION

This section outlines the steps needed to collect and estimate data for quantifying plastic usage within your operations. It includes how to establish your reporting list and the various methods to gather and estimate plastic quantity and weight data.

GTPI requires reporting on a company level, however data collection needs to follow a bottom up approach, starting at property level and then extrapolating out to portfolio level where necessary. This section provides guidance on how this can be addressed.

3.1. Establishing your Reporting List

The first step to take is to establish your reporting list, based on the plastic items and packaging used within the portfolio. These are the steps to take to derive your reporting list:

1. Conduct an inventory audit to see where your plastic items and packaging fall across the lists for Category I-III.
2. For any items that fall outside the existing lists for Category I-III, check Section 1.3 to determine if they are significant and relevant items that fall within the reporting boundary.
3. If yes, include and report these additional significant and relevant items under Category III. Should you choose not to report on these additional items, a reason should be provided.

3.2. Collecting Primary Data

Once the boundaries have been set, the primary data collection can take place. The following data needs to be collected at the property-level:

- Property operational information (e.g. number of guest nights)
- Plastic item/packaging quantity data
- Plastic item/packaging weight data

Once property-level data has been collected, they will need to be consolidated across the company.

3.3. Property Operational Information

Property operational information needs to be collected in order to be able to calculate intensity metrics and to support calculations upon which extrapolations can be based. For example, knowing that one plastic water bottle is used per guest night allows for projection of annual plastic water bottle consumption if the total number of guest nights is known.

The following property operational information should be collected:

- **Total Guest Nights in Reporting Year**. This is required to support the calculation of the mandatory intensity metric. It can also be used to apply industry coefficients for extrapolation of data.

Additional property operational information which can be collected, based on the metrics your company wishes to track:

- Occupied Rooms
- Gross Floor Area
- Food Covers
- Total Meeting Attendees

Apart from guest nights, usage intensities of plastic items or packaging can also correspond with other operational metrics, and can sometimes be better estimated with more closely related operational metrics. For instance, the number of newspaper holder bags used would correspond closely to the number of Occupied Rooms; the number of containers for cleaning products used would correspond closely to Gross Floor Area; the number of wet wipes used would correspond closely to the number of Food Covers; and the number of plastic packaging around pens used for meetings would correspond closely to Total Meeting Attendees. The more data is captured, the more accurate estimations could be.

3.4. Collecting Plastic Quantity Data

The next step is to collect data on the quantity (number) of each plastic type identified in the previous step.

There are various methods for collecting data on the quantity of plastic items and packaging used. This methodology has proposed a 'hierarchy' from most accurate to least accurate. You should aim to collect plastic quantity data at the highest possible level in the accuracy hierarchy.

HIERARCHY OF PLASTIC QUANTITY DATA

In order of preference, the data collected by plastic item or packaging type is as follows (1 being most preferable and 5 being least preferable):

1. Data obtained from inventory records
2. Data obtained from purchase records
3. Data extrapolated based on quantity of another item that is commonly used in conjunction (e.g. cups and lids, toothbrush and toothpaste, etc.)
4. Data extrapolated from a sampling exercise conducted over a time period (e.g. a month)
5. Data extrapolated based on data from other properties in the same company portfolio (if applicable)
6. Data extrapolated based on industry data gathered for this methodology (See Appendix H)

INVENTORY VS PURCHASE RECORDS

The objective is to derive a number that is as close to the actual plastic quantity used in a year.

This can be best fulfilled by inventory records when they are maintained accurately. The second-best alternative is to use purchase records, but it should be noted that these records may skew results in the case where the property buys an item and holds the stock beyond the year reported.

FILLING DATA GAPS

In the event that it is not possible to collect data across all items or properties, the scenarios below provide recommendations on how to fill gaps.

SCENARIO 1: Less than 12 months data available for one or more plastic items/packaging (and property was operational 12 months)

Sum up the total plastic quantity (by item), divide it by the number of months the data was collected over and multiply by 12 months. This approach can be taken with a minimum of 9 months' data to be sufficiently robust.

SCENARIO 2: No data on a particular item for a specific property, but data available elsewhere in the portfolio

Obtain average usage intensities of the item used (e.g. quantity used per guest night or Food Cover, etc.) from other properties. Follow extrapolation methodology outlined in Appendix G.

SCENARIO 3: No data on a particular item for property or portfolio

Apply coefficients provided in this methodology (See Appendix H).

3.5. Collecting Plastic Weight Data

Once the number of plastic items is known, the next step is to calculate the total weight.

There are various methods to collect plastic item/packaging weight data and they have been ranked in order of preference in a 'hierarchy' from most accurate to least accurate. Collect plastic item/packaging weight data at the highest possible level of the accuracy hierarchy.

In the collection of weight data, it is important to also gather other specifications (such as size dimensions) as these data can be useful in making extrapolations for items/packaging that are similar in material and function but varies in size.

HIERARCHY OF PLASTIC WEIGHT DATA

In order of preference, the data collected by plastic item or packaging type is as follows (1 being most preferable and 5 being least preferable):

1. Data obtained from inventory or purchase records
2. Data provided by supplier or by information made available by the supplier
3. Data obtained from a weighing scale on-site
4. Data obtained from similar item/packaging with available specifications online
5. Data obtained from other properties in same company portfolio
6. Data obtained from industry estimates (See Appendix J)

If you have multiple weights for a single item (e.g. large, medium and small garbage bags) you can elect either to report each type individually or you can apply the weight of the most common variation to all items.

FILLING DATA GAPS

SCENARIO 1: Volume data is available but no weight data for a particular item/packaging

Follow volume-to-weight conversion methodology outlined in Appendix K.

SCENARIO 2: No data on a particular item/packaging for a specific property, but data available elsewhere in the portfolio

Obtain average weight estimates of the item used from other properties. Where available, compare specifications of items used to obtain the most suitable estimates. Follow extrapolation methodology outlined in Appendix I.

SCENARIO 3: No data on a particular item/packaging for property or portfolio

Apply weight estimates provided in this methodology that are most appropriate (See Appendix J).

OPPORTUNITY FOR SUPPLY CHAIN ENGAGEMENT

The data gathering process provides a significant opportunity for hotel properties or companies to engage directly with suppliers to better understand the materials / types of plastics used in items as well as the weights and / or volumes of items. Ultimately this provides an opportunity to work with suppliers to reduce or eliminate plastics, and/or source alternatives. There is also an opportunity to work with waste contractors to have a better understanding of the recyclability and/or compostability of your plastic items in practice.

Steps for supply chain engagement:

7. Communicate your commitment to reducing plastic use and any requirement for suppliers to support/ collaborate by providing necessary information in your Request for Proposals (RFPs) with suppliers.
8. Ask your suppliers for plastic item and packaging specifications (e.g., size specification, plastic type, etc.)
9. Ask your suppliers if they are measuring the weight of plastic packaging
10. Ask your suppliers what actions are in place to reduce plastic packaging
11. Ask your waste contractors to share recyclability and/or compostability of the plastic types found in your list of plastic items and packaging

3.6. Determining the Company's Overall Plastic Usage

At the property level, for each plastic item/packaging, multiply the quantity used in the reporting year by the unit weight. Alternatively, use the overall weight of the plastic item/packaging used across the reporting year, if directly available. Sum up the total weight of all plastic items and packaging within your reporting list to derive your plastic items and packaging usage.

At the portfolio level, aggregate plastic usage across your properties for all relevant plastic items and packaging within your reporting list. For properties with data gaps, estimations can be made through the various scenarios outlined in the earlier section. For transparency and accountability, how the estimations were derived will need to be recorded.

Use the GTPI Plastics Calculation Tools (see Section 5) to facilitate this calculation process.

4 AUDITING AND VERIFICATION OF DATA

GTPI does not conduct data verification nor audit GTPI signatories. It is, nonetheless, a best practice for companies to undertake data verification or audit to offer a high level of confidence in the accuracy of both measured and estimated annual weight of plastics procured or used. GTPI signatories should indicate whether or not the data was verified or audited in their annual reporting to GTPI, and state the level of audit undertaken. If data verification has not taken place, the signatory should indicate if they have plans to have data verified in the future, and the associated timescale.

4.1. Documentation of Process and Assumptions

Regardless of the approach to data auditing and verification that is adopted, all assumptions, processes and calculations that support the final data reported should be fully documented. This is vital not only for transparency but will ensure that key decisions can be replicated in subsequent years in the event of personnel change.

4.2. Verification Approaches

Verification or auditing can take place throughout the data collection, measurement and reporting process and can include actions such as:

1. Physical audit and inspection of plastic items and packaging used and their weights to ensure that different plastic items and packaging are identified correctly, with correct and accurate weights
2. Physical and desktop audit to check the number of each plastic item/packaging used
3. Desktop audit of calculations, assumptions, boundaries and source data; and cross check against corresponding publicly reported figures

Auditing can be undertaken by different entities internally or externally and depending on the level of rigour required or the intended purpose of the audit. For example:

- Property level staff member who works directly or indirectly with plastics/waste
- Company level staff member who works directly or indirectly with plastics/waste data or calculations
- Company or property internal audit team or equivalent
- An external consultancy that is working normally with the company/property on plastics/waste to gather and calculate sustainability or plastics data
- An external third party that is independent of the company and process such as an independent audit company paid specifically for the purpose

Signatories should aim to have robust and regular audits of their data, with a full third party audit taken at least once before 2025.

5 GTPI PLASTICS CALCULATION TOOL AND REPORTING TEMPLATE

This methodology is supported by two Excel Tools which can be used at either individual property or whole portfolio level to facilitate the plastic calculation process, and a Reporting Template for GTPI signatories to submit their performance to GTPI for each reporting cycle.

You can download calculation tools through links below:

- GTPI Property Plastics Calculation Tool
- GTPI Portfolio Plastics Calculation Tool

The Tools help to generate the following GTPI performance metrics: (i) annual total weight of plastics (metric tonnes), (ii) weight of plastics (kg) per guest night, and (iii) percentage of plastics which are compostable (%).

The Property Tool is used by the property to identify plastic items used and consolidate relevant data (e.g. quantity, weight and compostability) to output its GTPI performance metrics. The Portfolio Tool consolidates the data inputted within the Property Tools by its properties to output GTPI performance metrics for the entire portfolio. Step-by-step instructions can be found in the respective tools.

Any deviations or exceptions to plastic measurement outlined in this methodology should be reported through GTPI reporting framework so that fair comparisons can be made across different companies.

6 | APPENDICES

APPENDIX A: FAQS / AREAS FOR FURTHER WORK

1. **Why are we measuring plastic footprint when we can take action to reduce plastic usage without knowing our exact plastic footprint?**

   It is crucial to measure plastic footprint to quantify progress and push actions towards the right direction to drive a circular economy for plastics. Measuring accurately and consistently plastic packaging footprint on a regular basis is also paramount to be transparent on this footprint and on the impact of the actions taken by signatories. As such, even if a company decreases its use of plastic packaging/items in one area of its business, it needs to be transparent on the overall amount of plastic packaging/items being used, in case the amount of plastic packaging/items increases in another area.

2. **Why is the measurement of plastics in weight and not in other quantity units?**

   GTPI is aligned with the Global Commitment, which measures plastics in weight (i.e. metric tonnes) as it is the only way to meaningfully compare such footprint across different industries, sectors, and products. Indeed, an alternative could be measuring plastics in units, but it would prevent comparability especially between sectors and also within the same organisation using different types of packaging. For example, one hotel chain might use beverages bottles, straws, and plastic wraps. For the beverages, the obvious unit is a 'bottle' (even though the size would already be a layer of complexity). However, this 'bottle' unit would not be relevant when compared to straws or plastic wraps. For these compatibility reasons, the measurement in weight is the most relevant.
   Nonetheless, measuring in units on top of the measurement in weight could have benefits as it could be relevant when looking at leakage for example. Therefore, Global Commitment signatories as well as Global Tourism plastics Initiative signatories are encouraged to report their elimination efforts both in weight and units (e.g. that they have eliminated X units of plastic bags, equivalent to Y metric tonnes) but for the overall plastic footprint, the weight is the only measurement accepted for the aforementioned reasons.

3. **Why is cost not proposed as a unit of measurement of plastics?**

   Although cost is a comparable measurement metric across industries, sectors, and products, it is a poor proxy of plastic footprint as cost does not always correlate with amount of plastic content in an item and or amount of plastic packaging. Cost can nonetheless be potentially a quicker approach for companies that find it difficult to collect quantity and weight data to use as proxies to track reduction trend in overall plastic usage over time.
   However, it should be noted that cost should only be used when it is tracked by property or within a specific geographical region. Attention should be paid to other factors, such as the rising and falling costs of plastic items, or when comparing across regions where plastics may be cheaper or more expensive.

4. Why are compostable plastics included as part of plastic reporting boundary?

Compostable plastics are also a form of plastic, thus they are part of the plastic reporting boundary. Compostable plastics, when effectively composted, can serve as viable eco-alternative to conventional fossil fuel-based plastics. There are different levels of compostability, mainly home- and industrial-compostable. Both require controlled conditions although the ease and likelihood of home-composting is generally higher than industrial-composting given that the latter requires industrial composting facilities which are not readily available in all parts of the world. Due to the difficulty in assessing and verifying local availability of suitable composting facilities, compostable plastics remain as plastics of concern which should be quantified and reported.

5. Why are items that contain plastic but less than 50% of total weight (eg Tetra Paks and paper cups lined with plastic) excluded from reporting scope?

This is aligned with the guidance from the Global Commitment. These items are excluded due to the challenge in obtaining good weight data for their plastic components. As further work is conducted and better weight plastic weight data is available for these items, we will be able to consider them for reporting.

6. Are food and beverage items in vending machines part of the reporting scope?

It depends on whether the accommodation provider has direct operational control over the vending machine. They can be excluded if third-party operated. But even if they are not under direct operational control, we recognise that these food and beverage items (e.g. plastic bottles, snack packaging, etc.) can contain large amounts of plastic and accommodation providers should work with their business partners to increase their offering of plastic-free options.

7. Why is there no guidance on hierarchy of sustainable alternatives and best practices in this methodology?

The focus of this methodology is specifically on measurement of plastics. Please refer to GTPI Tools & Resources for a repository of tools and resources aimed at supporting the elimination of single-use plastics, introduction of reusable models, engagement and collaboration with value chain stakeholders, etc. (and more specifically, GTPI publication on "Addressing Pollution from Single-use Plastic Products"), as well as at enabling additional tourism businesses and organisations to take action on plastic pollution.

APPENDIX B: SURVEY RESULTS AND ANALYSIS

The survey was shared with the GTPI network and members of the Sustainable Hospitality Alliance. The aim of the survey was to identify and prioritise the most relevant plastic items and identify organisations able to provide plastics data.

The survey received 32 responses in total. Of these, 10 were hotel operators (corporate level), 9 were individual accommodation properties, and 13 were consultancies, NGOs or other organisations.

Survey questions and key findings

Q: Please select the items you track for your plastic reduction efforts.

Q: What plastic items and packaging are you eliminating or planning to eliminate in the next 12 months?

Rank	Tracked	Rank	Eliminated
1	Water bottles	1	Mini toiletry bottles (shampoo, conditioner, etc.)
2	Straws	2	Straws
3	Mini toiletry bottles (shampoo, conditioner, etc.)	3	Water bottles
4	Garbage bags	4	Stirrers
4	Takeaway cups & lids	4	Takeaway containers
4	Takeaway cutleries	4	Takeaway cups & lids
7	Stirrers	7	Takeaway cutleries
7	Toothbrush	7	Takeaway condiment containers
9	Packaging around dry room amenities	9	Disposable plates
9	Takeaway containers	9	Takeaway bags
		9	Tasting spoons

The top item tracked was water bottles (70% of respondents) followed by straws and mini toiletries (both tracked by around 60%). Beyond the top 3, there was a drop in tracking with the rest of the top 10 tracked by only 40-50% of respondents.

Toiletries and straws were the top items being eliminated (68% of respondents), closely followed by water bottles (with 63%). The rest of the top 10 were being eliminated by 50-60% of respondents.

There was a heavy focus on F&B related items (especially takeaway packaging) in both lists.

Participants prioritised tracking over elimination for a few items including cling film, coffee capsules, containers for food storage and disposable slippers.

Hotel operators tracked more of the 50 items on the list than individual hotels, with 20 items being tracked by hotel operators, but not by hotels. Items in this list included coffee capsules, key cards, pallet wraps and wet-wipes.

Q: Please select all areas where your organisation has initiatives to address the use of plastic items and packaging.

Rank	Item
1	Rooms
1	Bathrooms
3	Food and drink services
4	Service areas (e.g. Wellness facilities, meeting rooms, lobby, etc.)
4	Cleaning services
4	Kitchens
7	Logistics

Rooms and bathrooms were the most common areas with initiatives (nearly 100% of respondents), followed by food and drink services (84%).

80% had initiatives in service areas, cleaning services, and kitchens, with logistics trailing behind at 58%.

Q: Please rank the following considerations for prioritizing plastic items and packaging in plastic reduction efforts, from highest to lowest importance.

Rank	Consideration
1	Availability of eco-alternatives
2	Likelihood of plastic waste entering the environment / not getting a second life
3	Cost of eco-alternatives
4	Potential harm to human health
5	Visibility to guests
6	Usage quantity
7	Usage weight

Availability and cost of alternatives were top considerations, alongside the likelihood of environmental impact and human health.

Visibility to guests and quantity were ranked relatively low as considerations, but usage weight was ranked the lowest by far. The highest ranking allocated to usage weight was 3rd place but was often much lower.

Q: Please list the top five most common plastic items or packaging in Rooms, Bathrooms, Food and drink services, Service areas, Logistics, Cleaning services, and Kitchens.

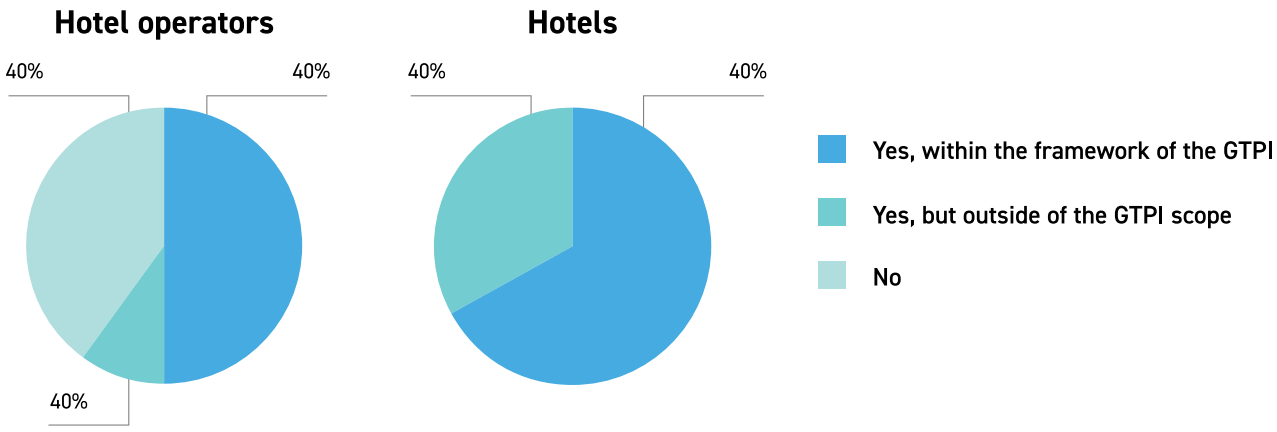
Respondents provided a list of the top 5 most common plastic items or packaging for each area. These were standardised and weighted according to priority (full results are beyond the remit of this report).

Q: In your experience, how easy is it to eliminate or replace the following plastic items and packaging with reuse models?

a. Easiest to replace **b. Most difficult to replace**

Rank	Item	Rank	Item
1	Newspaper holder bags	1	Garbage bags
1	Cocktail picks	2	Sanitary bags
3	Straws	3	Cling film
4	Stirrers	4	Toothpaste
5	Disposable shoehorns	5	Vacuum bags (for food / sous vide cooking)

Q: Does your organisation report on progress with plastic reduction?



Q: What are some key challenges or learnings related to reporting plastic reduction efforts?

The following themes emerged as key challenges for respondents:

- Data collection and reporting challenges caused by limited availability of data, human error, and/or lack of hotel resources.
- Lack of alternatives to plastic, and/or high cost of solutions.
- COVID leading to more single use items, changed priorities and fewer resources.
- Geographical variation in rules, standards, and infrastructures relating to plastics.
- Lack of universal definitions relating to plastic (e.g. 'plastic', 'SUPs', 'elimination', 'reduction'.)
- Difficulties engaging guests to explain why certain items are being eliminated.
- Lack of clear/relevant resources and guidance for independent hotels.
- Reluctancy to report on reduction as this admits how much was consumed
- The top plastic items/packaging that survey respondents prioritise for tracking and elimination correspond to the most common plastic items/packaging for the travel and tourism sector in existing literature. They also contain some of the top plastic items/packaging found to be polluting the oceans.

Additional Analysis

- According to respondents, the **top considerations for eliminating/replacing** a plastic item/packaging include (1) availability of sustainable alternatives, (2) likelihood of pollution (plastic waste entering environment and not getting recycled, composted, etc.), and (3) cost of sustainable alternatives. This shows that apart from practical concerns of availability and cost, respondents also care greatly about the impact of plastics on the environment.
- Although visibility of plastic item/packaging to guests was not a top consideration (ranked fifth of six options), it was observed that the **top property areas with plastic reduction initiatives** – Rooms, Bathrooms, and Food and Drink Services – coincide with areas that guests spend the most time. This shows that guests are a major influencing factor in properties' plastic reduction initiatives.
- In addition, the top tracked items (top 18) **did not feature the top 5 most common plastic items/packaging within each back-of-house area** (Logistics, Cleaning services and Kitchens).

    - For the back-of-house areas, assorted plastic packaging were cited as most common, including pallet wraps and F&B packaging. The sheer diversity and amount of such packaging, as well as them being outside of properties' direct operational control may be some possible reasons for their lower ranking in being tracked and eliminated.
    - Packaging around clean linen and towel and disposable gloves came up within top 5 for Cleaning Services and Kitchens. This may possibly be associated with the impacts of heightened hygiene requirements with COVID-19.

- The top 5 plastic items/packaging that are **easiest to address** included familiar items such as straws (#5) and cocktail picks (#2), as well as less featured items – newspaper holder bags (#1), disposable shoehorns (#3) and disposable shirt collar and pant clips (#4). It is no surprise that straws and cocktail picks are among the top picks as they are among plastic items that have captured the greatest public attention. The

anti-straw movement can be said to have kickstarted the global drive to reduce/eliminate unnecessary or problematic plastics. As for the less featured items, a commonality may be the relative ease of eliminating without replacement, as they are not perceived as necessary by guests, especially for properties with limited service.

- Among the **most difficult to replace**, we have Garbage bags, Sanitary bags, Cling film, Toothpaste and Vacuum bags (for food / sous vide cooking) in descending order. For these items, the challenge is likely to be a lack of suitable sustainable alternatives (top ranked challenge by respondents).
- Available alternatives may be hard to implement or not the most ideal in terms of sustainability. According to a sustainable alternatives index developed by NGO Save The Med, eliminating a garbage bag with no replacement at all would have the least impact 0, while replacing it by bio-based bags would have a negative impact greater than keeping to plastic bags. This index takes into consideration the impact of the product's material, the size of packaging, its reusability and end-of-life facilities for alternative products available in the Balearic Islands.
- There is a high degree of overlap in the plastic items/packaging prioritised for tracking and elimination. However, comparing top items that are tracked and being eliminated, we found that survey respondents prioritised tracking over elimination of the following items:

    - Cling film
    - Coffee capsules
    - Combs
    - Containers for food storage
    - Disposable gloves
    - Disposable slippers

- This is interesting to note and may possibly be attributed to challenges that survey respondents have cited, including:

    - Lack of alternatives to plastic, and/or high cost of solutions.
    - Impacts of COVID: many more items are now single use, priorities have changed, fewer resources available.
    - Difficulties engaging guests so they understand why certain items (associated with good service) are being eliminated.

- Visibility and guest perception of how "plastic" an item is, may also come into play. For example, disposable slippers are not visibly "plastic" even though they are made of polyurethane foam and polyester, both different forms of plastic, and can contribute to microplastic pollution.

APPENDIX C: REFERENCES

Relevant Methodologies / Documents

1. UNEP/WTTC – Rethinking Single-use Plastic Products in Travel & Tourism (2021)
2. One Planet Sustainable Tourism Programme – GTPI Accommodation Providers Signatory Pack (n.d.)
3. WWF/Greenview – Hotel Waste Measurement Methodology (2021)
4. Greenview – Client Work on Single-use Plastic footprint (2021)
5. One Planet Sustainable Tourism Programme– Addressing Plastic Pollution in Tourism through Sustainable Procurement
6. Global Tourism Plastics Initiative (2021) - Addressing pollution from single-use plastic products: A Life Cycle Approach – Key messages for tourism businesses
7. The Ellen MacArthur Foundation (EMF) – 2021 Global Commitment Reporting Guidelines for Business Signatories (2021)
8. WWF/Accenture – Resource Footprint Tracker (2020)
9. 5Gyres – B.A.N. List 2.0 (2017)
10. Futouris – Single-use Plastic Products Spreadsheet (2021)
11. WWF/McKinsey – No Plastic in Nature: A Practical guide For Business Engagement (2019)
12. IUCN – Review of plastic footprint methodologies (2019)
13. Plastic IQ – the Circular Solutions Tool (n.d.)

Resources for Plastic Weight Estimations

1. Clean the World
2. European Commission – Life Cycle Inventories of Single Use Plastic Products and their Alternatives (2018)
3. UNEP - Single-use plastic take-away food packaging and its alternatives. Recommendations from Life Cycle Assessments. (2020)
4. UNEP - Single-use plastic bottles and their alternatives. Recommendations from Life Cycle Assessments. (2020)
5. UNEP - Single-use plastic bags and their alternatives. Recommendations from Life Cycle Assessments. (2020)
6. UNEP - Single-use plastic tableware and its alternatives. Recommendations from Life
7. Cycle Assessments. (2021)
8. UNEP - Single-use beverage cups and their alternatives. Recommendations from Life Cycle Assessments. (2021)

APPENDIX D: REPORTING SCOPE OF HYGIENE RELATED PLASTICS

The Covid-19 pandemic has brought about an increase in the use of disposable plastic items and packaging as they are deemed to help reduce the spread of infection. Some of these plastics are unnecessary and can be avoided through the adoption of proper cleaning and disinfection practices.

The reporting scope includes disposable plastic items and packaging that an accommodation provider has direct control over. Examples include, but are not limited to:

- Disposable face masks
- Disposable face shields
- Disposable gloves
- Disposable gowns
- Disposable shoe covers
- Disposable medical caps
- Disposable plastic food service ware
- Plastic wrapping around high-touch surfaces
- Plastic wrapping around dishes and cutleries for dine-in or room services

In some cases, the accommodation provider may not have the final say in the use of disposable plastic items and packaging. Reporting scope would exclude these items and packaging given the following exceptional cases:

- Disposables are mandated by regulatory requirements
- Managed by third-party operator

Refer to The Oceanic Standard's Covid-19 Reopening Guidelines for best practices to achieve hygiene while eliminating the use of unnecessary disposable plastics and improving waste management.

APPENDIX E: GROSS FLOOR AREA BOUNDARY

The table below shows what areas should be included or excluded from the Gross Floor Area boundary[13].

Included in Area Boundary	Excluded from Area Boundary
Rooms Square Footage	Structured balcony/ covered area
Conditioned Guest Corridor (Square Footage / m2)	Structured open deck/ parking area
Un-Conditioned Guest Corridor (Square Footage / m2)	Structured planters area
Above Ground Meeting Space (Square Footage / m2)	Structured outdoor pool area
Above Ground Pre-Function (Square Footage / m2)	Pool bar area
Below Ground Meeting Space (Square Footage / m2)	Skylight area
Below Ground Pre-Function (Square Footage / m2)	
Above Ground Public Space (Square Footage / m2)	
Below Ground Public Space (Square Footage / m2)	
Above Ground F&B (Square Footage / m2)	
Below Ground F&B (Square Footage / m2)	
Above Ground Office Building / Leased Spaces	
Below Ground Office Building / Leased Spaces	
Above Ground Fitness (Square Footage / m2)	
Below Ground Fitness (Square Footage / m2)	
Above Ground Spa (Square Footage / m2)	
Below Ground Spa (Square Footage / m2)	
Above Ground Ceiling Space (Square Footage / m2)	
Below Ground Ceiling Space (Square Footage / m2)	
Structured Parking	
Basement Parking	
Above Ground Back of House (Square Footage / m2)	
Below Ground Back of House (Square Footage / m2)	

13 The current recommendation is to use the 'total conditioned space' definition of Gross Floor Area to ensure alignment with USALI (Uniform System of Accounts for the Lodging Industry https://www.hftp.org/hospitality_resources/usali_guide/) and HCMI, however this remains under review and will be updated as necessary in further iterations of the methodology guidance.

APPENDIX F: SHORTLISTING CRITERIA FOR LIST OF PRIORITY PLASTIC ITEMS AND PACKAGING FOR THE HOSPITALITY INDUSTRY

Across the 50 items that survey respondents were surveyed on, priority categories were established with consideration of the following factors:

- **Industry prevalence/awareness:** This is based on survey response on items and packaging tracked by the hospitality industry from survey respondents that included hotel operators, properties and industry practitioners. **Items that are already well-identified by most properties to be addressed are more highly prioritised.**
- **Industry action:** This is based on survey response on items and packaging that are being eliminated by the hospitality industry from survey respondents that included hotel operators and properties. **Items that most properties are already taking action on are more highly prioritised.**
- **Property's level of control:** This is based on the extent to which properties have direct operational control over the items and packaging.
- **Risk of littering:** This is based on the top 10 most common single-use plastic items found on European beaches8 and the top 20 plastic items found in the US9 and single-use plastic products that are used and disposed of across the Travel & Tourism value chain[14]. **Items with higher risk of littering are more highly prioritised.**
- **Typical usage intensity:** Usage intensity metric used is number of pieces of plastic item or packaging used per guest night, and calculated using data provided by hotel operators and properties. **Items with higher usage intensities are more highly prioritised.**
- **Typical unit weight:** For each plastic item or packaging, the median of all unit weights available was calculated. The unit weights were calculated using data gathered from hotel operators and properties and from desktop research. **Items with higher unit weights are more highly prioritised.**

For Category I, the pre-requisite is for over 40% of survey respondents to respond that the item is being tracked by the hospitality industry (**Industry prevalence/awareness**) and over 35% of respondents to be taking action to eliminate it (**Industry action**). The remaining factors were also considered but not pre-requisites. **Property's level of control** is high, and there is a high/very high **Risk of Littering** and high **Typical usage intensity** and/or **Typical unit weight.**

For Category II, the pre-requisite is for 30-40% of survey respondents to respond that the item is being tracked by the hospitality industry (**Industry prevalence/awareness**) and 30-35% of respondents to be taking action to eliminate it (**Industry action**). An exception is cling film – although just one-fifth of respondents were taking action on the item (respondents selected it as one of the most difficult items to replace), it is a prevalent item that is used significantly and is important to track. The remaining factors were also considered but not pre-requisites. **Property's level of control** is moderate, and there is a high **Risk of Littering** with a range of **Typical usage intensity/Typical unit weight** from low to high.

14 United Nations Environment Programme and World Travel & Tourism Council (2021). Rethinking Single-Use Plastic Products in Travel & Tourism - Impacts, Management Practices and Recommendations. Nairobi. https://wedocs.unep.org/bitstream/handle/20.500.11822/36324/RSUP.pdf

All other items fall under Category III.

Category I

No.	Plastic Item/ Packaging	Industry Aware-ness (%)	Industry Action (%)	Risk of Littering	Usage Intensity	Unit Weight	Rationale for Prioritising
1	Garbage bags	47	37	Medium /Low	High	High	Garbage bags can be considerable in weight and are used daily in all areas of the property . Garbage bags for small in-room bins can be eliminated with the introduction of new cleaning procedures such as to empty and sanitise the bin.
2	Mini toiletry bottles	59	68	Low	High	Low	Mini toiletry bottles are a significant waste of both plastic and liquid soap. These bottles need to be cleaned prior to recycling but the small size of these bottles make them tedious to clean. These bottles also tend to be too small to be recycled. In the UK alone, 200 million of these bottles end up in landfills each year. Leftover soap in these bottles also go to waste. Replacing these bottles by bulk dispensers can help to save natural resources, reduce waste and cut costs.
3	Packaging around dry room amenities	41	37	Data deficient	High	Very Low	There is a large number of plastic packaging around various assorted dry room amenities for hygiene purposes. These thin and small pieces of plastic are not usually recycled and they also fall through the gaps more easily at the recycling facility. Small and lightweight, they are easy to escape waste bins.
4	Stirrers	44	58	High	Medium	Very Low	Similar to straws, single-use plastic stirrers rank among the top plastic items polluting the ocean. They are not easily recyclable, and easy to escape waste bins being small, thin and lightweight.

No.	Plastic Item/ Packaging	Industry Aware-ness (%)	Industry Action (%)	Risk of Littering	Usage Intensity	Unit Weight	Rationale for Prioritising
5	Straws	63	68	**High**	**Medium**	**Very Low**	Single-use plastic straws are not easily recyclable, and easy to escape waste bins. They are common visible litter in destinations. They are also rarely functionally needed, except for select client groups (eg persons with disabilities).
6	Takeaway containers	41	58	**High**	**High**	**High**	Under the Covid-19 pandemic, there has been an increase in usage of takeaway items and associated waste. Single-use plastic containers can be avoided with reuse models or reusable options.
7	Takeaway cups	47	58	**High**	**High**	**Low**	Under the Covid-19 pandemic, there has been an increase in usage of takeaway items and associated waste. Plastic takeaway cups are typically made of clear plastic or foam (EPS). Although EPS is technically recyclable, recycling infrastructure does not exist in practice and at scale. Clear plastic could be recycled after washing but are more likely trashed out of convenience. Single-use takeaway cups can be avoided with reuse models or reusable options.
8	Takeaway cup lids	47	58	**High**	**High**	**Low**	Under the Covid-19 pandemic, there has been an increase in usage of takeaway items and associated waste. Single-use takeaway cup lids can be eliminated without replacement or avoided with reuse models or reusable options.
9	Takeaway cutleries	47	58	**High**	**High**	**Low**	Under the Covid-19 pandemic, there has been an increase in usage of takeaway items and associated waste. Single-use takeaway cutleries can be avoided with reuse models or reusable options.
10	Toothbrush	44	42	**Data deficient**	**Medium**	**High**	Plastic toothbrushes offered by properties typically have a short life span, being disposed right after the guest's stay. This waste could be avoided by encouraging guests to partake in 'Bring your own' programs.

No.	Plastic Item/ Packaging	Industry Aware-ness (%)	Industry Action (%)	Risk of Littering	Usage Intensity	Unit Weight	Rationale for Prioritising
11	Water bottles (below 750ml)	72	63	Very High	High	High	Plastic bottles are commonly identified as among the largest sources of plastic waste in a property after garbage bags, and more at risk of not being properly disposed. 8 million tons of plastic end up in the oceans each year. 1,500 plastic bottles are discarded every second. Although plastic bottles are recyclable, less than one third are recycled and plastic is not infinitely recyclable. Furthermore, not all markets have adequate recycling facilities. Reusable alternatives are available and switching to reusable helps reduce the footprint of buying and discarding things in general.

Category II

No.	Plastic Item/ Packaging	Industry Aware-ness (%)	Industry Action (%)	Risk of Littering	Usage Intensity	Unit Weight	Rationale for Prioritising
1	Bags and packaging for chips and sweets15	34	32	High	Low	Medium	These are very commonly littered items according to and typically non-recyclable multimaterial flexible packaging used are non-recyclable and often littered.
2	Cling film	38	21	Data deficient	High	High	These are heavily used in the kitchens for sealing of food items. They can be replaced by reusable containers and lids.
3	Disposable plates	34	47	High	Low	Low	These are used for serving food in meetings and events and could be easily replaced by reuse models or reusable options.

15 Survey response for Industry Awareness and Industry Action on 'Mini bar items' is taken as a proxy for this item/packaging category.

4	Laundry bags (for collection)	31	37	**Data deficient**	**High**	**Medium**	It is estimated that a good amount of plastic bags is used to collect laundry from guest rooms each day and these can be easily avoidable with reusable laundry bags.
5	Plastic beverage bottles (below 750ml) [11]	34	32	**Very High**	**Low**	**High**	These are commonly used items with high risk of littering. These plastic bottles are also thicker than single-use water bottles due to the carbonation and bottling process. These bottles are ranked lower in priority compared to their plastic water bottle counterparts as these are retail items which may not be under property's direct control and are consumed at much lower quantities compared to water bottles which are typically offered on a complimentary, daily basis.
6	Sachets or packets for single serve condiments	38	37	**High**	**High**	**Very Low**	These are non-recyclable as they are often multi-material plastics. Being small and lightweight, there is also a higher chance of them escaping into the environment.
7	Takeaway bags	38	47	**High**	**Medium**	**High**	Plastic bags are a threat to human and animal health when littered. They can block stormwater drains, entangle marine animals and cause them to starve when mistaken as food and consumed.
8	Takeaway condiment containers	34	53	**High**	**Low**	**Very Low**	These can be avoided by offering only upon request and replacing by reuse models or reusable options and naturally compostable and renewable materials like paper or bamboo. Consider also using food (eg cabbage leaf) as a separating dish within a larger takeaway container which contains the main dish.
9	Toothpaste	34	42	**Data deficient**	**Medium**	**Medium**	The multi-material design of toothpaste tubes makes them non-recyclable. It is also extremely difficult to empty toothpaste completely and these tubes could result in contamination issues for recycling facilities.

APPENDIX G: PORTFOLIO EXTRAPOLATION METHODOLOGY - USAGE

Where a property has no quantity data on a particular item, it may extrapolate using data from other properties in the same portfolio. In order to do so, it will be necessary to determine a 'usage coefficient' relevant to the property, based on other properties in the portfolio. This 'usage coefficient' (number of item per guest night) can then be multiplied by the property's guest nights in order to estimate total number of items used.

The guidance below suggests a usage coefficient based on items per guest night, as this is the intensity metric required by this methodology. However, usage coefficients may be based on item per food cover, item per occupied room etc, if data is available.

In order to calculate the 'usage coefficient' the following approach should be used:

1. Add the number of plastic item per guest night for each property for which there is data.
2. Divide by the number of properties for which there is data.
3. This is the 'usage coefficient'.
4. Multiply the 'usage coefficient' by the number of guest nights for each property for which there is not data.
5. This is the estimate of the total number of said plastic item used in that property per year.

Example:
Hotel Company ABC has a total of 50 hotels. Plastic bottles are in use across all 50 properties but the number of plastic bottles used is only available in 30 of the hotels. The average number of plastic bottles used per guest night for each of the 30 properties is added together and then divided by 30 to determine the 'usage coefficient' for plastic bottles for the portfolio.

Properties 1 – 10 have an average of 1.5 bottles per guest night
Propertes 11-20 have an average of 2 bottles per guest night
Properties 21-30 have an average of 3 bottles per guest night
*(1.5*10)+(2*10)+(3*10) = 65*

65/30 = 2.2

The usage coefficient for plastic bottles for Hotel Company ABC is 2.2 bottles per guest night.

*The total number of guest nights in Property 31 is 36,500 so the total number of bottles used in Property 31 can be estimated at 2.2 * 36,500 = 80,300*

This approach represents a simple way to identify the usage coefficient for different plastic types and should be replicated for each plastic type required.

Companies wishing to take a more comprehensive approach to extrapolation, based on like properties (asset class, geography etc) should use the full extrapolation methodology set out in the WWF Hotel Waste Measurement Methodology Section 3. However, GTPI recognises that this approach will be extremely onerous if it needs to be replicated for several plastic types and does not expect companies to provide this level of detail in this methodology.

APPENDIX H: INDUSTRY COEFFICIENTS FOR DETERMINING THE QUANTITY OF PLASTICS USED

This is a list of usage coefficients for each plastic item or packaging gathered from hotel operators and properties that contributed to this methodology. The usage coefficient for a plastic item or packaging is the mean of individual properties' quantity used per guest night. Guest night has been used as the operational metric as it is the most readily available metric for most properties.

To provide more reliable usage coefficients, this list only includes items/packaging which have at least 100 data entries. Properties with data that deviated significantly from others have also been excluded.

Please note that this data is limited and based on a very small sample of hotel companies. It should be used as a last resort where an internal coefficient (see Section 3.4 and Appendix G) is not able to be calculated. As more and better data is collected, more robust industry coefficients will be shared.

Category	Plastic Item/Packaging	No. of entries	Average per guest night
I	Garbage bags	218	**1.31**
I	Mini toiletry bottles	186	**2.56**
I	Packaging around dry room amenities	134	**4.23**
I	Stirrers	155	**0.63**
I	Straws	202	**1.27**
I	Takeaway containers	154	**0.43**
I	Takeaway cups	187	**2.73**
I	Takeaway cutleries	136	**0.99**
II	Sachets or packets for single-serve condiments	150	**1.83**

APPENDIX I: PORTFOLIO EXTRAPOLATION METHODOLOGY – UNIT WEIGHT

Where a property has no unit weight data on a particular item, it may extrapolate using data from other properties in the same portfolio.

In order to establish the portfolio's mean weight of a plastic item, the following steps should be taken:

Take the weight of the specific item as reported by other properties in the portfolio.

Calculate the mean weight of that item (sum the weight of the different types and divide by number of types)

Apply that mean weight to the number of plastic items used in a particular hotel.

Example:
Hotel Company ABC has 50 properties. 30 of those properties do not have specific weight data for takeaway containers used.

The 20 properties that have recorded weight data have five different weights recorded for takeaway containers:

Type 1 = 30g
Type 2 = 40g
Type 3 = 45.7g
Type 4 = 50g
Type 5 = 52g

The average weight of the different types is (Type 1 + Type 2 +... +Type 5) / 5.

= 43.54g

The weight coefficient for takeaway containers for Hotel Company ABC is therefore 43.54. This is then multiplied by the number of takeaway containers recorded for each property to calculate the total weight of takeaway containers per property.

*Property 49 used 3000 takeaway containers in the year, resulting in a total weight of 130,620kg. (3000*43.54).*

To ensure the reliability of weight coefficients used, the company should strive to collect data points from **at least 20%** for the portfolio.

APPENDIX J: INDUSTRY COEFFICIENTS FOR DETERMINING THE WEIGHT OF PLASTIC USED

Below is a list of unit weights for common plastic items and packaging. As there is not just one specific weight for each plastic item and packaging, the lower limit, upper limit and mean weight coefficients are provided, and the property can then select the weight which is most appropriate. Outliers have been excluded from this calculation.

There are items with a large range of size variations (and thus weight variations) that may be used across the property, such as garbage bags and takeaway containers. In this case, the property is recommended to apply the mean weight or the most common weight variation.

To improve the reliability of weight coefficients used, we compared the weight coefficients against plastic item or packaging weight cited in plastic-related reports by the UNEP and EU Commission, as well as product specification documents that are publicly available, to ensure no huge deviations.

It is should be noted that the coefficients below that are based on less than five sources may not be reflective of the typical unit weight of an item and should be used only as a last resort.

Category	No.	Plastic Item/Packaging	No. of Entries	Lower Limit (g)	Upper Limit (g)	Mean (g)
I	1	Garbage bags	30	3.3	172.0	57.6
I	2	Mini toiletry bottles	3	6.9	12.0	8.6
I	3	Packaging around dry room amenities	11	0.3	15.0	2.8
I	4	Stirrers	6	0.3	5.0	1.9
I	5	Straws	7	0.4	1.0	0.6
I	6	Takeaway containers	13	5.0	47.0	27.9
I	7	Takeaway cups	11	2.0	19.0	8.4
I	8	Takeaway cup lids	15	2.8	10.0	4.2
I	9	Takeaway cutleries	9	1.0	5.9	3.8
I	10	Toothbrushes	5	7.0	30.0	18.6
I	11	Water bottles (below 750ml)	20	1.8	36.0	19.8
II	12	Bags and packaging for chips and sweets	15	7.3	18.8	12.3
II	13	Cling film	23	843.7	7068.0	3242.6

II	14	Disposable plastic plates	7	1.7	15.0	8.4
II	15	Laundry bags (for collection)	4	0.1	20.0	10.1
II	16	Plastic beverage bottles (below 750ml)	19	17.3	47.9	29.5
II	17	Takeaway bags	5	6.0	27.0	16.3
II	18	Takeaway condiment containers	6	1.0	4.0	2.3
II	19	Toothpaste	1	8.0	8.0	8.0
III	20	Cocktail picks	13	0.6	5.3	1.6
III	21	Coffee capsules	1	9.0	9.0	9.0
III	22	Combs	2	2.0	8.0	5.0
III	23	Cotton ear buds	5	0.2	0.2	0.2
III	24	Disposable gloves	16	2.0	10.0	6.0
III	25	Disposable piping bags / pastry sleeves	7	8.4	26.0	12.6
III	26	Disposable slippers	2	148.0	200.0	174.0
III	27	Hair brushes	2	32.0	58.0	45.0
III	28	Hygiene products (eg tampon, etc.)	1	3.0	3.0	3.0
III	29	Loofahs	1	8.0	8.0	8.0
III	30	Plastic beverage bottles (750ml and above)	16	36.5	94.9	67.8
III	31	Sanitary bags	2	4.0	6.0	5.0
III	32	Shavers	2	9.0	16.0	12.5
III	33	Shower caps	2	3.0	4.0	3.5
III	34	Tasting spoons	6	1.2	3.0	2.3
III	35	Vacuum bags (for food / sous vide cooking)	28	0.3	74.0	19.2
III	36	Water bottles (750ml and above)	11	19.4	60.6	36.5
III	37	Wet wipes (for F&B)	1	0.6	0.6	0.6

APPENDIX K: VOLUME TO WEIGHT CONVERSION METHODOLOGY

This section outlines how the weight of plastic items and packaging may also be estimated based on volume data, if available. The steps below are adapted from the process set out in the Hotel Waste Measurement Methodology (HWMM).

Estimate weight by:

1. Refer to the table below and identify if your plastic item/packaging falls under any of the categories. If yes, proceed to the next step.

List of volume to weight conversion factors by plastic category and type[16]

Plastic Category	Plastic Type	Volume (Imperial System)	Estimated Weight (lb)	Volume (Metric System)	Estimated Weight (kg)
PET	PET Bottles - baled	30" x 42" x 48"	525-630	0.76m x 1.07m x 1.22m	238-286
	PET Bottles - loose	cubic yard	35	cubic metre	21
	PET Thermoform - baled	30" x 42" x 48"	525-595	0.76m x 1.07m x 1.22m	238-270
HDPE	Baled	30" x 42" x 48"	525-700	0.76m x 1.07m x 1.22m	238-318
Mixed	PET and HDPE - loose	cubic yard	32	cubic metre	19
	Bottles/Containers #1-#7 - loose	cubic yard	40	cubic metre	24
LDPE (film)	Loose	cubic yard	35	cubic metre	21
	Compacted	cubic yard	150	cubic metre	89
	Baled	30" x 42" x 48"	1100	0.76m x 1.07m x 1.22m	499
PVC	Loose	cubic yard	341	cubic metre	202
EPS	Packaging/Insulation	cubic yard	32	cubic metre	19
Others	Pallet	48" x 48"	40	1.22m x 1.22m	18
	Trash bags	cubic yard	35	cubic metre	21
	Grocery/ Merchandise Bags	cubic yard	35	cubic metre	21

16 Conversion factors are obtained from "Volume-to-weight Conversion Factors" by the DHEC's Office of Solid Waste Reduction and Recycling. https://scdhec.gov/sites/default/files/Library/CR-011175.pdf

2. Determine the volume of your bin used for each plastic type by either (i) requesting the information from the waste contractor or vendor, (ii) recording from volume labelled on the bin, or (iii) estimating using HWMM Section A.2 Common Bin Types and Volume.
3. Determine the number of times the bin is emptied each week and extrapolate for the entire month.
4. Estimate the level of bin fill via (i) general observations or (ii) use 80-90% as the default average bin fill level.
5. Identify the relevant volume to waste conversion factor from the table that is applicable for each plastic type, and waste format (ie, whether it is compacted, baled, or loose, etc.).
6. Harmonise volume-to-volume unit if the volume of your waste bin is different from the default volume unit in table. E.g. conduct unit conversion if waste bin volume is in cubic feet while default volume unit is in cubic yard.
7. Calculate final weight for each plastic type each month using the formula:

   Weight per Month =
   Volume of Waste Bin X Number of Dumpsters Emptied Each Month X Bin Fill Level X Identify Volume to Weight Coefficient X Harmonise Volume to Volume Unit

8. Add up monthly estimates across the year to derive the annual plastic weight for each plastic type.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