RECYCLE COLORADO

A Panel Discussion on Producer Responsibility and Recycling Refunds

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Moderated by Jessica Lally - Program Manager, City & County of Denver

Panelists

Megan Daum
- American Beverage Association

Dylan de Thomas
- The Recycling Partnership

Megan Lane
- Ball Corporation

Barrett Jensen
- Waste Connections

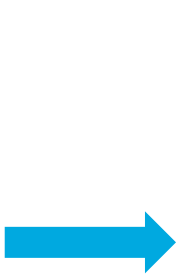
RECYCLE COLORADO

What is EPR?

A policy that shifts responsibility for what happens to packaging and printed paper from local governments and taxpayers to the producers who create them.

Current Linear Model

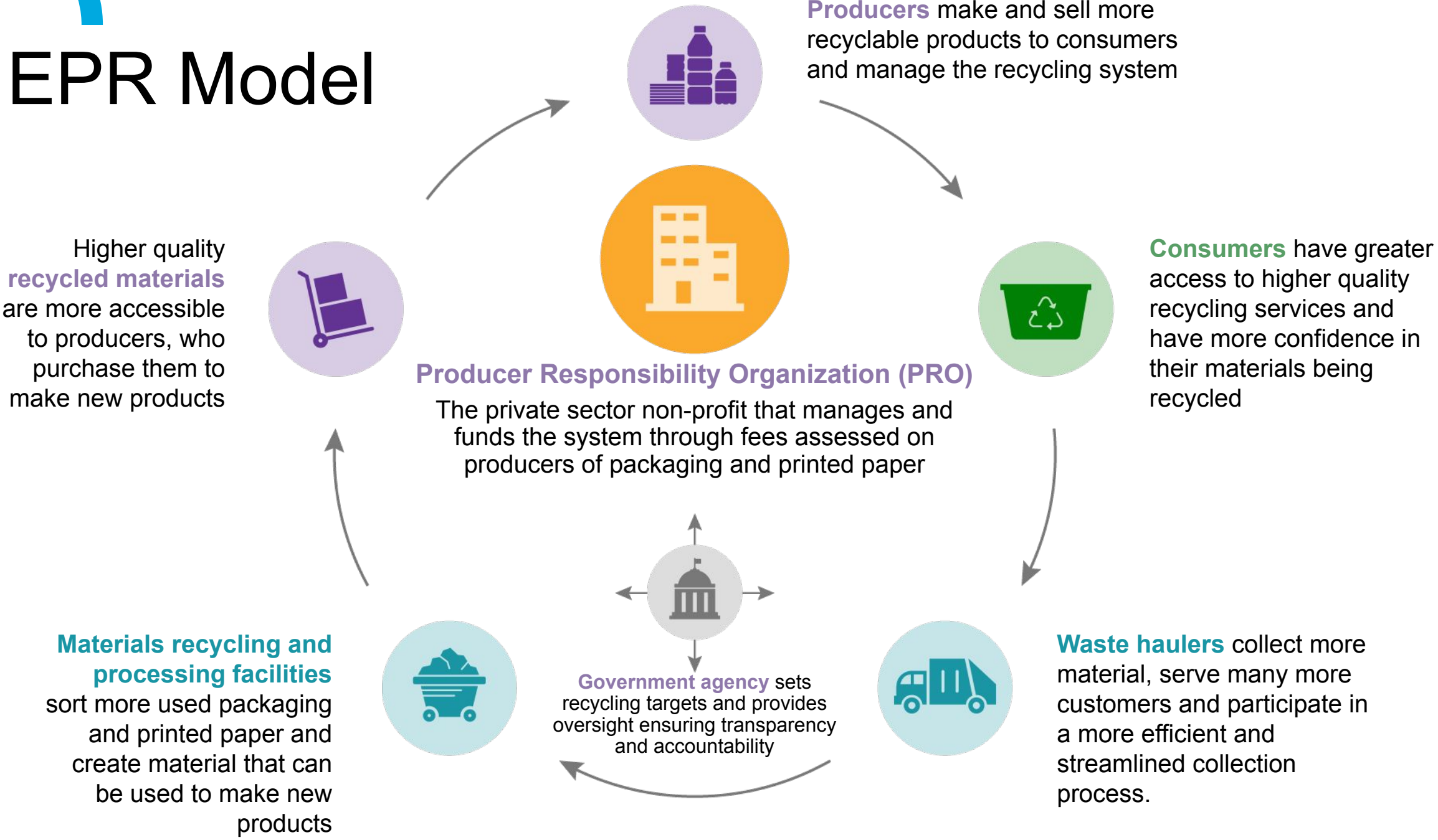
Producers:
Make and sell products to consumers



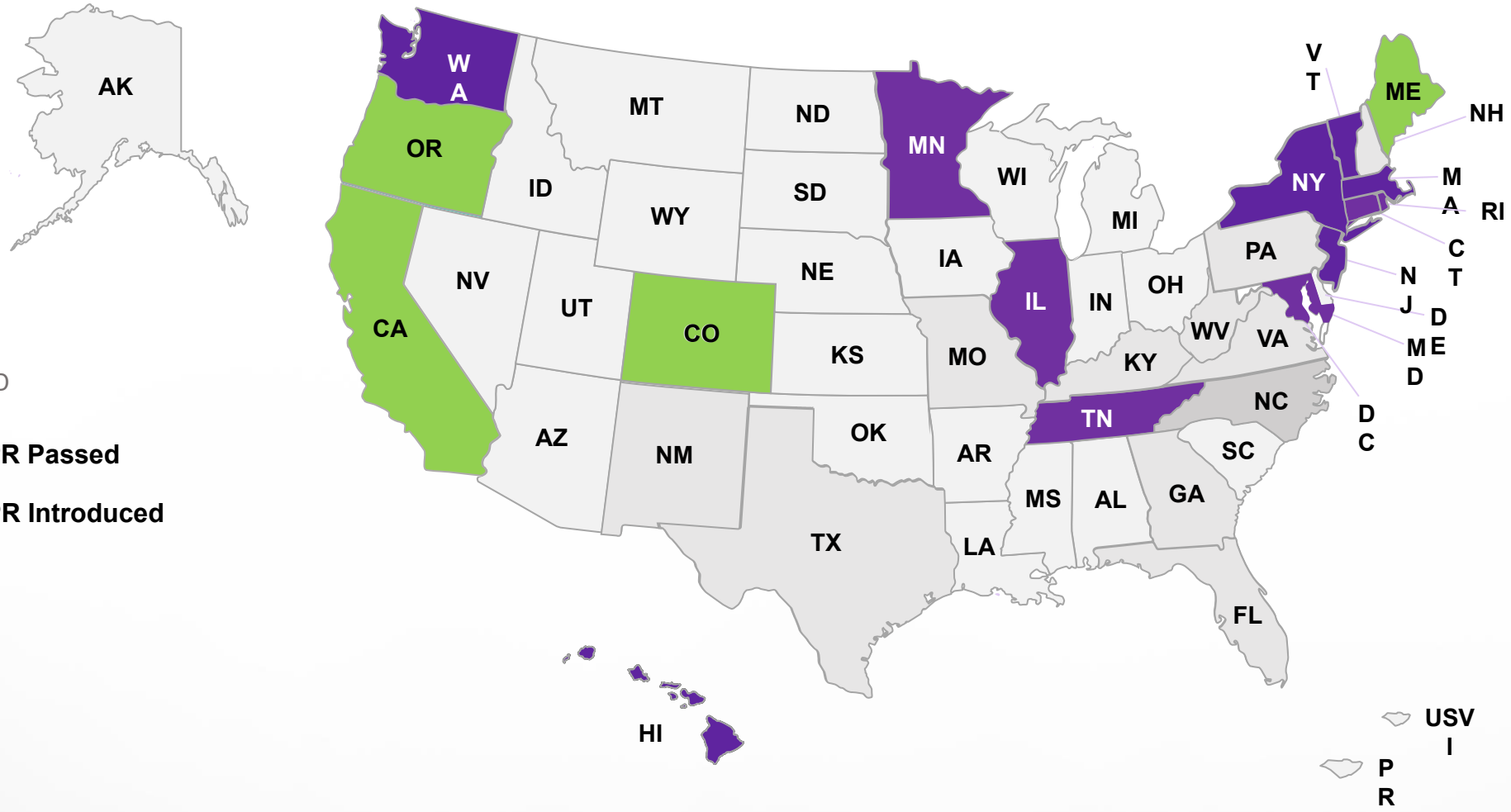
Consumers:
Use and recycle or dispose of the products

Municipalities are primarily responsible for waste collection and recycling services. Based on many different factors, most material does not get recycled.

EPR Model


Producers make and sell more recyclable products to consumers and manage the recycling system
Consumers have greater access to higher quality recycling services and have more confidence in their materials being recycled
Waste haulers collect more material, serve many more customers and participate in a more efficient and streamlined collection process.
Government agency sets recycling targets and provides oversight ensuring transparency and accountability
Materials recycling and processing facilities sort more used packaging and printed paper and create material that can be used to make new products
Higher quality **recycled materials** are more accessible to producers, who purchase them to make new products
Producer Responsibility Organization (PRO)
The private sector non-profit that manages and funds the system through fees assessed on producers of packaging and printed paper

EPR for Packaging in the United States



U.S. Producer Responsibility Laws

	Maine	Oregon	Colorado	California
Date Passed	July 2021	August 2021	June 2022	June 2022
Scope of Materials	Packaging (no printed paper)	Packaging, printed paper and plastic foodware	Packaging and printed paper	All packaging and plastic foodware
Cost Coverage Scope	Full	Improvements	100%	Improvements
Recycling Targets	Set by DEP	Plastic Targets in Law 25% by 2028, 50% by 2040, 70% by 2050	Set with PRO plan	Plastic Target in Law 65% by 2032
Number of PROs	Single PRO	Multiple PROs (10% market share required)	Single PRO to start (multiple after 2029)	Single PRO to start (multiple after 2030)
PRO Autonomy	None	Low	High	None

AMERICAN BEVERAGE

Colorado EPR Timeline

2023	Producer Responsibility Organization (PRO) forms
2024	Needs assessment finalized
2025	All producers must join PRO
2026	PRO begins to implement plan

Well-Designed and Implemented EPR and DRS Basics

	Extended Producer Responsibility	Recycling Refunds/Deposit Return Schemes
Overview:	Producers (i.e. brands) are given financial responsibility – from education to collection and sorting, as well as other related activities – to increase recycling rates.	Requires distributors or producers of beverage packaging to fund and operate a specialized, separate recycling infrastructure, provide an economic incentive to incentivize consumers to return the package to be recycled.
Centralized Responsibility Organization	In order to finance the recycling system for packaging, producers (i.e., brands) of packaging and printed paper create and manage a central producer responsibility organization (PRO) to administer the funds and support reaching the recycling goals laid out in statute.	In order to create and operate a redemption network that provides consumers with convenient opportunities to redeem their refunds, well-designed laws rely on a centralized industry-managed responsibility organization to administer and operate the program, ideally laid out in statute.
Recycling Infrastructure:	**Utilizes Existing Recycling Infrastructure:** Allows consumers to recycle using their existing or newly established curbside programs or drop-off programs.	**Specialized Drop-Off Recycling Network:** Responsible for creating and operating a redemption network and infrastructure that provides consumers with convenient opportunities to redeem refunds.
Who is Served:	Typically target residential recycling infrastructure.	Typically residential, commercial, and on-the-go

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

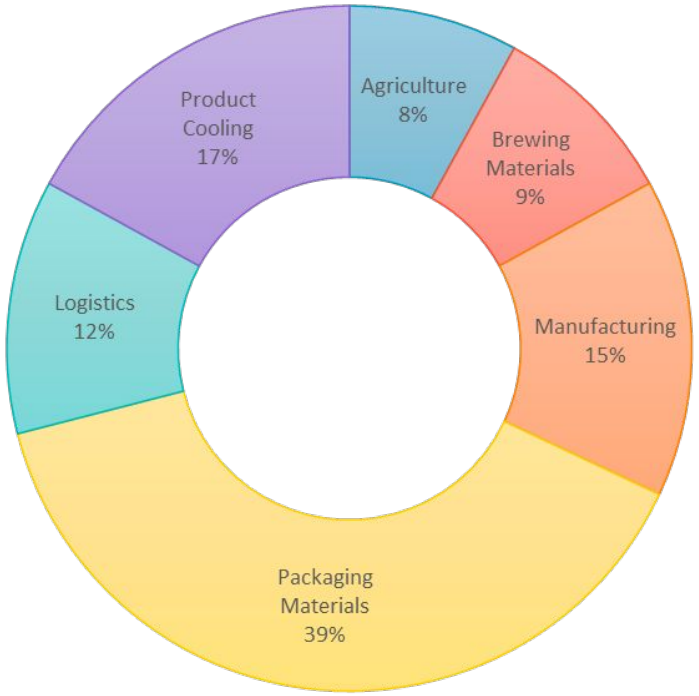
Recycling rates – Support extremely high beverage container recycling rates and high overall packaging recycling rates.	**Material circularity** – supporting domestic closed-loop markets, particularly for glass, aluminum and PET
Driving efficiency – Infrastructure could be developed in tandem to maximize 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)

HOW CAN PRODUCER RESPONSIBILITY AND RECYCLING REFUND PROGRAMS WORK TOGETHER IN COLORADO?

Megan Lane
Manager- Circularity & Public Affairs
May 22, 2023

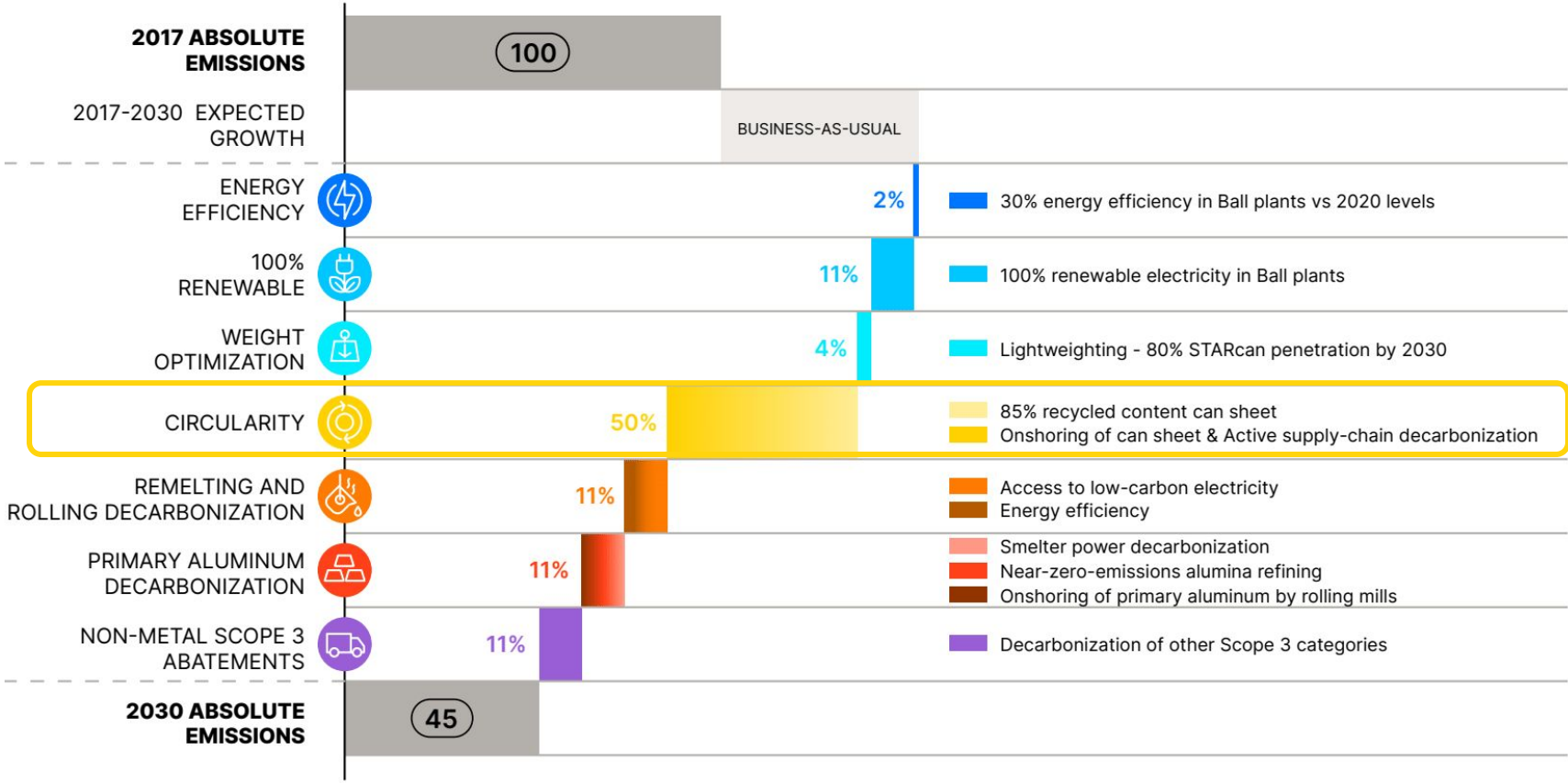
INCREASING RECYCLED CONTENT IS CRITICAL TO ACHIEVING NEAR TERM CLIMATE GOALS FOR OUR CUSTOMERS

Example Customer:
Molson Coors 2020 GHG Emissions – Breakdown by Segment



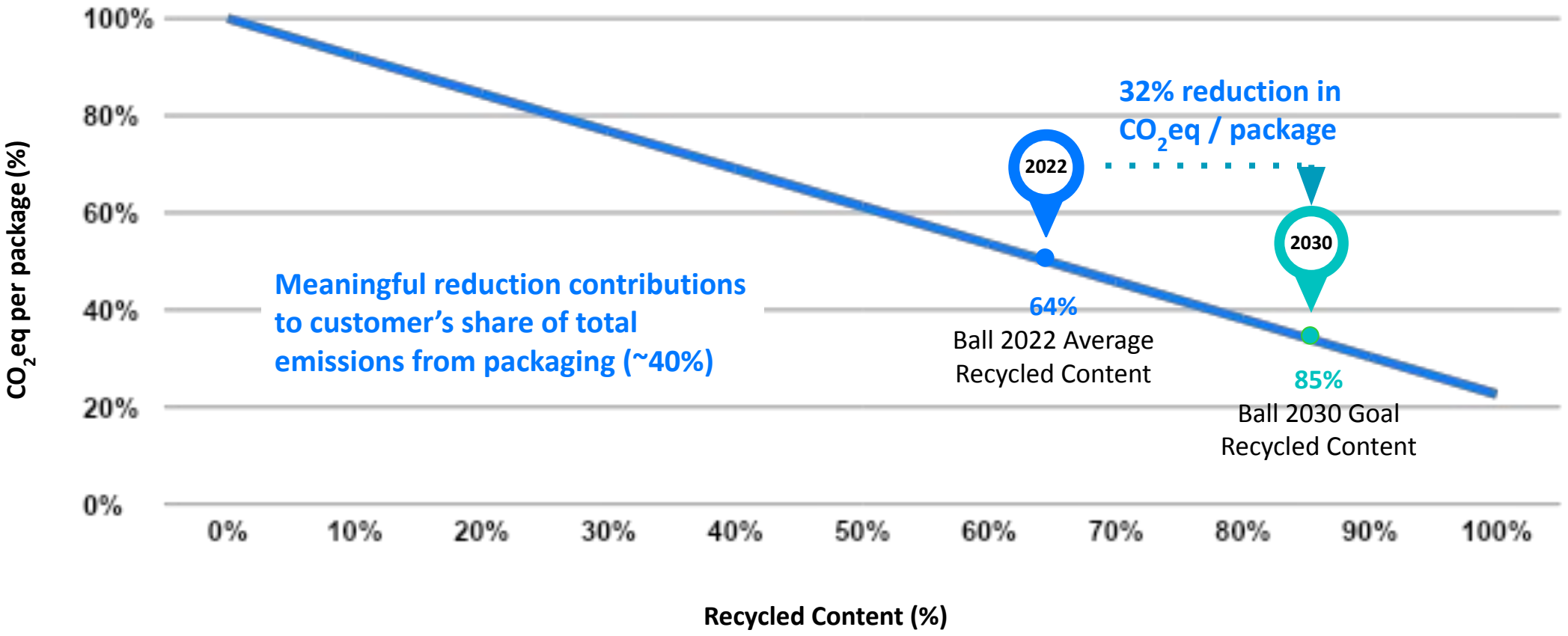
BALL'S 2017– 2030 DECARBONIZATION LEVERS

% CONTRIBUTION | INDEX 100 = BASE-YEAR 2017



INCREASING RECYCLED CONTENT REDUCES PRODUCT CARBON FOOTPRINT

12OZ ALUMINUM BEVERAGE CAN RELATIVE CARBON FOOTPRINT (U.S.)



Source: Ball Corporation graph based on data from Sphera Comparative LCA. 2020.

POLICY SCENARIO ANALYSIS - OBJECTIVE AND KEY ASSUMPTIONS

Objective

- Estimate the volume of beverage containers recycled under an EPR system with and without a recycling refund
- Estimate the cost of an EPR system with and without a recycling refund for beverage containers

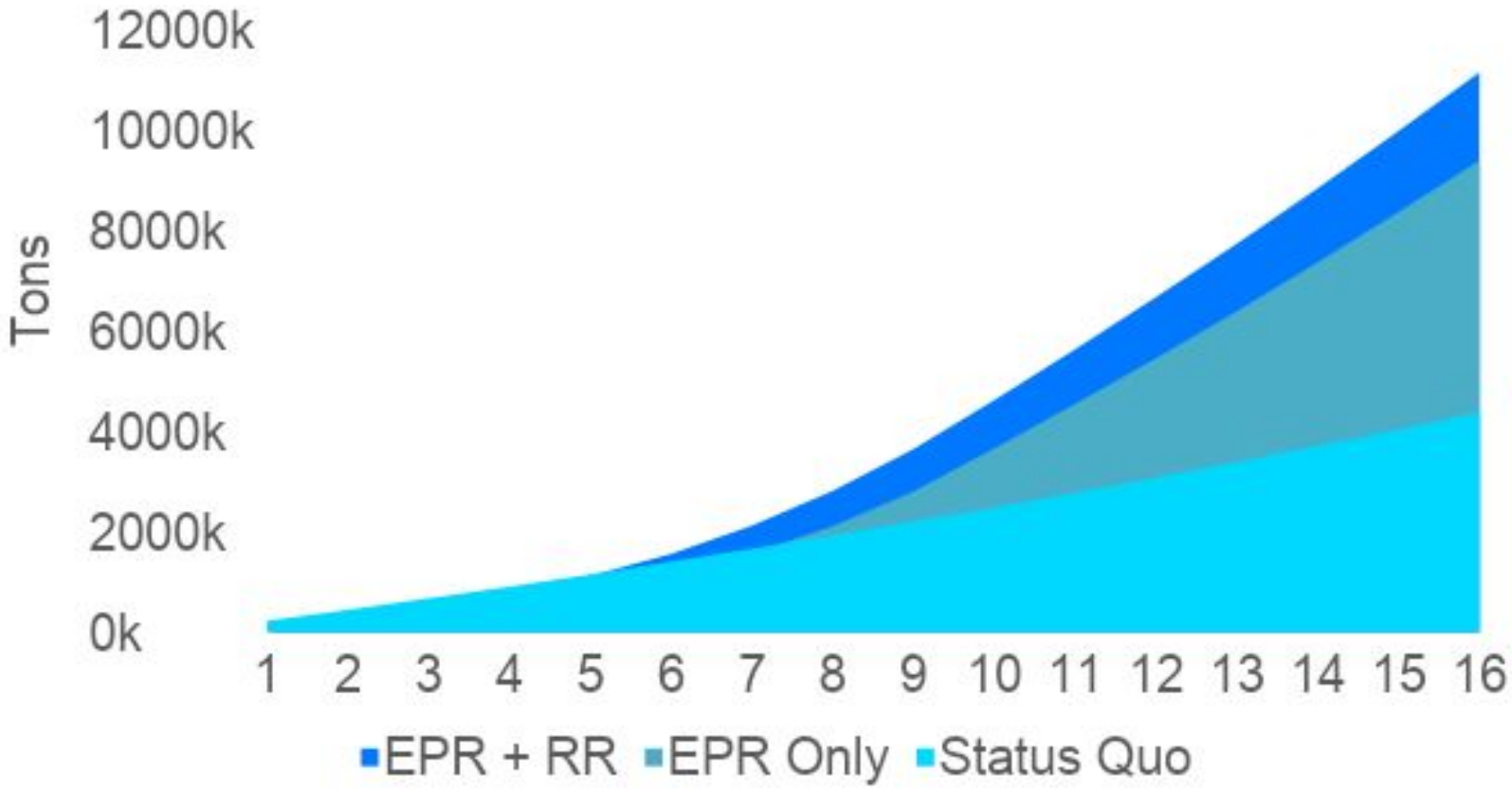
Key Assumptions

- Extended Producer Responsibility (EPR) includes recycling coverage for all residential properties with garbage collection
- EPR leads to capture rates in line with case studies in Ontario and Quebec for packaging materials (50.3% average recovery)
- Recycling Refund (RR) covers PET and HDPE bottles, aluminum beverage containers, and glass bottles
- Population growth rate of 1.1% per annum
- Generation per capita rises 2% per annum (with economic growth)
- Cost covers collection, sorting, treatment/disposal and material revenue, not environmental impacts

IMPLEMENTING EPR+RR WILL REALIZE MAXIMIZE MATERIAL RECOVERY ACROSS PAPER AND PACKAGING

- When considering all packaging materials over a 15-year timescale, EPR adds 5.0m tons of recycling on top of the status quo
- RR adds another 1.8m tons to this figure
- By year 15, packaging recycling rates are 17% under status quo, 51% under EPR and 58% under EPR + RR

Cumulative Tons Recovered Over Implementation Timeline Under Different Policy Scenarios

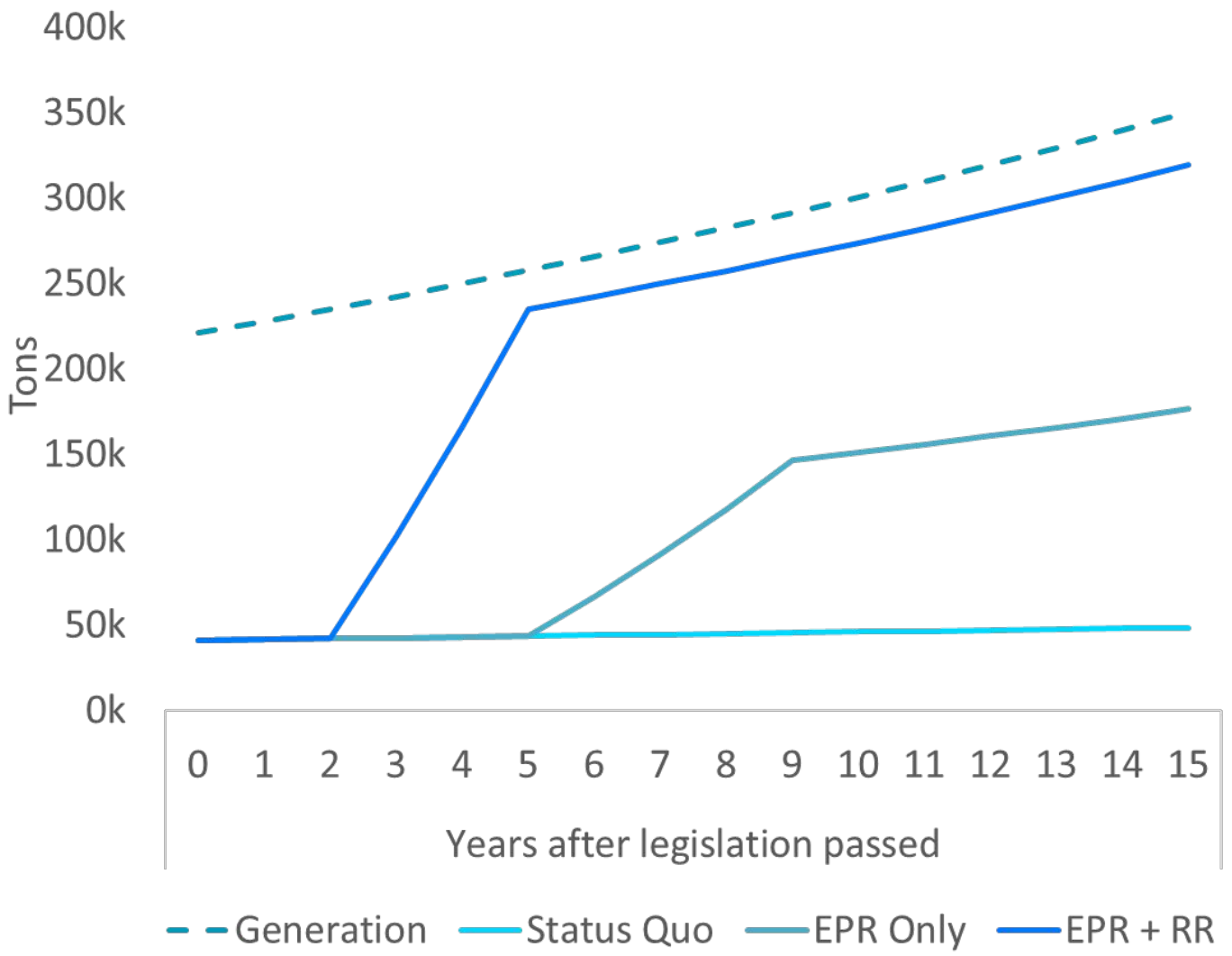


VALUE OF EPR + RECYCLING REFUNDS DELIVERS BETTER PERFORMANCE AT FASTER PACE – DELIVERING MAXIMUM OUTCOMES FOR COLORADO

- EPR assumed to begin impacting tonnages ~5 years after legislation passes
  - By this point, RR recycling 190k tons plus per year above baseline rates
- By year 15, EPR alone recycles 128k tons of beverage containers more than the baseline
- By year 15, EPR + RR recycles 271k tons per year more material than the baseline

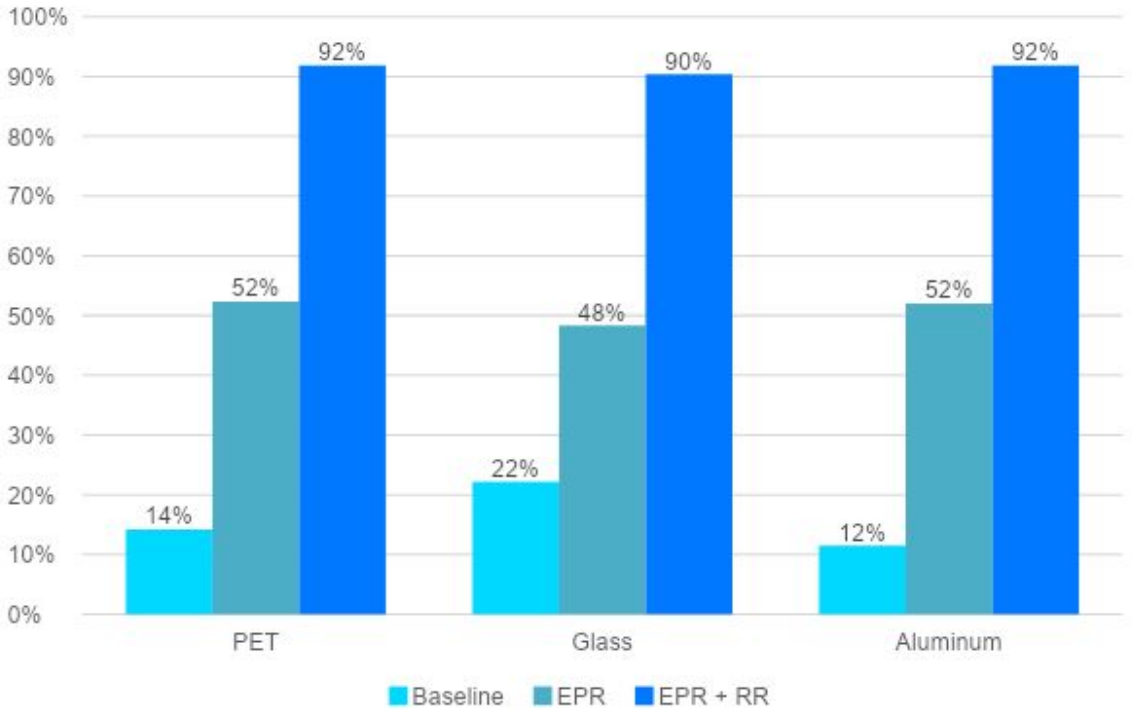
**Graph assumes legislation passed at the same time in Colorado to more easily compare the implementation timelines. Even if the public policy approach is staggered implementing RR alongside EPR will maximize collection rates*

Beverage Container Recovery Under Different Policy Scenarios



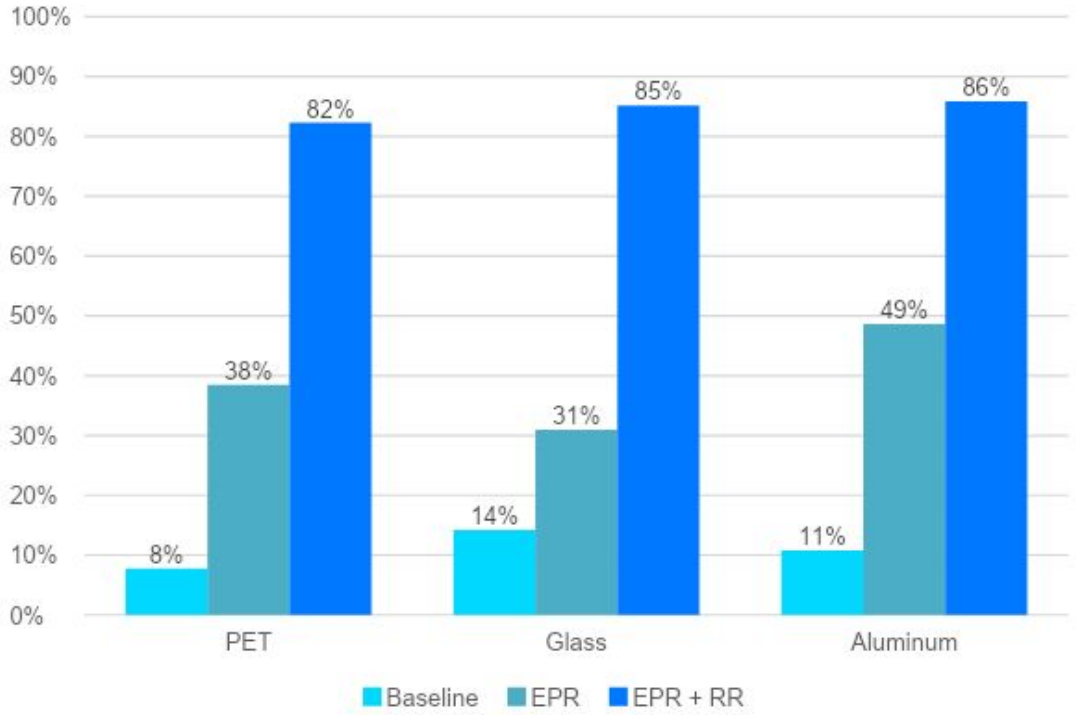
EPR + RR LEADS TO THE HIGHEST RECOVERY RATES AND THE MOST MATERIAL RECYCLED IN A CLOSED-LOOP FOR BEVERAGE CONTAINERS

Measure Beverage Container Materials Sorted for Recycling Under Different Policy Scenarios



Percentage of material sorted for recycling in each system under full implementation

Measure Beverage Container Materials Recycled in a Closed-Loop Under Different Policy

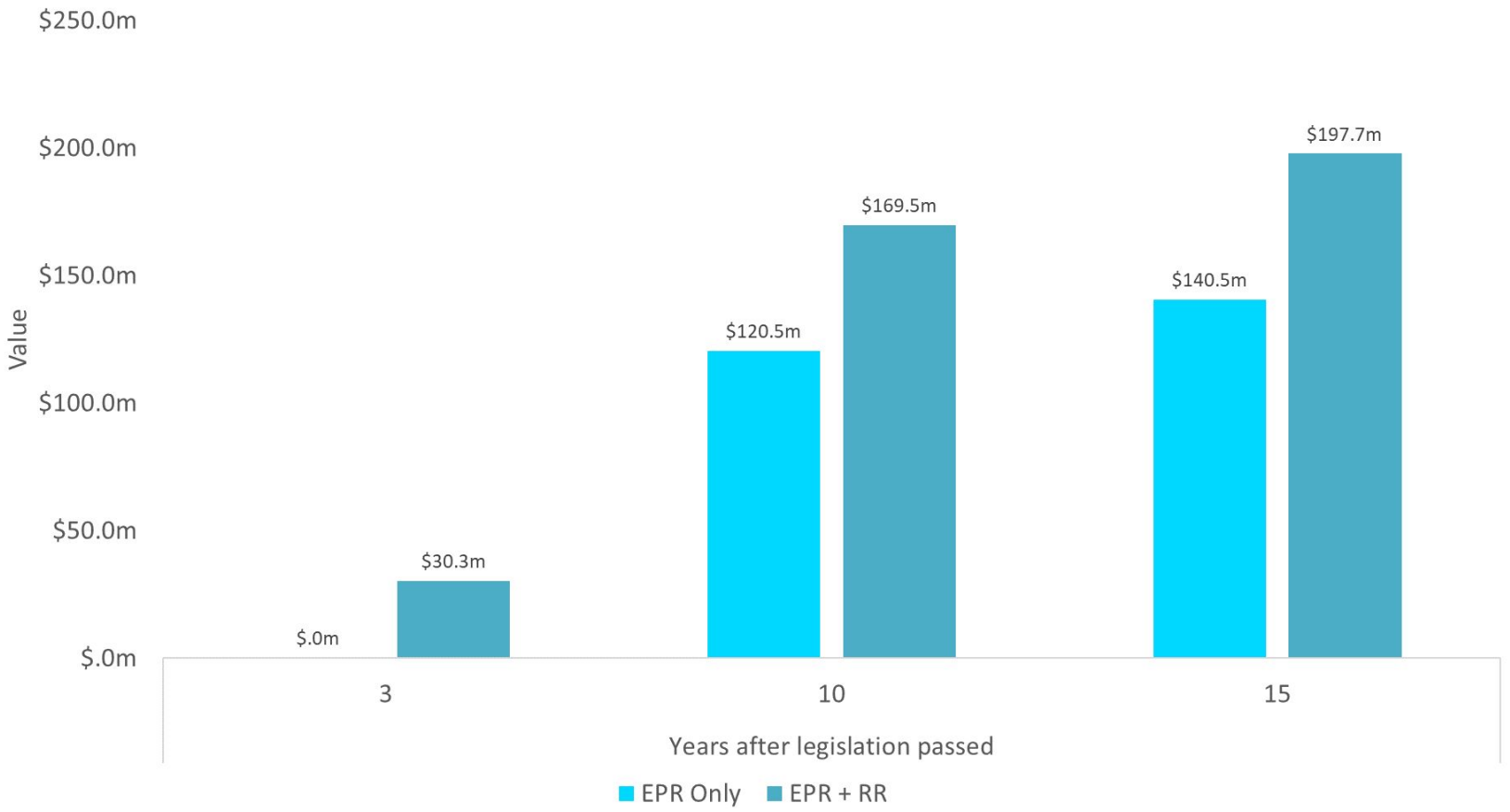


Percentage of material closed-loop recycled into beverage containers in each scenario under full implementation

EPR + RR TOGETHER WILL RETAIN THE MOST VALUE IN THE ECONOMY FOR ALL PAPER AND PACKAGING

- Both EPR and RR divert valuable material away from landfill to recycling
- In year three RR divert $30 m worth of material
- By year 15 EPR diverts $140 m while EPR + RR diverts $197 m

Potential Value of Additional Material Diverted from Landfill Under Different Policy



Source: Recycling Markets

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Please select the option which reflects your interest in continuing this discussion.

ⓘ Start presenting to display the poll results on this slide.

THANK YOU!

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Megan Lane (Ball Corporation) - Megan.Lane@ball.com
Barrett Jensen (Waste Connections) - Jeffrey.Jensen@wasteconnections.com

Jessica Lally (City and County of Denver) - Jessica.lally@denvergov.org

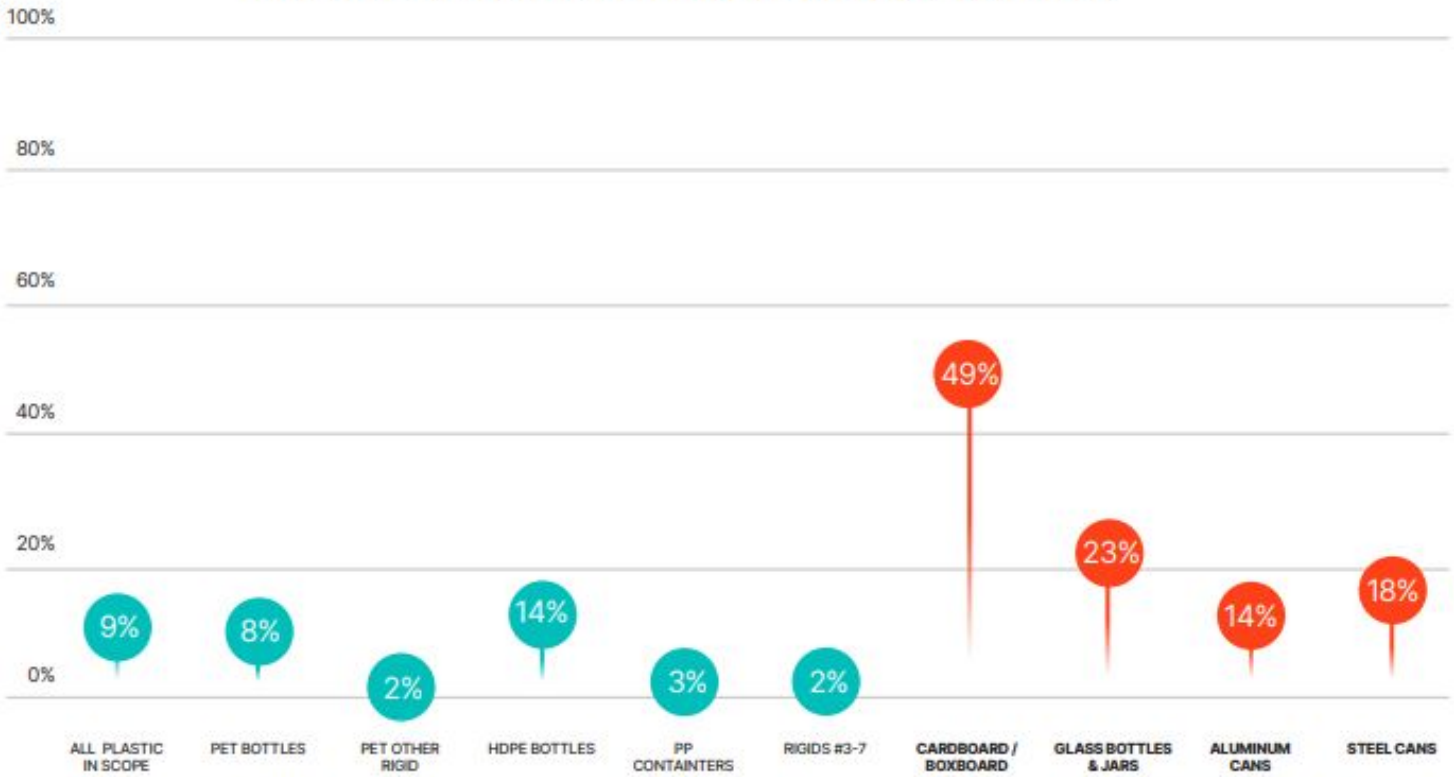
RECYCLE COLORADO

APPENDIX

STATE INSIGHTS:
COLORADO

50 STATE RANK	CCPM RECYCLING RATE (without cardboard)	BOTTLE BILL (DRS)	DISPOSAL COSTS IN TOP 25%
35	16%	NO	NO

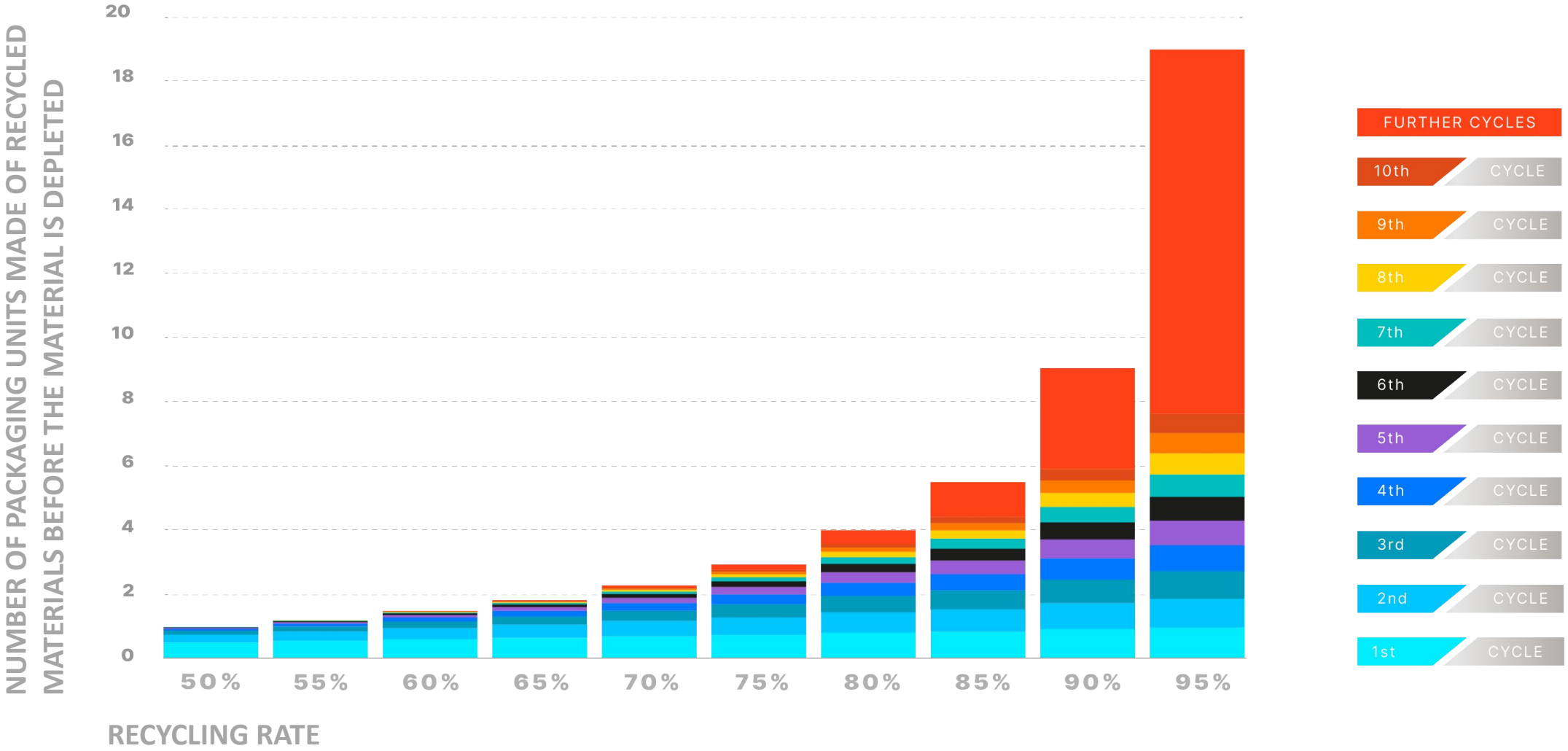
MATERIAL-SPECIFIC PACKAGING RECYCLING RATES



Colorado's low recycling rate reflects its patchwork recycling programs, with cities like Aspen and Boulder leading the state in programs and collection while more remote localities struggle with establishing a recycling program at all. Legislation that incentivizes recycling end-markets and a recycling grant program for rural areas signify a concerted effort to invest in Colorado's recycling economy.

THE NUMBER OF TIMES THE SAME MATERIAL RECYCLED BACK INTO THE SAME APPLICATION INCREASES EXPONENTIALLY AS RECYCLING RATES INCREASE

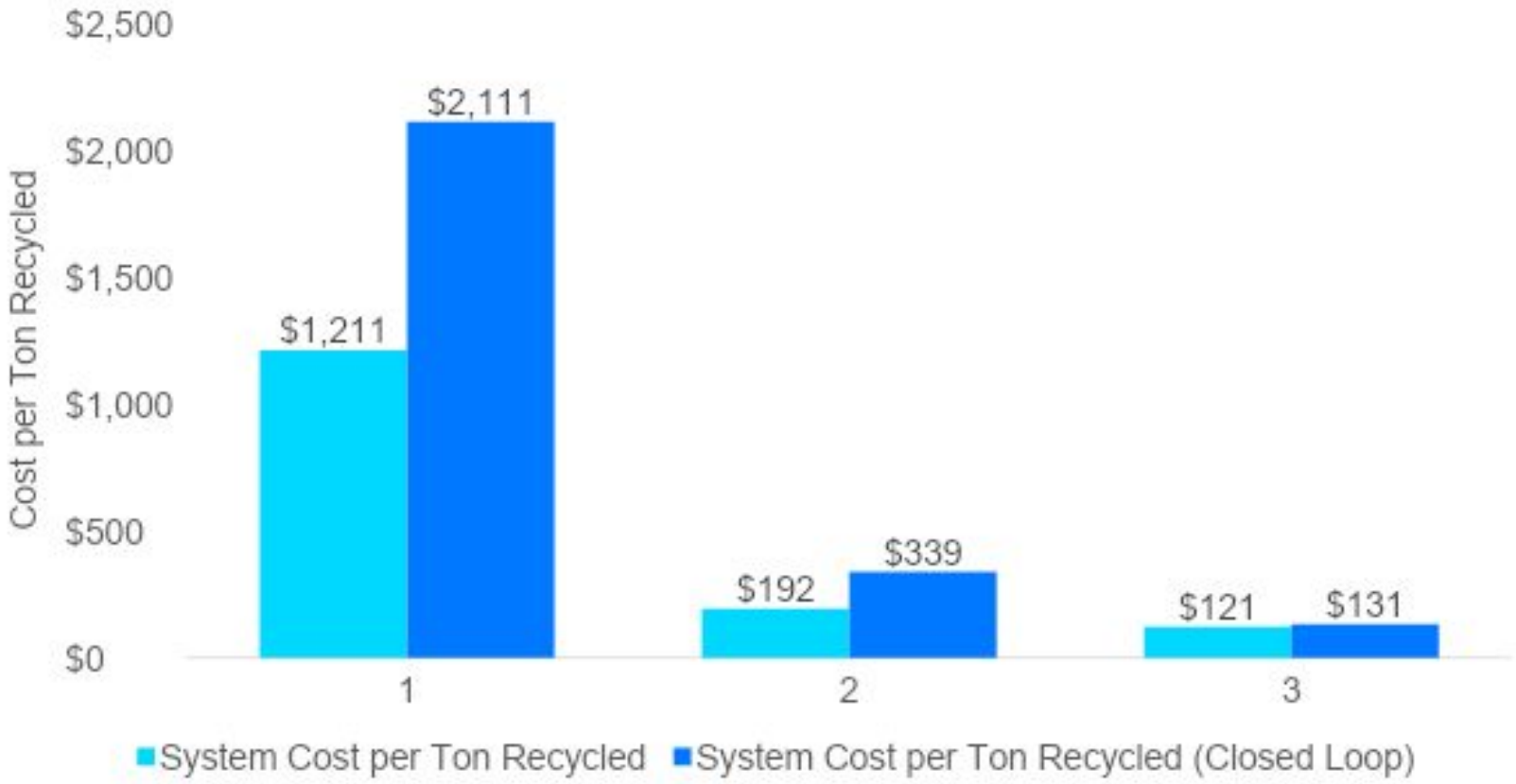
NUMBER OF PACKAGING UNITS THAT CAN BE MADE OF RECYCLED MATERIALS BEFORE THE MATERIAL IS DEPLETED, IN A CLOSE LOOP SCENARIO, WHEN NO RECYCLING RATE OCCURS



IMPLEMENTING EPR+RR WILL LEAD TO THE MOST COST-EFFECTIVE RECYCLING OUTCOMES FOR BEVERAGE CONTAINERS

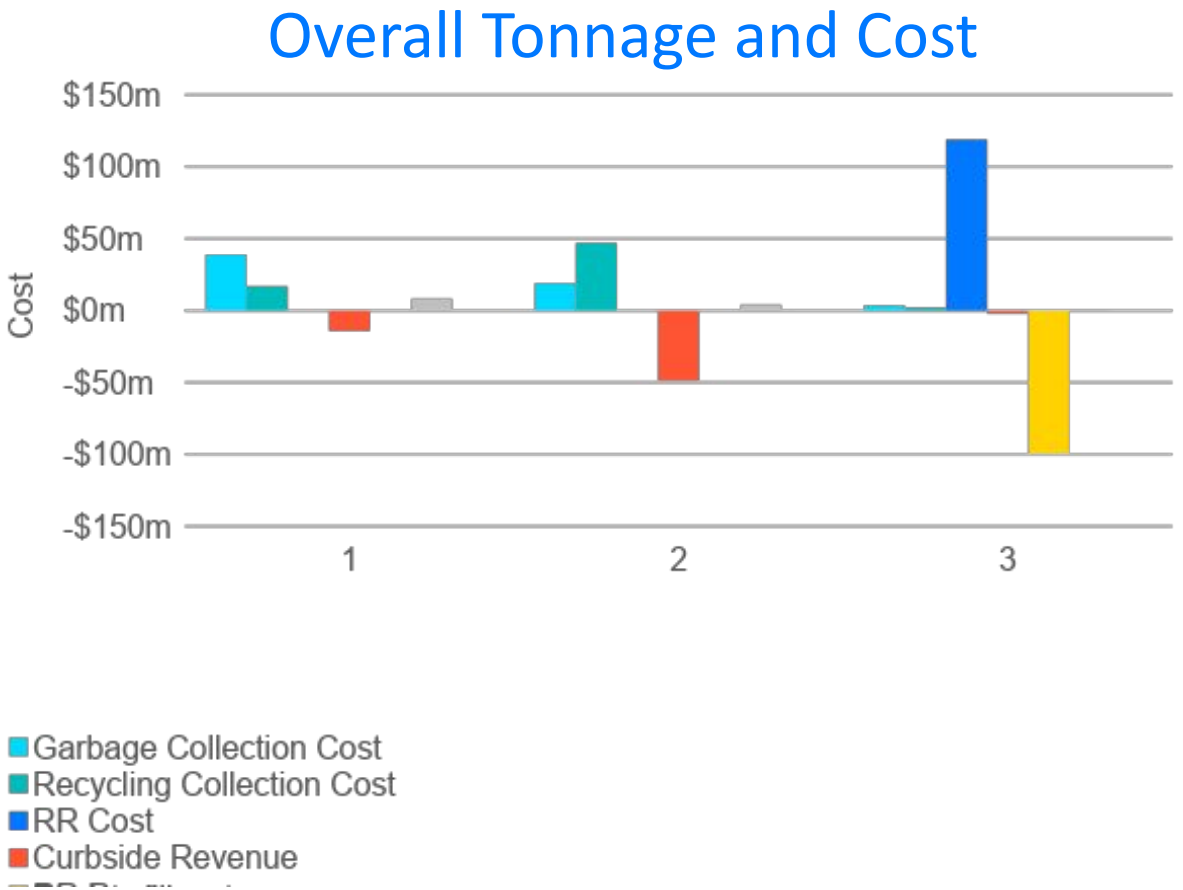
- The graph compares whole-system costs for beverage containers – including the cost of collecting and disposing of landfilled material.
- Per ton recycled in a closed loop system*, baseline significantly more expensive than other options
  - Most cost in baseline is directed towards landfilling materials
- EPR is more expensive than RR at producing material suitable to be recycled into beverage containers
- Measuring all recycling (including open-loop) reduces the gap between EPR and RR – but RR is still cheaper

System Cost per Ton Recycled Under Different Policy Scenarios (All Recycling vs Closed Loop)



*this measure is based on capturing and sorting material suitable for closed loop recycling; it cannot be guaranteed that there will be a closed-loop reprocessor for the material.

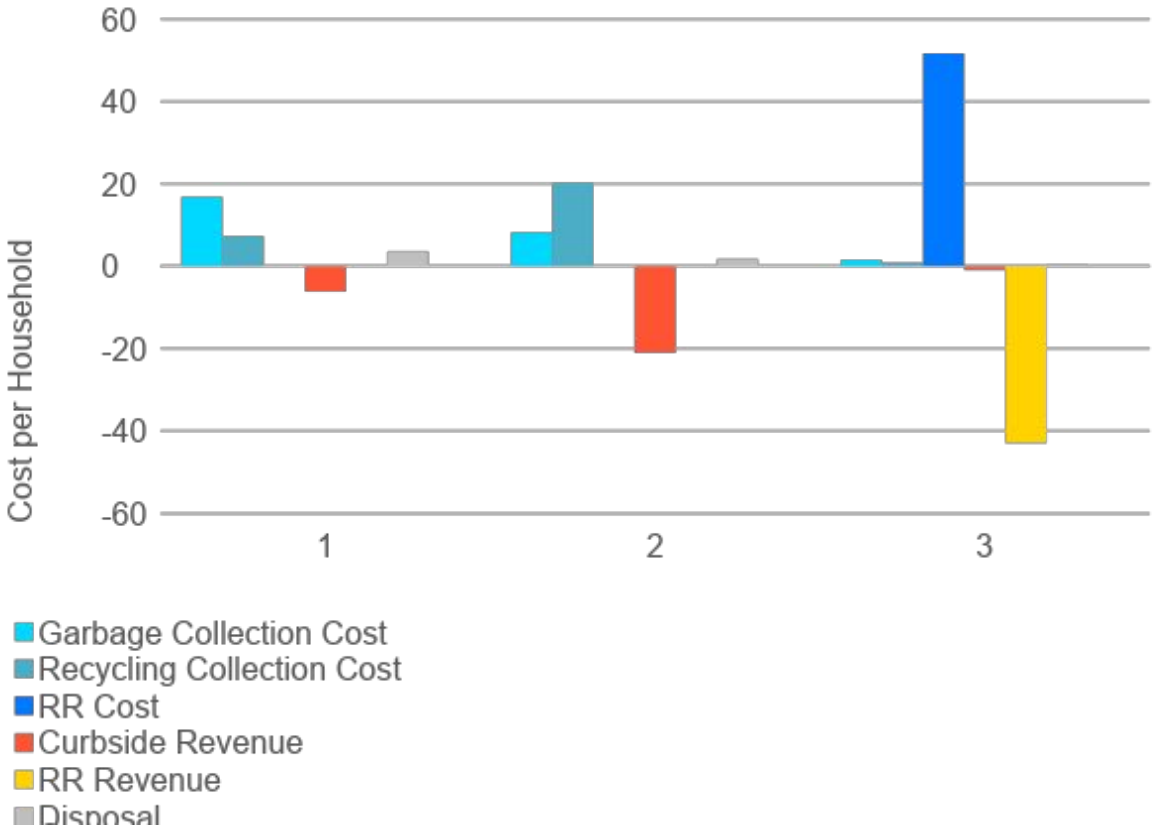
OVERALL BEVERAGE CONTAINERS TONNAGE AND COST



- Baseline scenario sees high garbage collection costs and low revenues
- EPR reduces garbage collection costs and adds revenue, but increases recycling collection costs
- RR significantly increases both collection cost and revenue achieved
  - Based on average of other schemes – potential for lower RR costs

OVERALL BEVERAGE CONTAINERS TONNAGE AND COST

Overall Tonnage and Cost (per hh)



- On a per-household basis, costs drop from $22 overall to $9 under EPR and $2 under EPR+RR
- The benefit of both EPR and RR is reliant on material revenues – if these fall the gap to baseline will reduce

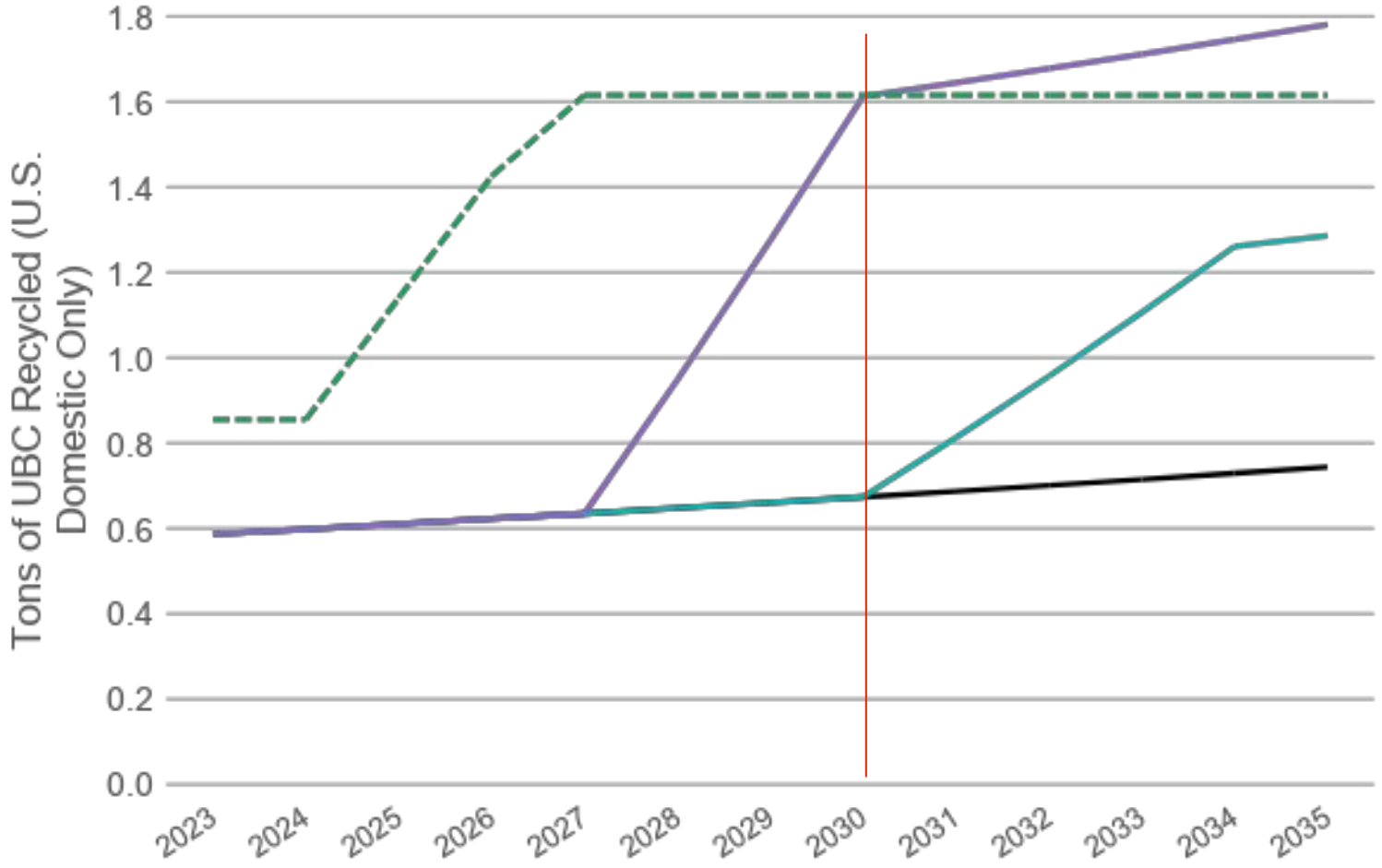
EXAMPLE OF LEVERAGING RR

Circolution

- Germany-based company that is manufacturing a returnable stainless steel cup with aluminum foil
- Can go through the reusable cycle 80 times
- Built on existing infrastructure (e.g., RR and deposit machines such as RVMs) to drive returns
  - RR value of 2.50 euros

EXAMINING PEAK RECYCLING RATES AND TIMELINES ASSOCIATED WITH DIFFERENT POLICY SCENARIOS

ALUMINUM UBC RECOVERY RATES UNDER DIFFERENT POLICY SCENARIOS



Status Quo – 38%
National EPR in 2025 – 65%
National RR in 2025 – 90%
Remelt Capacity

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

- New aluminum remelt capacity will be coming online which is critical to to achieving and maintaining high recycled content in can sheet as the can industry grows.
- Graph models the rate of change needed to fill the supply with recycled aluminum.
- While EPR can be an important first step to increasing recycling rates for beverage packaging, relying on EPR alone will not result in recycling rates aligned with our customers' net zero goals.
- RR programs can accelerate to high recycling rates within the first few years of implementation
- EPR programs will take up to 10 years to achieve 50-65% recycling rates.