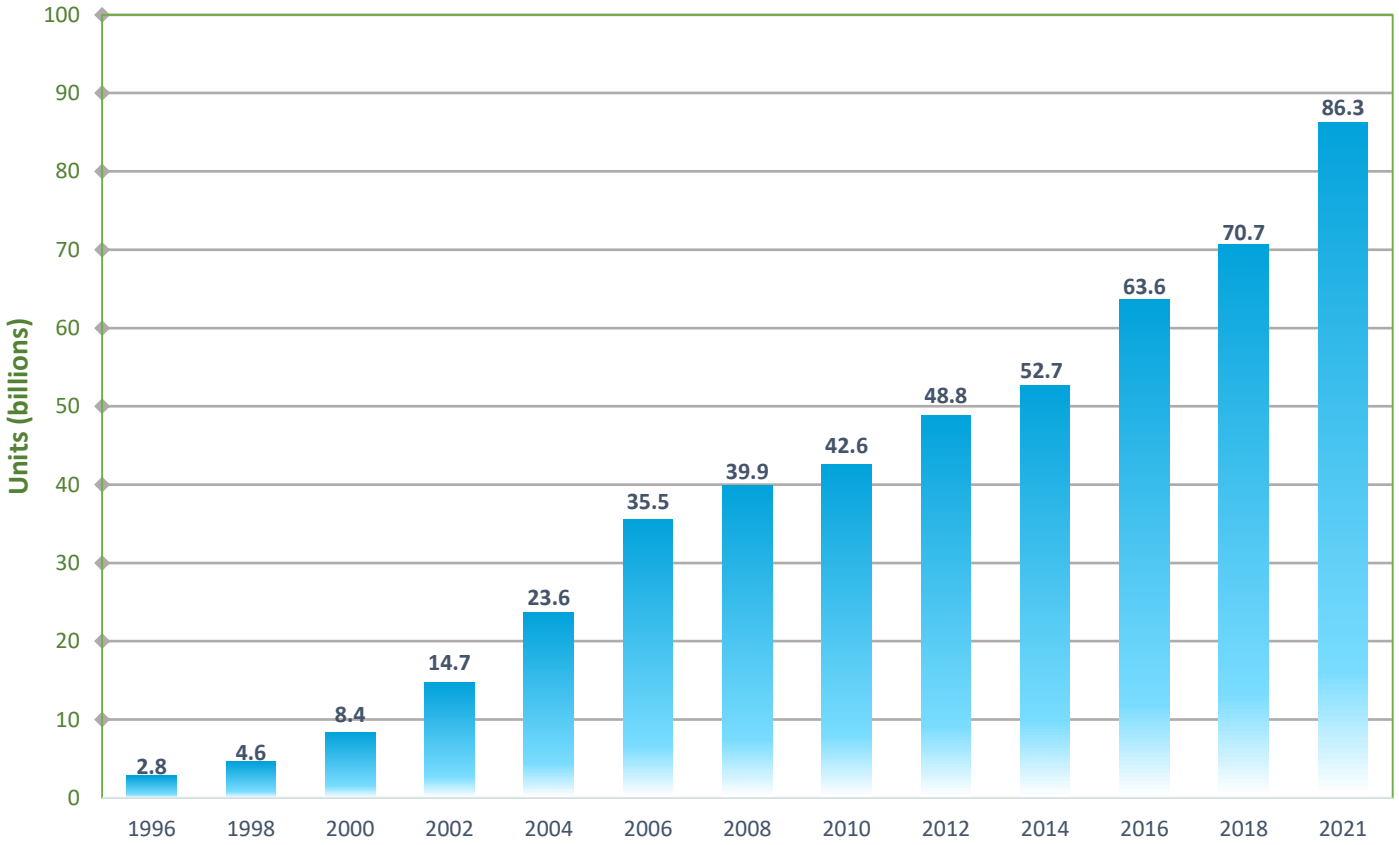
Bottle Bill Learning Session

Rhode Island Committee

Susan V. Collins, President
Container Recycling Institute

December 18, 2023

PET plastic water bottles are *the* primary source of beverage sales growth



"Plastic Bottled Water" defined as domestic, non-sparkling water packaged in plastic containers that are 1 gallon or less. Prior to 2015, this also excludes flavored, enhanced, and sweetened waters (3.2 billion units in 2014). Derived from Beverage Marketing Corporation data, 2002-2021.

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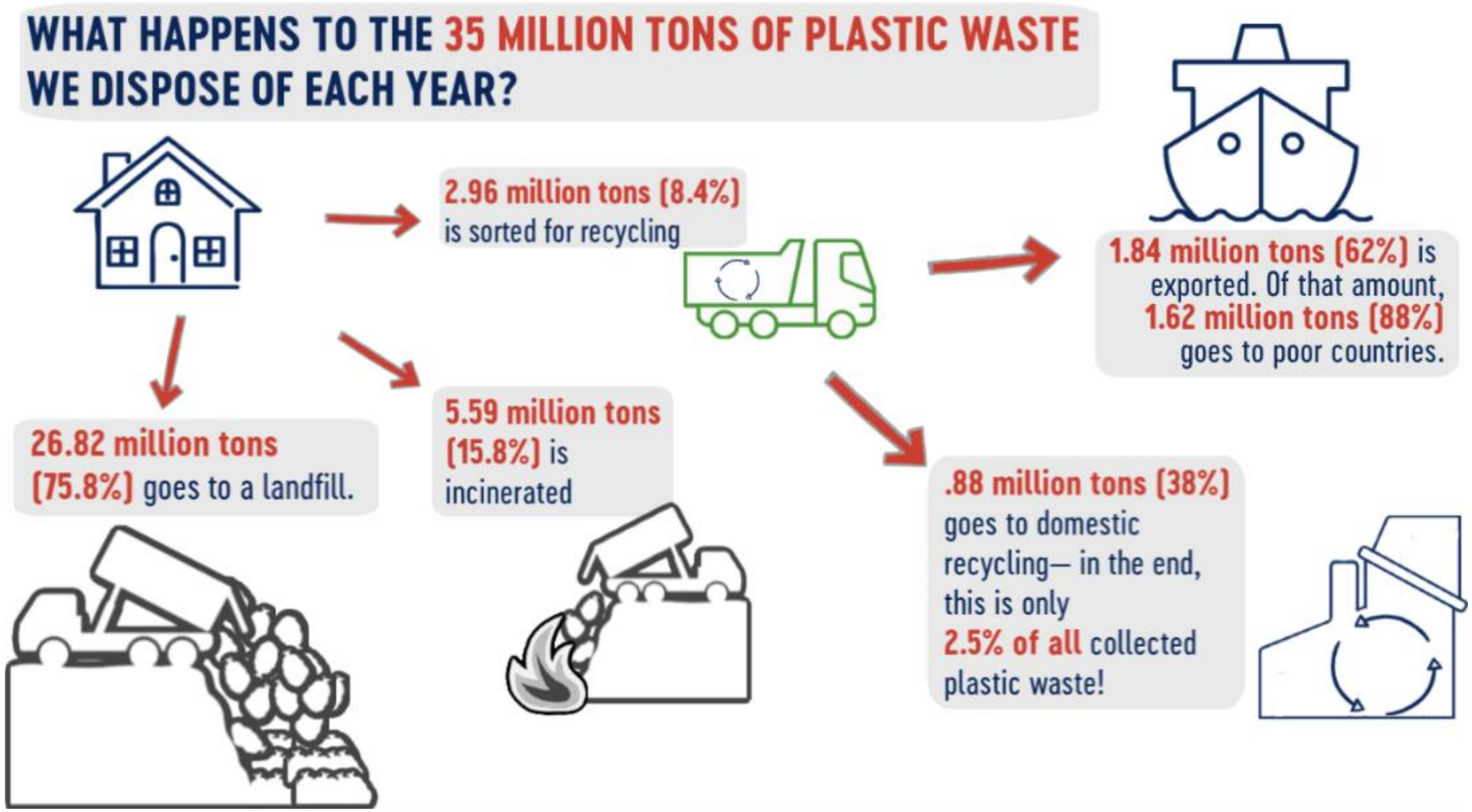
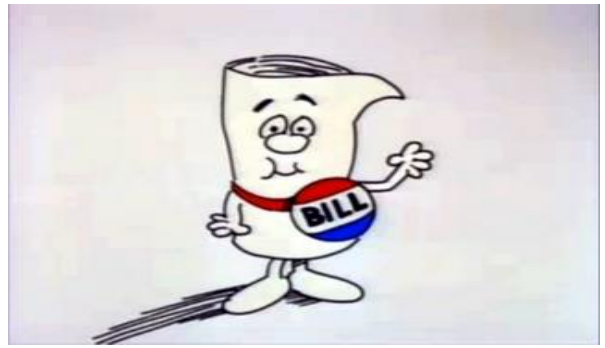
U.S.: The status quo isn't working



What is a Container Deposit-Refund Law?

(container deposit-refund, bottle bill, or container deposit law/CDL)

- Requires distributors and retailers to collect a minimum **refundable deposit**, usually 5-10 cents on certain beverage containers
- Creates a **privately-funded** collection infrastructure for beverage containers
- Makes producers and consumers **responsible** for their packaging waste



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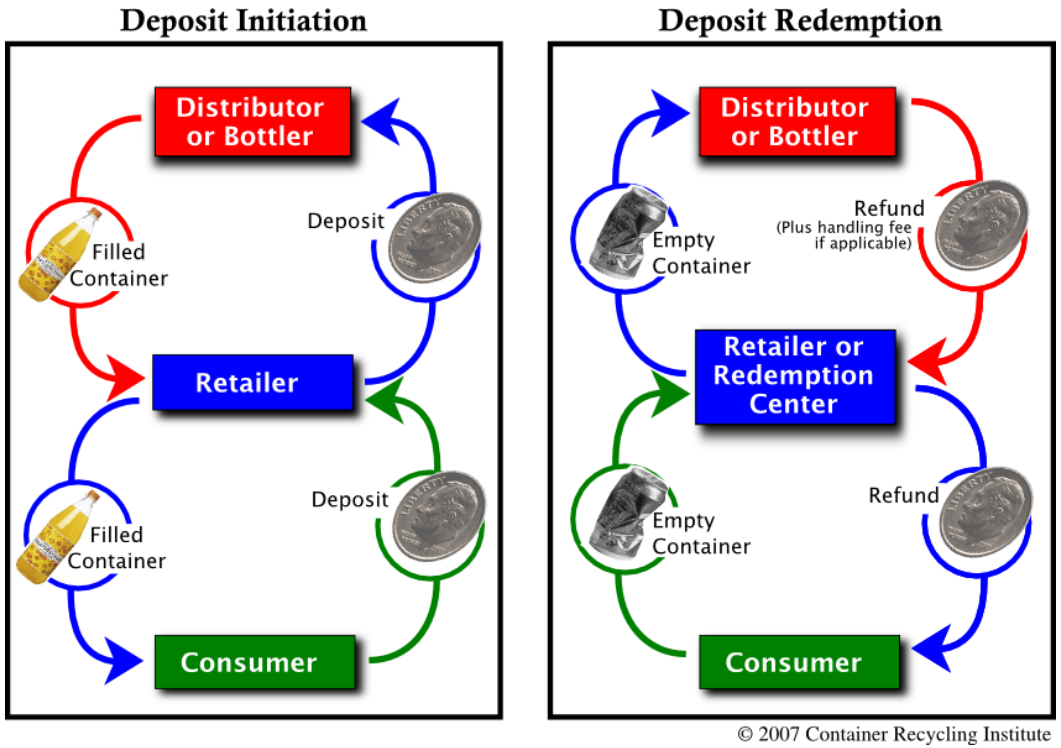
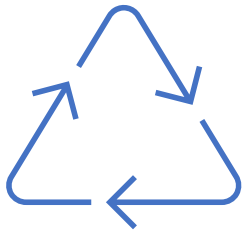
How do Container Deposits Work?



- Distributor collects deposit when they deliver containers to retailer
- Retailer collects deposit from consumer at point of purchase
- Deposit is refunded to consumer when container is returned
- Deposit is refunded to retailer when containers are returned to distributor

Benefits of deposit systems:

- **High recycling rates**: 80% for beverage containers
- Produce **clean** recycled materials for manufacturing
- Create **jobs** and **new businesses**
- Shift end of life costs for used beverage containers to **producers (EPR)**
- Reduce **litter**
- Conserve **energy** and natural resources
- Reduce **greenhouse gas emissions**
- **Prevent pollution** from manufacturing new containers from virgin materials



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Deposit Amount and Coverage by State

State	Beer	Soda/ Carbonated Water	Water	Juice, Tea, Energy Drinks, Sports, Other Non-Carbonated Drinks	Wine	Liquor
ME	5¢	5¢	5¢	5¢	15¢	15¢
OR	10¢	10¢	10¢	10¢	X	X
CT	10¢*	10¢*	10¢*	10¢*	X	X
CA	5¢/10¢	5¢/10¢	5¢/10¢	5¢/10¢	5¢/10¢ - 2024	5¢/10¢ - 2024
VT	5¢	5¢	5¢ - proposed	5¢ - proposed	X	15¢
HI	5¢	5¢	5¢	5¢	X	X
NY	5¢	5¢	5¢	X	X	X
IA	5¢	5¢	X	X	5¢	5¢
MA	5¢	5¢	X	X	X	X
MI	10¢	10¢	X	X	X	X

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* CT increase to 10 cents will be implemented January 1, 2024

In 2022, NEW Container Deposit Legislation Proposed in 8 States

New Hampshire

Kentucky

Minnesota

Missouri

Rhode Island

Illinois

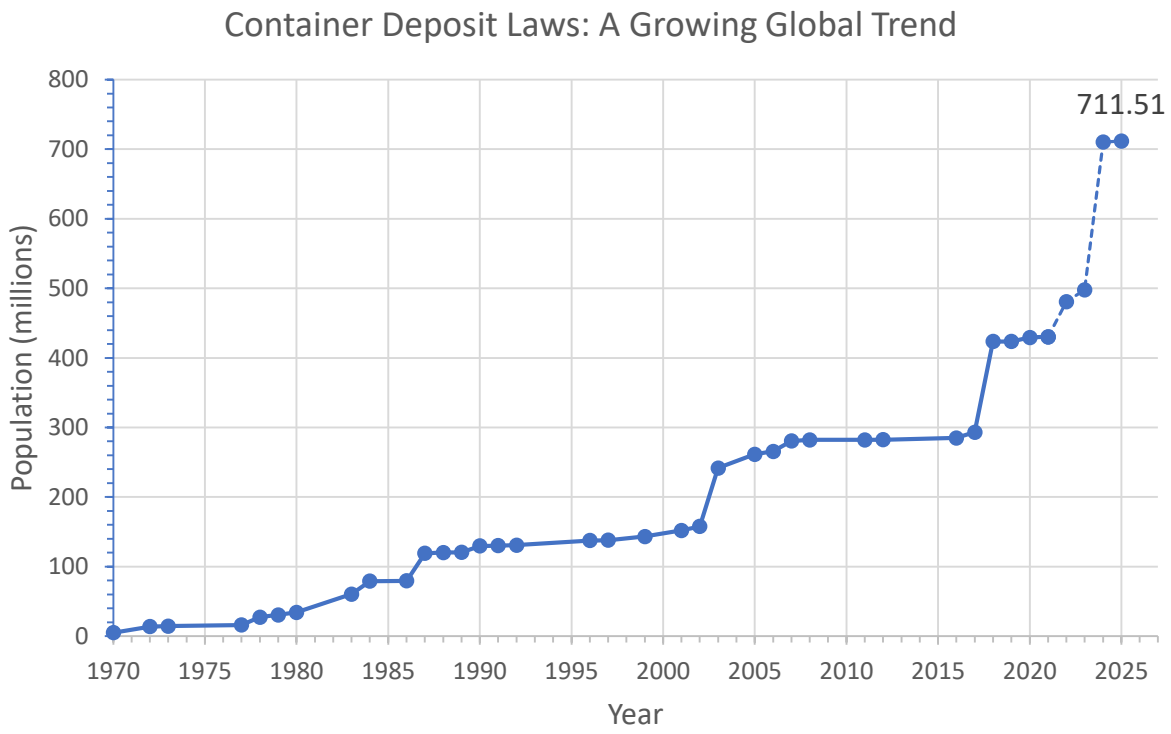
Virginia

West Virginia

2022 National (2)

Existing and new laws will serve more than ~~711~~ 758 million people

2022: Spain, Uruguay + expansion in CT, CA, and QC



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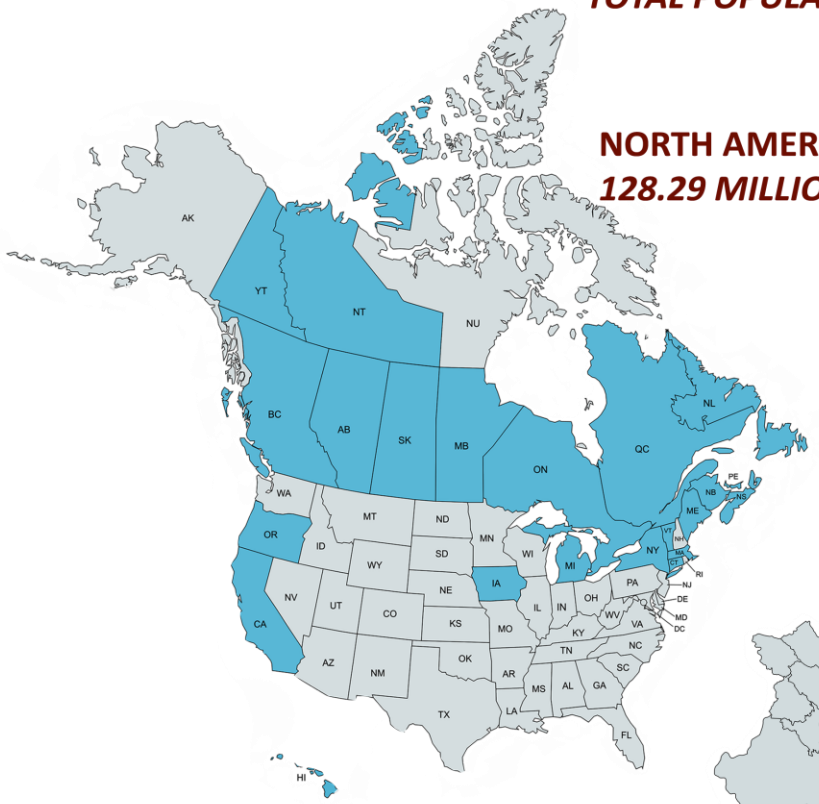
GLOBAL GROWTH IN CONTAINER DEPOSIT LAWS 2017-2021

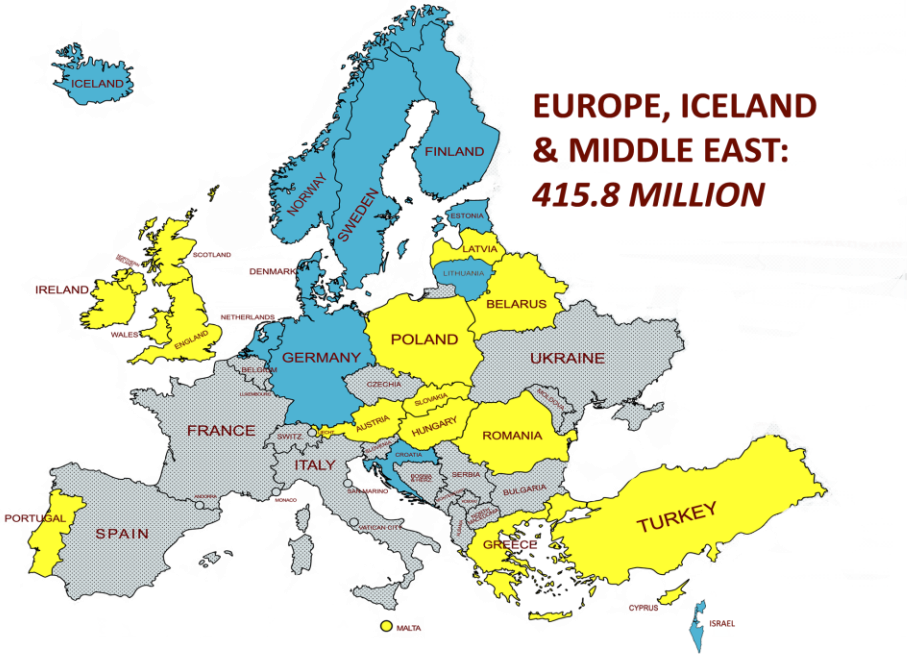
IMPLEMENTED BEFORE 2017:
293.21 MILLION PEOPLE COVERED

IMPLEMENTED 2017-2021:
418.3 MILLION PEOPLE COVERED

TOTAL POPULATION COVERED 711.51 MILLION

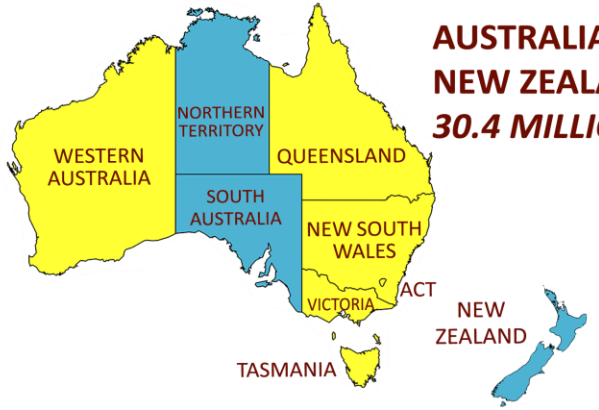


NORTH AMERICA:
128.29 MILLION



EUROPE, ICELAND & MIDDLE EAST:
415.8 MILLION

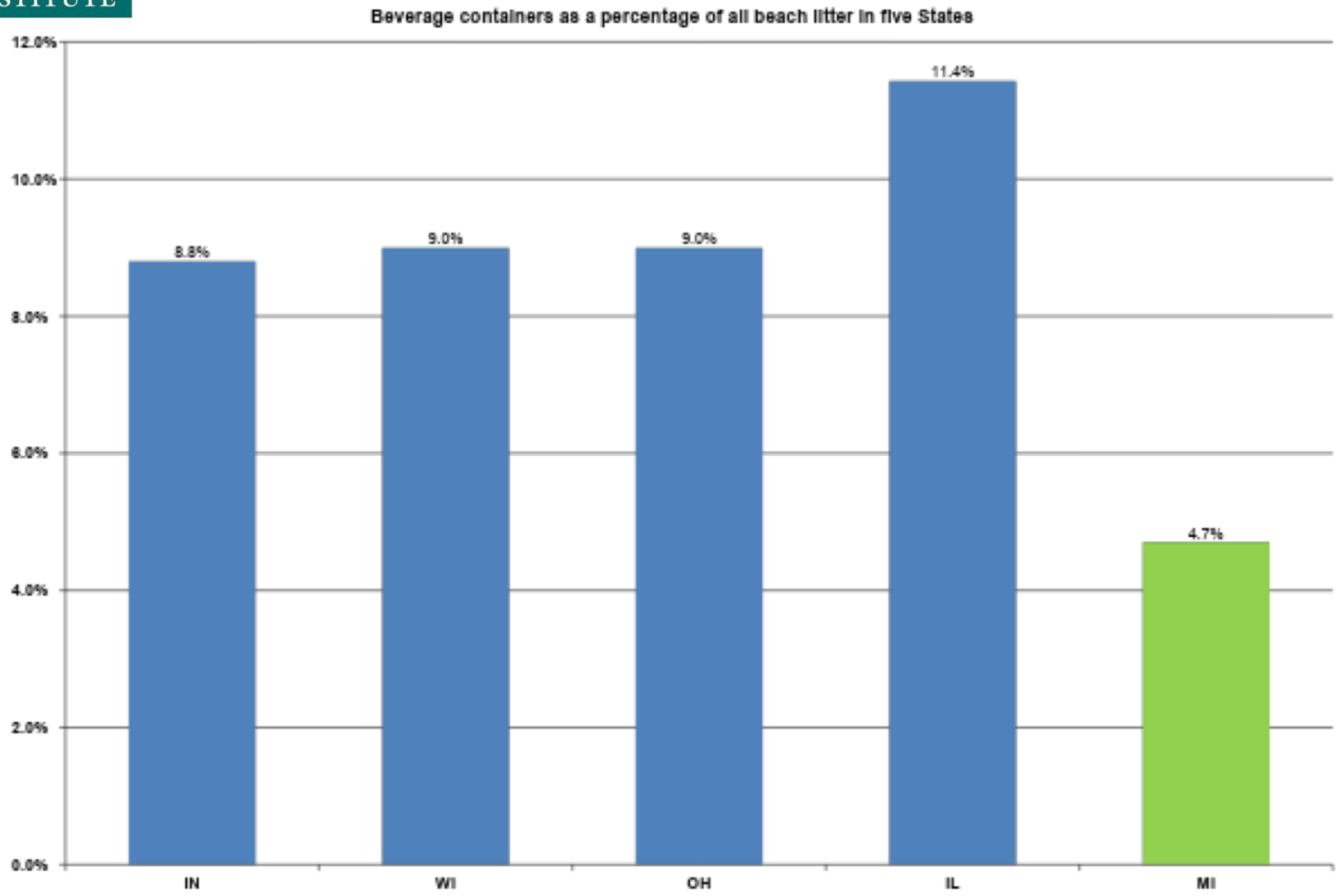
INDIA:
124.9 MILLION



AUSTRALIA & NEW ZEALAND:
30.4 MILLION

NOT SHOWN:
Barbados, Fiji, Jamaica, Kiribati, Mauritius, Micronesia, Palau, Seychelles, Singapore
12.12 MILLION

Deposits Reduce Beverage Container Litter – Great Lakes



Keep America Beautiful
2020 National Litter Study

"…There was substantially **more deposit-material litter per capita in non-bottle bill states** than in bottle bill states, by a difference of a **two-to-one ratio**."

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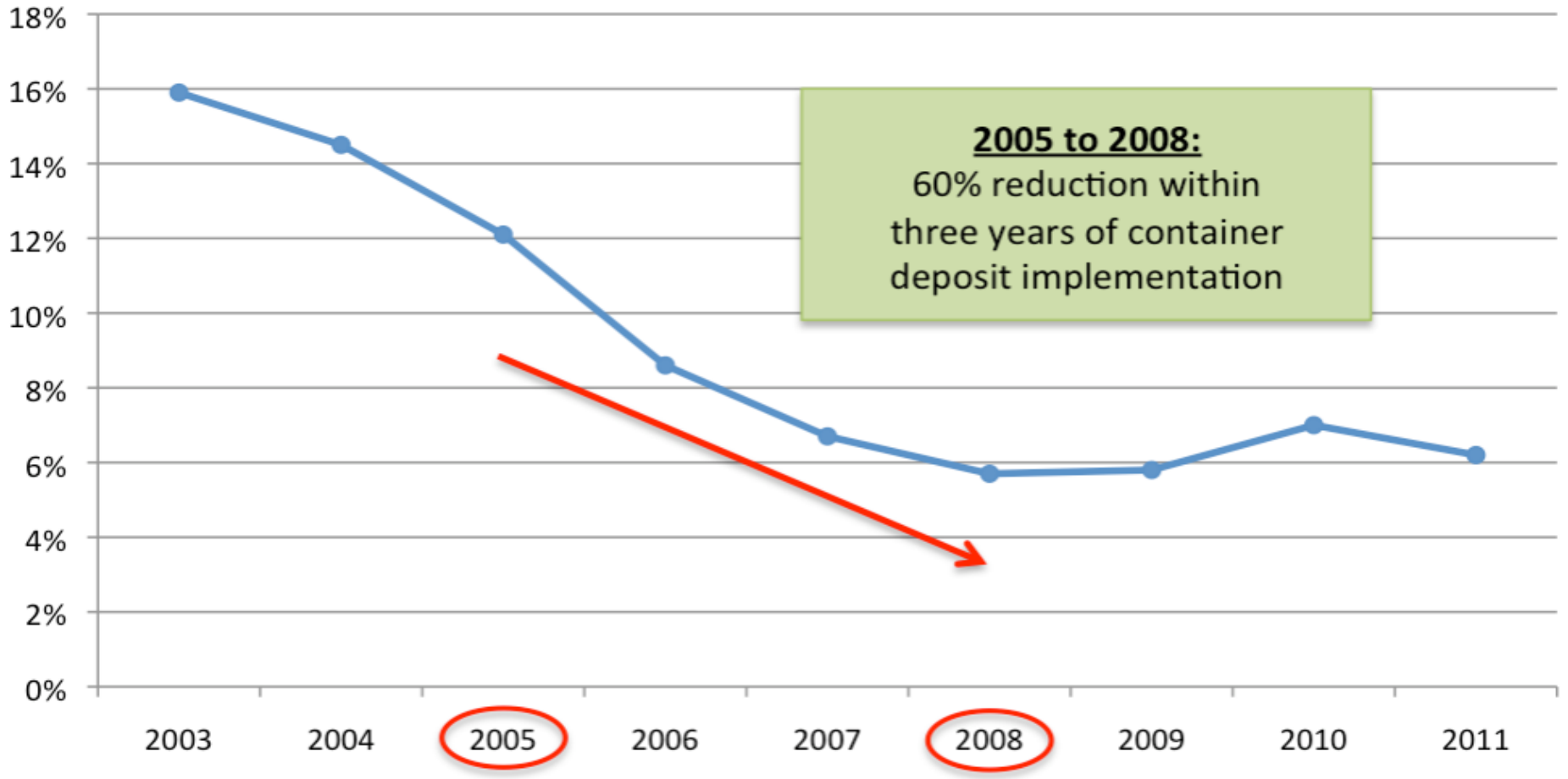
Beverage Containers As Percentage of Total Litter Collected in Hawaii



Source: Ocean Conservancy International Coastal Cleanup, 2003-2011

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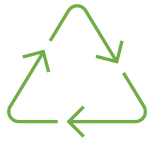
Recycling is More Than Just Diversion From Disposal



Recycled material *REPLACES* the use of virgin materials

Biggest Impacts: Extraction, transport and processing of virgin materials is avoided

Upstream environmental benefit: 10 to 20 times greater than downcycled or disposal options.

This avoids the upstream energy and associated environmental impacts

Weight is not an indication of environmental footprint

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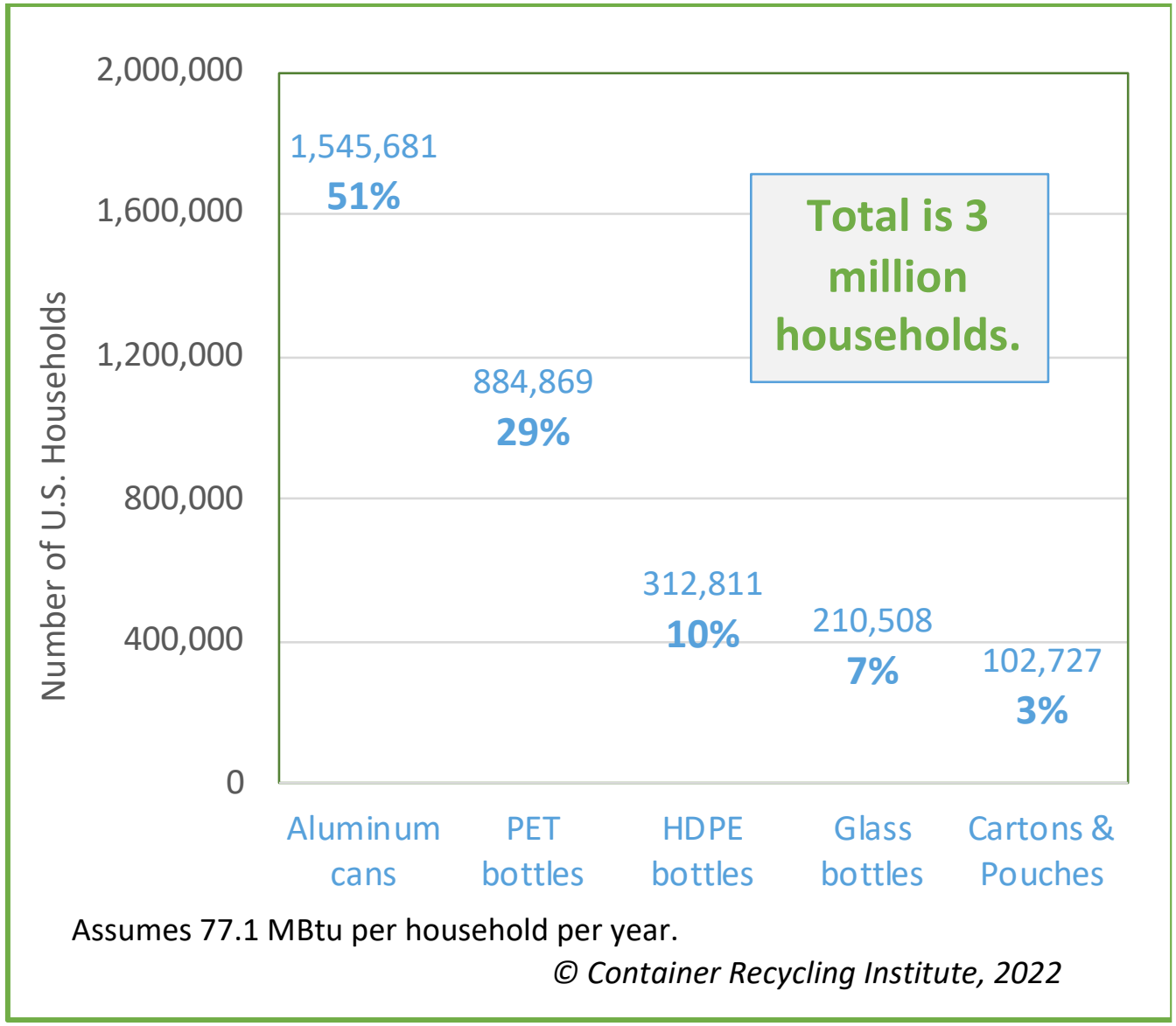
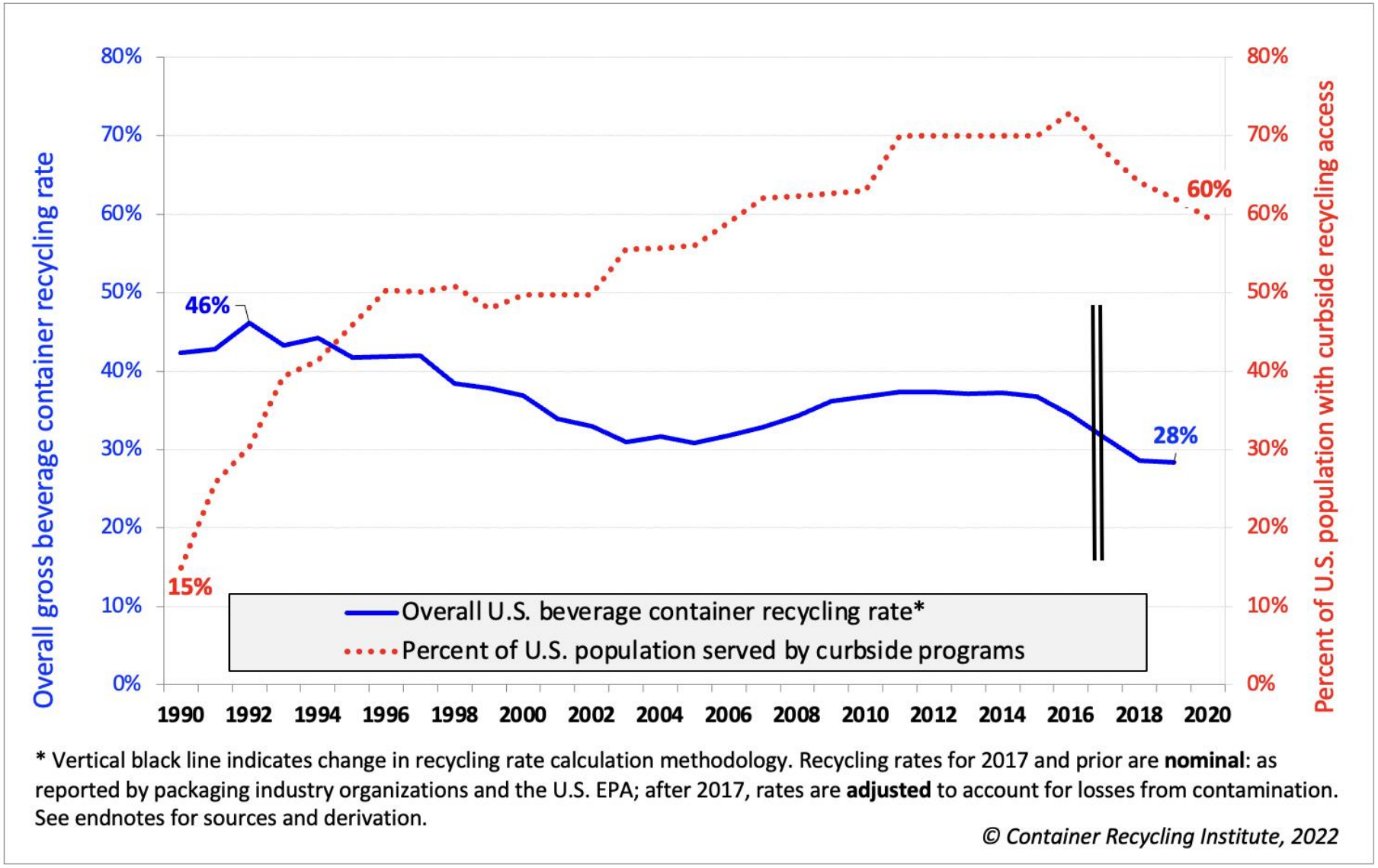
In total, about **3 million American homes** could have **all their energy needs met** (heating & cooling, cooking, utilities, etc.) with the amount of energy required to replace the beverage containers wasted in 2019.

Energy Required to Replace Wasted Beverage Containers, 2019
(in U.S. household equivalents)



Assumes 77.1 MBtu per household per year.

Comparing Curbside Recycling Access and Overall Beverage Container Recycling Rates in the U.S., 1990-2019



* Vertical black line indicates change in recycling rate calculation methodology. Recycling rates for 2017 and prior are **nominal**: as reported by packaging industry organizations and the U.S. EPA; after 2017, rates are **adjusted** to account for losses from contamination. See endnotes for sources and derivation.

Contamination, Loss Rates, and Factors That Affect Recycling Rates

Curbside Theoretical Maximum

- CRI estimates that the theoretical maximum (best case scenario beverage container recycling rate achievable by curbside recycling alone) is **38%**.
- Best case scenario: 100% of residents have curbside access; 100% participate in the program faithfully (no skipping).

Total beverage container waste generated	x	Proportion of tons consumed in residential sector	x	Retention after material losses: Sorting		Processing	=	**Total Recycling**
100%	x	63%	x	86%	x	71%	=	**38%**
		37% Away-from-home consumption		*14% loss*		*29% loss*		

Source: CRI memo "Theoretical maximum recycling rate in Michigan from curbside recycling programs only," January 2015.

Differences Between Deposit PET and Curbside PET (on average)

Metric	Deposit PET	Curbside PET
Processing Facility (extra transportation costs)	Facilities in MA & NY	Most plants that handle curbside PET are in the South
Pricing	Baseline deposit price	Worth 40% less than deposit baseline price (5-year average)
Percent Contamination + non-usable PET, other	85% production rate (NAPCOR/APR, 2017)	66% production rate (NAPCOR/APR, 2017)
Extra costs due to contamination	Minimal	Costs of transporting contaminants, extra cleaning costs and costs of disposing of contaminants
Product Use Potential	Food & beverage bottles, other food containers, many other uses	Fiber, carpet, strapping, etc.

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Deposit scrap is more valuable.

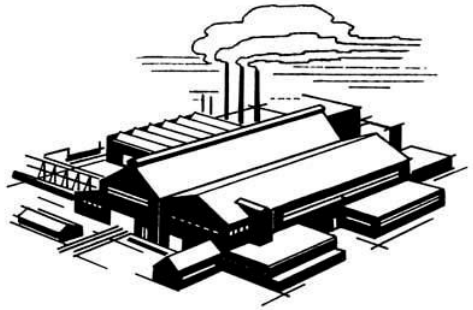
Single-stream curbside material is more contaminated, low quality vs. clean, separated deposit material.

- **PET plastic from curbside programs typically sells for 40% less than deposit PET**
- **Curbside glass** *costs* $20/ton to recycle—when markets can be found for it at all—versus deposit glass that has a $20/ton scrap value.
- **Aluminum: spec and off-spec**

Materials Collection and Processing:
3 Stages of Contamination

1. Collection

2. MRF



3. Post-MRF Processing

4. Manufacture Into New Products

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Deposit vs. Single Stream Glass

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The Amount of Furnace-Ready Glass Generated by Recycling Programs Across the Globe

Jurisdiction	Collection Method(s)	Cullet recovered annually, per cap.
Ohio	Single stream Curbside	7 pounds
Rhode Island	Single stream Curbside	9 pounds
Kansas City	Ripple drop-off	18 pounds
North Carolina	Single stream curbside + Bar/Restaurant	22 pounds
Leeds, U.K.	Extensive drop-off	28 pounds
Fayetteville, Ark.	Curbside sort + Bar/Restaurant	38 pounds
California/Oregon	Deposit-return + single stream curbside	41-42 pounds
British Columbia	Deposit-return + single stream curbside	44 pounds
Maine	Deposit-return + single stream curbside	73 pounds

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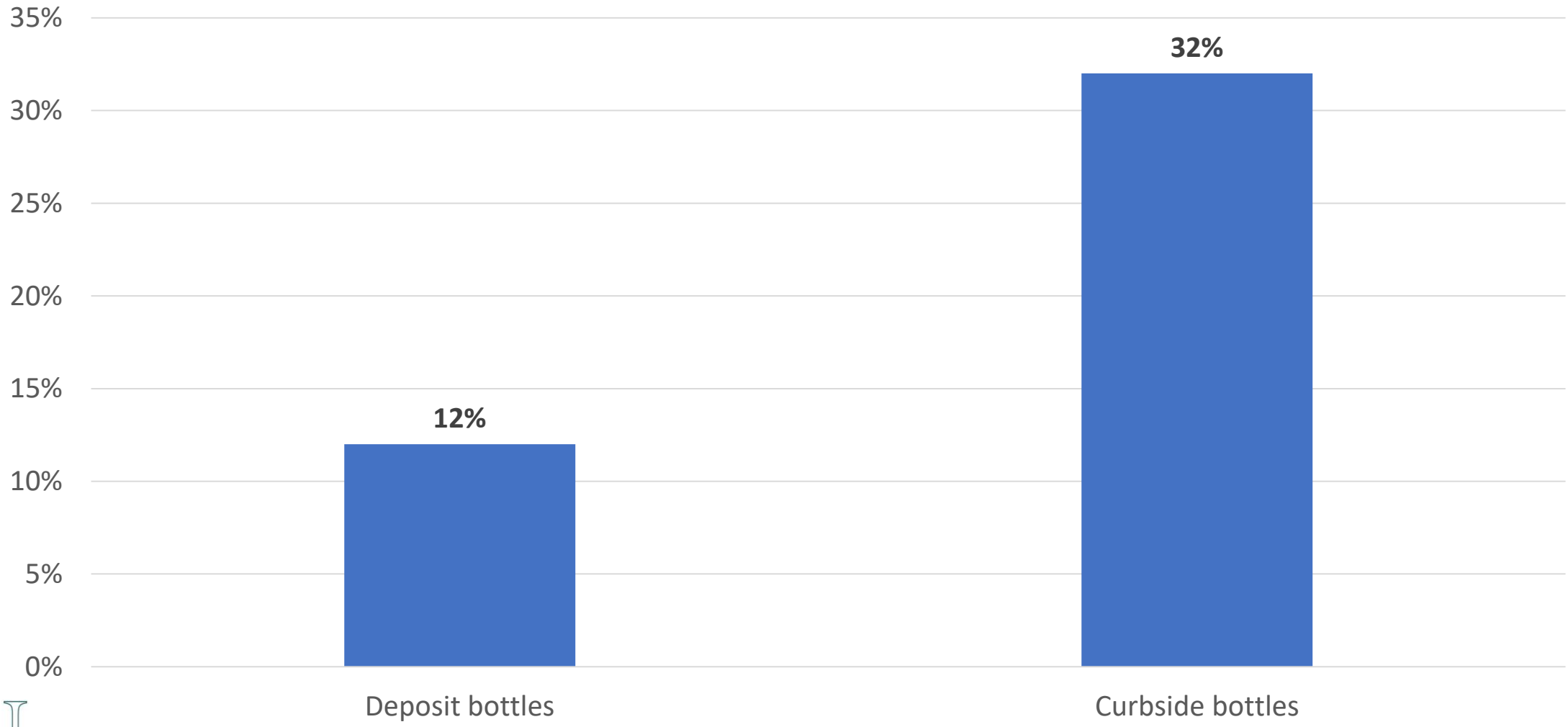
Production Loss (%) of PET Flake Material Based on Collection Type



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Source: 2017 NAPCOR Report

“The convenience of **mixed collection** of materials increases consumer participation, but also increases overall contamination of the various materials collected. This makes the material **more challenging** for a recycler to process, but especially for any plastic recycler that is trying **to make a recycled plastic for food-contact applications**.”

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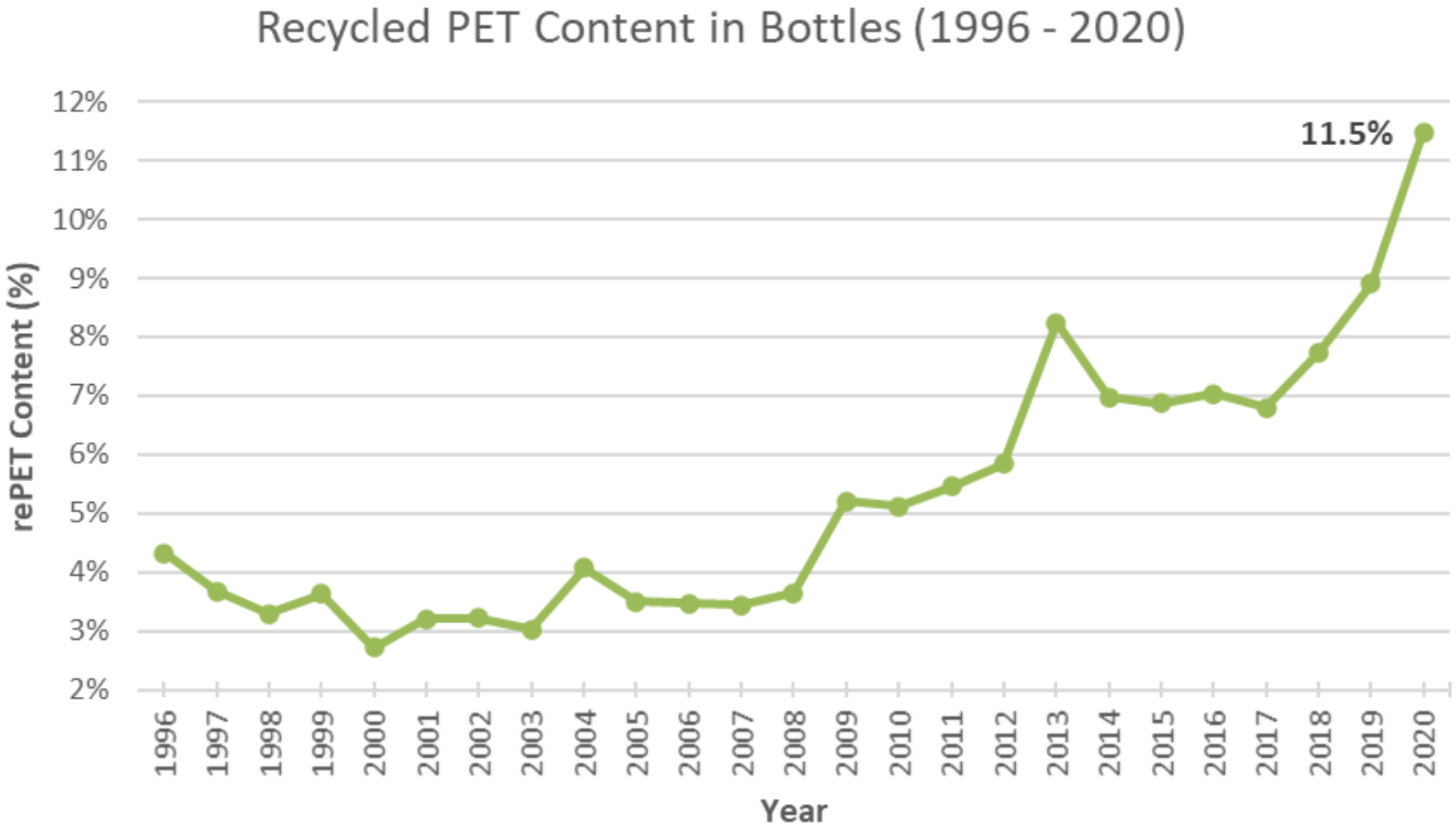
Source: "Assessing the State of Food Grade Recycled Resin in Canada & the United States." Stina Inc. for Environment and Climate Change Canada. 2021.



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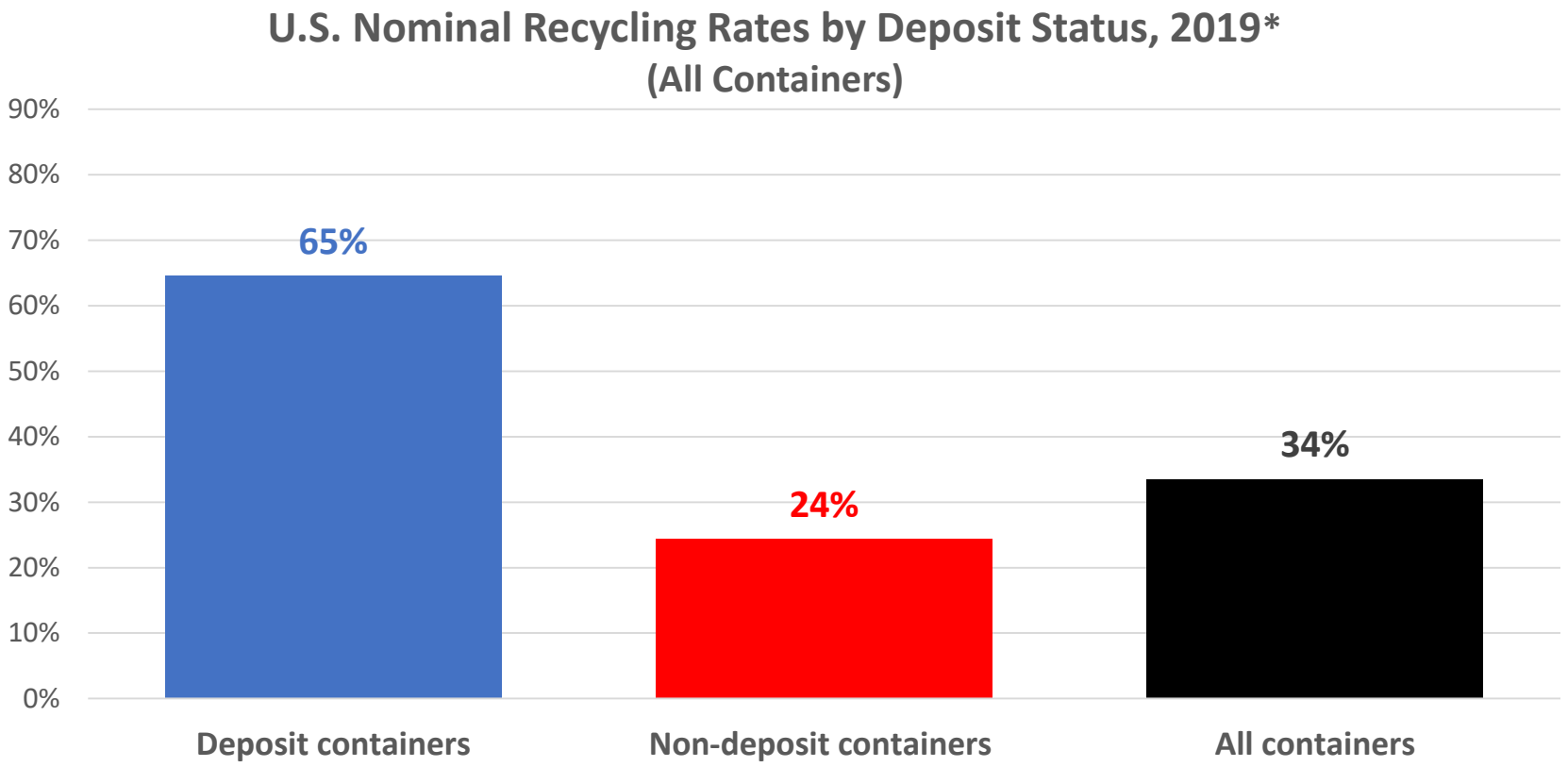
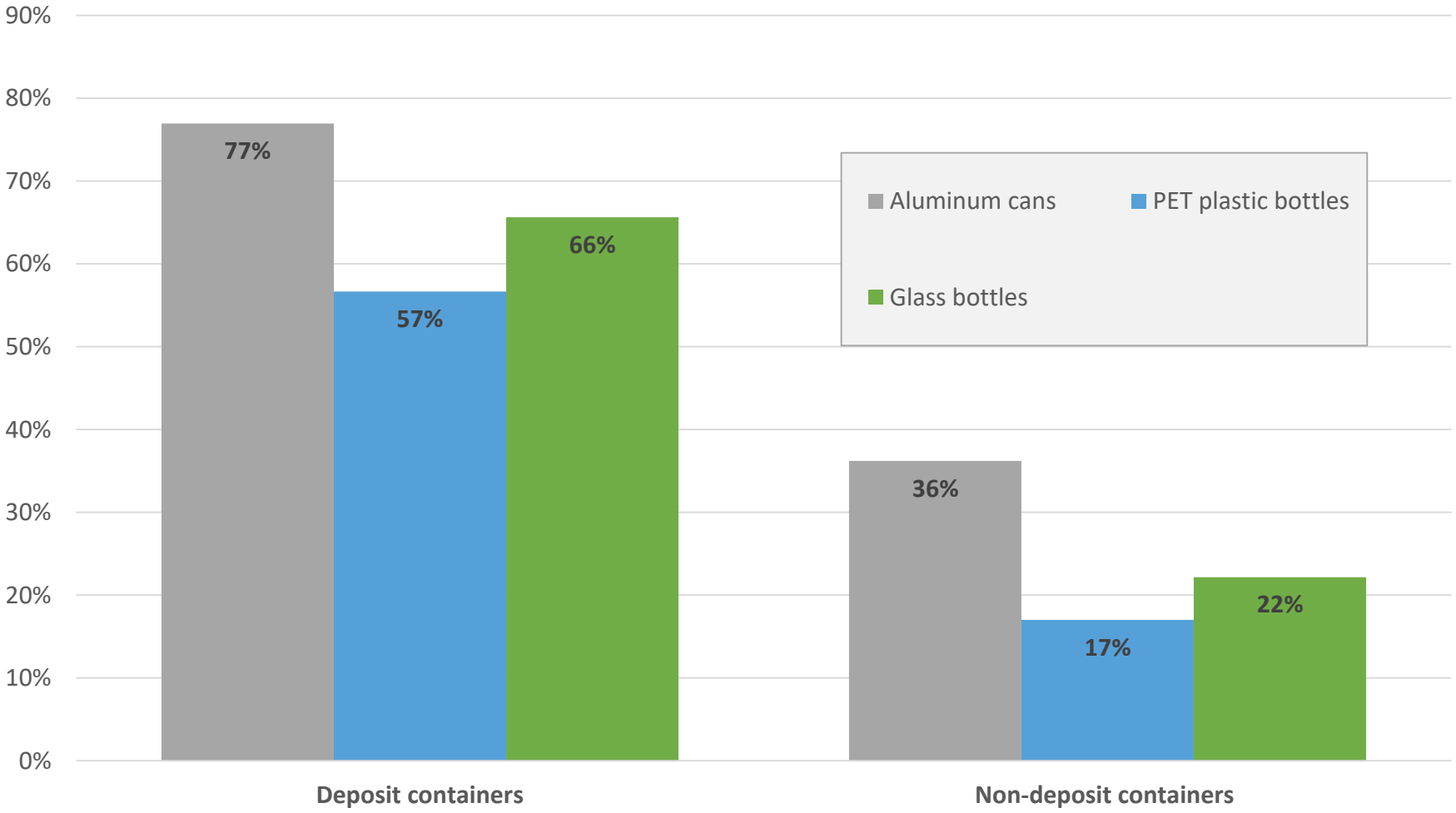


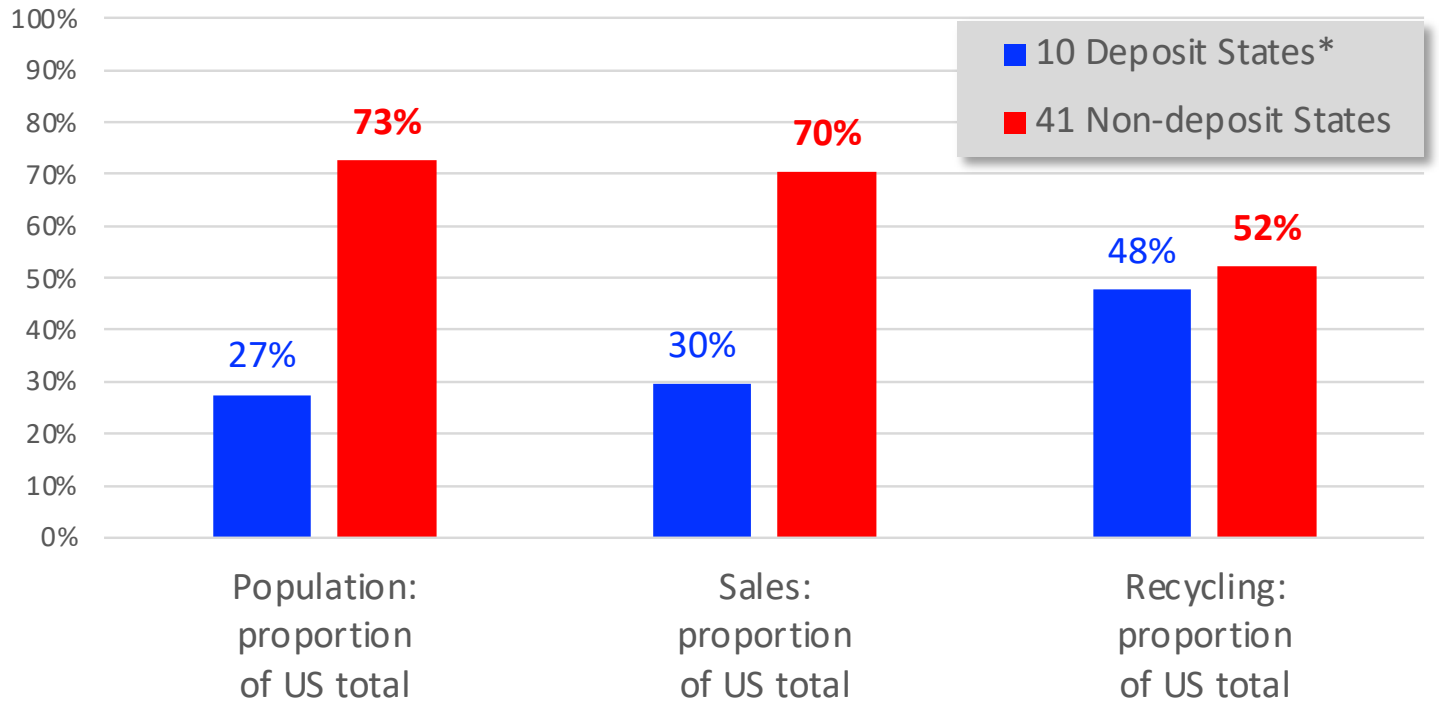
Includes all beverages packaged in aluminum cans, PET & HDPE plastic bottles, glass bottles, gable-top cartons, aseptic boxes, and foil pouches. Non-deposit containers include all containers in states without bottle bills, and all non-deposit beverage containers in states without non-modernized bottle bills. Source: 2019 Beverage Market Data Analysis.

U.S. Nominal Recycling Rates by Deposit Status, 2019



"2019 Beverage Market Data Analysis." Container Recycling Institute, 2022.

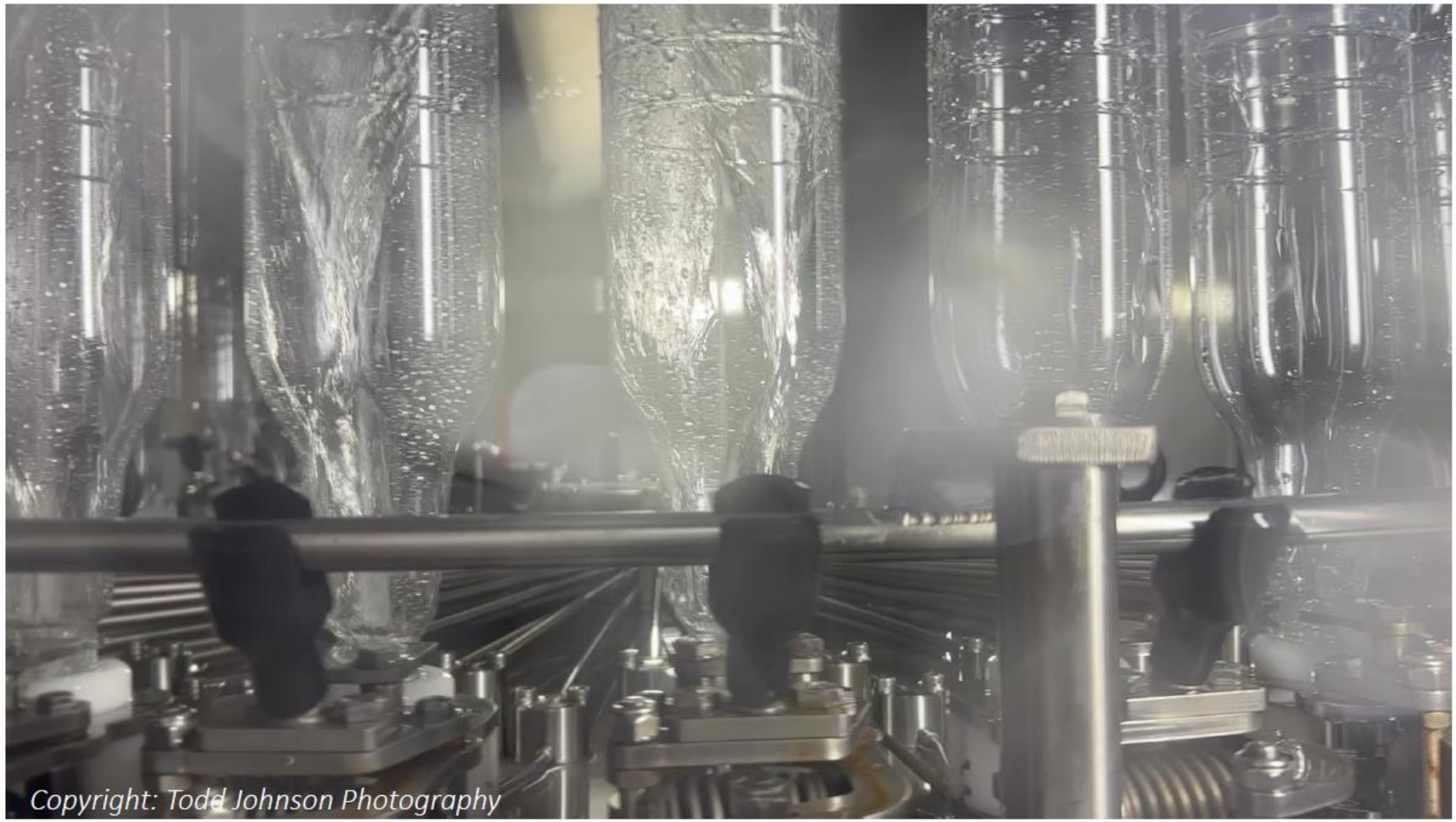
Deposit states' contribution to total US beverage container recycling, 2019



Source: "2019 Beverage Market Data Analysis." Container Recycling Institute, 2022.
* Note that most deposit states do not place deposits on *all* beverages sold, so our companion chart on deposit STATUS is more illustrative of the power of deposits to boost the recycling rate.

RVM redemption in Germany

Haaner Felsenquelle: Refillable Mineral Water Bottling Plant



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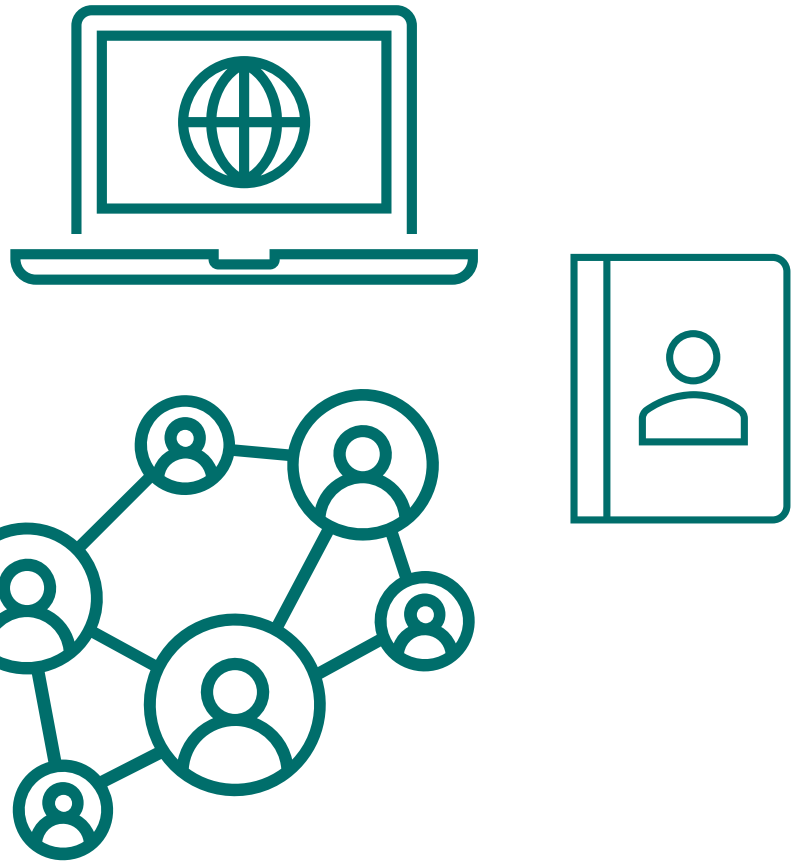

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