



THE 50 STATES OF RECYCLING

A State-by-State Assessment of Containers
and Packaging Recycling Rates

ESTABLISHING A COMPARABLE STATE-BY-STATE RECYCLING RATE FOR CONTAINERS AND PACKAGING

This study, for the first time, presents a state-by-state comparable assessment of recycling rates for common containers and packaging materials (CCPM). Using tonnage data and waste characterization reports sourced from the EPA, states, counties, municipalities, sorting facilities and material processors, a modeling approach has been developed and deployed to enable comparable recycling rates to be calculated. This calculation sets a baseline in each state that can be used to inform policy, design programs, and assess infrastructure needs.



PLASTICS

- PET Bottles
- PET other rigid plastics (thermoforms, trays)
- HDPE bottles
- PP
- Rigids #3-7



CARDBOARD BOXBOARD



GLASS, BOTTLES AND JARS



ALUMINUM CANS



STEEL CANS



Note: All data included in this report refers to the Eunomia report '50 States of recycling' published in 2021 unless referenced otherwise

KEY TAKEAWAYS

Recycling policies, such as DRS, and investment in infrastructure, such as curbside collection, and recycling technologies, are crucial to advancing packaging circularity.



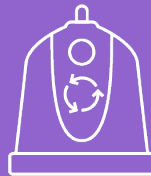
Policymakers at the state and federal level must prioritize enacting recycling policy and legislation but also supporting it with investment in local infrastructure.

Not all recycling is created equal when it comes to reducing GHG emissions and the economic costs of recycling.



We must prioritize the recycling of materials that have the greatest reduction potential in GHG emissions and the highest value for creating new products.

Collection and recycling are not synonymous.



We must measure real recycling and prioritize the recycling of high value materials instead of collecting non-recyclable contaminants that make the entire system less effective.

Comprehensive and accurate data and measurement is a crucial step in moving the US towards a more circular economy.

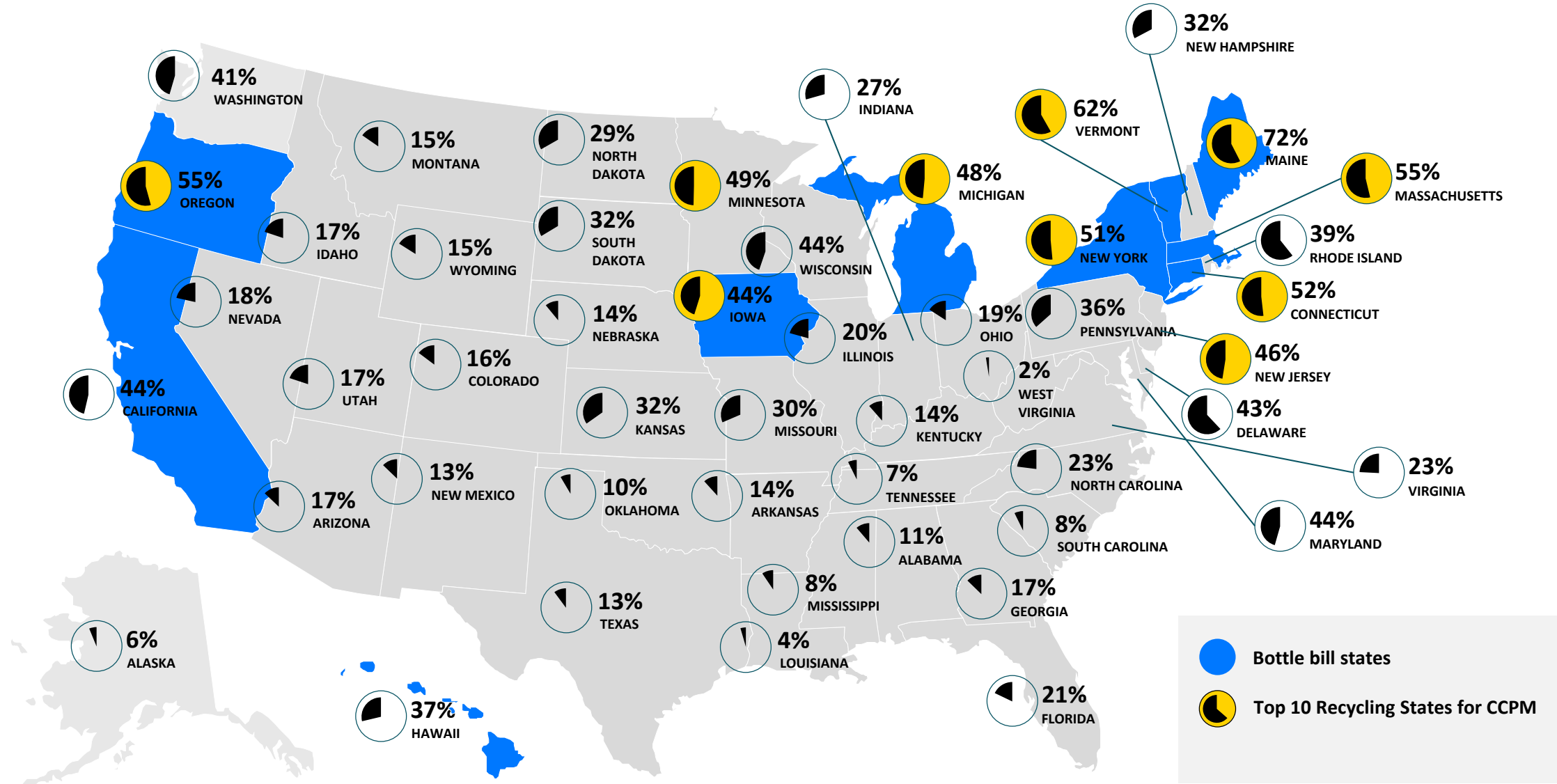
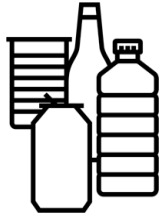


Overall, those states that have more comprehensive and current data along with a state-driven reporting system achieve higher recycling rates. We cannot continue to set targets to improve diversion rates and recycling rates without good data quality, availability, and reporting systems at the state and federal level.















Today only 25% of US waste is actually recycled.













TOTAL CCPM RECYCLING RATES FOR PER STATE (EXCLUDES CARDBOARD)



Note: Excludes Cardboard and boxboard Includes plastic (PET Bottles, PET other rigid plastics, HDPE bottles, PP, Rigids #3 – 7), Glass bottles and jars, Aluminum cans, Steel cans

TOP AND BOTTOM STATES ON RECYCLING RATES FOR CONTAINERS AND PACKAGING EXCLUDING CARDBOARD

	 Recycling Rate	 Bottle Bill
Maine	72%	 Yes
Vermont	62%	 Yes
Massachusetts	55%	 Yes
Oregon	55%	 Yes
Connecticut	52%	 Yes
New York	51%	 Yes
Minnesota	49%	 No
Michigan	48%	 Yes
New Jersey	46%	 No
Iowa	44%	 Yes

	 Recycling Rate	 Bottle Bill
New Mexico	13%	 No
Texas	13%	 No
Alabama	11%	 No
Oklahoma	10%	 No
Mississippi	8%	 No
South Carolina	8%	 No
Tennessee	7%	 No
Alaska	6%	 No
Louisiana	4%	 No
West Virginia	2%	 No

ASSESSING RECYCLING PERFORMANCE THROUGH DIFFERENT METRICS

WEIGHT PERSPECTIVE Tons of CCPM recycled



By weight, cardboard and boxboard account for **73%** of the total tons of CCPM recycled in 2018, much of this driven from the commercial sector.

GHG MITIGATION PERSPECTIVE Tons of GHG emissions avoided



Assess system performance using other metrics like GHG emissions avoided to provide a holistic picture of true environmental impact.

VALUE RECOVERED PERSPECTIVE Revenue from the materials recovered

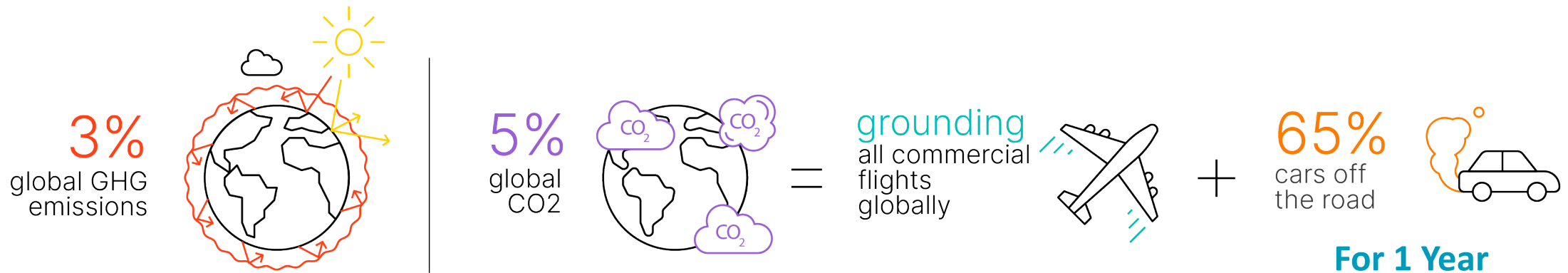


An increased understanding of the existing markets for recycled materials is essential for public decision-making processes concerning the implementation and evaluation of different categories of recycling policies.



HOW WASTE MANAGEMENT PERFORMANCE CAN CONTRIBUTE TO GLOBAL GHG EMISSION REDUCTION

- Waste management is responsible for **3% of global GHG emissions**
- But can play a vital role in reducing **5% of global CO₂**



- **Between 4.4 and 5.7 billion tons of CO₂e** is the GHG emissions from the production of materials that were disposed of in municipal waste
- By 2030 **it will increase between 5.6 and 7.3 billion tons** with the continued growth of packaging materials



Sources: Eunomia Research & Consulting Calculation using CAIT, for TOMRA

<https://cait.wri.org/projections/#/?collection=projections%20ghg%20emissions%20data&maxYear=undefined&minYear=undefined>

<https://newsroom.tomra.com/tomra-urges-holistic-approach-to-battle-climate-change/>

Emissions by Sector, Our World in Data Available: <https://ourworldindata.org/emissions-by-sector>

EFFECT OF INCREASING RECYCLED CONTENT ON CARBON FOOTPRINT ON BEVERAGE CONTAINERS



Glass bottle
16.0oz



PET bottle
16.9oz
(CARBONATED)



BEVERAGE
CARTONS
16.9OZ

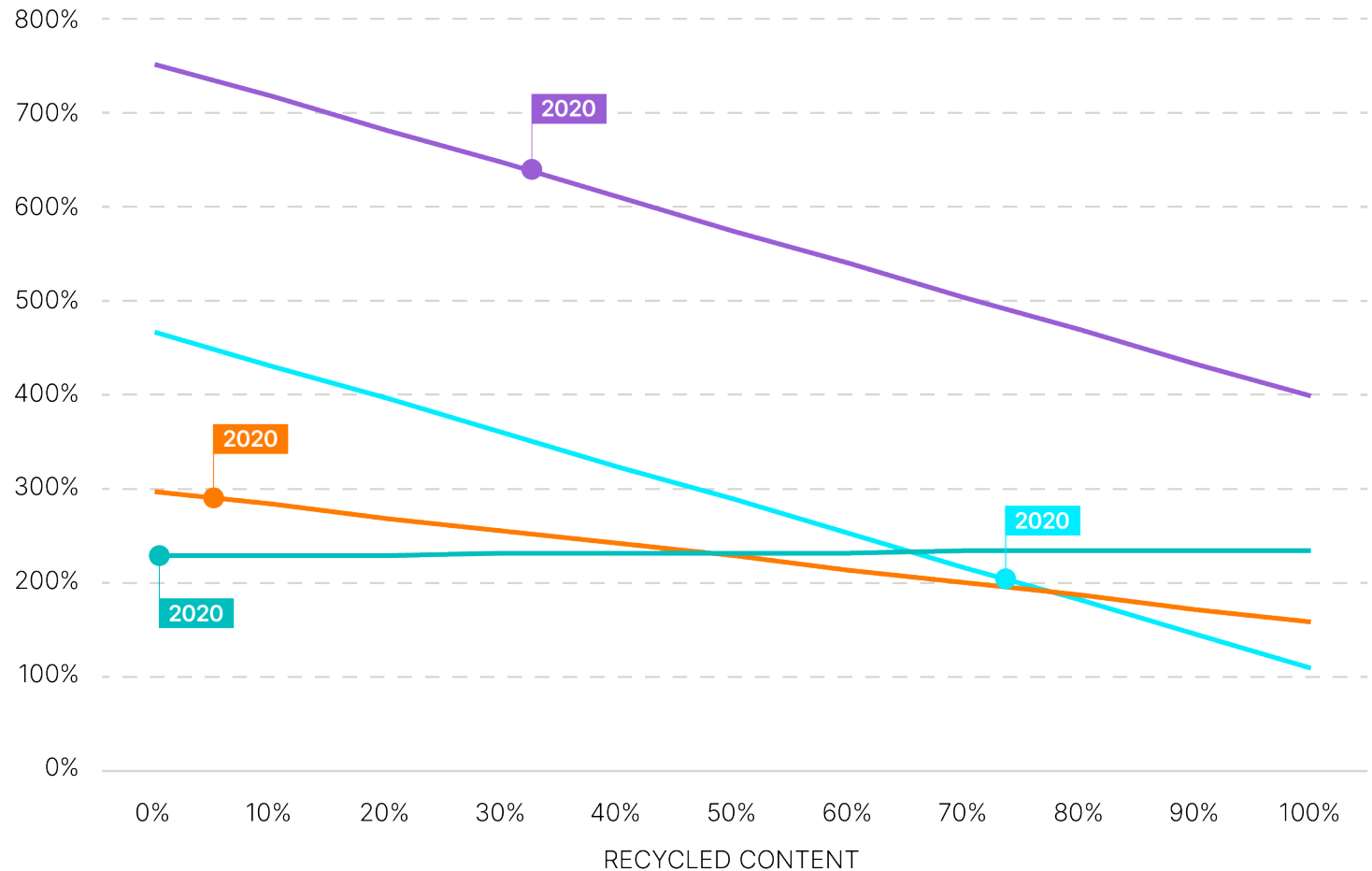


ALUMINUM
16.0OZ

2020

RECYCLED CONTENT
VALUES USED IN
SPHERA LCA BASED
ON LATEST INDUSTRY
STATICS

CLIMATE CHANGE
(% CO2 EQ.)
PER LITER OF
FILL VOLUME



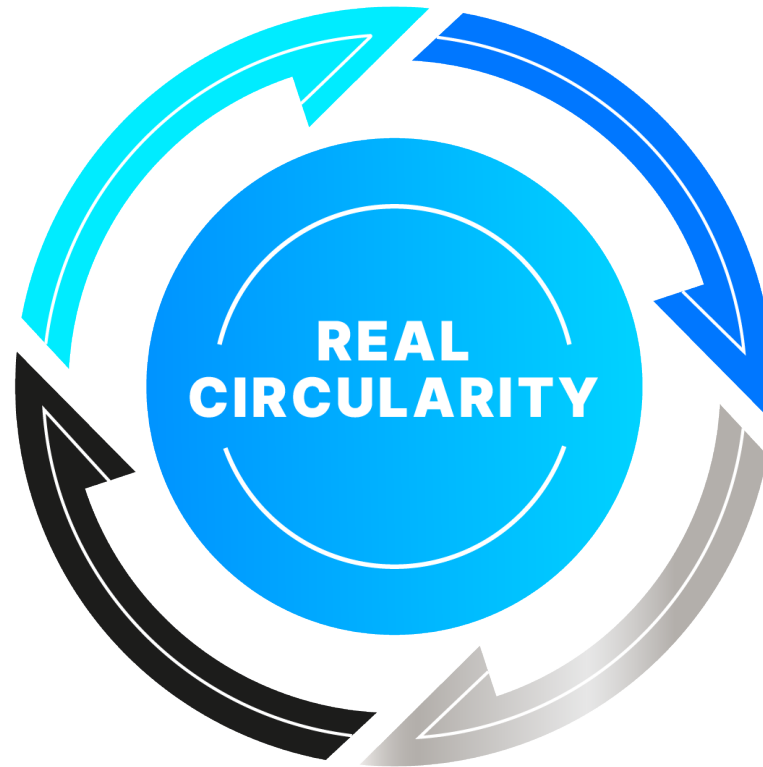
TO ACHIEVE FULL CIRCULARITY WE NEED HOLISTIC PACKAGING, WASTE & DESIGN POLICIES COVERING THE FULL CIRCLE

1 COLLECTION

- Extended Producer Responsibility
 - Deposit Return Systems
 - Extended Collection beyond Curbside
 - Higher Tipping Fees & Material landfill bans
-

4 RECYCLED CONTENT

- Global Standard for Recycled Content Accounting
 - Incentives to keep Product to Product Close Loops
 - Tax Advantages for Recycled Materials VS virgin
-



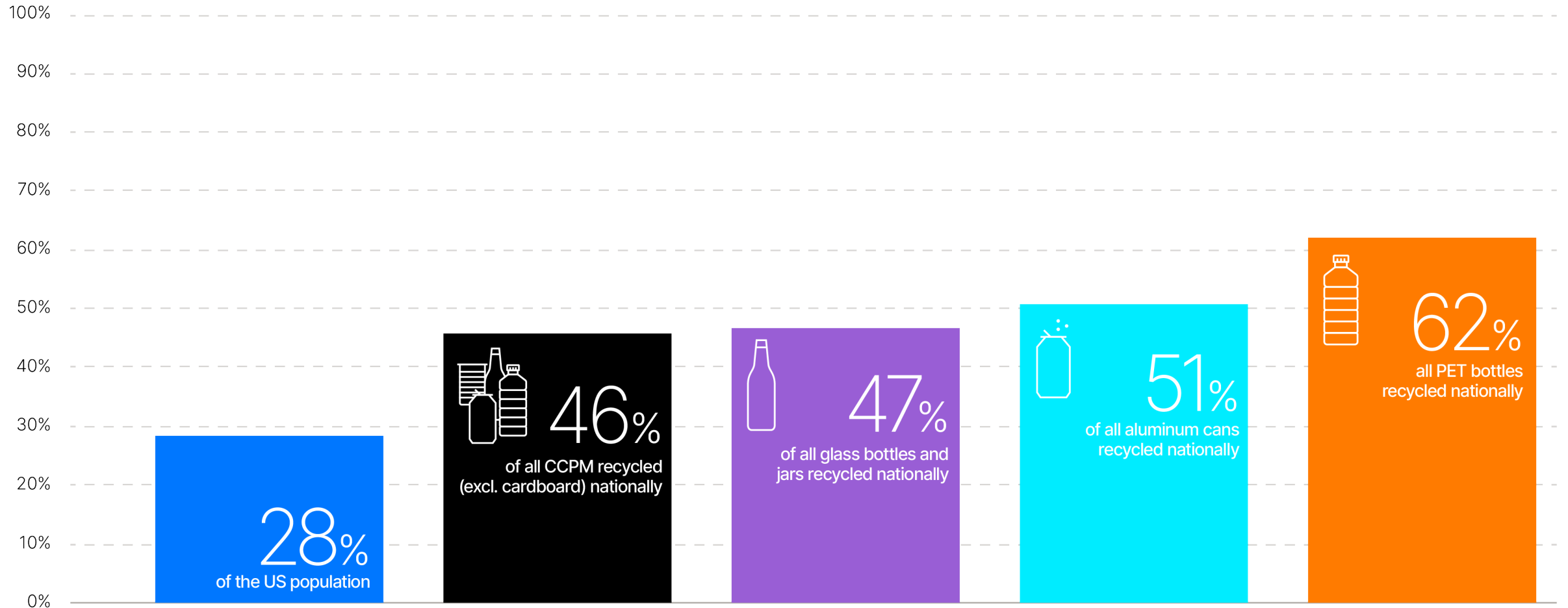
SORTING 2

- Product Design Guidelines & Recyclability Audits
 - Modular Fees
 - Remove Barriers for Investments in MRFs and Novel Sorting Technologies
-

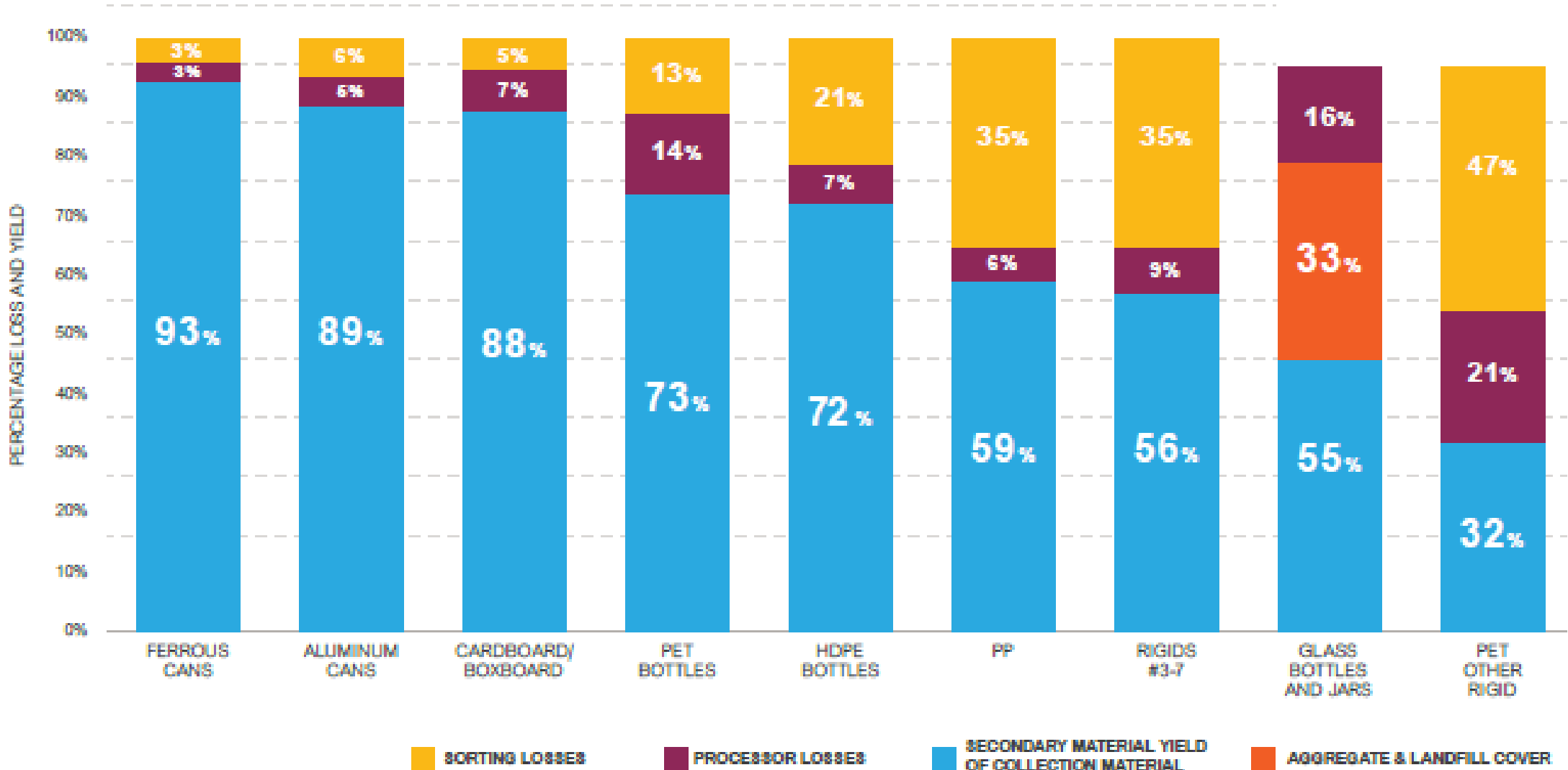
RECYCLING 3

- New Recycling Technologies with Maximum Yields and Quality
 - Local Recycling Instead of Importing Raw Materials
-

BOTTLE BILL STATES REPRESENT....



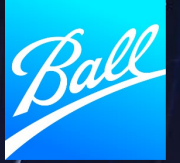
SORTING AND PROCESSING LOSSES FOR EACH CONTAINER



DATA DRIVES RESULTS

- **7 of the top 10** performing states have **good data** quality, availability, and state reporting systems.
- **Reliable and verifiable data is critical** to making effective policy and programming decisions.
- **Opportunity:** the EPA “to begin a **comprehensive data collection** effort to strengthen residential recycling and accelerate the move towards a circular economy,” including data on community recycling availability, contamination and amount of material collected through curbside and deposit programs for recycling.
- In 2020, the US House of Representatives Appropriations Committee issued House Report 116-448 that included a nationwide Recycling Needs Survey and Assessment in its report language.
- **Takeaway:** At a minimum, states need to:
 - Carry out **regular detailed waste characterization studies** for both residential and commercial waste streams.
 - Set up a system to **enable municipalities and waste and recycling facilities to annually report** on the amount of material collected, recycled, and disposed of in a **consistent way**.



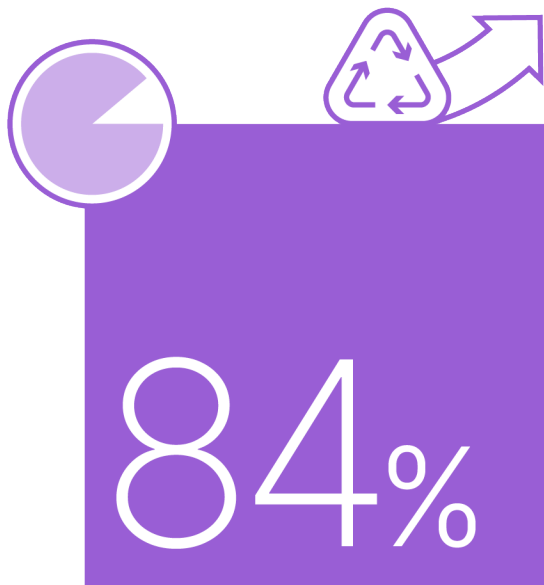


CONSUMER SURVEY:

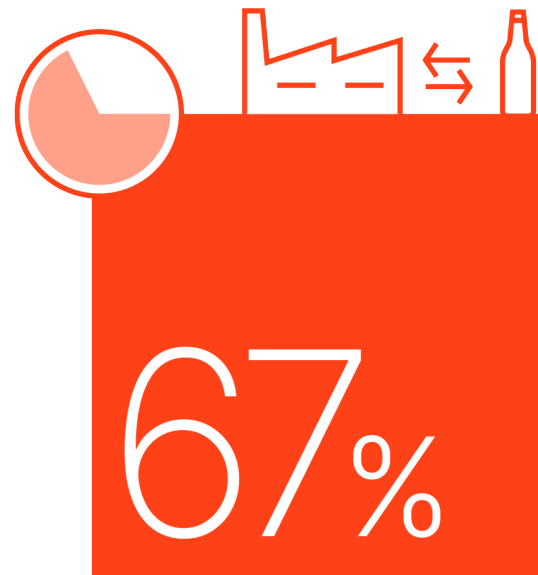
Key Attitudes About Recycling

National 4,000 adults survey, March 2021

AMERICANS SUPPORT INVESTING IN PACKAGING RECYCLING



agree that “investing in **expanding and improving our nation’s recycling infrastructure** should be a higher priority.”



agree that “companies that manufacture food and beverage containers **should be responsible for the cost of collecting and recycling** their products after people discard them.”

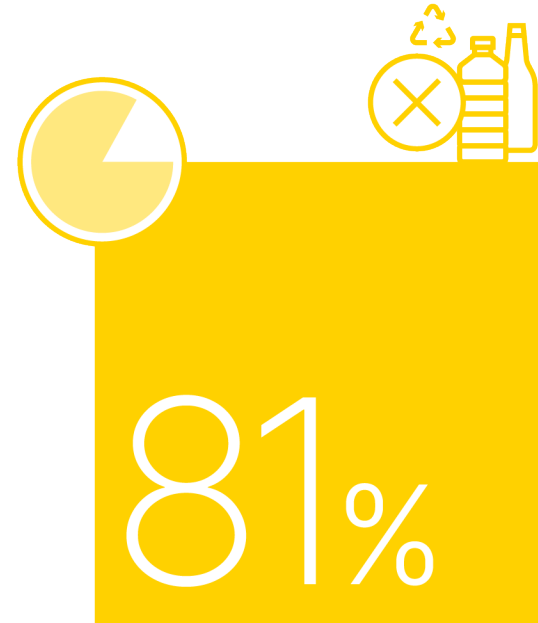


Source: Data from online survey of 4,000 US adults conducted March 2021

AMERICANS SUPPORT STRONGER PACKAGING RECYCLING POLICIES



agree that “the US should create a **nationwide beverage container refund program to encourage recycling**, where consumers get back a small fee for returning empty glass jars, aluminum cans and plastic bottles.”

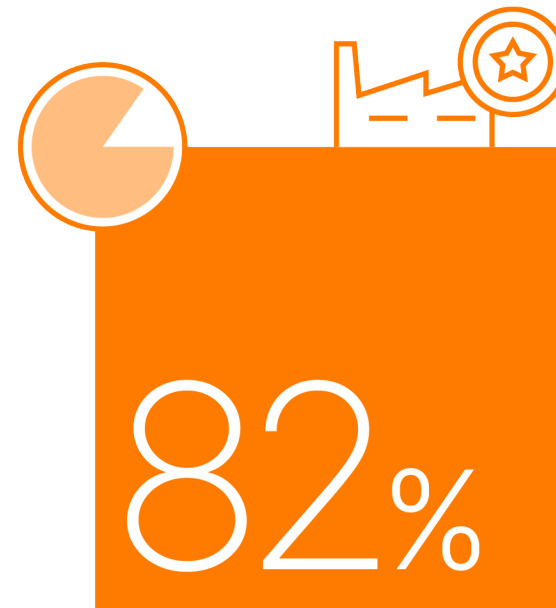
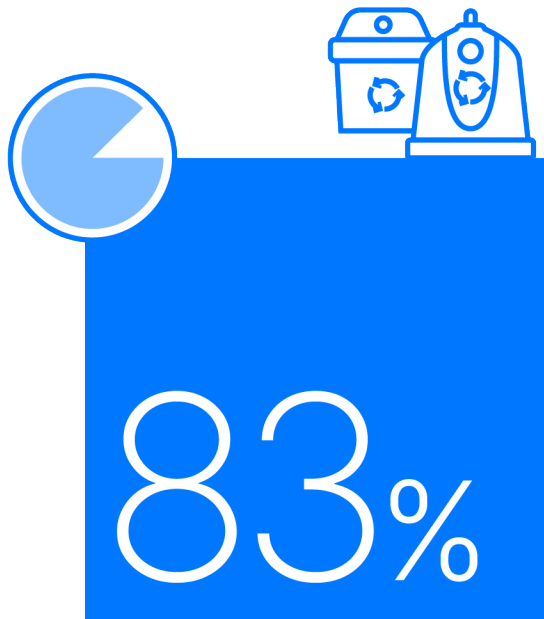


agree that “difficult or impossible to recycle packaging materials should be **phased out of use** in the US to reduce pollution.”



Source: Data from online survey of 4,000 US adults conducted March 2021

CONVIENCE AND CONFIDENCE IN THE SYSTEM ENCOURAGE RECYCLING



TAKING ACTION



- **Prioritize** policies and practices of states that achieve relatively high levels of recycling, to achieve better performance.
- **Link** increased recycling to environmental and economic impact at the state and federal level.
- **Standardize** data collection and reporting to show true progress towards circularity.



- **Design** products with circularity in mind aka products that are easily collected, sorted and have high economic value in the recycling stream.
- **Maximize** performance of products in the recycling system.
- **Advocate** for improvements in policies and infrastructure to ensure products are being recycled and end up back in the material stream for reuse.



- **Identify** service changes that may need to be adopted at the state or local level to ensure maximum efficiency of recycling system.
- **Advocate** for policies that support waste management in their efforts to move towards a circular economy.

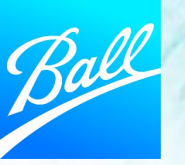




THANK YOU

Forward-Looking Statements

This presentation contains "forward-looking" statements concerning future events and financial performance. Words such as "expects," "anticipates," "estimates," "believes," "targets," "likely," "positions" and similar expressions typically identify forward-looking statements, which are generally any statements other than statements of historical fact. Such statements are based on current expectations or views of the future and are subject to risks and uncertainties, which could cause actual results or events to differ materially from those expressed or implied. You should therefore not place undue reliance upon any forward-looking statements and any such statements should be read in conjunction with, and, qualified in their entirety by, the cautionary statements referenced below. The Company undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. Key factors, risks and uncertainties that could cause actual outcomes and results to be different are summarized in filings with the Securities and Exchange Commission, including Exhibit 99 in our Form 10-K, which are available on our website and at www.sec.gov. Additional factors that might affect: a) our packaging segments include product capacity, supply, and demand constraints and fluctuations, including due to virus and disease outbreaks and responses thereto; availability/cost of raw materials, equipment, and logistics; competitive packaging, pricing and substitution; changes in climate and weather; footprint adjustments and other manufacturing changes, including the startup of new facilities and lines; failure to achieve synergies, productivity improvements or cost reductions; unfavorable mandatory deposit or packaging laws; customer and supplier consolidation; power and supply chain interruptions; potential delays and tariffs related to the U.K.'s departure from the EU; changes in major customer or supplier contracts or a loss of a major customer or supplier; political instability and sanctions; currency controls; changes in foreign exchange or tax rates; and tariffs, trade actions, or other governmental actions, including business restrictions and shelter-in-place orders in any country or jurisdiction affecting goods produced by us or in our supply chain, including imported raw materials; b) our aerospace segment include funding, authorization, availability and returns of government and commercial contracts; and delays, extensions and technical uncertainties affecting segment contracts; c) the Company as a whole include those listed above plus: the extent to which sustainability-related opportunities arise and can be capitalized upon; changes in senior management, succession, and the ability to attract and retain skilled labor; regulatory action or issues including tax, environmental, health and workplace safety, including U.S. FDA and other actions or public concerns affecting products filled in our containers, or chemicals or substances used in raw materials or in the manufacturing process; technological developments and innovations; the ability to manage cyber threats; litigation; strikes; disease; pandemic; labor cost changes; rates of return on assets of the Company's defined benefit retirement plans; pension changes; uncertainties surrounding geopolitical events and governmental policies both in the U.S. and in other countries, including policies, orders and actions related to COVID-19, the U.S. government elections, stimulus package(s), budget, sequestration and debt limit; reduced cash flow; interest rates affecting our debt; and successful or unsuccessful joint ventures, acquisitions and divestitures, and their effects on our operating results and business generally.



APPENDIX



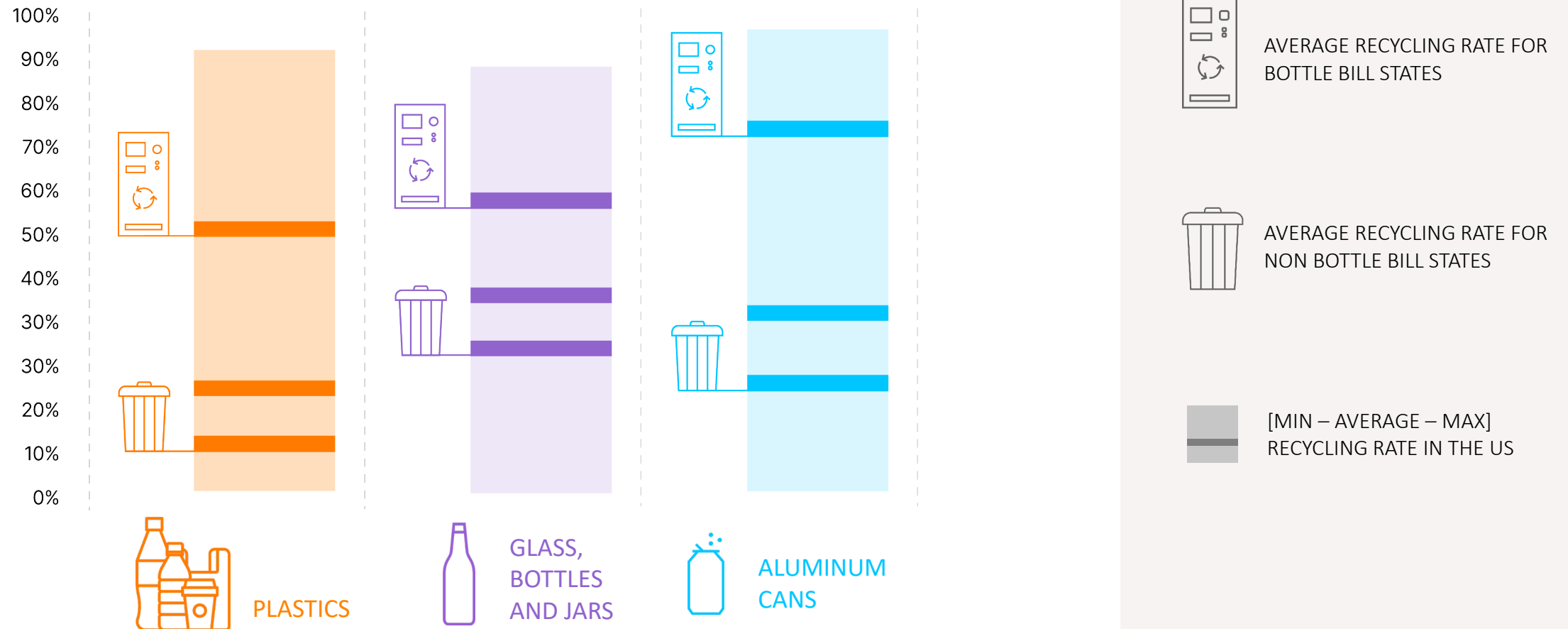
RECYCLING IMPACT ON CLIMATE CHANGE

- **Across its lifecycle**, the greatest GHG emissions associated with a packaging material come from the use of virgin material in the production process and the emissions associated with material extraction.
- **Under a circular economy**, the more secondary recycled material that can be fed into the supply chain to replace virgin material and the more times that same material can circulate within the system, the greater the GHG benefits.
- **Increasing recycling and minimizing losses across the full collection**, sorting, processing and recycling will have the greatest GHG reduction benefits. Good packaging design can increase recyclability and minimize total material losses.
- **Prioritize effective recycling of materials that reduce GHG impact**. Recycling one ton of aluminum has three times the GHG reduction benefit as compared to recycling one ton of cardboard. Additionally, an aluminum can may be recycled infinitely, therefore keeping this material in the circular economy can significantly reduce GHG emissions over the long term.

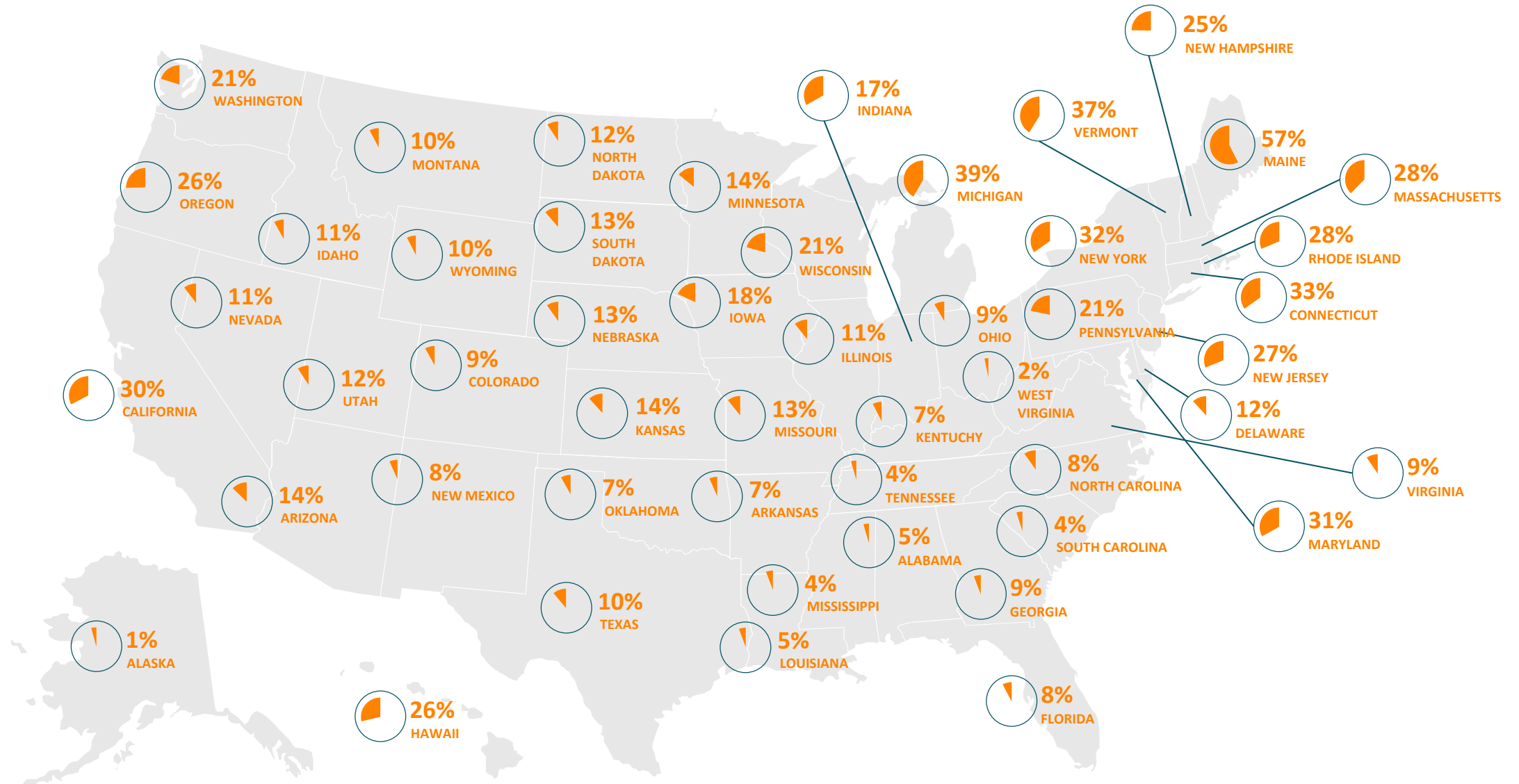


DRS ALONGSIDE CURBSIDE SYSTEMS ARE THE MOST EFFECTIVE AT COLLECTING BEVERAGE CONTAINERS

RECYCLING RATE

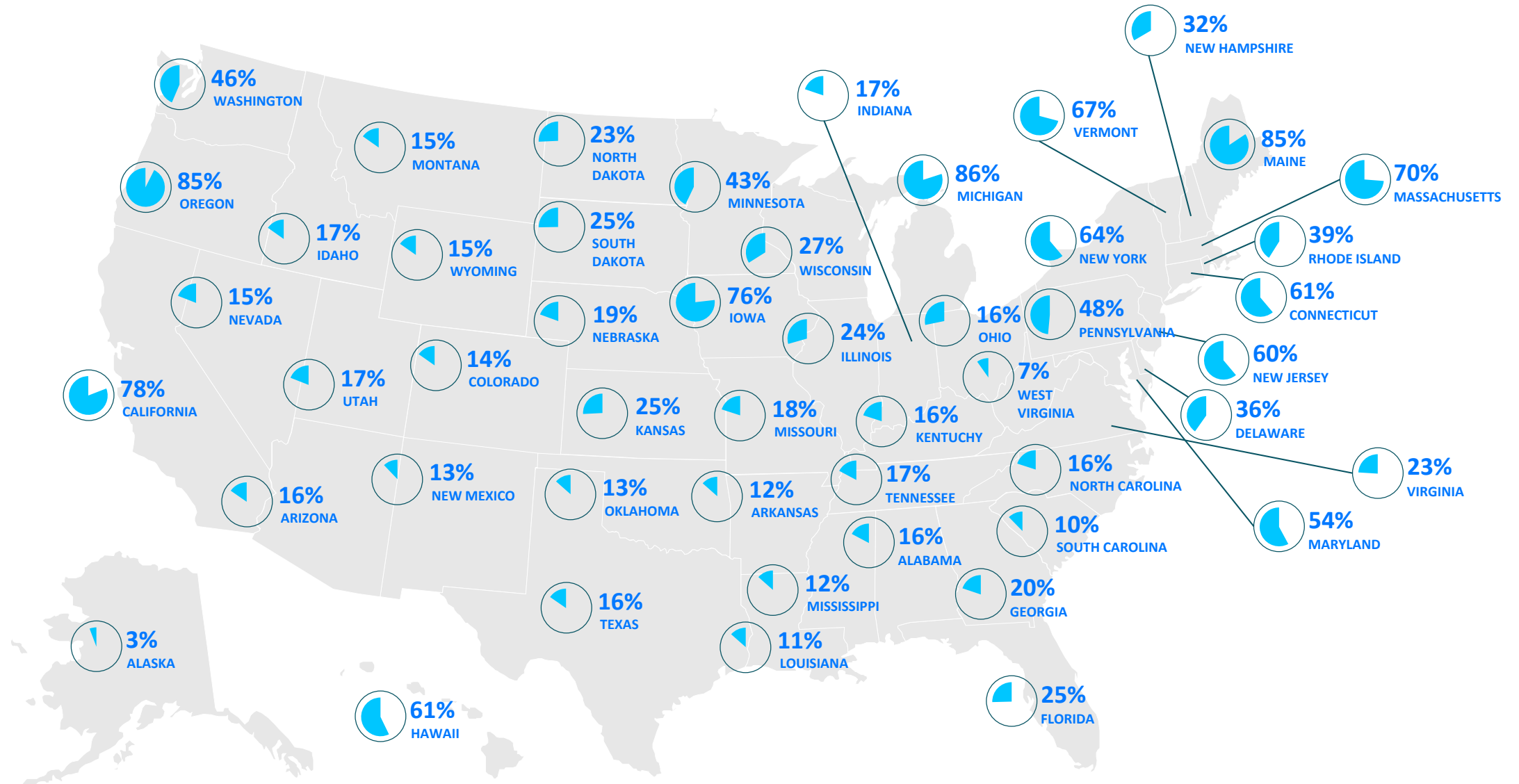


TOTAL PLASTIC RECYCLING RATES PER STATE

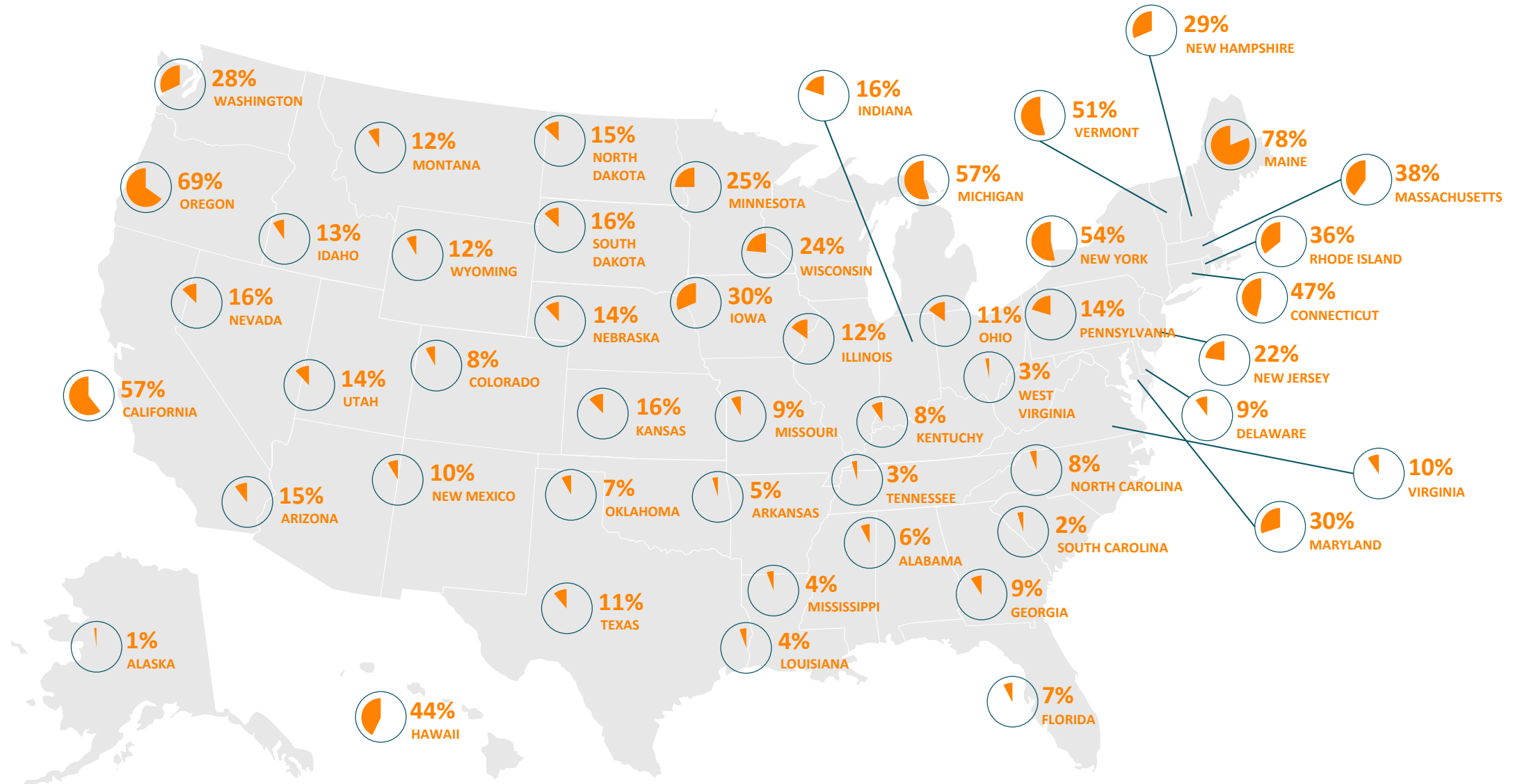


Note: Includes all plastic (PET Bottles, PET other rigid plastics, HDPE bottles, PP, Rigids #3 – 7)

ALUMINUM CAN RECYCLING RATES FOR CANS PER STATE

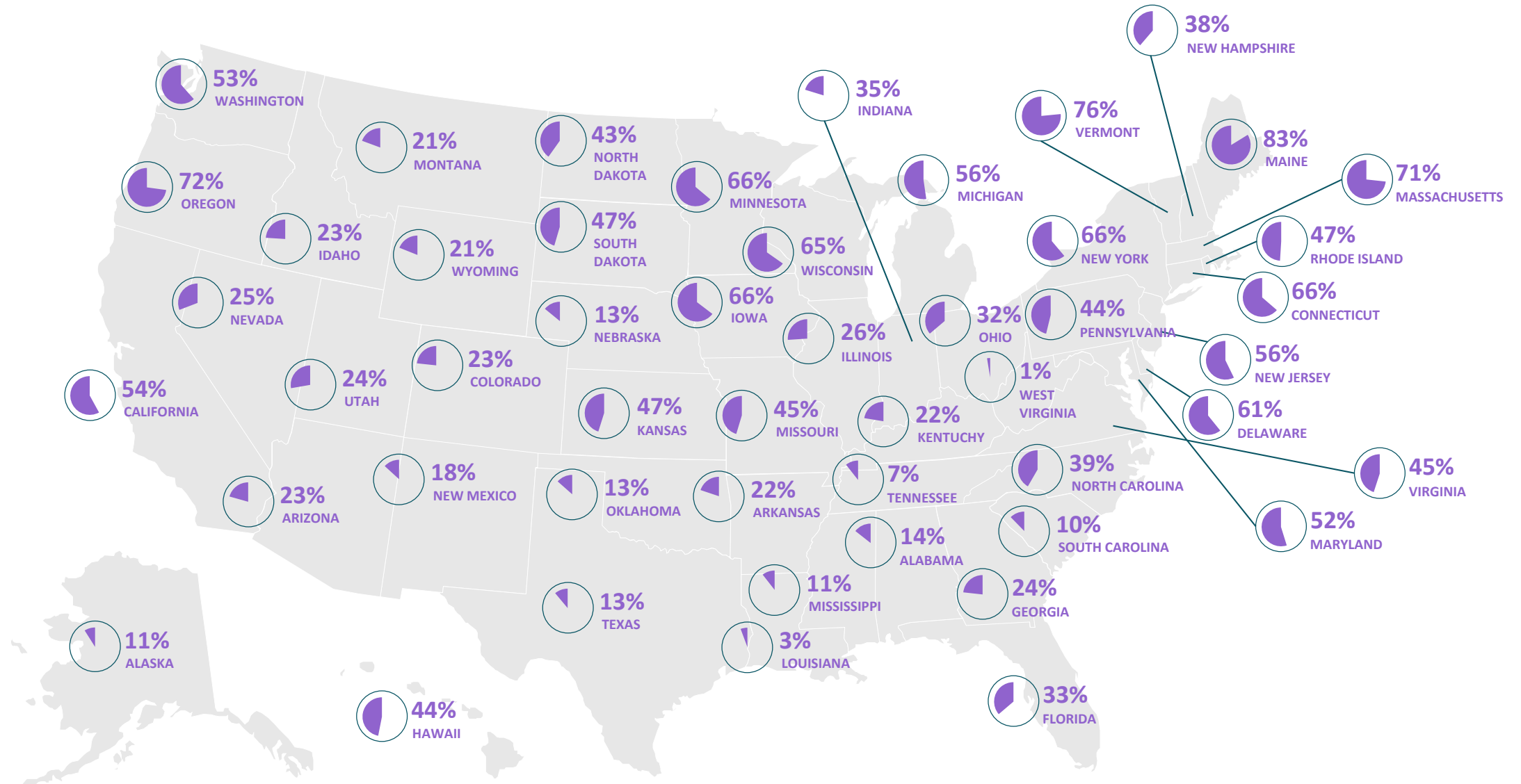
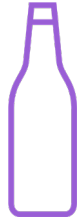


PET BOTTLE RECYCLING RATES PER STATE

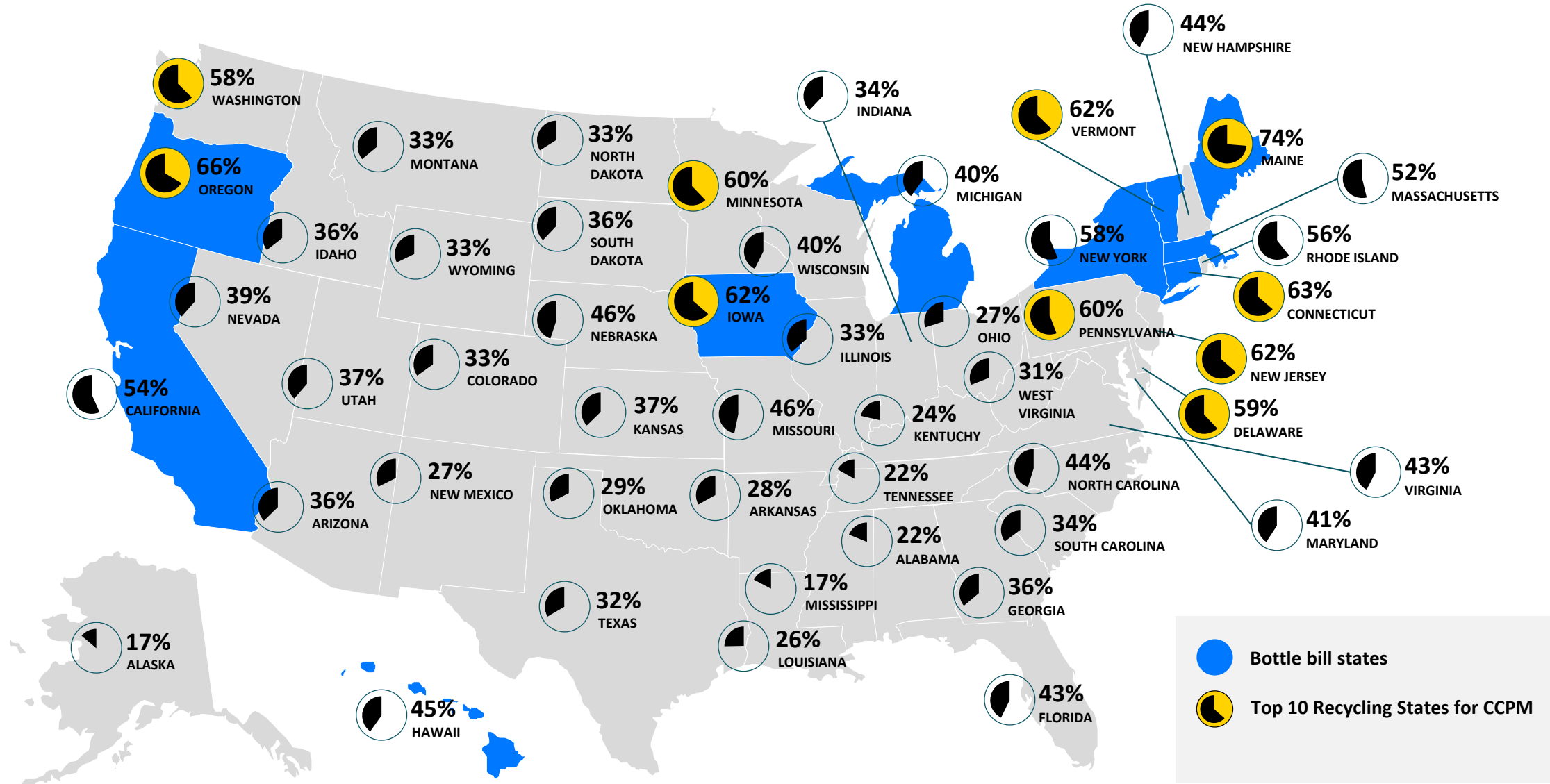


Note: Includes only PET Bottles

GLASS BOTTLES AND JARS RECYCLING RATES PER STATE



TOTAL CCPM RECYCLING RATES FOR PER STATE (INCLUDES CARDBOARD)



Note: Includes plastic (PET Bottles, PET other rigid plastics, HDPE bottles, PP, Rigids #3 – 7), Glass bottles and jars, Aluminum cans, Steel cans, Cardboard and boxboard

50 STATES OF RECYCLING



To achieve an ambitious global goal of 90% recycling by 2030, we need to dramatically boost US recycling rates. Good data is the foundation of smart policies that will grow our economy and protect the environment. That's why Ball Corporation, the world's leading producer of aluminum beverage containers, supported Eunomia in producing the first state-by-state comparable assessment of recycling rates for common containers and packaging materials (CCPM) in the US.

TODAY **ONLY 25%** OF US WASTE IS ACTUALLY RECYCLED.



3.5x more PET and 3x more aluminum is recycled in DRS states than in non-DRS states



Recycling one ton of aluminum has **3x THE GHG REDUCTION** benefit compared to recycling one ton of cardboard

Low-value cardboard and boxboard makes up **73% OF THE RECYCLING WASTE STREAM**



50% OF REVENUE from recycled materials at MRFs comes from aluminum – more than all other substrates combined



OF THE TOP 10 RECYCLING STATES...

9 of 10

states with the highest recycling rates for PET bottles and aluminum cans are states with a DRS and curbside recycling infrastructure



7

have good data quality, availability & state reporting systems



8

have a Deposit Return System (DRS) or "bottle bill"



8

have higher landfill disposal costs on a per ton basis

NATIONAL SNAPSHOT:



TAKEAWAY

As state & federal lawmakers consider recycling legislation and infrastructure investment, it's important to understand what's working – and what's not – when it comes to recycling in our country. With good data, smart policies and infrastructure investment, the US can be a leader in the global circular economy.

AMERICANS SUPPORT ACTION TO IMPROVE RECYCLING:

84%

agree that "investing in expanding and improving our nation's recycling infrastructure should be a higher priority."

67%

agree that "companies that manufacture food and beverage containers should be responsible for the cost of collecting and recycling their products after people discard them."

84%

agree that "the US should create a nationwide beverage container refund program to encourage recycling, where consumers get back a small fee for returning empty glass jars, aluminum cans and plastic bottles."

81%

agree that "difficult or impossible to recycle packaging materials should be phased out of use in the U.S. to reduce pollution."

*Data from online survey of 4,000 US adults conducted March 2021.

TOP & BOTTOM 10 RECYCLING STATES:

	RECYCLING RATE	BOTTLE BILL		RECYCLING RATE	BOTTLE BILL
#1 MAINE	72%	✓	#41 NEW MEXICO	13%	✗
#2 VERMONT	62%	✓	#42 TEXAS	13%	✗
#3 MASSACHUSETTS	55%	✓	#43 ALABAMA	11%	✗
#4 OREGON	55%	✓	#44 OKLAHOMA	10%	✗
#5 CONNECTICUT	52%	✓	#45 MISSISSIPPI	8%	✗
#6 NEW YORK	51%	✓	#46 SOUTH CAROLINA	8%	✗
#7 MINNESOTA	49%	✗	#47 TENNESSEE	7%	✗
#8 MICHIGAN	48%	✓	#48 ALASKA	6%	✗
#9 NEW JERSEY	46%	✗	#49 LOUISIANA	4%	✗
#10 IOWA	44%	✗	#50 WEST VIRGINIA	2%	✗

Learn more: Ball.com/RealCircularity