American Beverage: Plastic Footprint 2018 to 2021

In order to drive progress and transparency on its Every Bottle Back Initiative, the American Beverage Association (ABA) and its major brand owners, Coca-Cola, Keurig Dr Pepper, and PepsiCo, have developed an innovative metric for tracking the use and impact of its plastic bottles, which we are calling our plastic footprint. For now, this is limited to PET bottles and consists of both production data and data on the fate of bottles in the environment.

Every Bottle Back combines a focus on bottle design for improved recyclability with public awareness of our recyclable bottles, voluntary on-pack messaging to promote recycling, and partnerships to invest in community recycling. Advances in recyclability, increased use of recycled material in new bottles, and improved recycling rates are all reflected back in the components of the plastic footprint.

ABA developed the parameters of the plastic footprint and engaged with its partner, World Wildlife Fund (WWF), to ensure the metrics are based on sound principles. The footprint is consistent with WWF's ReSource: Plastic Footprint Tracker, and represents a sector-specific expansion of this measurement framework.

ABA's footprint is a composite of indicators that look at how containers are produced and what their fate is in the environment after use to create an index that can be tracked over time. The four indicators that are combined make up the footprint index are:

- Alternatives to virgin PET. Post-consumer recycled PET (RPET) and PET from plant-based sources (BPET) replace PET from petroleum (virgin resin), reducing the environmental impact of bottle production. The goal is to increase use of alternatives to virgin resin and drive down the share of virgin resin in the average bottle sold.

- Recyclability guidelines. The Association of Plastics Recyclers has established Preferred for Recycling guidelines for PET bottles and our goal is to reach 100 percent compliance with those guidelines, eliminating those bottles from our portfolio which have components that may interfere with the recycling process.

- Recycling rate for PET. ABA calculates a recycling rate for PET refreshment beverage bottles sold in the US; as the rate increases, the amount of PET disposed will decrease.

- PET bottles in the environment. PET bottles are among the many products found mismanaged in the environment, which we generically call litter. The indicator tracks the prevalence of PET beverage bottles in litter.

ABA has committed to collecting the data to calculate the footprint on a regular basis, with 2018 as the baseline. We now have data through 2021 and this report summarizes our updated findings and the value of the footprint index. Over time, ABA and its member companies will reduce the score by making packages more recyclable and using less virgin PET, while working to improve recycling and prevent and cleanup litter.

Plastic Footprint: Results Through 2021

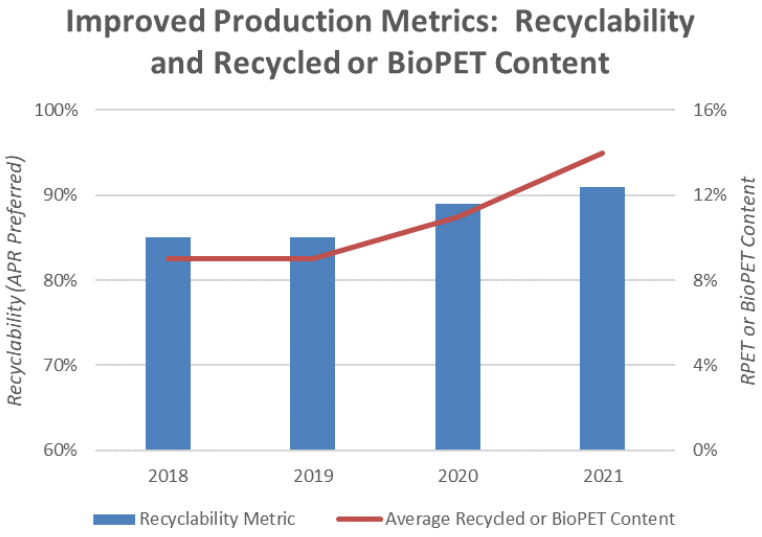
The industry has lowered its plastic footprint 5.5% since 2018. This encouraging progress, despite challenges presented by the global pandemic, is attributable primarily to changes in production indicators reflecting improved recyclability and increased use of recycled content in bottles.

Exhibit 1 on the following page summarizes the 2018 to 2021 footprint data and calculations. The goal of the Every Bottle Back initiative is to lower the index from its 2018 baseline. Comparing the baseline to 2021, we found the following changes in the components that make up the index:

- An increase in the share of containers that meet preferred for recycling guidelines from 85% to 91% (Figure 1)

- An increase in the use of alternatives to virgin PET resin in bottles (Figure 1). In 2018 the average PET bottle included 9% recycled or bio-based resin; the percentage climbed to 14% in 2021 amid severe disruption in supplies of recycled material due to the pandemic.

Figure 1



- Countering the progress on these production-related metrics, a small reduction in the share of PET bottles recycled from 31% to 30%

- The measure for litter remained unchanged because no new data were available. Plastic beverage bottles stood at 7.9% of large litter from the 2020 national litter study (see discussion below)

Our aggregate index of progress, the plastic footprint, increased slightly in 2019 but declined in 2020 and 2021 and stands 5.5% below the baseline of 2018. While metrics related to the fate of bottles in the environment were virtually unchanged, producer changes to reduce or eliminate container components that hinder recycling and to purchase more recycled resin for use in bottles were responsible for the improved index score.

The footprint is an index calculated across four metrics designed to show how changes in production and in materials management will reduce the impact of PET bottles on the environment. The index itself does not have any intrinsic meaning – it is simply a scoring mechanism to combine data that help to tell a story. The fact that the baseline score is 46 does not signal anything positive or negative; we are monitoring the change from the baseline over time to assess our progress.

Exhibit 1

ABA Plastic Footprint - 2018 to 2021

	Improve Recyclability	Increase Alternatives to Virgin PET	Increase Recycling	Reduce Litter	Footprint Reduction	
Definition of Metric Used In Calculation	*Coke, KDP, and Pepsi PET bottles not meeting APR standards for recyclability*	*Coke, KDP, and Pepsi systems' use of virgin resin in the average bottle sold*	*Share of PET bottles not recycled (i.e.,landfilled or burned)*	*National prevalence of liquid refreshment beverage PET bottles (all brands) in litter*	*An index for monitoring progress computed as the simple weighted average of scores for the four parameters*	
Objective	*Reach 100% recyclability for bottles, caps, and labels*	*Increase use of recycled content and bio plastics to replace virgin*	*Policies and investments to increase recycling*	*Eliminate bottles in the environment (litter) though prevention and control*	*Reduce the footprint as measured by the index*	
Calculations	**Share of Bottles Not Meeting APR Preferred for Recycling Guidelines***	**Virgin Resin Share in the Average PET Bottle***	**Share of PET Bottles Disposed****	**Share of PET beverage bottles in litter*****	**Weighted Score**	**Percentage Change from Baseline**
Baseline 2018	15%	91%	69%	7.9%	46	
2019	15%	91%	70%	7.9%	46	0.5%
2020	11%	89%	72%	7.9%	45	-1.6%
2021	9%	86%	70%	7.9%	43	-5.5%

** Data from member company surveys of suppliers and internal company data, compiled by Breezeway*
*** Annual PET recycling rate calculation prepared by Breezeway for ABA from supplier data*
**** Keep America Beautiful 2020 National Litter Survey - PET beverage share of large litter from roadway and waterway sites*

Discussion of Production-Related Metrics

ABA members have direct control over how they design and manufacture the containers used for their products but far less control over the fate of those containers after they are sold. The production data collected addresses the share of virgin PET in the average bottle (which will decrease with the use of more recycled PET and bio-based PET) and the percentage of PET bottles that do not meet certain plastics recycling industry standards. We then calculate the footprint as a score combining those two indicators along with the recycling rate and the litter rate.

Suppliers or bottlers who purchase resin and make preforms – the precursor to the bottle – report the amount of resin used to make new bottles. We have combined supplier and bottler data across the Coca-Cola, Keurig Dr Pepper, and PepsiCo systems. We collected all of the data under confidentiality agreements, and we are reporting only aggregate results in a form that cannot disclose data from an individual respondent.

We selected 2018 as a baseline, completed data collection through 2021, and are currently compiling 2022 data. The key findings that feed directly into the footprint calculation are:

- In 2021, 14% of the PET in member company bottles was from RPET or BPET, reflecting a five-percentage point improvement over three years (Figure 1, Exhibit 1). The remaining 86% is virgin resin.

- 91% of members' 2021 PET bottles met the "Design Guide Preferred" designation established by the Association of Plastic Recyclers (APR). These remaining containers had components that could hinder recyclability of the PET bottle, or they were awaiting evaluation by the association. This is a six-point improvement over the 85% baseline in 2018.

The data also enable us to draw a more complete picture of members' PET bottles, beyond the snapshots that we incorporated into the footprint index. For example (Exhibit 2):

- The total weight of virgin PET used by these companies was 3.3% lower in 2021 than in 2018, despite growth in the number of bottles sold over the period.

- The majority of bottles contained at least some RPET in 2020 and 2021: 52% of bottles included RPET, up from 41% in 2018.

- The average recycled content in bottles that contained recycled material reached 25%, up from 13% in the baseline and up six percentage points from 2020.

- Overall recycled content reached 13% across the entire portfolio in 2021.

Exhibit 2

Summary of PET Bottle Data from ABA Members

	2018	2019	2020	2021
RPET or BPET Share per Bottle (by weight)	9%	9%	11%	14%
Bottles Meeting APR Recyclable Definition	85%	85%	89%	91%
Bottles Containing RPET or BPET	55%	59%	61%	57%
Bottles Containing RPET	41%	46%	52%	52%
Average RPET Content in Those Bottles	13%	13%	19%	25%
Average RPET Content in All Bottles	5.7%	6.4%	9.6%	13%

Source: Breezeway analysis of confidential member data

Discussion of the Fate of Containers

ABA members have much less direct control over how their containers are managed once the beverages have been consumed. But the impact of packaging and therefore the plastic footprint tracks both production and disposition of the material. While these bottles are made to be recycled into new bottles, many do not make it into the recycling system and those that do may find their way to products other than new bottles. Further, some containers are littered, intentionally or accidentally.

Recycling Rate

The recycling rate for PET liquid refreshment beverage (LRB) bottles has dropped to 30% from the 2018 baseline of 31%. The pandemic drove rates down even more as it disrupted bottle redemption in deposit states, but overall rates have mostly rebounded with significant strength in curbside collections. The decline in the share of bottles collected increases this component of the plastic footprint (*i.e.,* it offsets some of the gains on the production side of the calculation).

The recycling rate for LRBs is developed from the overall PET bottle recycling rate, calculated annually by NAPCOR.[1] Because the NAPCOR report includes all PET bottles, not just those for liquid refreshment beverages, ABA conducts additional research to adjust the rates to focus solely on LRBs. This work includes:

- Research by SBA-CCI related to PET sales. This allows us to adjust NAPCOR data on pounds of total PET bottles in the market to the portion by weight used for LRB bottles.

[1] National Association for PET Container Resources represents manufacturers and reprocessors in the PET supply chain. The Association has compiled data on PET recycling dating back to the 1990s and conducts research with ABA funding to support this report and related projects.

- A NAPCOR-directed project to sort bales of recycled PET

- Weighting the volume of material recycled through different types of programs to calculate a beverage recycling total, conducted by NAPCOR and Breezeway Consulting

Adjusting recycling data from all PET bottles to only LRB PET bottles is a multi-step process, beginning with an annual sort of PET bales collected from a range of states and collection program types from across the country. Typically, the consultants sort thousands of pounds of PET and well over 100,000 bottles to characterize the share of bales made up of LRBs (as well as other important characteristics such as beverage type and bottle color). Next, NAPCOR and ABA estimate the amount of PET redeemed in the various deposit systems around the US with the remainder allocated to curbside and dropoff programs. That material is apportioned to LRBs *vs.* other PET bottles based on the bale composition data. The resulting weight of PET sold to end markets becomes the numerator of the recycling rate. In 2021, for example, 31 percent of the LRB PET bottles recycled came through deposit redemption systems; 69 percent of the material came through curbside and dropoff programs.

PET Bottles in Litter

Plastic beverage containers represented 7.9 percent of "large" litter across all environments tracked in the 2020 national litter survey conducted by Keep America Beautiful. ABA provided methodological and financial support for the survey, partly because of the need to develop a benchmark for the litter component of the plastic footprint.

For this analysis, we combined all plastic LRB container litter defined as large litter (>4" in at least one dimension). The sampling reflects both waterway and roadway-proximate sites in a wide range of demographic locations, weighted together to be representative of national conditions. Large litter is sometimes used as a proxy for visible litter and bottles in this size range are more readily identifiable as whole bottles than small litter which is much more numerous and consists of many small fragments of items that cannot be identified beyond simply the material from which it was made.

We note that while the plastic footprint is based on PET, the litter data include all types of plastic beverage bottles. PET dominates the LRB market, accounting for more than 95 percent of bottles, but it is important to remember that the statistic includes HDPE and 3 through 7 bottles as well. This should not affect the validity of this metric as a benchmark for showing future improvements in the prevalence of these bottles in litter.

Finally, we must acknowledge that KAB conducted the baseline litter survey in 2020, not 2018 like the other baseline data. Because of the cost and complexity of a survey like this, it is likely to be repeated only infrequently, so we will not see annual changes in this metric the way we will for the others. We are collaborating with Keep America Beautiful and expect to update the study in 2025. And, unfortunately, the baseline data collection occurred in the fall of a year that saw unprecedented changes in Americans' way of life and consumption patterns. The impact of the pandemic on this baseline metric is unknown, but the study remains the best available national benchmark from which to measure future changes in beverage container litter.

Outlook and Next Steps

Progress on production-related metrics is encouraging and reflects existing company commitments and statutory obligations in the form of recycled content mandates now in effect in five states. On the environmental side, investments through the Every Bottle Back program, other infrastructure funding, and new legislation such as extended producer responsibility programs in four states promise to improve the collection of PET bottles (along with other materials) and increase the supply of RPET. Much work remains to be done to support strategic investments and enactment of well-designed policies.

With regard to the plastic footprint, ABA will continue to collect production data from its members on an annual basis and work to improve the efficiency and timeliness of reporting. Changes and disruptions in supply chains and procurement operations both pose challenges to this work. We also plan to continue the multi-pronged analysis necessary to compute recycling rates for LRBs as we have since 2005. We continue to explore ways to streamline and speed up this process, which has a long lead time and is the last element of the footprint index to be available each year. Finally, we are planning updates to the litter study every five years due to the expense of this research (which captures hundreds of components of litter, not just beverage containers) and will work with KAB and others to refine the methodology of the study.