State of Recycling

The Present and Future of Residential Recycling in the U.S.

June 5, 2024

The Recycling Partnership
Solving for Circularity

We mobilize people, data, and solutions across the value chain to reduce waste and our impact on the environment while also unlocking economic benefits.

Each day we work together with communities and companies to help families in America recycle and recycle well.

How?

- Increase access to recycling
- Increase capture of recyclables
- Improve quality of recyclables

Why?

- 33 million homes in the U.S. cannot recycle at home as easily as they can throw something away.
- Those that can recycle easily are still putting 40% of their recyclables in the trash.**

*2024 State of Recycling Report;
** 2020 State of Curbside Report

Our Supporting Partners

The Recycling Partnership
Solving for Circularity

The Present and Future of Residential Recycling in the U.S.

The Recycling Partnership
Solving for Circularity

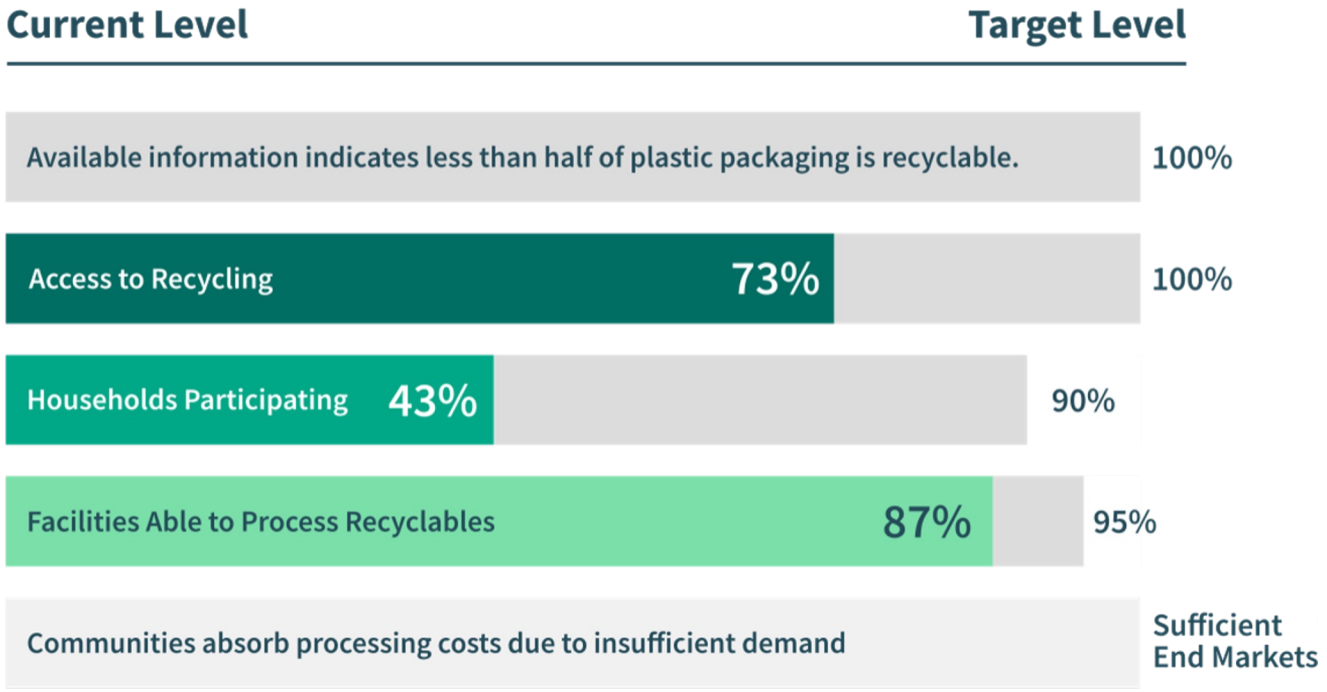
Five Requirements of an Effective Recycling System

For the U.S. Residential Recycling System to Function Effectively, Five Requirements Must Be Met:

The Recycling Partnership
Solving for Circularity

Requirements of an Effective Recycling System

These five links in the circle are the essential requirements of an effective recycling system. Below we describe the gaps in our current system:



The Recycling Partnership
Solving for Circularity

Modeling the Recycling Rate

Data and assumptions were combined to calculate the recycling rate

Recycling Access

National Database

Single family and multifamily recycling access data for each of the 9,000 U.S. communities in the database

Material Acceptance

National Database

Material acceptance data for the primary recycling collection program (typically curbside or drop-off) for each of 9,000 communities in the database

Recycling Participation

Community Survey

Based on average of participation rates submitted by 100 communities for the 2020 State of Curbside report, adjusted for each program type

Participant Capture

Capture Studies

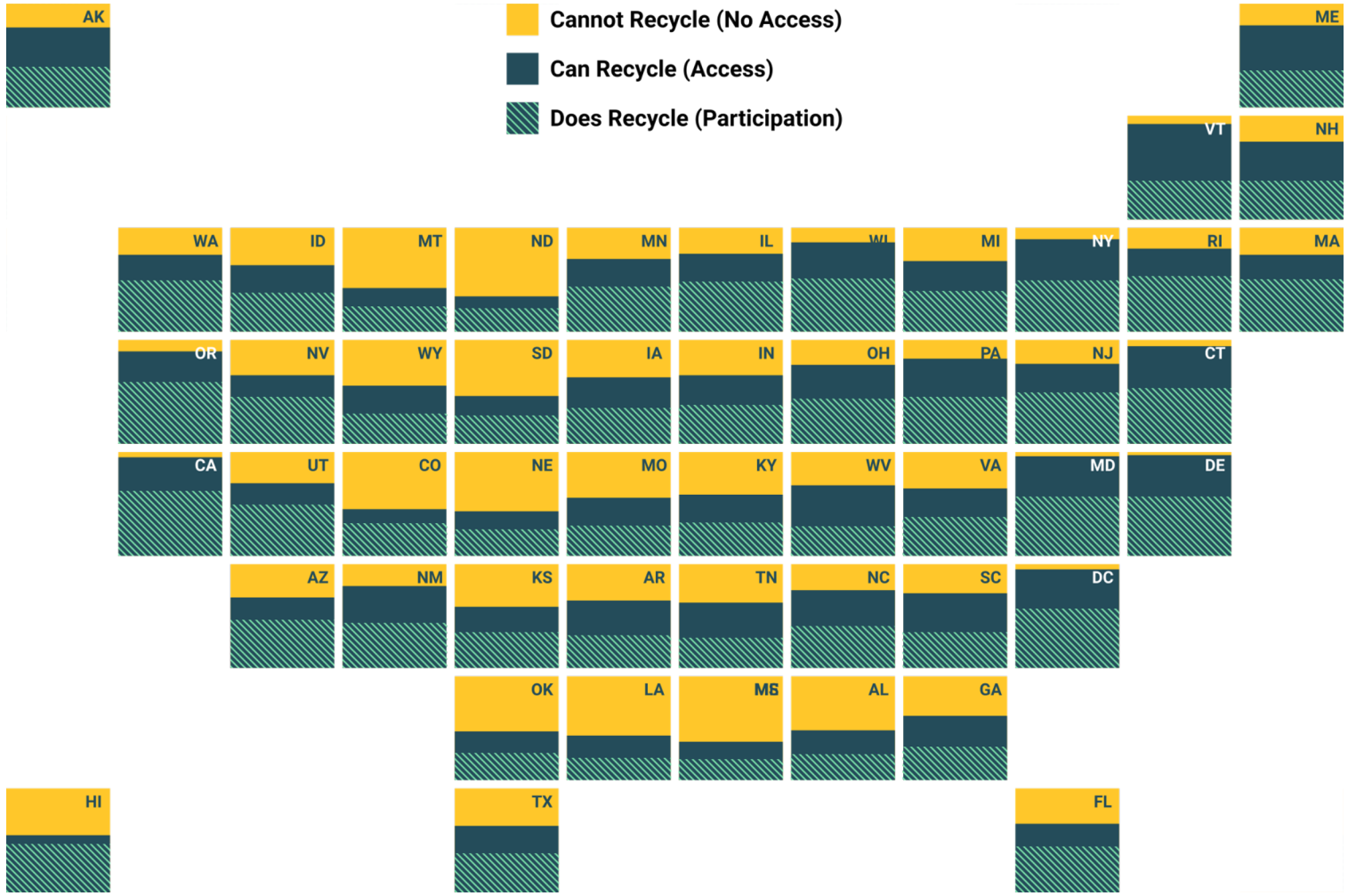
U.S. average rate for each material category based on 29 single-family participant capture rates collected in 2017-2022 from 15 cities and counties

MRF Capture

Industry Knowledge

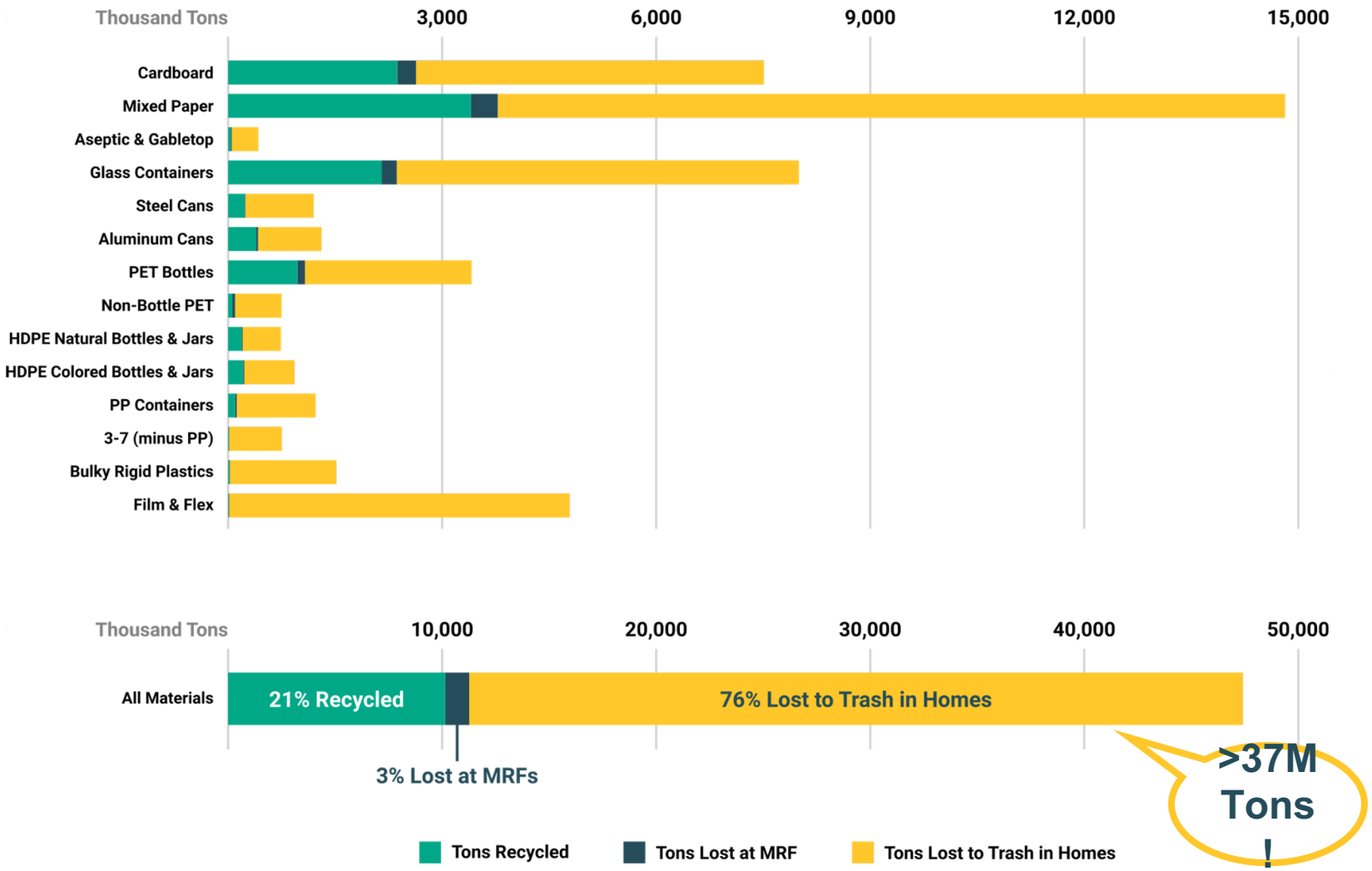
Estimated based on industry and staff knowledge

State-by-State Levels of Recycling Access and Participation



The Recycling Partnership
Solving for Circularity

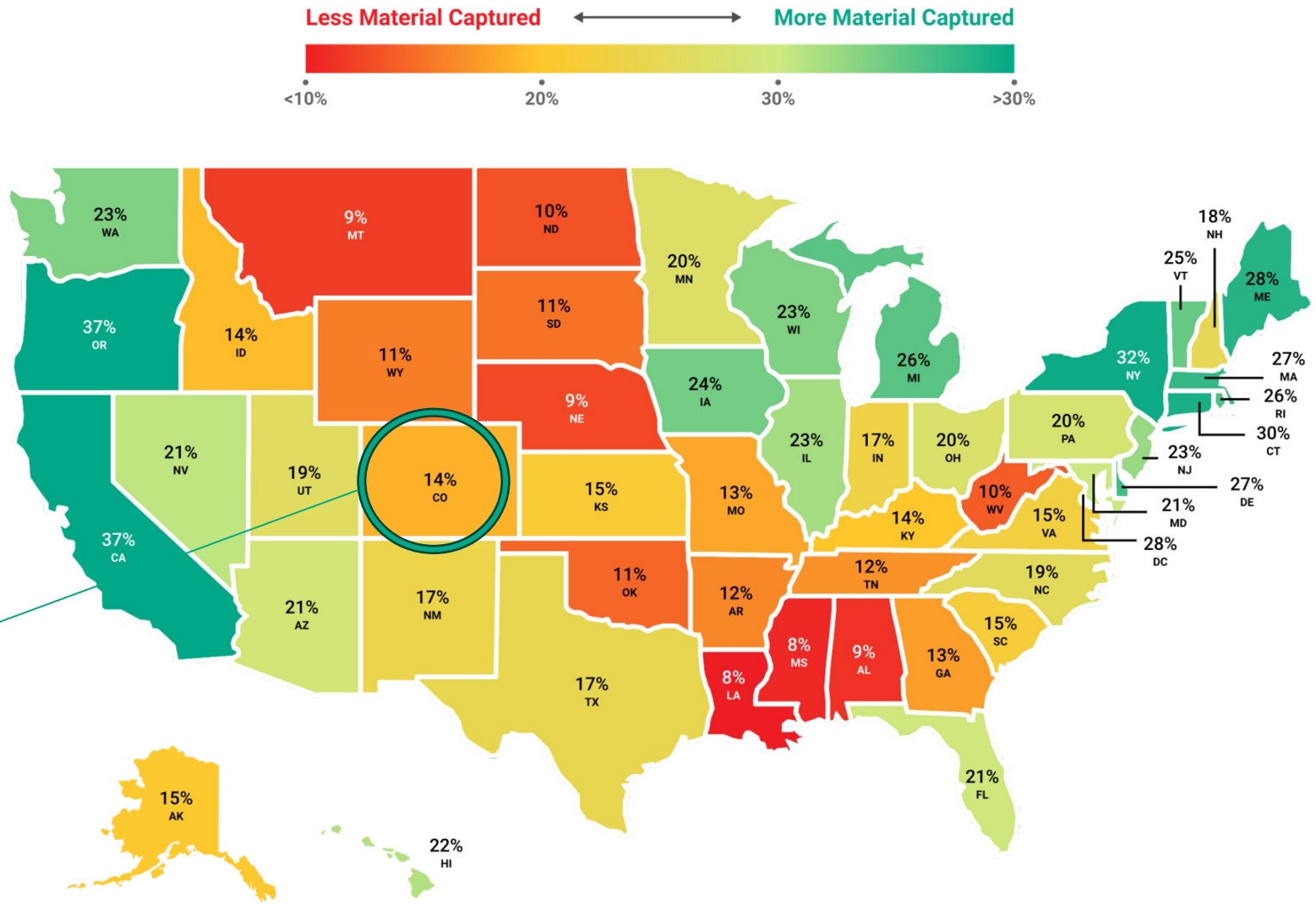
Fate of Material by Major Category



The Recycling Partnership
Solving for Circularity

Includes material captured through state deposit return systems

State-by-State Residential Recycling Rates



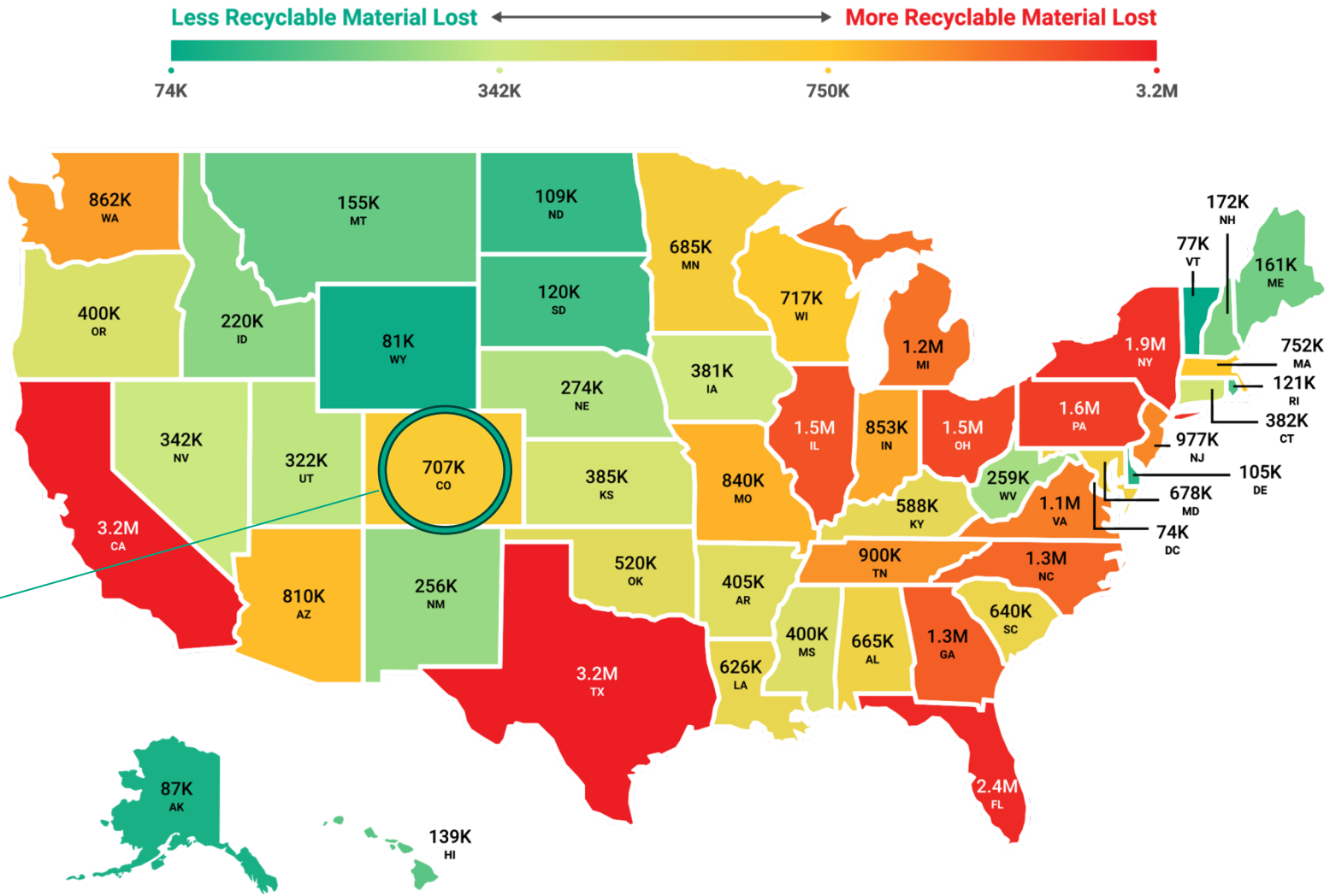
CO = 14% Residential Recycling Rate

The Recycling Partnership
Solving for Circularity

Includes material captured through state deposit return systems

State-by-State Residential Recyclable Material Lost

(in Tons Per Year)

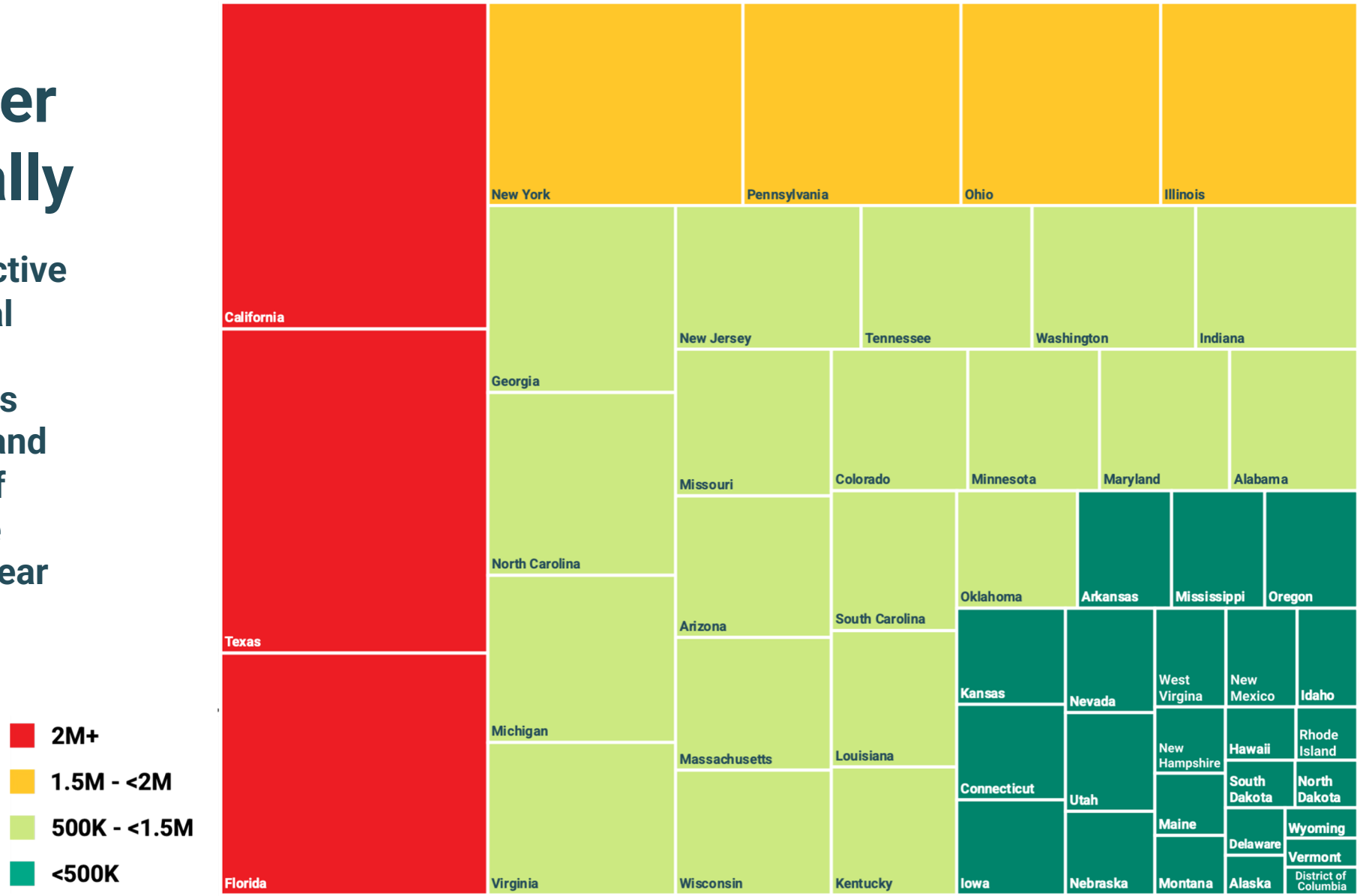


CO Recyclable Material Lost (Annually) = 707K Tons

The Recycling Partnership
Solving for Circularity

Tons Lost Per State Annually

An additional perspective on recyclable material lost by each state highlighting the states that lose the largest and smallest quantities of residential recyclable material in tons per year



The Recycling Partnership
Solving for Circularity

State-by-State Residential Recycling Rates by Commodity

	Cardboard	Mixed Paper	Aseptic & Gabletop	Glass Containers	Steel Cans	Aluminum Cans	PET Bottles	Non-bottle PET	HDPE Natural Bottles & Jars	HDPE Colored Bottles & Jars	PP	Plastics #3,4,6,7	Bulky Rigid Plastics	Film
Alabama	18%	13%	1%	2%	11%	12%	11%	3%	15%	13%	2%	1%	0%	0.2%
Alaska	29%	21%	9%	2%	16%	20%	18%	1%	23%	20%	2%	1%	0%	0.3%
Arizona	35%	25%	11%	18%	21%	24%	22%	10%	28%	25%	8%	0.3%	0.1%	0.01%
Arkansas	22%	15%	2%	5%	13%	15%	14%	2%	18%	16%	1%	0.4%	0%	0.04%
California	46%	34%	14%	58%	28%	64%	61%	14%	37%	33%	13%	2%	2%	0.5%
Colorado	23%	17%	8%	15%	14%	16%	14%	6%	18%	16%	7%	3%	1%	0.1%
Connecticut	38%	28%	14%	46%	23%	49%	47%	12%	31%	27%	12%	2%	1%	0.01%
Delaware	42%	31%	20%	32%	26%	29%	27%	15%	35%	30%	14%	1%	0%	0.1%
District of Columbia	43%	32%	21%	33%	27%	29%	28%	15%	35%	31%	14%	0%	16%	0%
Florida	34%	25%	11%	23%	21%	23%	22%	7%	27%	24%	8%	2%	0.2%	0.03%
Georgia	23%	17%	3%	8%	14%	16%	15%	5%	19%	16%	4%	1%	0.01%	0.1%
Hawaii	36%	1%	0%	53%	20%	58%	55%	10%	27%	24%	0%	1%	0%	0%
Idaho	28%	21%	1%	2%	17%	19%	15%	4%	19%	16%	5%	0.04%	0%	1%
Illinois	36%	26%	13%	24%	22%	24%	23%	11%	29%	26%	11%	1%	0.3%	0.02%
Indiana	27%	20%	6%	18%	17%	18%	17%	8%	22%	19%	7%	2%	0%	0.1%
Iowa	25%	17%	6%	50%	15%	47%	45%	8%	20%	18%	8%	2%	0%	0.1%
Kansas	25%	18%	5%	11%	15%	17%	16%	7%	20%	18%	8%	1%	0%	0.1%
Kentucky	23%	16%	7%	13%	14%	15%	15%	5%	18%	16%	5%	0.1%	2%	0.01%
Louisiana	16%	11%	1%	2%	10%	11%	9%	2%	12%	10%	2%	1%	0%	0.05%
Maine	24%	18%	6%	60%	15%	82%	65%	7%	18%	16%	6%	2%	1%	0.1%
Maryland	33%	25%	14%	25%	20%	23%	21%	6%	27%	24%	11%	0.02%	4%	0%
Massachusetts	37%	28%	4%	41%	23%	35%	34%	11%	30%	27%	12%	1%	0.4%	0.01%
Michigan	29%	21%	7%	51%	18%	50%	47%	9%	23%	21%	8%	2%	1%	0.1%
Minnesota	32%	24%	11%	23%	20%	21%	20%	10%	26%	23%	9%	1%	0.2%	0.04%
Mississippi	14%	10%	1%	5%	7%	10%	9%	3%	12%	10%	3%	0.3%	0.2%	0.04%

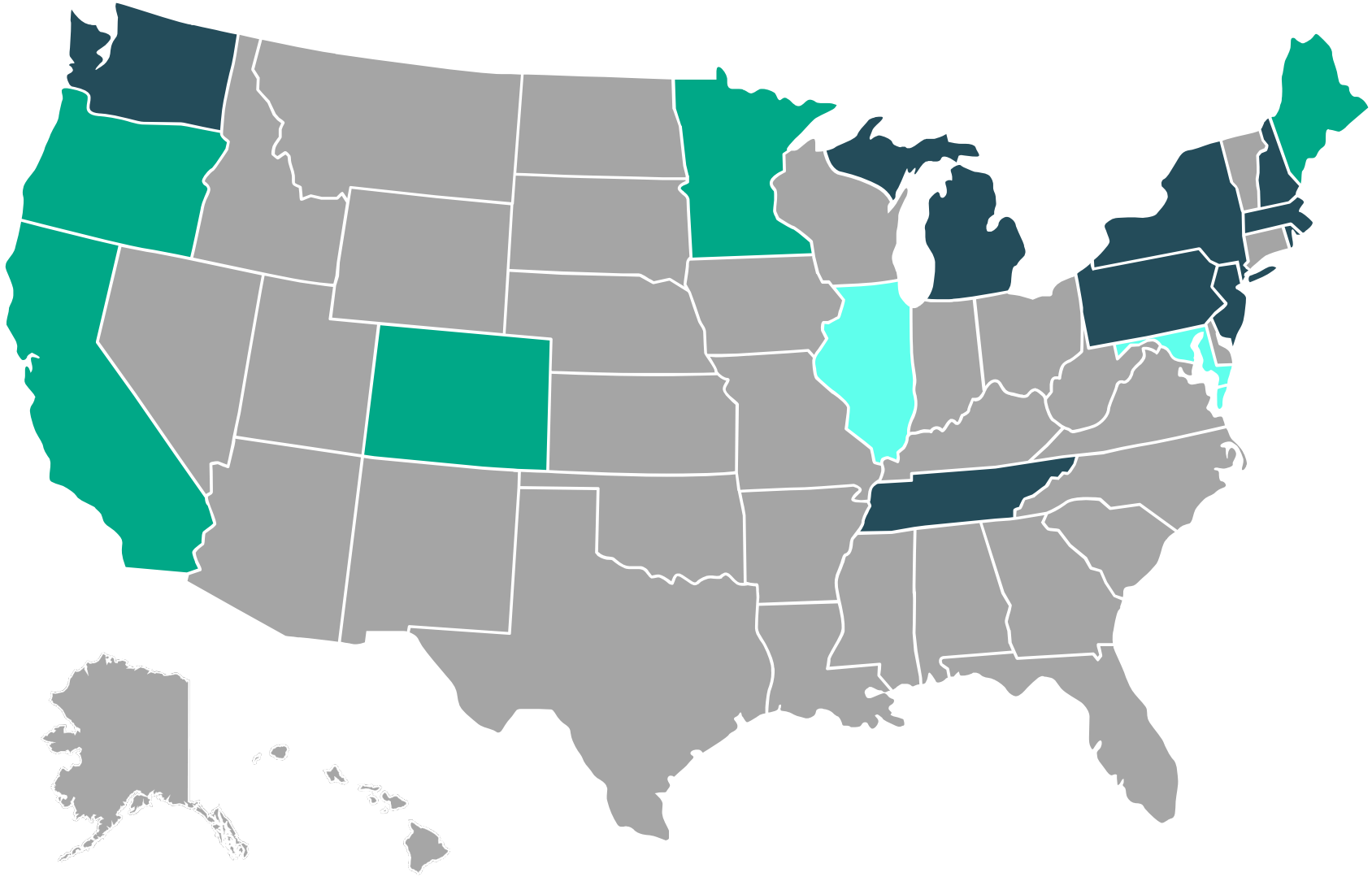
Includes material captured through state deposit return systems

2024 - State Legislative Updates & Activity

EPR for Packaging Legislative Activity in 2024
(introduced or expected)

EPR for Packaging Laws Passed & Currently in Implementation
(CA, CO, ME, MN, OR)

Needs Assessments passed in 2023



Projected Impact of EPR in Five Adopting States

(California, Colorado, Maine, Minnesota and Oregon)

Before implement ation of EPR

32% of material recycled

2.4M tons

of recyclables on average projected to be recycled in California, Colorado, Maine, Minnesota, and Oregon annually

After implementation of EPR

69% of material recycled

5.2M tons

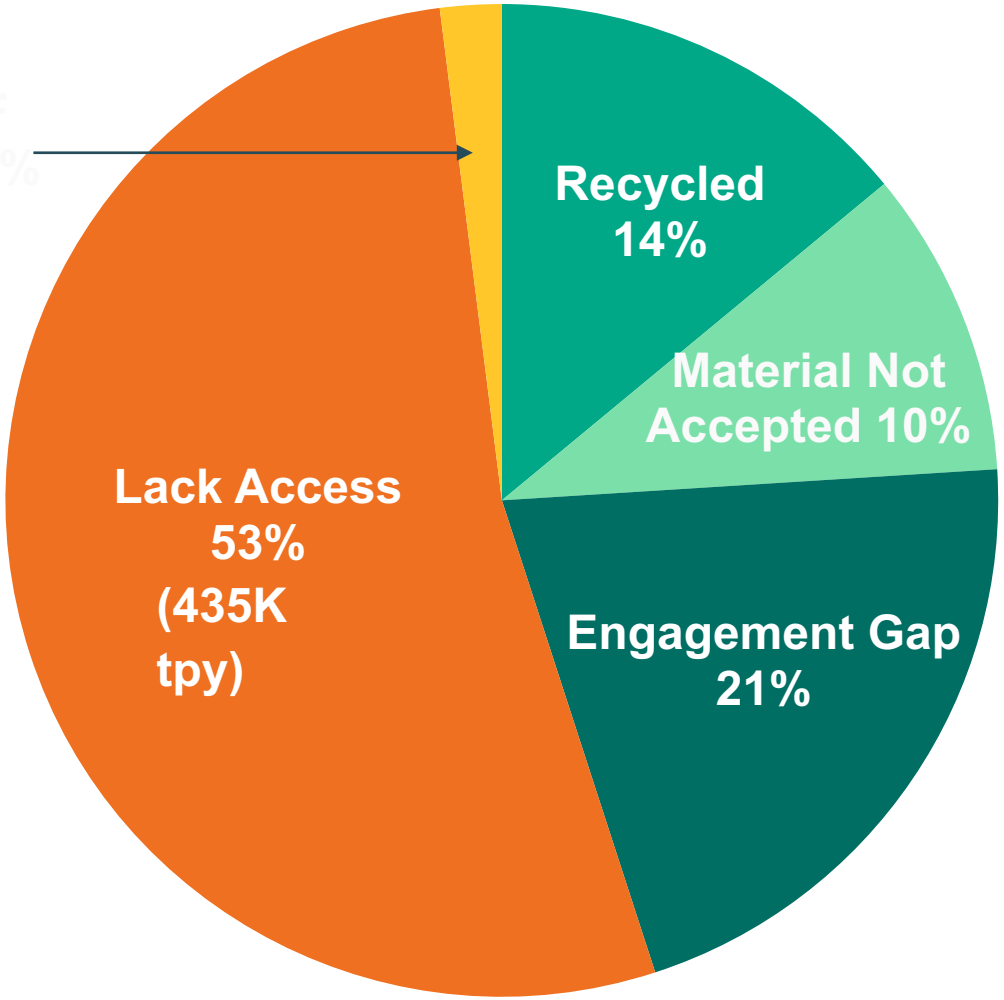
of projected recyclables on average will be recycled in California, Colorado, Maine, Minnesota, and Oregon annually

Implementation of EPR Policies takes 3-5 years following passage of legislation

Strategy 3: Invest in Recycling Engagement

Out of 826K Residential Tons of Recyclables Generated in CO

Lost to MRF Processing 2%



43% of Single-family households and
88% of Multifamily households
don't have access to recycling

32% of HHs w/ access are not participating

43% of materials from participating HHs are not captured

The Recycling Partnership
Solving for Circularity

Potential Benefits of Well-Designed and EPR and DRS Co-

Recycling rates – Support extremely high beverage container recycling rates and high overall packaging recycling rates.	**Material circularity** – supporting domestic closed-loop markets, particularly for glass, aluminum and PET
Driving efficiency – Infrastructure could be developed in tandem to maximize efficiencies and cost savings. (e.g., DRS sites could serve as drop-offs for some EPR materials; MRFs could process DRS materials)	**More tons recovered –** Well-designed EPR can support and financially offset the loss of beverage packaging for MRFs, supporting all materials to pay they share, via eco-modulated producer fees. EPR will increase the total tons processed by MRFs, bolstering curbside recycling programs
Access and convenience – supports away-from-home recovery (public and business/institutional) and will serve to complement recovery rates from curbside EPR programs.	**Other environmental benefits –** Support nascent reuse and refill infrastructure (e.g., OBRC refill)

Get in Touch:

Dylan de Thomas

VP of Public Policy & Government Affairs

ddethomas@recyclingpartnership.org

http://www.recyclingpartnership.org/residential-recycling-report/

Thank You!

The Recycling Partnership
Solving for Circularity

We mobilize people, data, and solutions across the value chain to reduce waste and our impact on the environment while also unlocking economic benefits.

50 STATES OF RECYCLING 2.0

Colorado Case Study Deep Dive
June 2024

BUILDING ON THE COMPARABLE STATE-BY-STATE RECYCLING RATE FOR CONTAINERS AND PACKAGING WE CREATED IN 2021

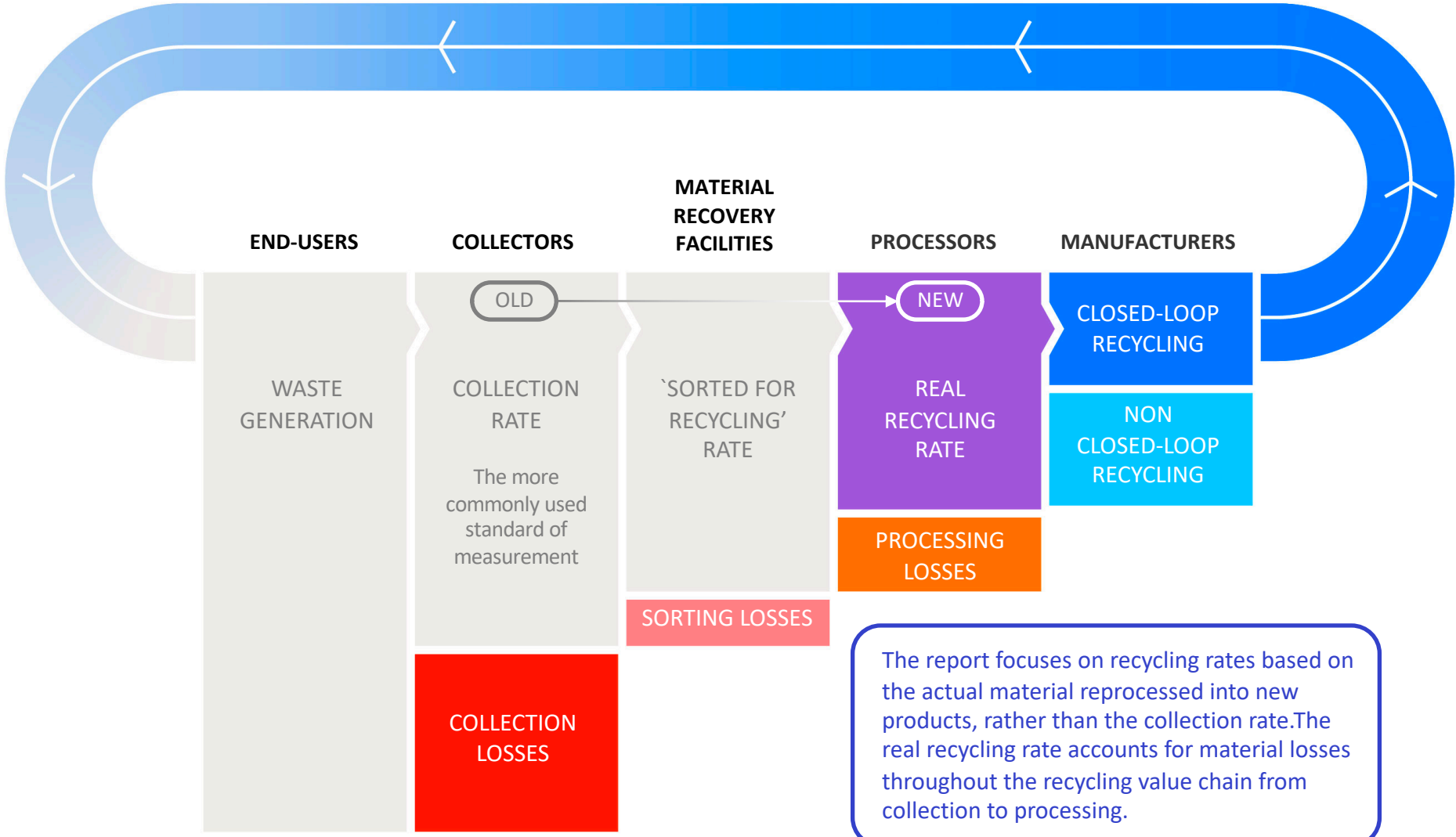
The 50 States of Recycling 2.0 provides an update to this analysis, the state recycling rankings are based on the recycling rate of packaging materials minus cardboard, boxboard, paper packaging, plastic films, and flexible plastic packaging – referred to as fiber and flexible plastics (FFP).

While the recycling of these materials is important, their large volumes -- 66% of the total weight of packaging analyzed – they mask the performance of other packaging materials. In addition to volume, much of this material comes from the commercial sector from which the data is less accurate.

The real recycling rate measures the quantity of material that is actually recycled and re-incorporated into a new product

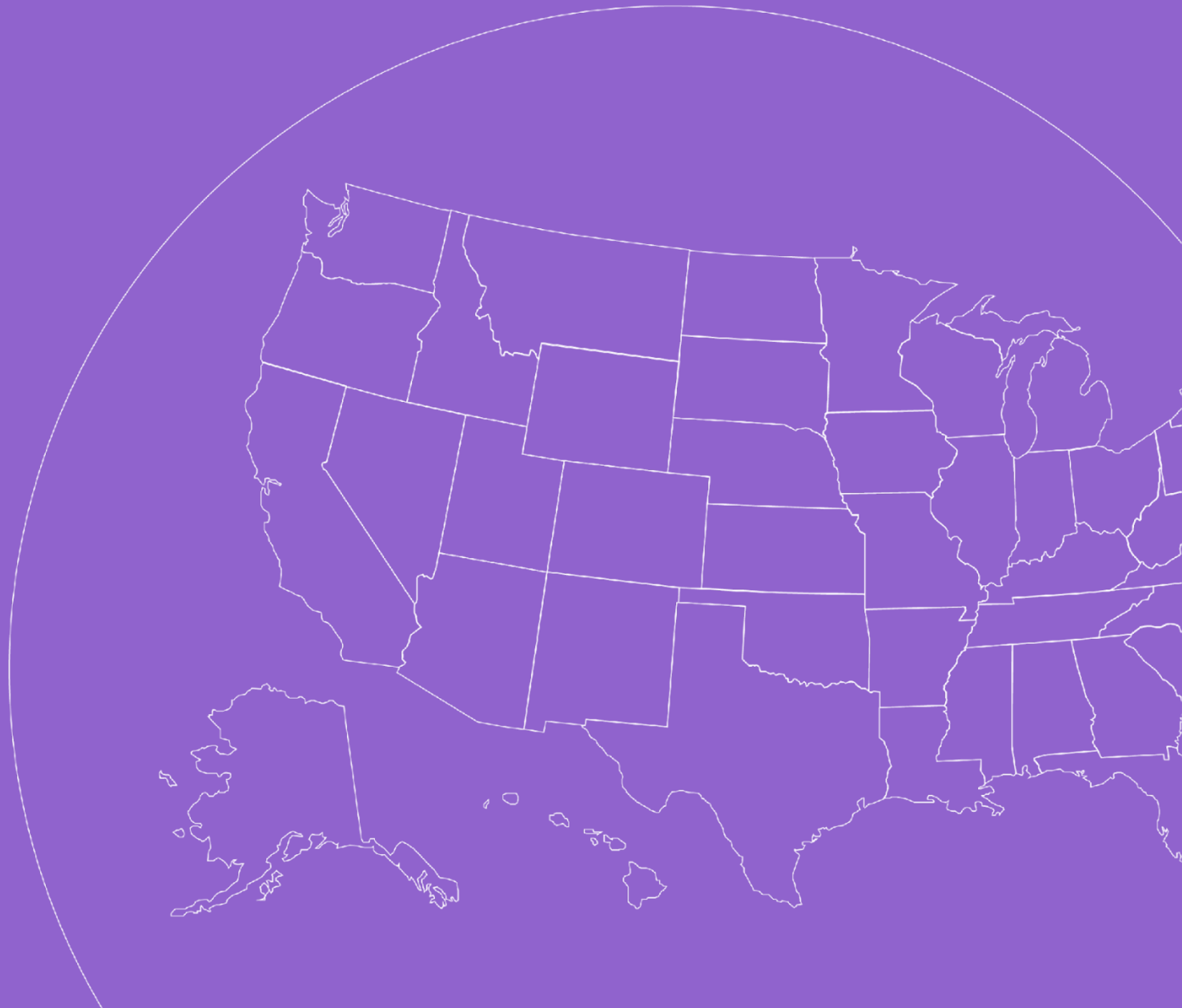
Collection and recycling are not synonymous, as the quantity of material collected for recycling today is often greater than what is actually processed and recycled into new products. The **real recycling** rate measures the quantity of material that is ***actually* recycled** and re-incorporated into a new product. All recycling rates presented in this report are the real recycling rate.

It is only when a recycled material makes it into a new product that we begin to obtain environmental benefit to offset the impacts of the collection, sorting and recycling processes.



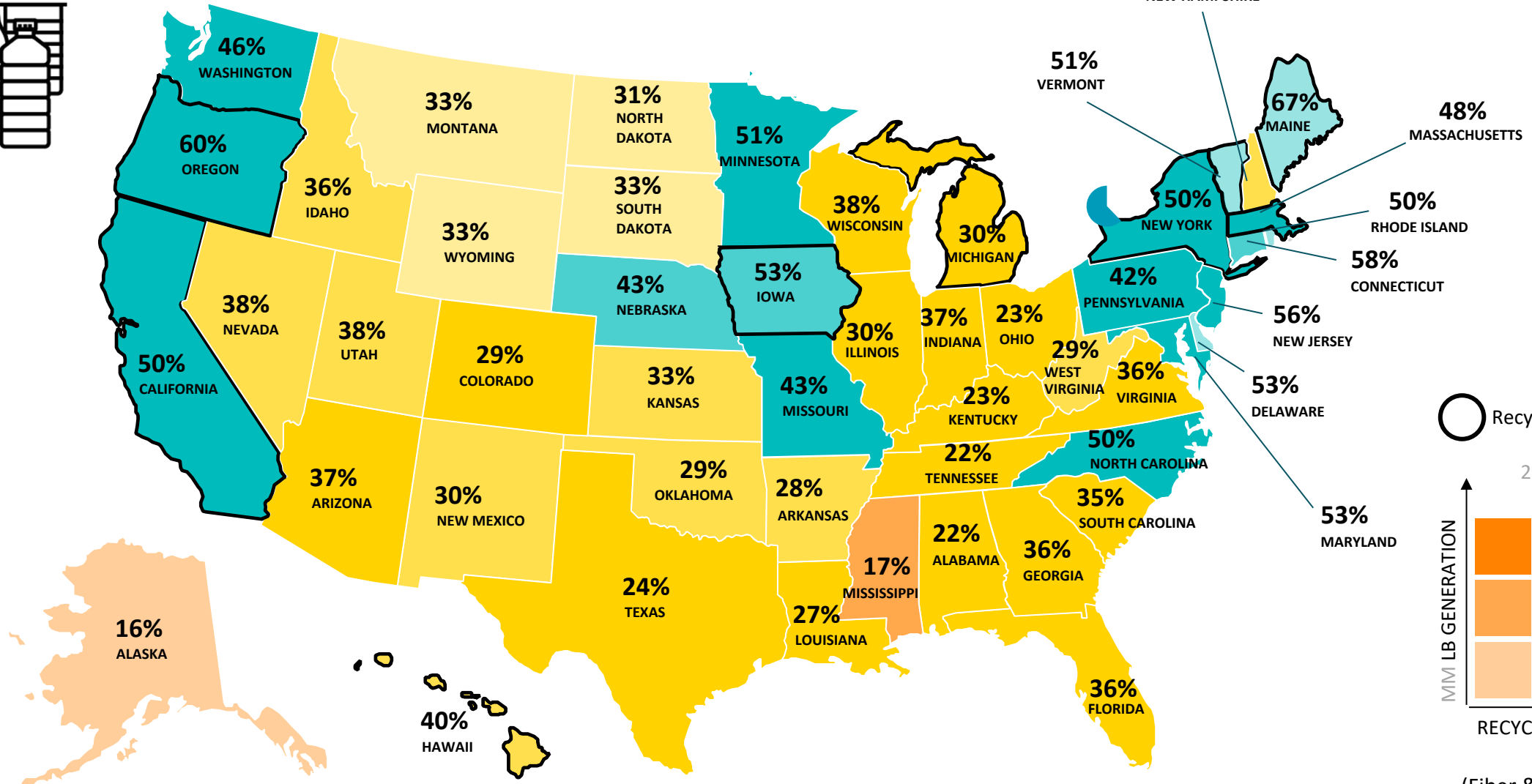
The report focuses on recycling rates based on the actual material reprocessed into new products, rather than the collection rate.The real recycling rate accounts for material losses throughout the recycling value chain from collection to processing.

Rankings

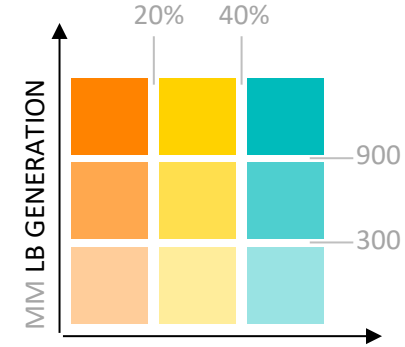


THE 50 STATES OF RECYCLING

US RECYCLING RATES PER STATE (INCLUDES FIBER & FLEXIBLE PLASTICS)



Recycling Refund State



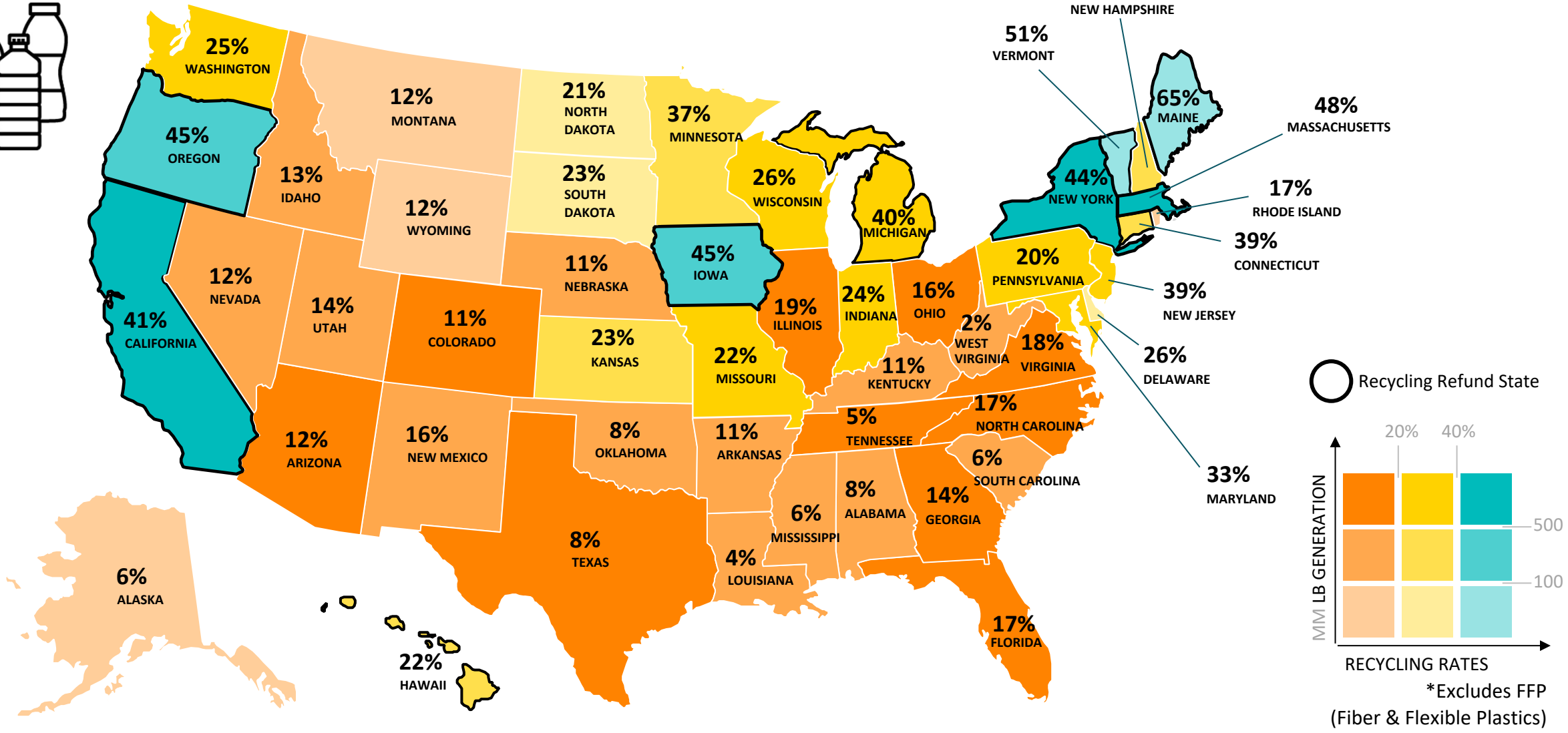
*Includes FFP (Fiber & Flexible Plastics)

STATE RECYCLING RANKINGS: EXCLUDES FIBER & FLEXIBLE PLASTICS
TOP 10 & BOTTOM 10

RANKING: TOP 10	STATE	RECYCLING RATE	RECYCLING REFUND	
#1	Maine	65%	Yes	✓
#2	Vermont	51%	Yes	✓
#3	Massachusetts	48%	Yes	✓
#4	Iowa	45%	Yes	✓
#5	Oregon	45%	Yes	✓
#6	New York	44%	Yes	✓
#7	California	41%	Yes	✓
#8	Michigan	40%	Yes	✓
#9	New Jersey	39%	No	✗
#10	Connecticut	39%	Yes	✓

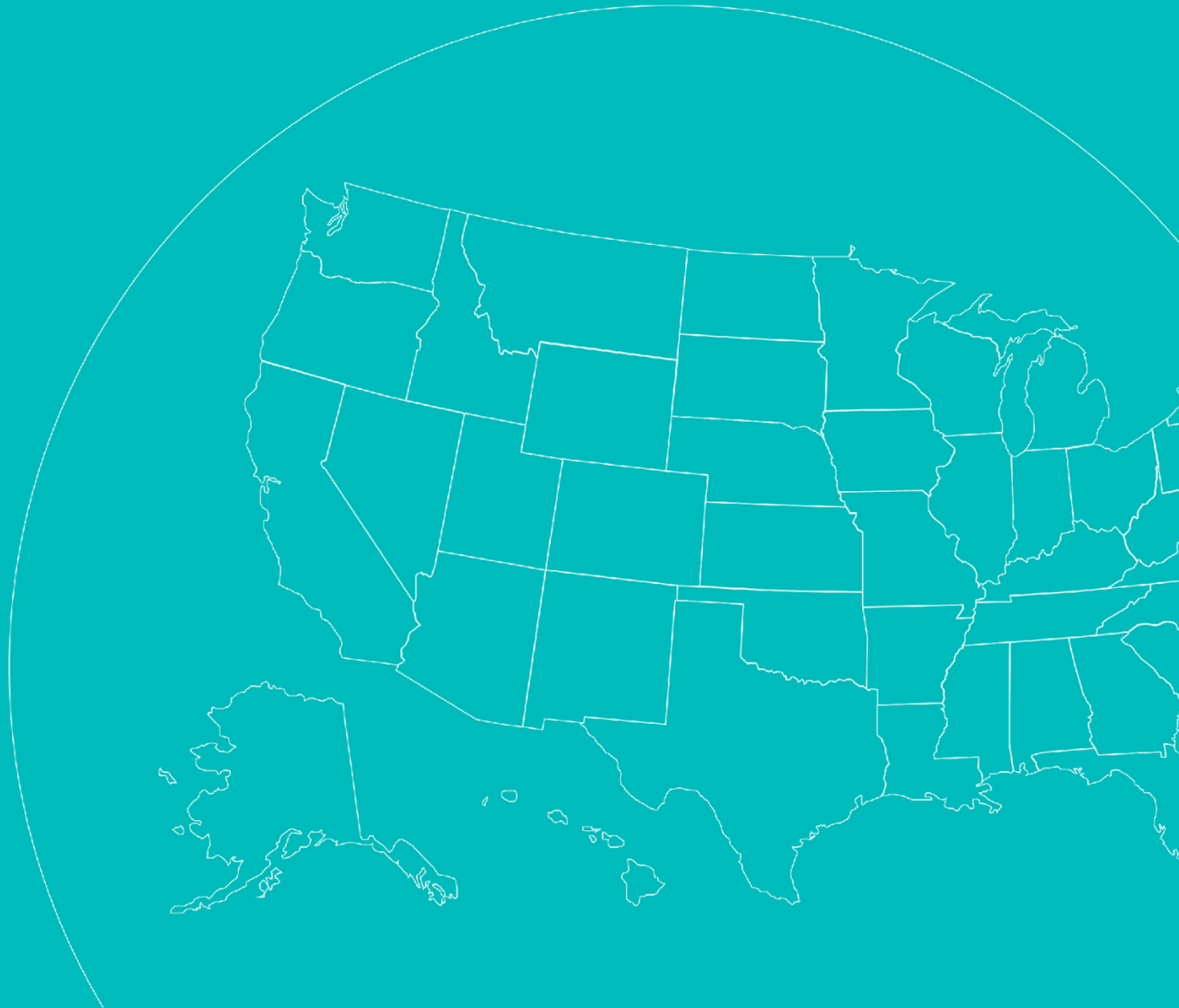
RANKING: BOTTOM 10	STATE	RECYCLING RATE	RECYCLING REFUND	
#41	Colorado	11%	No	✗
#42	Texas	8%	No	✗
#43	Alabama	8%	No	✗
#44	Oklahoma	8%	No	✗
#45	Mississippi	6%	No	✗
#46	South Carolina	6%	No	✗
#47	Alaska	6%	No	✗
#48	Tennessee	5%	No	✗
#49	Louisiana	4%	No	✗
#50	West Virginia	2%	No	✗

US PACKAGING RECYCLING RATES BY STATE (EXCLUDES FIBER & FLEXIBLE PLASTICS)



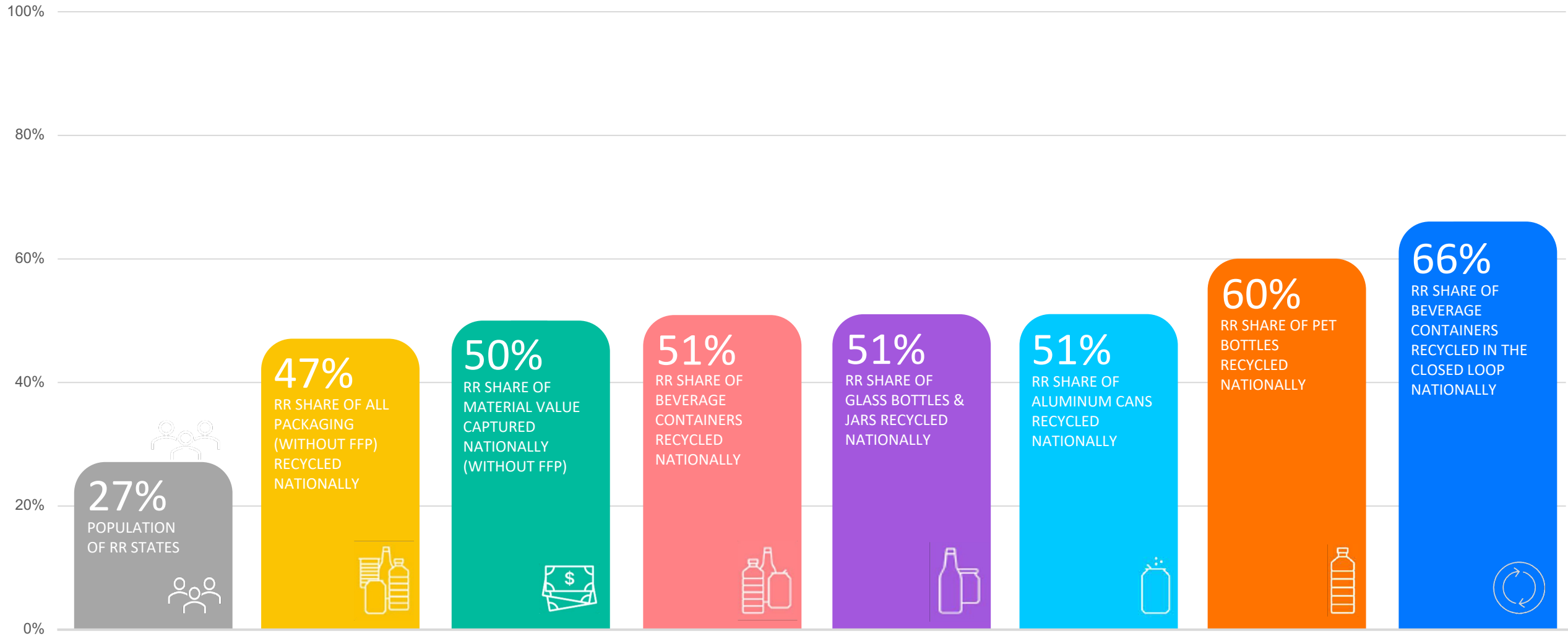
*Excludes FFP
(Fiber & Flexible Plastics)

Impact Analysis



THE 50 STATES OF RECYCLING

9 OF THE 10 STATES WITH THE HIGHEST RECYCLING RATES HAVE RECYCLING REFUNDS
THE 10 STATES WITH RECYCLING REFUNDS REPRESENT…



Ball | THE 50 STATES OF RECYCLING

CHARACTERISTICS OF A MODERNIZED AND HIGH PERFORMING RECYCLING REFUNDS PROGRAM

Include All Beverage Containers of All Sizes and Formats

Allow Beverage Producers to Operate and Finance a Centralized System

Incentivize Return by Offering Meaningful Consumer Refund

Set a Minimum Return Rate of 90% for All Beverage Packaging.

Reinvest Unredeemed Deposits in the Recycling System

Create Consumer-Driven and Convenient Return Points

COMBINING RR AND EPR FOR EXTRA CONVENIENCE

British Columbia (Canada) empowers producers to design and manage different EPR programs specific to their products creating a high performing, holistic recycling system with drop-off sites where consumers can return all different items: beverage containers, commingled recyclables, batteries, textiles, electronics, etc.

RR WITH BAG DROPS / EXPRESS RETURN

Several programs in North America operate an express / bag drop system where consumers can return mixed empty containers in a tagged bag that is then sent to a counting center and the refund is paid directly to their account after a few days.

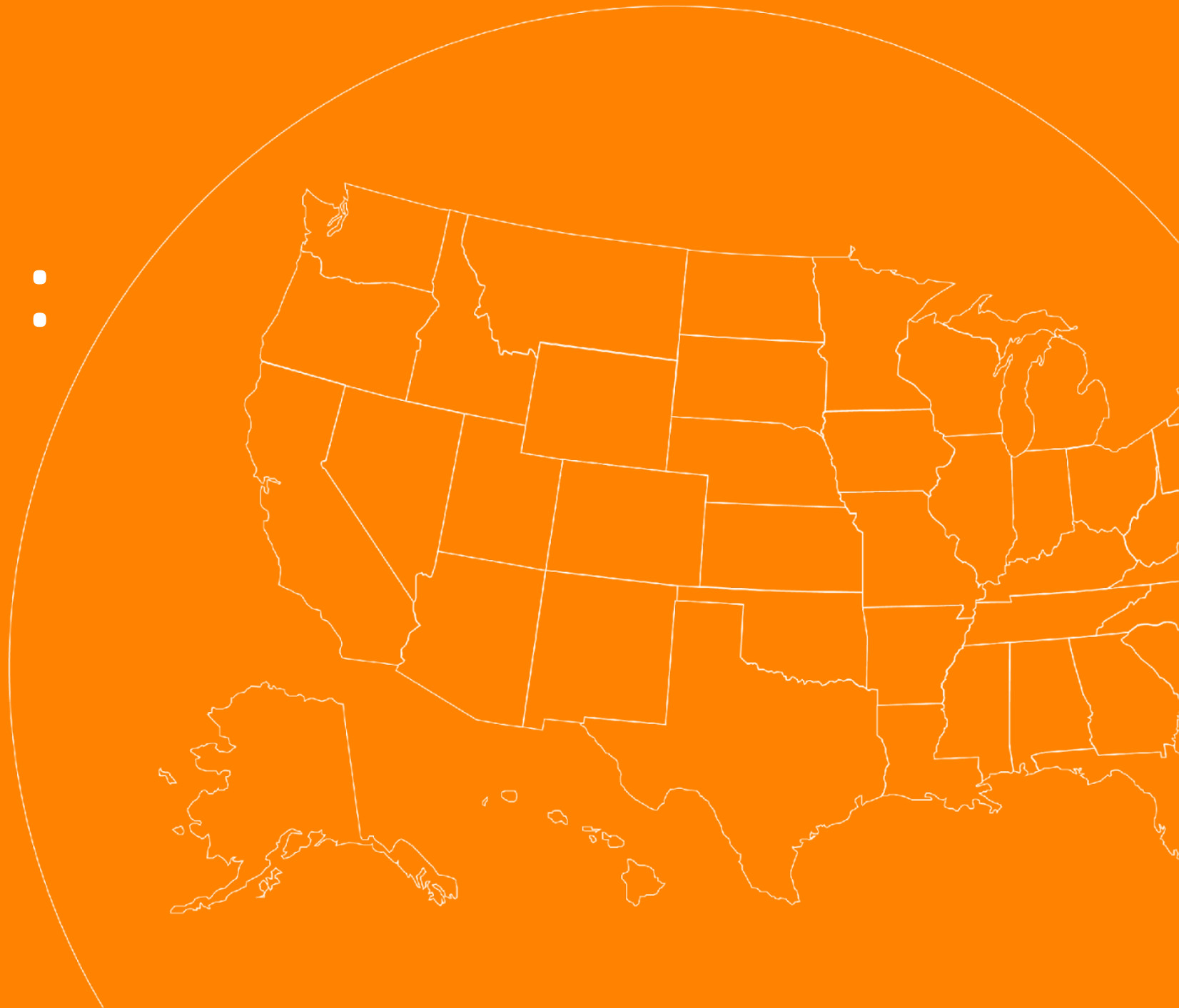
RR WITH ON-THE-GO 'DONATION'

An efficient way to overcome the lack of on-the-go return points in modern RR is through the adoption of collection 'pockets' outside general waste bins where refund-bearing packaging can be disposed of and easily spotted by individuals interested in collecting the deposit without requiring them to go through the bin.

HIGH VOLUME SELF-SERVICE REDEMPTION POINTS

Support individuals who collect refund bearing containers for income. For example, canners/binners collect cans and bottles from trash cans and from being littered in the environment. These individuals generally rely on same day refunds for their returns and benefit from high volume redemption points/depots.

Colorado Case Study : Impact of EPR+RR



Ball | THE 50 STATES OF RECYCLING

CASE STUDY

COLORADO

11% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#41	-6
RECYCLING RANK 2018	#35	

POPULATION
5,811,297

CENSUS SUB REGION
MOUNTAIN

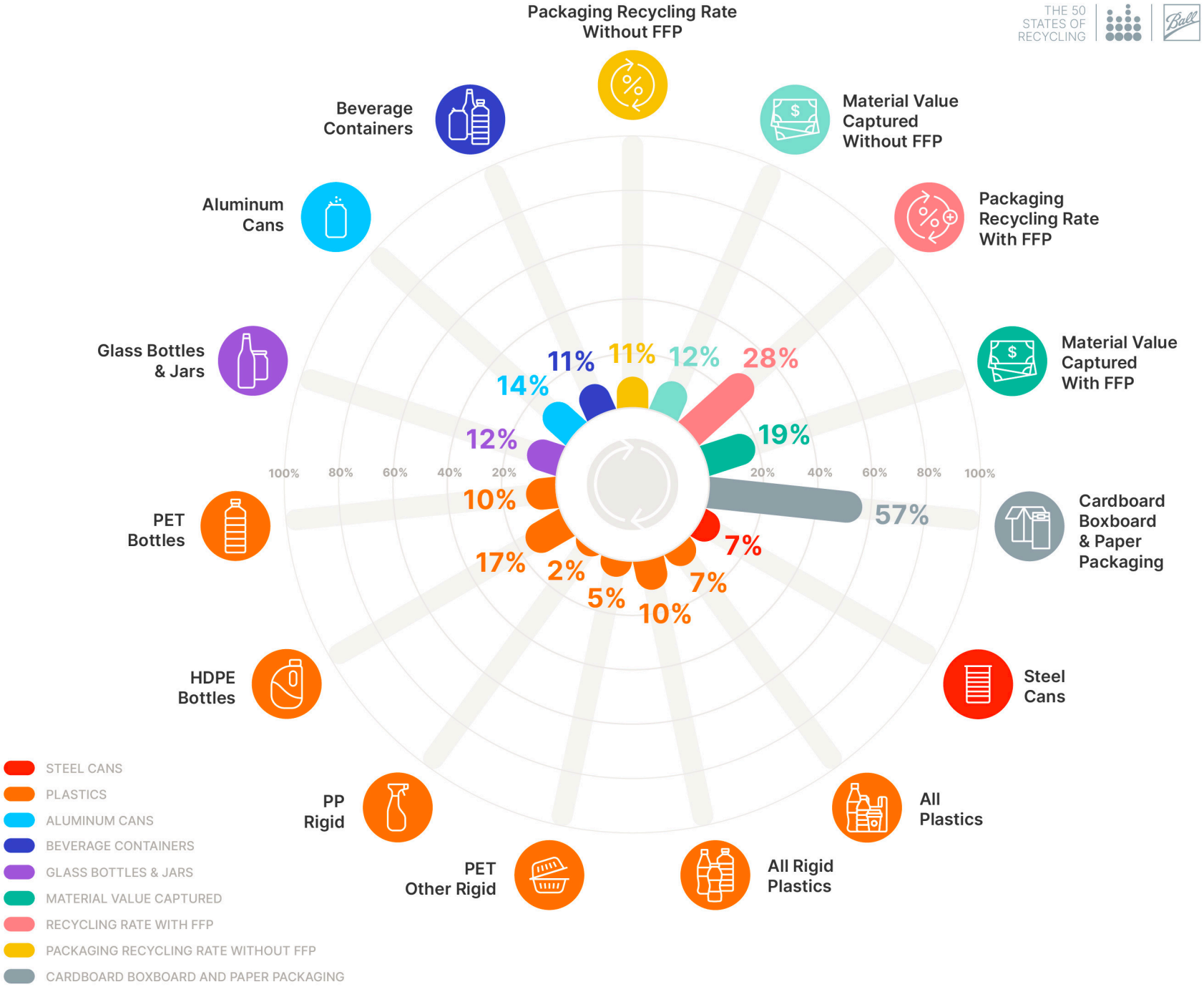
RECYCLING REFUND STATE
NO

DATA QUALITY

GOOD — FAIR — LIMITED

ANALYSIS OVERVIEW

Since EPR policy typically only includes residential waste, the EPR analysis focuses only on residential packaging waste. While the RR analysis includes all beverage containers both from the residential and commercial sectors.



CASE STUDY

COLORADO

49% RECYCLING RATE WITH EPR

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

HIGHLIGHTS

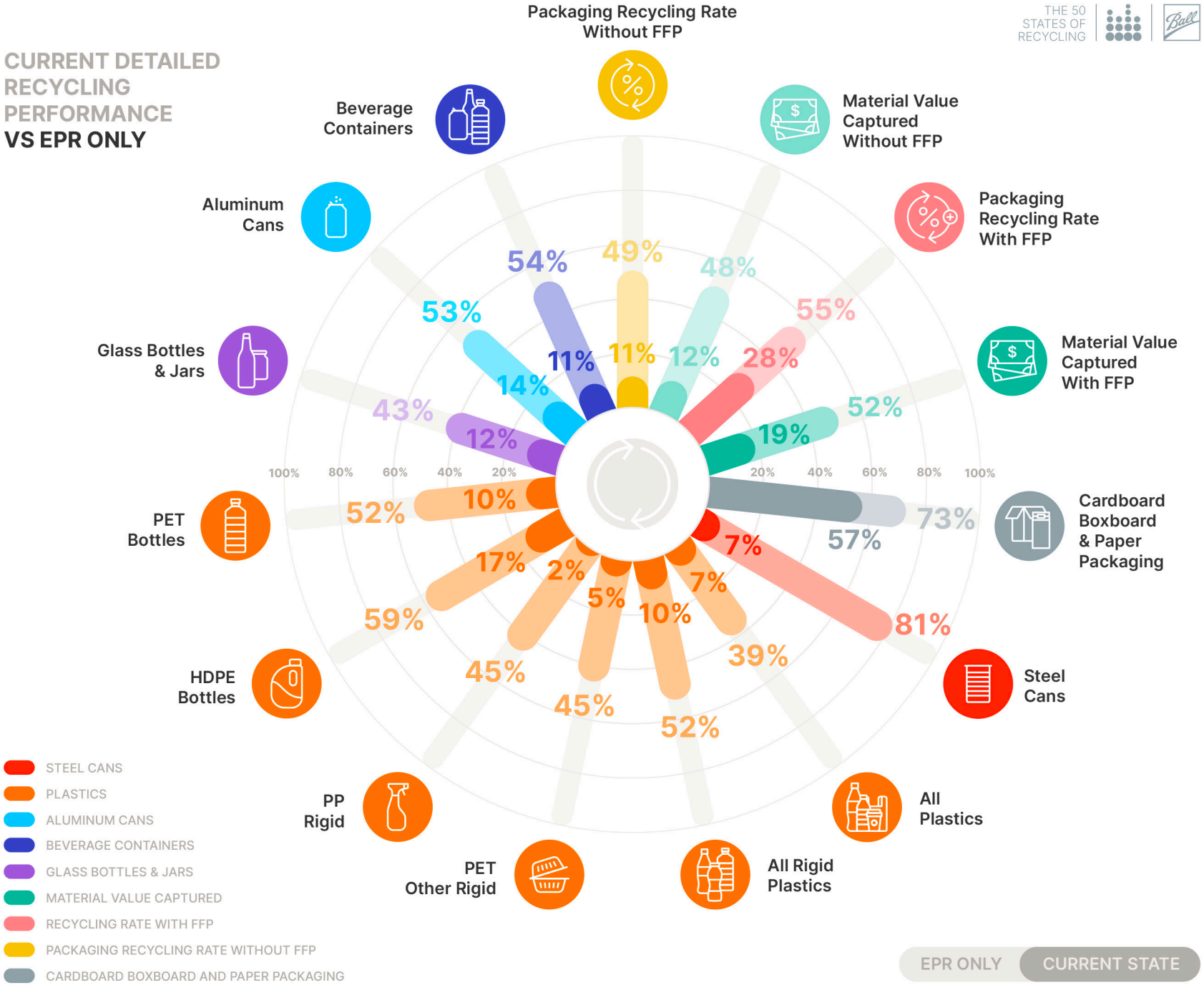
The introduction of EPR holds the potential to significantly transform recycling rates in Colorado.

- Presently, the recycling rate for 'Packaging without FFP' stands at 11%, but with EPR, there's a possibility of an increase to 49%.
- Similarly, for 'Packaging with FFP', currently at 28%, there's potential for a jump to 55%.
- A substantial shift is anticipated for 'All plastic', where the recycling rate is expected to climb from 7% to 39%, showcasing the positive impact of EPR on recycling practices.
- Specifically, 'Beverage containers' could witness notable improvement, as the current recycling rate is only 11%, but under the proposed legislation, there's potential to double the rate and reach 54%.

ANALYSIS OVERVIEW

Since EPR policy typically only includes residential waste, the EPR analysis focuses only on residential packaging waste. While the RR analysis includes all beverage containers both from the residential and commercial sectors.

CURRENT DETAILED RECYCLING PERFORMANCE VS EPR ONLY



THE 50 STATES OF RECYCLING

CASE STUDY

COLORADO

82% RECYCLING RATE WITH EPR + RR

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

HIGHLIGHTS

If Colorado implements EPR+RR legislation, recycling rates could see significant improvement compared to 'EPR only.'

Recycling rates for 'Packaging without FFP,' currently at 11%, might rise to 82% with EPR+RR.

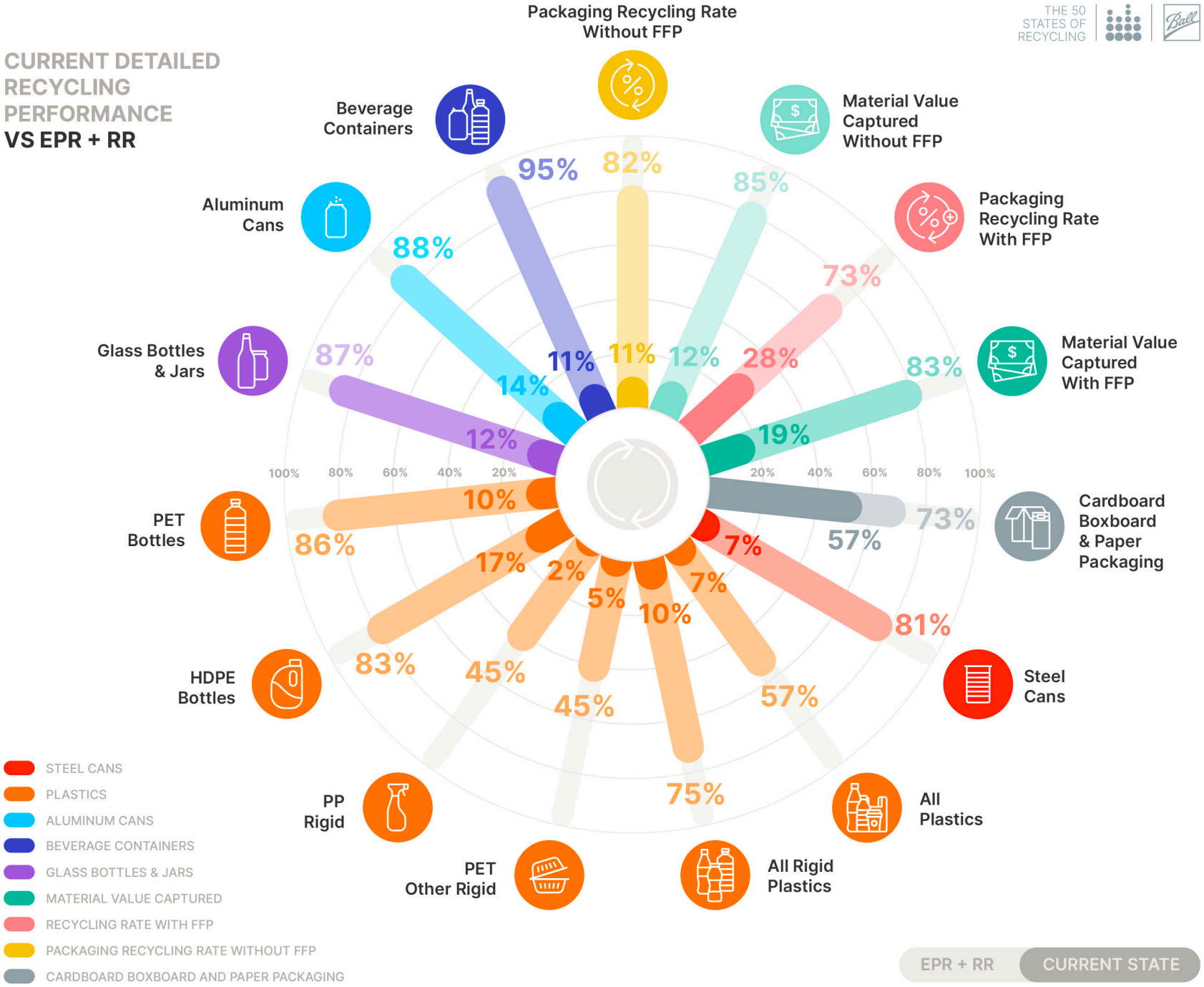
This positive trend spans various packaging segments, including 'Packaging with FFP,' which could go from 28% to 73%.

The impact extends to 'All plastics,' potentially increasing from 7% to 57%, while 'Beverage containers' could experience a remarkable boost, rising from 11% to 95%. The proposed legislation shows promise for a substantial shift in Colorado's recycling landscape.

ANALYSIS OVERVIEW

Since EPR policy typically only includes residential waste, the EPR analysis focuses only on residential packaging waste. While the RR analysis includes all beverage containers both from the residential and commercial sectors.

CURRENT DETAILED RECYCLING PERFORMANCE VS EPR + RR



EPR + RR DELIVERS BETTER PERFORMANCE AT FASTER PACE – DELIVERING MAXIMUM RECYCLING RATES FOR COLORADO

Well-designed RR programs can achieve 90% recovery within just a few years while EPR programs take 5-10 years to achieve peak recycling rates between 50%-65%. By pairing the programs together, states can deliver high recycling rates more quickly.

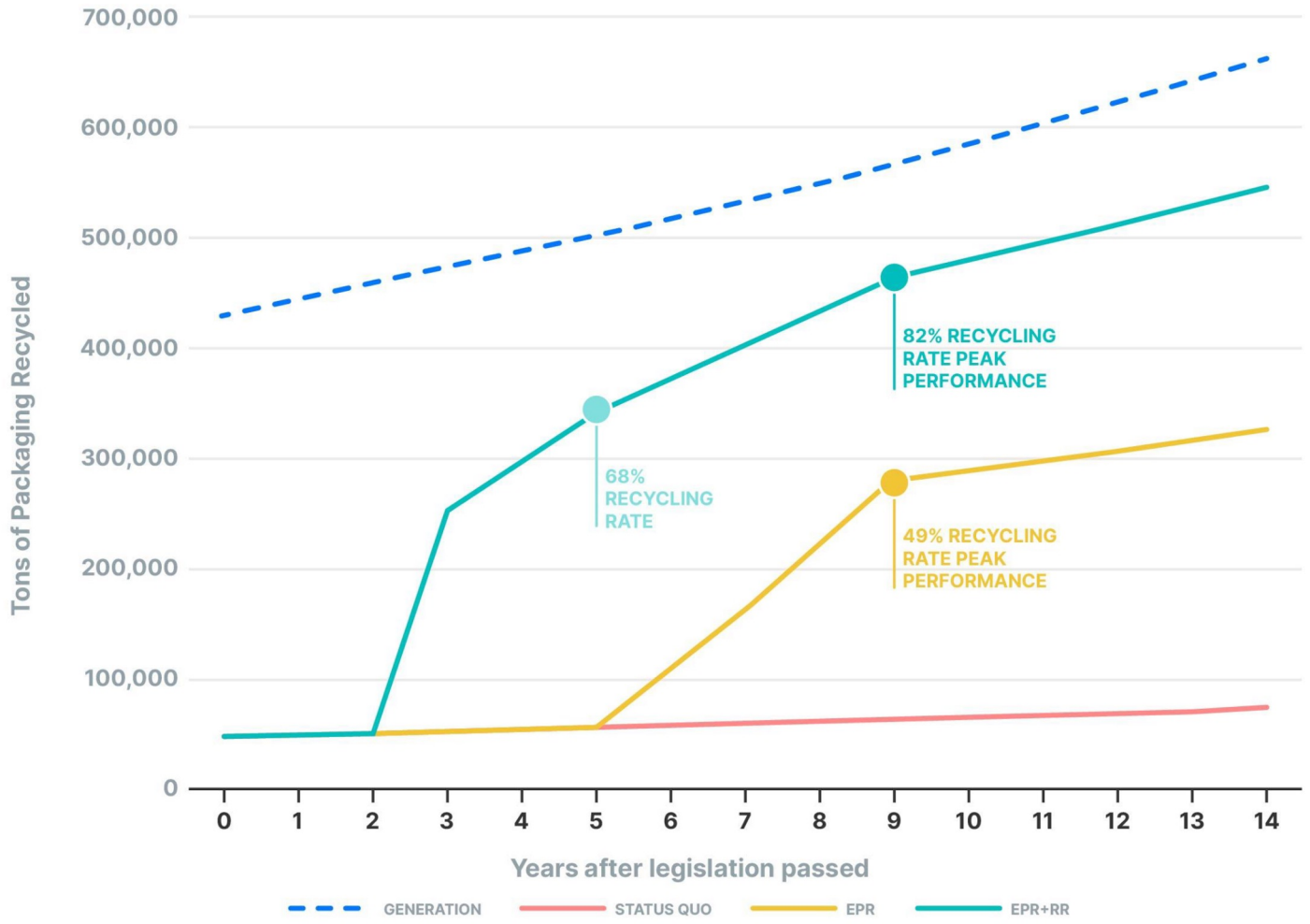
Baseline: 11% recycling rate

EPR alone is estimated to achieve a peak recycling rate of 49% within 9 years

However, EPR+RR leads to accelerated progress:

- 66% recycling rate by year 5
- 82% recycling rate by year 9

Impact of Policy on Recycling Rates in Colorado Excluding FFP



EPR + RR DELIVERS BETTER PERFORMANCE AT FASTER PACE – DELIVERING MAXIMUM RECYCLING RATES FOR COLORADO BEVERAGE CONTAINERS

Baseline: 11% recycling rate

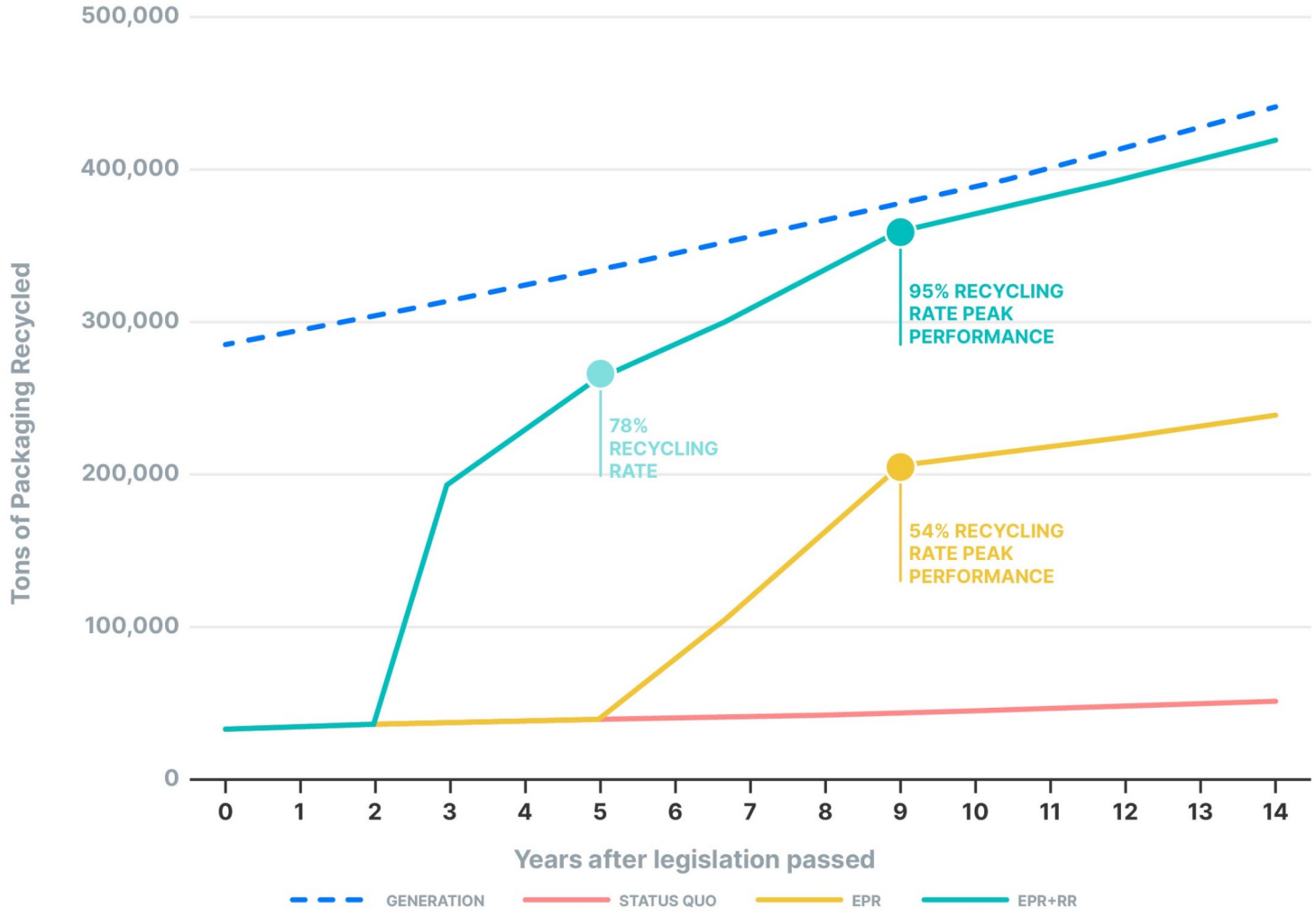
EPR alone is estimated to achieve a peak recycling rate of 54% within 9 years

However, EPR+RR leads to accelerated progress:

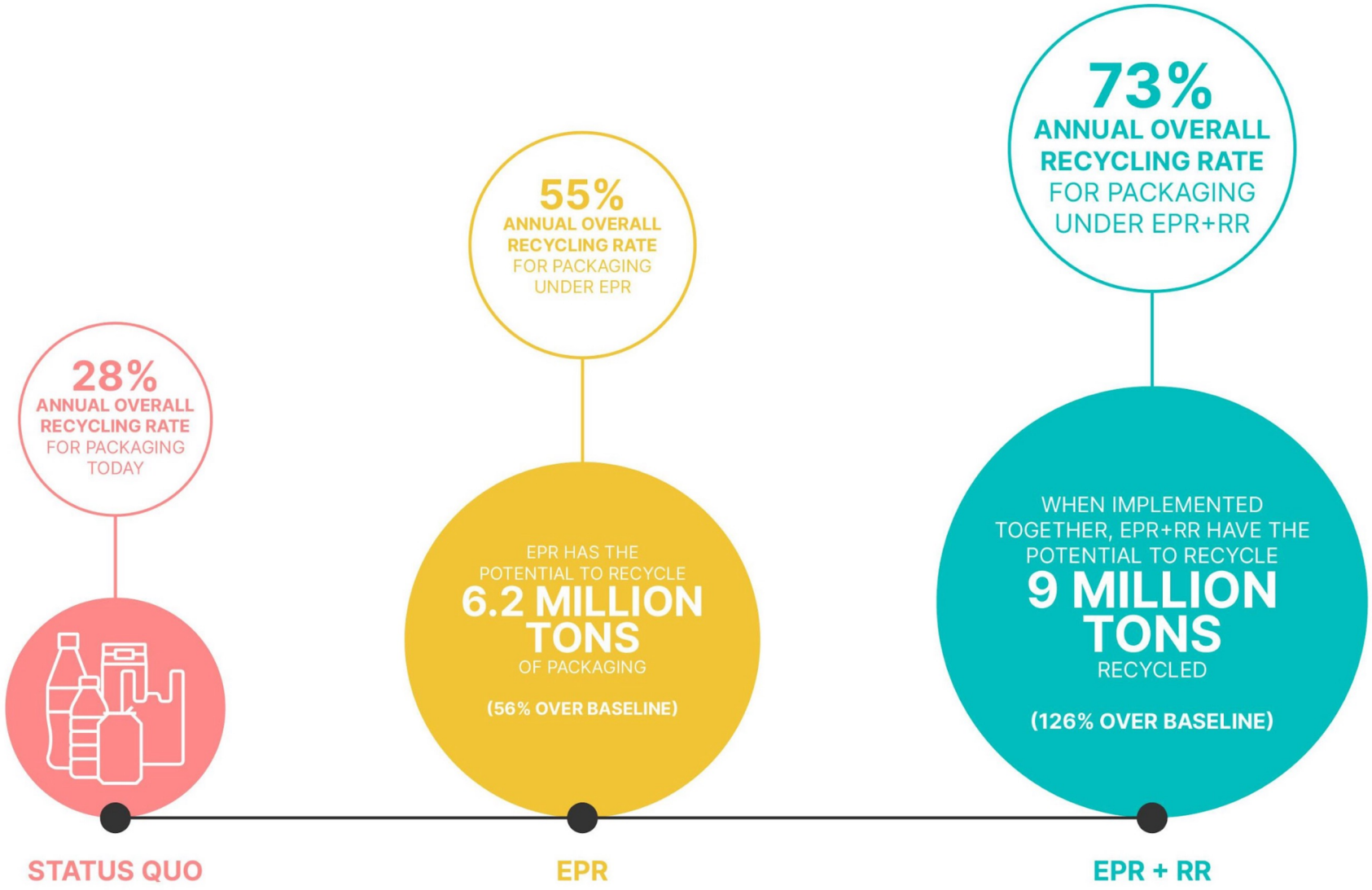
- 78% recycling rate by year 5
- 95% recycling rate by year 9

Due to the implementation timeline differences – RR would recycle approximately 571,000 more tons of packaging material before the full effects of EPR investment are realized.

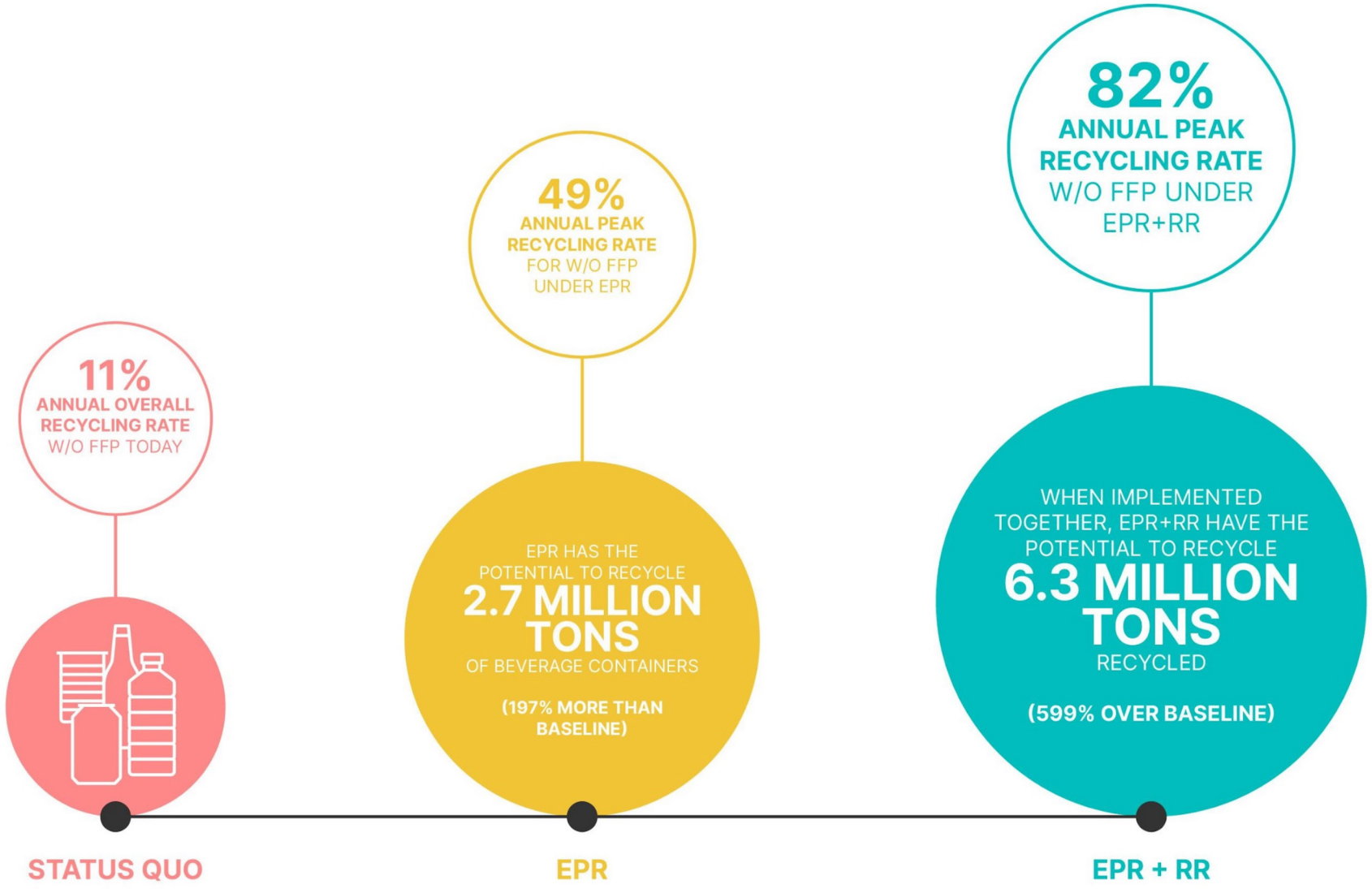
Impact of Policy on Beverage Container Recycling in Colorado



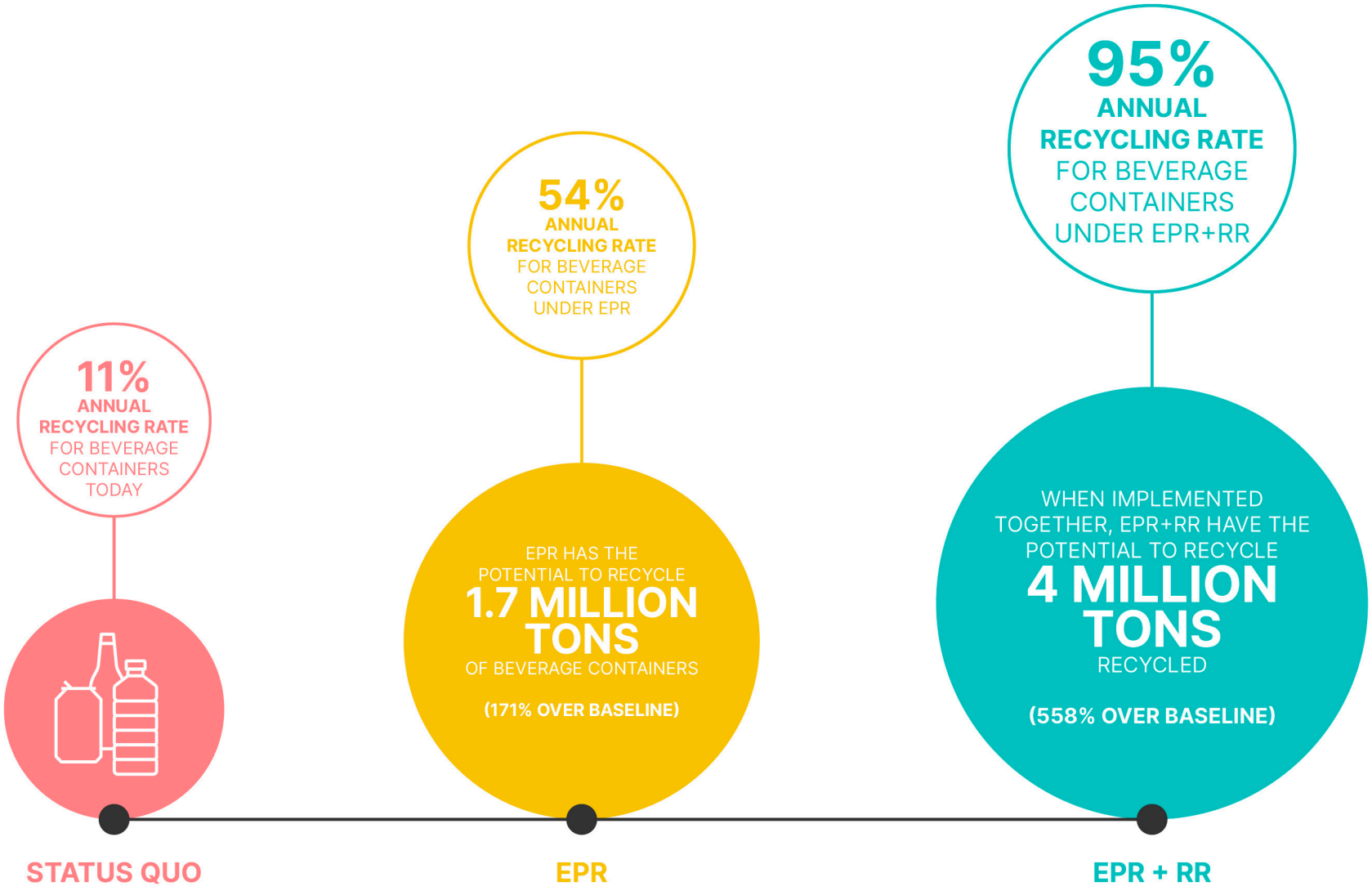
IMPACT OF POLICY ON CUMULATIVE TONS RECYCLED OVER 15 YEARS (INCLUDING FFP)



IMPACT OF POLICY ON CUMULATIVE PACKAGING TONS RECYCLED OVER 15 YEARS (EXCLUDING FFP)



Impact of Policy on Cumulative beverage container Tons recycled over 15 years



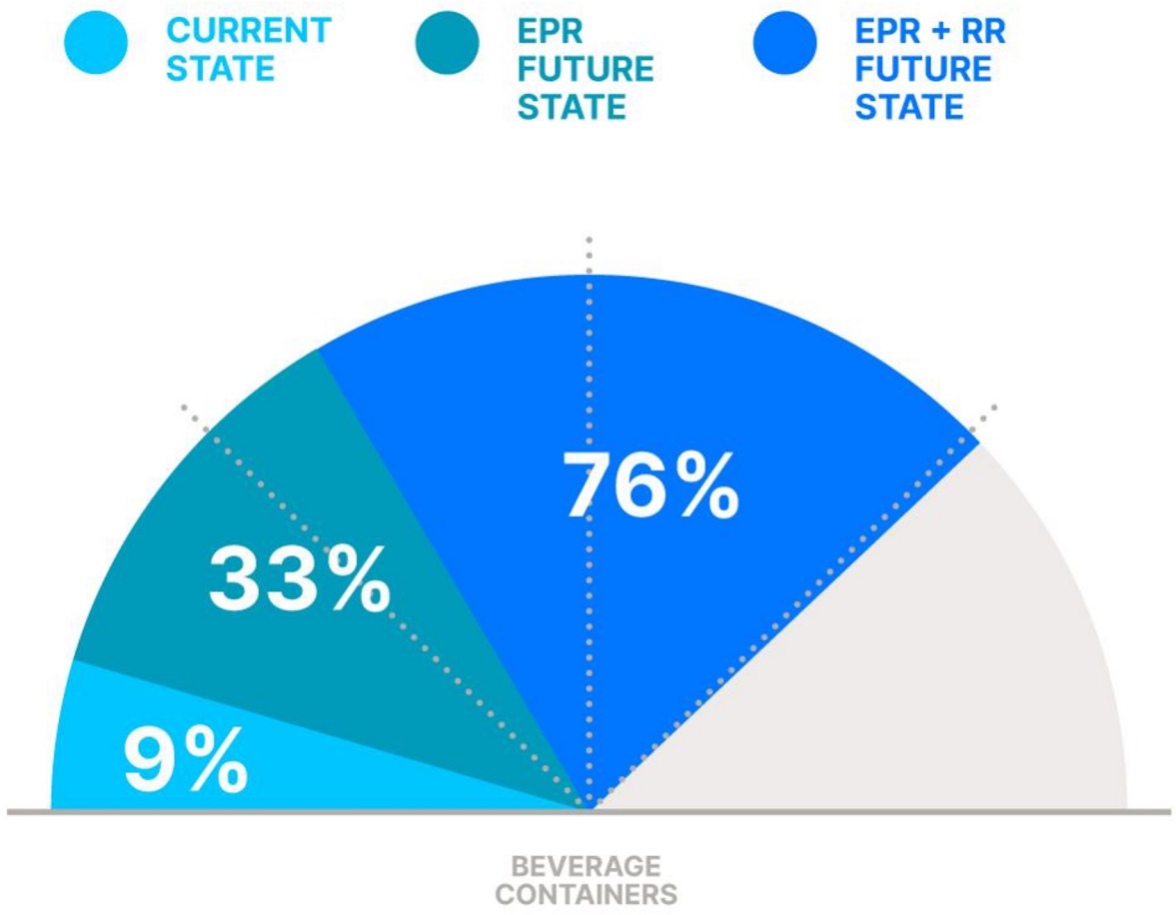
COLORADO STATE CASE STUDY MODELING: POLICY IMPACT ON CLIMATE AND CIRCULARITY OUTCOMES

Impact on Closed-Loop Recycling

- EPR alone could achieve a 33% Closed-Loop Recycling Rate
- RR+EPR could achieve a 76% Closed-Loop Recycling Rate
  - (7x the tons in the status quo)

EPR+RR Curtails Packaging Related Emissions by 65%

- EPR+RR curtail emissions linked to the creation, recycling, and landfilling of packaging materials 65% - a reduction of **343,000** MTCO2e.



COLORADO

CURRENT STATE OF RECYCLING

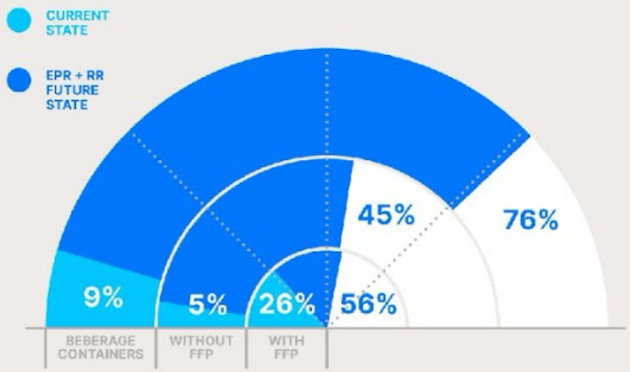
- In 2021, Colorado recycled approximately 11% of packaging materials without FFP. This recycling performance increases to 29% when considering materials with FFP.
- The value of the material captured for recycling was $45 million, just 24% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.1 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

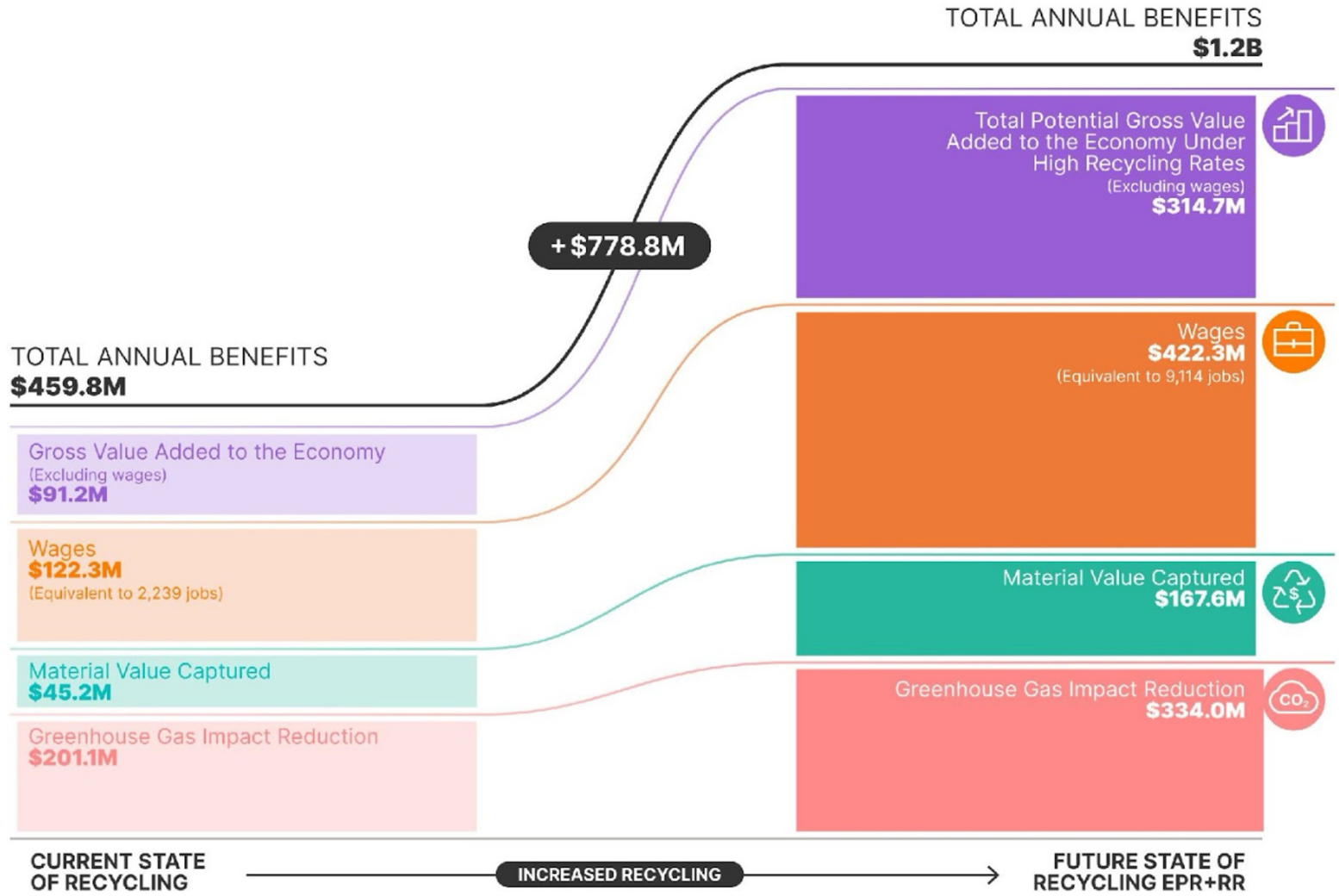
- Increase recycling related jobs from 2,200 to 9,100.
- Place $168 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.8 million MTCO2e annually.

CLOSED-LOOP IMPACTS



THE ECONOMIC AND ENVIRONMENTAL OUTCOMES OF WELL-DESIGNED EXTENDED PRODUCER RESPONSIBILITY (EPR) + RECYCLING REFUND (RR) PROGRAMS

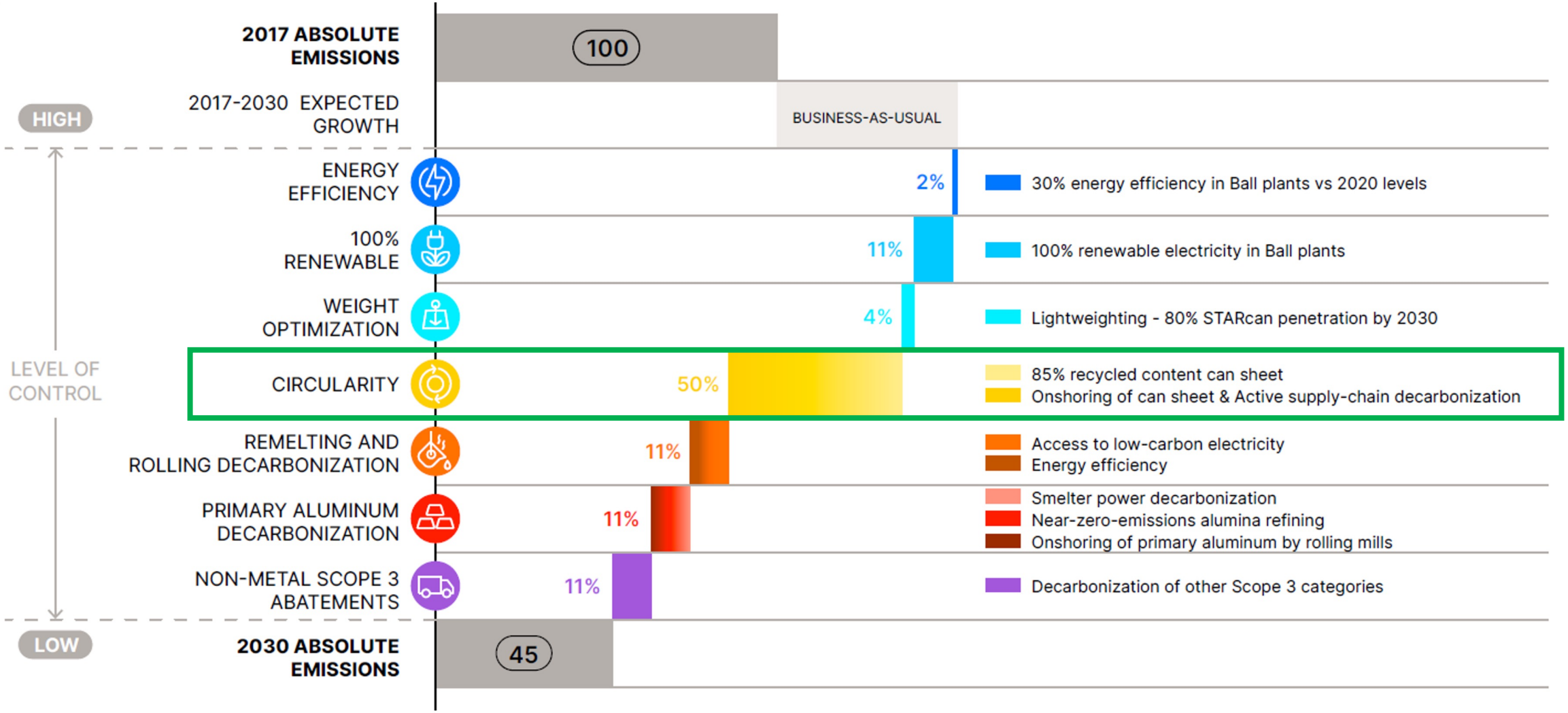
EPR assumes an overall recycling rate of 65% for residential packaging and RR assumes a 90% recycling rate for beverage containers



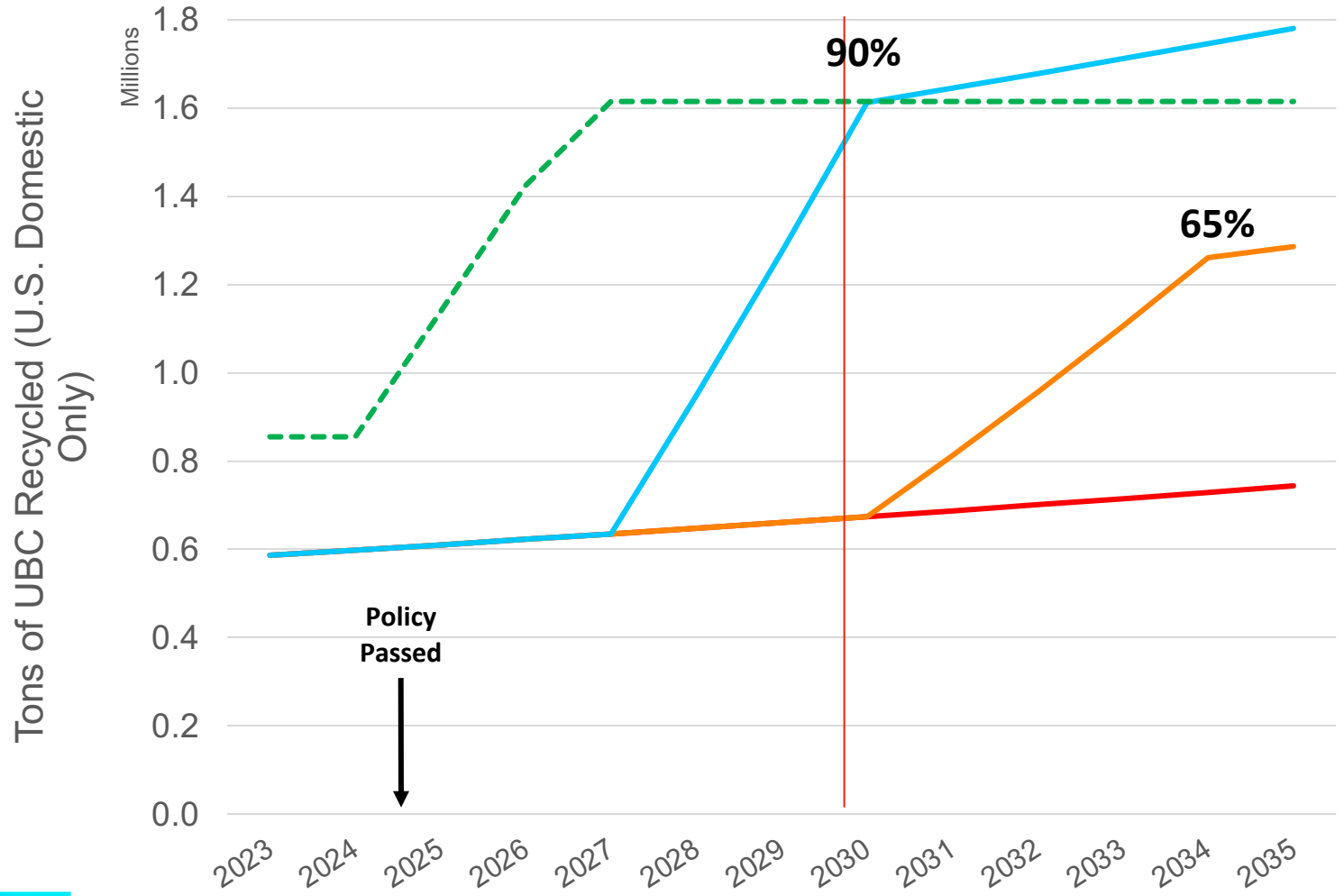
BALL CORPORATION

Industry Need to Dramatically Increase Aluminum Recycling Rates in the U.S.

CIRCULARITY: BY FAR THE LARGEST AND MOST EFFICIENT DECARBONIZATION LEVER



EXAMINING PEAK RECYCLING RATES AND TIMELINES ASSOCIATED WITH DIFFERENT POLICY SCENARIOS



Status Quo – 45%

National EPR in 2025 – 65%

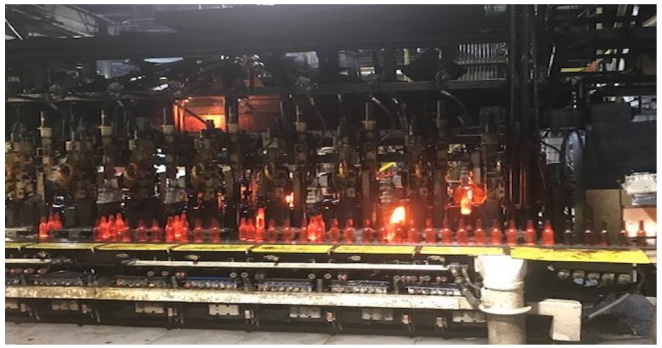
National DRS in 2025 – 90%

Remelt Capacity

Recycling Rates and Uncaptured Material: 50 States of Recycling
EPR Peak Rate = 65%
DRS Peak Rate = 90%
EPR Peak Rate Timeline = 9 years from passed legislation
DRS Peak Rate Timeline – 5 years from passed legislation
Can Market Growth CAGR = 2%

O-I's Colorado Footprint

Windsor, CO
OI Windsor
Founded: 2005
Employees: 215
Packages per year:
1,155,183,100



Wheat Ridge, CO
RMBC (JV with Molson-Coors)
Founded: 1997
Employees: 243
Packages per year:
1,100,000,000

Broomfield, CO
Glass to Glass Denver
Founded: 2022
Employees: 10
Glass Recycled Per Year:
>60,000,000 pounds

Glass is Infinitely Recyclable

Your Trash, Our Resource

Glass bottles or jars can be recycled over and over again, without loss in quality. They are 100% recyclable and infinitely recyclable. No other packaging material can do that.

Glass has a largely regional supply chain. It's rarely sent overseas to be recycled. Recycling 1,000 tons of glass creates about eight jobs in the local economy!

For every ton of glass recycled, about 1.16 tons of natural resources are saved, including 1,400 lbs. of sand, 430 lbs. of soda ash, and 400 lbs. of limestone.

For every 10% cullet used in the manufacturing process, energy consumption is reduced by about 3%.

Greenhouse gas reduction in which a ton of carbon dioxide is reduced for every 6 tons of recycled container glass used. A relative 10% increase in cullet reduces particulates by 8%, nitrogen oxide by 4%, and sulfur oxides by 10%.

Don’t Trash Glass Colorado – COMING SOON!!

EPR's Impact on Glass Recycling

Colorado 2030 Statewide Recycling Performance Compared to baseline by Material

GLASS	2022 Baseline		Low		Medium		High	
	Collected	Recycled	Collected	Recycled	Collected	Recycled	Collected	Recycled
	37-43%	27-33%	47-53%	34-40%	50-56%	44-50%	54-60%	48-54%

The medium program was selected and will move forward.
While we will see a large increase in glass recycling in Colorado (currently 12%) EPR will only increase recycled glass to 44-50% by 2030!
EPR is only focused on residential single stream collection.

O-I Supports an Expanded Deposit Return System with the EPR

Every state (aside from MA) has a higher DRS redemption rate than the projected recycling rate in Colorado.

The CO EPR system is expected to cost $430 million a year to operate and will not be fully operational until 2035. DRS can be set up faster and cheaper. Would provide significant results BEFORE 2030 – if passed in 2024/2025.

Colorado is currently the ONLY state with just an EPR system; California, Oregon, Maine all have DRS and all Canadian Providences have DRS and are adding EPR.

With a dual system (EPR/DRS) the recycling rates for ALL materials go up because large amounts of beverage material is removed from the single stream system helping clean up overall processing.

All proposals considered in Colorado are focused on residential single stream collection.
DRS would impact commercial as well as residential and could be set up quicker than an EPR only system.
Colorado did not study dual stream recycling.

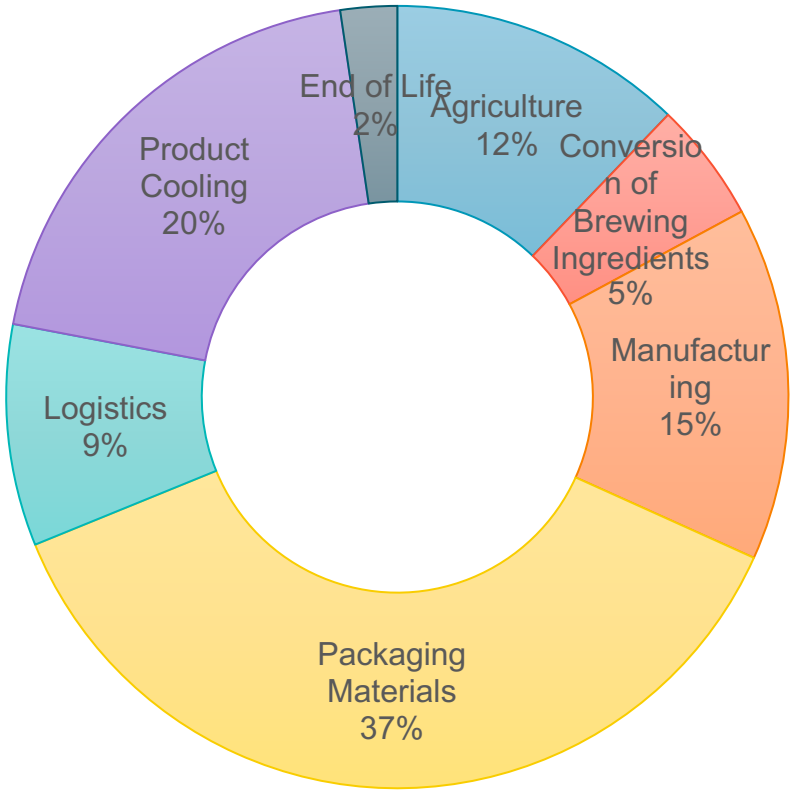
2022 Redemption Rates for Bottle Bill States

CA	61%
CT	44%
HI	59%
MA	38%
ME	78%
MI	76%
NY	70%
OR	86%
VT	72%

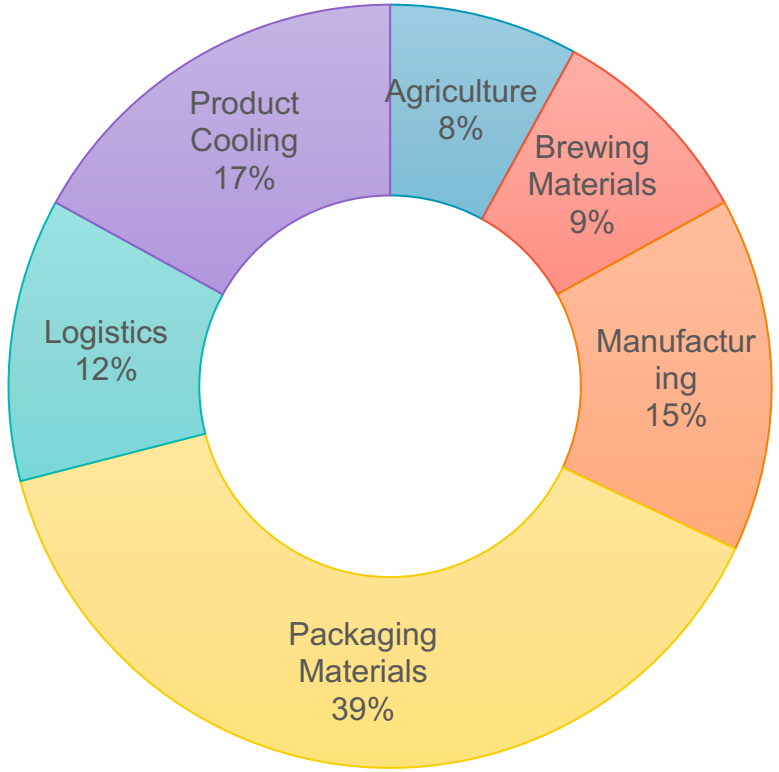
INCREASING RECYCLED CONTENT IS CRITICAL TO ACHIEVING NEAR TERM CLIMATE GOALS:

PACKAGING MATERIALS ACCOUNTS FOR 34-39% OF BREWER GHG EMISSIONS

Brewer 1 - GHG Emissions – Breakdown by Segment



Brewer #2 - GHG Emissions – Breakdown by Segment



Brewer #3 - GHG Emissions – Breakdown by Segment