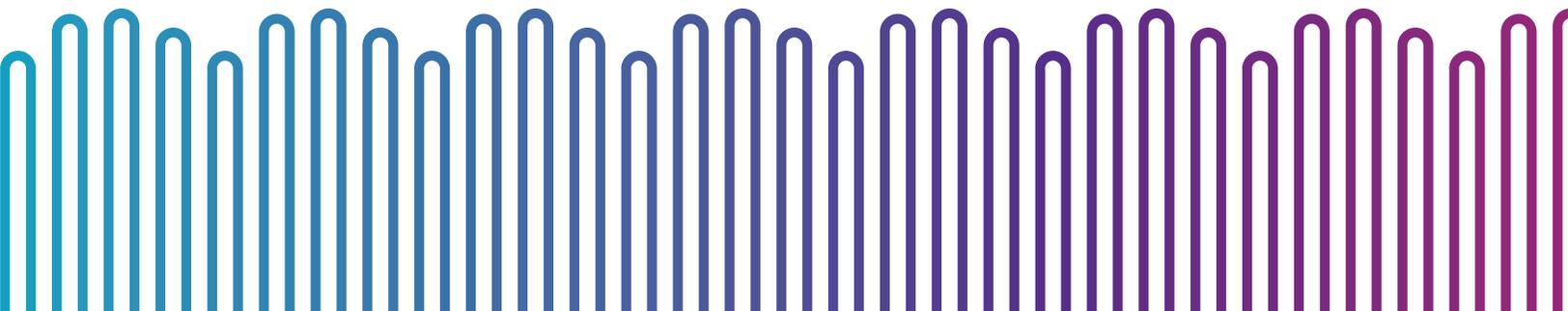




Transparent 2020

Mapping corporate action on plastic waste

June 2020



Acknowledgements

"In the past few years it has become evident that we must radically speed up the transition to a circular economy for plastic, in which it never becomes waste or pollution. We must eliminate the plastics we don't need, innovate to ensure that the plastics we do need are reusable, recyclable, or compostable, and circulate all the plastic items we use to keep them in the economy and out of the environment. The New Plastics Economy Global Commitment has brought unprecedented transparency on industry action, highlighting progress on elimination of and innovation for plastic packaging. We welcome WWF's inaugural *ReSource: Plastic* report as a step towards building further transparency on the circulation and after-use fate of plastic packaging across different geographies."

– SANDER DEFROYT, LEAD OF THE NEW PLASTICS ECONOMY INITIATIVE AT THE ELLEN MACARTHUR FOUNDATION

"As a Principal Member of *ReSource: Plastic*, Keurig Dr Pepper is proud to be a part of this inaugural report. The data outlined within provides a landscape analysis of the challenges that brands, packaging manufacturers and our global recycling systems face and, as a member of the first cohort of principal members, we are now positioned to accelerate the path forward with solutions grounded in data and collective action. The findings of the report underline the importance of the packaging and waste elimination goals we have set for our company and reiterate the importance of collaboration. We look forward to the expansion of this promising program and continuing to be an active and collaborative member as the group grows and evolves."

– MONIQUE OXENDER, CHIEF SUSTAINABILITY OFFICER, KEURIG DR PEPPER

"We recognize that plastic pollution is a challenge that none of us can tackle alone. Collaboration is critical, and we look forward to continuing to work alongside WWF and our fellow *ReSource: Plastic* Principal Members to identify ways to collectively advance more sustainable solutions at scale. McDonald's is already working on a wide-ranging program to keep plastic out of nature, which includes removing and minimizing plastic and improving recyclability in packaging. We are pleased to see the findings in this report are aligned with the direction of our packaging and recycling strategy, with a strong focus on circularity."

– KEITH KENNY, CORPORATE VICE PRESIDENT, SUSTAINABILITY, MCDONALD'S

"Plastics stemming from the food and beverage industry make up a majority of the items collected from beaches and waterways around the world during Ocean Conservancy's annual International Coastal Cleanup, so there is a critical need to better understand this sector's plastics footprint if we want to make a real dent in the ocean plastics crisis. This first *ReSource: Plastic* report is an important step in filling that knowledge gap, and it is encouraging to see other companies, including several members of the Trash Free Seas Alliance, committing to greater transparency, as well. Everyone needs to be part of the solution—the problem is simply too big to tackle alone."

– EDITH CECCHINI, PROJECT DIRECTOR FOR CORPORATE STRATEGY AND POLICY AT OCEAN CONSERVANCY

“Plastic pollution of our ocean is set to increase dramatically under current conditions. Pew welcomes this report by WWF further highlighting the problem and the need to take collective and decisive actions.”

– SIMON REDDY, DIRECTOR, ENVIRONMENT, THE PEW CHARITABLE TRUSTS

“At P&G we’re concerned about plastic waste in our environment. It’s a complex global challenge that requires a comprehensive approach across the entire plastics lifecycle, and everyone has a role to play. The findings in WWF’s *ReSource: Plastic* report will help point us to the biggest opportunities to work together on circular solutions so that plastic is treated as a resource that is collected, recycled and reused.”

– VIRGINIE HELIAS, CHIEF SUSTAINABILITY OFFICER, PROCTER & GAMBLE

“Global crises like plastic waste, climate change, and water, require private sector leadership and truly global collaboration. This means actively working with other brands, governments, NGO’s and key industry stakeholders to bring about sustainable change. *ReSource* and the detailed reporting by the participating companies provides a common framework and insights for us to act.”

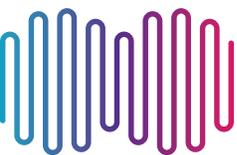
– MICHAEL KOBORI, CHIEF SUSTAINABILITY OFFICER AT STARBUCKS

“In 2018, we launched our World Without Waste initiative with a simple, focused purpose: make the world’s packaging waste problem a thing of the past. We know that we can’t do this alone—we need collective action. Building on our engagement with the Ellen MacArthur Foundation, *ReSource: Plastic* is another step that Coca-Cola is taking to advance this work. We need additional companies to join this effort as we focus on transparency and common frameworks that will help drive real, meaningful results.”

– BEN JORDAN, SENIOR DIRECTOR OF ENVIRONMENTAL POLICY, THE COCA-COLA COMPANY

“This thoughtful and transparent report is exactly what the industry needs to advance the U.S. recycling system and the circular economy. I commend WWF’s leadership through the ReSource Footprint Tracker as well as the companies that have boldly stepped up to be part of this solution-oriented approach. As stated in the report, the U.S. recycling system needs help now more than ever. The Recycling Partnership is proud to work with WWF on the solutions and actions that will keep plastic out of the environment and in a circular system.”

– KEEFE HARRISON, CEO, THE RECYCLING PARTNERSHIP



Executive Summary

WWF has established a vision of No Plastic in Nature by 2030 and imagines a world where our resources are never wasted. *ReSource: Plastic* leverages the power of business to achieve this vision. In its inaugural year, *ReSource: Plastic* worked with five Principal Members (Keurig Dr Pepper, McDonald's Corporation, Procter & Gamble, Starbucks, and The Coca-Cola Company) as well as Thought Partners (The Ellen MacArthur Foundation and Ocean Conservancy) to establish a baseline of plastic use.

The ReSource Footprint Tracker is the main analytical tool through which corporate action and progress are measured for *ReSource: Plastic*. The Tracker provides a standard methodology to track companies' plastic footprints and publicly report on the progress of their plastic waste commitments. Converging efforts will be key to success, and we are working toward the goal of aligning the *ReSource: Plastic* Footprint Tracker with the New Plastics Economy Global Commitment, and the Trash Free Seas Alliance.

The goal of the pilot year of the Footprint Tracker was to establish a baseline of plastic use and management pathways for our Members. Results from the first year and continued tracking in future years will help illuminate key challenges, provide insight into the most impactful opportunities for companies to take effective action on the plastic waste crisis, and measure progress over time.

This report presents key findings related to the *ReSource* Principal Members' global plastic footprints in 2018, including their use of plastic by polymer type and form, use of recycled content and sustainably sourced biobased content, and the likely waste management pathways for their plastic portfolios. The scope and characteristics of each company's data are outlined within the report. Keurig Dr Pepper reported 208,000 metric tons of plastic; McDonald's Corporation reported 153,000 metric tons; Procter & Gamble reported 605,000 metric tons; Starbucks reported 190,000 metric tons; and The Coca-Cola Company reported 3 million metric tons. In total, 4.2 million metric tons of plastic were reported by *ReSource* Members, based on 2018 data.¹ The Tracker identifies four waste management pathways for consumer-facing plastic packaging: recycled, landfilled, incinerated, or mismanaged.² Based on the results, we identify concrete calls to action for our Members, as well as broader recommendations for the private sector and other stakeholders to address global plastic pollution.

The report frames these opportunities in the context of the three *ReSource: Plastic* goals: eliminating unnecessary plastic, doubling global recycling and composting, and shifting to sustainable inputs for remaining plastic. Key calls to action for each goal are highlighted below.



ELIMINATE UNNECESSARY PLASTICS:

- Build on efforts to **reduce and redesign small plastics**, which include familiar single-use items like utensils, coffee stirrers, and straws. These are a significant category for three of the five *ReSource* Members. Because small plastics are largely excluded from recycling streams, eliminating or finding substitutes for these materials should remain a key priority for these companies.
- Explore reusable **packaging systems and services** as an alternative for other high-volume, low-recyclability products like cups and utensils. To support the enabling conditions for this innovation, these companies should focus on setting and reporting reusability targets at the country level and collaborate with other companies on localized solutions.

DOUBLE GLOBAL RECYCLING RATE:

- **Scale recycled content** availability and use through collective action.

– The **US has been identified as a key opportunity to increase recycling and reduce landfill rates.**

– In particular, **polypropylene recycling in the US** is highlighted as a strong opportunity for increased recycling. The US recycling rate for polypropylene is close to zero (0.6% in 2017), according to the EPA. The demand for quality recycled polypropylene far exceeds supply, and collective action is needed to increase availability.³

- Develop **action plans that focus on the largest country-level opportunities.** In the analysis, the United States, Mexico, China, India, and the Philippines were identified as priority countries to foster systems improvements in waste management collections and processing. Together, these countries represent 57.4% of *ReSource* Members' landfilled plastics, and 58.7% of Members' estimated mismanaged plastics. The United States represents the single biggest opportunity for recycling due to the high reported sales volumes of these companies coupled with high landfill rate (72%).

- Identify opportunities to **increase recycling and composting in specific geographies** where waste management collection and infrastructure are currently insufficient, and report annually on progress. Engage in collective action including policy dialogues and efforts to foster circular systems.

SHIFT TO SUSTAINABLE INPUTS FOR REMAINING PLASTIC

- **Use recycled plastic** for plastic packaging applications: Increase use of recycled plastic, to address the significant gap between current use and corporate commitments. Use of recycled or sustainably sourced biobased content ranged from 0.4% to 11.3% across all five Members. These results call out a clear need to accelerate the use of recycled content. This is indicative of the larger challenge around availability of consistently high-quality recycled resin. Many companies have set strong recycled content goals, but it can be a challenge to make progress when price parity between recycled and virgin content does not exist. Leaders are needed who commit to sourcing recycled plastic, even when the market price of recycled content may be above that of virgin plastic.
- Increase use of **sustainably sourced biobased plastic**: As with recycled content, the supply of sustainably sourced biobased plastic will need to increase in order to meet demand of company commitments in upcoming years. However, this content must be sourced and managed responsibly at end-of-life to contribute effectively to a circular system.

Finally, these calls to action will determine the progress on all the goals outlined above; their importance cannot be overstated:

- **Filling critical data gaps** and actively sharing information will improve the quality and precision of our understanding of the plastic waste system. There is a clear need for better waste management and fate data at the national level, international coordination on plastic data collection efforts, and agreement on common terminology and best practices. Furthermore, standardization in corporate data collection and reporting is also needed.

- **Improving data confidence** and achieving more comprehensive waste management information will allow us to more accurately model the pathways of plastic and design more effective interventions.

There are some important considerations when interpreting the findings of this report: First, the baseline results are not intended to represent global trends across industries. They instead serve as proof of concept that a common framework for the measurement of corporate plastic footprints and waste management outcomes is both possible and a necessary tool for change. Second, due to the limited availability of detailed data in several key geographies, it is not currently possible to meaningfully distinguish between individual company footprint waste management outcomes and national averages in several regions. Therefore, waste management outcomes are reported in the aggregate in this report, and not on an individual basis. Improving this data detail and confidence is a high priority for future reporting years, along with the incorporation of import/export data.

Additionally, this baseline assessment represents a relatively small set of companies, which has resulted in limitations on what can be concluded from the pilot results. While the set of companies represents five well-known global companies and respective leaders in their industries, these companies are not necessarily representative of their respective industries globally. Therefore, the aggregate results only represent the five companies based on their reported data and are not necessarily representative of wider industry trends. As *ReSource* grows, we will work to enable broader use of the *ReSource* Footprint Tracker so that the aggregated data produces more generalizable insights across industries.

ReSource: Plastic aims to enlist 100+ companies by 2030 in the effort to reach the ultimate goal of preventing at least 50 million metric tons of plastic waste from entering nature. The *ReSource* Footprint Tracker provides a common measurement framework, and through increased adoption of this tool, the highest-impact measures can be identified. The baseline results of the *ReSource* Footprint Tracker provide the necessary starting point for developing solutions whose impact will reverberate across supply chains and industries.

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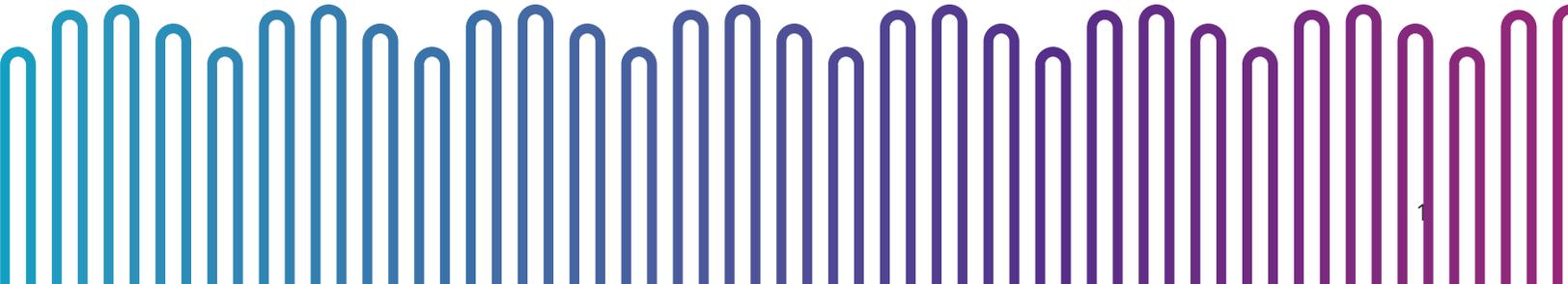
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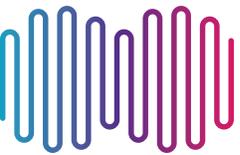
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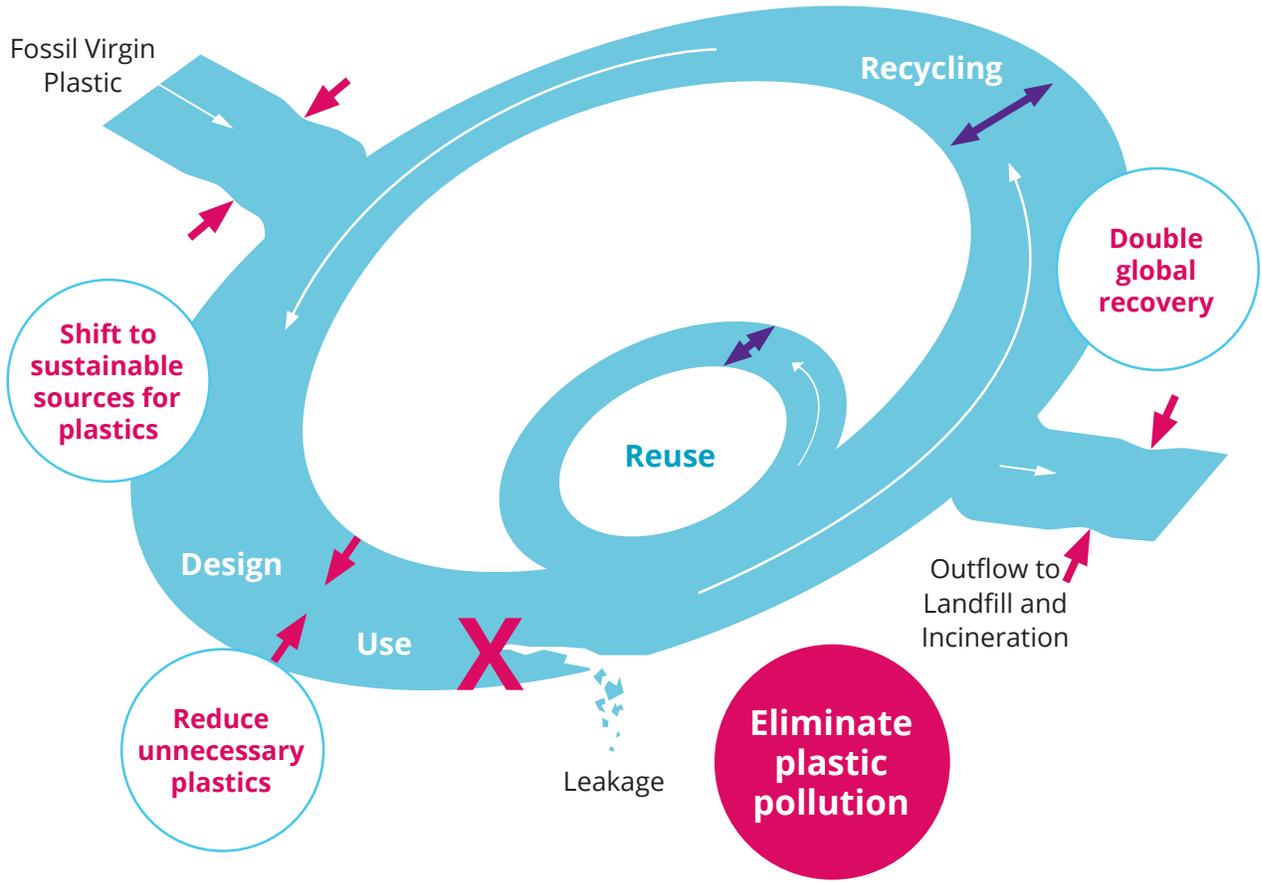
About *ReSource: Plastic*

Vision

Every day, plastic is flowing into our natural environment at an unprecedented rate—a dump truck every minute into our oceans alone. In one year, this plastic waste adds up to 8 million metric tons and impacts over 800 species.^{4, 5} And as this crisis spreads to every corner of the globe, World Wildlife Fund (WWF) is leading the charge to unite our global networks of industry leaders, consumers, and policymakers to transform our systems toward a vision of No Plastic in Nature by 2030. Because while plastic can help make our hospitals safer, our food last longer, and our packages more efficient to ship, it has no place in nature.

The role of business is critical to fixing the broken plastic system and accelerating progress. Businesses are uniquely positioned to reduce waste through improved sourcing, design, and business model innovation within their own supply chains, and by supporting recycling and composting system improvement efforts beyond their own supply chains.

FIGURE 1. Theory of Change for *ReSource: Plastic*



Through this lens, we find that as few as 100 companies have the potential to prevent roughly 10 million metric tons of the world’s plastic waste per year.⁶ Some of the world’s biggest companies have already gotten started with large-scale plastic commitments to reduce, re-source, recycle, and more. The New Plastics Economy Global Commitment, led by the Ellen MacArthur Foundation and UNEP, has been a foundational mechanism to set a common vision and commitment, and track progress.

Continued action and an amplification of efforts in line with this vision are needed to follow through on those commitments and achieve impact on plastic pollution at scale.

Effective action to stop plastic pollution requires an understanding of how corporate plastic footprints contribute to the issue at large. However, as companies

have entered this space through large-scale commitments, there hasn’t been a comprehensive, standardized methodology to track plastic usage and waste management outcomes, leaving companies without the ability to measure the impact and track the progress of their actions. *ReSource’s* measurement framework, the *ReSource Footprint Tracker*, is designed to fill this critical gap by providing a common framework for the measurement of corporate plastic footprints and waste management outcomes.

Through our *ReSource: Plastic* activation hub, we’re helping some of the world’s leading companies translate ambitious plastic commitments into systemic, measurable change across their business operations, and well beyond their supply chains.

An Activation Hub

ReSource: Plastic is WWF's activation hub for companies that are ready to translate plastic commitments to meaningful action but need help building a roadmap to get there. We close that "how" gap through an innovative measurement framework that tracks corporate action against *ReSource's* three-pronged approach to leveraging business as a catalyst for systems change:

- Eliminating unnecessary plastic through business model innovation, reduction, and substitution
- For plastic that is necessary, shifting from virgin plastic sourcing to sustainable inputs, including recycled content,⁷ sustainably sourced biobased content, and advanced materials⁸
- Doubling global collection, recycling, and composting of plastic so that the plastic going into the system is circulated back

ReSource launched in 2019 with a goal of tracking the progress of corporate action year over year to ultimately

reach a goal of preventing 50 million metric tons of plastic pollution from entering our oceans and other ecosystems by 2030.

To get there, *ReSource* is working with its Member companies to:

MEASURE IMPACT of corporate plastic activities within an innovative measurement framework, the *ReSource* Footprint Tracker, and provide an unprecedented view into company footprints within the global plastic system.

MAXIMIZE IMPACT by tracking implementation and progress of these activities through the *ReSource* Footprint Tracker to identify what interventions to reduce waste should be prioritized, scaled, or improved upon.

MULTIPLY IMPACT by uniting companies within a common plastic sustainability language that enables collaboration with other companies and stakeholders, bringing speed and scale to critical solutions and investments toward systems change.



Participating Members

ReSource was launched in May 2019 with five companies that have demonstrated ambition and sector leadership on plastic waste to serve as Principal Members: Keurig Dr Pepper, McDonald's, Procter & Gamble, Starbucks, and The Coca-Cola Company. As members of *ReSource*, the companies are committed to tracking and reporting on their plastic footprint annually as well as taking recommended actions to advance *ReSource's* goals, and importantly, pursuing collaborative efforts with other companies and stakeholders to address and scale critical interventions in waste management.

These companies piloted the ReSource Footprint Tracker in its first year, and their results in this report serve as a baseline assessment to measure progress annually moving forward.



Program Partnership

THOUGHT PARTNERS

Our Thought Partners, The Ellen MacArthur Foundation and Ocean Conservancy, are leaders in the global effort to stop plastic pollution and strengthen the conservation-driven objectives of *ReSource*. They have helped guide the strategy of *ReSource: Plastic*, and their expertise will continue to inform the work of *ReSource* in upcoming years. Furthermore, *ReSource: Plastic* aims to build on and align with their programs and tools, notably the Trash Free Seas Alliance, led by Ocean Conservancy, and The New Plastics Economy Global Commitment, led by the Ellen MacArthur Foundation and UNEP.



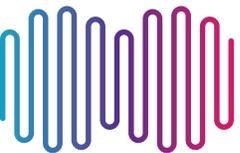
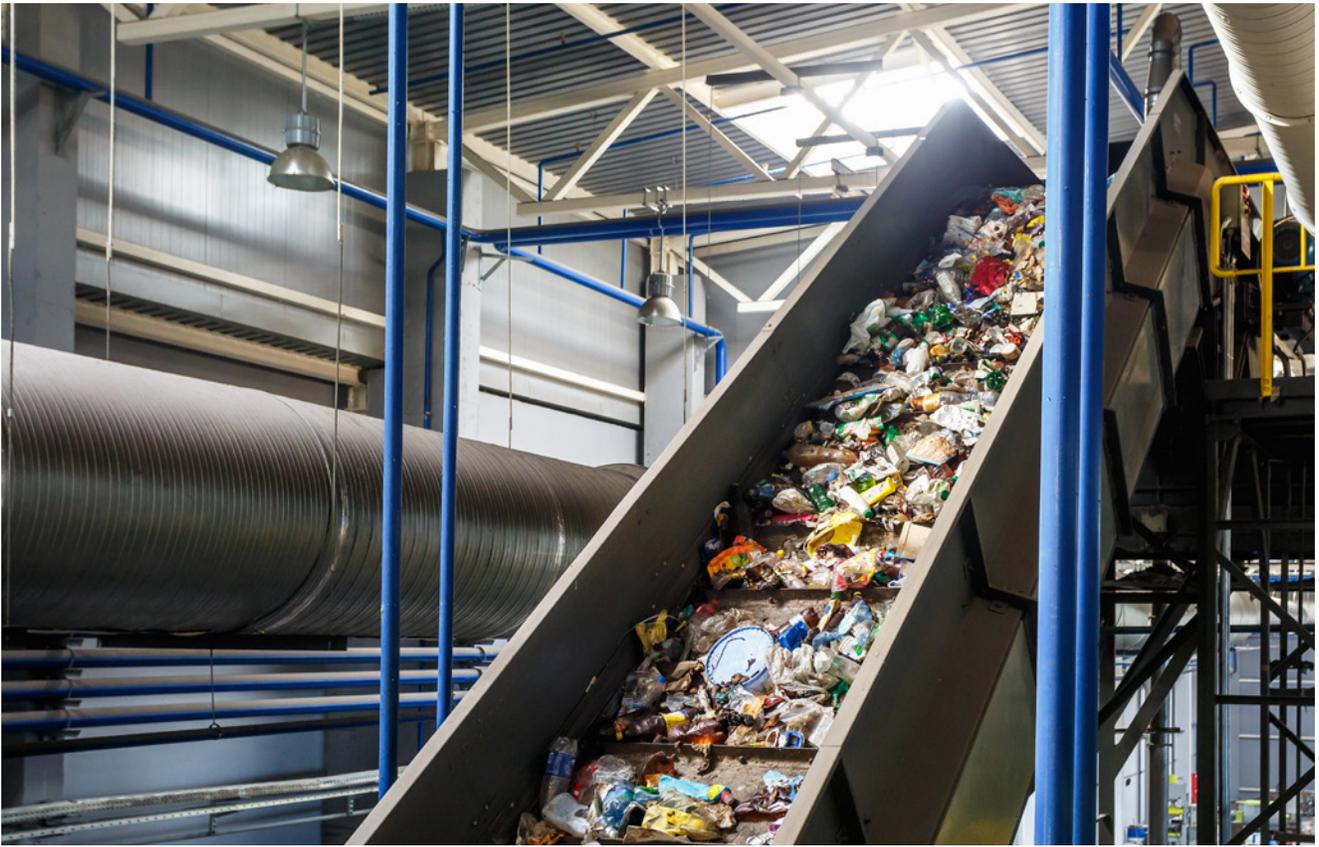
IMPLEMENTATION PARTNERS

Implementation Partners are organizations that are employing *ReSource* and/or amplifying our efforts to bring impactful solutions to scale. The American Beverage Association (ABA) became an Implementation Partner in 2019 to align measurement methods and programmatic expertise with its Every Bottle Back initiative, focused on increasing PET recycling in the United States. This collaboration will contribute to *ReSource's* overarching goals of eliminating plastic pollution and increasing circularity.



OTHER COLLABORATORS

ReSource is also collaborating to identify mitigation opportunities and align our Footprint Tracker methodology with current best practices. We acknowledge and appreciate the contributions that The Recycling Partnership, Circulate Capital, and the Plastic Leak Project put into the design of the ReSource Footprint Tracker.



ReSource Footprint Tracker Results

Transparent 2020 is the first of what will be an annual series of reports that detail Members' plastic footprints and track progress on corporate actions. This inaugural publication follows the pilot year of the ReSource Footprint Tracker methodology and demonstrates proof of concept for a common framework to measure effective corporate action on plastic. This baseline will serve as a starting point to track the progress of *ReSource: Plastic* and related activities over time and enables key recommendations for action, both internal to company supply chains and across wider multi-stakeholder efforts.

The baseline assessment also offers insights into what immediate, collective, and other actionable interventions can be taken to improve footprint results in the years ahead (see: "Recommendations" section of report, below).

Methodology

The ReSource Footprint Tracker is the mechanism that enables *ReSource* Member companies to measure, maximize, and multiply the impact of their actions on plastic. The methodology provides insight into how much and what type of plastic companies use, and where it goes once it is disposed of (the waste management outcome).

The big-picture view is designed to elicit data-driven actions aligned to *ReSource's* theory of change: eliminating unnecessary plastic, shifting to sustainable inputs for remaining plastic, and doubling global recycling and composting.

As such, the ReSource Footprint Tracker measures the following variables for each company: the amount of plastic used and sold by the company, polymer type and form, the source of the material, and where it goes upon disposal—whether it circulates back into the system or becomes a wasted resource (waste management outcome).

Additional information about each component of the Footprint Tracker, including survey structure, data sources, assumptions, and limitations can be found in the appendix. A complete methodology document is under development and is scheduled for publication in September 2020.

PILOT & IMPLEMENTATION

The pilot version of the ReSource Footprint Tracker consists of three components:

- A survey tool that companies fill out with information on the plastics they use and sell, which provides summary outputs related to the composition of their portfolio
- A plastic waste management model that uses the survey data as an input, and estimates the share of plastic that is recycled, landfilled, incinerated, and mismanaged based on country-level waste management data and the polymer and format of the item
- A Beyond Supply Chain survey where companies are asked to provide detailed information about any projects or investments they are involved in focused

on reducing plastic pollution beyond their own supply chain, as well as any measured impacts to date

The goals of implementing a pilot of the ReSource Footprint Tracker included demonstrating the feasibility of the methodology, establishing a baseline against which progress will be measured in future years, and raising the bar for transparency and accountability for all companies to follow.

DATA ASSUMPTIONS AND LIMITATIONS

The ReSource Footprint Tracker relies on companies providing accurate data. WWF works with Member companies to identify inconsistencies and fill data gaps, but the data submitted by companies for this report was not verified or audited by a third party.

As *ReSource* was developed to convene the disparate variables that contribute to the global plastic waste problem into a single framework, there were inevitable challenges in the data collection process during this pilot year of the methodology. Companies have had very different systems for tracking plastic throughout their supply chains, and global data on plastic waste management is not consistently collected.

There were three main constraints:

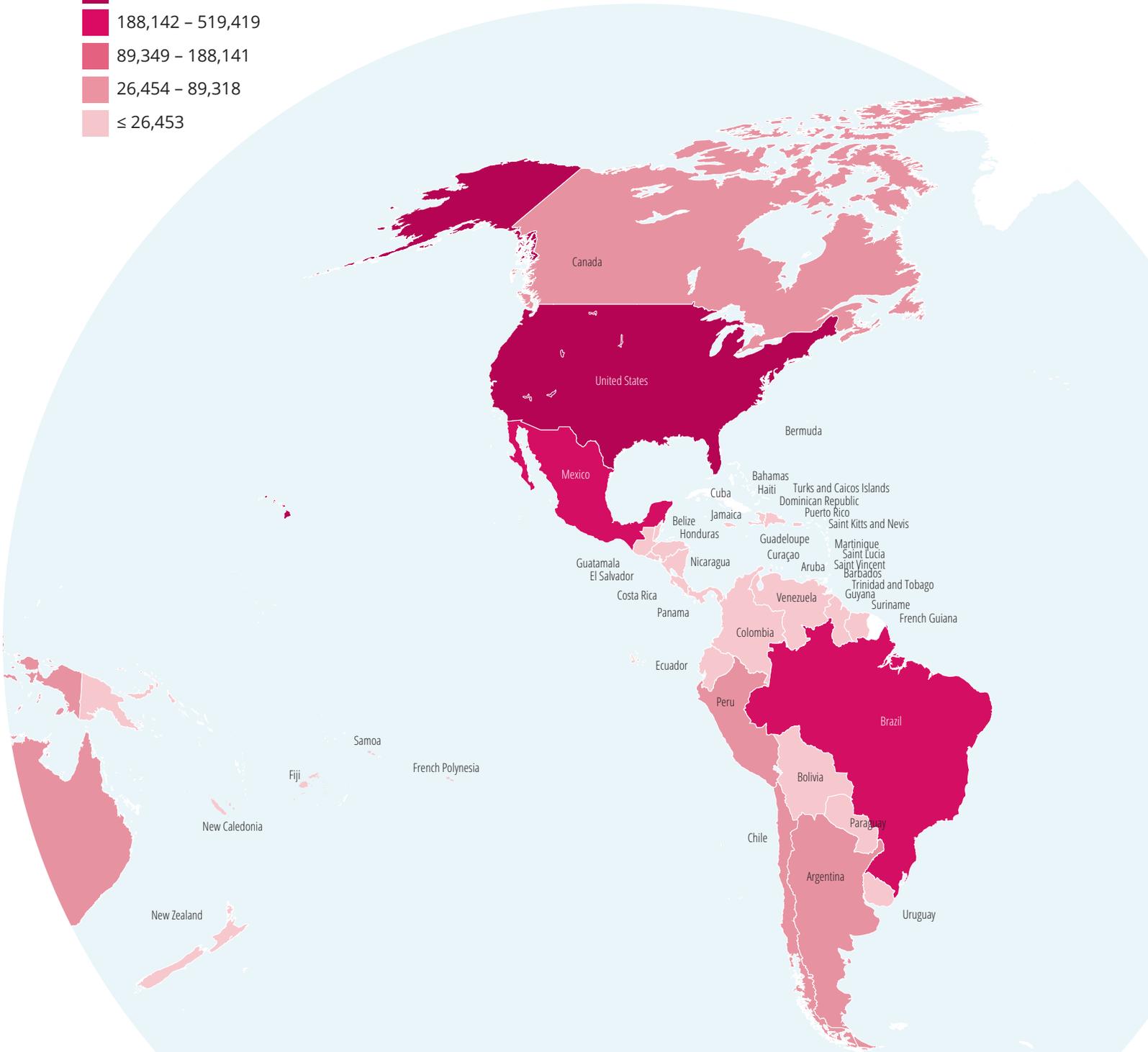
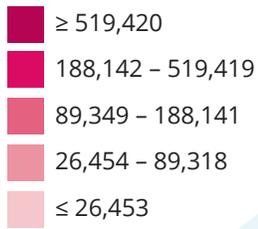
FIRST, secondary packaging and transport packaging are not currently included in the data reported by companies.⁹

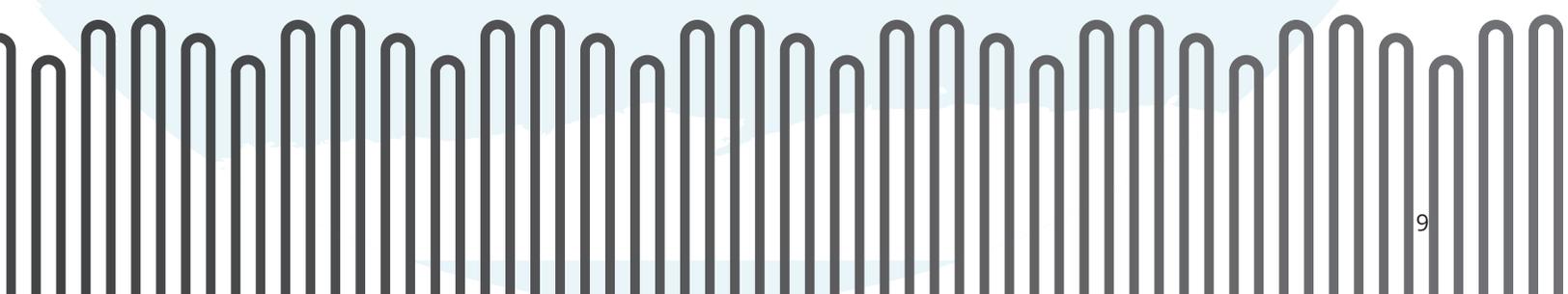
SECOND, some Member companies were not able to access packaging data for every country they operate in, so in some cases the country-level data was generated by extrapolating local sales or store count. For these reasons, the reporting scope does vary somewhat between Members, and detailed information about what is included is provided in each company's case study.

THIRD, there is limited availability of waste management data for plastics globally, especially data on how the performance of waste management varies across different packaging forms and polymers. As a result, proxy data and assumptions have been used to fill data gaps, as necessary. It is also important to acknowledge the lack of information on composting infrastructure globally today, and therefore the lack of available data on composting rates.

FIGURE 2. ReSource Members' aggregate reported plastic volumes by country.

Plastic Volumes (MT)





These constraints demonstrate the need for collaboration to fill key data gaps and improve data confidence levels, and such efforts will be a priority for platform refinements to *ReSource* moving forward. These efforts will include targeted research and reporting to improve plastic waste management data. Additionally, Members are working to improve their internal data gathering processes and expand the reporting scope for coming years.

Interpreting the Baseline Assessment

When reviewing the findings of the baseline assessment, **please consider the data limitations and assumptions** as outlined in the previous section. Due to the limited availability of detailed data in several key geographies, it is not possible at this time to meaningfully distinguish between individual company footprint waste management outcomes and national averages in several regions. Therefore, waste management outcomes are reported in the aggregate in this report, and not on an individual basis.

Additionally, this baseline assessment represents a relatively small set of companies, which has resulted in limitations on what can be concluded from the pilot results. While the set of companies represent five well-known global companies and respective leaders in their industries, these companies are not necessarily representative of their respective industries globally. For example, The Coca-Cola Company and Keurig Dr Pepper represent about 16% market share of the non-alcoholic beverage sector based on their sales; P&G represents about 11% of the global fabric and home care industry; and McDonald's represents 19% and Starbucks represents 11% market share of the restaurant industry.¹⁰

Therefore, the aggregate results only represent the five companies based on their reported data and are not necessarily representative of wider industry trends. For example, the geographies and specific opportunities identified as priority largely reflect the geographical and portfolio distributions of the Members, and therefore do not entirely match global trends. As *ReSource* grows, we will work to enable broader use of the *ReSource* Footprint Tracker so that the aggregated data produces more generalizable insights across industries.

Key Findings and Results

The Footprint Tracker includes analysis of product form and polymer composition, sustainable inputs to plastic, and waste management pathways for plastic after it is disposed. Data on Members' plastics product form and polymer composition helps identify opportunities to substitute, reduce, or redesign plastics that have low recyclability rates, thus reducing unnecessary plastic. Information on sustainable material inputs allows for year-to-year tracking on Members' conversion to these inputs, clarifying the largest opportunities for increasing recycled and biobased content. Calculating estimated waste management pathways illuminates top-priority regions and countries to invest in increased recycling and waste processing systems.

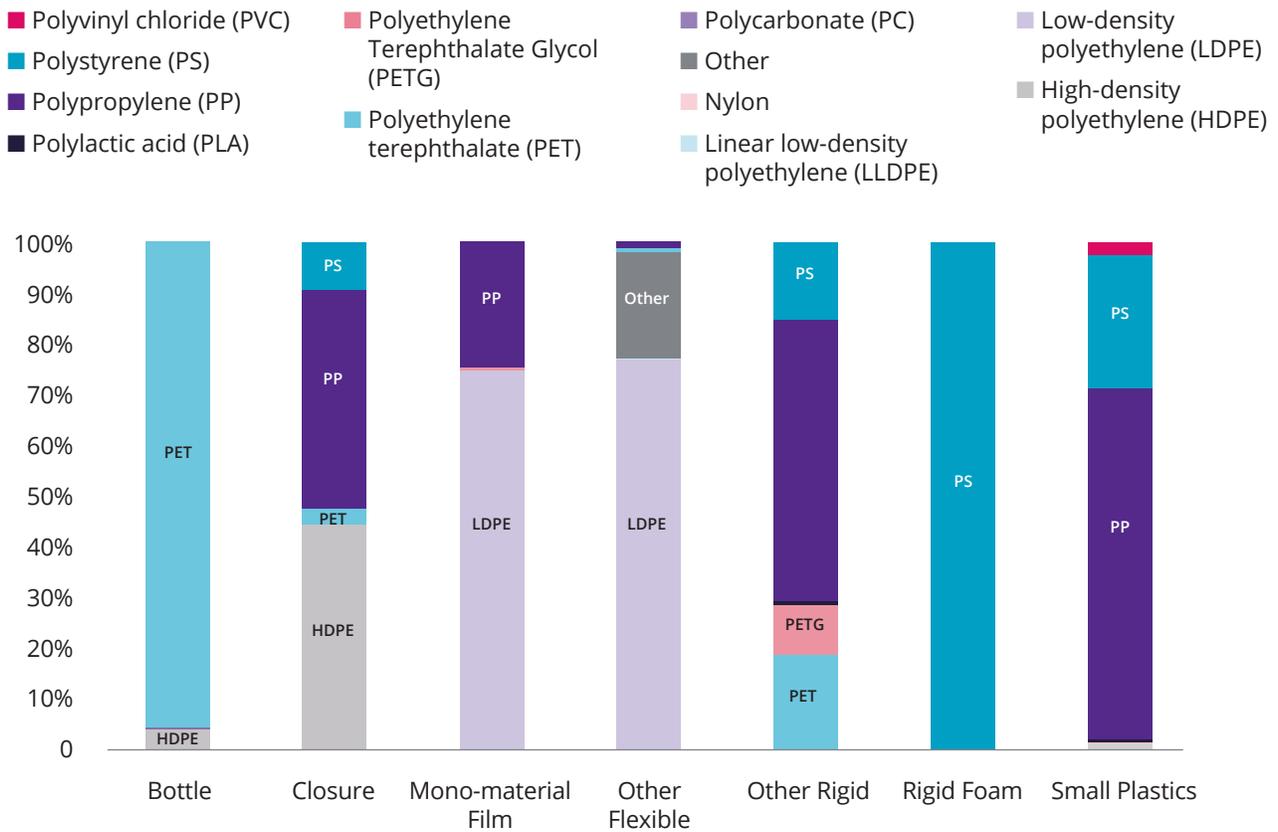
COMPANY PORTFOLIO AND CONTEXT

In this pilot year, *ReSource* Members reported a total of 4.2 million metric tons (MT) of plastic, primarily based on 2018 data. Geyer, Jambeck, and Law estimate global annual plastic generation at 302 million MT in 2015—141 million MT of which is from packaging.^{11,12} Taking just the packaging figure for 2015, *ReSource* Members' contribution to annual global plastic use is approximately 3%. It should also be noted that The Coca-Cola Company's reported volumes account for a significant portion of the total reported volume, which can skew averages. Therefore, alternate analysis is presented where appropriate. Waste management outcomes for Members' plastic footprints are primarily determined by in-country management rates and country-specific reported plastic volumes and forms. Thus, understanding the geographic distribution of reported plastic volumes is an important consideration when interpreting the management pathways results (Figure 2).

Results are reported in relation to *ReSource*'s three goals: 1. eliminate unnecessary plastic, 2. shift to sustainable inputs for remaining plastic, and 3. double global recycling and composting of plastic. All percentages are by weight of plastic. Portfolios differed significantly across *ReSource* Members, which can significantly influence the average results presented below. Key observations from the aggregate results include:

- PET bottles are a significant proportion of the plastic footprint for three of the five Member companies,

FIGURE 3. Polymer breakdown by form category for *ReSource* Members' aggregate portfolio.



ranging from 31% to 91% of the reported usage for these three companies.

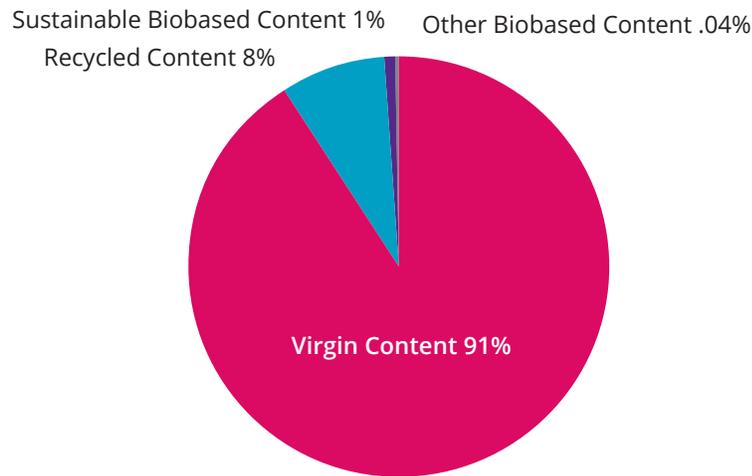
- Flexible plastic comprises 7% of the aggregate reported usage, ranging from 1% to 34% across Member companies. LDPE is used in 77% of Members' flexible plastic. In the United States, the recycling rate for flexible plastic is 1%.¹³
- Other rigids (e.g., cups, containers) account for 6% of the aggregate plastic footprint and range from 0% to 51% of Members' total reported usage. Polypropylene (PP) accounts for 55% of other rigids in the results.
- PP accounts for 8% of the aggregate portfolio. According to the Environmental Protection Agency's 2017 estimates, the polypropylene recycling rate in the US is less than 1% for all post consumer PP, and 8% for PP used in food service packaging.¹⁴ The opportunity to increase PP recycling in the US, as well as the use of recycled PP in corporate supply chains, is identified as a key action area.

- Lastly, small plastics,¹⁵ which are defined as being smaller than 2 inches in two dimensions,¹⁶ account for less than 1% of the aggregate plastic footprint. However, the range of reported volumes reported among Members is significant, with some Members reporting up to 16% of their reported volumes coming from small plastics. These small plastics require testing to be considered recyclable, as small plastics are often not incorporated into the recycling stream because of their size, as they fall between the belts and gears of recycling machinery.¹⁷ Sixty-nine percent of small plastics included in this analysis are composed of PP.

PRODUCT FORM AND POLYMER COMPOSITION

The Footprint Tracker includes an analysis of product form and polymer composition (Figure 3). Understanding the distribution of forms and polymers used by Members can help inform mitigation actions including opportunities to redesign, substitute material types, and adopt innovative business models to eliminate unnecessary plastic. These decisions are complex and often

FIGURE 4. Breakdown of recycled, biobased, and virgin content for *ReSource* Members' aggregate portfolio.



involve trade-offs. For example, consolidating polymer types and formats has the potential to support higher recycling and composting rates by simplifying collection and aggregation,¹⁸ but which polymers or formats should be changed and to what alternative? Another route to eliminating unnecessary plastics is to redesign the product form to reduce likelihood of landfill or mismanagement. Without a collective plan, this exercise could result in a proliferation of materials and formats instead of a consolidation. Understanding the breakdown of applications and formats across industries is the first step in working toward the reality of eliminating unnecessary plastic.

For example, some items falling into the small plastics category could be substituted for another material, while others could be eliminated through redesign or shifting of business models to reuse or other innovative systems. However, some small plastics are integrative to the application of the product, and the opportunity for some specific formats lies in enabling and increasing recycling.

The prevalence of reusable systems is currently low, accounting for only a small portion of the Members' reported volumes. It should be noted that non-plastic reusable and refillable packaging can exist in company portfolios. This report focuses exclusively on plastic packaging and not on overall packaging portfolios. Reuse

and other innovations that would eliminate the need for a single-use plastic item or package have been identified by several of the Members as key strategies to be implemented in coming years.

Results suggest that opportunities to eliminate unnecessary plastic vary by company portfolio. For example, while PP is a priority for some Members, comprising 8% of the total plastic footprint, 2% of The Coca-Cola Company's and 54% of McDonald's portfolio comprises PP. Further, flexibles, which are mostly not currently recycled, vary across Members' portfolio from 1% to 34%.

USE OF SUSTAINABLE INPUTS

After taking action to eliminate what is unnecessary, shifting to sustainable inputs for remaining plastic can improve environmental performance. Sustainable inputs include recycled content or responsibly sourced biobased content¹⁹ and other advanced materials in the future. Sustainable inputs for plastics represent between 0.4% and 11.3% of total plastic use across the Member companies. Recycled content is the most prevalent sustainable input and accounts for 8% of the aggregate reported volume (Figure 4). Recycled content is primarily used in bottles, followed by small plastics and other rigids (e.g., cups, containers). Responsibly sourced biobased content represents 1% of input materials and

is exclusively used in bottles. Other types of biobased content, such as in the polymer polylactic acid (PLA), are only used in 0.04% of the portfolio and are used in other rigids, closures, and small plastics.

WASTE MANAGEMENT PATHWAYS

The waste management pathways are based on in-country management rates and Members' respective plastic footprints in a given country. The estimated recycling rate of *ReSource's* Principal Members' aggregate plastic footprint (19%) is higher than the global estimate of plastic collected for recycling (14%) reported by the Ellen MacArthur Foundation (Figure 5).²⁰ As the plastic management outcomes are estimated based on country-level reported plastic volumes and country-specific waste management (Table 1), the *ReSource* Principal Members' high landfill rates compared to the global estimate can primarily be explained by high landfill estimates in the United States (72%), the country where all of the *ReSource* Principal Members sell their highest reported volumes of plastics. This concentration in the United States and the dominance of PET bottles can also explain the comparably high recycling rates—the United States has a PET bottle recycling rate of 29%, compared to its all-plastics recycling rate of 8.4%.²¹

FIGURE 5. Estimated waste management outcomes for *ReSource* Members' aggregate plastic footprint, compared to the Ellen MacArthur Foundation global plastic flow estimates, including material collected for recycling.²²

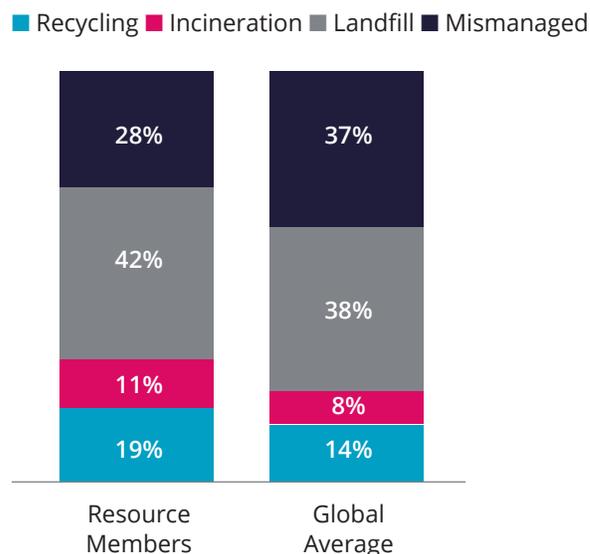


TABLE 1. Estimated waste management breakdown by region for *ReSource* Members' aggregate plastic footprint.^{23,24,25}

REGION	RECYCLING RATE	INCINERATION RATE	LANDFILL RATE	MISMANGED RATE
Africa	6%	0%	26%	68%
East Asia	12%	24%	11%	53%
Europe & Central Asia	41%	18%	29%	12%
Latin America & Caribbean	21%	0%	63%	16%
Middle East	4%	0%	76%	21%
North America	20%	15%	63%	2%
Oceania	13%	1%	79%	7%
South Asia	7%	0%	5%	88%
Southeast Asia	8%	4%	14%	74%

FIGURE 6. Waste management outcomes for rigid versus flexible plastics for *ReSource* Members.

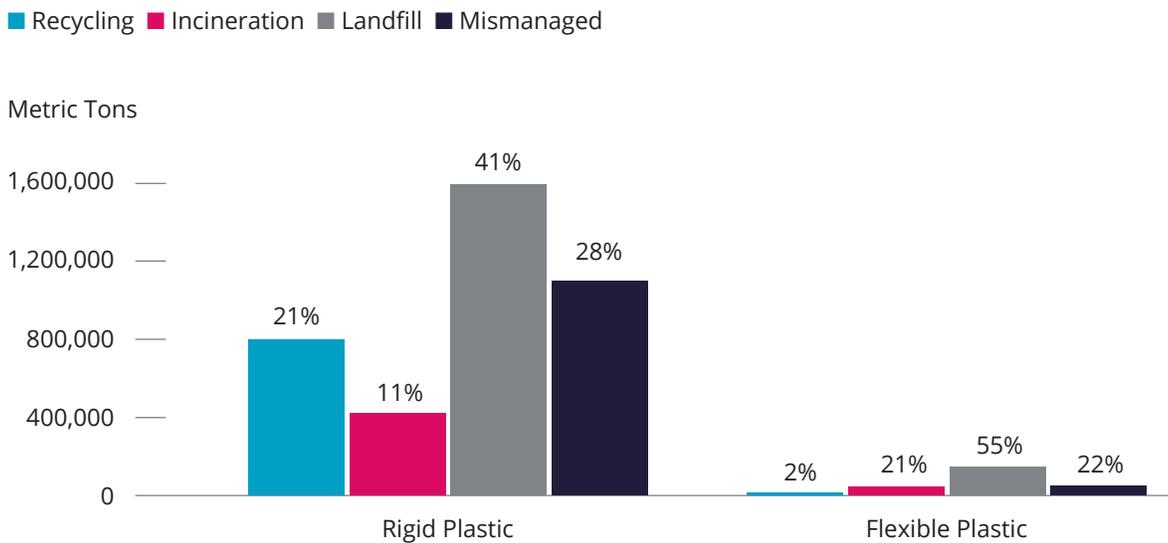
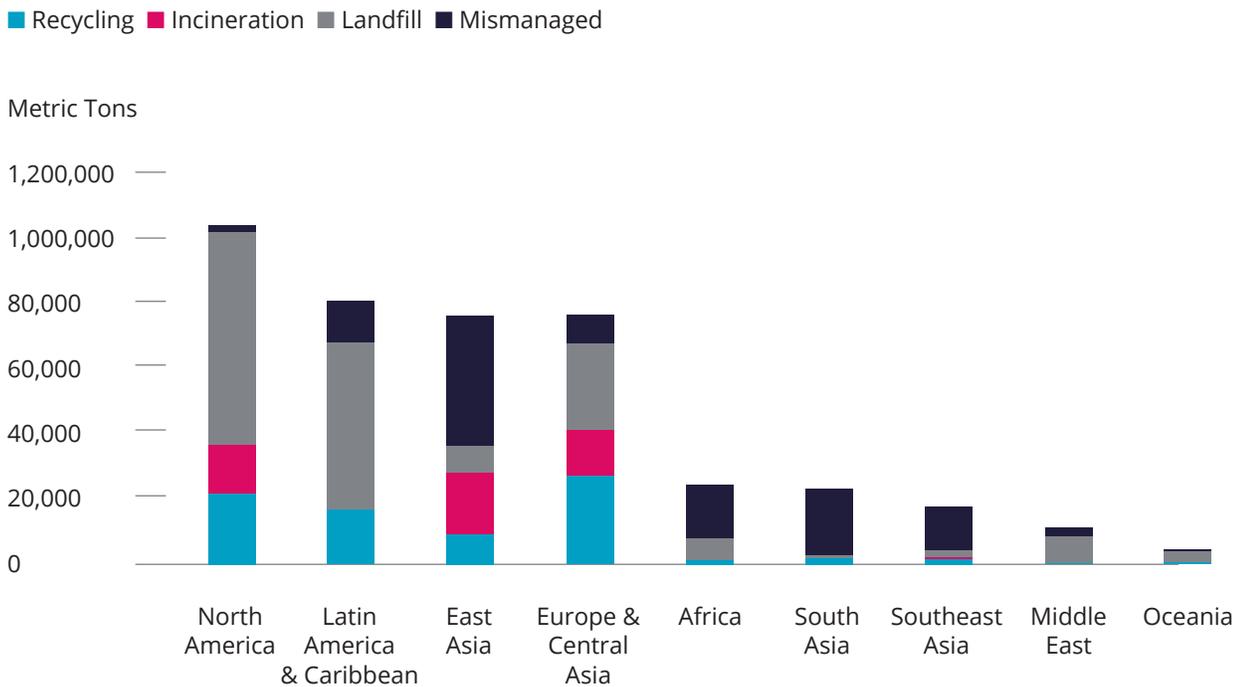


FIGURE 7. Estimated waste management outcomes by region for *ReSource* Members.



Waste management pathways were further calculated with the distinction between rigids and flexible plastics (Figure 6). Overall, the share of rigid plastic that is mismanaged (28%) is higher than that of flexibles (22%) for *ReSource* Members. This is due to the high use of rigid plastics in regions with high mismanagement rates, specifically in East and South Asia. The differences in recycling rates between rigids (21%) and flexibles (2%) is indicative of European trends.²⁶ Flexibles are also landfilled at higher rates than rigids (55% for flexibles; 41% for rigids). A limitation of the current model is that mismanaged rate estimates between rigids and flexibles do not differ, which does not reflect known trends that flexibles are mismanaged at higher rates than rigids. This is discussed in more detail in the Methodology section in the appendix, and we hope to implement improvements in the next version of the model to address this.

Regional Breakdown

The likely waste management pathways for plastics by region are aggregated based on *ReSource* Members' reported plastic volumes by country within set regions (Figure 7 and outlined in the appendix). These regional waste management estimates are dependent on the geographical distribution of sales and proportions of various plastic forms within the *ReSource* aggregate plastic footprint and thus are not meant to be representative of the end-life of plastics across all sectors.

Regionally, *ReSource* Members' aggregate plastic footprint is concentrated in North America, with lesser but still significant concentrations in Latin America and the Caribbean (where landfill rates are also comparatively high), East Asia (where mismanaged rates are high), and Europe and Central Asia (where recycling rates are highest globally) (Figure 7). The high landfill rates and high reported tonnage volumes in North America (63% of regional tonnage) and Latin America (63% of regional tonnage) contribute to the higher aggregate landfill rate of *ReSource* Members (42%), compared to the global estimate of 38% (Figure 5). Further, although East Asia is third in terms of total tonnage, the high mismanagement rate (53%) and the large footprint in China, where mismanaged rates are 76%, contribute to the region having the highest total tonnage of estimated mismanaged plastics. Africa, South Asia, and Southeast Asia also all have high mismanagement rates (68%, 88%, 74%, respectively), but *ReSource* Members' have comparatively

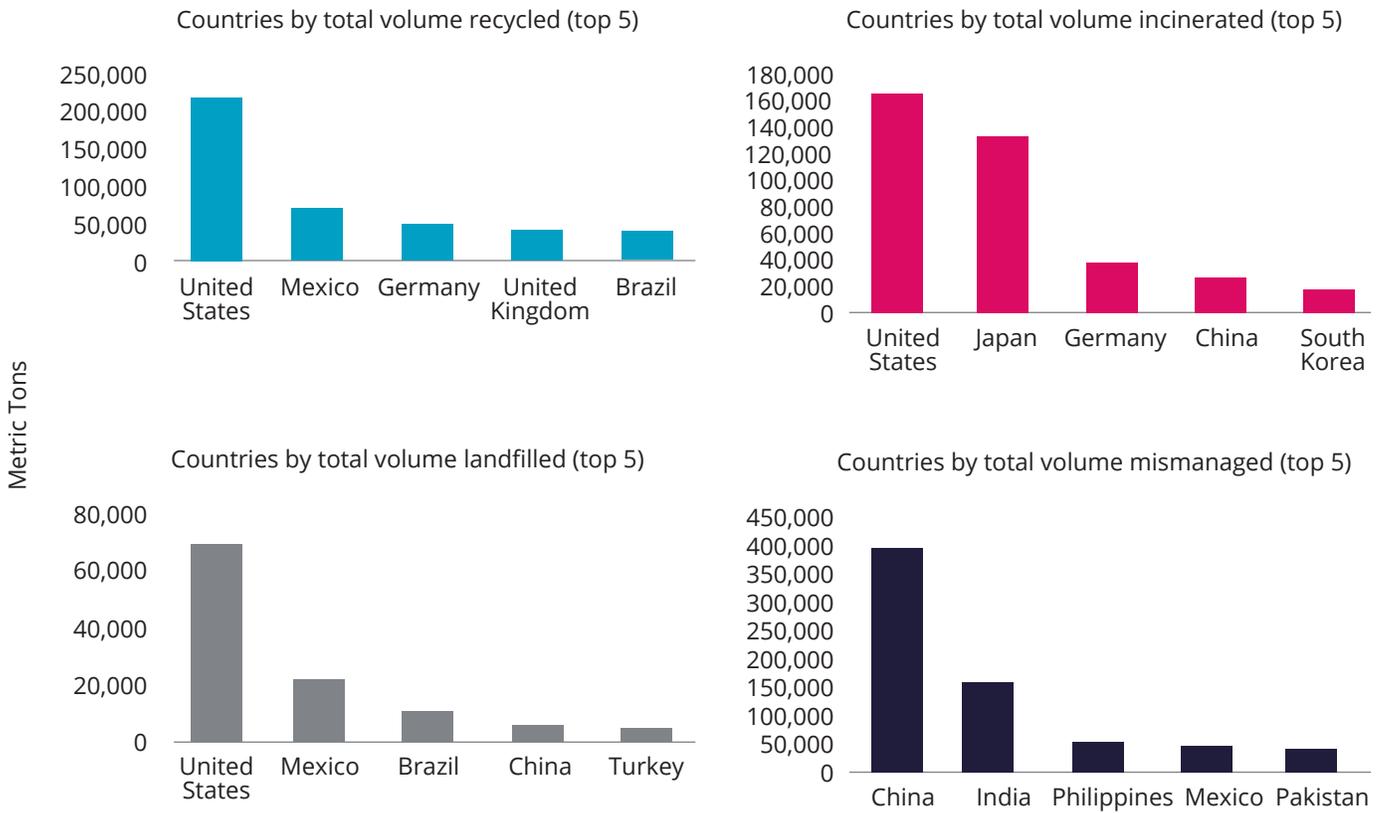
low tonnage in those regions (5.8%, 5.5%, and 4.2% of the global plastic footprint, respectively). Finally, the Europe and Central Asia region has the fourth largest plastic footprint in terms of tonnage, but also has the highest recycling rate at 36%, which translates to a decrease in landfilled and mismanaged plastics. The landfill rate for Europe and Central Asia is their second highest estimated waste management pathway, at 35%.

Country Spotlights

As waste management is determined by the recycling and composting collection infrastructure available in a given country, the Tracker results help identify opportunities in key geographies to reduce mismanaged plastics and promote collection and recycling. Examining the five countries where Members had the highest volumes for recycling, incineration, landfill, and mismanagement can help prioritize geographies for mitigation and intervention (Figure 8). We provide general estimates in aggregate for all Members, and we also consider the top five countries for each Member, as data can be skewed by Members with higher overall reported plastic volumes. Because we are looking at volumes, the countries identified as having high opportunity for intervention will be heavily influenced by where Members reported the largest sales volumes. These countries may differ significantly from the countries with the highest recycling, incineration, landfill, or mismanagement rates in the global waste management model. For instance, based on estimates from Jambeck et al.,²⁷ China and India have mismanagement rates of 76% and 87%, respectively. However, Members reported significantly higher volumes in China, leading China to have a higher estimated volume of mismanaged waste in this analysis.

For total reported volume of plastic recycled, the United States is the top country by tonnage for all Members. The United Kingdom, Germany, and Japan are also in the top five countries for estimated recycled plastic volumes for three of the five Principal Members. For incinerated plastic, the US, Japan, Germany, and China are consistently within the top five countries across the Members. For landfilled plastic, the United States is the top country in terms of estimated volume of landfilled plastic for all Members, with Mexico also frequently showing up in the top five. China, Brazil, the United Kingdom, and Canada are also within the top five for landfilled plastics across at least two Members. Lastly, for mismanaged plastic,

FIGURE 8. *ReSource* Members' countries by total estimated volume (top five) for each waste management outcome.



China is the top country by volume for all Members who operate in the country, typically followed by the US, the Philippines, Indonesia, India, and Thailand, which are also seen in the top five across the Members' plastic footprints. The Philippines is within the top five countries for mismanaged plastic for all Members who operate in the country due to its high estimated mismanagement rate (83%).

Waste management context varies significantly across countries due to variations in local collection and recycling systems and waste processing infrastructure. Deeper dives into identified priority countries enable a more nuanced understanding of potential interventions, specifically to address landfilled and mismanaged plastics. Priority countries identified in the analysis are United States, Mexico, China, India, and the Philippines. Together, these countries represent 57.4% of *ReSource* Members' landfilled plastics, and 58.7% of Members' estimated mismanaged plastics.

The United States

The United States represents the highest reported volume of plastic use for each of the five Principal Members. It also has the highest estimated volumes of landfilled plastic, as landfill rates for all plastics in the US are 72% (71% and 78% for rigids and flexibles, respectively). However, as the management pathways of *ReSource* Members' plastic footprints are also dependent on the form types and polymers used, the estimated landfill rate for the *ReSource* Members' portfolio is 41%—lower than the US average. This is largely due to the high concentration of PET bottles in the Members' aggregate plastic footprint, and the in-country recycling rate of 29% for bottles, compared to a recycling rate of 9% for all plastics. Regardless, the high landfill rates and the high overall tonnage within the United States result in 17% of all *ReSource* Members' plastics ending up in US landfills—the highest estimated end-life destination across all countries and management outcomes. The US



also has the highest tonnage of recycled plastics (5.2% of all reported plastics) and is within the top two countries for incinerated plastics (4.0% of all reported plastics) across the Members. Further, although the US mismanagement rate for all plastics is only 2%, the sheer volumes of plastics sold there means that it is in the top five countries by estimated volume of mismanaged plastic for four of the five Principal Members. Reported waste management data for the US is generally of high quality due to statutory reporting responsibilities.

Mexico

Mexico, while only within the top five countries by reported volume for two of the five Members, is within the top five for landfilled plastic for four of the five Members. This is largely attributed to its high all-plastics landfill rate of 71%. However, the management pathways of *ReSource* Members' plastic footprint in Mexico are more closely aligned with the estimated management rates of rigids in Mexico (21% recycled, 0% incinerated, 64% landfilled, 14% mismanaged) than the all-plastics

management estimates. This is because of the high proportion of rigids to flexibles in the Members' portfolios.

Over 5% of *ReSource* Members' aggregate plastic footprint by reported volume is estimated to end up in Mexico's landfills, and Mexico is also within the top five countries for recycled and mismanaged plastic in the aggregate data. In Mexico, there are many areas where informal recyclers are responsible for large proportions of the recycling undertaken.²⁸ There is also a heavy reliance on landfilling of waste via both informal and sanitary landfills.²⁹

China

While the United States has the highest total tonnage, China is the country with highest tonnage of mismanaged plastics across all the Members who operate in the country due to its high estimated mismanagement rates. Due to limitations of the model in differentiating waste management outcomes for different packaging types in

China, the management outcomes of *ReSource* Members' plastic footprint in China closely match the overall estimated management rates for all plastics in the country.

With high mismanaged rates and a high total tonnage, China is considered a priority country for mitigating mismanagement risk. In China, recycling economies traditionally relied on large amounts of international plastics for recycling, while domestically, there was still a focus on developing collection systems and relying on landfills. It should be noted that over the past decade, China has had several campaigns to restrict imports of plastics, specifically through the Green Fence and National Sword campaigns in 2013 and 2018, respectively. From 2018 to 2019, Chinese plastic imports fell by 99%, according to some experts.³⁰ However, restricting plastic imports has been beneficial in making domestic recycling more valuable and a higher priority. Since early 2019, over 40 cities in China have piloted waste sorting programs for waste and plastics.³¹ The Tracker does not incorporate waste imported into China, and China waste management estimates are based primarily on data from 2015, and thus do not reflect potential improvements in domestic recycling over that time period. While this is true in several cases, it is notable for China in particular due to its priority and the recent changes to its waste management and recycling systems driven by the discussed policies.

The Philippines

As in Mexico, total plastic tonnage in the Philippines is not considerable compared with other countries (1.5% of the total plastic footprint); however, the high mismanaged rate of 83% places the Philippines in the top countries for absolute mismanaged tonnage for all the companies that operate in this country; it is almost always second to China in terms of potential mismanagement. Due to limitations of the model in differentiating waste management outcomes for different packaging types in the Philippines, the management outcomes of *ReSource* Members' plastic footprint in the Philippines closely match the general estimates for all plastics in the country. The Philippines' geography as an island nation with short pathways to the ocean contributes to its high estimated mismanagement rate, and international policies have driven change in recent years. In the Philippines, recycling economies providing infrastructure for global plastics supply and waste imports have nearly tripled from 2016 to 2018 due to the reallocation of restricted waste exports to China.³² Domestically, there is still a high reliance on landfilling of waste with limited source separation of recyclables.^{33,34}

India

India is second to China in terms of aggregate estimated volume of mismanaged plastics but is only in the top five countries for mismanagement for two Members. India's mismanagement rate of 87% is the highest among priority countries and is among the highest overall. In India, recycling economies have previously provided infrastructure for global plastics supply, but plastic import bans in March 2019 have mirrored China's approach—using import bans in March 2019 have mirrored China's rationale for import restrictions as an opportunity to invest in domestic waste management infrastructure.³⁵ Domestically, there is still a high reliance on landfilling of waste, with limited source separation of recyclables.³⁶



Member Case Studies

KEURIG DR PEPPER OVERVIEW AND GOALS

KDP is channeling their sustainability efforts to high-impact opportunities through their Drink Well. Do Good. corporate responsibility platform. The Company's portfolio includes more than 125 owned, licensed and partner brands such as Keurig®, Dr Pepper®, Green Mountain Coffee Roasters®, Canada Dry®, Snapple®, Bai®, Mott's®, CORE® and The Original Donut Shop®.

Keurig Dr Pepper's packaging goals, set or re-affirmed in June of 2019, are comprised of three main components:

1. Make all K-Cup® pods in the US recyclable by the end of 2020
2. Convert to 100% recyclable or compostable packaging by 2025
3. Use 30% post-consumer recycled content across the packaging portfolio by 2025

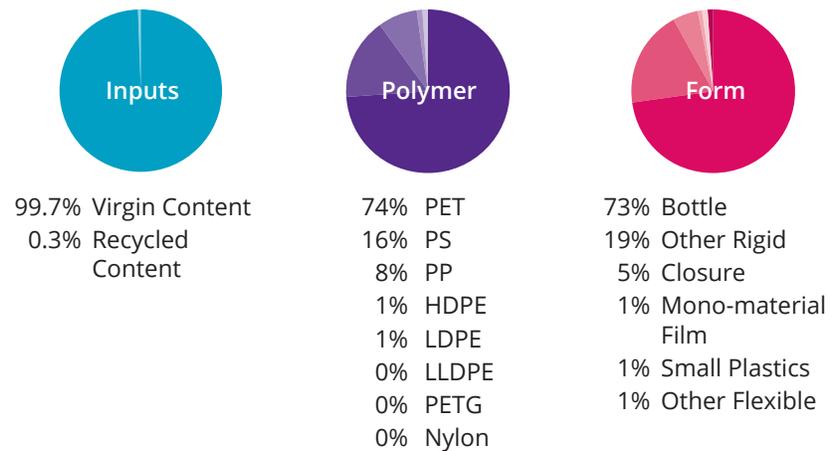
Eliminating packaging waste is a top priority for KDP, with a focus on holistic solutions that start with designing for recyclability and reducing the amount of material used. KDP's journey to ensure that K-Cup® pods are recyclable and recycled remains a critical priority.



Keurig Dr Pepper (KDP)

Data provided by KDP cover consumer-facing plastic packaging during the reporting period January 1, 2018 through December 31, 2018 for the United States, Mexico, and Canada, which is comprehensive of their wholly owned operations. Secondary packaging, transport packaging, and franchised bottled beverage volumes are out of scope for this assessment.

FIGURE 9. Input, polymer, and form distribution of Keurig Dr Pepper's plastic portfolio.



Keurig Dr Pepper has a significant proportion of PET bottles, which comprise 72% of their plastic footprint. Increasing the use of recycled PET or substituting PET with sustainably sourced biobased content pose viable opportunities for shifting to sustainable content. Collective action associated with improving actual recycling of bottles in the United States is also an identified opportunity in which KDP is already engaged. Specifically, KDP is a founding member and funder of the American Beverage Association's Every Bottle Back initiative, which aims to increase available-to-use recycled PET by 20% by 2030 through investments in collection and recycling sorting, as well as consumer education.³⁷

Another identified priority is related to polystyrene (PS) containers used for coffee pods which, at 16% of the portfolio in 2018, were a notable contributor to their total plastic footprint. In the US, only 0.4% of all PS and 1.8% of PS

packaging is recycled due to limitations on recycling infrastructure.³⁸ KDP has committed to completely eliminating PS from their packaging by 2020, redesigning K-Cup® pods to be made of PP.

Aligning with their commitment to eliminate unnecessary plastics, KDP has committed to invest in light-weight options to reduce sheer tonnage of plastic. In addition, the company develops package-free options, such as batch-brewed coffee and fountain drinks in reusable glassware. Identifying opportunities to scale up reuse or package-free options in specific markets is a key area of action for KDP. Lastly, KDP's market is concentrated in the United States where landfill rates are high; therefore, the management outcome of their portfolio is dependent on the overall performance of the US waste management and recycling system. Engaging in collective action efforts and policy advocacy in the US is identified as a significant opportunity for KDP, including the enabling of reuse and other alternative models.

INSIGHTS FROM KDP:

The Tracker results have strong alignment with KDP's current efforts and strategy. For example, KDP has already made significant efforts regarding packaging design for recyclability, with a focus on high-value materials such as PET and PP. Smart design and material choice at KDP include eliminating unnecessary plastic use, enabling recycling, and facilitating the use of recycled plastic — all outcomes aligned with the goals of ReSource: Plastic. KDP also designs packaging materials to be the highest value possible for recycled plastic buyers. Current examples of KDP's efforts include replacing dark-colored plastics with clear plastic, making bottle labels and caps compatible with recycling processes, and pursuing consumer education campaigns on 'recycle right' behavior to reduce contamination in the recycling stream.

KDP is also focusing on material substitution for polystyrene (PS) containers. KDP has committed to transitioning 100% of its K-Cup® pods from PS and into recyclable, all white polypropylene (PP) by the end of 2020. In Canada, KDP's transition to the PP container was completed in 2018, two years ahead of its publicly stated goal. Through this process, KDP did extensive testing with material recycling facilities (MRFs) and communities to ensure that the product was not only recyclable by design, but that it would be recyclable in practice.

The initial pilot of the ReSource Footprint Tracker has illuminated useful insights across participating companies and highlights areas of common polymer use and form applications. The data reinforces KDP's partnership and collaboration strategy to affect change and deepen impact. KDP launched this strategy in 2014 as an initial investor in the Closed Loop Fund and supporter of community projects led by The Recycling Partnership in the US. KDP is now mobilizing on

McDONALD'S CORPORATION OVERVIEW AND GOALS

With more than 38,000 locations in over 100 countries and 69 million guests served daily, McDonald's is one of the world's largest restaurant chains. McDonald's recognizes the opportunity to use its scale to take action on some of these most pressing social environmental challenges. That's why McDonald's launched its Scale for Good commitments, which address five key areas where it believes it can have the greatest global impact, including packaging and recycling. The majority of McDonald's global packaging portfolio by weight is fiber (78%) with the remaining comprised of plastics (22%).

McDonald's wants to use its global scale to help accelerate a circular economy and has made two key commitments:

- 1. Source 100% of McDonald's guest packaging from renewable, recycled, or certified sources by 2025. This includes an interim goal to source 100% of primary fiber-based guest packaging from recycled or certified sources where no deforestation occurs by 2020.*
- 2. Recycle guest packaging in 100% of McDonald's restaurants by 2025. McDonald's understands that recycling infrastructure varies from city to city and country to country but plans to be part of the solution and help influence powerful change.*

material-specific, regional collaborations for PET with the American Beverage Association and for PP in both the US and Canada. In order to optimize plastics recycling in Canada, KDP co-founded the Circular Plastics Task Force with several other companies. The Task Force aims to identify and trial concrete solutions to align market needs with the plastics recycling value chain and to build a circular plastics economy in that country. Overall, KDP has committed over \$26 million to collaborative projects and partnerships across the value chain in North America to encourage the circular economy.

While the Tracker's data inputs will require improvement over time, the results will demonstrate the impact of companies investing in the future and will show progress—something which will be critical for reusable solutions. In addition to significant volumes of refillable beverage servings available as batched brewed coffee, fountain beverages and reusable glass bottles that are currently not evident in a beverage company's plastic footprint, new options and investment in reuse infrastructure is critical. In 2018, KDP invested in LifeFuels, Inc., to accelerate the commercialization of their reusable, portable drink maker.



McDonald's Corporation

The data provided by McDonald's covers consumer-facing plastic packaging, excluding pre-packaged items, during the reporting period January 1, 2018 through December 31, 2018, with some data carried over from 2017. Almost 93% of McDonald's restaurants are owned by franchisees and therefore due to tracking complexities this data represents an estimated 75% of the company's total sales volume. Secondary packaging and transport packaging are out of scope for this assessment. Overall, plastics make up about 22% of McDonald's global packaging portfolio with the remaining 78% being fiber.

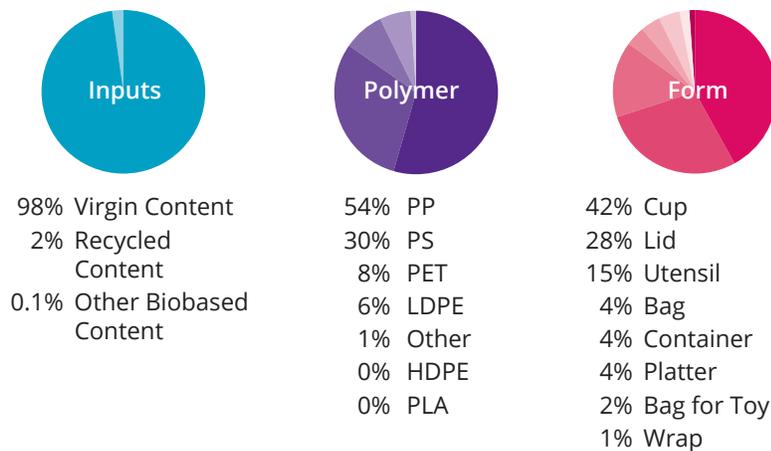
Cups are the most prevalent form in McDonald's plastic footprint, comprising 42% of all plastic. This is followed by lids at 28% and utensils at 16%. Utensils are classified as small plastics which, due to their size and shape, have limited acceptance in recycling systems across geographies.³⁹ Exploring opportunities for substitution or reuse models for small plastics, as well as reuse models for cups, is an identified opportunity. McDonald's is already exploring this opportunity for cups and lids, including reuse models, redesigning packaging to minimize material use, and switching to different materials. For smaller plastics such as utensils, McDonald's is testing alternative materials, including fiber.

McDonald's has a small amount of recycled content (2%) and biobased PLA (0.1%) in their packaging portfolio, including salad bowls and bags in the US and

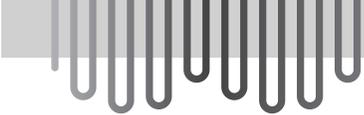
cups and lids in European markets. PP is 54% of McDonald's plastic footprint, mostly represented by cups. Currently, there are challenges in the use of recycled PP for food contact applications, including an extremely limited supply, which constrains opportunity to scale its use across product lines. This is a challenge for McDonald's sourcing goal and directly informs the recommendations focusing on increasing PP recycling in the US.

McDonald's market concentration is in the US, and therefore, the waste management outcomes of their portfolio are largely dependent on the overall conditions of the US waste management system. McDonald's also has an added in-store opportunity to increase recycling and composting through optimization of in-store recycling systems and customer engagement. As part of their Scale for Good goals, McDonald's committed to globally increasing recycling efforts, including testing in-store recycling separation.

FIGURE 10. Input, polymer, and form distribution of McDonald's plastic portfolio.



Finally, building upon and enhancing data collection efforts will enable more robust insights regarding potential mismanagement pathways for McDonald's. Targeted waste audits in high mismanagement risk locations (e.g. China, the Philippines, the United States, Thailand, Indonesia) will help identify the most important action points moving forward. Expanding data collection efforts will enable analysis of a broader swathe of McDonald's supply chain in the future, to increase the threshold of coverage beyond 75%. McDonald's identified this as a need in 2018 and continues to expand data collection efforts across the globe, which will be reported annually through *ReSource*.



INSIGHTS FROM McDONALD'S

The McDonald's packaging and recycling strategy looks at the company's plastic footprint and beyond, encompassing a range of initiatives to reduce the use of packaging, switch to more sustainable materials and help customers reuse and recycle. McDonald's has partnered at a global and market level, including with Quantis on the Plastic Leak Project, in order to help find solutions to drive change at scale.

McDonald's is pleased to see the findings in this report are aligned with the direction of their packaging and recycling strategy, with a strong focus on circularity. While some plastic packaging is necessary to maintain food quality, safety, and reduce food waste, finding ways to first eliminate unnecessary plastic use and then to responsibly manage those waste streams is key to reducing plastic pollution. McDonald's believes that transparent reporting and working collaboratively across the industry will enable the collective advancement of solutions which help address plastic waste.

McDonald's focuses on four key strategies to make progress on the Scale for Good packaging goals:

- Eliminate packaging through design innovation, reusable solutions, and encouraging behavior change. This includes reducing plastic in guest packaging which is hard to recycle, is not needed for safety or functionality, and is likely to leak into the environment, such as straws, plastic bags and cutlery.*
- Shift materials to use 100% renewable, recycled or certified content and streamline the variety of materials used to enable customers to more easily recycle packaging, without compromising on quality and performance.*
- Recover and recycle by finding ways to scale up systems to allow for greater acceptance of recycling, and making it easier for guests to recycle. This includes partnering with companies and non-profit organizations to support the development and expansion of recycling programs for plastics and using local restaurants to support community level anti-litter initiatives such as consumer communication campaigns and clean-up days.*
- Close the loop by using more recycled materials, including recycled plastic content, in packaging, restaurants, and facilities, and helping to drive global demand for recycled content.*

As part of these strategies, McDonald's uses its restaurants as mini innovation hubs to conduct pilot tests around the world. This allows for immediate customer feedback and identification of the best solutions to accelerate and scale across multiple markets.

- Since the end of 2018, all centrally managed guest packaging does not use foam for any local guest packaging items.*

- *McDonald's is working on increasing the recoverability of existing cups as well as exploring additional solutions for cups. This includes becoming a founding partner of the NextGen Consortium, to improve the recoverability of the fiber to-go cup and to test reusable cup schemes. In Germany, McDonald's is piloting a program called ReCup, where customers can ask for a reusable coffee cup and return it at partnering restaurants to be cleaned and reused.*
- *Across France and in some restaurants in Canada, McDonald's has introduced an innovative new fiber lid for cold drinks which replaces the plastic lid and is made from 100% certified sustainable sources and recyclable materials. In France alone this change will save 1,322 metric tons of plastic per year.*
- *The McFlurry ice-cream packaging no longer requires a separate plastic lid in Australia and some markets in Asia, and this will be fully implemented across Europe by the end of 2020.*
- *An evolved, more durable, paper straw is being rolled out across Europe. In addition, McDonald's is offering straws upon request in several markets to cut down material use and drive behavior change.*
- *McDonald's is working to find a more sustainable solution for plastic cutlery globally and is currently testing alternatives, including transitioning to wooden cutlery in Australia.*

McDonald's is expanding its focus beyond packaging including the toys in Happy Meals. A global working group is exploring the development and production of more sustainable Happy Meal® toys, and markets around the world are currently testing different options. Specific toy sustainability initiatives vary market-to-market. As an example, in March 2020, McDonald's UK and Ireland pledged to remove non-recycled and non-renewable hard plastic from its iconic Happy Meal® toys. From 2021, every Happy Meal® in the UK & Ireland will include either a soft toy, paper-based toy, or book.



Procter & Gamble (P&G)

The data provided by P&G covers the company's consumer-facing plastic packaging for the reporting period July 1, 2018 through June 30, 2019, with an estimated completeness of 90% for all polymer types. Because P&G tracks data regionally, regional plastic tonnages were proportionately divided among countries that account for 80% of sales in each region to calculate country level estimates. Secondary packaging and transport packaging are out of scope for this assessment.

PROCTER & GAMBLE OVERVIEW AND GOALS

P&G serves consumers around the world, with brands including Always®, Ambi Pur®, Ariel®, Bounty®, Charmin®, Crest®, Dawn®, Downy®, Fairy®, Febreze®, Gain®, Gillette®, Head & Shoulders®, Lenor®, Olay®, Oral-B®, Pampers®, Pantene®, SK-II®, Tide®, Vicks®, and Whisper®. P&G operates in approximately 70 countries worldwide.

P&G's Ambition 2030 Environmental Sustainability program includes a number of goals specific to packaging, including:

- *100% recyclable or reusable packaging*
- *Decreasing our use of virgin petroleum plastic packaging by 50%*
- *Finding solutions to ensure no P&G packaging finds its way to the ocean*

As we advance progress against these goals, we are guided by three overarching principles:

- *Lifecycle Thinking: Plastic packaging can drive significant and meaningful benefits such as*

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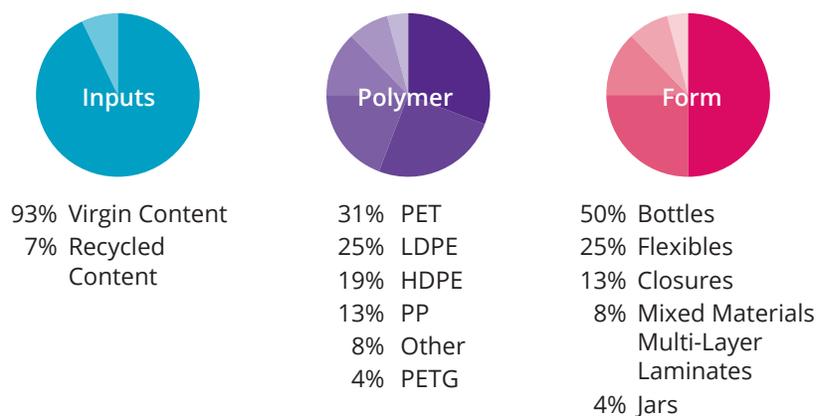
Proctor & Gamble overview continued

product protection, consumer safety, and GHG emission benefits. As we assess packaging material and design choices that drive greater circularity, we are careful to look at full lifecycle implications to help guide our choices and avoid unintended consequences.

- **Waste Management Hierarchy:** *We subscribe to the waste management hierarchy and as much as feasible seek to progress our efforts towards the higher order and preferred solutions within the hierarchy, starting with source reduction and reuse.*
- **Collaboration:** *The challenge of plastic waste is bigger than any one company, and we believe collaboration across the value chain and with civil society and governments will be key to driving solutions at scale. That is one of the reasons why we joined ReSource: Plastic—it represents an opportunity to work with WWF and industry leaders seeking to drive reporting tools, which can help better inform where strategic interventions are needed.*

Based on the data provided for this pilot, half of P&G's plastic footprint is HDPE and PET bottles, a quarter of their plastic footprint is LDPE flexibles, and an eighth is comprised of PP closures. Seven percent of the portfolio is recycled content, which is exclusively in bottles. P&G has a goal to reduce use of virgin plastic in their packaging by 50% by 2030. The intention is to achieve this goal through a combination of eliminating unnecessary plastic, increasing use of recycled content, redesigning products, and using alternative materials. While recycling systems exist in some geographies for mono-material films, global recycling rates for flexible films as a broad class are low (1-2%). This represents an opportunity for redesign as well as collective action on collection and recycling. PP also generally has low recycling rates and low availability of recycled material, and represents an opportunity for collective action to improve recyclability in priority regions.

FIGURE 11. Input, polymer, and form distribution of Procter & Gamble's plastic portfolio.



Approximately one-third of P&G's plastic footprint is in the US, while about one-sixth is in China. Due to high estimated mismanagement rates in China and high landfill rates in the US, these two countries are priorities for action. By 2030, P&G aims to have no P&G packaging entering nature as pollution, which will require broad changes in waste management systems, especially in these key locations.

Finally, since P&G reported regional data, targeted data collection efforts in high mismanagement risk countries (e.g., China, India, the Philippines) can help validate the Tracker's baseline findings and provide more detailed insight for strategy and action planning.

INSIGHTS FROM PROCTER & GAMBLE

The initial pilot of the ReSource Footprint Tracker proved to be helpful by reinforcing the importance of several elements of our plastics strategy, and identifying areas where tracking and reporting could be enhanced. Elements of our existing strategy that were validated or informed by the initial exercise included:

- The Tracker highlighted that the largest portion of our plastic footprint is in the United States, which has the highest volume of landfilled waste. While landfilling in the US serves to prevent leakage, increasing recycling rates in the US represents a significant opportunity to drive greater circularity in the use of plastics. Our efforts with groups like the Closed Loop Fund and The Recycling Partnership, who are focused on increasing recycling rates in the US, are a key part of our approach to address this opportunity.*
- The Tracker highlighted that while our plastic footprint in Southeast Asia was a relatively small portion of our overall plastic footprint, the high mismanagement rates in several countries in the region made it a major contributor to P&G's overall mismanaged waste. This was one of the key drivers for P&G to play a leadership role in the formation of the Alliance to End Plastic Waste, which is a cross-value chain effort to invest \$1.5 billion over five years in solutions that will help stop the flow of plastic to the world's oceans.*
- The Tracker highlighted that ¼ of our plastic footprint was flexible packaging, which has a relatively low recycling rate. This reinforces the importance of efforts like Materials Recovery for the Future, where we have partnered with several other companies to demonstrate the feasibility of curbside collection of flexible films. A large-scale pilot is now underway in the United States, and our intent is to broadly share outputs from the pilot to enable reapplication of what we believe will be a success demonstration of curbside collection of flexible film.*
- The Tracker highlighted polypropylene (PP) as a relevant resin for P&G which has a relatively low recycling rate. This is why we are advancing efforts like Purecycle, a technology developed by P&G scientists that takes recovered PP and returns it to near virgin-like state, which we have now licensed externally for commercial development. Based on the insights the tracker provided on polypropylene, we are also actively exploring collaboration opportunities with Resource members and other partners such as The Recycling Partnership that would serve to drive greater recycling of polypropylene.*

The Tracker pilot also highlighted areas where enhancing data collection and reporting can help better inform future efforts. For example, from a waste management standpoint, it highlighted the global need to get better data on the management outcome of packaging in key geographies to better target specific interventions that can have the greatest impact. From a plastic footprint standpoint, we have been tracking our use of packaging on a global and regional basis

STARBUCKS COFFEE COMPANY OVERVIEW AND GOALS

Aligning with its organizational vision, Starbucks is looking ahead with a heightened sense of urgency and conviction that we must challenge ourselves, think bigger, and do much more in partnership with others to take care of the planet we share. In January 2020, we announced our commitment to pursue a bold, multi-decade aspiration to become resource positive and give more than we take from the planet.

Starbucks has set preliminary targets for 2030 that will be the focus of our research and operational plans over this next year:

- *A 50% reduction in carbon emissions in our direct operations and supply chain.*
- *50% of our water withdrawal for direct operations and coffee production will be conserved or replenished with a focus on communities and basins with high water risk.*

continues next page

for many years. The initial pilot allowed us to better understand the value of having more granular country specific tracking, and we will be working towards that objective.



Starbucks Coffee Company

The data provided by Starbucks include all consumer-facing and 'behind the counter' plastic packaging for US company-operated stores during the reporting period October 1, 2017 through September 30, 2018. The company's global plastic footprint for all company-operated and licensed stores was extrapolated based on the average plastic use of US company-operated stores and per-country store counts. Country- and region-specific data on polymer types were applied to the extrapolated numbers. Secondary packaging, transport packaging, non-store operations, and Starbucks' CPG business are out of scope for this assessment.

Cold cups comprise 46% of Starbucks' plastic footprint, and are composed of PP in the US, and PET in other markets. PP closures (lids for both hot and cold cups) comprise 12% of Starbucks' plastic footprint. These polymers and forms vary in their acceptance for recycling. Exploring substitution, redesign, and reuse options is an opportunity to enable Starbucks to achieve their goal of removing unnecessary plastics from supply chains and operations and potentially piloting circular business models. As part of Starbucks' recently announced sustainability commitment, they will prioritize the shift from single use to reusable packaging.

Starbucks sources a small amount of recycled content (6%) and a smaller amount of biobased content in the form of PLA (1%); however, the majority of their content is conventional virgin. A current barrier to achieving their above goals is the limited availability of recycled PP approved for food contact applications.

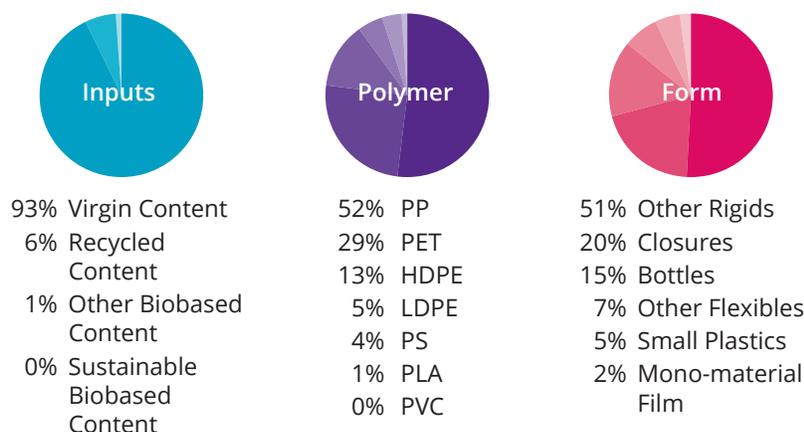
Fifty percent of Starbucks' plastic footprint is in the United States, while the next highest market is China with only 12% of their plastic footprint. The US and China both have relatively high landfilling rates, and China has a high estimated mismanagement rate, making these two markets the priorities for action. Starbucks has made a commitment to become resource positive, including eliminating waste and moving to reusable packaging.⁴⁰ Focusing this work in the identified priority regions is an opportunity to maximize outcomes and has the potential to accelerate uptake of reusable systems and improve recycling, composting, and collection across the restaurant and beverage sectors.

Finally, since Starbucks reported extrapolated data based on plastic use in US stores, targeted data collection efforts in high mismanagement risk countries

(particularly China, Indonesia, and the Philippines) can help validate the Tracker's baseline findings. Enhanced data collection efforts in the future would ensure a strong data foundation for more specific action plans and opportunity evaluation.

While the recycling rate for PET is higher than other polymer types, this is driven by water and soda bottles. Thus, it is not necessarily true for PET food service packaging when compared to PP food service packaging. Both rigid PP and rigid PET (non-bottles) are equivalent in their levels of recyclability claims and labeling in the most recent guidance from How2Recycle.⁴¹ More importantly, Starbucks intentionally chooses PP for its cold cups, because on a per cup basis, it has a 35% lower carbon footprint than one made from PET, based on a comparative Life Cycle Analysis conducted by Starbucks. This is because PP allows for significantly less material by weight than PET, due to its lower density and higher performance properties.

FIGURE 12. Input, polymer, and form distribution of Starbucks' plastic portfolio.



INSIGHTS FROM STARBUCKS

Regarding the Tracker findings focused on unnecessary plastics, Starbucks is well on the way to reducing its single use plastic usage. Starbucks is taking specific actions in alignment with this analysis, namely:

- In July 2018, Starbucks announced it would phase out plastic straws from more than 30,000 stores worldwide by 2020. The new lightweight, strawless cold drink lid will complete its roll out in 2020. The core PP straw will be replaced with an alternative material later in early 2021.

Starbucks overview continued

- A 50% reduction in waste sent to landfill from stores and manufacturing, driven by a broader shift toward a circular economy. To underscore this commitment, Starbucks joined Ellen MacArthur Foundation's New Plastics Economy Global Commitment, setting ambitious circular targets for our packaging, as well as the ReSource: Plastic platform to measure our progress and implement meaningful interventions.

This is an aspiration that we take on, recognizing it will come with challenges and will require transformational change. We also know that leadership in sustainability takes commitment, investment, innovation, and partnership, and so we are excited to work with WWF and the ReSource: Plastic Members to reduce plastic waste.

THE COCA-COLA COMPANY OVERVIEW AND GOALS

The Coca-Cola Company's vision of a World without Waste guides their approach to this topic. They work to reduce the impact of packaging waste on the environment through partnerships with bottling partners, NGOs, regulators, retailers, local communities, and competitors. The development of more complete data and metrics is critical to advancing this work. In January 2018, The Coca-Cola Company established three fundamental goals:

- Make packaging 100% recyclable globally by 2025—and use at least 50% recycled material in our packaging by 2030.
- Collect and recycle a bottle or can for each one sold by 2030.
- Bring people together to support a healthy, debris-free environment.

Underlying these three goals is the need for more inclusive collection rates to include all consumer packaging, for stronger accounting of plastic packaging that reflects the breakdown of packaging by units sold, and for the use of more meaningful metrics to drive progress toward stated goals.

- Starbucks is continuing R&D efforts to find alternative materials for difficult-to-recover plastics, reduce plastic usage through lightweighting, and incorporate recycled plastic into our packaging.
- In January 2020, Starbucks announced they will prioritize the shift from single use to reusable packaging.
- Starbucks assesses all new packaging items as well as changes to existing items by completing a full life cycle analysis to inform the business as it shifts to a more sustainable packaging offering

To further commit to making operations more sustainable, in 2019 Starbucks joined the Ellen MacArthur Foundation New Plastics Economy to make the following commitments:

- Take action to help eliminate problematic or unnecessary plastic packaging by 2025
- Take action to move from single-use towards reuse models where relevant by 2025
- 100% of plastic packaging to be reusable, recyclable, or compostable by 2025
- Use 5-10% recycled content across all plastic packaging used by 2025

More broadly, Starbucks recognizes that its targets and aspirations will come with challenges and will require transformational change. We also know that leadership in sustainability takes commitment, investment, innovation, and partnership. For these reasons, we are excited to continue working with WWF and the ReSource: Plastic Members to reduce plastic waste.

THE *Coca-Cola* COMPANY

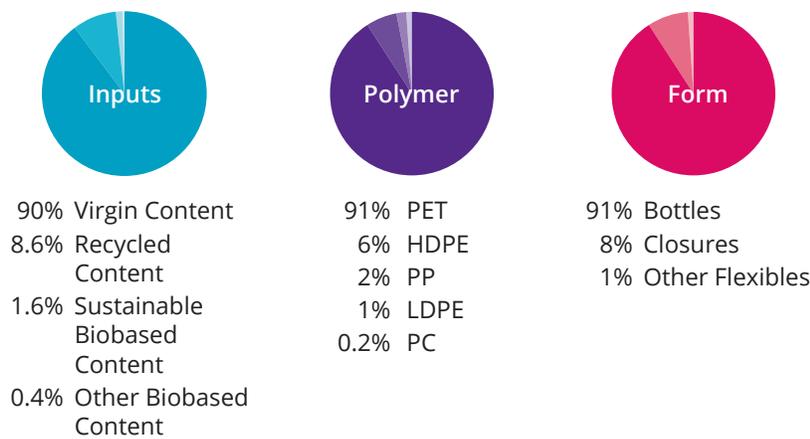
The Coca-Cola Company

The data provided by The Coca-Cola Company covers all consumer-facing plastic packaging during the reporting period January 1, 2018 through December 31, 2018. Secondary packaging, transport packaging, and packaging items with volumes over three liters or three kilograms are out of scope for this assessment. Closures and labels were not reported separately; however, the volume of closures was estimated by WWF based on understanding of global industry averages and The Coca-Cola Company's regional split of resin type usage for closures.

The Coca-Cola Company's reported plastic footprint is 91% comprised of PET bottles, which have high recyclability generally around the world. The next highest reported volume form is closures representing 8% of their reported footprint (75% of closures comprised of HDPE, and 25% comprised of PP). Finally, LDPE flexible plastics are 1% of The Coca-Cola Company's reported footprint.

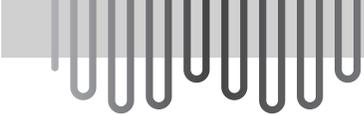
The Coca-Cola Company has completed several activities focused on reuse, including a portfolio analysis, piloting, and implementation of key reuse initiatives. They have set a goal focused on innovating technologies, such as the Coca-Cola Freestyle® soda fountain, to enable the use of reusable cups/bottles; this aligns with *ReSource's* goal of eliminating unnecessary plastics. The Coca-Cola Company has also invested USD \$25 million in reusable PET bottles and \$400 million in expanding reuse infrastructure.⁴² The company has set specific reuse targets—e.g., a target of 50% reusable packaging by 2030. Setting and reporting on reuse targets in key markets are increasingly important components of public commitments.

FIGURE 13. Input, polymer, and form distribution of Coca-Cola Company's reported plastic portfolio.



Nine percent of The Coca-Cola Company's bottles are made of recycled content, while 2% of bottles and 2% of their plastic footprint are made of responsibly sourced biobased content. The Coca-Cola Company has set a goal of at least 50% recycled materials for packaging by 2030. Activities working toward this goal include 100% rPET bottles in 16 countries, including Japan, the Philippines, Peru, Western Europe, and South Africa.

The company also aims to collect and recycle the equivalent of every bottle and can it sells globally by 2030, which will require beyond supply chain action given varying regional capacities. Regional priorities for promoting collection and recycling should include China, India, and Mexico. While in North America (United States and Canada) the recycling rate for bottles is 29%, according to the analysis The Coca-Cola Company's highest reported usage volumes by region are in Latin America and the Caribbean, where recycling rates for rigids are approximately 21% (specific bottle recycling rates were unavailable). Based on the Tracker analysis, the most significant countries for mismanagement are China and India, respectively.



It is important to acknowledge the current limitations in publicly available data regarding waste management outcomes for PET bottles. Robust, publicly available waste management data is only available for a select few regions of the world (primarily North America and Europe). Due to their value and recyclability, it is likely that PET bottles are recycled at a higher rate than most other plastic packaging items, including in areas of high mismanagement. However, without robust polymer- and form-specific data to substantiate this, we often have to rely on data sources for plastics more broadly. The current analysis may therefore underestimate recycling rates and overestimate mismanagement rates for PET bottles in many regions. Utilizing beverage industry estimates to inform future iterations of the waste management model is being explored.

INSIGHTS FROM THE COCA-COLA COMPANY

The takeaways from this analysis are aligned with many activities already underway at The Coca-Cola Company. In addition to the efforts on reuse and recycled content discussed in the analysis, activities to address closures are being pursued. Aligned with the need to reduce and redesign small plastics, the Coca-Cola company has been leading the industry in lightweighting of closures, removing approximately 20% of plastic from these compared with three years ago. On the use of recycled plastic, in addition to increasing the use of rPET in bottles, the first ever recycled HDPE content in closures was launched in 2019 in Dasani® products.

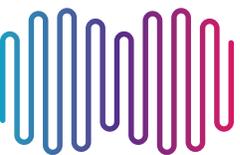
Additionally, increasing transparency about packaging footprints is critical in helping industry, government and key stakeholders prioritize areas of action. But significant data gaps exist across supply chains, particularly on the fate of packaging materials after use by consumers.

Beverage packaging is some of the most highly collected material in plastics recycling, as PET is a high value plastic that can sustain a circular economy. However, collection and recycling rates for PET beverage containers are not yet fully reflected in models that look generally at all plastics. We need to learn from what's working in some areas and apply it more broadly to others.

As examples, 2018 collection rates for PET as reported by the beverage industry were 77% for China, 82% for India and 56% for Mexico. And these rates didn't happen by accident. Recycling programs targeted at beverage containers are successful in many markets. In Mexico, the cross-industry platform, ECOCE, raises awareness about recycling, encourages consumers to recycle and helps support informal sector collection. Organizations like PetStar turn old bottles into new bottles, and through high rates of collection, we are even able to produce bottles with 100% recycled content, as we now do in over 16 markets.

Industry has a real role to play in helping improve data on the fate of packaging materials in the marketplace. We need our industry peers and supply chain partners to engage in platforms like ReSource plastic so we get an accurate picture of the global situation, and can prioritize future collective action.





Recommendations for Action

The pilot year of *ReSource: Plastic* identified several key takeaways for Members to target when developing interventions, as well as broader insights on what actions and information are needed for the private sector to drive progress on the plastic pollution crisis. These learnings and opportunities have been categorized below using the three goals that *ReSource* strives for: eliminating unnecessary plastic, shifting to sustainable inputs for remaining plastic, and doubling global recycling and composting. All three of these categories of action are needed, as there is no one action that can solve the plastic waste crisis. Therefore, one product or application may need multiple action points—for example, moving to a reuse system for some demand, and also working to increase recycled content in the portion that can't be changed to a reusable system. *ReSource's* Principal Members intend to use the takeaways from this analysis to inform their strategies and focus action, and they will share learnings and progress in the next report.

Eliminating Unnecessary Plastic through Business Model Innovation, Reduction, and Substitution

BUILD ON EFFORTS TO REDUCE AND REDESIGN SMALL PLASTICS

Small plastics, such as utensils, coffee stirrers, and straws less than two 2x2 inches in two dimensions, are a significant category for three of the five *ReSource* Principal Members. Small plastics are often not incorporated into the recycling stream,⁴³ which presents opportunities to implement reduction and substitution in some cases, and to improve uptake into recycling streams via sorting equipment (initial or secondary), collective action, product design, and/or policy engagement in others. Members have committed to working toward eliminating specific single-use plastics, and this should remain a priority. For example, Starbucks has committed to eliminating plastic straws across global stores and providing reuse products for in-store consumer consumption.

EXPLORE REUSABLE PACKAGING AND SERVICE SYSTEMS

Reuse systems are estimated to have the potential to replace 20% of single-use plastic packaging,⁴⁴ and several *ReSource* Members have identified these systems as key to their strategies moving forward. Opportunities exist, particularly for cups, utensils, and other high-volume, low-recyclability products, especially in high-volume and densely populated markets. The baseline results indicate that implementation on this front is very much still in testing phases across the board. Drivers for the relatively small volumes reported in reusable formats likely include both the fact that these efforts have only begun relatively recently, and lack of existing supports for reusable formats (in regulations, in retail settings, etc.). Setting and reporting on reusability targets at the country level are recommended, as conditions are highly variable. Additionally, collaboration on localized solutions (i.e., across companies operating in the same area) should be investigated, as these have proven successful under certain conditions. In order for reusable packaging systems to be successful on a significant scale, cooperation across supply chains and industries is needed, and restaurants and retailers must engage the public to test promising models.

Shifting to Sustainable Inputs for Remaining Plastic

SCALE RECYCLED CONTENT AVAILABILITY AND USE THROUGH COLLECTIVE ACTION

Recycled and responsibly sourced biobased content of plastics ranged from 0.4% to 11.3% across all five Members, with higher concentrations in some markets and for some package types, like bottles in Europe. These results call out a clear need to accelerate the use of recycled content and support continued efforts to promote industry-wide availability and adoption of recycled content. Collective action around sustainable inputs and disincentivizing virgin plastic should continue to be a priority for Member portfolios. Compared to the Members' goals, the current level of recycled content is low and indicative of the larger challenge around availability of consistently high-quality recycled resin. This is true for all plastics, even the most widely recycled PET bottle.

While many companies have committed to increasing their recycled content in the coming years, evidence indicates that the current supply of recycled plastic is not sufficient to meet demand for high-quality recycled plastic.⁴⁵ Furthermore, the current recycling infrastructure in the United States, identified as an opportunity due to high landfill rates and reported sales volumes, is insufficient to deliver on our shared circular economy goals, and according to The Recycling Partnership will require \$500 million in investments to meet demand and function effectively.⁴⁶

There are examples of successful recycling markets in some places, providing a proof point of what is possible. So far, bottles have been the most significant application of recycled content, and films are the second largest (for secondary and non-contact packaging).⁴⁷ There are several cases of policies mandating the use of recycled content in certain products—these include the European Union (requirement for 30% recycled content for bottles by 2030) and for Oregon in the US.^{48,49} Learning from previous successes in scaling recycled content can help accelerate current efforts.⁵⁰

Collective action in this space, where many stakeholders commit to purchasing recycled content in future years,

can be especially beneficial in bolstering markets, as it signals continued demand. However, as has been seen in the past, it can be a challenge to make progress when price parity between recycled and virgin content does not exist. Leaders are needed who follow through on commitments to sourcing recycled plastic, even when the market price of recycled content is above that of virgin plastic.

In order to further deliver on high-quality recycling streams, action to increase the recyclability of plastic packaging is a complementary effort to the use of recycled content. This means following existing standards for recyclability and reducing the variety of material composition, additives, and colors, aiming for a harmonization of plastic materials. Simplifying the plastic palette can enable a cleaner and more efficient recycling stream.

INCREASE USE OF SUSTAINABLY SOURCED BIOBASED CONTENT WHERE APPROPRIATE

As with recycled content, the supply of sustainably sourced biobased content will need to increase in order to meet the demand laid out in company commitments in upcoming years. Sustainably sourced biobased content can play an important role in the circular economy, filling in demand for virgin plastic after reduction and reuse strategies have been prioritized and when recycled content is not available or cannot be used for the application.

Sourcing biobased content must be done within the context of the One Planet Perspective, ensuring that our sourcing decisions are respecting the limits of nature and not trading one negative impact for another. Biobased plastic can provide environmental advantages over virgin fossil-based plastic, but it must be sourced and managed responsibly to realize this potential. Metric-based decision making⁵¹ and adherence to a credible standard such as the Roundtable for Sustainable Biomaterials⁵² are highly recommended. The Bioplastic Feedstock Alliance, convened by WWF, provides thought leadership on the responsible sourcing of bioplastics, and the role of bioplastics in circular systems.⁵³ Biobased plastics are not a solution for plastic pollution, as they face the same end-of-life challenges as traditional plastic, and in most cases are as likely to become plastic pollution as fossil-based plastics. If appropriately sourced, they may offer environmental advantages over

their fossil-based counterparts, but there is still a need to drive interventions to improve end-of-life management of these materials.

Doubling Global Recycling and Composting of Plastic

INCREASE POLYPROPYLENE RECYCLING IN THE US, AND INCREASE ITS USE IN CORPORATE SUPPLY CHAINS

PP is significant for four of the five Principal Members and is the highest-reported-volume polymer for two of the Members. Currently, there is a huge mismatch between demand for high-quality, recycled PP and actual availability of recycled PP. According to the Association of Plastic Recyclers (APR), in North America alone, demand for recycled PP holds at 1 billion pounds annually.⁵⁴

Incorporating a larger share of recycled PP into existing PP supply chains can reduce the direct consumption of crude oil and gas and achieve energy savings as compared to virgin PP. Despite previous challenges in recycling polypropylene, The Recycling Partnership released a joint statement along with Closed Loop Partners, The Association of Plastic Recyclers, and GreenBlue in February 2020 in support of polypropylene as a valuable material in the circular economy whose recycling at scale is possible.⁵⁵ There is an opportunity for industry collaboration to increase PP recycling in the US, including improving quality and bolstering markets for recycled PP. There are specifics to be considered, including availability of clear recycled PP, and the acceptance (and consistent quality to warrant acceptance) of recycled PP for food contact. Collective action opportunities on this topic are emerging, such as the Polypropylene Recycling Coalition led by The Recycling Partnership.

DEVELOP ACTION PLANS THAT FOCUS ON THE LARGEST COUNTRY-LEVEL OPPORTUNITIES

While the highest estimated volumes of mismanaged plastic are concentrated in East and South Asia (specifically China and India), countries vary in significance for each company's footprint. The Philippines was the second-highest country for estimated mismanagement volume for several companies, following China. Other

notable countries for mismanagement in Asia include India, Indonesia, and Thailand. Within Latin America, Mexico is in the top five countries for mismanagement for four *ReSource* Members. Although there are limitations to current mismanagement estimates, the regions identified in this report provide an important opportunity for action for *ReSource* Members. We encourage companies to contextualize these insights with findings from other data sources, whether internal reports or industry sources, to ensure a robust approach. More broadly, we recommend that companies undertake the Tracker assessment or similar measurement activities to understand the largest opportunities for action and create country-level action plans.

Although the US has a low estimated mismanagement rate (2% for all plastics), it has very high reported sales volumes and therefore is listed in the top five countries from a volume perspective for estimated mismanagement. Further, the high landfill rates of 72% in the United States makes it the top country for landfilled plastics across the plastic footprint of all Member companies and presents the single largest opportunity to increase recycling.

For this reason, the United States, Mexico, China, India, and the Philippines were identified in the analysis as priority countries for the Members to foster systems improvements in waste management collections and processing. Together, these countries represent 57.4% of *ReSource* Members' landfilled plastics, and 58.7% of Members' estimated mismanaged plastics.

IDENTIFY OPPORTUNITIES TO INCREASE RECYCLING IN SPECIFIC GEOGRAPHIES

As waste management footprints in these countries will always be dependent on the overall performance and function of country waste management systems, efforts to increase recycling and composting and close leakage points at a system level are necessary to successfully address the issue. While individual companies have limited and variable influence in this arena, they can amplify this influence by joining collective action efforts. Such efforts can take the form of engagement in country level dialogues for improved policy and regulatory measures for waste management systems and the implementation of circular systems in the identified

geographies, specifically targeted at addressing high mismanagement rates in China and Southeast Asia and high landfill rates in North America and Latin America and the Caribbean.

Additionally, opportunities to collaborate with NGOs and conservation groups to improve recycling and engage local waste pickers could also be explored in China and Southeast Asia where informal waste management is high.^{56, 57} However, these projects require strong social and environmental safeguards, and are therefore currently time and resource intensive. Project standards, which are currently emerging on this topic, have the potential to reduce barriers to engagement on these activities if they are created and managed according to best practices that ensure inclusion and environmental performance.^{58, 59}

Other Opportunities

FILL DATA GAPS AND SHARE INFORMATION

There are ongoing challenges for data collection and quality related to the production, use, disposal, and waste management outcomes of plastics. As a global community, we need more complete data from multiple stakeholders—cities, national level agencies, and companies. The low and medium data confidence underlying many of the Tracker's results underlines this need. At the national level, there is a demand for consistent reporting of municipal solid waste management (MSW) using standardized definitions. Until more comprehensive MSW reporting is rolled out, any mitigation strategies will be based on an incomplete understanding of rates of collection, sanitary landfill, recycling, composting, and other forms of management at a country level. The highly variable data quality and lack of country-level reporting on this issue represent a significant impediment to prevention of plastic leakage. Innovation is necessary to accelerate data collection, as it is clear that traditional national reporting is not currently sufficient. However, which innovative methods will be practical and reliable remain to be seen. It is the intention of *ReSource* to further explore how this acceleration can be accomplished. Furthermore, long-term success will likely require policy action at an international level, to ensure consistent reporting across borders.⁶⁰

Areas for action on this topic over the next year for Member companies could include 1. identifying opportunities for improvement in supply chain data collection (e.g., selecting locations and providing transparent protocol for waste or supply chain audits depending on company structure), 2. refining internal data collection for a year two assessment based on the pilot's lessons learned, and 3. targeting data collection to high-mismanagement-risk locations.

The lack of data on waste management globally is a shared challenge—no one institution can address it alone, and coordinated collective action is needed. *ReSource: Plastic* will continue to drive progress on this front through public release of our Tracker methodology and advocacy for improved measurement by companies and at national levels through relevant government agencies. International coordination of plastic data collection efforts will vastly improve our ability to make science-based decisions regarding plastics sustainability and reduction of plastic pollution.

Additional data gaps for future research and reporting include more comprehensive data collection focused on China, particularly due to the recent changes in its waste management and recycling industries in recent years; information on recycling for different plastic types (e.g., rigid vs. flexible); updating and refining information regarding the scale and relevance of informal recycling in key markets; and information regarding the prevalence of industrial and home composting for plastic. The latter is important in order to establish a baseline for the prevalence of composting,⁶¹ which is necessary to track progress and design interventions appropriately. *ReSource: Plastic* will continue to look for opportunities to accelerate and amplify current data collection efforts.



Thought Partner Insights



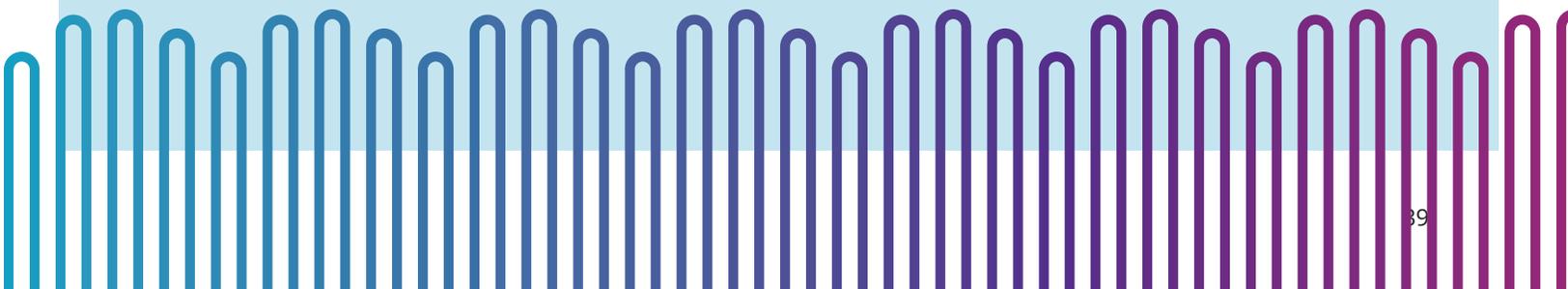
This initial report provides valuable insights, including the types of plastics being utilized across geographies. This is critical as it may ultimately allow for greater mitigation efforts, such as the elimination of unnecessary plastic and/or allow for redesign to support higher recycling rates through consolidation. It is also important to recognize that this is just the beginning of the data collection and there is a lot more we can learn as more data is provided. The Footprint Tracker has the potential to track real progress made by these and additional companies in the years ahead. We look forward to seeing the results and tying them to the work of the Trash Free Seas Alliance.”

– Edith Cecchini, Project Director for Corporate Strategy and Policy, Ocean Conservancy



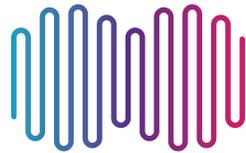
In the past few years it has become evident that we must radically speed up the transition to a circular economy for plastic, in which it never becomes waste or pollution. We must eliminate the plastics we don't need, innovate to ensure that the plastics we do need are reusable, recyclable, or compostable, and circulate all the plastic items we use to keep them in the economy and out of the environment. The New Plastics Economy Global Commitment has brought unprecedented transparency on industry action, highlighting progress on elimination of and innovation for plastic packaging. We welcome WWF's inaugural *ReSource: Plastic* report as a step towards building further transparency on the circulation and after-use fate of plastic packaging across different geographies.”

– Sander Defruyt, Lead of the New Plastics Economy initiative at the Ellen MacArthur Foundation





Moving Forward



ReSource: Plastic aims to fill a critical gap by helping companies translate large-scale plastic commitments into meaningful and measurable action. In the first year since launch in May 2019, *ReSource* took the critical step of defining what “meaningful” and “measurable” look like through addressing an important missing piece of the puzzle: a common measurement framework. By measuring and tracking Members’ progress to the same standard, the *ReSource* Footprint Tracker bolsters accountability not just for individual companies, but across an entire system. It also enables companies to identify common pain points, which in turn can catalyze collective action toward solving them. The plastic pollution crisis requires solutions at scale that match its daunting scope—and through a common measurement framework, we are hopeful that collaboration will flourish and set the path toward transformational change. The baseline assessments shared in this report will provide that vantage point from which companies can not only collaborate effectively, but shape their strategies at large, and we look forward to reporting on the progress they yield next year and on an annual basis to follow.

Furthermore, we aim to adapt and improve as more information becomes available in the near future. Several significant efforts are underway across the spectrum of actors in this space, which we predict will advance the current knowledge state and enable more precision in solution pathways. Converging efforts will be key to success, and we are already working toward the goal of aligning metrics, reporting, and targeted interventions with our Thought Partners on their signature initiatives, The New Plastics Economy Global Commitment and The Trash Free Seas Alliance.

As our research demonstrates that 100 influential companies have the power to prevent roughly 10 million metric tons of plastic waste per year, we seek to recruit at least 100 *ReSource* Members. While there is a need for mitigation across many industry sectors, in the short term, *ReSource* will continue to target the food and beverage and fast-moving consumer goods sectors, while expanding our engagements into retail, hospitality, and technology. Long-term plans include a much more diverse portfolio of Member companies, from clothing and footwear to solution providers so that we can collectively meet the challenge of plastic pollution. While some companies have already set ambitious goals, others are just getting started, and all would benefit from a clear roadmap. Given limited time and resources, prioritizing actions to improve a company’s sustainability performance will continue to be a challenge. *ReSource: Plastic* provides the framework and the platform to drive progress in our shared fight against plastic pollution.

Glossary

Advanced Materials

Advanced products are those that are sustainably produced, mitigate climate change, and reduce the risk of fossil depletion. This term typically captures future materials innovations that are currently in the design stage or at a very small scale. We align with the Roundtable for Sustainable Biomaterials' Advanced Products Standard.

Bottle

A bottle is a form of rigid packaging having a comparatively narrow neck or mouth with a closure and usually no handle.

Source: ISO 21067: 2007

Closure

Closures include caps and closures that would be left on containers going to recycling. Caps/closures that would be disposed separately from the primary container would fall under small plastics (problematic to recycle as separate components due to size).

Compostable

Packaging or a packaging component is compostable if it is in compliance with relevant international compostability standards and if its successful post consumer collection, (sorting), and composting are proven to work in practice and at scale.

Source: EMF Global Plastics Commitment

Durable Product

Durable goods are products with a life span of three years or more.

Source: US Environmental Protection Agency

Mismanaged Waste

We follow the definition of mismanaged waste outlined by Jambeck et al. 2015: "material that is either littered or inadequately disposed." Mismanaged waste typically includes uncontrolled landfills and open dumps, waste that is not collected, and waste that is littered. Thus, this value is not how much plastic enters the ocean, but rather a potential volume that is not adequately managed, which has the potential to enter ecosystems.

Mono-material Film

Recycled content is post consumer recycled content and does not include pre-consumer recycled content.

Post consumer recycled content is defined as the proportion, by mass, of post consumer recycled material in a product or packaging.

Shrink Film

Shrink film is a plastic material that shrinks in size when heated to conform to the item(s) packaged.

Source: ISO 21067: 2016

Stretch Wrap

Stretch wrap is a material that elongates when applied under tension and which, through elastic recovery, conforms to item(s) packaged.

Source: ISO 21067:2016

Other Flexible

Other flexible includes multi-material/laminate films.

Other Rigid

The "other rigid" category is used to capture rigids that are not classified as bottles, closures, foamed rigids, or small plastics.

Recyclable

Packaging or a packaging component is recyclable if its successful post-consumer collection, sorting, and recycling are proven to work in practice and at scale. A package is considered recyclable if its main packaging components, together representing greater than 95% of the entire packaging weight, are recyclable according to this definition, and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components.

Source: EMF Global Plastics Commitment

Recycled Content

Recycled content is post consumer recycled content and does not include pre-consumer recycled content.

Post consumer recycled content is defined as the proportion, by mass, of post consumer recycled material in a product or packaging..

- Pre-consumer recycled content is defined as material diverted from the waste stream during a manufacturing process.

Source: ISO 14021:2016

Responsibly Sourced Biobased Content

Responsibly sourced biobased content is, at a minimum:

1. Legally sourced;
2. Derived from renewable biomass and must pose no adverse impacts on food security;
3. Does not have negative impact on land conversion, deforestation, or critical ecosystems; and,
4. Must provide environmental benefits.

Credible certifications such as the Roundtable on Sustainable Biomaterials certification can help ensure responsible sourcing. Together, we consider responsibly sourced biobased content and post consumer recycled content as constituting sustainable plastic inputs.

Source: Bioplastics Feedstock Alliance (<https://bioplasticfeedstockalliance.org/>)

Rigid Foam

Forms under the “rigid foam” category include rigid products made from foamed polymers, typically polystyrene (PS).

Small Plastics

Small plastics are items smaller than 2 inches in two dimensions require testing to determine the appropriate APR recyclability category. These small packages are lost to the plastic recycling stream.

Source: The Association of Plastic Recyclers

Sustainable Plastic Inputs

Sustainable plastic inputs as referred to throughout this report include recycled content, responsibly sourced biobased content, and advanced materials.

Unnecessary Plastic

Unnecessary plastic is plastic that, if not used, would not create adverse environmental or social trade-offs—related to, for example, energy use, food waste, or quality of life.

Polymer Classification

List of Polymers for Single Use Plastics Abbreviation

List of Polymers for Single Use Plastics	Abbreviation
Acrylonitrile-butadiene-styrene copolymer	ABS
Ethylene vinyl alcohol	EVOH
High-density polyethylene	HDPE
Low-density polyethylene	LDPE
Linear low-density polyethylene	LLDPE
Nylon	Nylon
Other	Other
Polybutylene adipate terephthalate	PBAT
Polybutylene succinate	PBS
Polybutylene succinate adipate	PBSA
Polycarbonate	PC
Polyethylene furanoate	PEF
Polyethylene terephthalate	PET
Polyethylene terephthalate Glycol	PETG
Polyhydroxyalkanoate	PHA
Polylactic acid	PLA
Polypropylene	PP
Polystyrene	PS
Polyvinyl chloride	PVC
Polyvinyl alcohol	PVOH

Appendix

TABLE A1. Form description and classification

Packaging Classification	Form Category (Column E)	Form Category Definition	Form Description Examples (Column)
RIGID	Bottle	A form of rigid packaging having a comparatively narrow neck or mouth with a closure and usually no handle. <i>Source: ISO 21067:2007</i>	Bottle
	Closure	Includes caps and closures that would be left on containers going to recycling. Caps/closures that would be disposed separately from the primary container would fall under small plastics (problematic to recycle as separate components due to size)	Screw caps on plastic bottles
	Rigid Foam	Rigid products made from foamed polymers, typically Polystyrene (PS).	Foamed products like EPS cups, foamed PS plates, egg cartons, meat and produce trays
	Other Rigid	Category used to capture rigids that are not classified as bottles, closures, foamed rigids, or small plastics.	Solid cups, jars, disposable utensils, thermoforms, trays, blisters, non-foam clamshells
RIGID/FLEXIBLE	Small Plastics	Items smaller than 2 inches in two dimensions require testing to determine the appropriate APR recyclability category. These small packages are lost to the plastic recycling stream. <i>Source: APR</i>	Plastic coffee sticks, coffee pods
	Raw Material	Polymer used as raw material for manufacturing plastic products or packaging	Polymer pellets used as primary content of molded or extruded product; polymer used as coating or barrier material
FLEXIBLE	Mono-material Film	Includes monomaterial stretch and shrink films or monomaterial film bags and sacks that are suited for recycling. Shrink film: plastic material that shrinks in size when heated to conform to the item(s) packaged. <i>Source: ISO 21067-1:2016</i> Stretch wrap: material that elongates when applied under tension and which, through elastic recovery, conforms to item(s) packaged. <i>Source: ISO 21067-1:2016</i>	Pallet wrap, stretch or shrink wrap around products for shipment, single-use plastic grocery bags
	Other Flexible	Other Flexible would include multi-material/laminate films.	Direct product packaging, laminated beverage or food pouches, metallized films, snack bags and wrappers

TABLE A2. List of countries reported by *ReSource* Members and the regional groupings used in the analysis.

Region	Country
Africa	Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Chad, Comoros, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe
East Asia	China, Hong Kong SAR, Japan, Republic of Korea, Taiwan
Europe & Central Asia	Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Turkmenistan, Ukraine, United Kingdom, Uzbekistan
Latin America & Caribbean	Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Curaçao, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, Venezuela
Middle East	Bahrain, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates, Yemen
North America	Bermuda, Canada, United States
Oceania	Australia, Fiji, French Polynesia, New Caledonia, New Zealand, Papua New Guinea, Samoa
South Asia	Afghanistan, India, Pakistan
Southeast Asia	Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam

ReSource Footprint Tracker

Methodology

PART 1: RESOURCE FOOTPRINT TRACKER DATA SURVEY

The ReSource Footprint Tracker data survey is an Excel-based tool shared with Member companies for data entry and returned to WWF for analysis. The survey was developed by ERG (Eastern Research Group, Inc.), with review and input from World Wildlife Fund, key Thought Partners, and Member companies in fall 2019. The key data fields required for each product or packaging type include country (in which the product is ultimately used and disposed), form category and description,⁶² polymer type, weight, percent recycled content, percent biobased content, and a mono-material or multi-material designation.⁶³ Additionally, companies can indicate whether these plastics are compostable, recyclable, durable, or reusable based on standardized definitions. In cases where companies manage their waste internally or have other insights into how their plastic waste is managed, companies can report this information directly.

Additional portions of the survey request that companies provide high-level company and contact information, as well as information on the reporting period, scope of the data provided, and the company's plastic goals and commitments. The ReSource Footprint Tracker is intended to gather data covering a company's entire direct operations, as determined by the company, across all business units, brands, and geographies. This includes consumer-facing packaging, back-of-house packaging, and transport packaging, and both single-use and reusable or durable plastics. In cases where companies are unable to report on the full scope of their operations, this is indicated in their submission.

PART 2: RESOURCE FOOTPRINT TRACKER PLASTIC WASTE MANAGEMENT MODEL

The ReSource Footprint Tracker plastic waste management model is designed to estimate the share of consumer-facing plastic packaging for individual companies that is recycled, landfilled, incinerated, or mismanaged.

To develop the model, Anthesis first conducted a literature review of publicly available data sources on recycling, landfill, incineration, and mismanagement rates for plastics and constructed a country-level waste management database.⁶⁴ As there is currently not a complete data set available for the global flows and management of plastic waste, Anthesis used this database as a basis for developing assumptions to fill in the remaining data gaps. Advice from an expert in plastic waste management was used to fill in data gaps and inform and verify the assumption development. The identified data sources provided the following:

- **Waste management information at various levels of material.** E.g., some data sets look at all waste materials (including plastic), others at plastic waste, others at plastic packaging waste, and still others at specific formats and/or plastic resins.
- **Varying levels of completeness of waste management data for each country.** E.g., some data sets only provide information on one form of management (such as recycling), whereas others provide information for the complete set of management systems.
- **Different number of countries within the data set.** E.g., some data sets are only relevant to the European Union, and in some cases, there is information at a regional level but not for specific countries within the region.

Plastic waste management data was evaluated across two dimensions: (1) tier, based on the level of granularity of the waste management data; and (2) assumptions made, based on robustness of the data source and/or the number of assumptions used to calculate the management rates.

The model uses six tiers of data with increasing specificity to identify the management of single-use plastic packaging (Figure A1), from all solid waste (Tier 1) to specific polymers and packaging forms e.g. PET bottles (Tier 6).

For each assumption, a level of confidence has been applied using the following confidence rating (Table A3).

FIGURE A1. Tiered Approach Taken to Identify and Report on the Management of Plastic Waste

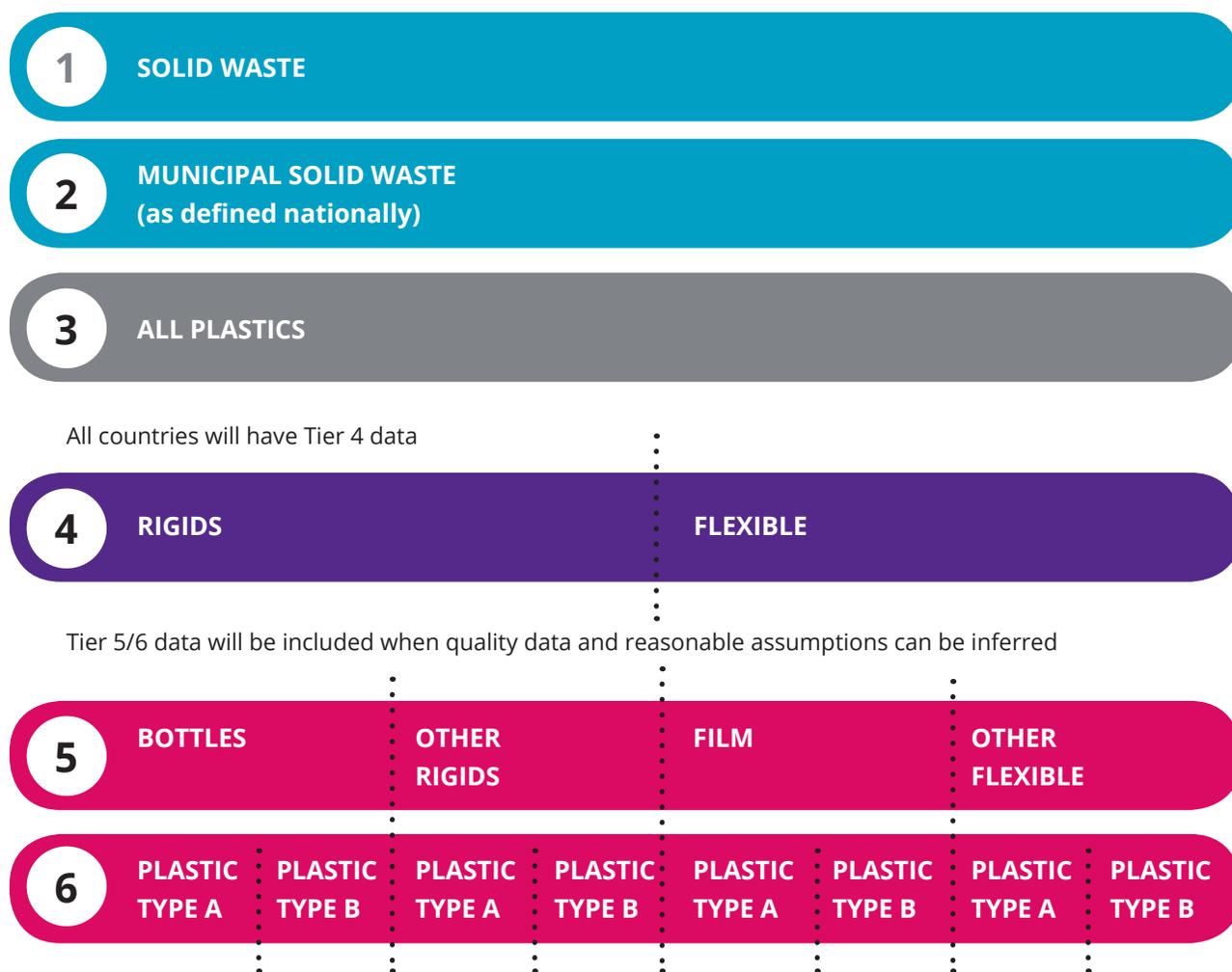
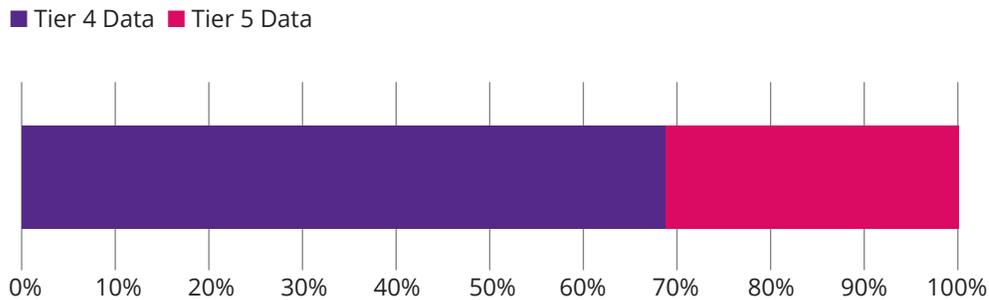


TABLE A3. Confidence ratings applied to each data output.

Confidence Level	Description/Criteria of Source Data
HIGH	Robust data set, specific to country and waste management tier
MEDIUM	Robust data set, but estimated from a lower waste management tier or proxy data
LOW	Limited data set

FIGURE A2. Proportion of Tier 4 and 5 data used to calculate waste management outcomes of *ReSource* Members' aggregate plastic footprint.



Waste Management Data

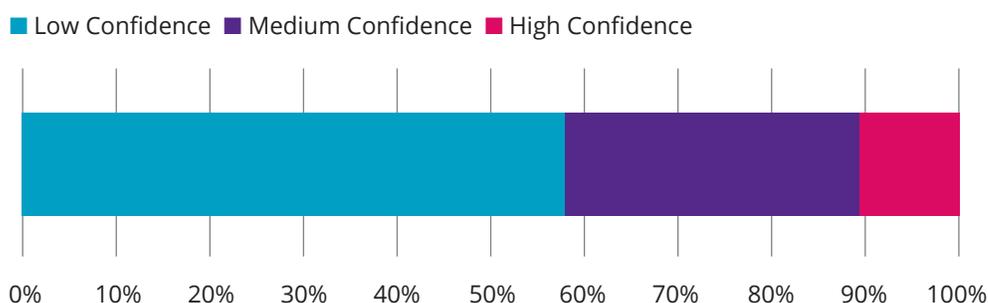
Most reported waste management data for plastic is aggregated for all plastics (Tier 3). At this tier, country-level plastic recycling rate data is either sourced, assumed to be similar to a comparator country, or estimated based on Anthesis' knowledge and engagement with an external expert on secondary plastics. The model's country-level mismanagement rates are based on those estimated by Jambeck et al.⁶⁵ If landfill and incineration rates specific to plastic are not available, estimates from the World Bank's *What a Waste 2.0* report⁶⁶ are used to apportion the remaining material after taking account of recycling and mismanagement. Reported rates may be adjusted to allow for consistency across all waste management pathways (e.g., to ensure that all rates add up to 100%).

Waste management rates for rigid and flexible plastics were either calculated using the ratio of recycling rates for rigids and flexibles in Europe based on the Waste and Resources Action Programme (WRAP)⁶⁷ and Deloitte Sustainability and Plastic Recyclers Europe⁶⁸ and then multiplied by the Tier 3 all-plastics recycling rates for the remaining countries. Mismanagement estimates from Jambeck et al.⁶⁹ are applied across all waste management tiers, meaning estimated mismanagement is currently the same for rigids and flexibles. This does not reflect known trends that flexibles are mismanaged at higher rates than rigids and has been identified as a desired key improvement area in the next version of the model.

All countries in the model have waste management rates for rigid and flexible plastic (Tier 4), and additionally, countries in North America and Europe have form-specific rates (Tier 5) for bottles, "other rigids,"⁷⁰ and mono-material film. The model does not currently utilize any polymer- and form-specific rates (Tier 6). This limits the ability of the analysis to differentiate waste management pathways for specific packaging types (e.g., PP cups) from their broader category (e.g., rigid plastic). The model is designed for assumptions to be easily updated as better information is published, and this information will be reviewed and available updates incorporated prior to 2021 reporting.

In order to generate each company's model results, packaging forms that have form-specific (Tier 5) data are first analyzed, multiplying the total tonnage of that packaging form by the estimated recycling, landfill, incineration, and mismanagement rates. For the remaining forms, rigid and flexible (Tier 4) rates were applied. Although additional assumptions are generally needed as waste management estimates become more form-specific, incorporating this data allows the results to more accurately reflect each company's individual portfolio. This is particularly important for portfolios predominantly composed of PET bottles, which are known to have a significantly higher recycling rate than other forms (half of PET bottles are recycled globally, reaching 80%–90% in some markets, as compared to the 14% global average for all plastics in 2013).⁷¹ The waste management pathways were estimated using Tier 5 data for about 31% of *ReSource* Members' aggregate tonnage, with the remainder using Tier 4 data (Figure A2).

FIGURE A3. Proportion of high-, medium-, and low-confidence data used to calculate waste management outcomes of *ReSource* Members' aggregate plastic footprint.



In terms of confidence level, waste management pathways were estimated using high-confidence data for about 10% of *ReSource* Members' aggregate tonnage, and 34% and 56% for medium- and low-confidence data, respectively (Figure A3). High-confidence data primarily includes form-specific (Tier 5) recycling rates in North America and Europe. Medium-confidence data includes calculated recycling rates for rigids and flexibles (Tier 4), calculated using robust data for all plastics (Tier 3), and mismanagement estimates for Tier 4 and Tier 5, reduced from the high-confidence rating for Tier 3 mismanagement estimates. Landfill and incineration estimates, which in many cases are based on World Bank estimates for all municipal solid waste (Tier 2), account for most of the low-confidence data. This reliance on low-confidence data directly underlines the need for better data collection and sharing, described in our calls to action at the conclusion of this report.

Limitations and Assumptions

In this initial baseline assessment, several limitations are present.

First, the model estimates waste management outcomes and does not provide any estimate of plastic pollution inputs into the environment (e.g., the ocean or freshwater) specifically. While mismanaged plastic is likely to be leaked, this is also influenced by local factors like weather, infrastructure, etc., which are beyond the scope of the current waste management model.

Second, waste and recycling rates are not globally defined, and national reporting frameworks for each country differ. For example, while management reporting for the United States is generally of high quality due to statutory reporting responsibilities, in many countries in Africa, there are limited formal collections for waste, which restricts the extent of waste management reporting.

Third, informal recycling rates make it difficult to collect reliable data, which can lead to underestimation in cases where informal recycling is significant. It was estimated that globally, informal recycling rates ranged from 20% to 30% in low-income economies.⁷² In India, it is estimated that urban waste recyclers can decrease the amount of waste sent to landfills by 70%.⁷³

Fourth, materials may be sent for recycling but may not be recycled (e.g., black plastic, multilayer film bags, paper coffee cups lined with PE), which can lead to an overestimation of recycling rates in some cases.

Finally, data on waste imports and exports is not included in this version of the model. In the United States, plastic waste exports equaled 1.7 million metric tons (MT) in 2017.⁷⁴ However, the EPA estimates that the United States generated 32.1 million MT of plastic waste in 2017, indicating an export rate of approximately 5.3%. Due to recent waste import restrictions from China in 2017, US waste exports went down from 1.7 million MT in 2017 to 1.1 million MT in 2018. However, globally, plastic waste export and import are still significant and have been identified as key to improving future model updates.

PART 3: BEYOND SUPPLY CHAIN SURVEY

The Beyond Supply Chain survey is an Excel-based component of the Tracker survey.

Member companies are asked to report information about efforts to reduce plastic pollution outside their direct operations to develop an understanding of the scope and locations of such projects, as well as their potential and actual impact. Beyond Supply Chain data is primarily qualitative and was not integrated with the quantitative data of companies' plastic footprint. However, Beyond Supply Chain information can be paired with information about plastic waste management to inform strategy for reducing plastic leakage into the environment.

In the pilot year of the ReSource Footprint Tracker, WWF and Member companies prioritized data collection and development of metrics for companies' direct plastic footprint. The Beyond Supply Chain survey poses a relatively high reporting burden given the large number of activities in which our Members are engaged and often requires significant coordination with other business units or regional offices. There is also currently not a consistent framework for reporting on the impact of projects or investments targeting plastic pollution reduction. WWF and Member companies will continue improving data collection and alignment with relevant third-party initiatives for the Beyond Supply Chain survey in upcoming reporting cycles.

ReSource Footprint Tracker—Lessons from the Pilot

How will the ReSource Footprint Tracker look in the future? First, Member companies will continue to report data on an annual basis, and as new Members join *ReSource*, they will complete a baseline assessment during their first year of membership. WWF will publish a report annually that will track Members' progress and provide accountability against their goals.

Second, we have identified key opportunities for updates and improvements to the ReSource Footprint Tracker based on learnings from the pilot year. In the next reporting year, WWF will work with Members to further standardize (and where relevant, expand) the scope of operations on which companies report, ensure consistency in data gathering processes and methods for imputing or extrapolating to fill data gaps, and apply best practices identified in this report.

Third, WWF will initiate the development of a web-based version of the ReSource Footprint Tracker in order to streamline the data gathering and analysis process and enable use by a larger number of companies. The launch of the web-based tool is tentatively scheduled for May 2021.

Finally, in terms of the waste management model, WWF will update the database as new information on plastic waste management becomes available. The priorities will be improving data confidence for all plastics (Tier 3) and rigids/flexibles (Tier 4) estimates globally, particularly in regions that currently rely on assumptions and proxy data, and providing better coverage of form- and polymer-specific data (Tiers 5 and 6), particularly in regions that have high reported volumes for our Members and high estimated mismanagement. This includes data that would allow the model to differentiate mismanagement rates for rigids and flexibles, as well as specific packaging forms. A longer-term goal is to integrate global trade flows of plastic waste into the model.

Endnotes

- 1 It is also important to acknowledge that the current 2020 COVID-19 pandemic has introduced new challenges and ways of operating within our economic and materials systems. The information presented in this report was collected before the impact of COVID-19 and does not reflect any emerging trends connected to the pandemic.
- 2 We follow the definition of mismanaged waste outlined by Jambeck et al. 2015: “material that is either littered or inadequately disposed.” For more information, see the Glossary.
- 3 “The APR Design Guide for Plastics Recyclability.” The Association of Plastic Recyclers, 2018. https://plasticsrecycling.org/images/pdf/design-guide/Full_APR_Design_Guide.pdf.
- 4 “The New Plastics Economy: Rethinking the Future of Plastics.” World Economic Forum, Ellen MacArthur Foundation, and McKinsey & Company, January 2016. <https://newplasticseconomy.org/publications/report-2016>.
- 5 “Marine Debris: Understanding, Preventing and Mitigating the Significant Adverse Impacts on Marine and Coastal Biodiversity.” Technical Series No.83. Secretariat of the Convention on Biological Diversity, 2016. <https://www.cbd.int/doc/publications/cbd-ts-83-en.pdf>.
- 6 Analysis conducted by WWF using data from UNEP, Trucost, and the Plastic Disclosure Project.
- 7 We rely on the ISO 14021:2016 definition of postconsumer recycled content, and the USDA definition of biobased content. Together, we consider postconsumer recycled content and responsibly sourced biobased content as constituting “sustainable” or “responsible” inputs. WWF follows the Bioplastic Feedstock Alliance’s definition of responsibly sourced biobased content; see Glossary for complete definitions.
- 8 Advanced products are those that are sustainably produced, mitigate climate change, and reduce the risk of fossil depletion. This term typically captures future materials innovations that are currently in design stage or at a very small scale. We align with the Roundtable for Sustainable Biomaterials’ Advanced Products Standard.
- 9 Secondary packaging can have a higher recycling rate than postconsumer plastic because it is generally possible to aggregate secondary packaging waste in relatively high volumes of homogenous material. For this reason, primary packaging was prioritized for this pilot.
- 10 2019 financial reports for the following companies:
 - “KO’s Competition by Segment and its Market Share.” CSI Market, 2019. <https://csimarket.com/stocks/competitionSEG2.php?code=KO>.
 - “KDP’s Competition by Segment and its Market Share.” CSI Market, 2019. <https://csimarket.com/stocks/competitionSEG2.php?code=KDP>.
 - “MCD’s Competition by Segment and its Market Share.” CSI Market, 2019. <https://csimarket.com/stocks/competitionSEG2.php?code=MCD>.
 - “PG’s Competition by Segment and its Market Share.” CSI Market, 2019. <https://csimarket.com/stocks/competitionSEG2.php?code=PG>.
 - “SBUX’s Competition by Segment and its Market Share.” CSI Market, 2019. <https://csimarket.com/stocks/competitionSEG2.php?code=SBUX>.
- 11 Geyer, R., J. R. Jambeck, and K. L. Law. “Production, use, and fate of all plastics ever made.” *Science Advances* 3, no. 7 (July 19, 2017). <https://doi.org/10.1126/sciadv.1700782>.
- 12 More recent estimated annual plastic production statistic unavailable.
- 13 Flexible plastics can be mono-material or comprised of multiple materials and laminates. These different compositions lead to different recycling capabilities and outcomes, with multi-material packaging typically posing additional recycling challenges.
- 14 “Advancing Sustainable Materials Management: 2016 and 2017 Tables and Figures.” US Environmental Protection Agency, November 2019. https://www.epa.gov/sites/production/files/2019-11/documents/2016_and_2017_facts_and_figures_data_tables_0.pdf. See pages 14 and 15 for recycling figures.
- 15 The small plastics category as reported in our baseline is primarily composed of straws, cutlery, and splash sticks. Bottle caps fall under the “closures” category, rather than the small plastics category.
- 16 “The APR Design Guide for Plastics Recyclability.” The Association of Plastic Recyclers, 2018. https://plasticsrecycling.org/images/pdf/design-guide/Full_APR_Design_Guide.pdf.
- 17 Davis, R. and C. Joyce. “Plastics: What’s recyclable, what becomes trash – and why.” NPR, August 21, 2019. <https://apps.npr.org/plastics-recycling/>.
- 18 “No Plastic in Nature: A Practical Guide for Business Engagement.” World Wildlife Fund, February 25, 2019. https://c402277.ssl.cf1.rackcdn.com/publications/1208/files/original/WWF_McK_Plastic_Waste_FinalWeb2.pdf?1560193480.

- 19 WWF believes that responsibly sourced biobased content at a minimum must be legally sourced; derived from renewable biomass; pose no adverse impact on food security; have no negative impact on land conversion, deforestation, or critical ecosystems; and provide environmental benefits — including near-term climate benefits — compared with fossil-based plastic. Credible certifications such as the Roundtable on Sustainable Biomaterials can help ensure responsible sourcing.
- 20 “The New Plastics Economy: Rethinking the Future of Plastics.” World Economic Forum, Ellen MacArthur Foundation, and McKinsey & Company, January 2016. <https://newplasticseconomy.org/publications/report-2016>.
- 21 “Plastics: Material-Specific Data.” US Environmental Protection Agency (blog), October 30, 2019. <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/plastics-material-specific-data>
- 22 “The New Plastics Economy: Rethinking the Future of Plastics.” World Economic Forum, Ellen MacArthur Foundation, and McKinsey & Company, January 2016. <https://newplasticseconomy.org/publications/report-2016>.
- 23 Region categories with countries can be found in the appendix.
- 24 Rounding is to the nearest whole number for regional management rates.
- 25 Waste management rates are generally based on averages for all plastics but have been adjusted to account for differences by form (subject to data availability).
- 26 “PlasticFlow 2025 – Plastic Packaging Flow Data Report.” Waste and Resources Action Programme, October 12, 2018. <https://www.wrap.org.uk/content/plasticflow-2025-plastic-packaging-flow-data-report>.
- 27 Jambeck, J. R., R. Geyer, C. Wilcox, T. R. Siegler, M. Perryman, A. Andrady, R. Narayan, and K. L. Law. “Plastic Waste Inputs from Land into the Ocean.” *Science* 347, no. 6223 (February 13, 2015): 768–71. <https://doi.org/10.1126/science.1260352>.
- 28 Botello-Álvarez, J. E., P. Rivas-García, L. Fausto-Castro, A. Estrada-Baltazar, R. Gomez-Gonzalez. “Informal collection, recycling and export of valuable waste as transcendent factor in the municipal solid waste management: A Latin-American reality.” *Journal of Cleaner Production* 182 (May 1, 2018): 485–495. <https://doi.org/10.1016/j.jclepro.2018.02.065>.
- 29 Rodriguez, A., M.L. Castrejon-Godinez, M.L. Ortiz-Hernandez, and E. Sanchez-Salinas. “Management of Municipal Solid Waste in Mexico.” Fifteenth International Waste Management and Landfill Symposium Conference Paper (November 2015).
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- 31 Kanthor, R. “After limiting imports, China aims to boost domestic plastic recycling.” *Plastics News*, December 11, 2019. <https://www.plasticsnews.com/news/after-limiting-imports-china-aims-boost-domestic-plastic-recycling>.
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- 33 Castillo, A. L., and S. Otoma. “Status of Solid Waste Management in the Philippines.” *Proceedings of the Annual Conference of Japan Society of Material Cycles and Waste Management* 24 (2013): 677. https://doi.org/10.14912/jsmcwm.24.0_677.
- 34 Mawis, S. M. D. “Solid Waste Mismanagement in the Philippines.” *Philippine Daily Inquirer*, May 18, 2019. <https://business.inquirer.net/270819/solid-waste-mismanagement-in-the-philippines>.
- 35 Staub, C. “India to end plastic scrap imports.” Resource Recycling (blog), March 6, 2019. <https://resource-recycling.com/recycling/2019/03/06/india-to-end-plastic-scrap-imports/>.
- 36 Kumar, S. S. R. Smith, G. Fowler, C. Velis, S. J. Kumar, S. Arya, Rena, R. Kumar, and C. Cheeseman. “Challenges and opportunities associated with waste management in India.” *Royal Society Open Society* 4 (2017). <https://soi.org/10.1098/rsos.160764>.
- 37 “Every Bottle Back.” American Beverage Association, 2020. <https://www.innovationnaturally.org/plastic/>.
- 38 “Advancing Sustainable Materials Management: 2016 and 2017 Tables and Figures.” US Environmental Protection Agency, November 2019. https://www.epa.gov/sites/production/files/2019-11/documents/2016_and_2017_facts_and_figures_data_tables_0.pdf.
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- 40 “A message from CEO Kevin Johnson: Starbucks new sustainability commitment.” Starbucks (blog), January 21, 2020. <https://stories.starbucks.com/stories/2020/message-from-starbucks-ceo-kevin-johnson-starbucks-new-sustainability-commitment>.
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- 42 "The New Plastics Economy Global Commitment: 2019 Progress Report." Ellen MacArthur Foundation, October 2019. <https://www.newplasticseconomy.org/assets/doc/Global-Commitment-2019-Progress-Report.pdf>.
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