The 50 States of Recycling

A State-by-State Assessment of US Packaging Recycling Rates

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eunomia

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REPORT FOR

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Reloop

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Starting in 2021, Ball Corporation, began working with Eunomia, to publish a first-of-its-kind state-by-state comparative analysis of recycling rates across all 50 states. Today, we are publishing an update to that study, with state-specific data on generation, recycling and disposal rates for the most common packaging materials in the United States.

This update to "The 50 States of Recycling" shows just how much work remains in the United States when it comes to recycling. It remains part of our continued commitment to help increase recycling rates, which are a key lever in **Ball's Climate Transition Plan** and in our industry's ability to meet decarbonization goals. Since we last visited this research, overall recycling rates across the country have stagnated or dropped. Many factors contributed to these declines, including pandemic-related shutdowns at many recycling centers. For example, the U.S. recycles just 45.2% of aluminum cans today. Getting that rate closer to our goal of a 90% recycling rate by 2030 would create massive opportunities to improve our environment and grow our economy.

Many consumers want to, and think they are, doing the right thing when they put their can or bottle in the recycle bin. However, collection does not equal real recycling. Creating a true closed-loop system — where a can becomes a can, or a bottle becomes a bottle — will require a well-designed recycling policy that creates compelling incentives to recycle and expand recycling infrastructure and systems to ensure the process is simple, convenient and affordable for everyone.

As state governments, the federal government, and American-based corporations set bold decarbonization goals, it is critical that we embrace the significant role closed-loop recycling plays in addressing climate change. On this front, the public and private sectors must continue working together to advance real solutions. We need smart and effective policies, like pairing Recycling Refunds (also known as bottle bills or deposit return systems) with Extended Producer Responsibility, which encourages public-private partnerships, benefits consumers and helps create a circular economy.

If we do this right, increased recycling has the potential to add $6.5 billion in material value to the U.S. economy each year. Across the country, the demand for material like recycled aluminum far outpaces supply, and recycling is an important creator of local, community-based jobs. By diverting valuable materials from landfills to recycling centers and ultimately to the producers that want to dramatically increase the recycled content of their packaging, we can literally turn trash into treasure.

We encourage you to dive into "The 50 States of Recycling" 2023 report to see how your state is doing and to join us as we work collectively to increase recycling of aluminum and keep other truly circular materials out of landfills.

EXECUTIVE SUMMARY

In 2021, Eunomia Research & Consulting and Ball Corporation partnered to publish the first comprehensive look at the U.S. recycling system: "The 50 States of Recycling." The past report was a first-of-its-kind state-by-state comparable assessment of common packaging materials based on 2018 data on generation, recycling and disposal rates.

Now updated with 2021 data, this report provides recycling rate figures for packaging materials in each state. It also takes a closer look at the potential benefits of emerging policy by assessing the benefits of modernizing Recycling Refunds (RR) (also known as bottle bills and deposit return systems) in the Northeast and implementing RR alongside Extended Producer Responsibility (EPR) in both Washington and Colorado.

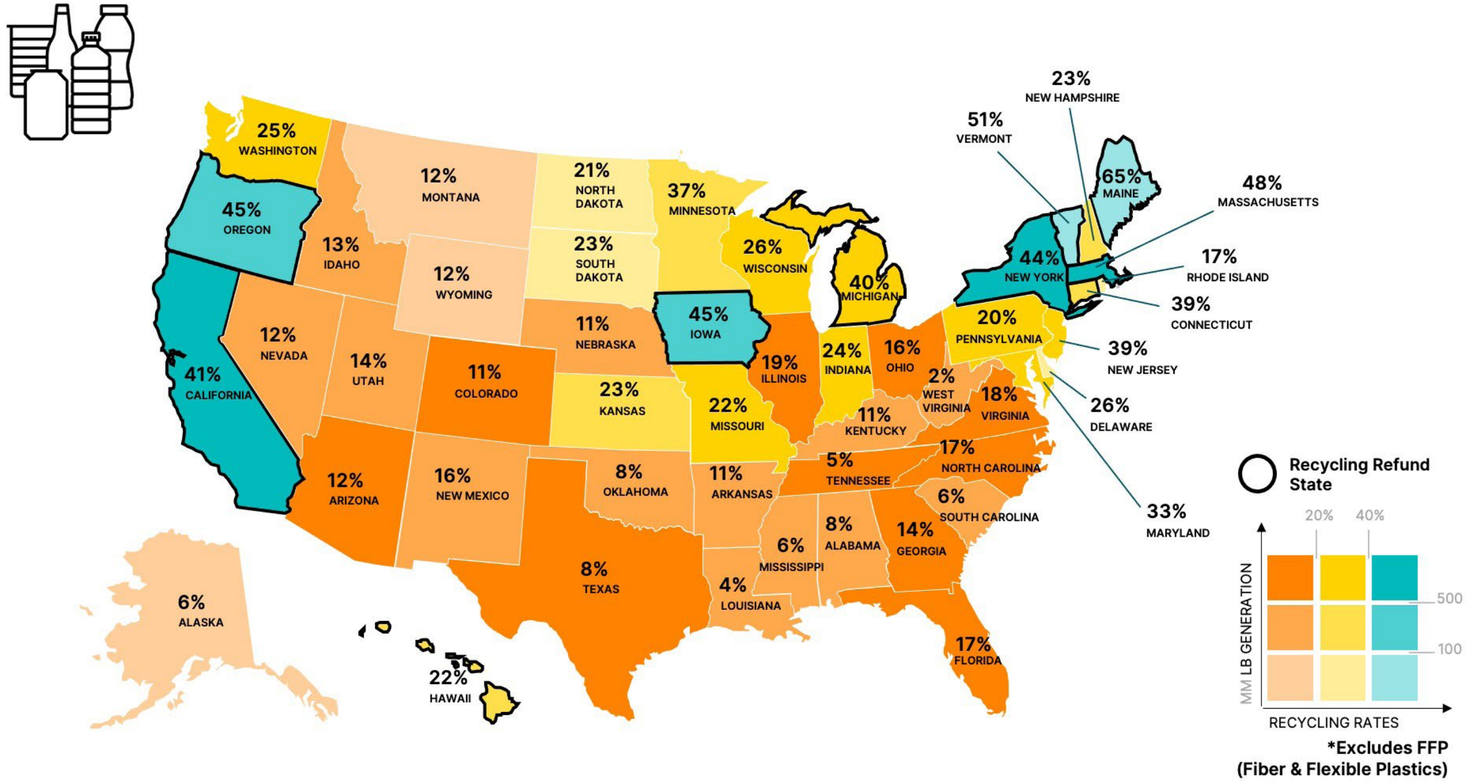
Similar to the first report, this report ranks state recycling rates with and without cardboard, boxboard, paper packaging, plastic films and flexible plastic packaging, referred to as fibers and flexible plastics (FFP). While the recycling of these materials is important, their large volumes — 66% of the total weight of packaging analyzed — mask the performance of other packaging materials. In addition to volume, much of this material comes from the commercial sector for which the data is less accurate.

This report provides recycling performance analyses for each state and compares the economic and environmental benefits of the current condition of recycling to an ideal future that models the outcomes of implementing EPR+RR.

Like the first report, this report provides recycling performance analyses for each state. In addition to current state analysis, this report compares the economic and environmental benefits of the current condition of recycling to an ideal future state that models the outcomes of implementing EPR+RR together in each state.

This report will help policymakers and stakeholders from across the supply chain work together to enact well-designed policies and develop efficient and effective programs to enable a strong circular economy that will greatly benefit both the U.S. economy and the planet.

50 STATES OF RECYCLING 2023 RANKINGS



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

RANKINGS - KEY TAKEAWAYS

- **On average, recycling rates across states have stagnated** and some of the largest shifts between 2018 and 2021 are the result of the inclusion of new and more accurate data. This shows the need for continued action to improve U.S. recycling systems.

- **It's important to calculate and use the real recycling rate rather than assuming all material collected for recycling is actually recycled.** This is a key distinction that was also made in the previous report. Recycling rates in many states are still measured in terms of what is collected for recycling. For example, 89% of the volume of aluminum cans through single stream collection is recycled compared to only 32% for non-bottle PET. All recycling rates presented in this report are the real recycling rate — in other words, the quantity of material that is actually recycled and re-incorporated into a new product.

- **Recycling can support the fight against climate change.** In 2021, The "50 States" analysis found that nationally, 79 million MTCO2e of greenhouse gas (GHG) emissions is avoided through recycling, comparable to removing more than 17 million vehicles from the roads. The five states with the lowest packaging related GHG emissions per capita (Maine, Vermont, Oregon, Minnesota, and New York) are also among the ten states with the highest recycling rates. Recycling, combined with material reduction has the maximum impact potential for reducing emissions.

- **Increasing recycling rates could unlock economic potential by recapturing millions in value currently being lost in landfills.** The "50 States" analysis determined that today the U.S. recycling industry only captures about 32% of the total value of material in the packaging waste stream. Consequently, there is an enormous untapped economic potential of around $6.5 billion that could be harnessed through more effective recycling practices annually.

- States with recycling refunds continue to outperform other states. In 2018, states with RRs accounted for 8 of the 10 states with the highest recycling rates for packaging excluding FFP. In this report, **9 of the top 10 states all have RRs. While the 10 RR states only account for 27% of the U.S. population, they account for 47% of all the packaging (without FFP) recycled and 51% of all beverage containers recycled.**

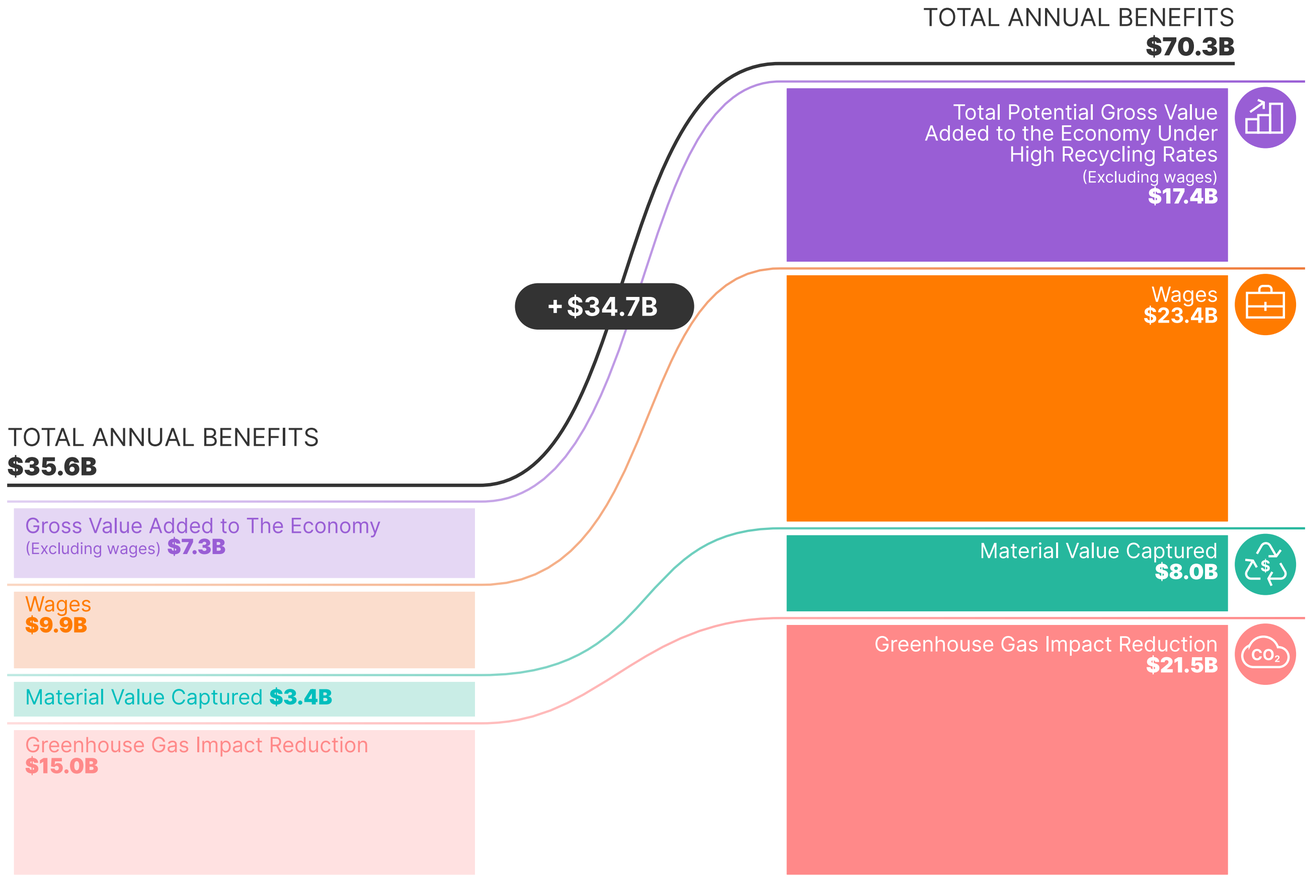
- **Closed-loop recycling maximizes recycling benefits**. As recycling systems are improved, it is important to keep material value in the economy by recycling materials in a closed-loop process whenever possible. Closed-loop recycling maintains a material's utility and value, enabling it to be fed into the supply chain multiple times (i.e., can-to-can or bottle-to-bottle recycling). States with Recycling Refunds recycle 34% of material packaging (excluding FFP) through closed-loop end markets compared to 7% for non-RR states.

- **Well-designed recycling refunds paired with extended producer responsibility result in the highest recycling rate and maximize closed-loop recycling.** Through regional and state-specific analysis, this report found that enacting EPR for packaging and paper products alongside RR for beverage containers will maximize the materials recycled thereby delivering the best social, environmental and economic outcomes for the U.S.

The **key takeaways** show that recycling has a variety of benefits. If some of these benefits, such as the gross value added to the economy, the employment income from recycling related jobs, the value of the material captured, and the GHG impact reduction benefit (calculated based on the social cost of carbon) are all expressed as a monetary benefit, the total benefit recycling provides is approximately $35 billion. If effective recycling policies were enacted, such as RR and EPR, then the national benefit of recycling would double to $70 billion.

This report should serve as a resource for shaping well-crafted recycling policies and developing beneficial programs for the future. How the next generation of recycling systems is designed matters, and smart policies and programs that work together are needed to deliver the best outcomes.

If effective recycling policies were enacted, such as RR and EPR, then the national benefit of recycling would be approximately $70 billion.



*Social and environmental cost of carbon valued at $190 per MTCO2e.[1]

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1.0

State Recycling Rates and Rankings

1.1 INTRODUCTION

In 2021, Eunomia Research & Consulting and Ball Corporation released the inaugural edition of the 50 States of Recycling Report, a first-of-its-kind state-by-state comparable assessment of common packaging materials based on 2018 data on generation, recycling and disposal rates. This report, using 2021 data, provides:

- **Updated data and ranking of state recycling rates by material type.**
- **New analysis related to the current economic, social and environmental impacts of recycling.**
- **An evaluation of the impact of potential policies including:**
  - Modernized Recycling Refunds (also known as Deposit Return Systems or Bottle Bills).
  - Extended Producer Responsibility (EPR) with or without Recycling Refunds in two states, Washington and Colorado.

This data and analysis will help equip policymakers and industry partners with the information needed to maximize economic, social and environmental outcomes.

For over 25 years, public and private sector waste management entities in the United States have collected consumer packaging through single and dual stream residential and commercial recycling programs. While the U.S. Environmental Protection Agency (EPA) calculates the national recycling rate for different materials (including packaging), it has not updated this information since 2018.

Until the inaugural report was released, there was no way to compare the recycling rates of various packaging formats in or across all states due to conflicting measurement methodologies. Eunomia developed a robust methodology to assess the data available and account for differences across states. The bottom-up approach used to calculate comparable recycling rates using city, county, state and facility data is necessary for understanding circularity in the absence of producer reporting that is required under RR and EPR. Having a comparable data set is more important than ever given the evolving domestic and international circular economy policy landscape.

RANKINGS KEY TAKEAWAYS

- Nine of the ten states with the **highest recycling rates** have Recycling Refunds.
- States with **Recycling Refunds** are likely to recycle a greater share of material through closed-loop end markets (i.e., can-to-can or bottle-to-bottle).
- Nationally, the value of material diverted from landfills is **$2.6 billion**, which only represents 32% of the value that could be captured annually.
- Nationally, 79 million MTCO2e of GHG is avoided through recycling, comparable to removing more than 17 million vehicles from the roads. This is only **28% of the total potential of GHG** that could be avoided annually.

1.2 METHOD, MATERIALS AND METRICS

- This **report** analyzes available residential and commercial waste and recycling data from across the U.S. and presents a consistent calculation methodology to quantify the amount of packaging generated, collected for recycling, recycled (accounting for contamination, sorting losses and processing losses), and disposed in 2021.
- The **tables** on the following pages provide information on different packaging materials and metrics.
- The **analysis** allows for a state-by-state ranking and comparison.
- **Tonnage results** are normalized per capita to enable a fair ranking of material generation, recycling and disposal quantities, which account for population differences across states. The normalization gives insight into how the recycling systems are working between states regardless of population size.

MATERIALS ANALYZED

Figure 1.1 Materials Analyzed in this Report

Having a comparable data set is more important than ever given the evolving domestic and international circular economy policy landscape.

1.2 METHOD, MATERIALS AND METRICS

IMPACT METRICS

This report also compares states against metrics that can contribute to high recycling rates, quantities of different materials recycled, and societal impacts of recycling based on climate, economy and equity.

Figure 1.2
Report Impact Materials

Material capture

Recycling impact measued through recycling rates for packaging materials in addition to the overall closed-loop recycling rate.

Policy

Policy impact measured through policies contributing to high recycling rates.

Economy

Economic impact of recycling measured through material value capture, job creation/wages, and gross value added.

Climate

Climate impact of recycling measured through greenhouse gas emissiones avoided.

Equity

Equitable recycling systems measured through qualitative insights throughout the report.

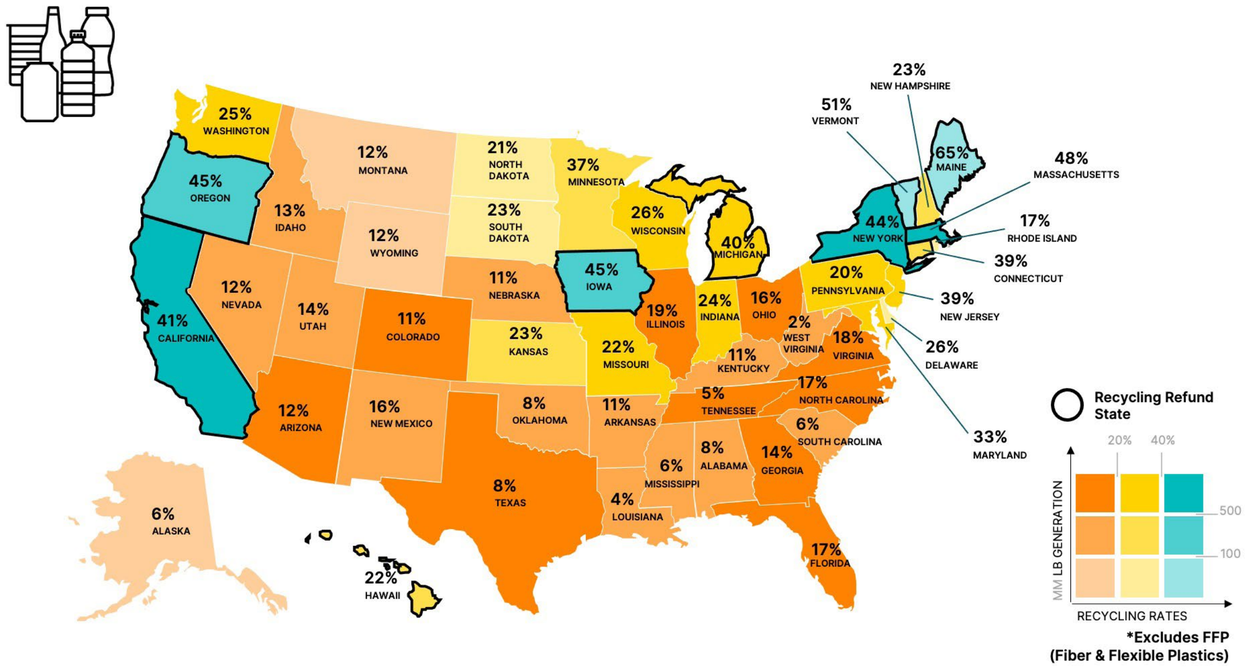
1.3 STATE-BY-STATE OVERVIEW OF PACKAGING RECYCLING RATES WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

Table 1.1 includes a ranking of the 50 states based on the recycling rate of packaging materials without cardboard, boxboard, paper packaging, plastic films, and flexible plastic packaging, which will be referred to as fiber and flexible plastics throughout the report (FFP). While the recycling of these materials is important, their large volumes — 66% of the total weight of packaging analyzed — 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 map on the right compares the recycling rates for common packaging materials across states:

- **The color for each state is associated with the state's recycling rate. States colored green have the highest recycling rates, then yellow, then red-orange for states with the lowest recycling rates.**
- **The gradation of the color is tied to the millions of pounds of material that is available for recycling in the state.**

Figure 1.3 State-by-State Overview of Packaging Recycling Rates (without FFP)



METRICS SUMMARY

- **Rank** – The state ranking based on the state's recycling rate compared to other states. The state ranked 1 has the highest recycling rate.

- **Ranking Movement** – The change in ranking in 2021 compared to the previous edition of the 50 States of Recycling report, which was based on 2018 recycling rates. The potential reason for the movement is explored in more detail in the individual state-by-state section.

- **Recycling Rate** – The recycling rate calculated for each material within this report. The recycling rates presented in this report are calculated based on the tons used by processors (not the amount collected for recycling) divided by the amount of material generated, which is the total amount of the material collected for recycling and disposed.

- **Closed-Loop Recycling** – The percent of all material which was recycled through closed-loop processes in 2021. Closed-loop recycling is any end-of-life management recycling process that maintains the quality and utility of the material to enable it to be fed multiple times into the system and that continues to allow the material to be recycled. This table includes the closed loop recycling rate of packaging materials excluding FFP.

- **Material Value Captured** – The material revenues associated with tonnages sorted for recycling in 2021. Material revenues are quoted from recyclingmarkets.net and are based on regional bale values submitted by MRFs. As recyclingmarkets.net does not include a regional analysis for Alaska or Hawaii, assessments for these states for this metric are not provided. This table includes the material value capture of packaging materials excluding FFP.

- **Percent of Total Potential Material Capture** – The percent of the total potential value of material that could be diverted from landfills that is currently captured through recycling. Material values are taken at the sorted for recycling stage and then divided by the maximum potential total value of the material if the best performing system existed. This table includes the material value capture of packaging materials excluding FFP.

- **Recycling Refunds State** – Whether the state is a Recycling Refunds (RR) state. Recycling Refunds, also called deposit return systems, container deposit systems or "bottle bills," place a refundable deposit on beverage containers, which is returned to consumers when they bring back empty containers for recycling and/or reuse at a redemption location.

Table 1.1 State-by-State Overview of Packaging Recycling Rates (without FFP) by Recycling

	STATE	RANKING MOVEMENT	RECYCLING RATE WITHOUT FFP	ALUMINUM CANS	STEEL CANS	GLASS BOTTLES AND JARS	PET BOTTLES	HDPE BOTTLES	RIGID PLASTICS	CLOSED LOOP RECYCLING WITHOUT FFP	MATERIAL VALUE CAPTURED ($M) WITHOUT FFP	MATERIAL VALUE CAPTURED (%) WITHOUT FFP	RECYCLING REFUND STATE
1	MAINE	0	65%	83%	32%	76%	75%	47%	48%	55%	14	65%	YES
2	VERMONT	0	51%	59%	41%	57%	44%	49%	35%	33%	7	45%	YES
3	MASSACHUSETTS	0	48%	74%	39%	57%	31%	42%	27%	26%	58	43%	YES
4	IOWA	6	45%	62%	27%	68%	38%	17%	17%	41%	36	40%	YES
5	OREGON	-1	45%	82%	24%	51%	71%	42%	31%	34%	33	55%	YES
6	NEW YORK	0	44%	61%	39%	61%	42%	15%	23%	38%	150	35%	YES
7	CALIFORNIA	4	41%	77%	29%	49%	56%	24%	30%	33%	380	46%	YES
8	MICHIGAN	0	40%	76%	34%	53%	29%	39%	22%	30%	94	42%	YES
9	NEW JERSEY	0	39%	56%	48%	40%	22%	56%	30%	23%	106	48%	NO
10	CONNECTICUT	-5	39%	47%	34%	45%	45%	19%	28%	31%	28	34%	YES
11	MINNESOTA	-4	37%	55%	40%	46%	27%	39%	20%	20%	36	41%	NO
12	MARYLAND	1	33%	50%	48%	34%	21%	36%	23%	15%	62	39%	NO
13	WISCONSIN	-1	26%	28%	44%	40%	18%	25%	12%	13%	30	23%	NO
14	DELAWARE	0	26%	27%	27%	30%	12%	29%	17%	11%	4	23%	NO
15	WASHINGTON	0	25%	41%	40%	27%	28%	39%	18%	13%	33	38%	NO
16	INDIANA	8	24%	15%	32%	26%	16%	40%	19%	14%	26	23%	NO

	STATE	RANKING MOVEMENT	RECYCLING RATE WITHOUT FFP	ALUMINUM CANS	STEEL CANS	GLASS BOTTLES AND JARS	PET BOTTLES	HDPE BOTTLES	RIGID PLASTICS	CLOSED LOOP RECYCLING WITHOUT FFP	MATERIAL VALUE CAPTURED ($M) WITHOUT FFP	MATERIAL VALUE CAPTURED (%) WITHOUT FFP	RECYCLING REFUND STATE
17	NEW HAMPSHIRE	2	23%	29%	27%	22%	29%	36%	23%	6%	6	30%	NO
18	KANSAS	3	23%	23%	22%	30%	16%	18%	13%	10%	9	18%	NO
19	SOUTH DAKOTA	1	23%	23%	21%	30%	16%	18%	13%	5%	3	19%	NO
20	HAWAII	-3	22%	55%	4%	20%	37%	15%	22%	19%	0	NO DATA	YES
21	MISSOURI	1	22%	17%	22%	29%	9%	21%	12%	11%	16	16%	NO
22	NORTH DAKOTA	1	21%	21%	20%	28%	15%	17%	12%	4%	2	17%	NO
23	PENNSYLVANIA	-5	20%	25%	38%	27%	10%	17%	10%	13%	51	22%	NO
24	ILLINOIS	4	19%	22%	22%	25%	10%	17%	10%	11%	44	17%	NO
25	VIRGINIA	0	18%	21%	32%	28%	8%	17%	8%	6%	26	16%	NO
26	RHODE ISLAND	-10	17%	70%	23%	0%	31%	41%	27%	10%	6	45%	NO
27	FLORIDA	0	17%	16%	27%	22%	6%	19%	7%	8%	70	14%	NO
28	NORTH CAROLINA	-2	17%	15%	16%	26%	8%	19%	9%	9%	21	14%	NO
29	NEW MEXICO	12	16%	33%	38%	9%	16%	32%	17%	7%	9	29%	NO
30	OHIO	-1	16%	16%	16%	25%	10%	17%	9%	9%	26	14%	NO
31	GEORGIA	1	14%	18%	21%	17%	8%	15%	9%	7%	29	15%	NO
32	UTAH	-1	14%	16%	15%	16%	14%	18%	11%	4%	8	15%	NO
33	IDAHO	1	13%	15%	14%	15%	13%	17%	11%	4%	4	15%	NO
34	ARIZONA	-1	12%	14%	16%	14%	10%	17%	10%	6%	14	14%	NO

	STATE	RANKING MOVEMENT	RECYCLING RATE WITHOUT FFP	ALUMINUM CANS	STEEL CANS	GLASS BOTTLES AND JARS	PET BOTTLES	HDPE BOTTLES	RIGID PLASTICS	CLOSED LOOP RECYCLING WITHOUT FFP	MATERIAL VALUE CAPTURED ($M) WITHOUT FFP	MATERIAL VALUE CAPTURED (%) WITHOUT FFP	RECYCLING REFUND STATE
35	MONTANA	1	12%	14%	13%	14%	12%	16%	10%	3%	2	14%	NO
36	WYOMING	1	12%	14%	13%	14%	12%	15%	10%	4%	1	14%	NO
37	NEVADA	-7	12%	10%	33%	13%	8%	11%	7%	7%	5	10%	NO
38	NEBRASKA	2	11%	17%	17%	9%	14%	16%	12%	6%	6	17%	NO
39	ARKANSAS	-1	11%	11%	11%	16%	5%	14%	7%	3%	5	10%	NO
40	KENTUCKY	-1	11%	15%	9%	15%	8%	10%	7%	6%	7	11%	NO
41	COLORADO	-6	11%	16%	7%	12%	11%	13%	10%	5%	17	13%	NO
42	TEXAS	0	8%	14%	9%	10%	7%	7%	5%	4%	56	10%	NO
43	ALABAMA	0	8%	15%	9%	10%	5%	8%	5%	3%	8	10%	NO
44	OKLAHOMA	0	8%	12%	12%	8%	7%	10%	7%	4%	6	10%	NO
45	MISSISSIPPI	0	6%	11%	7%	8%	4%	6%	4%	2%	4	8%	NO
46	SOUTH CAROLINA	0	6%	13%	8%	5%	4%	9%	5%	3%	9	10%	NO
47	ALASKA	1	6%	13%	8%	7%	3%	3%	2%	2%	0	NO DATA	NO
48	TENNESSEE	-1	5%	15%	4%	5%	3%	5%	3%	2%	10	9%	NO
49	LOUISIANA	0	4%	11%	5%	2%	4%	6%	5%	2%	6	8%	NO
50	WEST VIRGINIA	0	2%	6%	6%	1%	3%	4%	2%	1%	1	5%	NO

1.4 STATE-BY-STATE OVERVIEW OF PACKAGING RECYCLING RATES (WITH FIBER & FLEXIBLE PLASTICS) BY RECYCLING RANK

The second recycling rate map and Table 1.2 provide the total recycling rate of packaging materials and include cardboard, boxboard, paper packaging, plastic films and flexible plastic packaging. In the 2021 version of this report, plastic film and flexible plastic packaging were not included; therefore, comparing the recycling rates in this report to the previous report does not provide a like-for-like comparison The map on the right compares the recycling rates for common packaging materials across states:

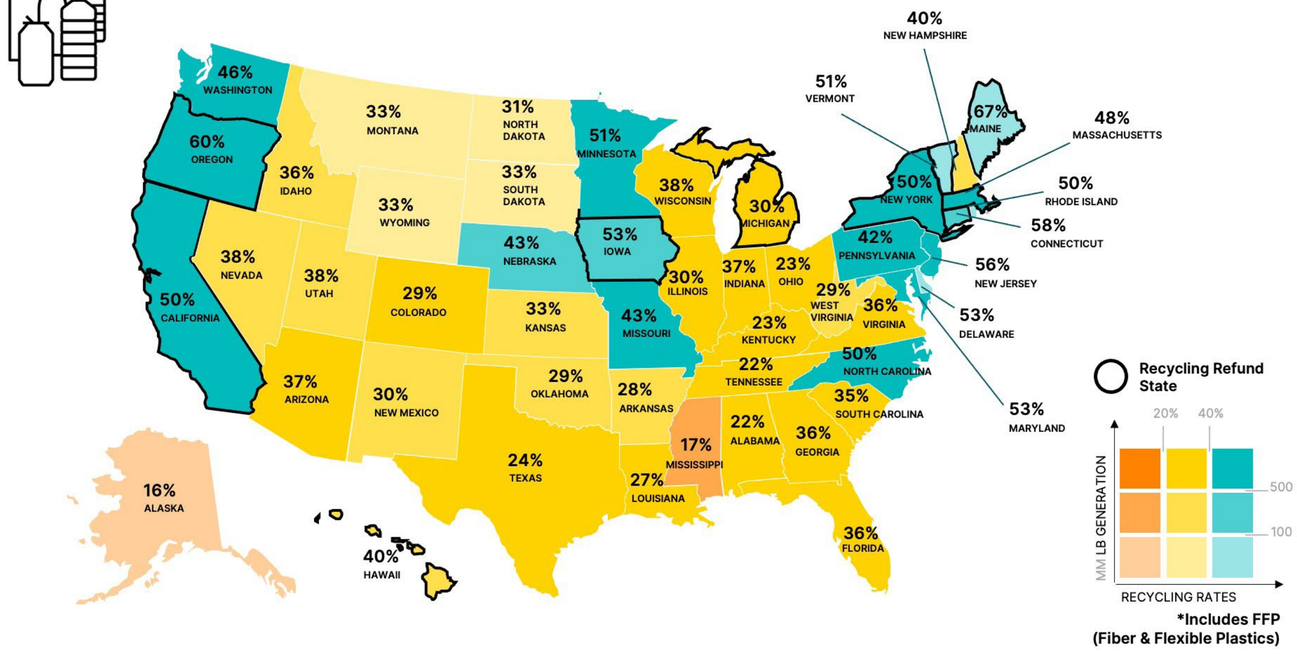


Figure 1.4
State-by-State Overview of Packaging Recycling Rates (with FFP)

METRICS SUMMARY

- **Rank** – The rank of the state when compared to other states based on the state's recycling rate. The state ranked 1 has the highest recycling rate.
- **Recycling Rate** – The recycling rate is calculated for each material within this report. The recycling rates presented in this report are calculated based on the tons used by processors (not the amount collected for recycling) divided by the amount of material generated.
- **Recycling Refunds State** – If the state is a Recycling Refunds (RR) state. Recycling Refunds, also called deposit return systems, container deposit systems or "bottle bills," place a refundable deposit on beverage containers, which is returned to consumers when they bring back empty containers for recycling and/or reuse at a redemption location.
- **Closed-Loop Recycling** – The percent of all material which was recycled through closed-loop processes in 2021. Closed-loop recycling is any end-of-life management recycling process that maintains the quality and utility of the material to enable it to be fed multiple times into the system and that continues to allow the material to be recycled. This table includes the closed loop recycling rate of packaging materials including FFP.
- **GHG Avoided** – The total volume of GHG avoided through recycling processes in 2021. Expressed as MTCO2e. This table includes the GHG avoided of packaging materials including FFP.
- **Material Value Captured** – The material revenues associated with tonnages sorted for recycling in 2021. Material revenues are quoted from recyclingmarkets.net and are based on regional bale values submitted by MRFs. As recyclingmarkets.net does not include a regional analysis for Alaska or Hawaii, assessments for these states for this metric are not provided. This table includes the material value capture of packaging materials including FFP.
- **Percent of Total Potential Material Capture** – What the percent of the total potential value of material that could be diverted from landfills that is currently captured through recycling. Material values are taken at the sorted for recycling stage and then divided by the maximum potential total value of the material if the best performing system existed. This table includes the material value capture of packaging materials including FFP.
- **Recycling Supportive Legislation** – Whether the state has legislation that supports the recycling of packaging waste in addition to Recycling Refunds. This includes Extended Producer Responsibility, landfill bans, and recycled content requirements, among other policies.
- **Data Quality** – The quality and availability of the data in each state. Indicators are provided to identify differences in terms of data availability and quality. Availability: The extent to which necessary data was available at the state, county, city or municipality level. Quality: How complete, granular, and up-to-date the data was, as reported.

Table 1.2 State-by-State Overview of Packaging Recycling Rates (with FFP) According to Recycling Rank

	STATE	RECYCLING RATE WITH FFP	CARDBOARD BOXBOARD AND PAPER PACKAGING	METAL CANS	GLASS BOTTLES AND JARS	ALL PLASTICS (INCLUDING FLEXIBLES)	OTHER PET RIGID	PP CONTAINERS	RIGIDS #3-7	CURRENT CLOSED LOOP RECYCLING WITH FFP	GHG EMISSIONS AVOIDED (1,000 MTCO2E) WITH FFP	MATERIAL VALUE CAPTURED ($M) WITH FFP	MATERIAL VALUE CAPTURED (%) WITH FFP	RECYCLING SUPPORTIVE LEGISLATION (EXCL.RR)	DATA QUALITY
1	MAINE	67%	78%	61%	76%	22%	14%	13%	20%	61%	517	26	69%	YES	FAIR
2	OREGON	60%	82%	50%	51%	13%	5%	3%	2%	53%	1,607	61	64%	YES	FAIR
3	CONNECTICUT	58%	76%	42%	45%	16%	9%	2%	0%	53%	1,392	62	49%	YES	FAIR
4	NEW JERSEY	56%	76%	52%	40%	18%	23%	10%	12%	47%	3,684	188	56%	NO	FAIR
5	DELAWARE	53%	72%	27%	30%	12%	12%	11%	12%	45%	361	13	44%	NO	FAIR
6	IOWA	53%	66%	52%	68%	10%	2%	2%	1%	49%	1,129	61	47%	YES	FAIR
7	MARYLAND	53%	83%	49%	34%	16%	22%	8%	8%	42%	1.750	99	48%	NO	FAIR
8	VERMONT	51%	65%	49%	57%	20%	10%	15%	20%	41%	143	10	49%	YES	FAIR
9	MINNESOTA	51%	78%	47%	46%	10%	8%	7%	8%	42%	1,413	68	50%	NO	GOOD
10	CALIFORNIA	50%	60%	50%	49%	21%	12%	11%	12%	45%	12,029	590	51%	YES	GOOD
11	RHODE ISLAND	50%	68%	26%	0%	16%	13%	18%	4%	45%	347	14	55%	NO	FAIR
12	NORTH CAROLINA	50%	72%	15%	26%	5%	6%	5%	2%	45%	3.313	113	39%	NO	FAIR
13	NEW YORK	50%	64%	51%	61%	13%	6%	3%	2%	45%	4,521	251	42%	YES	FAIR
14	MASSACHUSETTS	48%	53%	54%	57%	15%	20%	10%	9%	39%	2,008	103	47%	YES	FAIR
15	WASHINGTON	46%	67%	41%	27%	11%	12%	12%	2%	40%	1,976	69	47%	NO	GOOD
16	MISSOURI	43%	60%	20%	29%	6%	7%	7%	5%	37%	1,720	60	34%	NO	LIMITED

	STATE	RECYCLING RATE WITH FFP	CARDBOARD BOXBOARD AND PAPER PACKAGING	METAL CANS	GLASS BOTTLES AND JARS	ALL PLASTICS (INCLUDING FLEXIBLES)	OTHER PET RIGID	PP CONTAINERS	RIGIDS #3-7	CURRENT CLOSED LOOP RECYCLING WITH FFP	GHG EMISSIONS AVOIDED (1,000 MTCO2E) WITH FFP	MATERIAL VALUE CAPTURED ($M) WITH FFP	MATERIAL VALUE CAPTURED (%) WITH FFP	RECYCLING SUPPORTIVE LEGISLATION (EXCL.RR)	DATA QUALITY
17	NEBRASKA	43%	66%	17%	9%	7%	6%	7%	6%	39%	603	21	36%	NO	LIMITED
18	PENNSYLVANIA	42%	62%	33%	27%	6%	13%	36%	1%	37%	3,610	140	35%	NO	GOOD
19	NEW HAMPSHIRE	40%	55%	28%	22%	13%	5%	9%	5%	32%	374	16	40%	NO	LIMITED
20	HAWAII	40%	59%	34%	20%	12%	5%	4%	2%	37%	420	N/A	NO DATA	YES	FAIR
21	NEVADA	38%	56%	21%	13%	4%	7%	3%	5%	34%	769	20	27%	NO	FAIR
22	UTAH	38%	54%	15%	16%	6%	5%	2%	2%	33%	836	31	32%	NO	LIMITED
23	WISCONSIN	38%	58%	36%	40%	8%	9%	2%	1%	30%	1,133	56	31%	NO	GOOD
24	ARIZONA	37%	51%	15%	14%	6%	7%	3%	3%	33%	1,637	60	31%	NO	FAIR
25	INDIANA	37%	52%	23%	26%	11%	15%	7%	6%	32%	1,647	67	34%	NO	FAIR
26	VIRGINIA	36%	58%	26%	28%	4%	6%	1%	1%	30%	1,769	69	28%	NO	FAIR
27	FLORIDA	36%	54%	24%	22%	4%	4%	3%	4%	31%	5,570	214	27%	NO	GOOD
28	GEORGIA	36%	52%	19%	17%	5%	5%	3%	4%	32%	2,644	100	29%	NO	LIMITED
29	IDAHO	36%	51%	15%	15%	6%	4%	2%	2%	31%	441	12	29%	NO	LIMITED
30	SOUTH CAROLINA	35%	56%	11%	5%	3%	3%	2%	8%	32%	1,258	43	28%	NO	GOOD
31	KANSAS	33%	44%	22%	30%	7%	5%	3%	3%	27%	613	25	29%	NO	LIMITED
32	SOUTH DAKOTA	33%	44%	22%	30%	7%	5%	3%	3%	26%	188	7	29%	NO	LIMITED
33	MONTANA	33%	47%	14%	14%	5%	4%	2%	2%	29%	234	8	27%	NO	LIMITED
34	WYOMING	33%	47%	14%	14%	5%	4%	2%	2%	29%	121	4	27%	NO	LIMITED

	STATE	RECYCLING RATE WITH FFP	CARDBOARD BOXBOARD AND PAPER PACKAGING	METAL CANS	GLASS BOTTLES AND JARS	ALL PLASTICS (INCLUDING FLEXIBLES)	OTHER PET RIGID	PP CONTAINERS	RIGIDS #3-7	CURRENT CLOSED LOOP RECYCLING WITH FFP	GHG EMISSIONS AVOIDED (1,000 MTCO2E) WITH FFP	MATERIAL VALUE CAPTURED ($M) WITH FFP	MATERIAL VALUE CAPTURED (%) WITH FFP	RECYCLING SUPPORTIVE LEGISLATION (EXCL.RR)	DATA QUALITY
35	NORTH DAKOTA	31%	40%	20%	28%	7%	5%	3%	3%	24%	161	6	26%	NO	LIMITED
36	ILLINOIS	30%	42%	22%	25%	5%	5%	1%	1%	26%	2,703	110	26%	NO	FAIR
37	NEW MEXICO	30%	41%	35%	9%	9%	14%	8%	8%	26%	402	20	34%	NO	FAIR
38	MICHIGAN	30%	35%	54%	53%	10%	16%	1%	1%	25%	999	108	40%	YES	FAIR
39	COLORADO	29%	51%	10%	12%	6%	11%	4%	3%	26%	1,058	45	24%	NO	FAIR
40	WEST VIRGINIA	29%	48%	6%	1%	1%	0%	0%	0%	27%	362	11	21%	NO	LIMITED
41	OKLAHOMA	29%	43%	12%	8%	4%	2%	5%	5%	26%	760	27	24%	NO	LIMITED
42	ARKANSAS	28%	41%	11%	16%	4%	0%	5%	0%	24%	549	20	23%	NO	LIMITED
43	LOUISIANA	27%	43%	8%	2%	3%	2%	7%	4%	25%	861	30	22%	NO	LIMITED
44	TEXAS	24%	36%	12%	10%	3%	4%	1%	1%	21%	5,020	192	20%	NO	GOOD
45	OHIO	23%	33%	16%	25%	5%	9%	2%	1%	20%	1,328	58	20%	NO	FAIR
46	KENTUCKY	23%	33%	12%	15%	3%	6%	2%	2%	20%	687	26	20%	NO	LIMITED
47	ALABAMA	22%	32%	12%	10%	3%	4%	2%	2%	19%	742	28	20%	NO	LIMITED
48	TENNESSEE	22%	33%	9%	5%	2%	2%	4%	3%	20%	1,061	38	19%	NO	FAIR
49	MISSISSIPPI	17%	25%	9%	8%	2%	3%	2%	1%	14%	323	12	15%	NO	LIMITED
50	ALASKA	16%	25%	11%	7%	1%	1%	1%	1%	14%	71	N/A	NO DATA	NO	FAIR

1.5 MATERIAL AND PRODUCT TAKEAWAYS

Not all materials and products are similarly managed and recycled, therefore takeaways for the different materials are included. Detailed recycling rate maps for each material are in the appendix.

Aluminum Cans

Eight of the 10 states with the highest recycling rates for aluminum cans are states with RR. Aluminum cans are the most recycled beverage container in the United States, and the 83% recycling rate for aluminum cans in Maine is the highest recycling rate for any material across the 50 states. **Despite aluminum cans making up only 2% of the total weight of materials recycled in 2021, they contribute 23% of the total material value captured.**

Fiber (Cardboard, Boxboard and Paper Packaging)

In 2021, cardboard, boxboard and other fiber packaging **represented 57% of packaging material generated and 79% of packaging material recycled.** This was the only packaging material stream that demonstrated increases in recycling levels at pace with generation growth on average across the states and therefore demonstrates a recycling rate increase.

Glass Bottles and Jars

Nine of the 10 states with the highest recycling rates for glass are states with RR. The recycling rate for glass bottles and jars in this report includes aggregate, new glass bottles, fiberglass and other packaging. However, it excludes glass sent for landfill cover also known as alternative daily cover. States with RR are more likely to achieve higher quality recycling and avoid sending material to landfill cover as the quality of the material collected is higher. **According to EPA data, beverage bottles account for 66% of the weight of glass bottles and jars generated.[2]**

Beverage Containers

Nine of the 10 states with the highest recycling rates for beverage containers are states with RR. **Beverage containers make up approximately 18% of the total packaging stream analyzed within this report.** They are recycled at some of the highest rates of any product type and especially so in RR states as these materials are targeted and effectively collected. **Analyzing the beverage container recycling rate is important given that it is generally some of the most valuable material and more likely to be recycled in a closed-loop process.**

Nine of the 10 states with the highest recycling rates for beverage containers are states with Recycling Refunds.

PET Bottles

Nine of the 10 states with the highest recycling rates for PET Bottles are states with RR. **The average amount of PET recycled (on a lbs. per capita basis) in RR states is over 3.5 times greater than in non-RR states.** This difference occurs even though many RR states do not include all beverages commonly packaged in PET bottles. For example, non-carbonated water is currently not included in Michigan, Massachusetts, or Vermont. There is further opportunity to improve recycling rates for these container types even in RR states by including a wide scope of beverages. **Of all rigid plastic packaging recycled in 2021, 53% is PET bottles**. 60% of all PET bottles recycled come from the ten states with RR, which means that approximately 32% of all plastic containers and rigid packaging recycled in the U.S. in 2021 are PET bottles collected through RR.

Plastics

The rigid plastics recycling rate in the top ten states ranges from 23%-48%. When film and flexible packaging is included, these states have a total plastics packaging recycling rate of 16%-22%. **The recycling rate drops significantly because flexible plastic packaging represents approximately 41% of the entire plastic packaging stream and has the lowest recycling rate (less than 1%) of any plastic packaging.**

Steel Cans

Recycling rates for steel cans generally range from 38%-50% in the top ten states and less than 10% in states with lower recycling rates. **Generally, states with strong curbside recycling programs have higher recycling rates for steel cans.**

2.0

Recycling Impact Analysis

2.0 RECYCLING IMPACT ANALYSIS

Recycling in the U.S. reduces greenhouse gas emissions and replaces virgin materials with secondary materials, delivering economic, environmental and social benefits; however, there is room for improvement. This section considers the factors that can support improvements in our recycling system, which will, in turn, increase social, environmental and economic benefits. Key factors include:

Calculating the Real Recycling Rate:

The Real Recycling rate represents the quantity of material that is recycled. This is different from the quantity of material collected for recycling. Some states are overestimating their recycling rates as they rely on collection rates versus measuring the material that is actually sorted and processed, i.e., the real recycling rate. All of the recycling rates in this report are based on the amount of material that can be used in the production of a new product, not what is collected for recycling.

Embracing The Power of Closed-Loop Recycling:

Closed-loop recycling occurs when a material's utility and value are retained, enabling it to be fed into the supply chain multiple times (i.e., can-to-can or bottle-to-bottle recycling). This keeps materials in use for as long as possible, further maximizing the other benefits of recycling.

Supporting Recycling for Climate Action:

Recycling plays a role in addressing climate change by mitigating the negative environmental impacts associated with resource extraction, production, waste disposal and packaging pollution. Recycling combined with material reduction has the maximum impact potential for reducing emissions.

Unlocking Economic Potential Through Recycling:

Increased recycling can stimulate economic growth, create job opportunities, and provide a secure domestic supply of material for U.S.-based manufacturing. Shortened supply chains can drive local economic development. In addition, international political, social, and economic factors pose great risks to supply chain stability. A shift to more localized supply chains can decrease external disruptions and increase production resiliency.

Ensuring Equitable Recycling Systems and Impact:

Recycling should also ensure people have equitable access to recycling services and ensure that marginalized communities are not adversely impacted by these systems.

Well-Designed Recycling Refunds Paired with Extended Producer Responsibility Maximizes Desired Outcomes:

The data shows that Recycling Refunds deliver the highest recycling rates for beverage containers and could perform even better by modernizing the existing programs in the U.S. Through evaluating the outcomes of various policies, this report found that enacting extended producer responsibility (EPR) for packaging and paper products alongside Recycling Refunds (RR) for beverage containers will maximize the materials recycled and thereby deliver the best social, environmental and economic outcomes for the U.S.

2.1 MAXIMIZING RECYCLING RATES

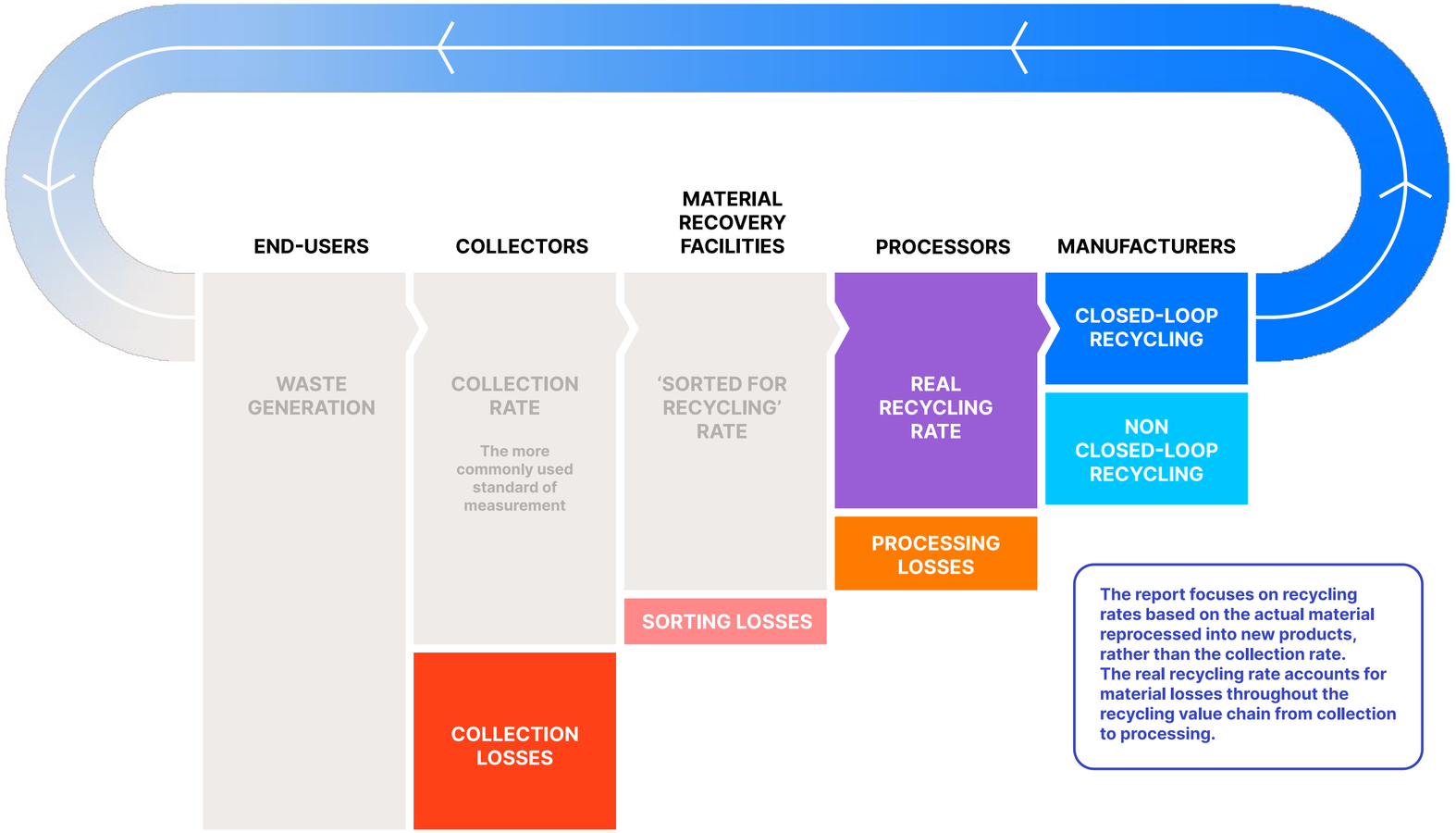
CALCULATING THE REAL RECYCLING RATES

Across the U.S., most programs still measure recycling rates in terms of what is collected for recycling versus what is actually recycled and reincorporated into a new product. Measuring recycling rates at the point of collection doesn't account for sorting losses at Material Recovery Facilities (MRFs) or processing losses when they are made into new products.

The real recycling rate measures the quantity of material that is actually recycled and re-incorporated into a new product. This accounts for material losses throughout the recycling value chain from collection to processing. Figure 2.2 details losses for material collected through single stream systems. The difference between the collection rate and recycling rate for different packaging types varies. For example, just 32% of non-bottle PET (such as clamshells) collected in single stream recycling systems is estimated to be recycled across the 50 U.S. states compared to 91% of aluminum cans. All recycling rates presented in this report are the real recycling rate.

2.1 MAXIMIZING RECYCLING RATES

Figure 2.1 Calculating the Real Recycling Rate



Losses at a MRF can occur for a number of reasons, including inefficiencies in the sorting equipment, which could be linked to:

- **The age of the facility**, technologies and sorting equipment for the various packaging streams.
- **Non-recyclable material** impacting material shapes or target materials (i.e., flattening 3-D material) reducing the equipment's ability to identify and sort that material.
- **Significant quantities of residue** remaining in containers, which reduces the likelihood of the equipment being able to correctly identify and separate the specific packaging type.

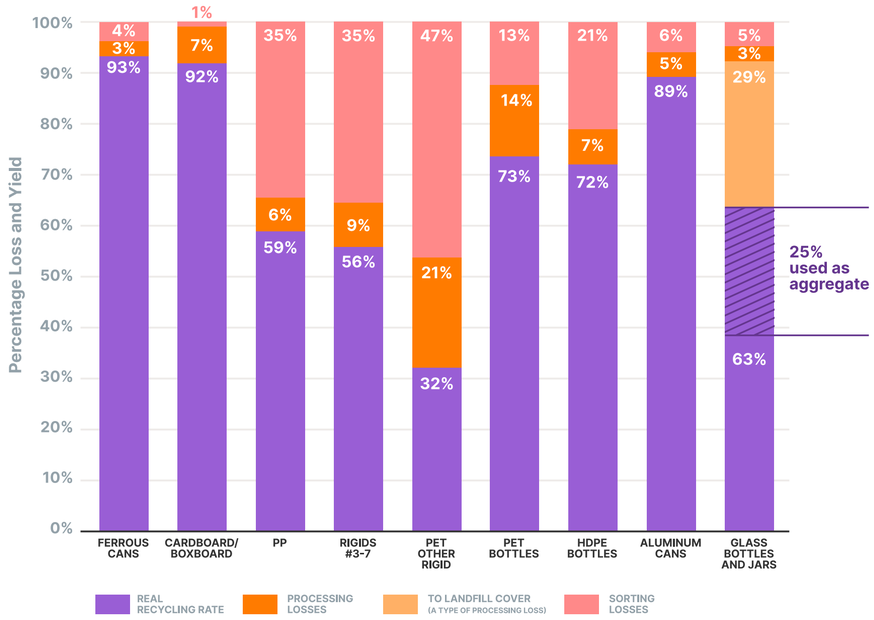


Figure 2.2

Material Loss Rates Through Single Stream Recycling

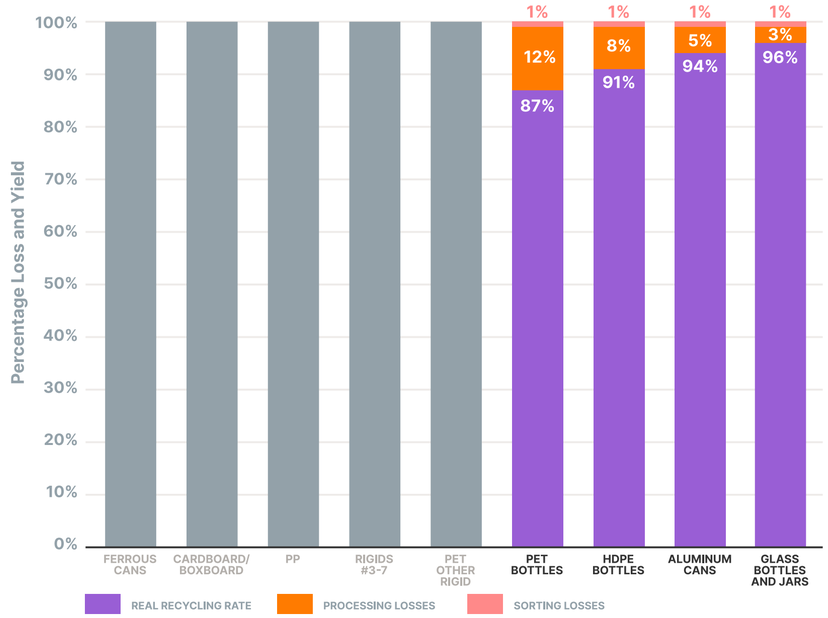


Figure 2.3

Material Loss Rates Through RR Collection

Different recycling collection methods also yield different recycling rates. For example, under a Recycling Refunds program for beverage containers, the real recycling rate far exceeds single stream recycling systems:

- **PET Bottles:** In a single stream system, 73 out of 100 bottles collected for recycling are recycled, while 87 out of 100 are recycled in an RR.
- **Glass Bottles:** In a single stream system, 63 out of 100 bottles collected for recycling are available for producing new bottles or fiberglass, 25 are used as aggregate, while 37 are disposed or used as alternative daily cover. For this report the ”real recycling rates” include aggregate alongside containers and fiberglass. In an RR, 96 bottles are available to produce new bottles while only 4 are disposed.

Measuring the real recycling rate will empower local governments, producers and other partners across the supply chain to make data-informed investments and advance policies to help improve the U.S. recycling system.

THE BENEFIT OF CLOSED-LOOP RECYCLING

A closed-loop system enables materials to not only be collected and repurposed once, but channeled back into systems multiple times. Currently, less than 20% of packaging waste (not including FFP) generated in the U.S. is recycled through closed-loop processes.

Additionally, in some regions, only half of packaging material recycled is done in a closed-loop process, meaning the other half of packaging recycled goes to applications where it cannot be recycled again and is likely sent to a landfill at its end of life. For example, PET packaging is often recycled into textiles for clothing or carpet instead of being recycled in a closed-loop back into packaging.

Collection methods such as RR that maximize the quality of the materials collected enable closed-loop recycling and maximize the value of the original material retained. For example, 71% of PET bottles collected through RR go toward closed-loop recycling while only 36% of PET bottles collected through single stream collection go toward closed-loop recycling.

States with Recycling Refunds recycle 34% of packaging (excluding FFP) through closed-loop end markets (i.e., can-to-can or bottle-to-bottle) compared to 7% for non-RR states. The impact of effective recycling legislation is clear as 10 RR states are responsible for 66% of all beverage containers that get recycled in a closed-loop process nationally.

The impact of effective recycling legislation is clear as 10 RR states are responsible for 66% of all beverage containers that get recycled in a closed-loop process nationally.

Figure 2.4

Closed-Loop Recycling Rate for Packaging (without FFP)

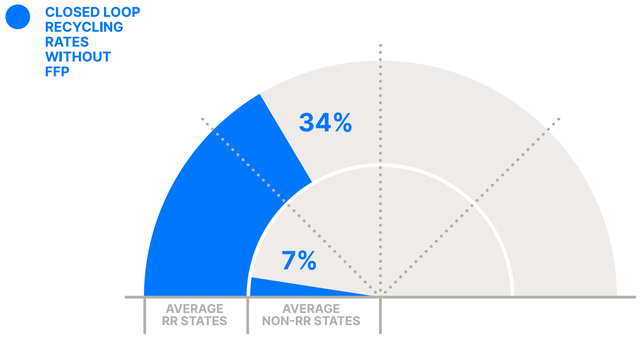
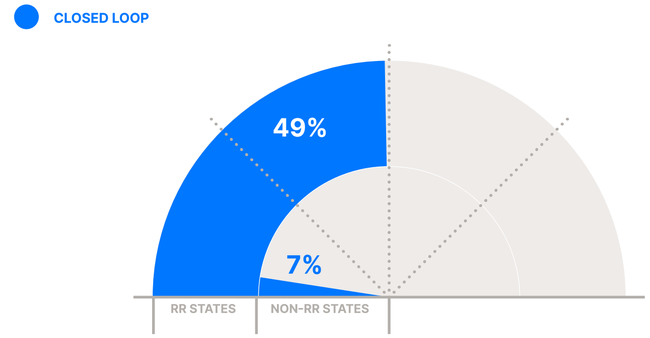


Figure 2.5

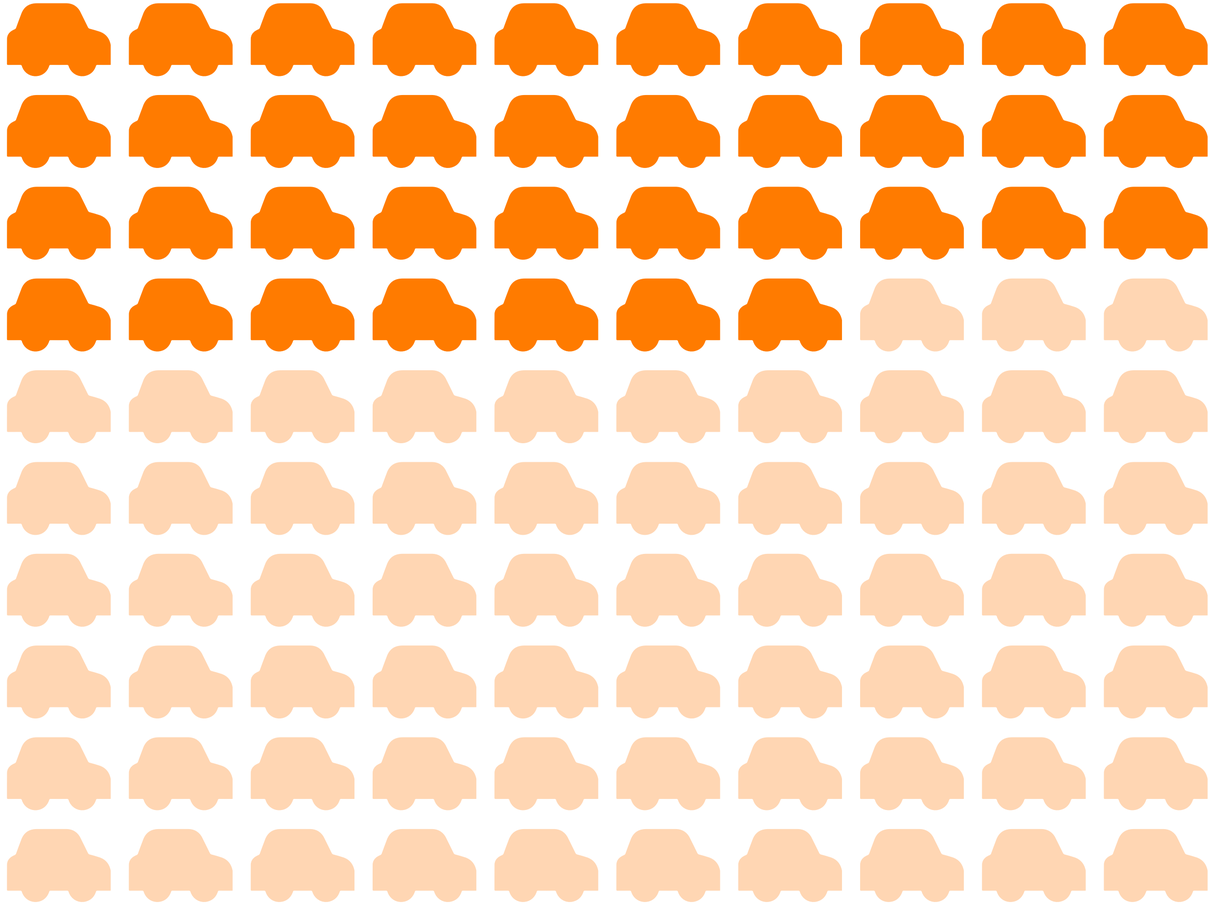
Closed-Loop Recycling Rate for Beverage Container Packaging



2.2 RECYCLING'S ROLE IN CLIMATE ACTION

Recycling is an important lever in tackling climate change while also mitigating environmental justice issues globally from the extraction of raw materials. The virgin production of the packaging materials analyzed within the scope of this report is responsible for GHG emissions of approximately 273 million MTCO2e, roughly 4% of total emissions in the U.S. in 2021.[3]

Nationally, **recycling results in the avoidance of over 79 million MTCO2e emissions in the U.S. annually, which is comparable to removing more than 17 million vehicles from the roads.** As many states have low recycling rates, there is a significant opportunity to reduce emissions moving forward. Recycling, especially recycling through closed-loop processes, limits the amount of materials disposed via landfills or incineration. 79% of landfills and incinerators in the U.S. are in environmental justice communities,[4] and recycling reduces the need for these facilities and incinerators.



RECYCLING WHILE PRACTICING RESPONSIBLE RESOURCE USE CAN ACCELERATE GHG EMISSIONS REDUCTION

The five states with the lowest packaging related GHG emissions per capita (Maine, Vermont, Oregon, Minnesota and New York) are also among the ten states with the highest recycling rates. There is an additional correlation between the top ten states with the lowest packaging generation per capita and low packaging-related GHG emissions. **Eight of the ten states with the lowest packaging generation per capita also rank among the states with the lowest packaging-related GHG emissions per capita.** This demonstrates that practicing responsible resource use is closely linked to effectively reducing GHG emissions.

Reducing resource extraction plays a vital role in decarbonization efforts because it helps eliminate carbon-intensive processes. When the volume of material generated is reduced, the demand for energy-intensive production, transportation and waste generation is also reduced, thereby curbing carbon emissions. However, despite generating less per capita than their peers, Ohio and Alaska do not similarly rank among states with the lowest GHG emissions as they exhibit lower recycling rates. **Weak recycling performance limits GHG reduction as the emissions associated with extracting more virgin resources to replace these materials, no matter how low, are not being offset by keeping those materials in use through recycling.** This reinforces that when recycling and material reduction strategies are promoted in tandem, the impact on decarbonization becomes even more pronounced. Promoting recycling and responsible use of resources simultaneously enables companies to adopt a comprehensive approach to decarbonization. It allows them to tackle emissions from multiple angles, reinforcing their commitment to sustainability and driving significant progress toward meeting climate goals.

RECYCLING CAN REDUCE PACKAGING POLLUTION

Studies show that **the United States is the world's largest generator of waste**, generating up to eight times more municipal waste than comparable countries, and accounting for up to 2.24 million metric tons, or roughly 25% of plastic waste that leaks into the environment annually.[5] Presently, the nation produces a staggering 42 million metric tons of plastic waste annually. Effective policy that incentivizes consumers to recycle packaging leads to less waste littered, decreasing leakage into the environment.

The United States is the world's largest generator of waste accounting for up to 2.24 million metric tons, or roughly 25% of plastic waste that leaks into the environment annually.

2.3 UNLOCKING ECONOMIC POTENTIAL THROUGH RECYCLING

Increasing U.S. recycling rates can deliver economic growth, create jobs and establish a reliable domestic source of materials for manufacturing.

RECYCLING DELIVERS ECONOMIC VALUE TO COMMUNITIES

In the United States, the recycling industry captures roughly $2.6 billion worth of secondary raw materials from the waste stream annually. **This is only ~32% of the total material value that could be captured.** The remaining 68% value of the packaging waste stream is disposed of in landfills, incinerated or leaks into the environment. This annual untapped economic potential, valued at ~$6.5 billion, could be harnessed through more effective recycling.

RECYCLING CREATES LOCAL JOBS AND STRENGTHENS DOMESTIC SUPPLY CHAINS

Local Jobs

Recycling contributes to job creation and economic growth, particularly within local communities. The establishment of recycling facilities, collection networks and related services generates employment opportunities across various sectors and stimulates the local economy. This job creation extends to positions involved in sorting, processing, transporting and managing recyclable materials. **In the U.S., there are an estimated 185,000 jobs created through recycling the materials included in the scope of this report**. And 50% of jobs associated with recycling are local, assuming the recycler is not a local facility.[6]

Recycling Refunds provide additional economic opportunity as non-recycled containers with unclaimed deposits can provide low barrier income opportunities, such as the role of “canners” who collect deposit containers for a refund.[7] [8]

Domestic Supply Chains

The more material that can be collected in the U.S. and stay in the U.S., the greater the opportunities are for local job creation. U.S. based manufacturers are investing in new facilities, yet domestic supply of recycled content is lacking. Insufficient supply not only impacts economic growth, it also impacts a company’s carbon reduction and recycled content goal.

The recycling industry captures roughly $2.6 billion worth of secondary raw materials from the waste stream annually in the US. This is only ~32% of the total material, leaving a remaining 68%that goes to waste and is valued at ~$6.5 billion.

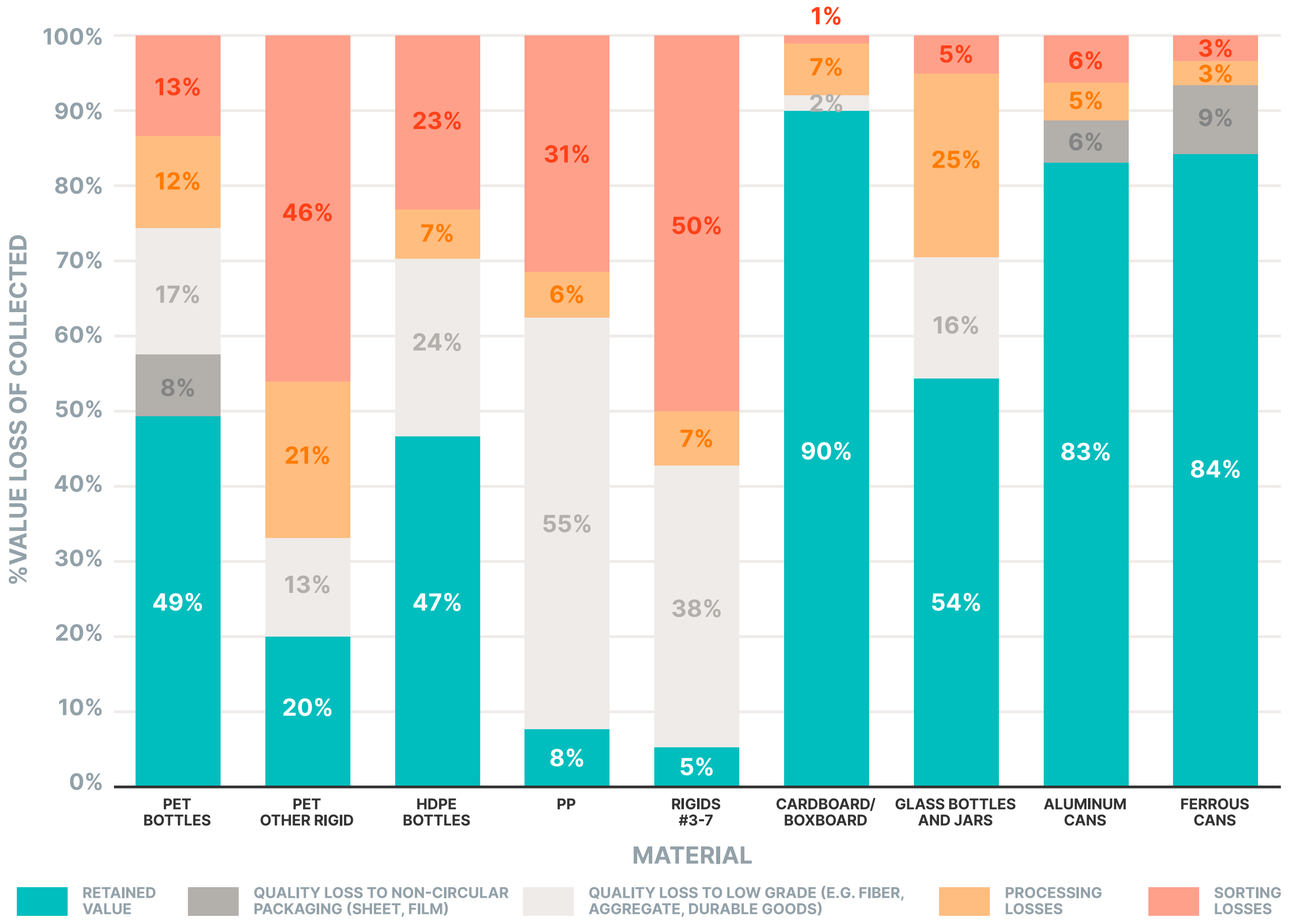
Domestic secondary material supply enables manufactures to better withstand global events that impact the availability and cost of supply. Considering resilience and risk mitigation, shorter and locally rooted supply chains exhibit capacity to withstand disruptions stemming from global events, whether they be natural disasters, geopolitical shifts or pandemics. This resilience translates into a steady flow of goods and services, thereby mitigating the adverse effects of supply chain shocks on overall economic advancement.

In 2022, Novelis announced a $2.5 billion investment to build a new aluminum recycling and rolling mill to increase the company’s recycling capacity by 15 billion cans per year and create up to 1,000 local jobs.8 With cross-sector demand for aluminum expected to continue to increase, availability of secondary material is critical to building a sustainable and resilient domestic aluminum supply chain.

RECYCLING PRESERVES THE VALUE OF MATERIALS

As previously written in this report, not all material goes to closed-loop recycling processes, and large volumes of material go to recycling applications that limit the ability of the material to be recycled again. Much of this non closed-loop recycling has a lower monetary value than closed-loop recycling. For example, PET bottles recycled into pellets that can be reincorporated into new bottles are more valuable than PET fiber. Figure 2.6 shows the realized value of different materials after the material is collected for recycling. For example, only 8% of the total value of collected polypropylene is preserved because 31% is lost to sorting, 6% is lost to processing losses, and 55% is lost due to a very high proportion of the material being recycled into lower-valued non packaging applications. Alternatively, 83% of the value of aluminum cans is preserved as there are lower sorting losses and nearly all aluminum recycled goes to closed-loop applications retaining its value much more than other materials.

Figure 2.6 Value of Material Retained of Collected Material



2.4 WELL-DESIGNED RECYCLING REFUNDS PAIRED WITH EXTENDED PRODUCER RESPONSIBILITY MAXIMIZE DESIRED OUTCOMES

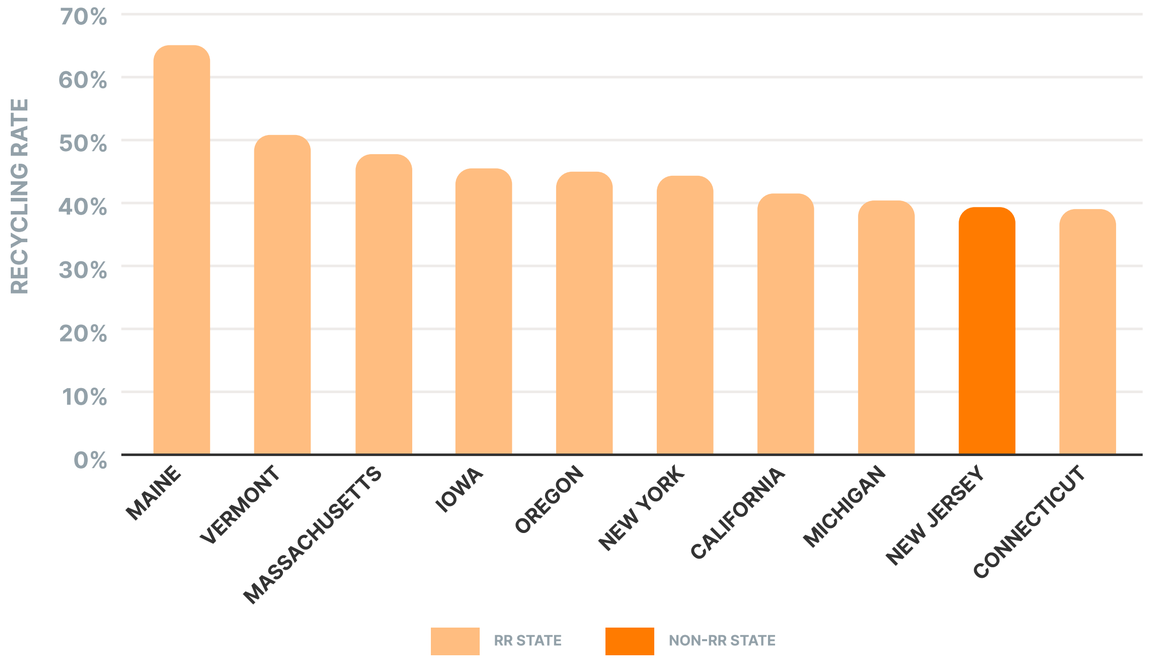
As legislators and business leaders seek to increase recycling rates and boost the environmental, economic and social impact of recycling across the United States, well-designed policy will be required. The two proven policies that can drive up recycling rates, support closed-loop recycling and maximize supply to domestic markets are Recycling Refunds for beverage containers and Extended Producer Responsibility for packaging and paper products.

RECYCLING REFUNDS ARE AN EFFECTIVE POLICY FOR INCREASING RECYCLING RATES

Recycling Refunds (RR) demonstrate how policy can support high recycling rates. Recycling Refunds are a type of Extended Producer Responsibility that targets beverage containers. Consumers have a financial incentive — a deposit paid — to return the beverage container for recycling and and receive their refund.

Out of the top ten states with the highest recycling rates for packaging (without FFP), nine have established RR in addition to widespread curbside recycling systems.

Figure 2.7 Recycling Rates of Top 10 States (without FFP)



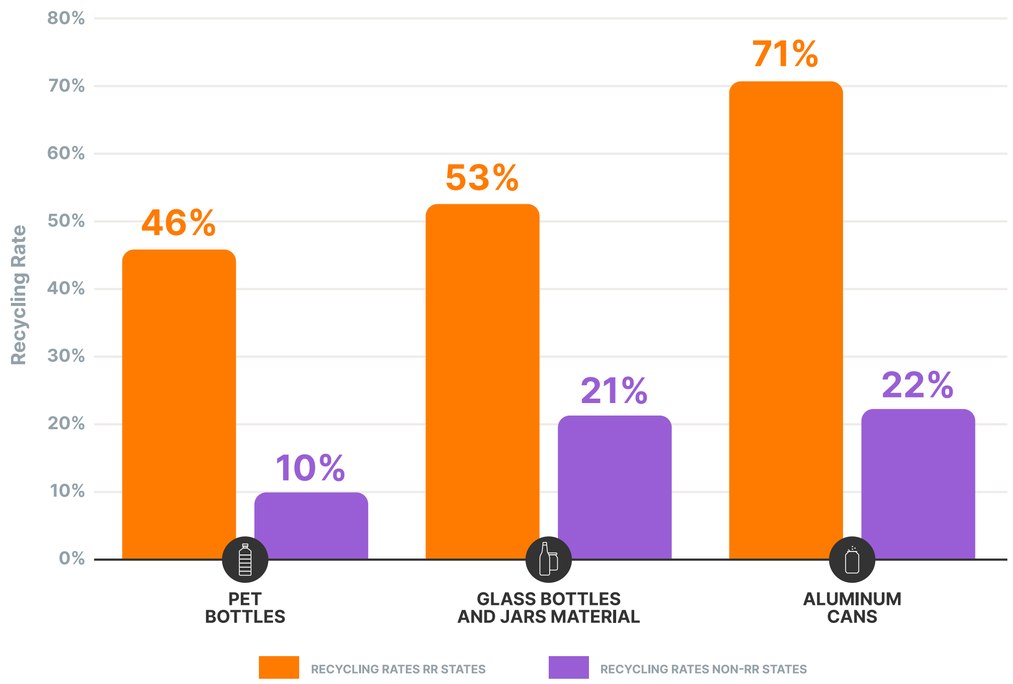
Despite only ten RR states representing approximately 27% of the national population, these states make an outsized contribution to the country's overall recycling rates. They account for 47% of all packaging (not including FFP) recycled and 51% of beverage containers recycled. This includes 60% of PET bottles, 51% of glass bottles and jars, and 51% of aluminum cans.

Figure 2.8
RR States Share of Recycling

States with RR recycle more material compared to states without RR. However, when measured against top performing RR states that consistently achieve collection rates surpassing 90%, there emerges a clear opportunity for improvement. RR states must modernize their programs to include critical components that enable 90% collection rates to be achieved consistently.

Figure 2.9

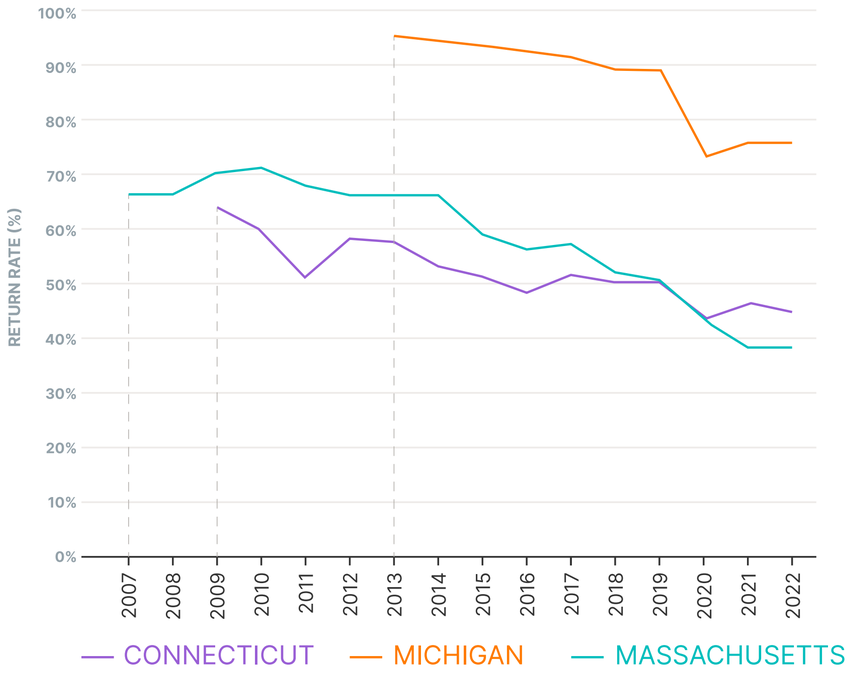
Recycling Rates in Deposit vs Non-Deposit States



While states with Recycling Refunds generally outperform states without RR, many RR states' redemption rates have declined. Stagnant and declining redemption rates point to a need for program modernization.[9]

Figure 2.10

Declining Redemption Rates in Select RR States



Source Container Recycling Institute

KEY COMPONENTS TO ENABLE CONSISTENTLY HIGH PERFORMING RECYCLING REFUNDS

Include All Beverage Containers of All Sizes and Formats:

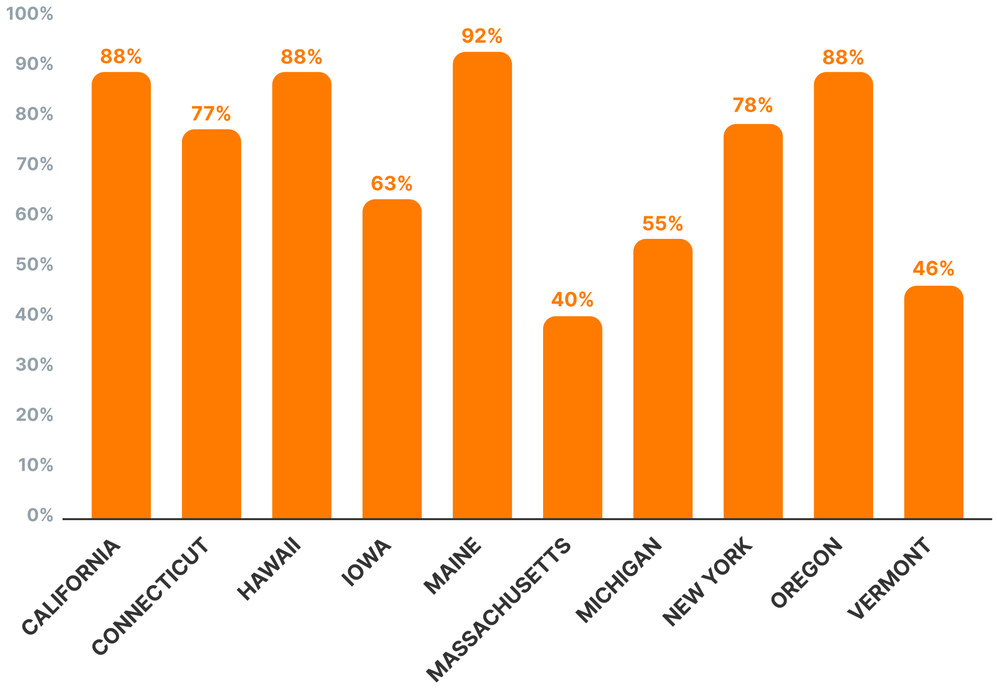
Figure 2.11 shows that beverages included in RR vary by state; for example, in Massachusetts, only 40% of beverage containers sold are included while, in Maine, 92% are included.[10] In Michigan, despite achieving collection rates between 75%-95%, the RR only covers 55% of the beverage containers on the market as bottled water and sports drinks are excluded.[11] This is a missed opportunity. RR programs should include all beverages and container formats put onto the market to maximize beverage container recovery and closed-loop recycling potential.

Incentivize Return by Offering Meaningful Consumer Refund:

Setting a high enough refund value is essential to achieve high redemption rates. The deposit should be high enough to incentivize and motivate consumers to return their containers for their refund. Meaningful deposit values should be considered alongside the purchase power of the respective market. For example, today in the U.S., RR states with a minimum $.10 deposit achieve higher redemption rates overall than states with a $.05 deposit. In April 2017, Oregon increased its deposit on beverage containers from $.05 to $.10, which dramatically increased its redemption rate from 64% to 82% by December 2017. As of April 2023, Oregon's rate was 88.5%, the highest in the U.S.

Figure 2.11

Percent of Beverage Units Sold That are Covered by Recycling Refunds in Each State



Source Container Recycling Institute

Allow Beverage Producers to Operate and Finance a Centralized System:

While beverage distributors/producers are generally responsible for managing redeemed containers, the governance for each RR program varies across the ten RR states. A best practice is to empower the industry to create a centralized organization, a producer responsibility organization (PRO), formed by producers to finance and operate the entire system with clear oversight from the government. Producer fees should reflect the true sorting and recycling costs of each container and incentivize containers that maximize recycling efficiencies. The system should be designed to recover the most materials at the lowest possible cost and ensure that revenues are reinvested into the collection program to optimize program efficiency and convenience for consumers.

Set a Minimum Return Rate of 90%:

Policymakers should set a high return rate target with phased targets for new programs. This will hold producers accountable so they strive to make the programs as operationally efficient, convenient and high-performing as possible. Many of the best RR programs have ambitious targets of 90% or higher and have enforced financial penalties when the targets aren't achieved.

Reinvest Unredeemed Deposits in the Recycling System:

Markets where the unredeemed deposits are used outside the recycling system can incentivize system operators to minimize collection, impeding the model's efficiency. Instead, unredeemed deposits should be used to mitigate recycling system costs, improve collection and fund public education efforts on recycling instead of funding unrelated programs.

Create Consumer-Driven and Convenient Return Points:
An extensive network of redemption points needs to be designed to optimize ease and convenience for consumers to redeem their refund. A variety of collection modalities, including bag-drop, return to depot, reverse vending machines (RVM), bulk return and on-the-go redemption, should be considered to optimize access and convenience for consumers. Designing a system to minimize the inconvenience to the consumer via quick redemption opportunities and providing both onsite cash refunds and secure electronic refund will help reduce the burden on consumers and redemption locations.

Examples of Collection Modalities under RR **Figure 2.12**

COMBINING RR AND EPR FOR EXTRA CONVENIENCE

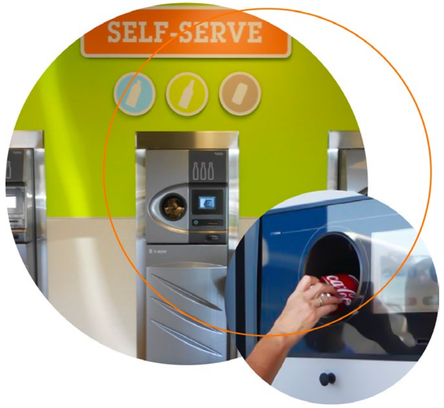
British Columbia (Canada) empowers producers to design and manage different EPR programs specific to their products creating a high performing, holistic recycling system with drop-off sites where consumers can return all different items: beverage containers, commingled recyclables, batteries, textiles,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

EXTENDED PRODUCER RESPONSIBILITY IS AN EMERGING POLICY TO TACKLE MORE SEGMENTS OF THE WASTE STREAM

Recycling refunds effectively manage the 18% of the packaging stream that is beverage containers. To support necessary investment in curbside recycling systems necessary to increase recycling rates for the wider packaging stream, extended producer responsibility (EPR) legislation is an established policy mechanism that is gaining momentum in the U.S. Since the Break Free from Plastic Pollution Act[12] became the first federal bill to present EPR as a financial mechanism to support the provision of recycling services, 20 states have introduced EPR bills for packaging and four states have adopted EPR legislation for packaging.[13]

Combining EPR and RR offers the highest recycling rates and overall benefits.

EPR offers broad-based funding to boost recycling for a wide range of packaging and paper products and is crucial to improve overall recycling performance for cardboard, printed paper and a wide range of paper, plastic, metal, and glass packaging. EPR programs typically focus on residential recycling programs and allow consumers to recycle using their existing or newly established curbside and drop-off recycling programs. EPR programs shift the cost of local recycling programs (collection, sorting and processing materials) from taxpayers and local governments to the producers of paper and packaging products. **EPR programs aim to expand access to recycling services and can achieve between 50-65% residential recycling rates on their own.**

EPR+RR IMPLEMENTED TOGETHER DELIVER HIGH-PERFORMING AND OPTIMAL RECYCLING SYSTEMS

According to the analysis in the subsequent case studies, implementing EPR and RR together delivers the highest recycling rates and associated environmental, economic and social benefits. **Currently, EPR and RR systems co-exist across 26 jurisdictions around the world.** When they are developed thoughtfully, they can provide a robust and high-performing recycling system to maximize the quality and quantity of materials recycled.[14] States with existing RR programs would benefit from also passing EPR legislation to maximize outcomes and to bolster local recycling programs. **States that don't have either EPR or RR in place should endeavor to adopt both programs together in the same legislation so they can be co-developed to emphasize each of their strengths and drive efficiencies.** There are several synergies and benefits of implementing EPR + RR together.

States with RR programs should consider EPR for better outcomes, while those without either should adopt both for enhanced efficiency and strength.

EPR+RR IMPLEMENTED TOGETHER DELIVER HIGH-PERFORMING AND OPTIMAL RECYCLING SYSTEMS

ACCELERATES A PATH TO MAXIMUM RECYCLING RATES

RR programs can scale and accelerate more quickly than EPR programs alone. As shown in this report for the National Waste and Recycling Association, EPR can gradually increase recycling rates over time.[15] **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.** While EPR generally focuses on residential material, RR applies to all beverage containers, providing an avenue to recycle beverage packaging from businesses, schools, parks, and on-the-go. RR can complement recycling rates from curbside EPR programs. About 30% of beverage containers are used away from home[16] and ~18% of beverages are consumed on-premise, like a bar, restaurant or hotel.

ENABLES CLOSED-LOOP RECYCLING, WHICH CREATES A STRONG DOMESTIC SUPPLY OF MATERIAL

RR deliver higher quality beverage container material than EPR programs alone because the containers are separately collected. The quality of this material enables it to flow into closed-loop recycling thereby retaining the material maximum value. **EPR+RR programs will help enable consumer goods companies to achieve their ambitious recycling rate, recycled content and climate goals to create a circular economy and comply with existing mandatory recycled content laws around the country.** By increasing closed-loop recycling rates, EPR+RR can reduce carbon emissions and lower air and water pollution by enabling greater use of recycled material.

MAXIMIZES ACCESS & CONVENIENCE

RR programs establish a network of easily accessible and strategically located collection points. These can include recycling centers/depots, redemption points at retailers or in their parking lots, and even public spaces. By providing convenient options for returning containers, RR makes recycling more accessible to people on the go. **Redemption locations set up for the return of containers can also serve as convenient drop-off locations for other packaging material that is difficult or costly to collect through curbside programs, such as flexible films, expanded polystyrene (EPS) and bulky rigid packaging.** They can also serve as collection points in rural areas which may not have convenient existing recycling drop-offs. This has proven to be the case in British Columbia and other high-performing systems.[17]

EPR+RR IMPLEMENTED TOGETHER DELIVER HIGH-PERFORMING AND OPTIMAL RECYCLING SYSTEMS

REDUCES LITTER

Studies have shown that states with RR programs have witnessed up to an **84% reduction in littered beverage packaging compared to those without such initiatives.**[18, 19]

This is because consumers are incentivized to return these containers for recycling in exchange for the refund. **In addition, overall litter has also seen reductions, ranging from 34% to 65%.**[20]

EXPANDS REUSE AND REFILL OPPORTUNITIES

EPR proposals increasingly include reuse goals, and RR can provide the mechanism to make this a reality. Therefore, high-performing RR systems are an essential prerequisite for a successful market for refillable beverage containers. Unlike EPR, RR provides a return incentive through the **program's structure. RR can facilitate the reverse distribution system needed to support greater reuse of some types of containers.** RR establishes a common infrastructure by which single-use and refillable containers are returned. In RR systems, the consumer does not need to distinguish between returning a container for recycling or refill; the backend handling systems efficiently handle this distinction. This simplifies the return process for consumers who are motivated by the prospect of receiving their refund.

PROTECT AND ENHANCE LOCAL RECYCLING PROGRAMS

Well-designed EPR can support and financially offset the loss of beverage packaging for MRFs; this means that every material will need to pay its own way via modulated fees, i.e., fees that correspond to the recyclability of the packaging. Any financial loss to curbside programs from **an integrated RR program could be offset by the increased tons of materials entering the system.** Additionally, RR can provide a temporary recycling revenue augmentation fund to help bolster recycling programs through the transition to an EPR and RR system. Lastly, the RR can allow MRF operators to redeem the deposit value of the remaining quality beverage containers found in curbside recycling by returning the containers to the PRO.

- **Shifts Financial Responsibility:** Well-designed EPR policies can provide a more stable source of funding for MRFs and financially offset the loss of beverage containers to a RR system. Under EPR, producers become financially responsible for end-of-life management of their products. Through EPR producers pay modulated fees to cover the cost of collection, sorting, and processing for the packaging they put onto the market. This means that every material will need to pay its own way.

- **Provides Stable Funding:** EPR policies can provide a more stable source of funding for MRFs. Instead of relying on subsidizing their per-ton fees from municipalities and customers with revenue generated from selling recycled materials (which can fluctuate based on market demand and commodity prices), MRFs can receive consistent financial support from producers that cover the full costs of processing and capital improvements, making their operations more financially sustainable.

- **Increases Recycling Tonnage Throughput:** EPR expands recycling access to all residents across the state and increases the total tons of recyclables collected and processed.

- **Increase Materials Captured for Recycling and Improve Material Quality :** While RR diverts beverage containers away from MRFs, MRFs will be able to capture other types of recyclables (such as other types of aluminum) that they may fail to capture today. Also by reducing the number of glass bottles processed through a MRF may reduce contamination from broken glass and improve the quality of paper bales.

- **Ability to Redeem the Refund:** MRFs and recycling programs should have an opportunity to turn beverage containers over to the responsibility organization to receive at least a portion of the unredeemed refund.

- **Provide a Temporary Curbside Augmentation Fund:** The RR Responsibility Organization can also offer financial support to aid local recycling programs and MRFs during the transition to EPR via a temporary augmentation fund. The fund can help compensate MRFs and recycling programs for the loss of revenue from beverage container scrap value for a few years until EPR is fully operational, and aid with upgrades and capital investments needed to adjust systems to new material composition.

CONCLUSION

As we set our sights on the future of recycling, well-designed EPR and RR policies implemented together hold the potential to maximize the recycling of materials, thereby delivering the most favorable outcomes for our society, environment and economy within the United States. The subsequent section analyzes three distinctive case studies and possible policy outcomes. This approach signifies a comprehensive commitment to decarbonization and the responsible management of resources, setting the stage for a more efficient and environmentally conscious recycling landscape in the years to come.

Photo: Return-It Express Plus LoLo

Location: A multipurpose recycling location that accepts beverage containers, single stream recyclables, batteries, light bulbs, appliances, electronics, textiles, and chopsticks for recycling.

3.0

Policy Impact Deep Dives

3.0 POLICY IMPACT DEEP DIVES

The comparable analysis of recycling rates across 50 states shows a varying degree of successful recycling systems in the United States. This is illustrated by the range in packaging recycling rates (not including FFP) from 2% at its lowest to 65% at its highest. As discussed in Section 2.0, recycling provides economic, social and environmental benefits. As these case studies will demonstrate, policy can be designed to foster high recycling rates for packaging material.

Material capture

Recycling impact measued through recycling rates for packaging materials in addition to the overall closed-loop recycling rate.

Policy

Policy impact measured through policies contributing to high recycling rates.

Economy

Economic impact of recycling measured through material value capture, job creation/wages, and gross value added.

Climate

Climate impact of recycling measured through greenhouse gas emissiones avoided.

Equity

Equitable recycling systems measured through qualitative insights throughout the report.

To comprehensively illustrate these dynamics, the subsequent section presents three in-depth examinations of recycling at the state level. These case studies aim to quantify the potential of well-designed policies to maximize material recycling rates, climate benefits, economic outcomes, and equitably designed systems. The three areas selected are as follows:

Modernizing Policies to Match Best-in-Class RR: Impact Assessment in the Northeast: Five states in the Northeast have RR, which have largely remained the same since their implementation in the 19z70s -1980s. This case study builds up Reloop's "Northeast Reimagining the Bottle Bill" report. This analysis illustrates the impact of modernizing these RR based on best-in-class principles to maximize beverage containers recycled and create program efficiencies while increasing the convenience for program participation.

Washington State: Impact of Extended Producer Responsibility + Recycling Refunds: Washington state has proposed, but not yet passed EPR with RR. This analysis compares the performance of implementing EPR alone versus implementing EPR and RR together.

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.

Colorado: Examining the potential of Implementing Recycling Refunds Alongside Extended Producer Responsibility to Achieve Maximum Material Recovery: Colorado passed EPR in 2022, but it has yet to be implemented. This analysis compares the performance of implementing EPR alone versus implementing EPR and RR together.

Although EPR in Colorado includes some nonresidential waste generators as covered entities, this analysis focuses only on residential packaging waste, while the RR analysis does include beverage containers from the residential and commercial sectors.

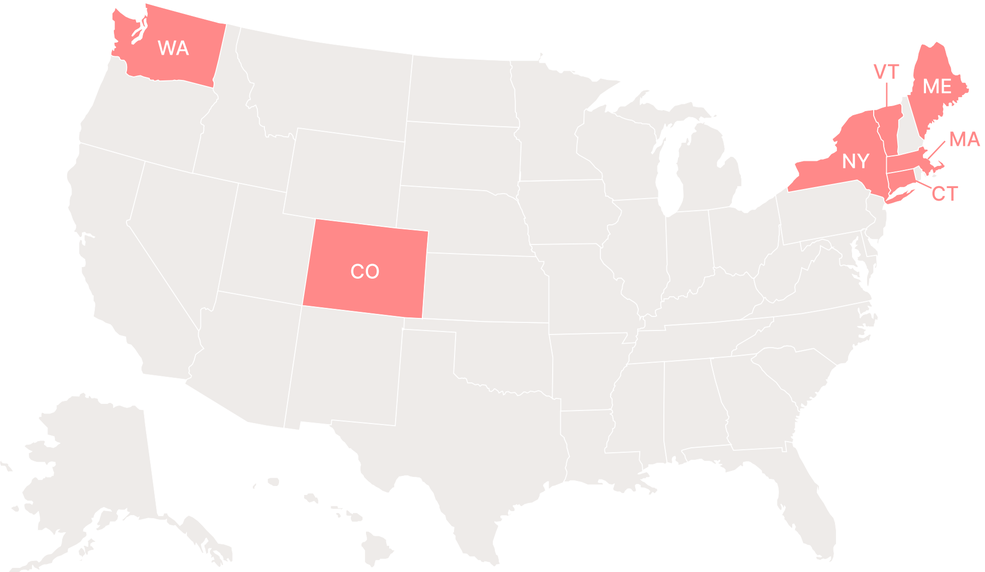


Figure 3.1
Geographic Scope of State Deep Dives

3.1 BEST-IN-CLASS RECYCLING REFUNDS: IMPACT OF MODERNIZING RECYCLING REFUNDS IN THE NORTHEAST

While recycling refunds (RR) have historically demonstrated their effectiveness in achieving high recovery for beverage containers, recycling rates in the five northeastern states with RR have shown signs of stagnation and even decline. This can be attributed to RR legislation remaining essentially unchanged in these states.

This shows the importance of modernizing RR in the northeastern region as a strategic next step in improving recycling performance. Given that a lot of infrastructure is in place and consumers are well aware of the program, focusing on modernizing recycling refund systems presents a comparatively lower marginal investment with the potential for substantial impact. This modernization should integrate best practices and principles tailored to meet current needs and address emerging challenges. The improvement of RR is important to ensuring they remain effective tools for maximizing recovery rates and achieving a closed-loop recycling system.

KEY BENEFITS TO MODERNIZING RR IN THE NORTHEAST:

- **Material Capture:** 460,000 additional tons of material would be collected, equivalent to over 9 billion containers.
- **Economy:** Over $800m of unclaimed deposits would be available to invest in recycling infrastructure and ~2,750 additional jobs would be created.
- **Climate:** 556,800 MTCO2e GHG would be reduced.
- **Equity:** 99% of households would have access to return locations no further than 2 miles in urban areas and 5 miles in rural areas.

WELL-DESIGNED RECYCLING REFUNDS SHOULD:

MATERIAL CAPTURE

Maximize volume of material recycled especially for closed-loop applications through:

- **Including nearly all beverages and beverage containers:** Legislation should extend deposit requirements to encompass all beverage containers except for those intended for medical or infant formula use. Building flexibility into the product list is important to ensuring that newly introduced beverages are not excluded from the list of products subject to deposit and reducing the need for frequent legislative revisions.
- **Set phased performance targets** to achieve a 90% minimum redemption rate over time.
- **Establish a $0.10 minimum deposit** that can be adjusted if targets are not met to enable a redemption rate of 90+%.
- **Retaining value through separately collected material**, enabling closed loop recycling.

ECONOMY

Support a sustainably funded recycling system and increase economic opportunity through:

- **Establishing an industry-funded responsibility organization to operate or at least oversee the program to ensure efficiency and cost-effective performance with clear government oversight.**
- **Producer or distributor fees should be modulated to reflect the true sorting and recycling costs of each container without cross-subsidization between products.**
- **Unclaimed deposits must be kept in the system and some may be used to improve regional recycling including:**
  - **Compensating municipalities and MRFs** during the transition for material losses.
  - **Consider allowing MRFs and local recycling programs** to have an opportunity to turn beverage containers to the responsibility organization to receive the unredeemed deposit.
  - **Making fair payments to service providers,** including retailers providing return sites and haulers processing material through curbside systems, reflecting the cost of managing the return containers (only applies to systems that aren't wholly owned and operated by the PRO).
  - **Strive for interoperability and minimum requirements across different markets**, to minimize specialized labeling requirements on producers and allow for a seamless consumer experience.

CLIMATE

Create a clean environment and support climate goals through:

- **Reducing litter** in communities. Well-designed RR programs can reduce littered beverage container by 84% and overall litter by 65%.
- **Lowering GHG emissions** through more sustainable material management and replacing primary material with secondary in the production of new products and packaging.
- **Expand reuse and refill opportunities**: high-performing RR provides a return incentive to facilitate the reverse distribution system needed to support greater reuse of some types of containers. RR establishes a common infrastructure by which single-use and refillable containers are returned.

EQUITY

Provide convenient, accessible, and equitable recycling options through:

- **Implementation of collection infrastructure that is convenient and accessible for consumers** to redeem the deposit, including on-the-go returns, bag drops, and RVMs.
- **Requiring minimum accessibility targets** to ensure all communities have a minimum number of return points that can be reached via public transport and a minimum drive time.
- **Innovating to provide consumer-centric return points** for low- and high-volume users in all communities such as bag drop, on-the-go returns, RVM, depot and large retail.

MATERIAL CAPTURE

CURRENT STATE

- **Scope:** No state currently has a complete scope of beverages included in the program.
- **Deposit:** Only Connecticut has an adequate deposit level but does not have a trigger to adjust the deposit level if recycling rates drop.
- **Targets:** Only Connecticut has set a collection target of 85%. Other states do not have targets.

FUTURE STATE

If programs are modernized based on the principles outlined, the following can be achieved:

- **Over 27 billion containers** would be recycled when an optimized RR is delivered alongside existing curbside containers. This is 9 billion more containers than currently recycled.
- **1.8 million tons of recycled content** to support circular supply chains with a market value of $375 million. This is 460,000 tons more than currently recycled.

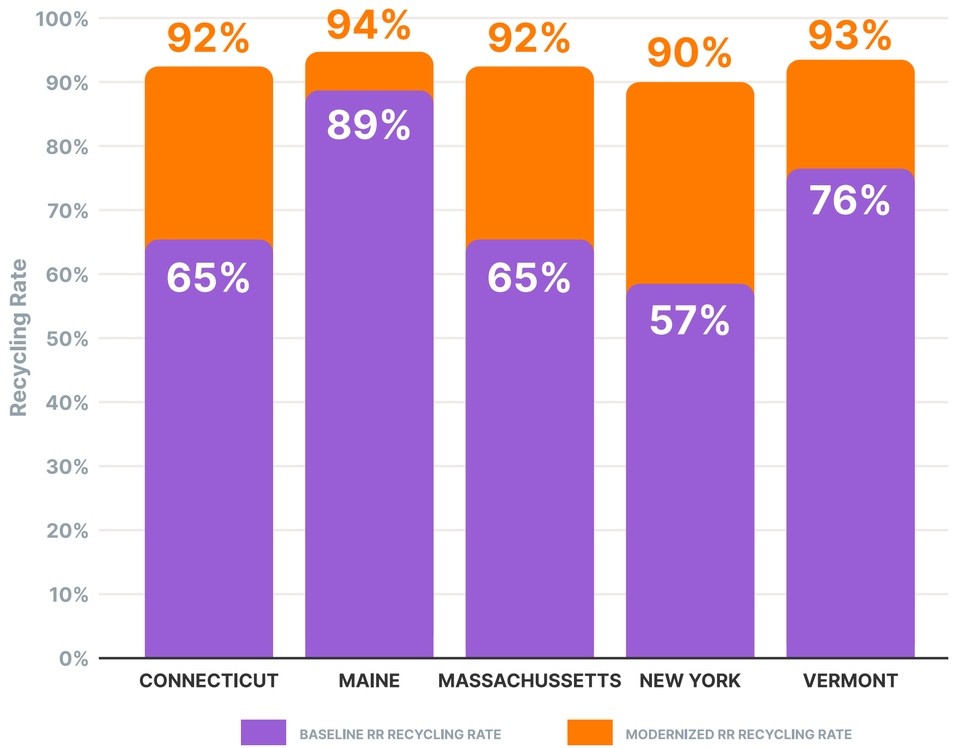
Table 3.1

Annual Tons of Glass, Aluminum, and Plastic Beverage Containers Available for Closed-Loop Recycling Resulting from an Optimized RR

	TOTAL ACROSS NORTHEAST
GLASS	
CURRENT	1,063,800
ADDITIONAL	271,300
TOTAL	1,335,100
% INCREASE	26%
IMPACT ON RECYCLING RATE (PERCENTAGE POINT INCREASE)	+18%
ALUMINUM	
CURRENT	94,600
ADDITIONAL	30,500
TOTAL	125,100
% INCREASE	32%
IMPACT ON RECYCLING RATE (PERCENTAGE POINT INCREASE)	+21%
PLASTIC	
CURRENT	215,900
ADDITIONAL	120,200
TOTAL	336,100
% INCREASE	56%
IMPACT ON RECYCLING RATE (PERCENTAGE POINT INCREASE)	+31%

MATERIAL CAPTURE

Figure 3.2 Impact of Modernized RR on Recycling Rates



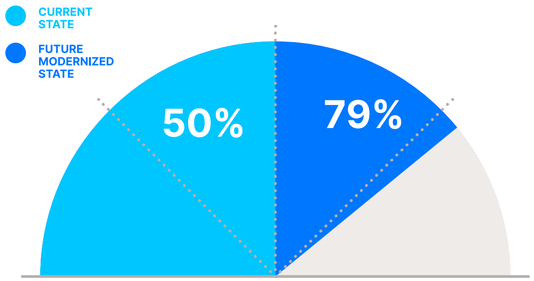
A modernized RR can increase the recycling rate for beverage containers:

- **From 65% to 92% in Connecticut**
- **From 89% to 94% in Maine**
- **From 65% to 92% in Massachusetts**
- **From 57% to 90% in New York**
- **From 76% to 93% in Vermont**

A modernized RR can also dramatically increase the closed loop recycling rate for beverage containers in the Northeast from 50% to 79%.

Figure 3.3

Closed Loop Recycling Rate For Beverage Containers Current State & Future State Of Under Well-designed Modernized RR In The Northeast



ECONOMY

CURRENT STATE

- Unclaimed Deposits: Only one state allows producers to use unclaimed deposits to develop a more accessible and technology-driven return network.
- Access to Deposits: No state allows municipalities and MRFs to access the deposits associated with the material they handle, nor do they use any of the unclaimed deposits to support curbside recycling and improvements in MRFS.

FUTURE STATE

If programs are modernized based on the principles outlined, the following can be achieved.

- $800 million+ of unclaimed deposits over 3-year period available for investment before return rates reach 90%.
- $45 million in redemption revenue available to MRF operators from access to deposits versus material value and less impact from market fluctuations.
- ~2,750 additional jobs created.
- $1.4 billion direct and indirect gross value added to the economy each year.
- “More than 460,000 tons of material diverted from landfill or removed from land and waterways
- $33 million of savings for municipalities from reduced material sent to landfill.

A bale of aluminum is valued at ~$1,600 depending on the market. The equivalent number of containers, each with a $0.10 deposit, is valued at ~$6,000. Allowing MRFs access to the deposit more than offsets the loss in material value.

CLIMATE

CURRENT STATE

Current recycling levels do not maximize the opportunity to reduce litter and lower GHG emissions.

FUTURE STATE

If programs are modernized based on the principles outlined, the following can be achieved:

- **Up to 34% litter reduction**, creating cleaner neighborhoods for residents and reducing litter management costs by $21.5 million.
- **556,800 MTCO2e GHG reduced,** equivalent to removing over 100,000 gasoline-powered passenger vehicles from the road for one year.

EQUITY

CURRENT STATE

- Accessibility Targets: No state requires producers to ensure that all communities have access to return locations.
- Return options: Return locations limited to some retailers and depots.
- Infrastructure: Only Maine and parts of New York, on a pilot basis, provide different collection modalities such as bag drop redemption in the Northeast.

FUTURE STATE

If programs are modernized based on the principles outlined, the following can be achieved:

- 99% of households can access return locations within 2 miles in urban areas and 5 miles in rural areas. In NYC, 95% of the population would be within 0.5 miles of a return location.
- Consumers can return through a range of return locations such as retailers, schools, libraries and other everyday locations to accommodate low- and high-volume returns including bag drop, RVM, and manual returns. See further discussion in Section 2.4.
- 21,400 return points across the region, or one for every 1,500 people.

Table 3.2

Population per Return Location in a Modernized System

	POPULATION PER RETURN POINT IN FUTURE STATE
CONNECTICUT	1,297
MAINE	1,620
MASSACHUSETTS	2,020
NEW YORK	1,325
VERMONT	870

3.2 WASHINGTON STATE: IMPACT OF EXTENDED PRODUCER RESPONSIBILITY + RECYCLING REFUNDS

Washington state is currently ranked 15th among all states for recycling packaging materials, not including fiber and flexible plastics (FFP). Today, Eunomia estimates that ~89% of the state's population has access to curbside recycling, but only recycles 25% of packaging (without FFP).[21]

Although Washington has made efforts to bolster the recycling system, such as the recycled content requirement in SB 5022 which targets increasing demand for recycled material, additional legislation is required to boost the state's performance.

Through the 2023 Washington Recycling and Packaging Act (WRAP Act),[22] Washington state recognized the importance of Extended Producer Responsibility (EPR) and Recycling Refunds (RR) working together to elevate recycling rates and bolster a thriving local circular economy. Furthermore, this bill would have mandated the state to recycle or reuse 90% of its packaging by 2040.[23] Although this legislation did not pass in the first session it was introduced, a poll conducted by the Oregon Beverage Recycling Cooperative (OBRC) revealed that 68% of Washington residents supported RR, increasing to 82% when they learned about RR.

While EPR will shift the costs of curbside recycling from local governments to producers, increasing access to curbside recycling alone likely won't maximize recycling rates, making Washington an excellent example of the potential benefits that implementing RRs alongside curbside EPR would provide.

The economic, environmental and equity impacts of implementing these policies together is presented here.

Eunomia estimates that ~89% of the state's population has access to curbside recycling but only recycles 25% of packaging (without FFP).

KEY TAKEAWAYS: IMPACT OF IMPLEMENTING EPR + RR IN WASHINGTON

- **Recycling:** Including FFP, there could be a significant boost in recycling with 2.2 million tons of residential material added to the supply chain over a 15-year period under EPR. RR can contribute a further 1.4 million tons of beverage container material from residential and commercial sectors when implemented with EPR.
- **Economy:** Creation of 8,400 jobs, fostering employment opportunities while developing bag drop and depot infrastructure for beverage containers and packaging formats not currently viable for curbside collection, particularly flexible packaging.
- **Climate:** EPR AND RR aid in reducing packaging related emissions with FFP by 23% and excluding FFP by 70%.
- **Equity:** Establishing beverage container recycling facilities alongside EPR infrastructure can improve convenience and accessibility of recycling universally in Washington, regardless of location or property type.

CASE STUDY

WASHINGTON

26% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #15 =

RECYCLING RANK 2018 #15

POPULATION

7,740,745

ESTIMATED POPULATION WITH ACCESS TO RECYCLING: 89%

CENSUS SUB REGION

PACIFIC

RECYCLING REFUND STATE

NO

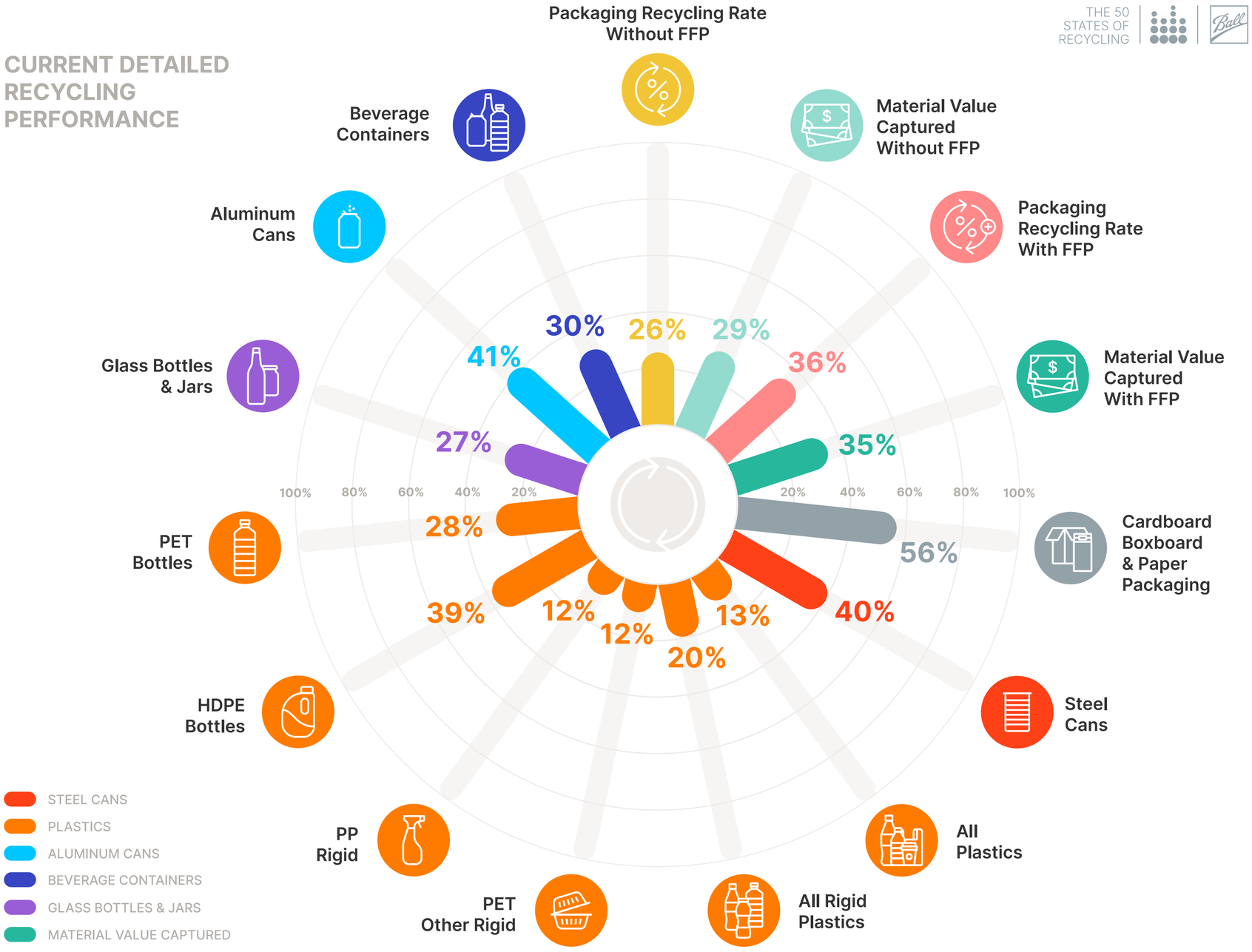
DATA QUALITY

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.

CURRENT DETAILED RECYCLING PERFORMANCE



CASE STUDY

WASHINGTON

59% RECYCLING RATE WITH EPR

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

HIGHLIGHTS

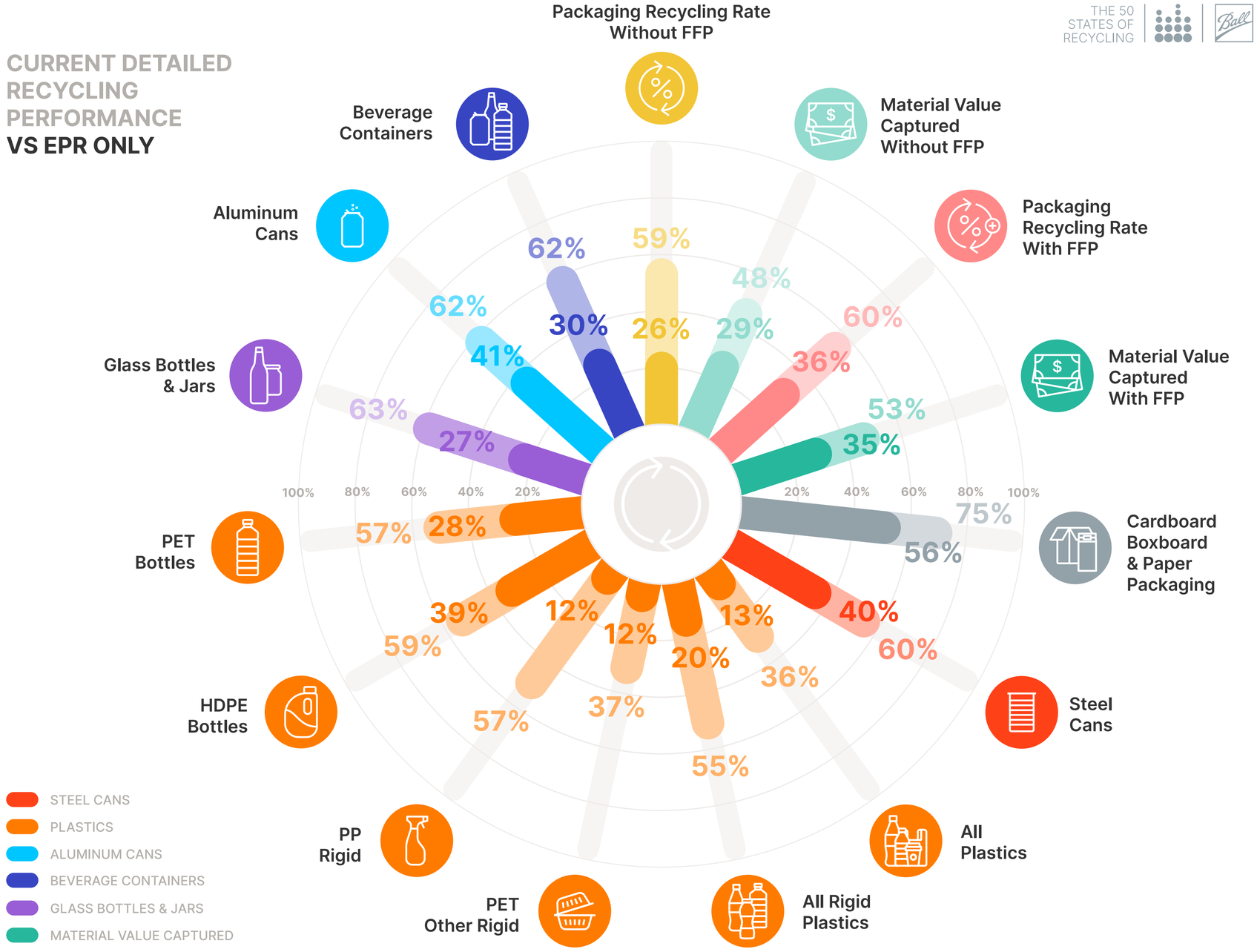
The implementation of EPR could substantially impact recycling rates in WA.

- Currently, the recycling rate for 'Packaging without FFP' is 26%, but with EPR, it could potentially increase to 59%.
- The recycling rate for 'Packaging with FFP' is currently 36%, but has the potential to jump to 60%.
- A noticeable change is expected for 'All plastic', with the recycling rate increasing from 13% to 36%.
- 'Beverage containers' in particular could see a significant improvement, as only 30% currently find their way to recycling, but under the proposed legislation this rate could double to 62%.

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



EPR ONLY | CURRENT STATE

CASE STUDY

WASHINGTON

78% RECYCLING RATE WITH EPR + RR

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

HIGHLIGHTS

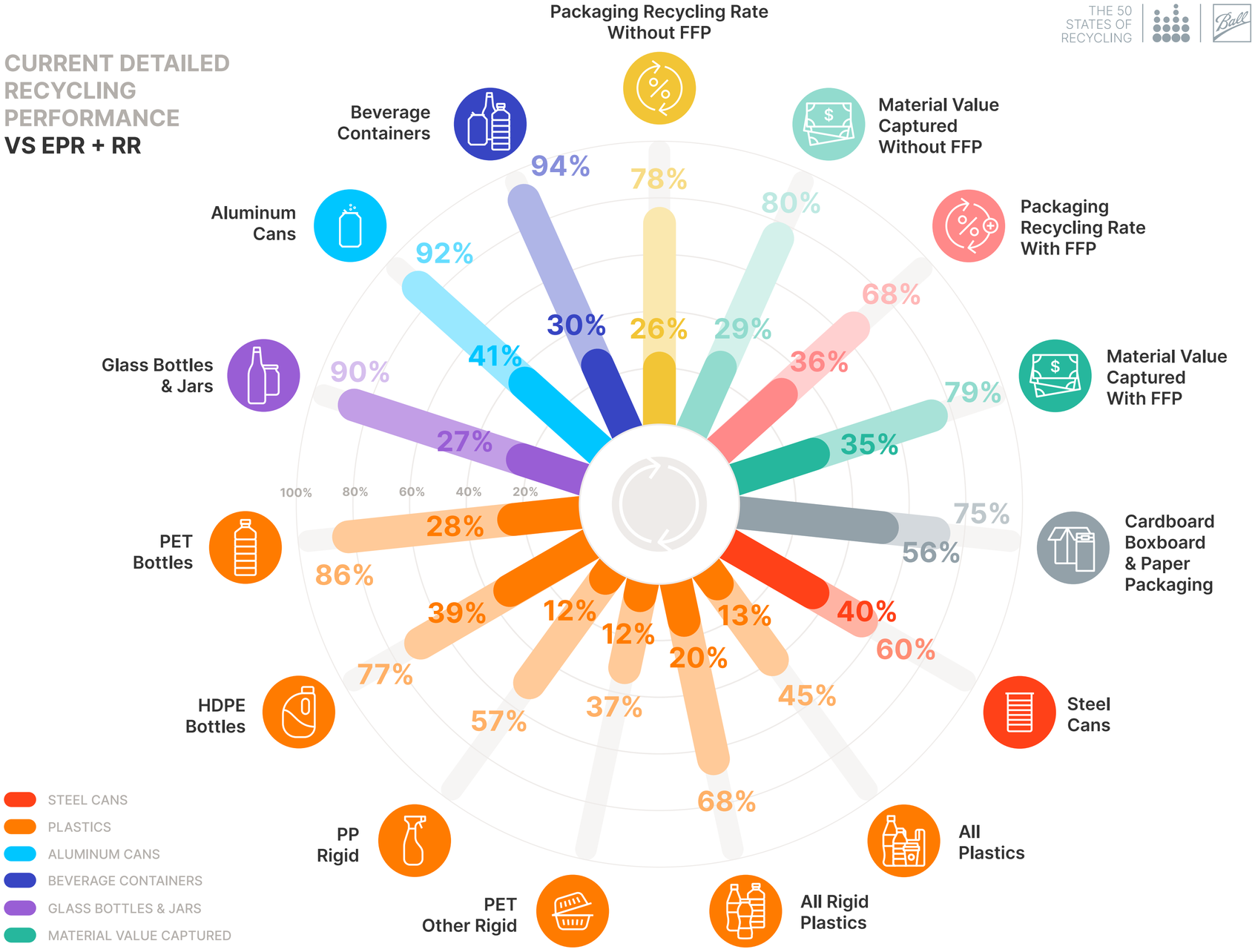
If WA were to implement EPR+RR legislation, there's a potential for significant improvements in recycling rates compared to the 'EPR only' scenario.

- The overall recycling rates for 'Packaging without FFP', currently at 26%, might experience a notable increase, potentially reaching 78% with EPR+RR.
- This positive change is not limited to a specific category but spans various packaging segments. In the case of 'Packaging with FFP', recycling rates, currently at 36%, could rise to 68%, showcasing advancements in waste management practices under the EPR+RR scenario.
- The impact extends to 'All plastics', with the recycling rate possibly increasing from 13% to 45%.
- Embracing the proposed legislations could result in a substantial boost for 'Beverage containers', increasing recycling rates from the current 30% to 94%.

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 | CURRENT STATE

MATERIAL CAPTURE

MAXIMIZING MATERIAL CAPTURE: EPR AND RR DELIVER AN ESTIMATED 3.6 MILLION TONS OF ADDITIONAL RECYCLABLE MATERIAL OVER 15 YEARS, 26% MORE THAN WITH EPR ON ITS OWN.

If EPR is implemented with RR in Washington, 1.5 million tons of additional material will be recycled over a 15-year period compared to EPR alone. This substantial increase is due to RR programs operating to cover commercial beverage containers as well, compared to EPR which only covers residential. Additionally, this substantial increase is partly due to the faster implementation time of RR, which only takes 2-5 years, compared to 5-8 years for EPR as outlined in the four EPR bills that have passed thus far.[24, 25, 26, 27] Because RR can be implemented more quickly, it allows for the collection of more high-quality recyclable material at a larger volume in the early stages of the recycling program.

STAKEHOLDER BENEFITS

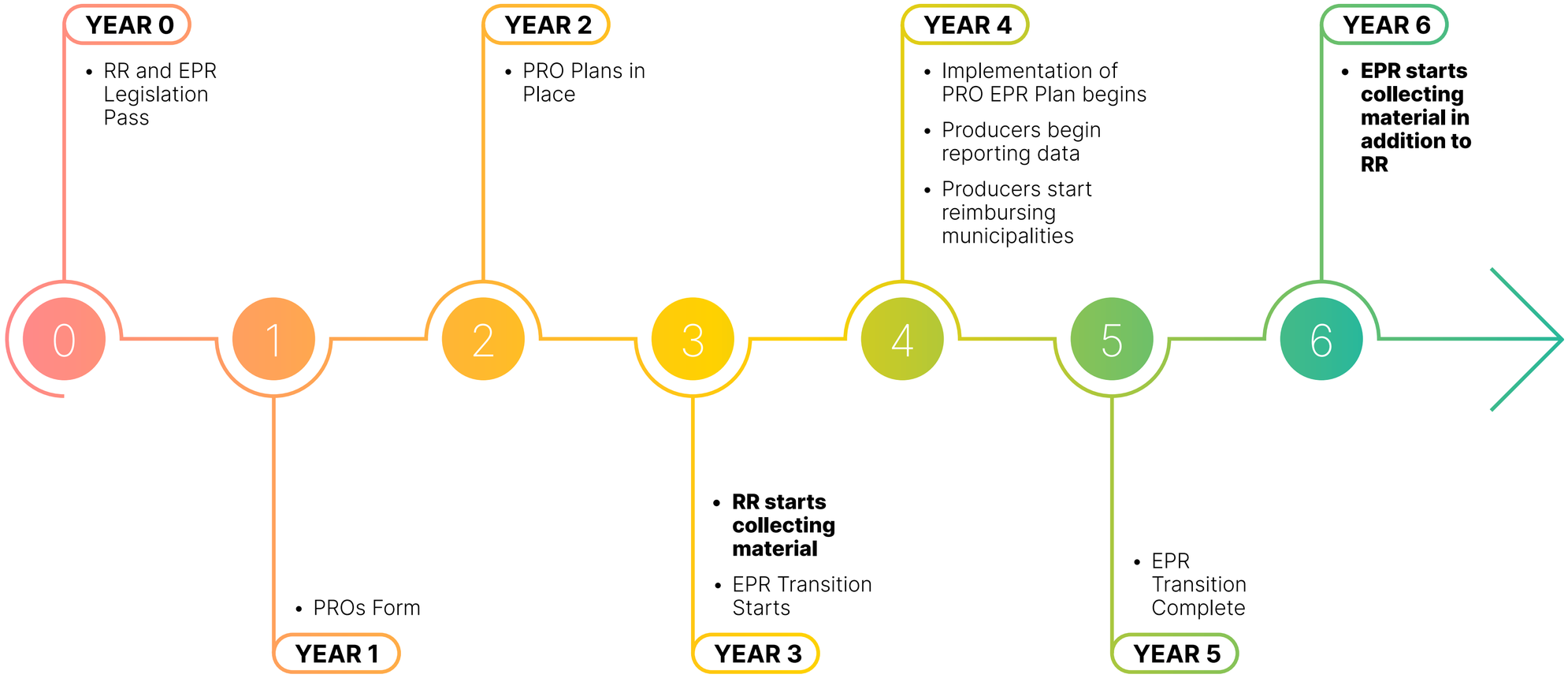
- **Enhances Local Recycling Targets:** Aids municipalities in achieving their recycling targets and waste reduction goals by increasing recycling rates of beverage containers to 90% and single and dual stream recycling rates to 65%.
- **Empowers Consumer Engagement:** Involving consumers in a better recycling system through closed-loop options fosters a sense of responsibility and environmental stewardship.
- **Optimizes Waste Management:** Operators service a greater number of households, which introduces a higher volume of materials managed, specifically high-quality material. The policy would also increase the overall throughput for MRFs.
- **Advantages to Producers:** Benefit from the increased availability of high-quality recycled content resulting from closed-loop recycling.

MATERIAL CAPTURE

FOR EPR TO BE IMPLEMENTED, 5-8 YEARS ARE NEEDED TO CONDUCT THE FOLLOWING:	FOR RR TO BE IMPLEMENTED, 2-5 YEARS ARE NEEDED TO CONDUCT THE FOLLOWING:
• Appointment of a Producer Responsibility Organization (PRO). • Development and phase-in of a minimum recyclable packaging materials list. • Completion of a needs assessment to inform access and recycling targets. • Phased increased in curbside access to all households including rural and multifamily areas, as guided by the needs assessment. • Investment in primary and secondary sorting to maximize capture of a wider range of packaging materials. • Depots and curbside services working together to capture a broad range of packaging through the most cost-effective collection route. • Service agreements to be put in place between the Producer Responsibility Organization (PRO), municipalities and service providers.	• Development of a fair compensation model to providers and operators of potential return locations including retailers, depot operators, as well as MRFs by producers through their PRO. • Introduction of a range of return locations to provide equitable access for all communities based on a minimum number of return locations, which is adjusted according to beverage sales density and accessibility requirements. This enables locations to be reached via public transport and minimal drive times. • Reimbursement to municipalities and their service providers for any loss in revenue that may occur prior to EPR being fully implemented. Once EPR is implemented, municipalities, haulers and MRFs will be paid the net cost of providing services so will not be impacted by RR. Additionally, municipalities and their service providers will be collecting and sorting more material and will receive increased payments accordingly.

MATERIAL CAPTURE

Figure 3.4 Timeline of Policy Implementation



MATERIAL CAPTURE

Figure 3.5 displays the impact different policy scenarios will have on recycling rates for packaging including FFP. Over nine years the implementation of EPR alone is estimated to culminate in a peak recycling rate of approximately 60%.

However, when EPR is integrated with RR, the synergy between the two leads to accelerated progress, achieving a 53% recycling rate by the fifth year, significantly surpassing the baseline recycling rate of 35%. By the ninth year, the collaborative implementation of EPR and RR is projected to yield a notable 69% recycling rate.

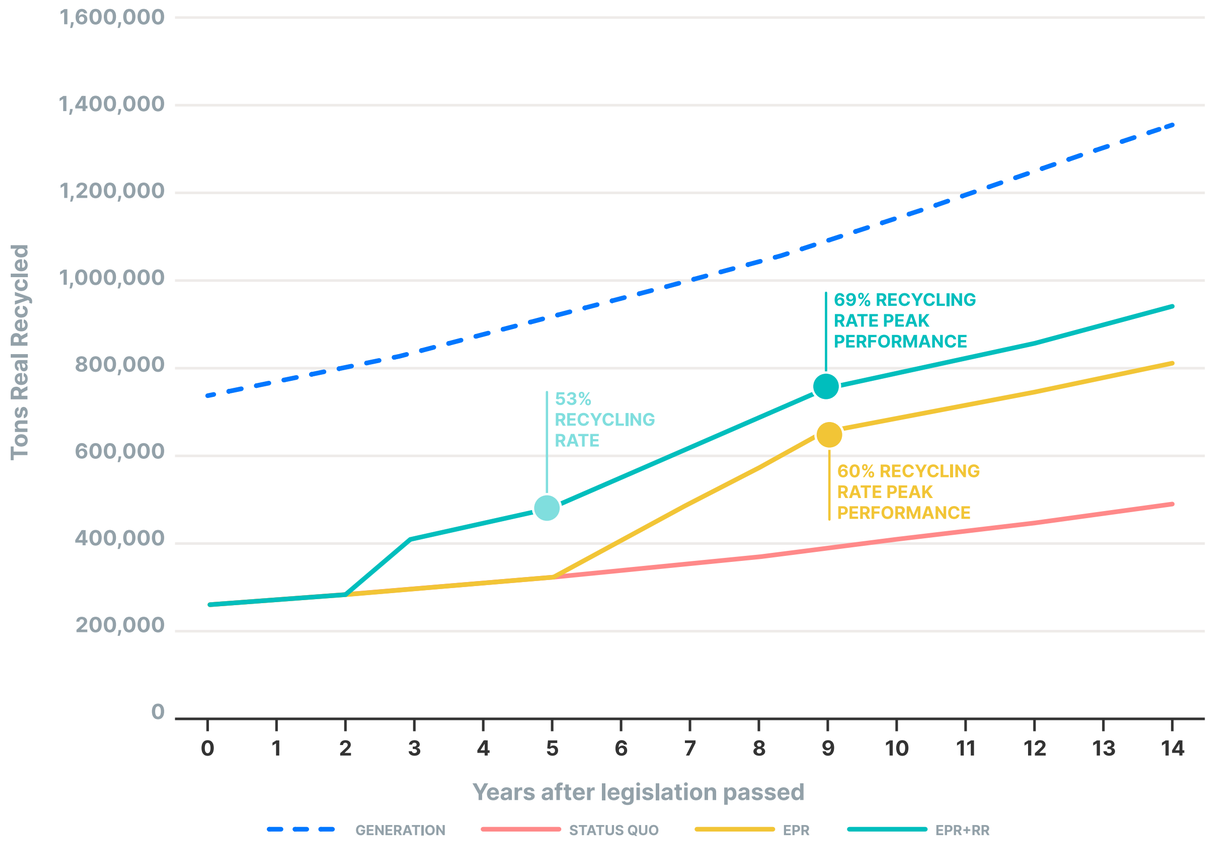


Figure 3.5

Recycling of Packaging (with FFP) under Various Policies

MATERIAL CAPTURE

Figure 3.6 displays the impact different policy scenarios will have on recycling rates with excluding FFP. The data suggests that implementing EPR alone is expected to take around nine years to achieve its maximum recycling rates, reaching approximately 59%.

However, when EPR is coupled with RR, a more rapid increase in recycling rates may be achieved, hitting a 62% recycling rate by the fifth year, a significant improvement from the baseline rate of 26%. Collectively, the combined implementation of EPR and RR is forecasted to reach a 79% recycling rate within the initial nine years of deployment.

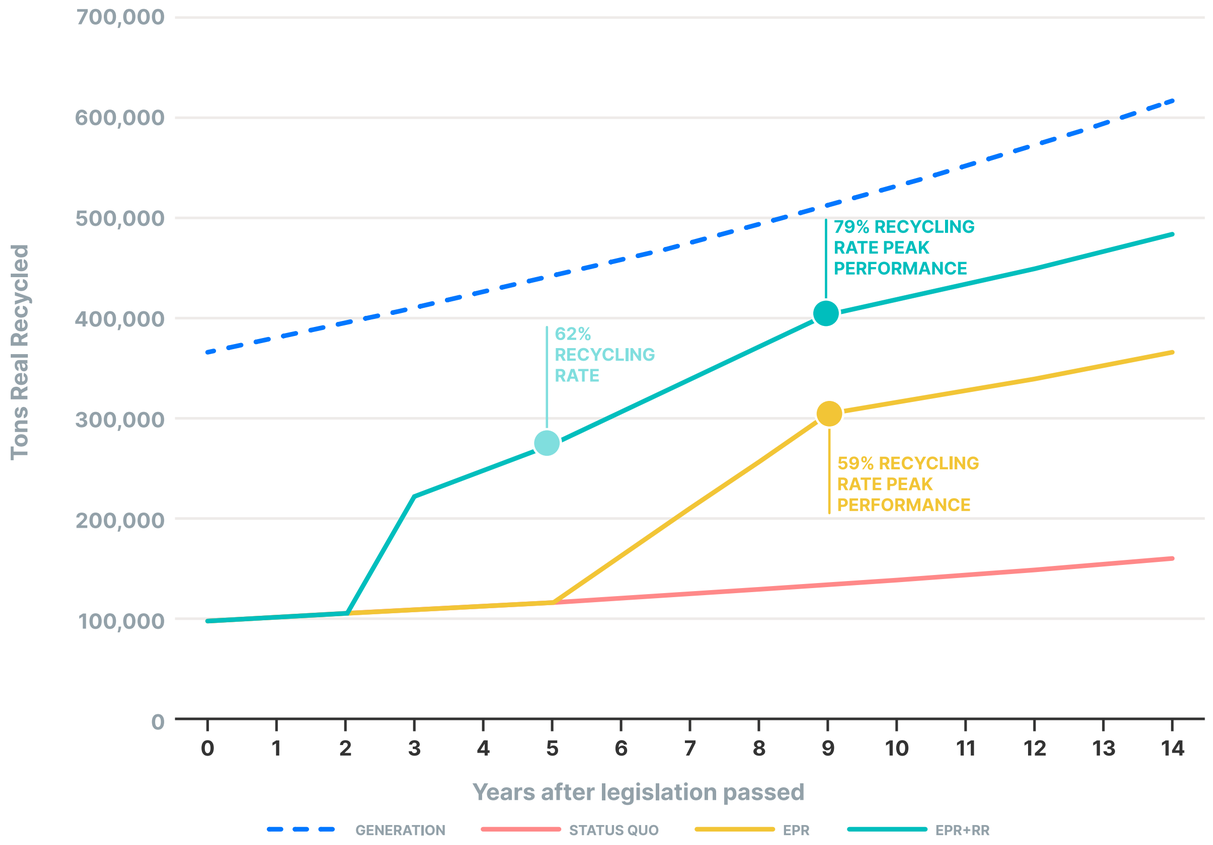


Figure 3.6

Recycling of Packaging (without FFP) under Various Policies

MATERIAL CAPTURE

Figure 3.7 models how different policy scenarios will impact beverage container recycling rates. EPR alone is expected to take nine years to achieve its maximum recycling rates, hovering at approximately 62%.

However, when EPR is combined with RR, there is a notable acceleration in recycling rates, reaching 90% by the fifth year, a substantial leap from the baseline rate of 30%. Together EPR and RR are projected to result in a 94% recycling rate within the initial nine years of deployment.

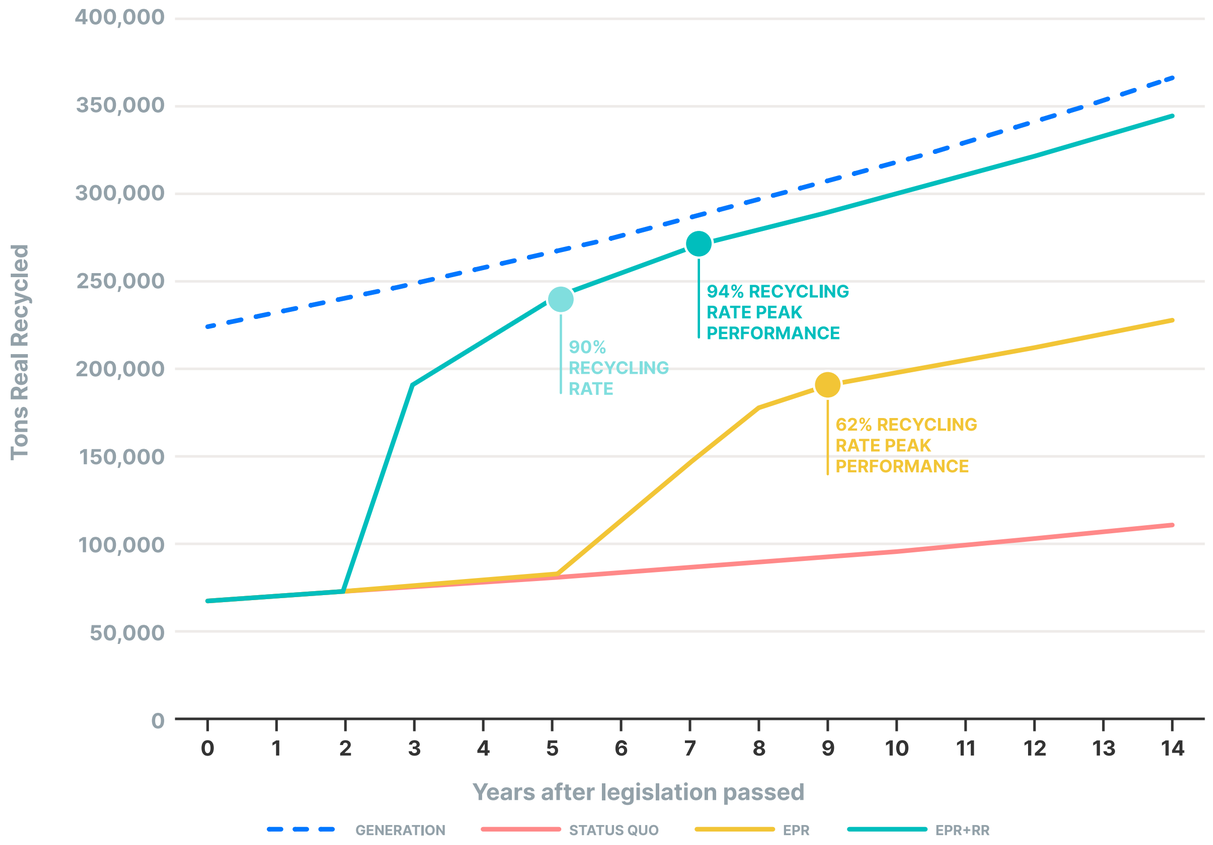


Figure 3.7

Impact of EPR and Recycling Refunds on Beverage Container Recycling

MATERIAL CAPTURE

EPR could to recycle 2.2 million additional tons of residential packaging including FFP, a total of 7.7 million tons over 15 years. This reflects a 40% increase compared to the baseline. However if EPR and RR are implemented together, these systems collectively recycle a total 9.1 million tons (an additional 1.4 million tons compared to EPR alone), demonstrating a 66% increase over the baseline.

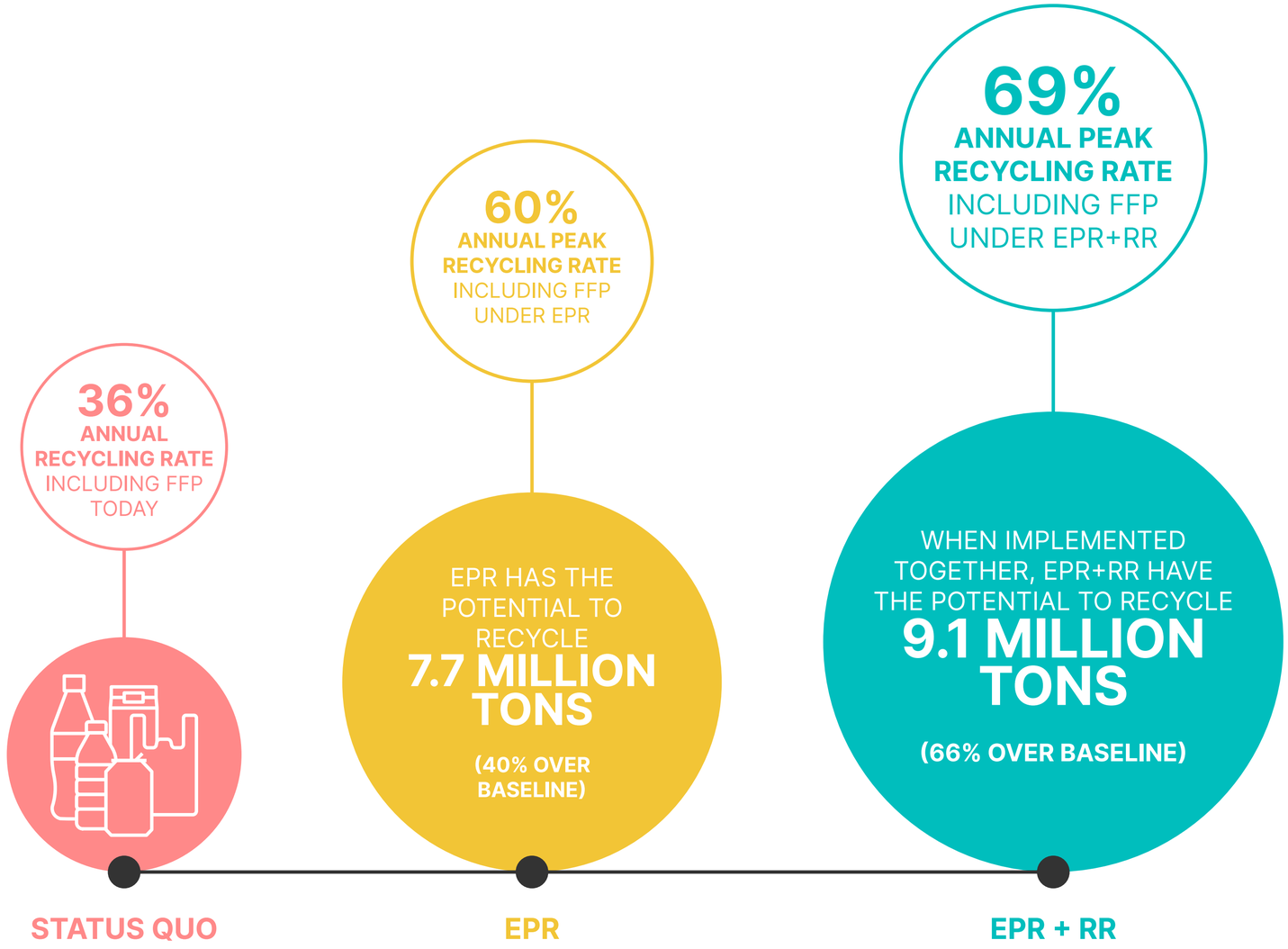


Figure 3.8

Impact of Policy on Cumulative Tons Recycled over 15 years (Including FFP)

MATERIAL CAPTURE

Excluding FFP, EPR could recycle 1.4 million additional tons of residential packaging, a total of 3.3 million tons over a 15-year period. This a 74% increase compared to the baseline. However if EPR and RR are implemented together, these systems collectively recycle a total 4.7 million tons (an additional 1.4 million tons compared to EPR alone), to achieve even more substantial 151% increase compared to the baseline.

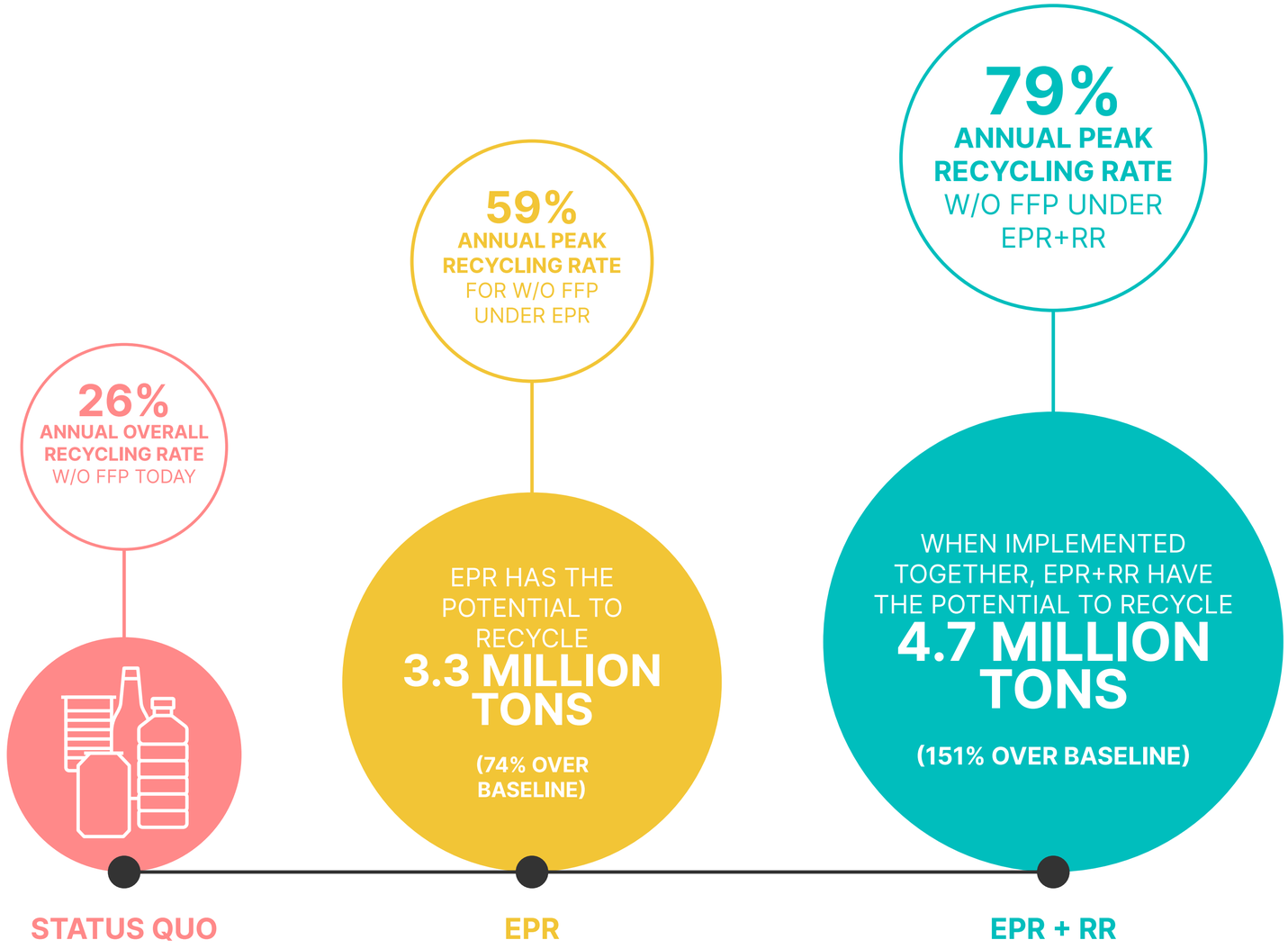


Figure 3.9

Impact of Policy on Cumulative Tons Recycled over 15 years (Excluding FFP)

MATERIAL CAPTURE

EPR alone can recycle 825 thousand additional tons of beverage containers, a total of 2.1 million tons over 15 years, achieving a 63% increase compared to the baseline. However if EPR and RR are implemented together, these systems collectively recycle a total 3.6 million tons (an additional 1.4 million tons compared to EPR alone), to achieve even more substantial 172% increase compared to the baseline.

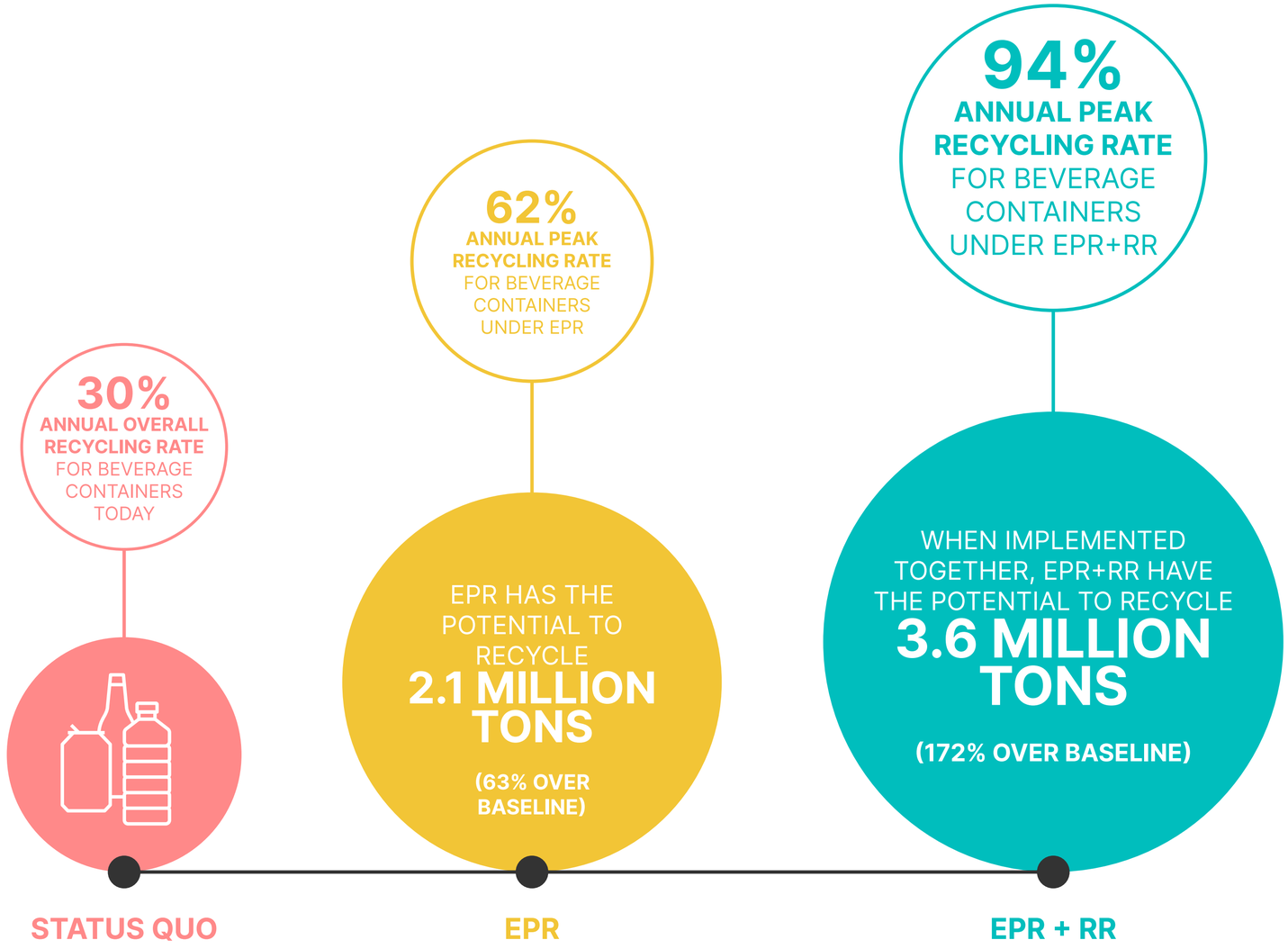


Figure 3.10

Impact of Policy on Cumulative Beverage Container Tons Recycled over 15 years

MATERIAL CAPTURE

CLOSED-LOOP RECYCLING IMPACTS

RR collection systems typically reduce the contamination of the material stream. This allows for higher-quality recycled content, which increases closed-loop recycling for beverage containers. At full implementation, EPR improves the amount of beverage container recycling in a closed-loop process by approximately 85,400 tons (111% over the status quo). EPR + RR increases this amount by 229,600 tons (3x the status quo) due to greater capture rates for beverage containers under RR and the addition of commercial beverage container tonnage. EPR+RR would be the best policy solution to enable companies to achieve the recycled content requirements set-forth by SB 5022.

Figure 3.12

Closed Loop Recycling Under Different Policy Scenarios

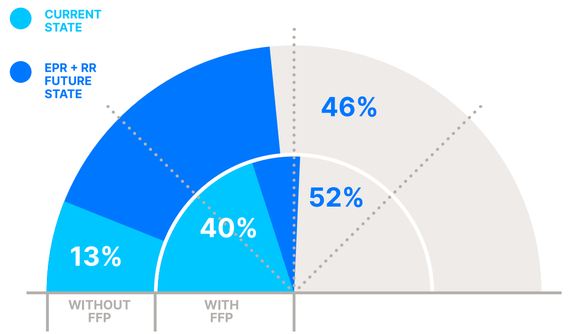
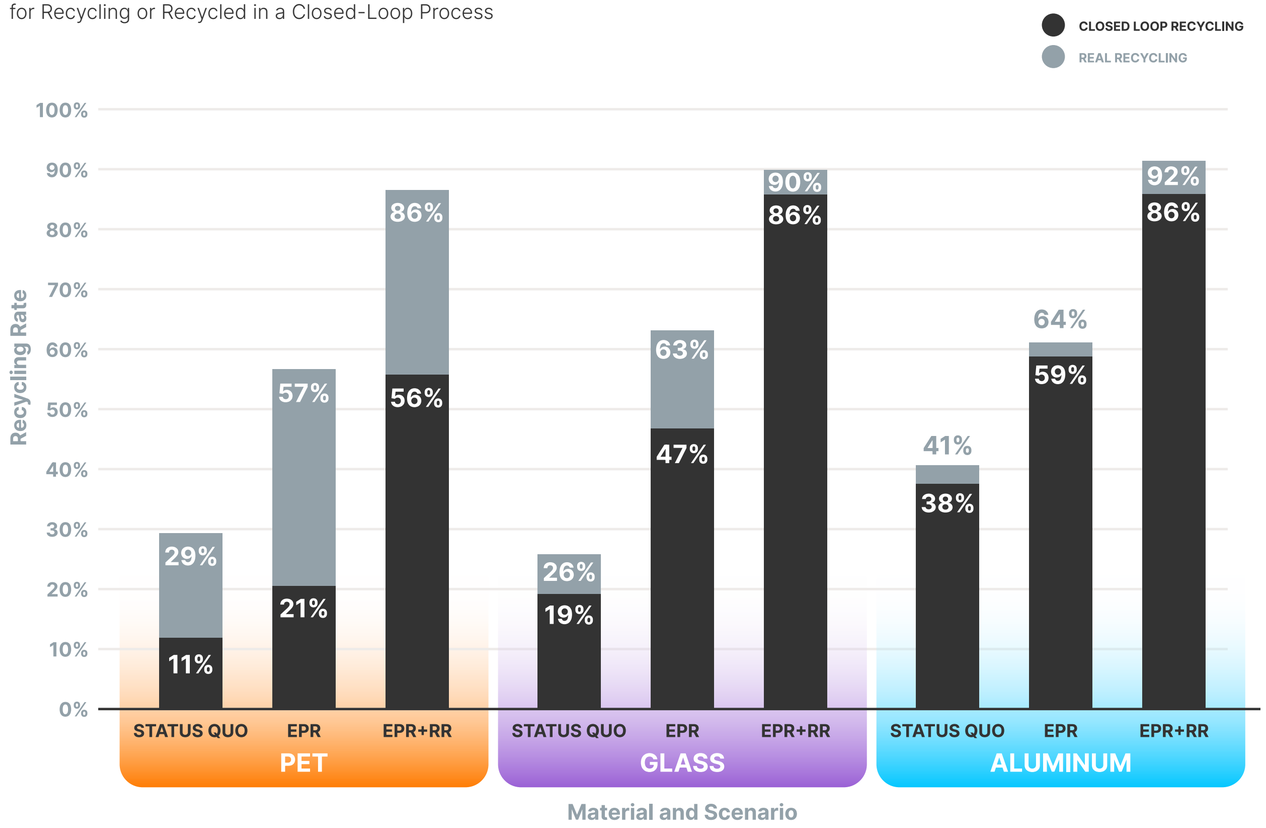


Figure 3.11

Amount of Packaging Sold into the Market that is Sorted for Recycling or Recycled in a Closed-Loop Process



ECONOMY

STAKEHOLDER BENEFITS

- **Increased Economic Opportunity for Operators:** Producer-funded investment in recycling infrastructure provides operators with the means to handle a higher volume of materials efficiently, increasing revenues and associated profits, creating job opportunities and stimulating economic growth within the waste management industry. Additionally, operators can assume multiple roles across the RR and EPR system providing opportunities for new revenue streams. In Washington, MRFs would see a material revenue increase of $12 million under an EPR + RR scenario, as well as potentially adding $11-23 million in tipping fees. EPR systems can also ensure long term contracts for MRFs, thus removing some of the inherent variability in relying on scrap prices.
- **Cost Benefits for Producers:** Implementing EPR with RR would increase the quantity of high-quality material available to be recycled into high-quality recycled materials. This increase in supply could, over time, reduce the cost for producers to purchase this material for re-manufacturing.
- **Financial Relief for Communities and Local Governments:** Communities can reduce or eliminate the need for expensive waste management services. Municipalities are relieved of paying for recycling services, potentially leading to savings of $245 million annually.

ECONOMY

Figure 3.13 models the effects of various policy scenarios on the material value obtained from recycling. Including FFP at full implementation, together EPR with RR can capture up to $149 million in material value that might otherwise be sent to landfill. This is $82 million increase than the baseline and $47 million more than with EPR alone.

Figure 3.13

Material Value Capture Under Different Systems (1000 $) with FFP

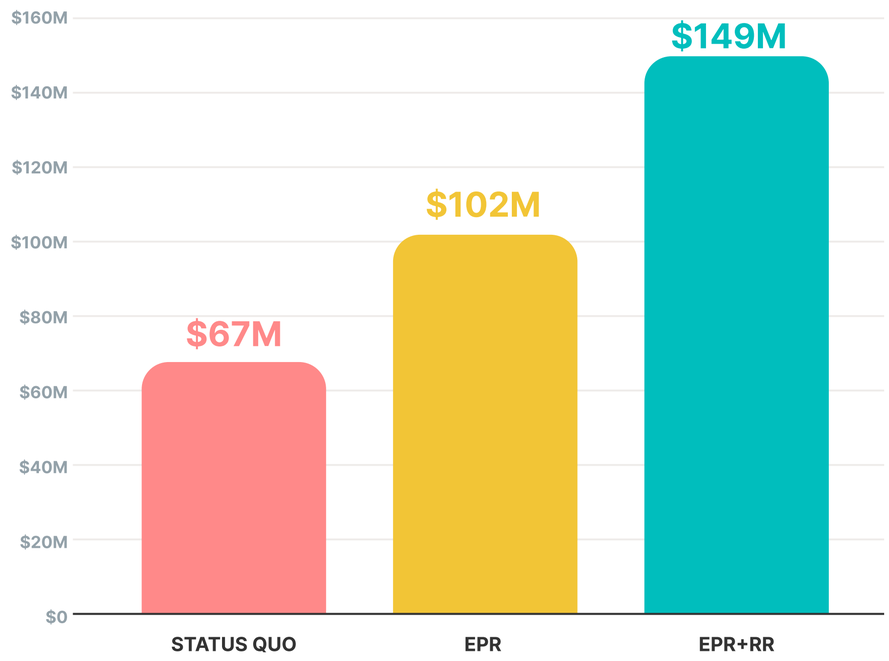
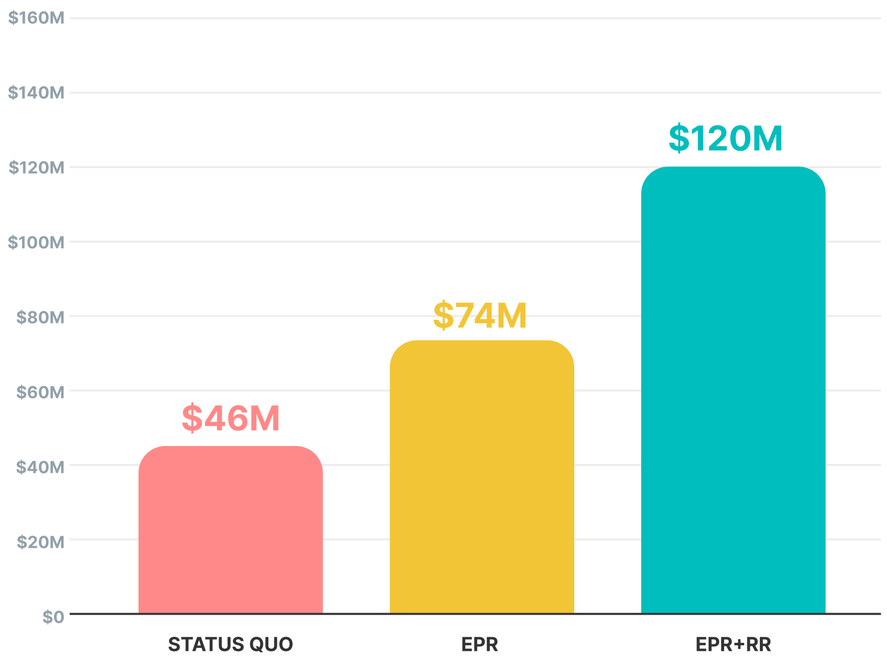


Figure 3.14 models the effects of various policy scenarios on the material value obtained from recycling excluding FFP. At full implementation, EPR with RR has the potential to capture up to $120 million in material value, excluding FFP. This marks a $74 million increase compared to the baseline and a $46 million improvement compared to EPR alone.

Figure 3.14

Material Value Capture Under Different Systems (1000 $) without FFP



ECONOMY

SUPPORTING ECONOMIC GROWTH: EPR AND RR CONTRIBUTE AN ADDITIONAL $1.2 BILLION TO THE ECONOMY.

The introduction of EPR alongside RR can generate over 8,400 jobs in Washington. These employment opportunities encompass diverse aspects of the recycling system, including collection, sortation, and management. Beyond direct jobs, the economic impact of these employment opportunities extends further with indirect and induced jobs resulting from the increased economic activity (Table 3-4). Notably, the economic stimulation from the combined RR and EPR system translates to an additional Gross Value Added (GVA) of over $550 million than EPR alone.

Implementing these policies in tandem provides economic benefits as infrastructure can be shared. Nowhere in the U.S. have these policies been passed at the same time. Therefore, there is an opportunity to build infrastructure together from the ground up, and by sharing infrastructure, costs can be reduced overall. Unredeemed deposits emerge as a critical funding source for transitioning to EPR+RR and establishing robust waste management infrastructure, as section 312 of the WRAP Act outlined. This legislation would ensure that investments in waste management infrastructure pave the way for a comprehensive and efficient recycling approach. The overall system becomes more cost-effective and viable by embracing the concept of sharing infrastructure among various stakeholders, such as leveraging curbside collection or depots for redemption purposes.

Table 3.3 Jobs Created Through Different Systems

JOB CATEGORY	ESTIMATED JOBS FROM CURRENT RESIDENTIAL RECYCLING SYSTEM	ESTIMATED JOBS FROM EPR	ESTIMATED JOBS FROM EPR + RR
DIRECT	1,500	2,200	3,400
INDIRECT AND INDUCED	2,400	3,400	5,000
TOTAL	3,900	5,600	8,400

**Note numbers may not add due to rounding

Table 3.4 Gross Value Added Through Different Systems

GVA CATEGORY	GVA FROM CURRENT RECYCLING SYSTEM	GVA FROM EPR	GVA FROM EPR + RR
DIRECT GVA ($M)	200	290	510
INDIRECT GVA ($M)	170	240	420
INDUCED GVA ($M)	130	180	330
TOTAL ($M)	500	700	1,250

CLIMATE

MEETING CLIMATE TARGETS: INCLUDING FFP- EPR AND RR DELIVER A 23% DECREASE IN PACKAGING EMISSIONS.

In 2020, Washington set GHG emission targets in the Climate Commitment Act (CMA), which aims to reach 45% below 1990 levels (93.5 MMT CO2e) by 2030, and net-zero emissions by 2050.[28, 29] As shown in Figure 3.15 EPR + RR combined policy approach holds the potential to aid Washington in achieving its goals with a reduction of approximately 0.4 million metric tons associated with the generation, recycling and landfilling of residential packaging. This is a 23% reduction compared to current emissions of 1.7 million MTCO2e. This surpasses the GHG reduction that EPR alone could accomplish by approximately 200,000 MTCO2e, the equivalent impact of removing an additional 44,506 gasoline-powered passenger vehicles from the road for one year.[30]

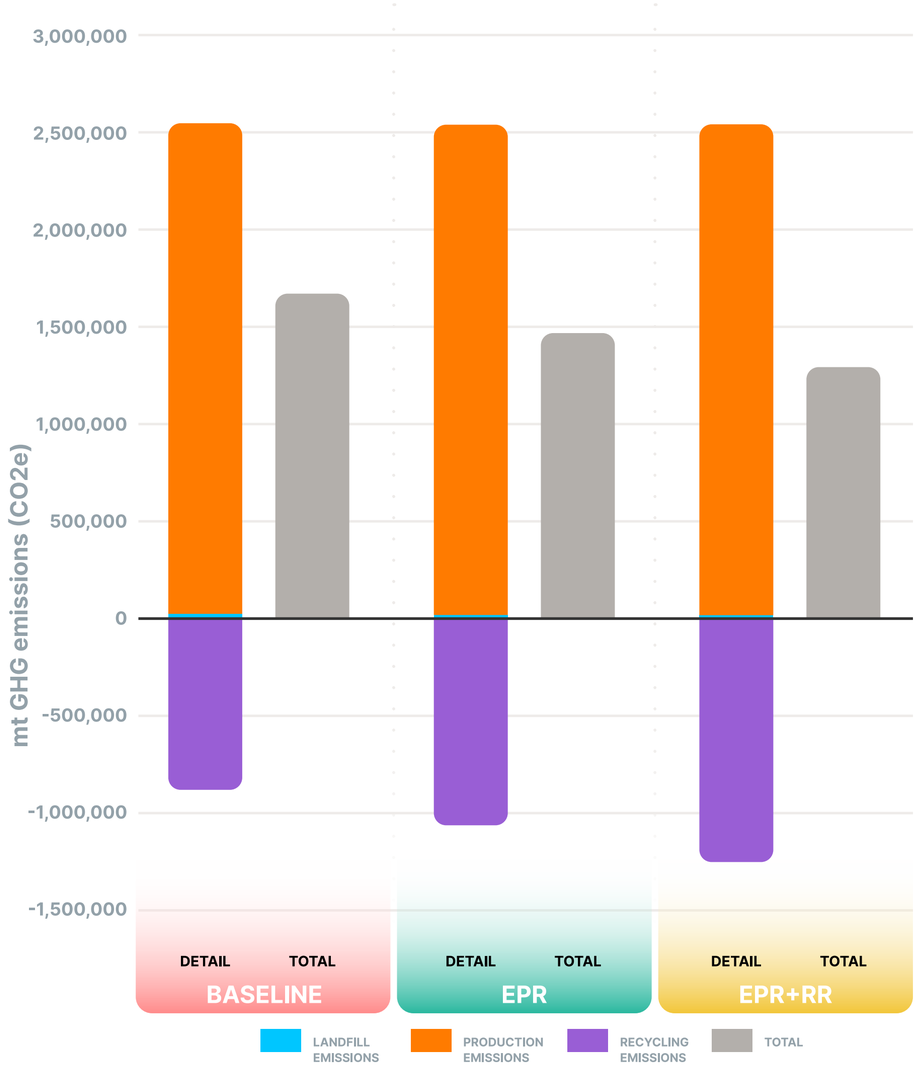


Figure 3.15
Packaging Emissions by Lifecycle Stage and Scenario (Including FFP)

CLIMATE

MEETING CLIMATE TARGETS: EXCLUDING FFP - EPR AND RR AID IN REDUCING PACKAGING RELATED EMISSIONS BY 70%.

As displayed in Figure 3.16 the implementation of EPR coupled with RR has the potential to curtail emissions linked to the creation, recycling, and landfilling of packaging materials by 196 thousand MTCO2e associated with the generation, recycling and landfilling of residential packaging. This is a 70% reduction compared to current emissions of 282 thousand MTCO2e. This surpasses the GHG reduction that EPR alone could accomplish by approximately 111 thousand MTCO2e.

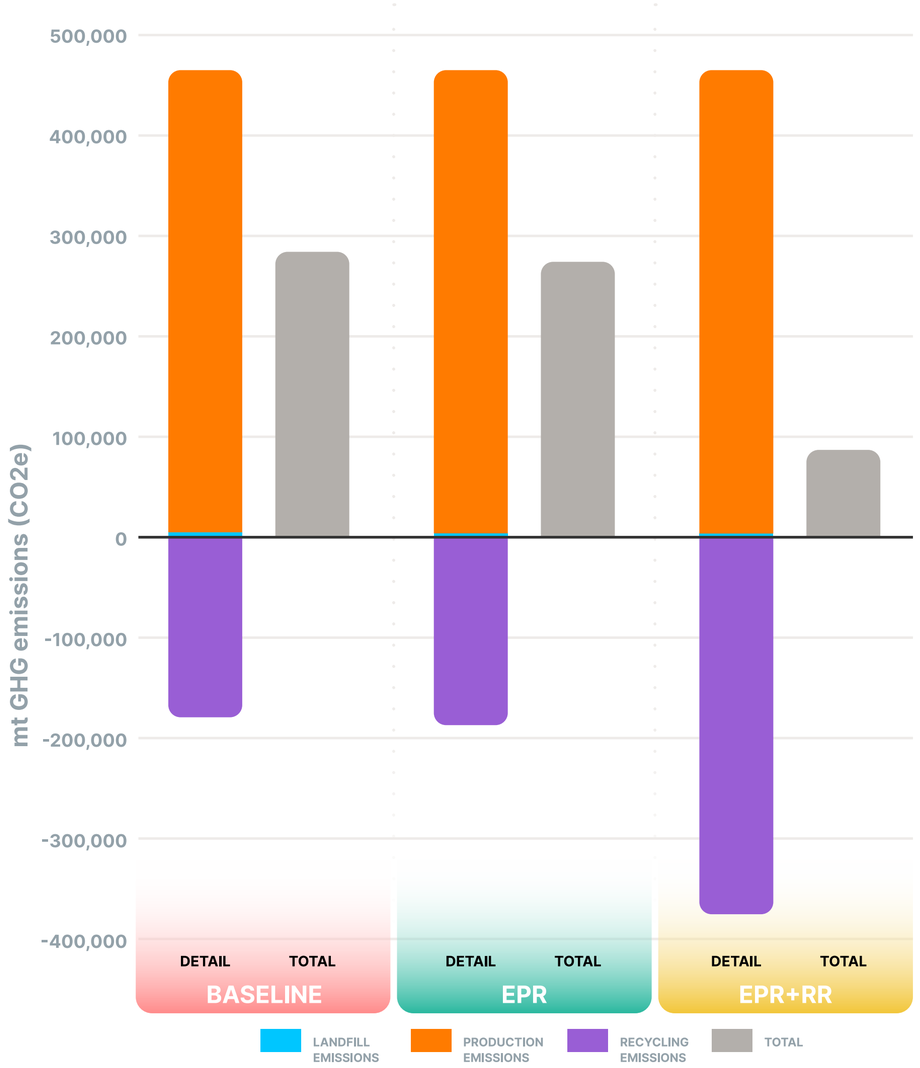


Figure 3.16
Packaging Emissions by Lifecycle Stage and Scenario (Excluding FFP)

CLIMATE

STAKEHOLDER BENEFITS

- **Promoting a Clean Environment:** Emphasizing the sharing of infrastructure in the recycling sector fosters a more climate-friendly approach that reduces carbon emissions and minimizes the environmental impact associated with waste management.
- **Empowering Haulers to Meet Climate Goals:** Increased investment in the recycling system with more households served will allow revenue generated through efficient recycling practices allows haulers to invest in sustainable initiatives such as electric or low-emission fleets.
- **Enhancing Material Recovery Facilities (MRFs):** Investments in advanced and more efficient infrastructure limit loss and waste during the recycling process, effectively decreasing GHG emissions and resource consumption.

The substantial decrease in GHG emissions when including RR is mainly attributable to additional commercial beverage containers that are captured by the system. One climate-friendly aspect of the merged system lies in the sharing of infrastructure. By integrating EPR and RR, stakeholders can harness the full potential of existing facilities, eliminating the need for redundant centers and unnecessary transportation. This streamlined approach curtails GHG emissions associated with materials processing, resource consumption and logistical transportation, leaving a lighter carbon footprint on our environment.

CASE STUDY

WASHINGTON

CURRENT STATE OF RECYCLING

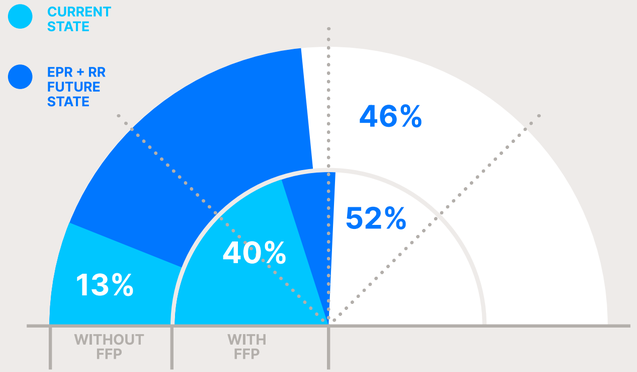
- In 2021, Washington recycled approximately 25% of packaging materials without FFP. This recycling performance increases to 46% when considering materials with FFP.
- The value of the material captured for recycling was $69 million, just 47% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 2 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

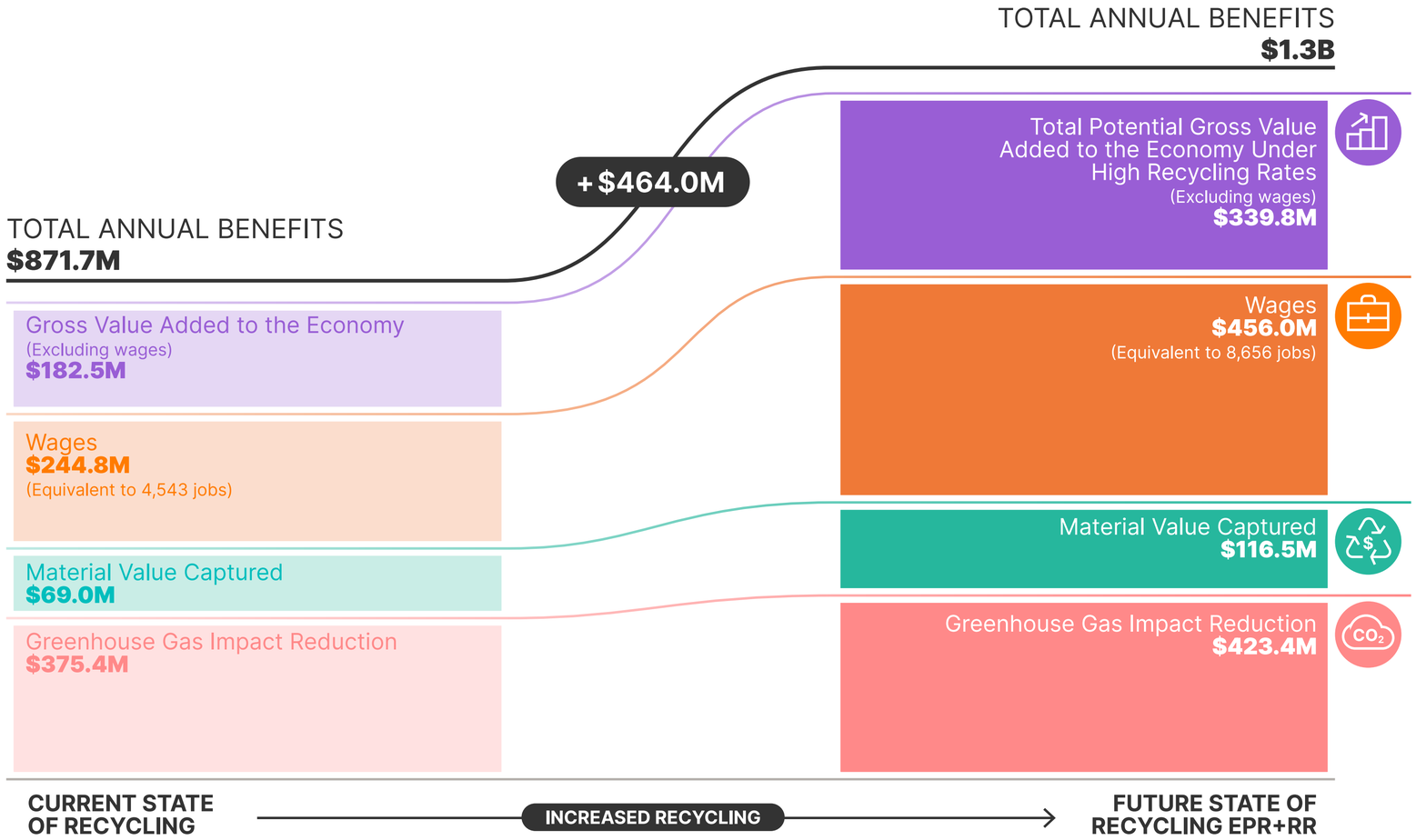
- Increase recycling related jobs from 4,500 to 8,700.
- Place $117 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.2 million MTCO2e annually.

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



EQUITY

EPR AND RR PRESENT AN OPPORTUNITY FOR MORE EQUITABLE WASTE MANAGEMENT.

STAKEHOLDER BENEFITS

- **Achieving Universal Recycling Access:** Introducing 100% access to recycling services ensures that no one is excluded in the effort to recycle responsibly, in addition to providing diverse return opportunities.
- **Equitable Economic Opportunities:** Creating low-barrier work opportunities within the sector ensures that community members from vulnerable backgrounds can actively participate and benefit from the recycling system.
- **Improved Welfare through Litter Reduction:** A decrease in litter, facilitated by robust recycling initiatives, enhances the overall welfare of communities.

Presently, ~11% percentage of households in Washington lack easy access to recycling.[31] A well-designed recycling ecosystem should not only support clean communities, but also provide equal opportunities for all.

These locations can be shared with drop-off locations for some difficult to recycle materials under EPR, such as plastic film. It is imperative that these locations are sited at or near convenient locations that consumers may already travel to such as grocery stores, schools, or libraries. This allows people with different preferences to recycle materials through various options, thus encouraging broader participation in recycling efforts. Additionally, since RR can be implemented faster than EPR, the communities without current recycling access will have opportunities to recycle sooner with RR than with EPR alone. Another form of collection that could serve to reduce opposition to participation is Reverse Vending Machines (RVMs). For instance, these can be strategically placed in public housing buildings to offer onsite return and same day refunds. This could be further supported by the increase in on-the-go returns placed more densely in low-income communities to reduce the challenge of carrying waste throughout the day.

According to a recent survey in Washington, 80% of people with incomes under $50.000 annually are supportive of RR.[32] Although there is support for RR across all income groups, to address equity concerns associated with deposit infrastructure, specific measures should be taken to alleviate any additional burden on overburdened communities. One potential approach, presented in the report “Container Deposit Study” for Washington’s Responsible Recycling Task Force (RRTF) that could be further studied is called a “deposit holiday”, where producers cover deposit fees for the first week to support low income consumers. In theory, consumers could purchase in-scope beverages during this first week without paying the deposit fee, but still receive the refund when they return the containers. This idea could be especially impactful for low-income households, removing their financial barriers to entry and ensuring inclusivity in the new recycling system.

EQUITY

Moreover, grocery stores and retailers could also participate in the system by offering coupons in addition to the deposit, or vouchers that allow consumers to redeem the value of the deposit at the grocery store for a larger amount, e.g., an extra 20%, while also increasing consumer foot traffic and sales.[33]

RR also creates low-barrier work opportunities, as individuals can collect discarded or littered containers and redeem them. This is especially beneficial for those who may lack alternative sources of income generation, but also benefits individuals who may collect containers in their spare time to increase their incomes. RR programs can recognize and support these efforts by collaborating with these communities when drafting legislation. Additionally, as infrastructure is implemented, stakeholders can collaborate with the informal collection sector to empower their access to materials that can be redeemed for a deposit.

Furthermore, RR policies enable waste management stakeholders to give back to local initiatives. For example, rather than have their deposit returned to them, consumers can choose to donate their deposit to a local program. Lastly, RR implementation contributes to a decrease in litter, particularly in vulnerable communities with inadequate waste management infrastructure, improving the cleanliness and livability of these areas.

3.3 COLORADO: EXAMINING THE POTENTIAL OF IMPLEMENTING RECYCLING REFUNDS ALONGSIDE EXTENDED PRODUCER RESPONSIBILITY TO ACHIEVE MAXIMUM MATERIAL RECOVERY

KEY BENEFITS TO IMPLEMENTING RR ALONGSIDE EPR IN COLORADO:

- **Material Capture:** EPR is expected to boost recycling by 5.1 million tons of residential packaging material over a 15-year period. Implementing RR would contribute a further 3.9 million tons of beverage container material from residential and commercial sectors.
- **Economy:** The creation of 9,500 jobs and approximately $148 million in material value captured from the residential sector and commercial beverage containers.
- **Climate:** Reduce 32% of current emissions from packaging materials (530,000 MTCO2e). RR represents approximately 29,000 MTCO2e of this decrease, in part due to additional material coming from covering commercial beverage containers too.
- **Equity:** Provide residents maximum access to recycling services, diverse return options to meet varying consumer preferences, and shared infrastructure to support innovation such as implementing reuse and refill programs.

Colorado is currently ranked 41st on the 50 States ranking for recycling packaging materials, not including FFP at 11%.

In June 2022, Colorado enacted the Producer Responsibility Program for Statewide Recycling Act (HB 22-1355). The statute requires companies that sell products in packaging, paper products and food service ware to fund a statewide recycling program for these materials. The legislation seeks to establish a sustainably funded and centralized system for managing recycling that increases recycling access and recycling rates for packaging.

Notably, Colorado is the sole state thus far to implement EPR legislation without an existing recycling refund system in place. This makes it an interesting case study for the impact of EPR, especially as Washington and other states without RR look to establish their own EPR legislation and infrastructure.

For this case study, Eunomia modeled the impact of EPR-only compared to implementing RR alongside the EPR program over a 15-year timeframe to measure the full impact of both policy scenarios. Although EPR in Colorado includes some nonresidential waste generators as covered entities, this analysis focuses only on residential packaging waste. However, the RR analysis does include beverage containers from the residential and commercial sectors.

The economic, environmental and equity impact of implementing these policies together is presented here.

CASE STUDY

COLORADO

11% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #41

RECYCLING RANK 2018 #35

-6

POPULATION
5,811,297

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

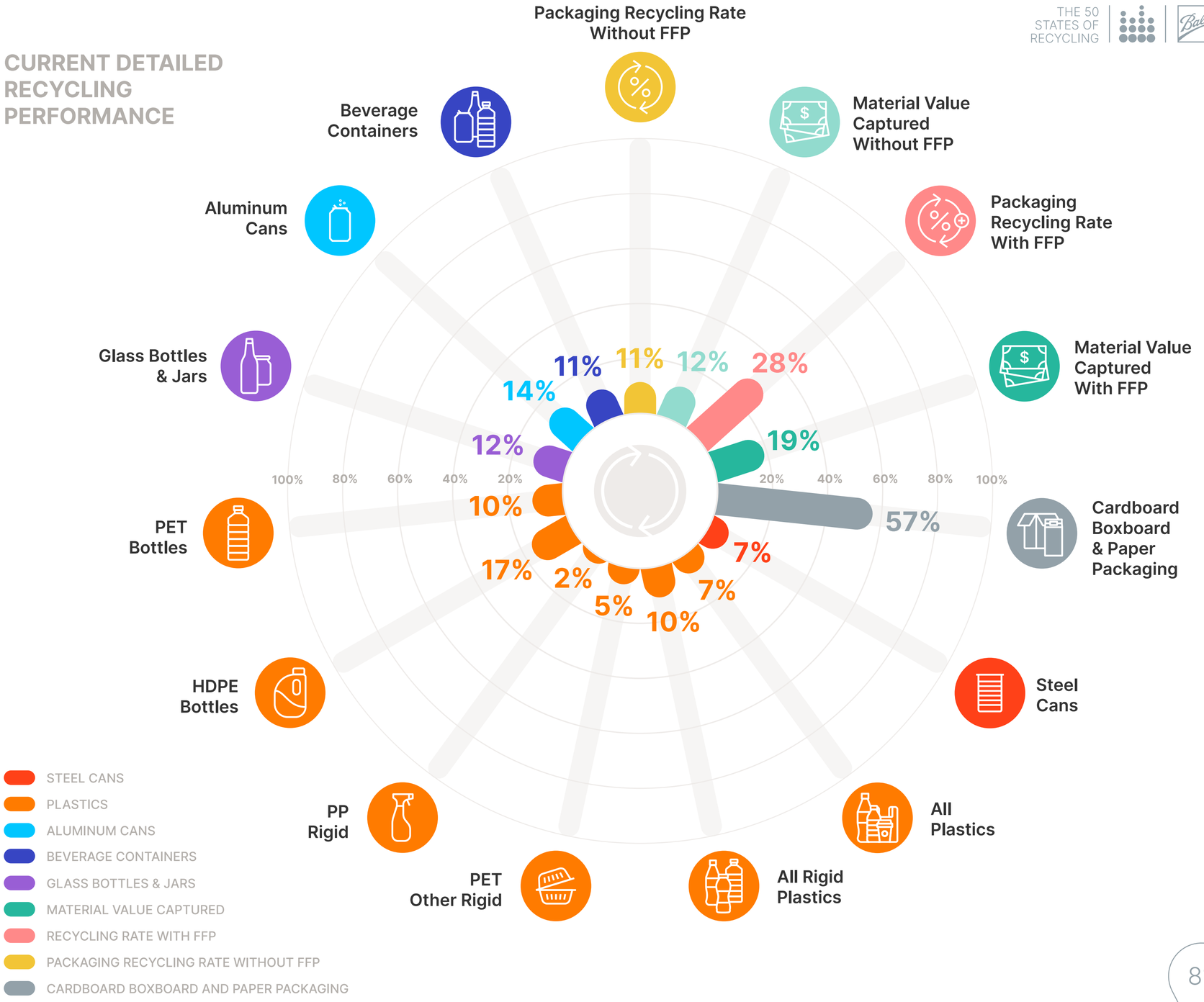
DATA QUALITY

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.

CURRENT DETAILED RECYCLING PERFORMANCE



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%.

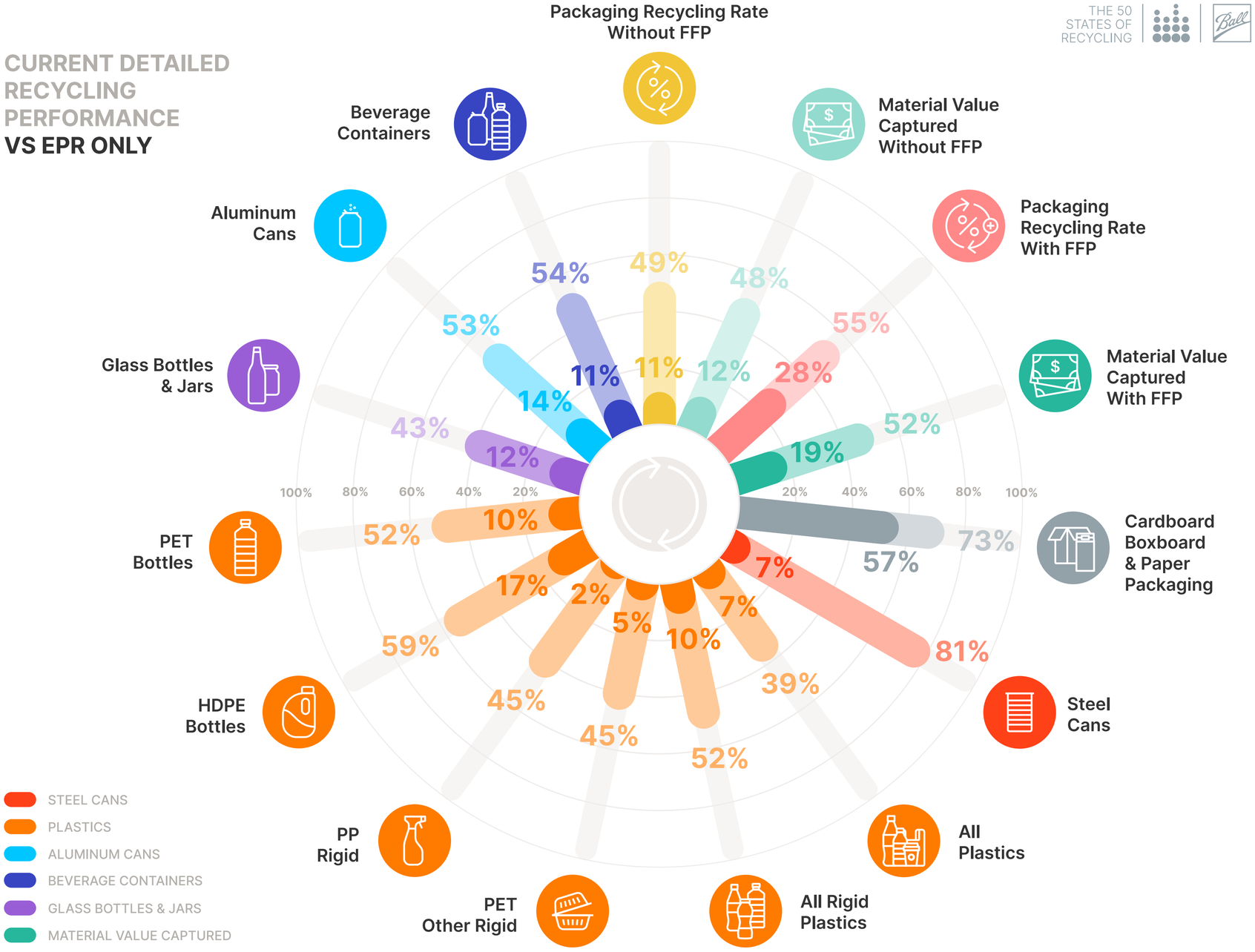
A substantial shift is anticipated for 'All plastic', where the recycling rate is expected to climb from 7% to 39%, showcasing the positive impact of EPR on recycling practices.

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



EPR ONLY | CURRENT STATE

CASE STUDY

COLORADO

82% RECYCLING RATE WITH EPR + RR

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

HIGHLIGHTS

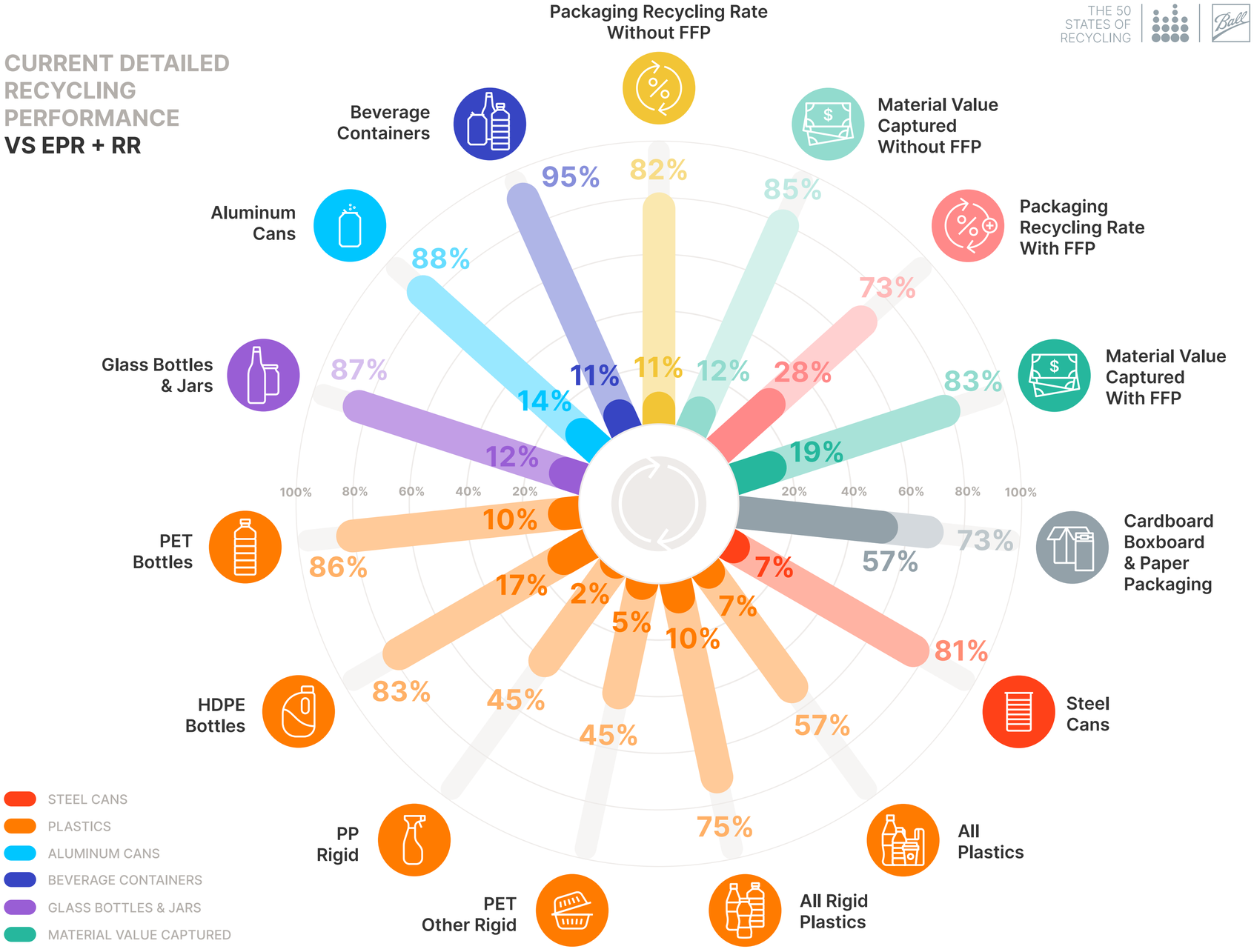
If Colorado implements EPR+RR legislation, recycling rates could see significant improvement compared to 'EPR only.'

- 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 recycling rates from 7% to 57%.
- 'Beverage containers' recycling rates could experience a remarkable boost, rising from 11% to 95%.

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 | CURRENT STATE

MATERIAL CAPTURE

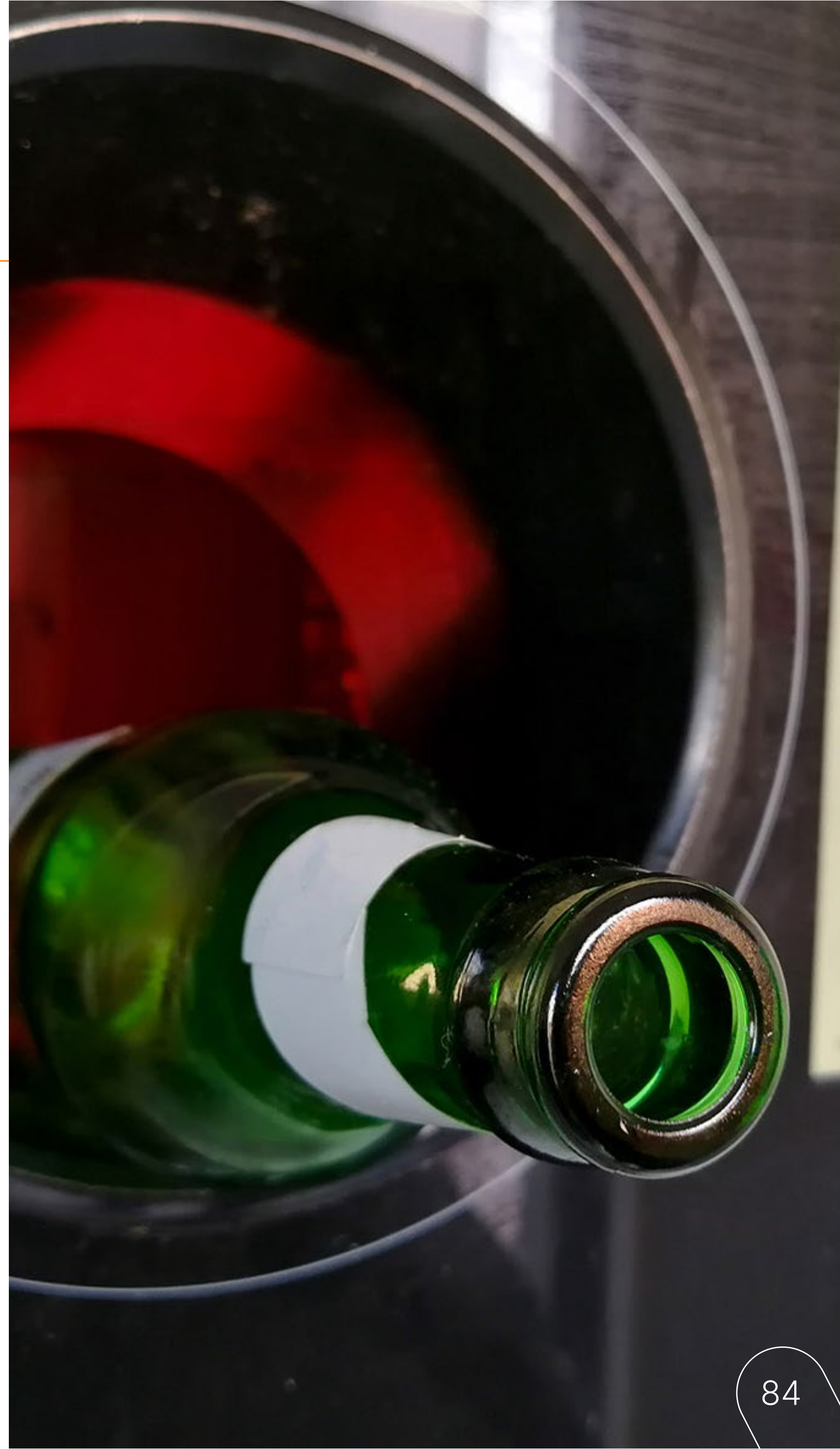
Over 15 years, EPR with RR will collect and recycle 2.8 million more tons of materials than EPR alone. This substantial increase is due to RR programs operating to cover commercial beverage containers as well, compared to EPR which only covers residential in this analysis. Annually, together EPR and RR will enable 369,000 more tons of beverage containers to be recycled and potentially available for closed-loop processes compared to current performance. This additional high quality material would be available for use in the production of new bottles and cans in Colorado and across the U.S.

Time to maximize impact:
EPR+RR can reach maximum collection rates of 90+% within 3-5 years of passing legislation compared to EPR alone, which will deliver increases in other packaging but over a longer timescale (see Figures 3.17-3.19). Figures 3.20-3.22 show the incremental cumulative year-on-year tonnage benefits for EPR coupled with RR over a 15-year timeframe.

STAKEHOLDER BENEFITS

As discussed in the Washington case study, introducing EPR and RR infrastructure:

- **aids municipalities in achieving their recycling and waste reduction goals,**
- **involves consumers in a better recycling system,**
- **increases the volume of higher-quality materials for MRFs to sort, and**
- **increases access to high-quality recycled content for producers.**



MATERIAL CAPTURE

Figure 3.17 displays the impact different policy scenarios could have on recycling rates for packaging including FFP. Over nine years the implementation of EPR alone is estimated to culminate in a peak recycling rate of approximately 52%.

However, when EPR is integrated with RR, the synergy between the two leads to accelerated progress, achieving a 60% recycling rate by the fifth year, significantly surpassing the baseline recycling rate of 26%. By the ninth year, the collaborative implementation of EPR and RR is projected to yield a notable 69% recycling rate.

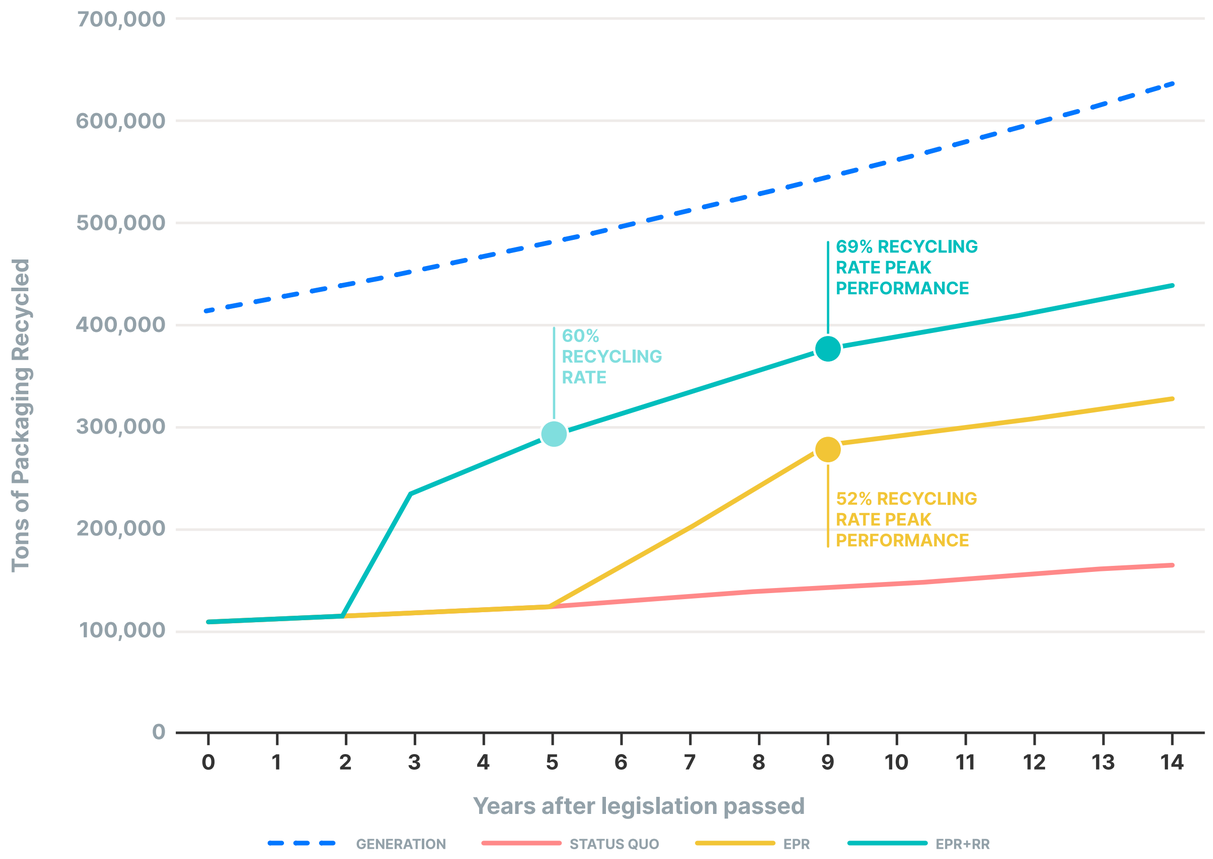


Figure 3.17

Recycling of Packaging (Including FFP) under Various Policies

MATERIAL CAPTURE

Figure 3.18 showcases the potential effects of various policy scenarios on packaging recycling rates, excluding FFP. The data depicted in Figure 3.18 illustrates that EPR independently may take approximately nine years to reach its peak recycling rate of 49%.

However, when EPR is combined with RR, there is a notable acceleration in recycling rates, achieving a 68% recycling rate by the fifth year, a substantial improvement from the baseline rate of 11%. The collaborative implementation of EPR and RR is projected to achieve an impressive 82% recycling rate within the initial nine years of deployment.

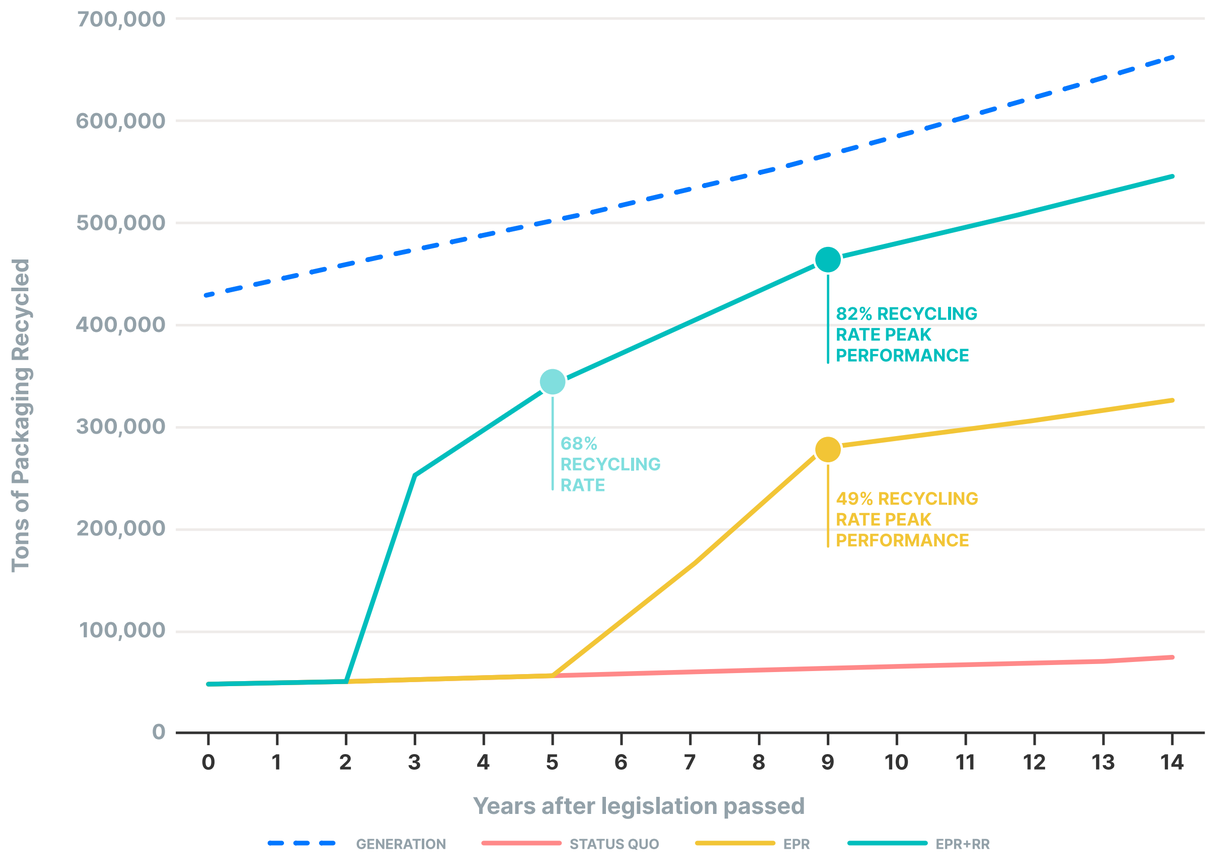


Figure 3.18

Recycling of Packaging (Excluding FFP) under Various Policies

MATERIAL CAPTURE

Figure 3.19 underscores the notable impact of recycling legislation on beverage containers. When considering EPR alone, it may take roughly nine years to reach its peak recycling rates, plateauing at around 54%. EPR with RR yields higher recycling rates more quickly, achieving a 78% recycling rate by year five compared to baseline at 11%. Together EPR and RR will achieve a 95% recycling rate within the initial nine years of implementation.

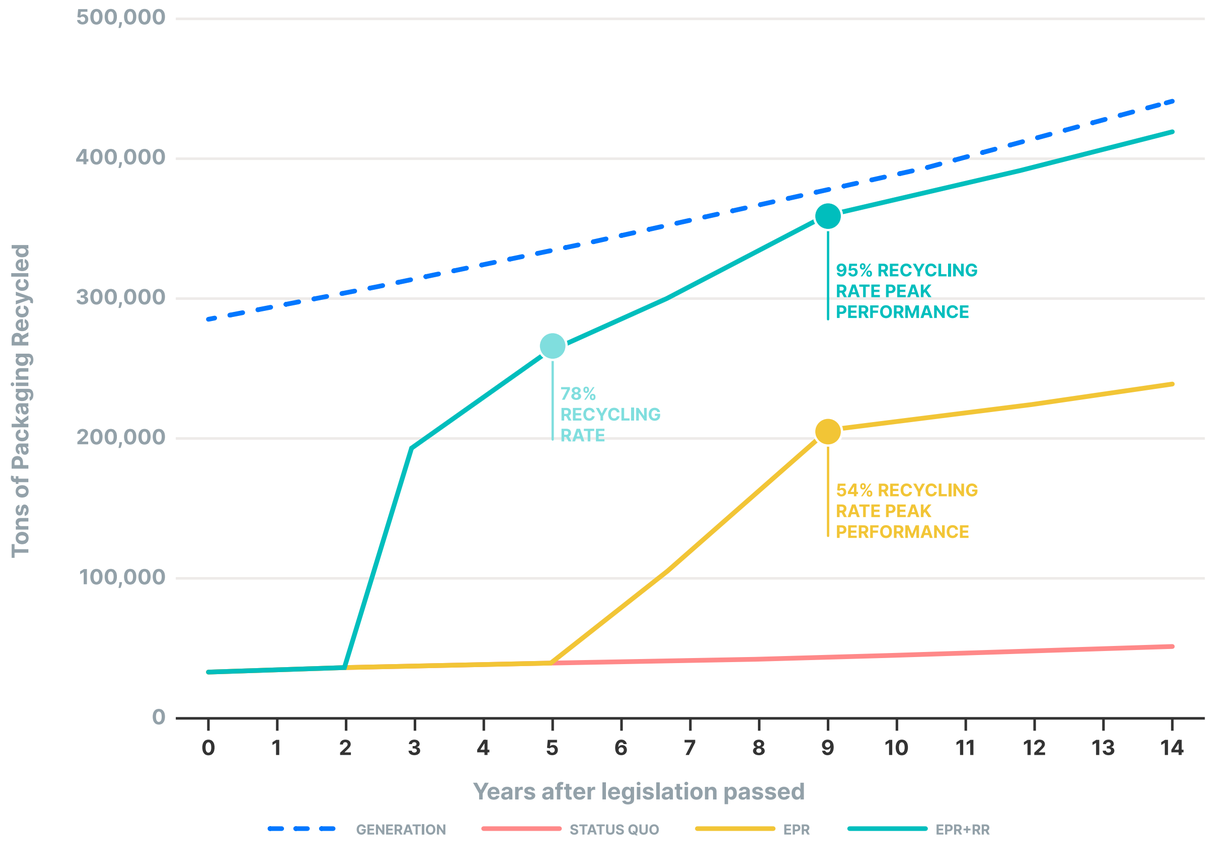


Figure 3.19

Recycling of Beverage Containers under Various Policies

MATERIAL CAPTURE

EPR could recycle 2.2 million additional tons of residential packaging including FFP, a total of 6.2 million tons over 15 years. This reflects a 56% increase compared to the baseline.

However if EPR and RR are implemented together, these systems collectively recycle a total 9 million tons (an additional 2.8 million tons compared to EPR alone), demonstrating a 126% increase over the baseline.

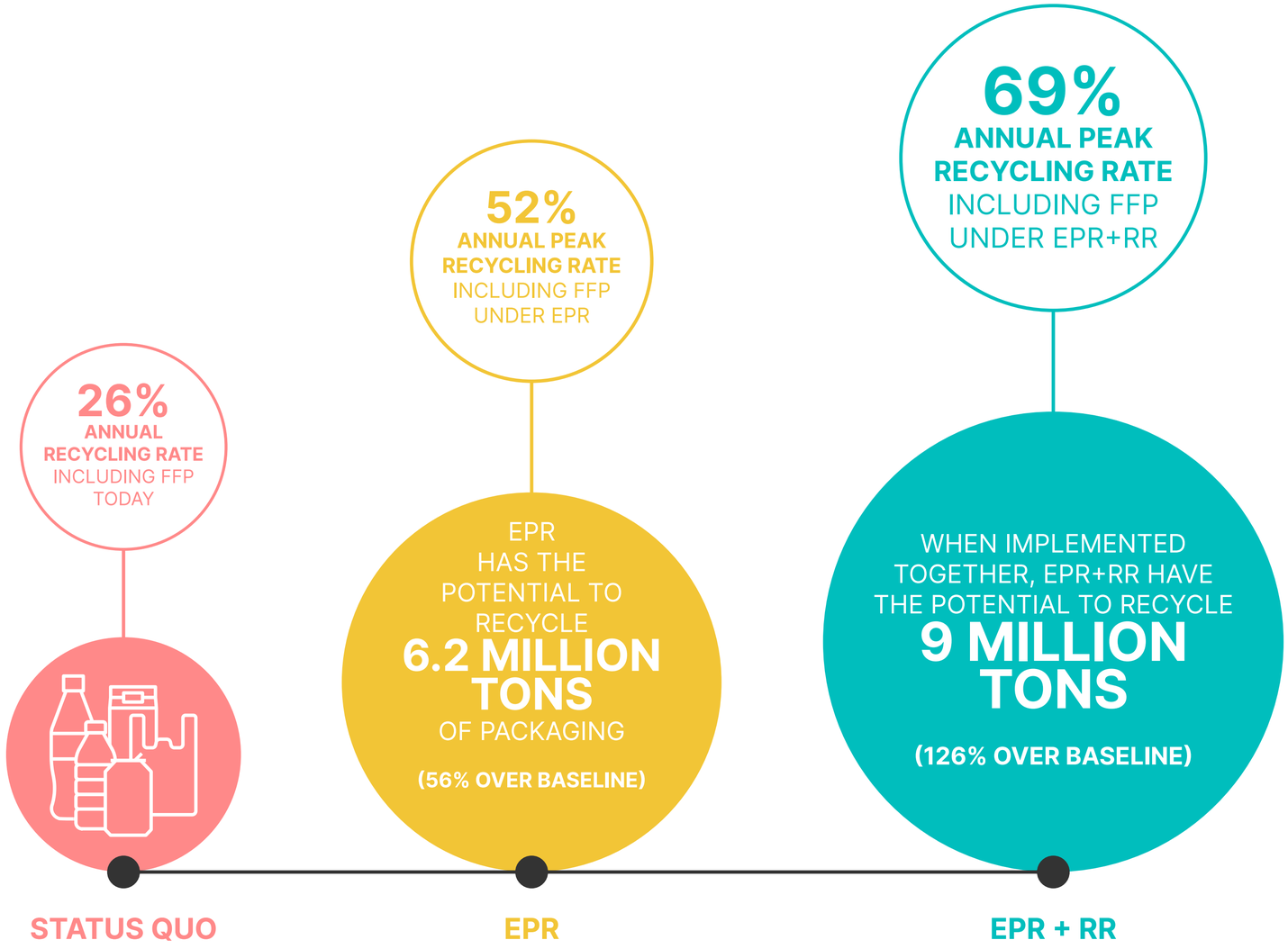


Figure 3.20

Impact of Policy on Cumulative Tons Recycled Packaging over 15 years (Including FFP)

MATERIAL CAPTURE

EPR could recycle 1.7 million additional tons of residential packaging excluding FFP, a total of 2.7 million tons over 15 years. This reflects a 197% increase compared to the baseline.

However if EPR and RR are implemented together, these systems collectively recycle a total 6.3 million tons (an additional 3.6 million tons compared to EPR alone), demonstrating a 599% increase over the baseline.

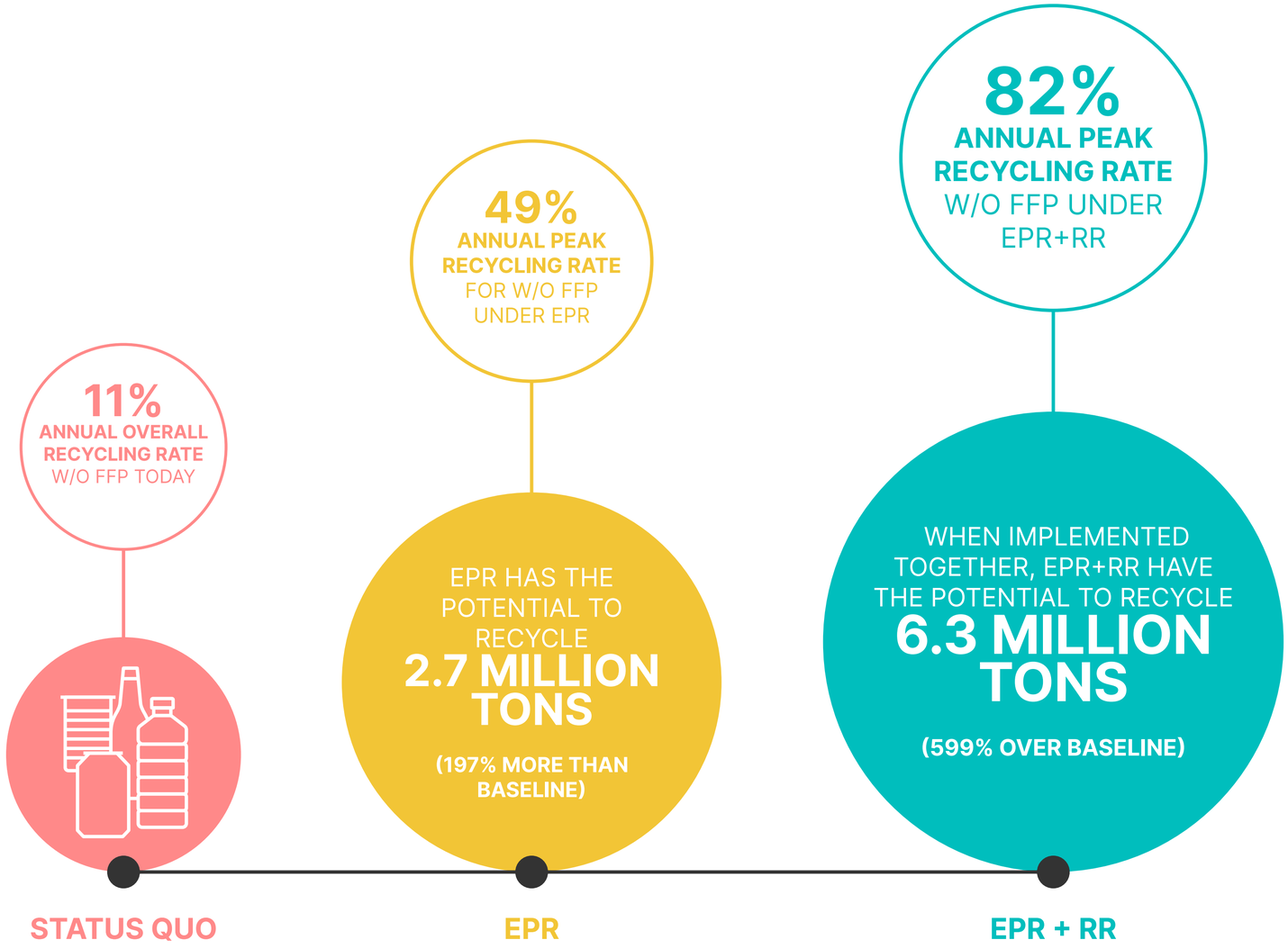


Figure 3.21

Impact of Policy on Cumulative Tons Recycled Packaging over 15 years (Excluding FFP)

MATERIAL CAPTURE

Operating independently, EPR can recycle an additional 1 million tons of beverage containers, a total of 1.7 million tons over 15 years. This reflects a 171% increase compared to the baseline.

However, when EPR if EPR and RR are implemented together, these systems collectively recycle a total 4 million tons (an additional 2.3 million tons compared to EPR alone). This signifies a significant 558% increase in beverage container recycling compared to scenarios without legislative intervention.

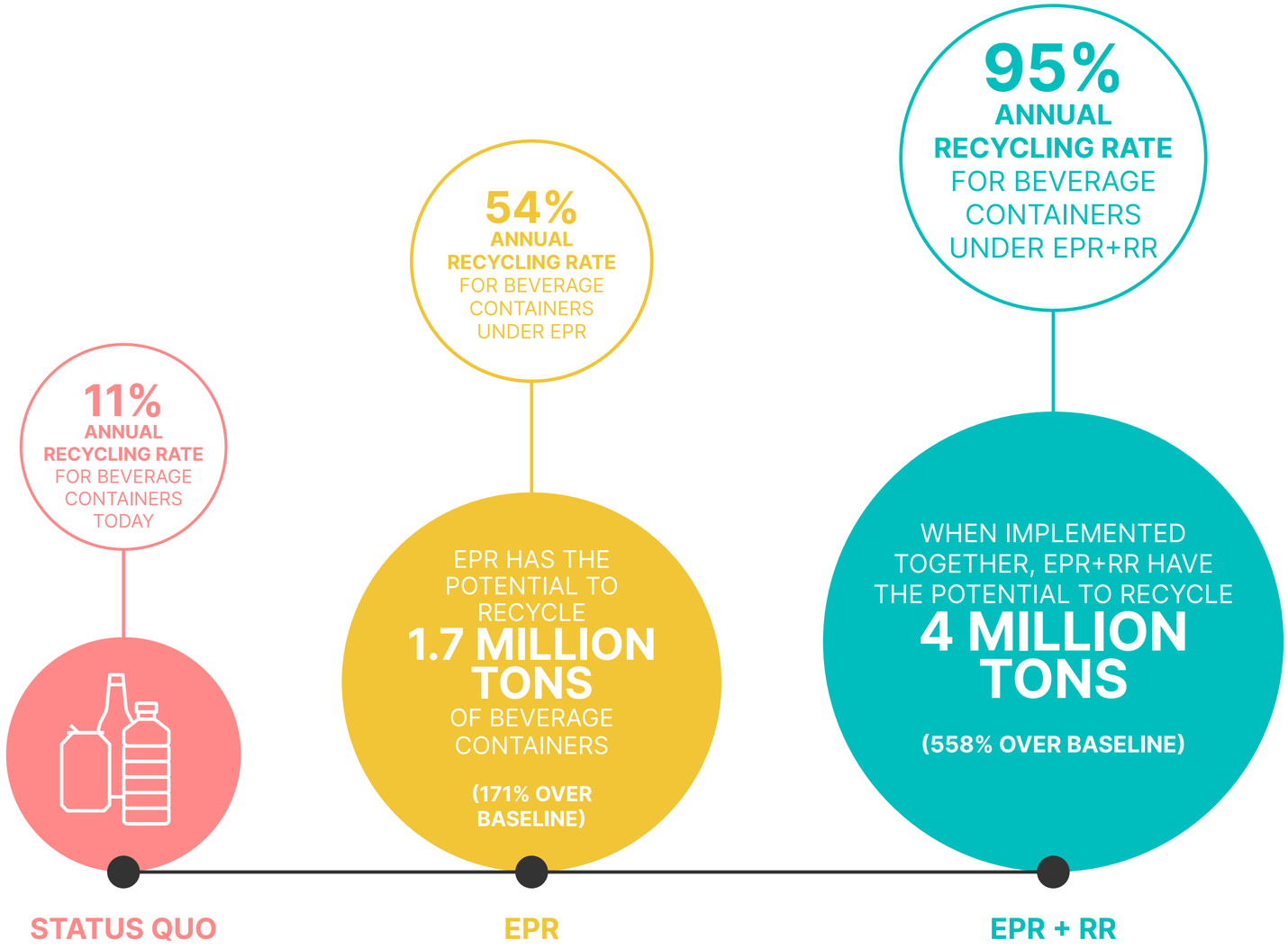


Figure 3.22

Impact of Policy on Cumulative Beverage Container Tons Recycled over 15 years

MATERIAL CAPTURE

CLOSED-LOOP RECYCLING IMPACTS

A system with RR creates a less contaminated material stream that enables more closed-loop recycling for beverage containers specifically.[34] At full implementation, EPR alone improves the amount of packaging recycled in a closed-loop process by approximately 77,000 tons. (271% over the status quo). EPR + RR increases this amount by 140,100 tons (7x the status quo) due to greater capture rates for beverage containers under RR and the addition of commercial beverage container tonnage.

Figure 3.24

Closed Loop Recycling Under Different Policy Scenarios

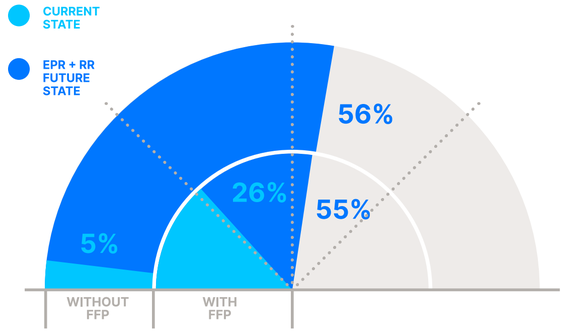
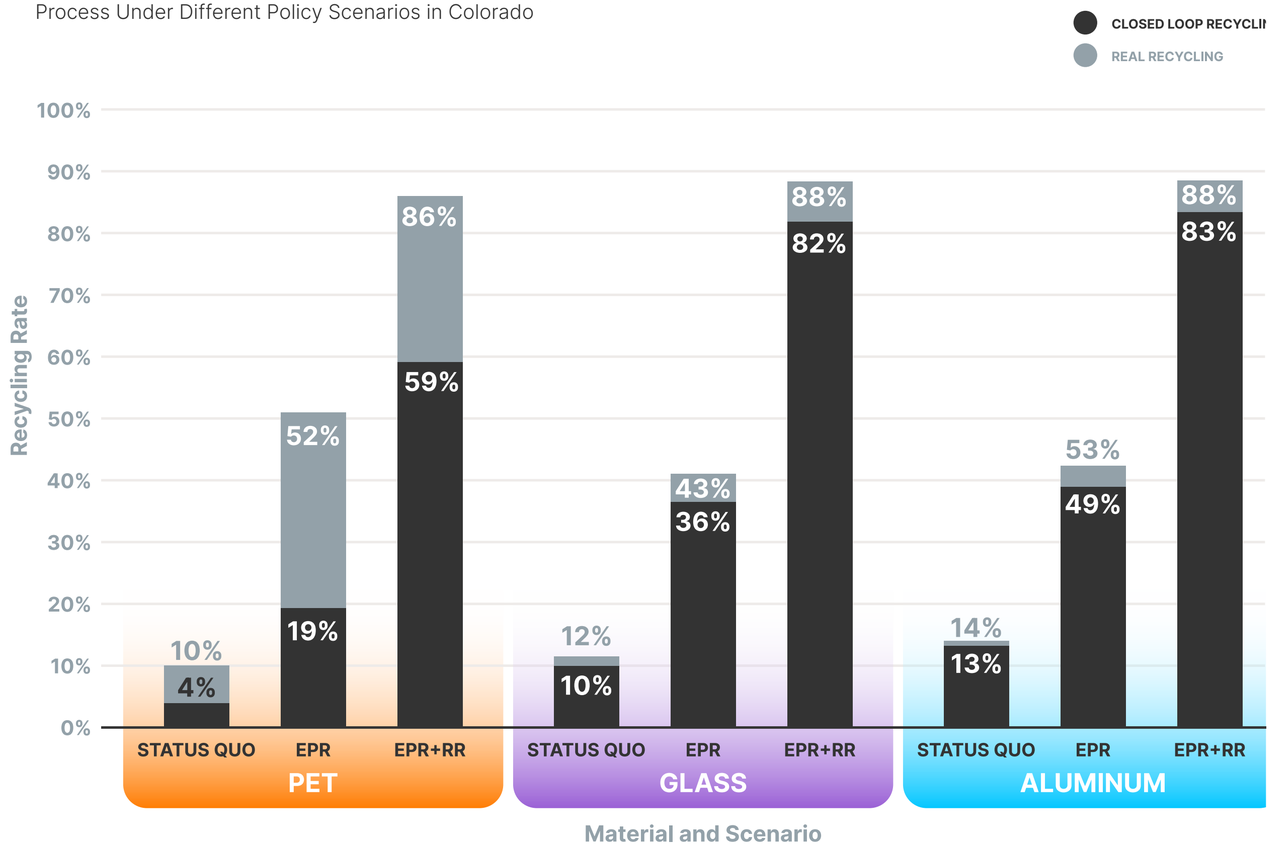


Figure 3.23

Beverage Container Material Recycled in a Closed-Loop Process Under Different Policy Scenarios in Colorado



ECONOMY

At full implementation, EPR with RR has the potential to capture up to $126 million in material value, excluding FFP. This marks a $108 million increase compared to the baseline and a $54 million improvement compared to EPR alone.

Moving to a producer-funded system increases economic opportunity for operators as the funding increases the ability of these players to handle a higher volume of materials efficiently, which, in turn increases revenues and projects. This is optimized under RR and EPR as operators can assume multiple roles across the system creating opportunities for new revenue streams, while also taking on beverage containers from the commercial sector At full implementation, EPR with RR could create over 9,500 green jobs due to the increase in material being recycled annually, which is 5,000 more than EPR alone. The overall system becomes more cost-effective and viable by embracing the concept of sharing infrastructure among various stakeholders, such as leveraging curbside collection or depots for redemption purposes.

Additionally, under a producer funded system, municipalities and residents are relieved of directly paying for recycling services. Producers that rely on recycled content or will be legislated to increase recycled content in their manufacturing, will benefit as well because these systems increase access to high-quality materials.

ECONOMY

Figure 3.25 models the effects of various policy scenarios on the material value obtained from recycling. Including FFP at full implementation, together EPR with RR can capture up to $146 million in material value that might otherwise be sent to landfill. This is $113 million increase than the baseline and $49 million more than with EPR in isolation.

Figure 3.25

Material Value Capture Under Different Systems (1000 $) with FFP

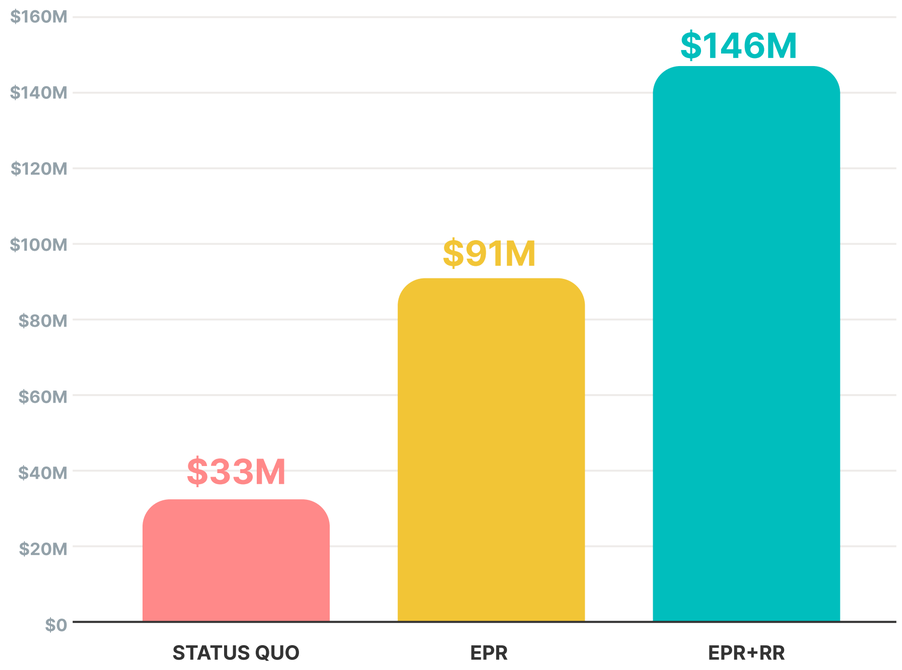
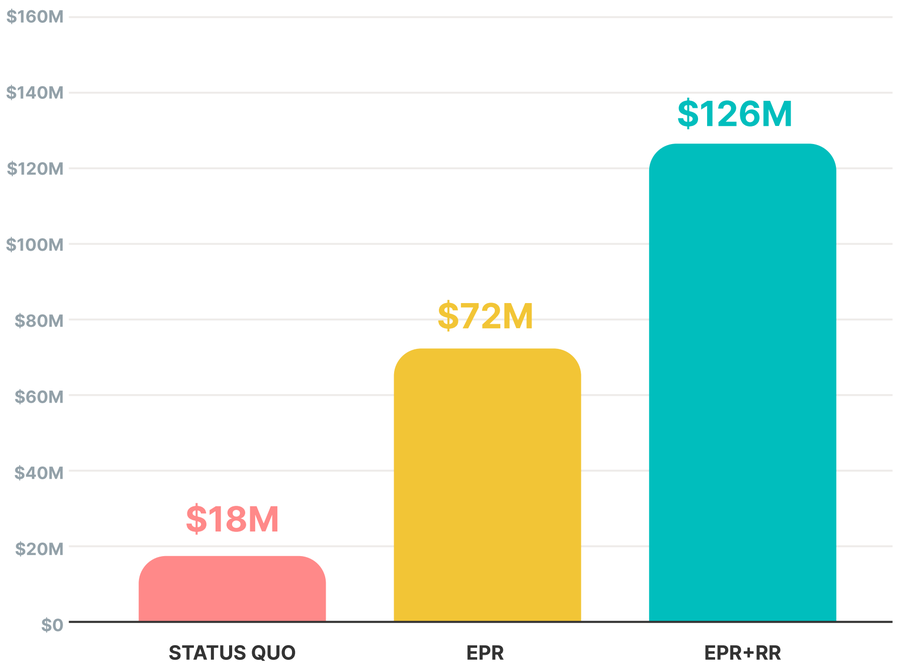


Figure 3.26 models the effects of various policy scenarios on the material value obtained from recycling excluding FFP. At full implementation, EPR with RR has the potential to capture up to $126 million in material value, excluding FFP. This marks a $108 million increase compared to the baseline and a $54 million improvement compared to EPR alone.

Figure 3.26

Material Value Capture Under Different Systems (1000 $) without FFP



CLIMATE

Colorado enacted their Climate Action Plan to Reduce Pollution in 2019, aiming to reduce statewide GHG emissions by at least 26% in 2025, 50% in 2030, and 90% in 2050, compared to GHG emissions in 2005.[35] **Including FFP, implementing EPR with Recycling Refunds can reduce the packaging related emissions by 505,630 MTCO2e, which is approximate 31% reduction of current emissions.** This emphasizes the climate benefits of implementing EPR and RR legislation. Additionally, the ability of both programs to share infrastructure in the recycling sector fosters a more climate-friendly approach.

Implementing EPR with an RR has the equivalent impact of removing 112,518 gasoline-powered passenger vehicles from the road for one year.

CLIMATE

MEETING CLIMATE TARGETS: INCLUDING FFP - EPR AND RR DRIVE A 69% DECREASE IN PACKAGING RELATED EMISSIONS.

Colorado enacted their Climate Action Plan to Reduce Pollution in 2019, aiming to reduce statewide GHG emissions by at least 26% in 2025, 50% in 2030, and 90% in 2050, compared to GHG emissions in 2005. Including FFP, implementing EPR with Recycling Refunds can reduce the packaging related emissions by 505,630 MTCO2e, which is approximate 31% reduction of current emissions. This surpasses the GHG reduction that EPR alone could accomplish by 348,000 MTCO2e. This emphasizes the climate benefits of implementing EPR and RR legislation. Additionally, the ability of both programs to share infrastructure in the recycling sector fosters a more climate-friendly approach.

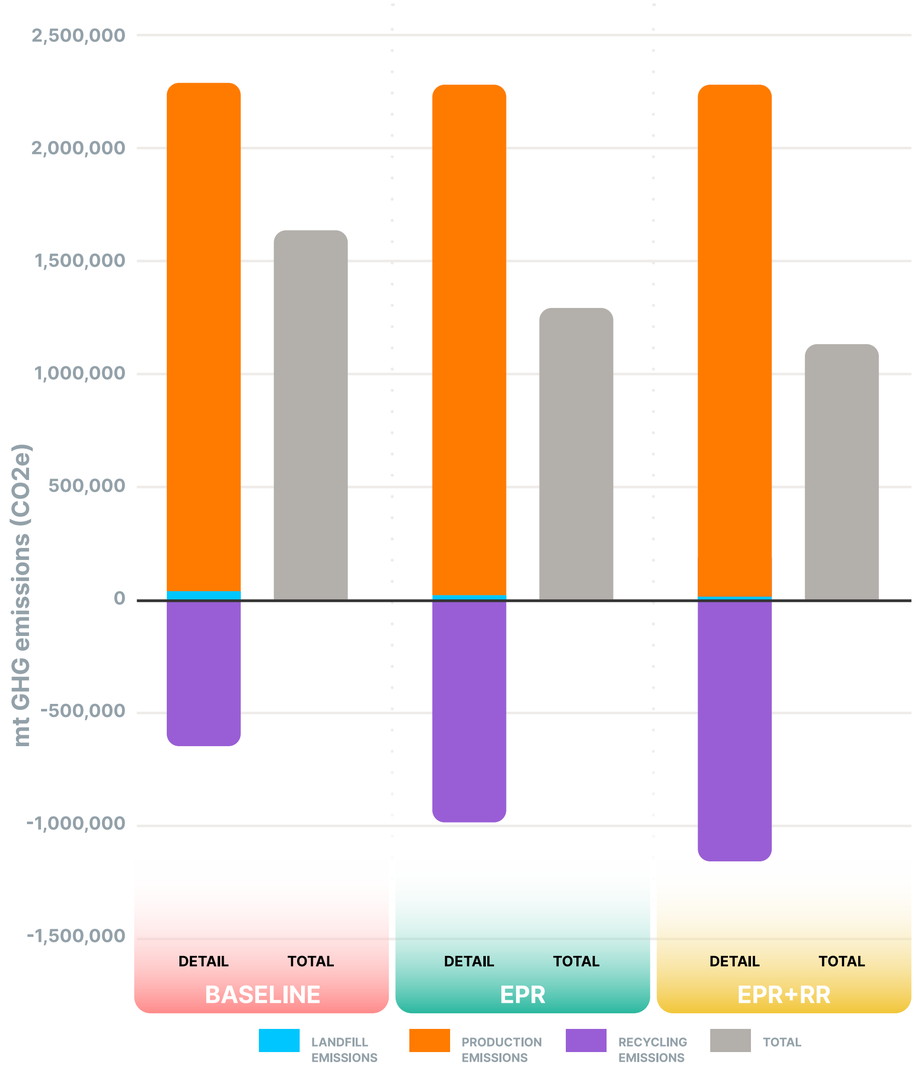


Figure 3.27
Packaging Emissions by Lifecycle Stage and Scenario (Including FFP)

CLIMATE

MEETING CLIMATE TARGETS: EXCLUDING FFP - EPR AND RR AID IN REDUCING EMISSIONS BY 65%.

Excluding FFP, implementing EPR with Recycling Refunds can reduce the same emissions by 343,000 MTCO2e, which is approximate 65% reduction of current emissions. This surpasses the GHG reduction that EPR alone could accomplish by 158,000 MTCO2e. Implementing EPR and RR has the equivalent impact of removing 76,328 gasoline powered Passenger vehicles from the road for one year. This emphasizes the climate benefits of implementing EPR and RR legislation.

Increasing the amount of high-quality material collected and recycled rather than landfilled can significantly impact Colorado's GHG emissions. Implementing an RR with EPR recycling allows for significantly more material in addition to a separate and less contaminated stream of beverage containers to be collected. This allows for maximum impact on GHG reduction as more material can be recycled through closed-loop processes which keeps the material in use for longer and reduces the need for material extraction, which is the greatest source of emissions for packaging material. Nearly 100% of all packaging emissions are production emissions, while landfill gas makes up between 1% and 2% of total material emissions. Furthermore, the improved quality of material that passes through the system will allow for increased revenue generated throughout the system to be invested into sustainable initiatives such as electric or low-emissions fleets."

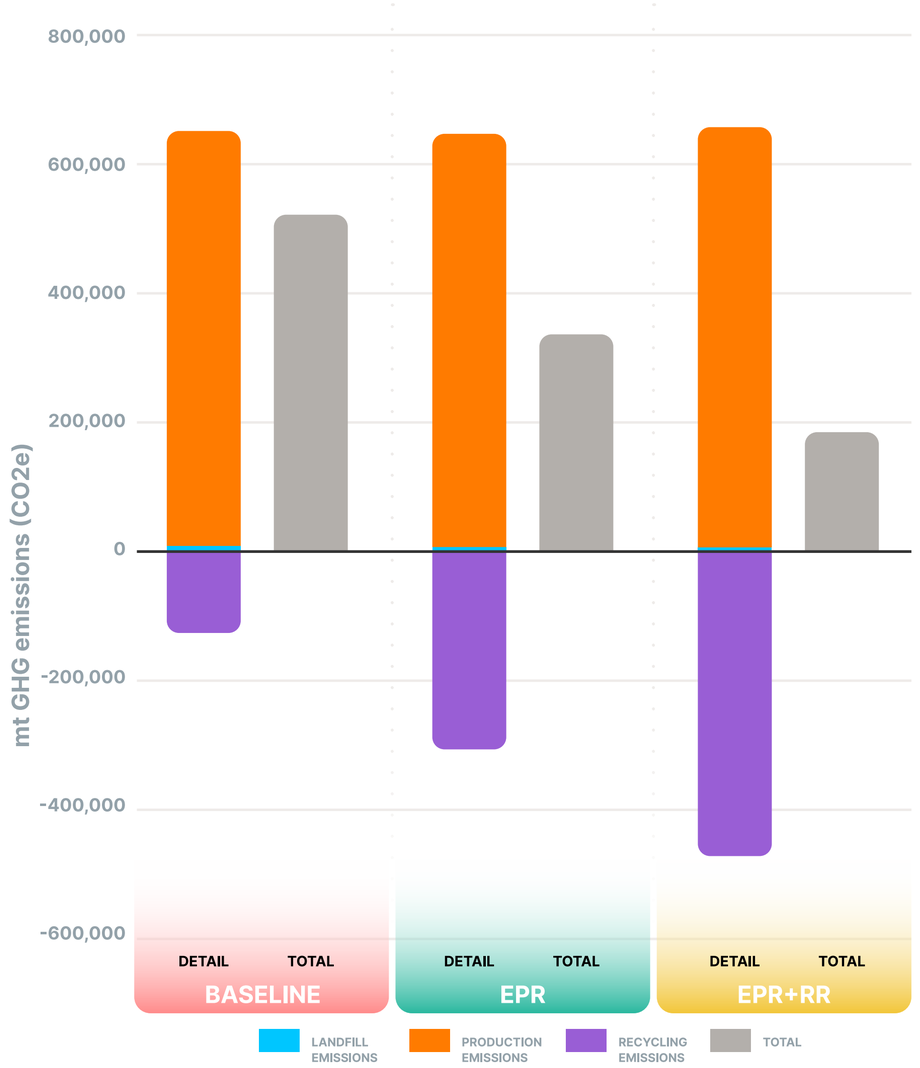


Figure 3.28
Packaging Emissions by Lifecycle Stage and Scenario (Including FFP)

EQUITY

Implementing EPR with an RR will provide residents in Colorado maximum access to recycling services, diverse return options to meet varying consumer preferences, and shared infrastructure to support innovation, including implementing reuse and refill programs.

Across the state, many Coloradans do not have access to recycling which is a significant barrier to increasing the state's recycling rates. Limited recycling access underscores the the importance of implementing EPR, which will provide access to recycling at no additional cost for every resident. Improving both cost-efficiency and equity, under EPR recycling must be as convenient as a resident's trash collection. However, under EPR, this will take several years to achieve which is why RR offers a valuable intermediate intervention to bridging the gap in recycling access. Since an RR system is quicker to implement than EPR, implementing EPR + RR would provide more immediate access to communities that currently don't have recycling. When designed properly, the RR infrastructure will offer additional and convenient ways to recycle covered material.

This could include offering drop-off points where residents typically travel, such as schools, libraries and grocery stores. These locations could be shared with EPR materials to offer diverse recycling return options for consumers with varied preferences.

Although there is support for RR across all income groups, to address equity concerns associated with deposit infrastructure, specific measures must be taken to alleviate any additional burden on overburdened communities. For instance, the bulk acceptance of recycling refund containers at grocery stores offers a more time-efficient return method for consumers, who can efficiently return their bag of containers during their regular grocery visit. Grocery stores could also participate in the system by offering coupons in addition to the deposit, or vouchers that allow consumers to redeem the value of the deposit at the grocery store for a larger amount, e.g., an extra 20%, while also increasing consumer foot traffic and sales. This offers an immediate incentive to increase uptake in the recycling system from all communities, especially low income communities that do not have the time or resources to navigate and invest in a complicated recycling system. This offers an immediate incentive to increase uptake in the recycling system from all communities, especially low-income communities that do not have the time or resources to navigate and invest in a complicated recycling system.

4.0

State-by-State Results

METRICS FOR A CIRCULAR ECONOMY

THE FOLLOWING METRICS ARE PROVIDED FOR EACH STATE. THIS SECTION PROVIDES AN EXAMPLE OF HOW STATE OUTPUTS ARE PRESENTED.

ALABAMA

8% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

States are ranked according to their packaging (without FFP) recycling rank compared to 2018. #1 is the best performing

RANKING

RECYCLING RANK 2021 #43

RECYCLING RANK 2018 #43 (=)

2021 population from US Census

POPULATION

5,049,846

CENSUS SUB REGION

EAST SOUTH CENTRAL

RECYCLING REFUND STATE

NO

The extend to which necessary data was available at the state, city, county, or municipality level, and how complete, granular, and up-to-date data is as reported. Limited, Fair, or Good.

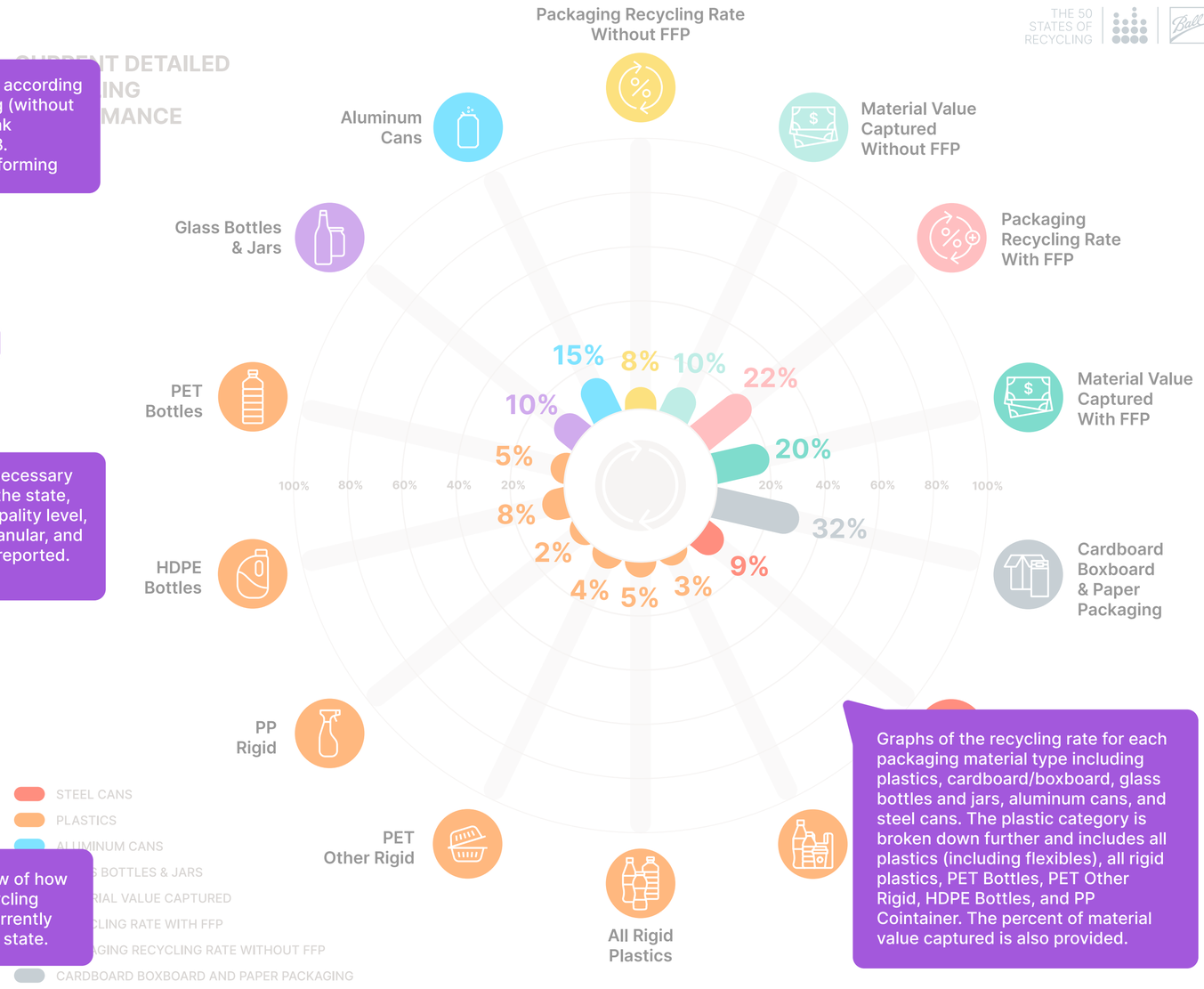
DATA QUALITY

GOOD FAIR LIMITED

OVERVIEW

The Alabama Department of Environmental Management (ADEM) oversees statewide waste management rules and regulations, which are written into Div[illegible]13 of the ADEM Administrative Code, pursuant to Al[illegible] §§22-27-1 to 22-27-49. The State has a no[illegible] statutory waste reduction goal of 25%, set [illegible] 2008 Solid Wastes and Recyclable Material[illegible] Management Act.

A brief overview of how waste and recycling services are currently provided in the state.



Graphs of the recycling rate for each packaging material type including plastics, cardboard/boxboard, glass bottles and jars, aluminum cans, and steel cans. The plastic category is broken down further and includes all plastics (including flexibles), all rigid plastics, PET Bottles, PET Other Rigid, HDPE Bottles, and PP Cointainer. The percent of material value captured is also provided.

METRICS FOR A CIRCULAR ECONOMY

THE FOLLOWING METRICS ARE PROVIDED FOR EACH STATE. THIS SECTION PROVIDES AN EXAMPLE OF HOW STATE OUTPUTS ARE PRESENTED.

ALABAMA

CURRENT STATE OF RECYCLING

A summary of the benefits recycling provided to the state in 2021.

In 2021, Alabama recycled approximately 8% of packaging materials without FFP. This recycling performance increases to 22% when considerin materials with FFP.

The value of the material captured for recycling was $28 million, just 20% of the total value of material that could be captured for recycling.

Recycling in the state avoided GHG emissions of

OUTCOMES EPR+RR

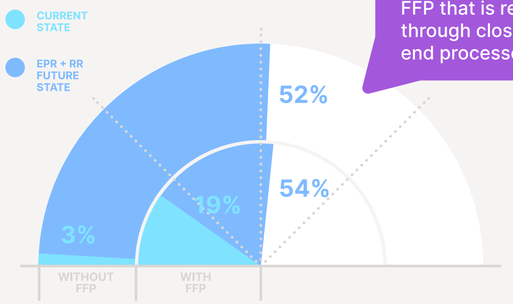
The potential future benefits of recycling in the state if EPR and RR policy was enacted and high recycling rates were achieved.

Extended Producer Responsibility Refund policy together could:

- Increase recycling related jobs from 1,300 to 6,700.
- Place $121 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 percent of material whether with or without FFP that is recycled through closed loop end processes.

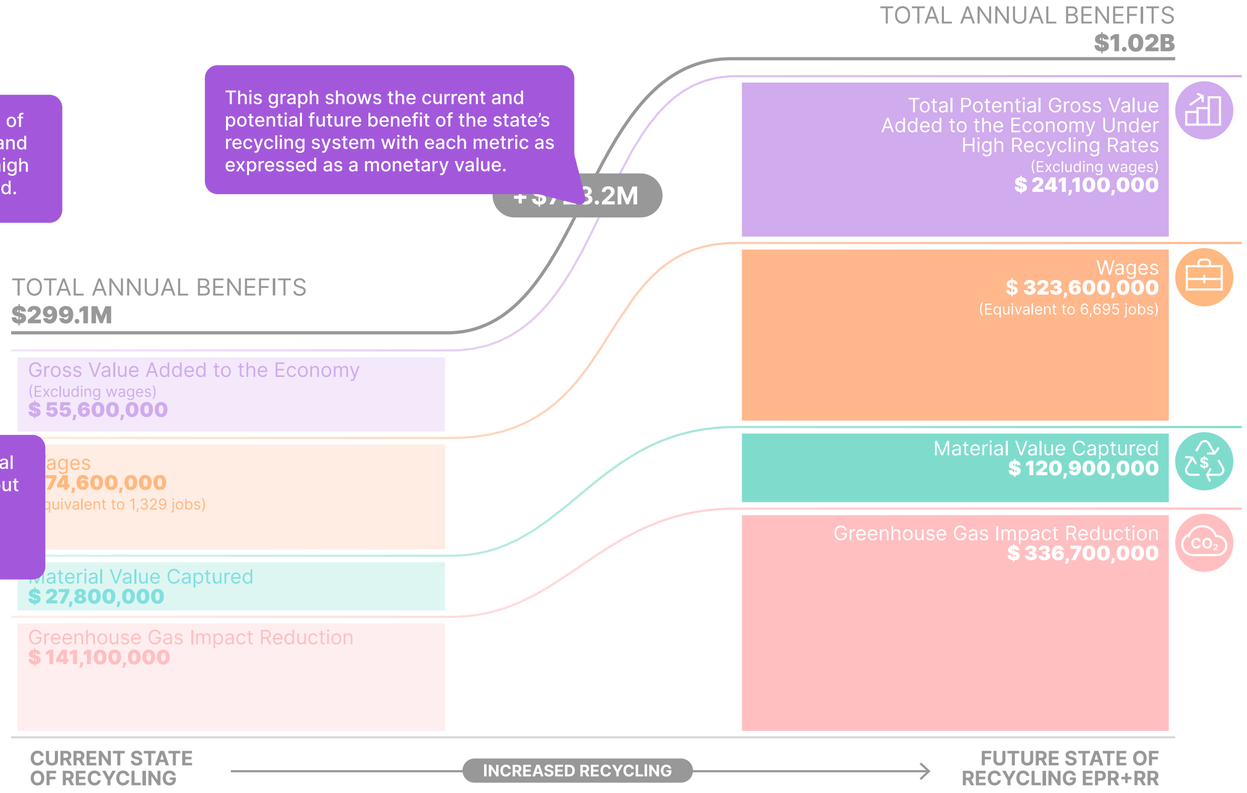


THE 50 STATES OF RECYCLING

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

erall recycling rate of 65% for residential packaging
0% recycling rate for beverage containers

This graph shows the current and potential future benefit of the state's recycling system with each metric as expressed as a monetary value.



STATE-BY-STATE INDEX

ALABAMA

8% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #43

RECYCLING RANK 2018 #43 =

POPULATION
5,049,846

CENSUS SUB REGION
EAST SOUTH CENTRAL

RECYCLING REFUND STATE
NO

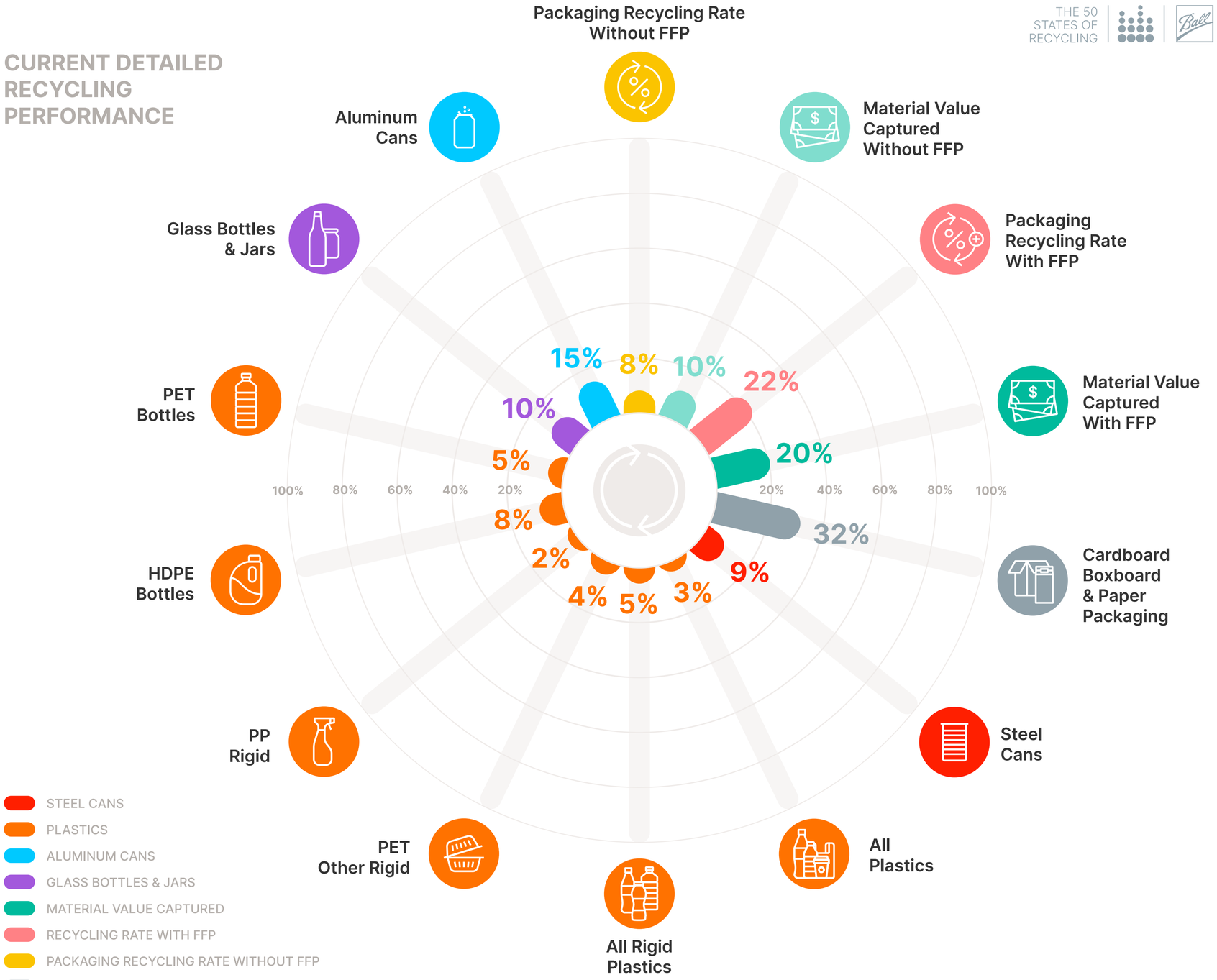
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Alabama Department of Environmental Management (ADEM) oversees statewide waste management rules and regulations, which are written into Division 13 of the ADEM Administrative Code pursuant to Alabama Code §§22-27-1 to 22-27-49. The state has a non-binding statutory waste reduction goal of 25% set through its 2008 Solid Wastes and Recyclable Materials Management Act.

CURRENT DETAILED RECYCLING PERFORMANCE



THE 50 STATES OF RECYCLING

ALABAMA

CURRENT STATE OF RECYCLING

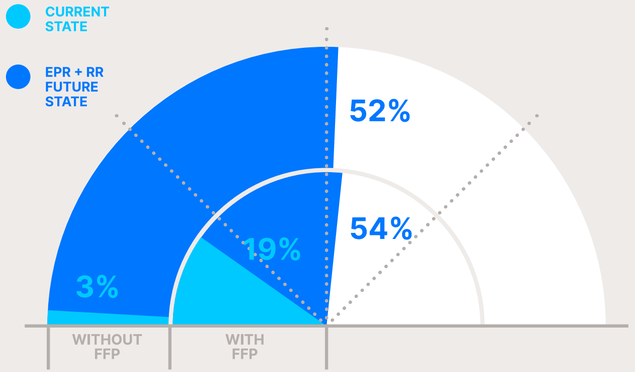
- In 2021, Alabama recycled approximately 8% of packaging materials without FFP. This recycling performance increases to 22% when considering materials with FFP.
- The value of the material captured for recycling was $28 million, just 20% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 742,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

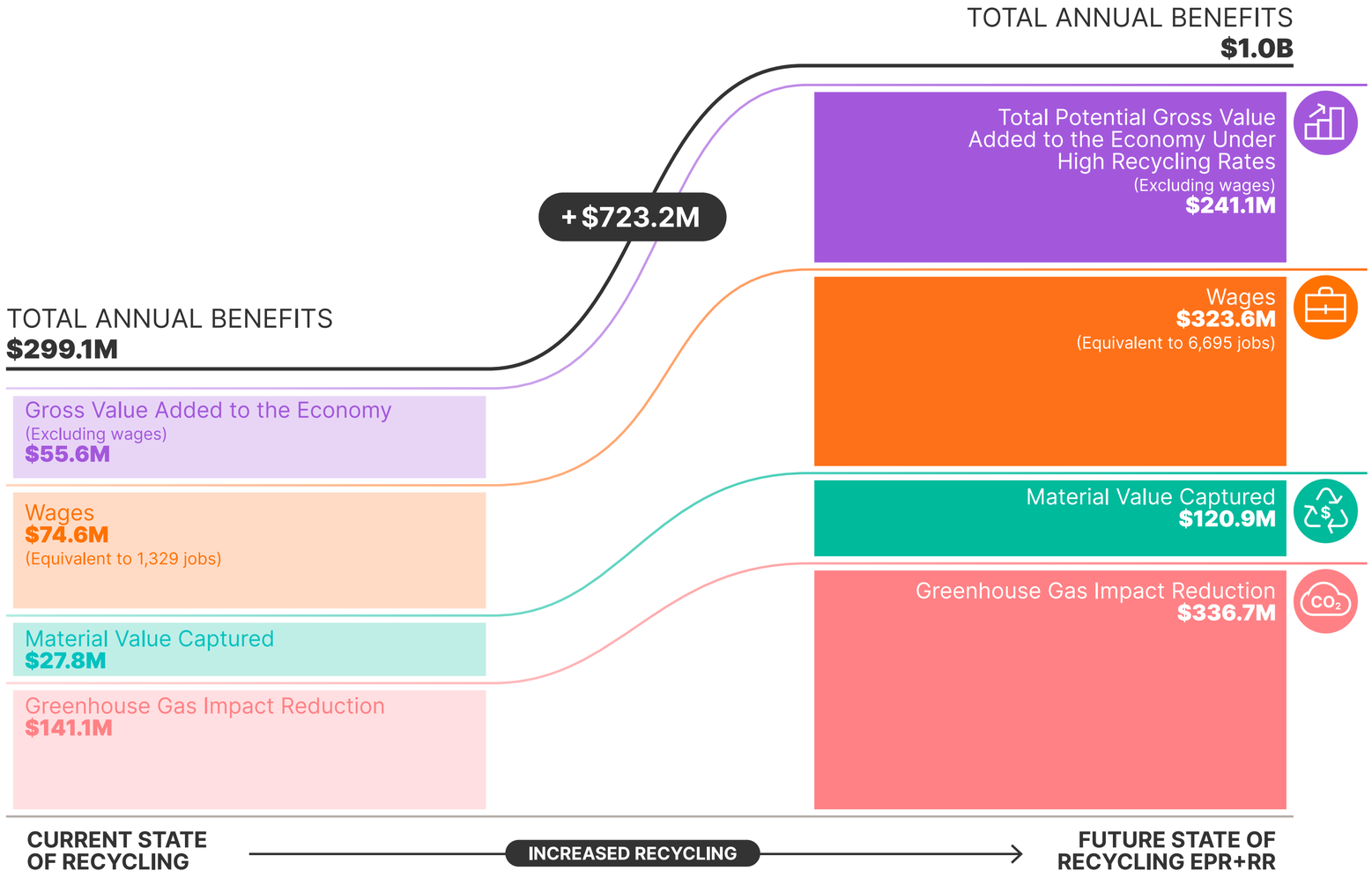
- Increase recycling related jobs from 1,300 to 6,700.
- Place $121 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.8 million MTCO2e annually.

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



ALASKA

6% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#47	+1
RECYCLING RANK 2018	#48	

POPULATION
734,182

CENSUS SUB REGION
PACIFIC

RECYCLING REFUND STATE
NO

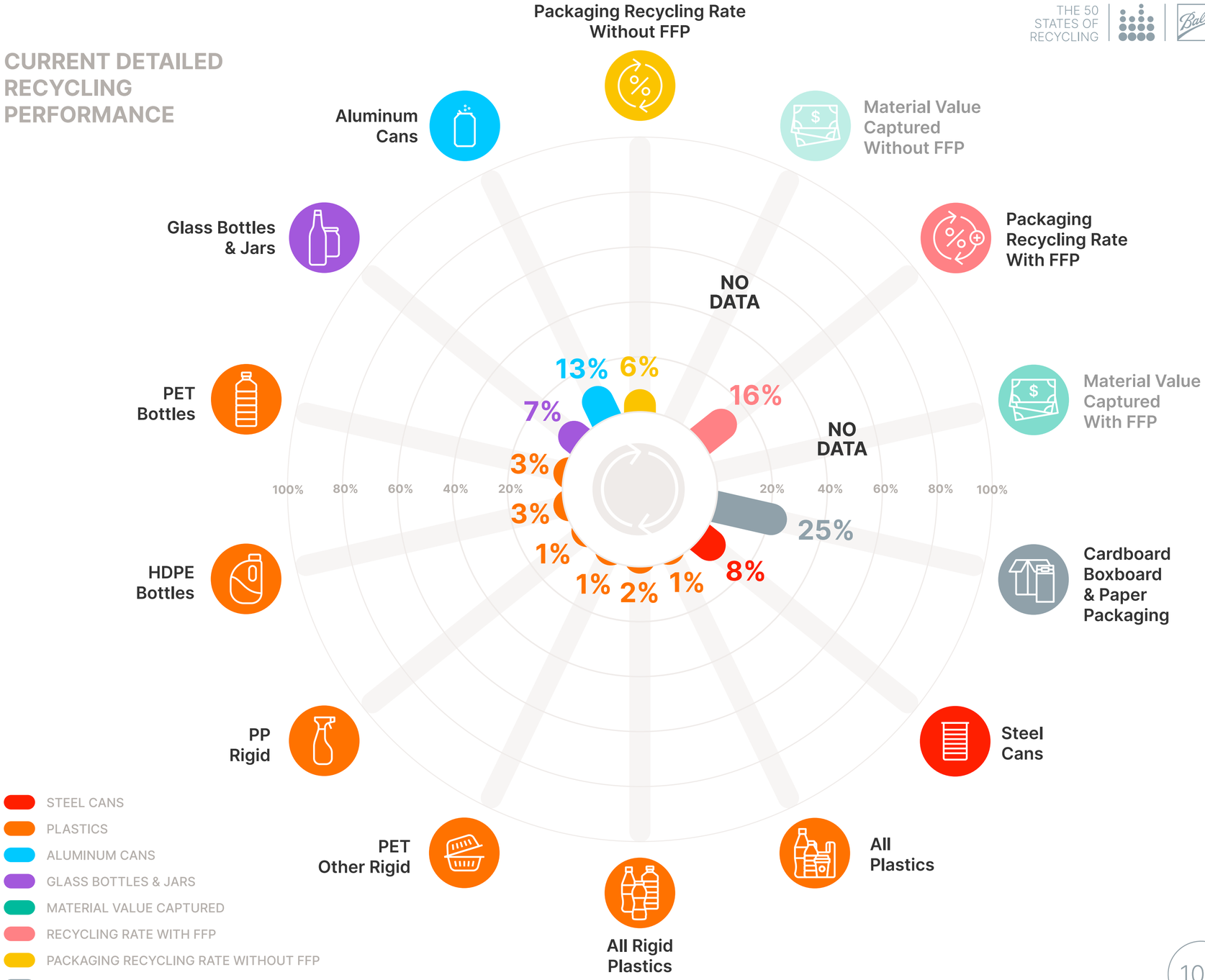
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Recycling in Alaska faces unique challenges due to the small population, distance to markets and transportation costs. Though there are few state programs, many local governments implement policies that target specific materials. These include backhaul programs for rural areas, which target e-waste, and the “Flying Cans” program run by Alaskans for Litter Prevention & Recycling.z

CURRENT DETAILED RECYCLING PERFORMANCE



ALASKA

CURRENT STATE OF RECYCLING

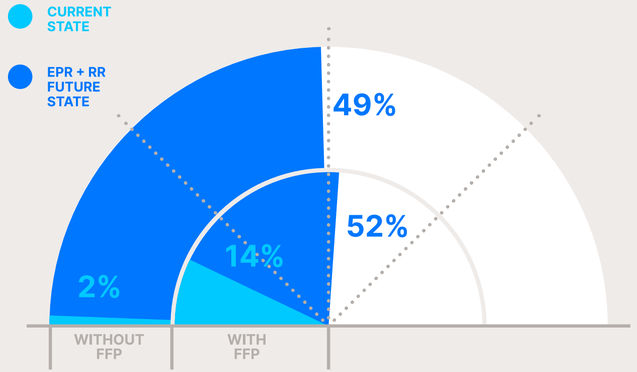
- In 2021, Alaska recycled approximately 6% of packaging materials without FFP. This recycling performance increases to 16% when considering materials with FFP.
- The gross value added (GVA) to the economy is $12 million in the form of jobs.
- Recycling in the state avoided GHG emissions of 70,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

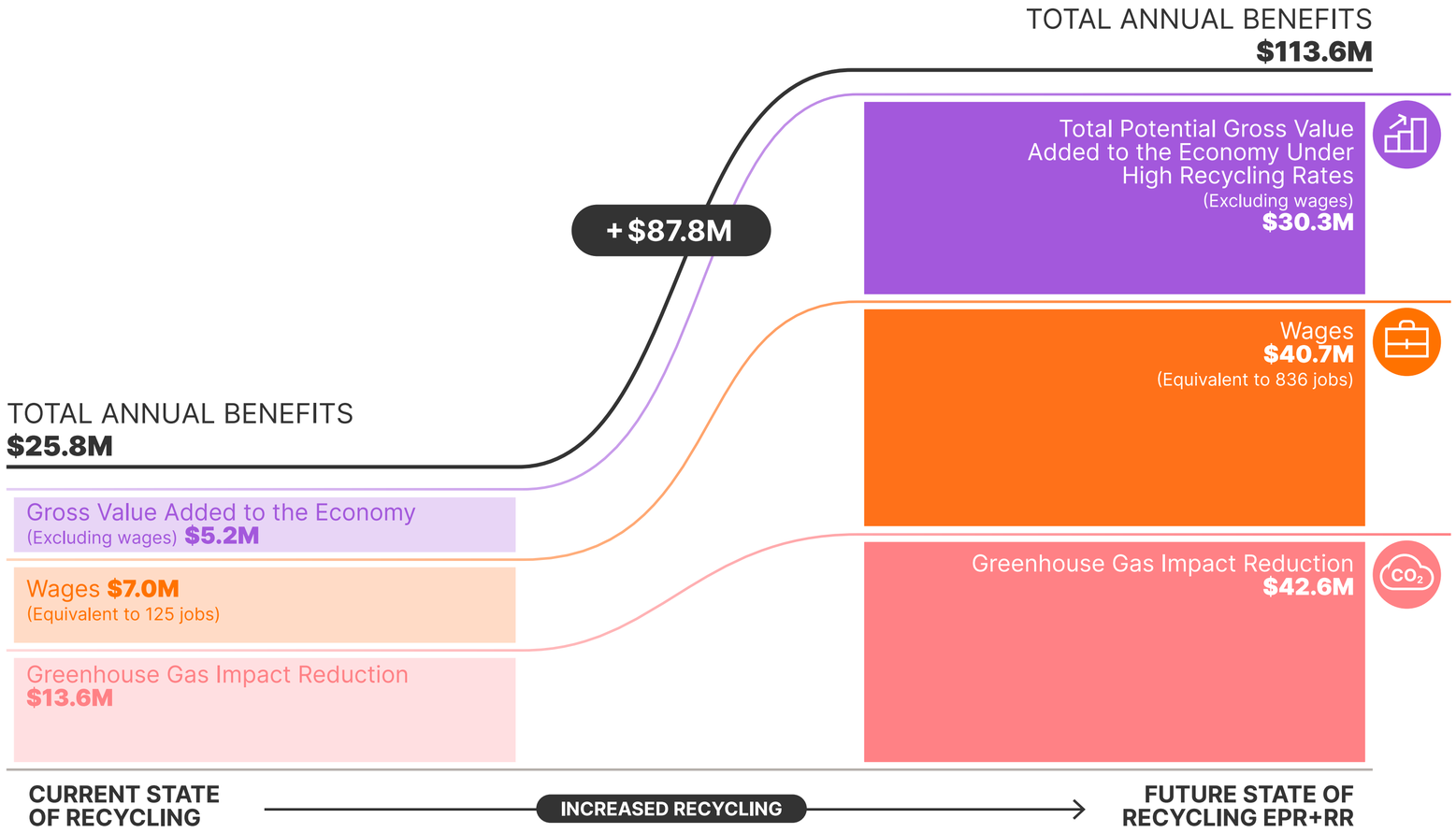
- Increase recycling related jobs from 130 to 800.
- Increase GVA to $71 million in the form of jobs to the economy.
- Avoid emissions of 220,000 annually.

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



ARIZONA

12% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#34	-1
RECYCLING RANK 2018	#33	

POPULATION
7,264,877Z

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

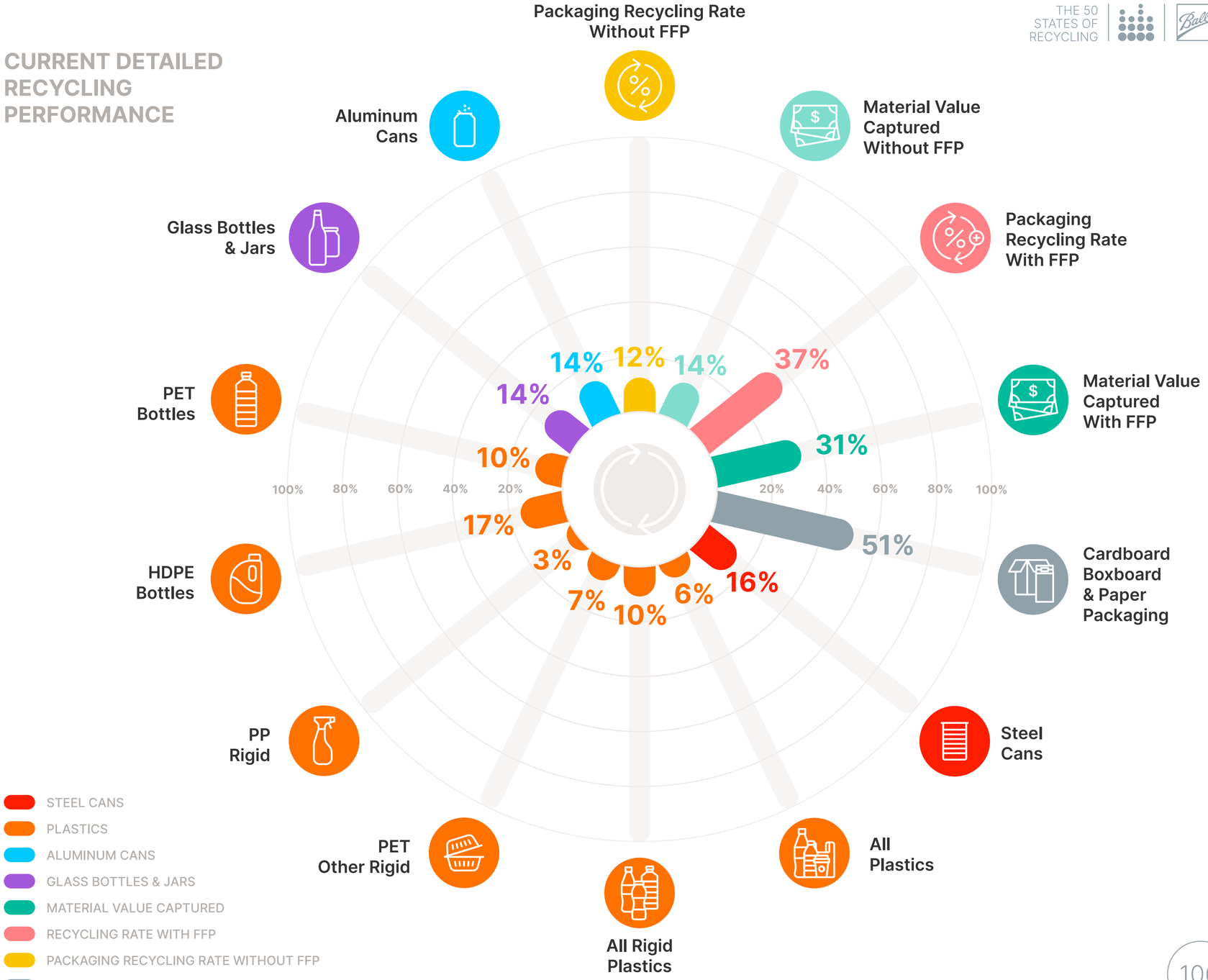
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Arizona Department of Environmental Quality (DEQ) oversees solid waste and recycling for the state, though all services are provided at the local government level. The DEQ provides guidance on community programs, with dedicated program support for local e-waste collection and food waste prevention. Arizona has a preemption law (2015 SB 1241) that prevents cities and towns from banning plastic grocery bags or disposable containers or charging for them.

CURRENT DETAILED RECYCLING PERFORMANCE



ARIZONA

CURRENT STATE OF RECYCLING

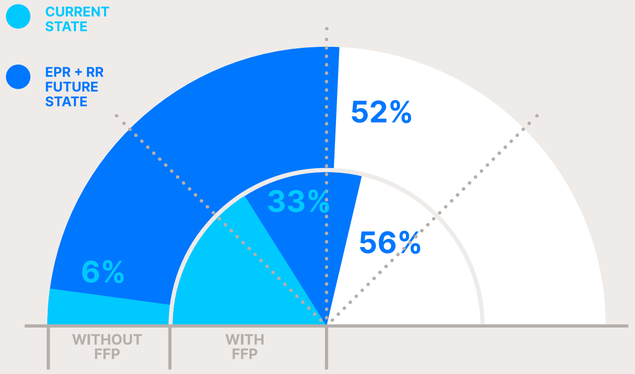
- In 2021, Arizona recycled approximately 12% of packaging materials without FFP. This recycling performance increases to 37% when considering materials with FFP.
- The value of the material captured for recycling was $60 million, just 31% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.6 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

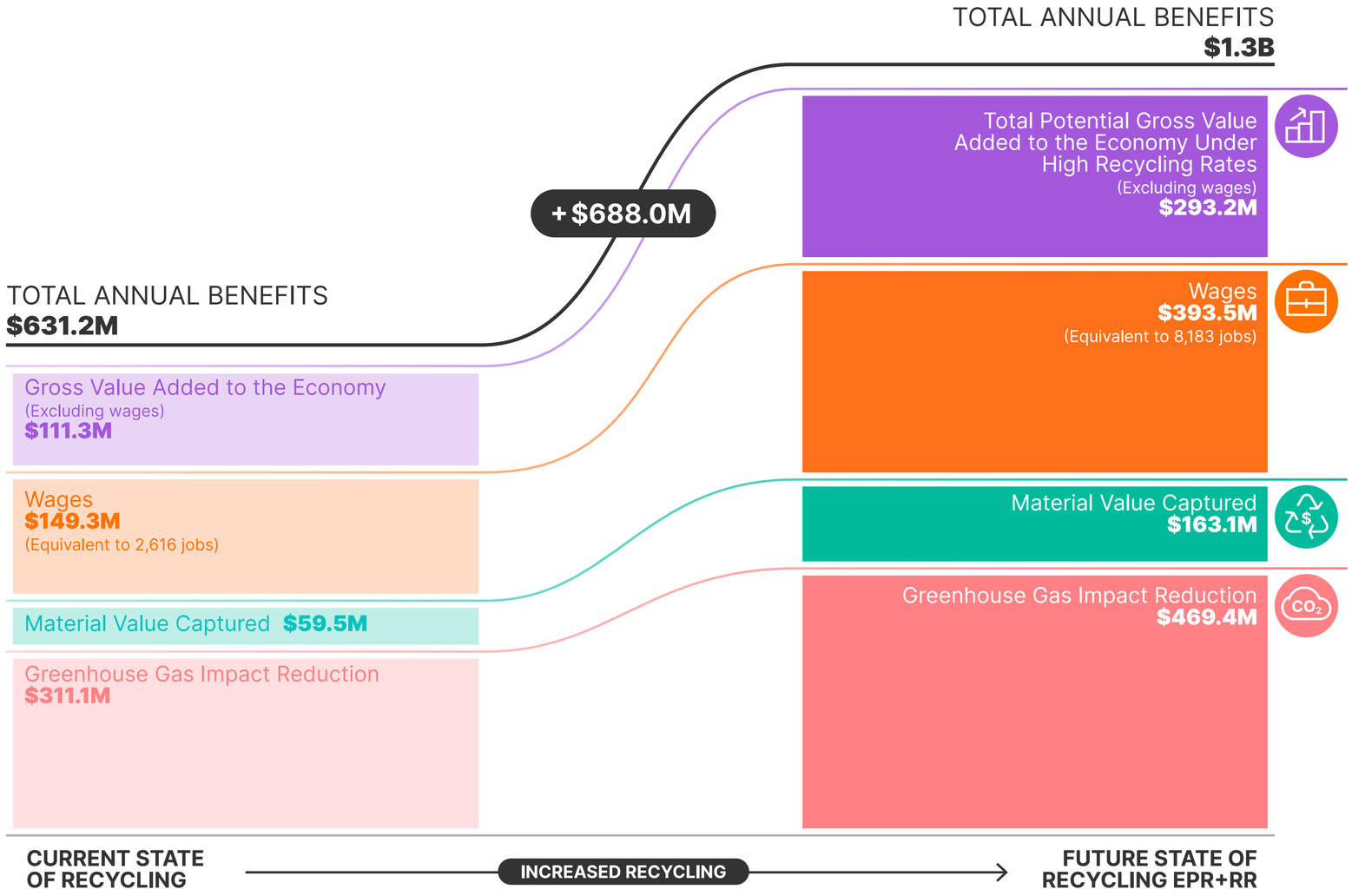
- Increase recycling related jobs from 2,600 to 8,100.
- Place $163 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.5 million MTCO2e annually.

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



ARKANSAS

11% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #39

RECYCLING RANK 2018 #38

-1

POPULATION
3,028,122

CENSUS SUB REGION
WEST SOUTH CENTRAL

RECYCLING REFUND STATE
NO

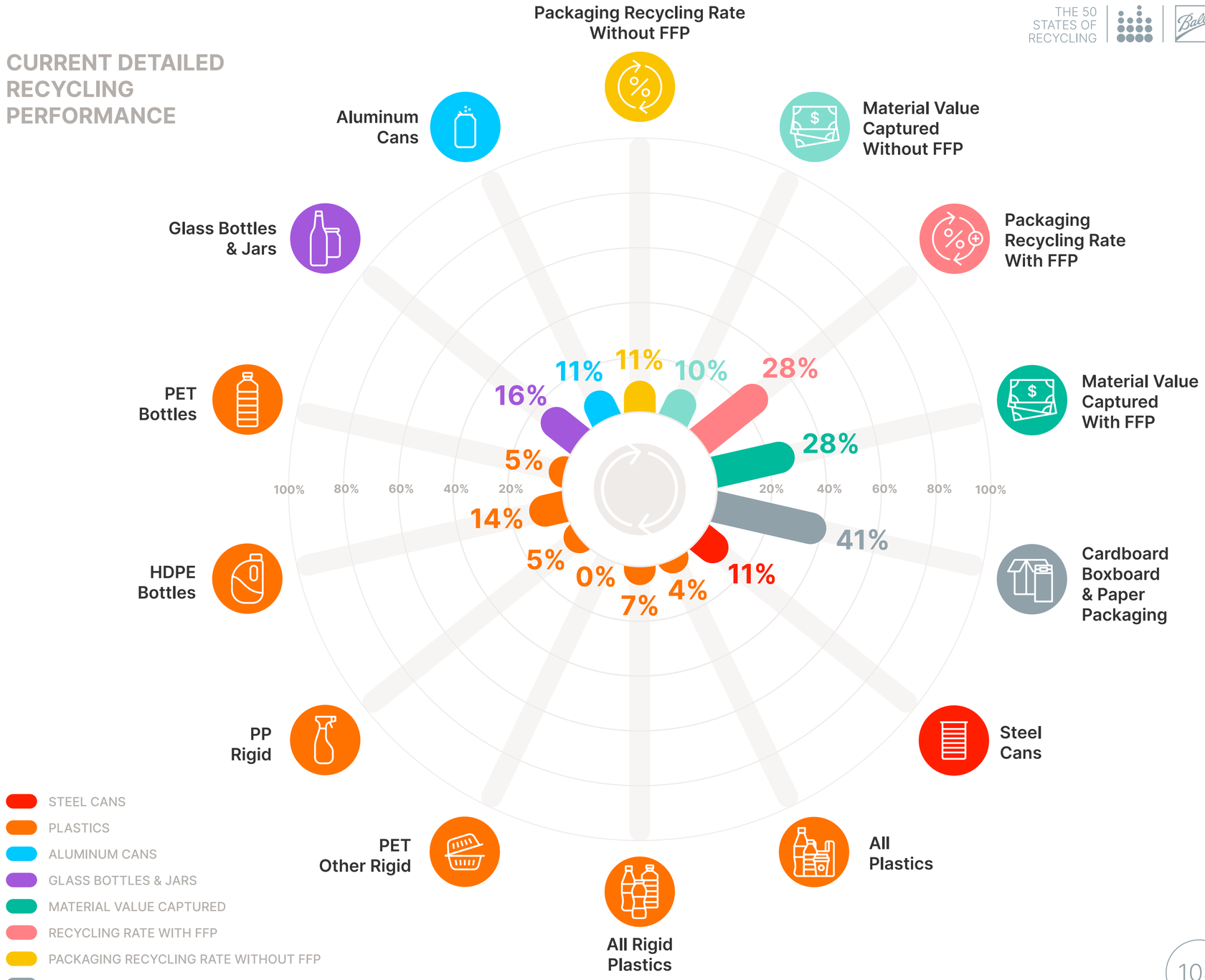
DATA QUALITY

GOOD | FAIR | LIMITED

OVERVIEW

While Arkansas has introduced deposit return legislation for beverage containers several times since 2007, it has never passed any. The latest effort in 2019 (HB1771: Arkansas Litter Reduction and Deposit Beverage Container Recycling Act), would have created a state agency to oversee the program and applied a 5 cents deposit to covered containers.

CURRENT DETAILED RECYCLING PERFORMANCE



ARKANSAS

CURRENT STATE OF RECYCLING

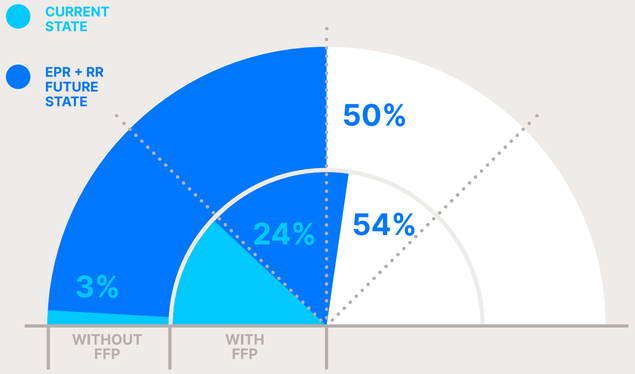
- In 2021, Arkansas recycled approximately 11% of packaging materials without FFP. This recycling performance increases to 28% when considering materials with FFP.
- The value of the material captured for recycling was $20 million, just 23% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 550,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

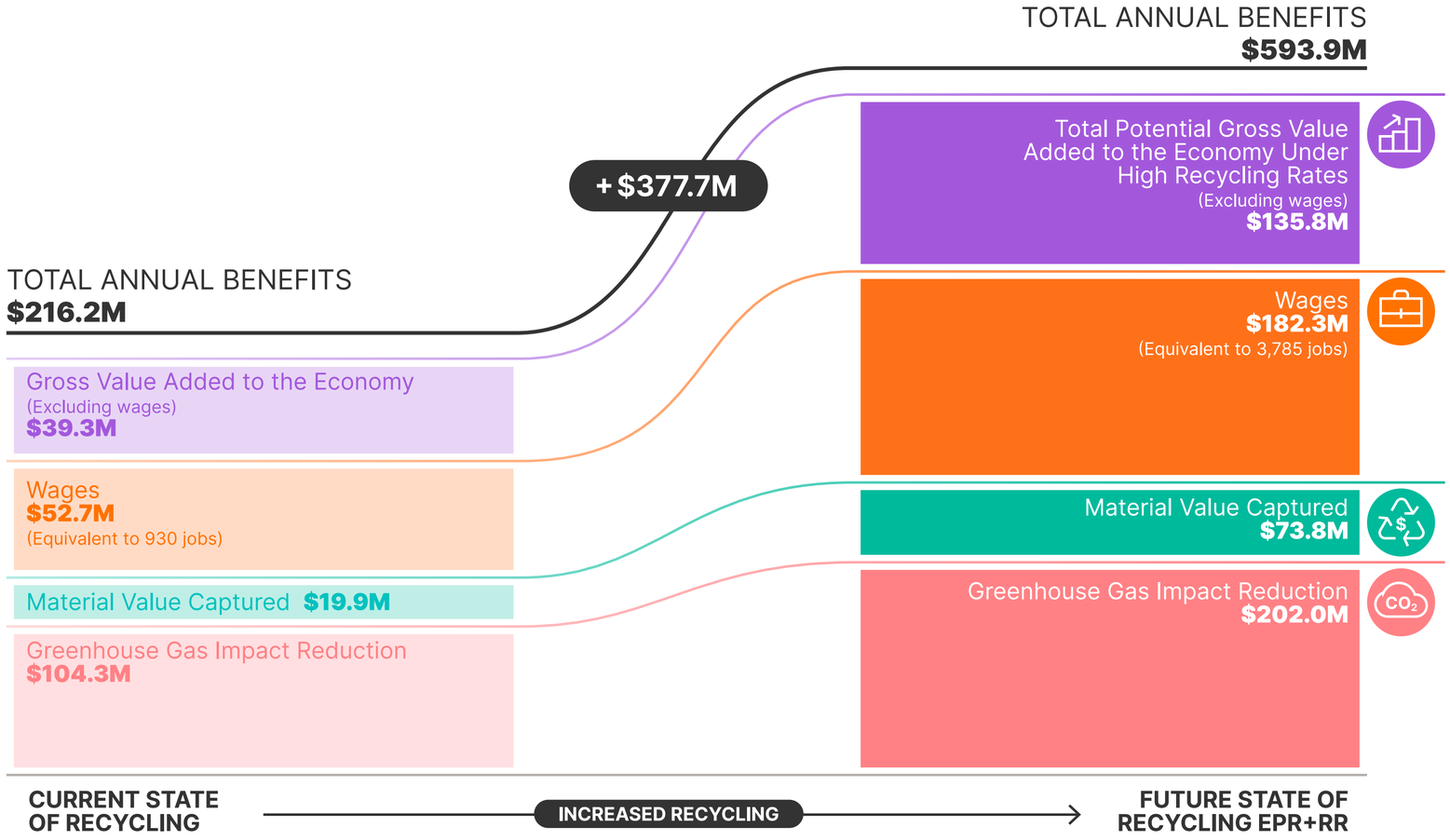
- Increase recycling related jobs from 900 to 3,800.
- Place $74 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1 million MTCO2e annually.

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



CALIFORNIA

41% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #7

RECYCLING RANK 2018 #11

+4

POPULATION
39,142,991

CENSUS SUB REGION
PACIFIC

RECYCLING REFUND STATE
YES

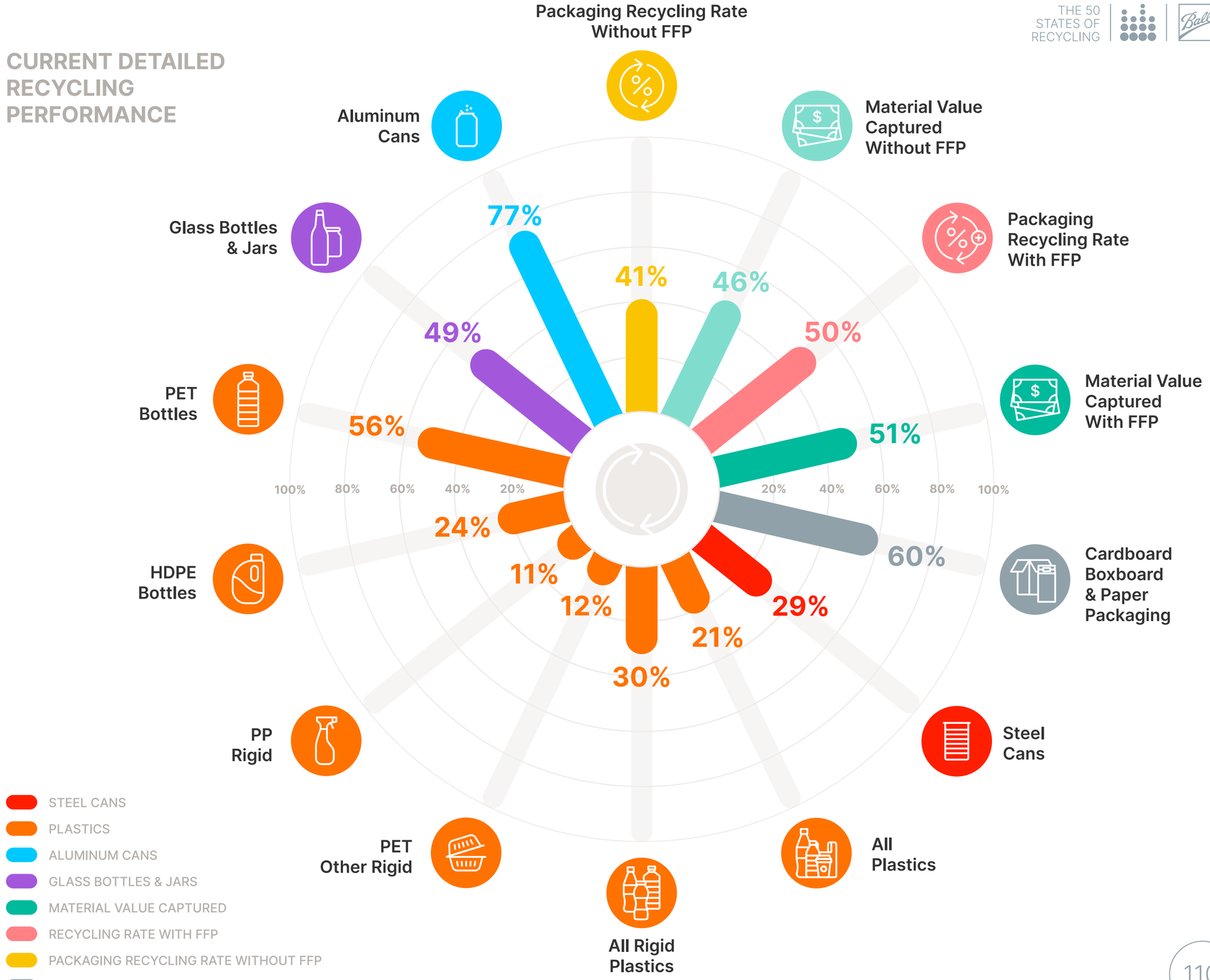
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

California is one of 10 states in the US that has a Recycling Refund program. It also has legislation imposing a fee on material sent to landfill and a recent law that creates new recycling infrastructure development programs. All of this, combined with its large size and population, means California has an extensive and well-developed recycling infrastructure, leading to a relatively high recycling rate.

CURRENT DETAILED RECYCLING PERFORMANCE



CALIFORNIA

CURRENT STATE OF RECYCLING

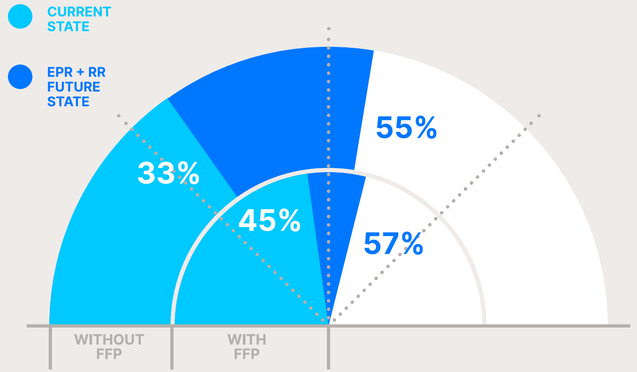
- In 2021, California recycled approximately 41% of packaging materials without FFP. This recycling performance increases to 50% when considering materials with FFP.
- The value of the material captured for recycling was $590 million, just 51% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 12 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

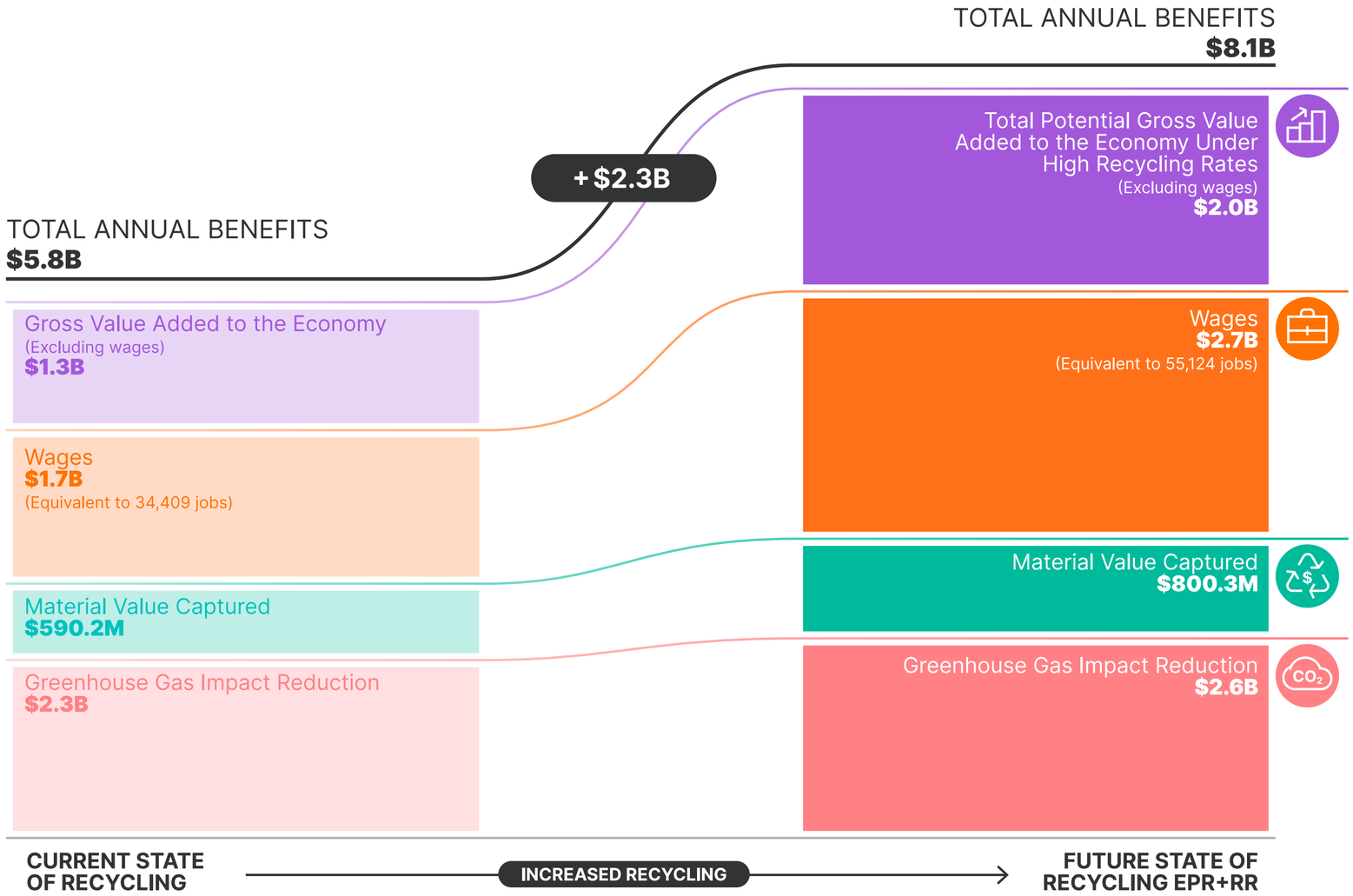
- Increase recycling related jobs from 34,400 to 55,100.
- Place $800 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 13.9 million MTCO2e annually.

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



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

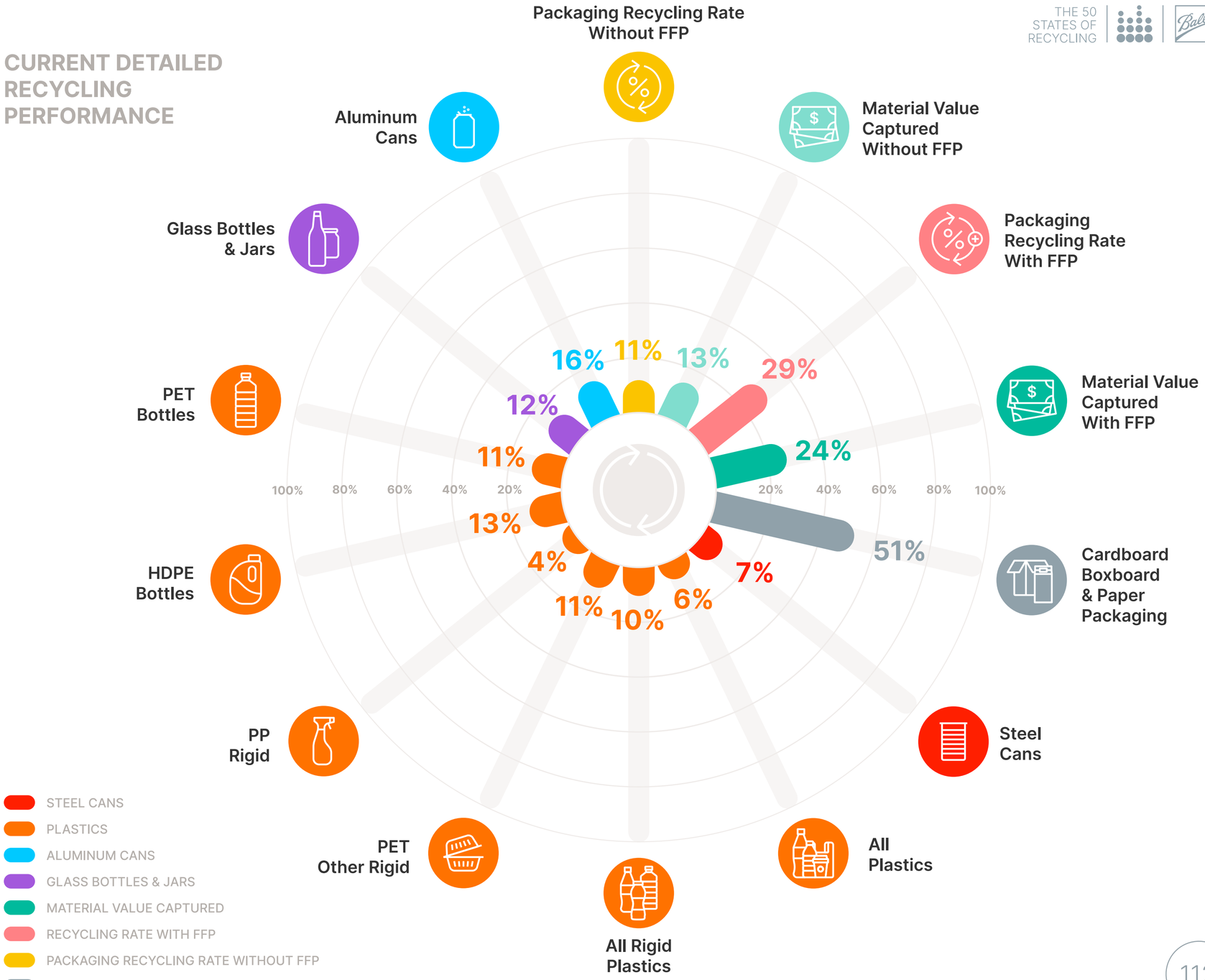
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Colorado Department of Public Health and Environment (CDPHE) has oversight of all waste management and recycling activities in the state. The recent passing of EPR legislation means that the state is currently in a transition period where recycling management falls to the producers.

CURRENT DETAILED RECYCLING PERFORMANCE



COLORADO

CURRENT STATE OF RECYCLING

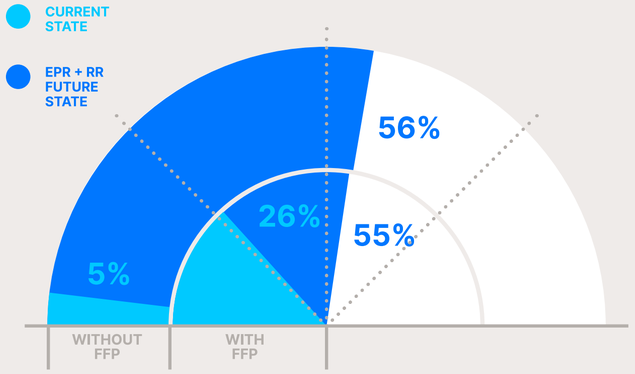
- In 2021, Colorado recycled approximately 11% of packaging materials without FFP. This recycling performance increases to 29% when considering materials with FFP.
- The value of the material captured for recycling was $45 million, just 24% of the total value of material that could be captured for recycling.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

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

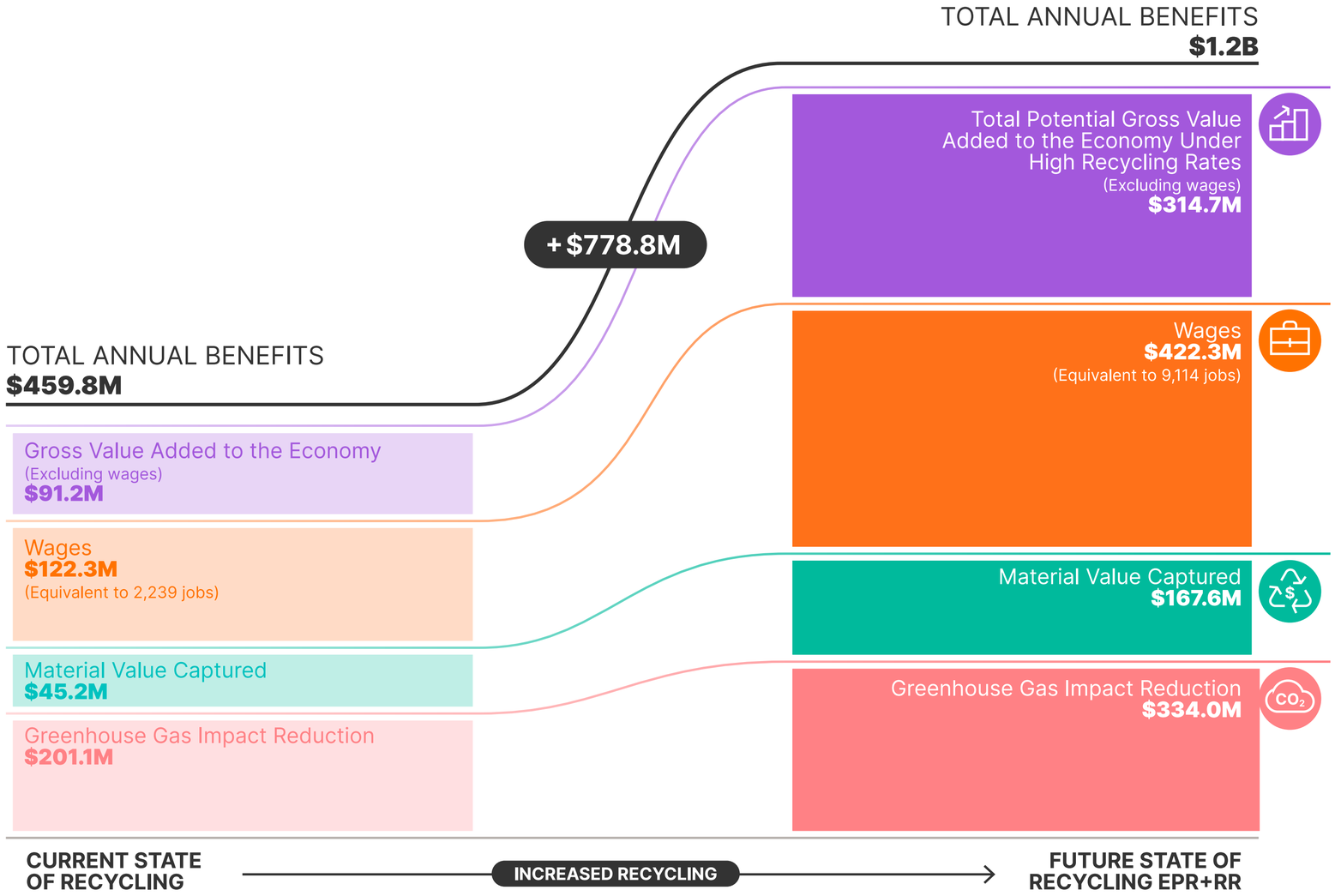
- Increase recycling related jobs from 2,200 to 9,100.
- Place $168 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.8 million MTCO2e annually.

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



CONNECTICUT

39% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #10 -5

RECYCLING RANK 2018 #5

POPULATION
3,623,355

CENSUS SUB REGION
NEW ENGLAND

RECYCLING REFUND STATE
YES

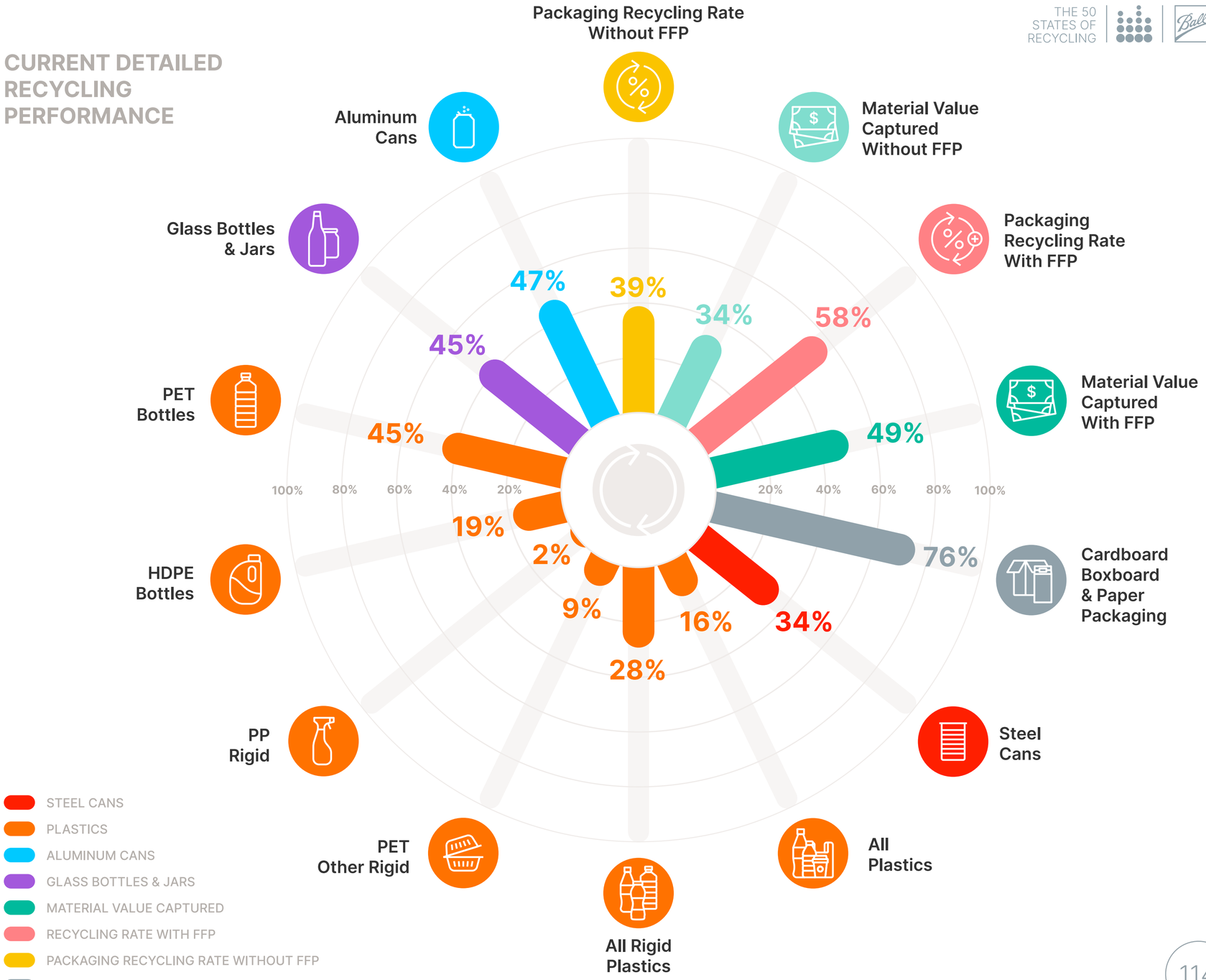
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Department of Energy & Environmental Protection (DEEP) administers statewide programs for beverage containers. Connecticut's Beverage Container Deposit and Redemption Law currently applies to beer, malt, carbonated soft drinks and bottled water (the last of which was added in 2009).

CURRENT DETAILED RECYCLING PERFORMANCE



CONNECTICUT

CURRENT STATE OF RECYCLING

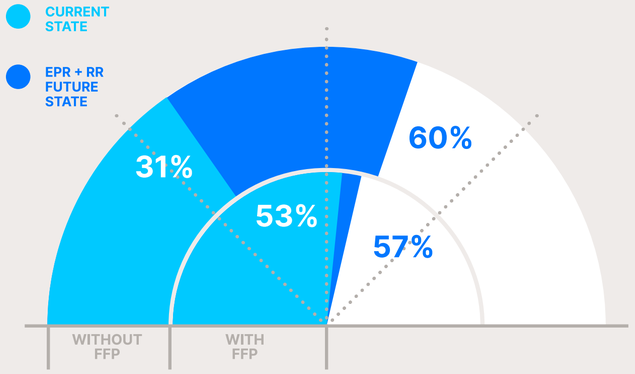
- In 2021, Connecticut recycled approximately 39% of packaging materials without FFP. This recycling performance increases to 58% when considering materials with FFP.
- The value of the material captured for recycling was $62 million, just 49% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.4 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

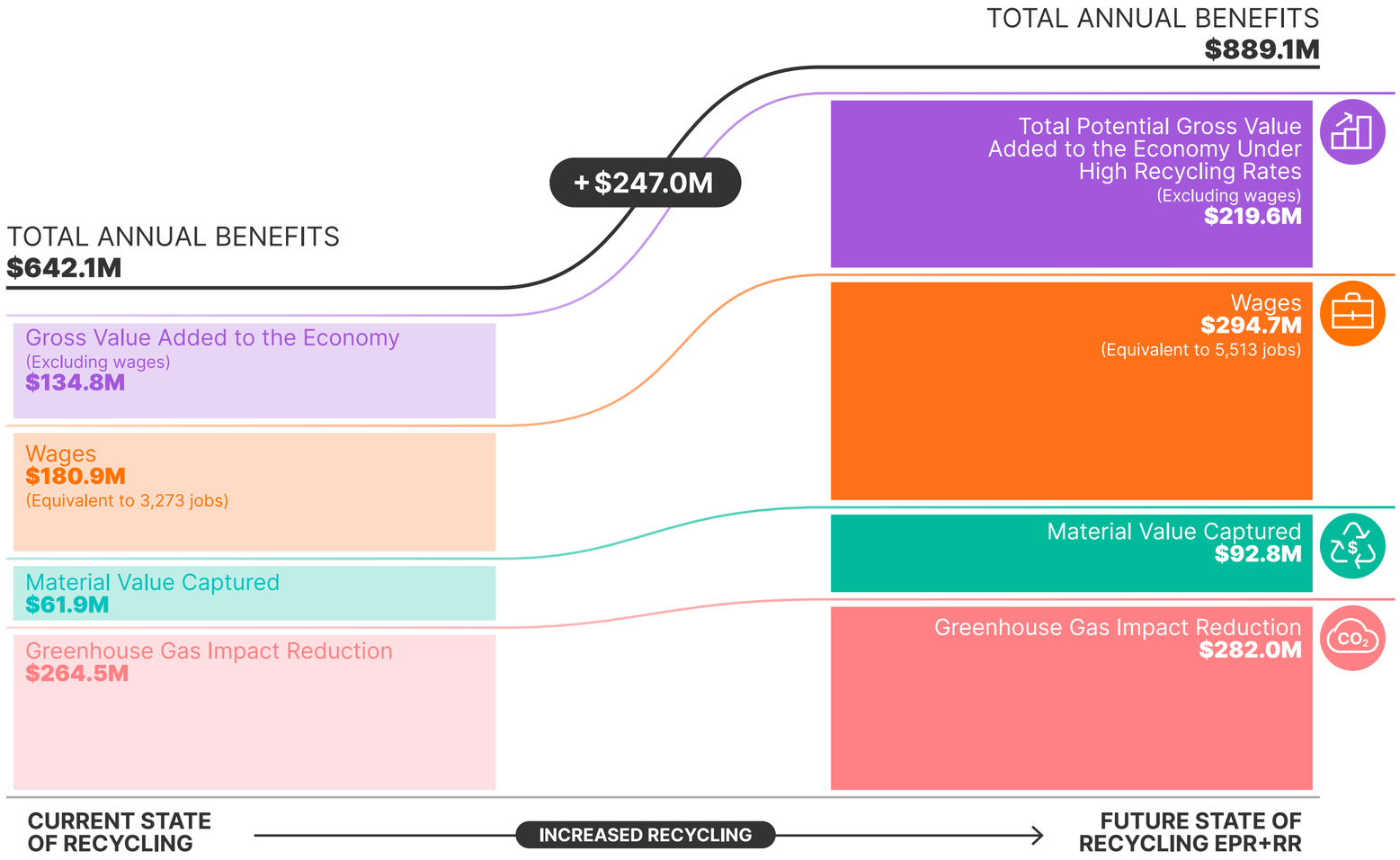
- Increase recycling related jobs from 3,300 to 5,500.
- Place $93 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.5 million MTCO2e annually.

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



DELAWARE

26% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK	2021	#14
RECYCLING RANK	2018	#14

=

POPULATION
1,004,807

CENSUS SUB REGION
MIDDLE ATLANTIC

RECYCLING REFUND STATE
NO

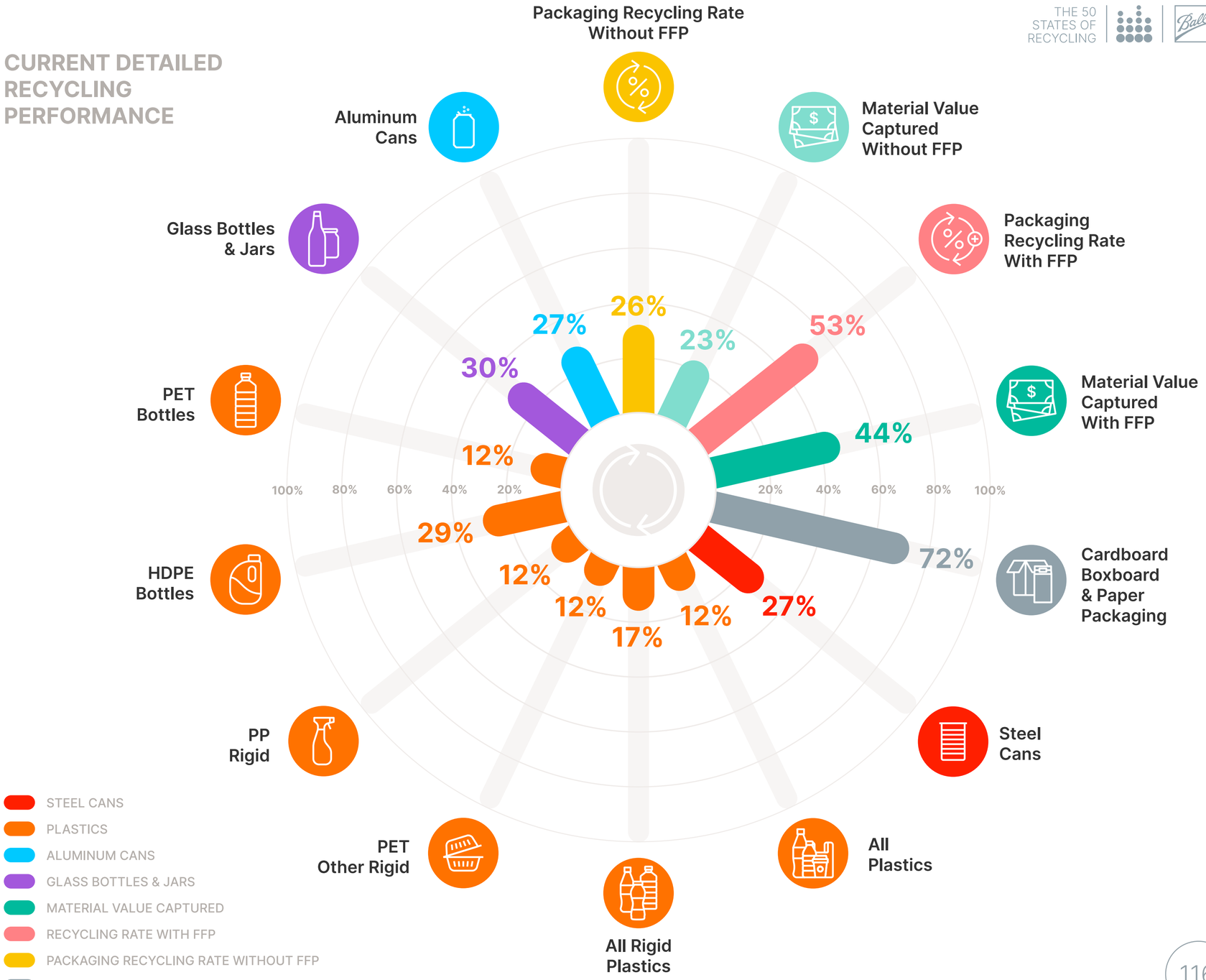
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Department of Natural Resources and Environmental Control (DNREC) works with local governments in Delaware to manage solid waste and encourage recycling, though operational responsibility lies with local government. They have developed guidelines for the recycling industry to report information as directed by the Universal Recycling Law (7 Del. C., §6056). This mandated reporting system aims to generate more accurate and detailed data. The state had a target diversion rate (of recyclables) of 60% in 2020.

CURRENT DETAILED RECYCLING PERFORMANCE



DELAWARE

CURRENT STATE OF RECYCLING

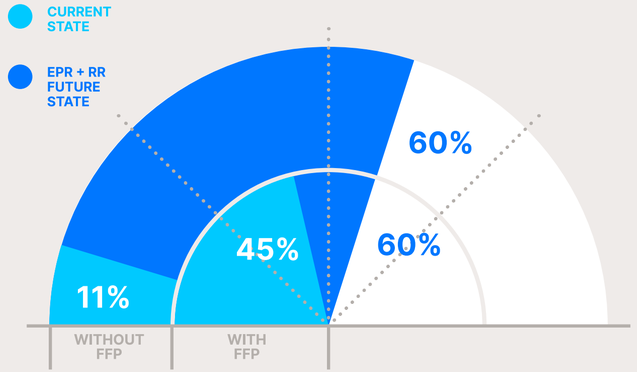
- In 2021, Delaware recycled approximately 26% of packaging materials without FFP. This recycling performance increases to 53% when considering materials with FFP.
- The value of the material captured for recycling was $13 million, just 44% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 360,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

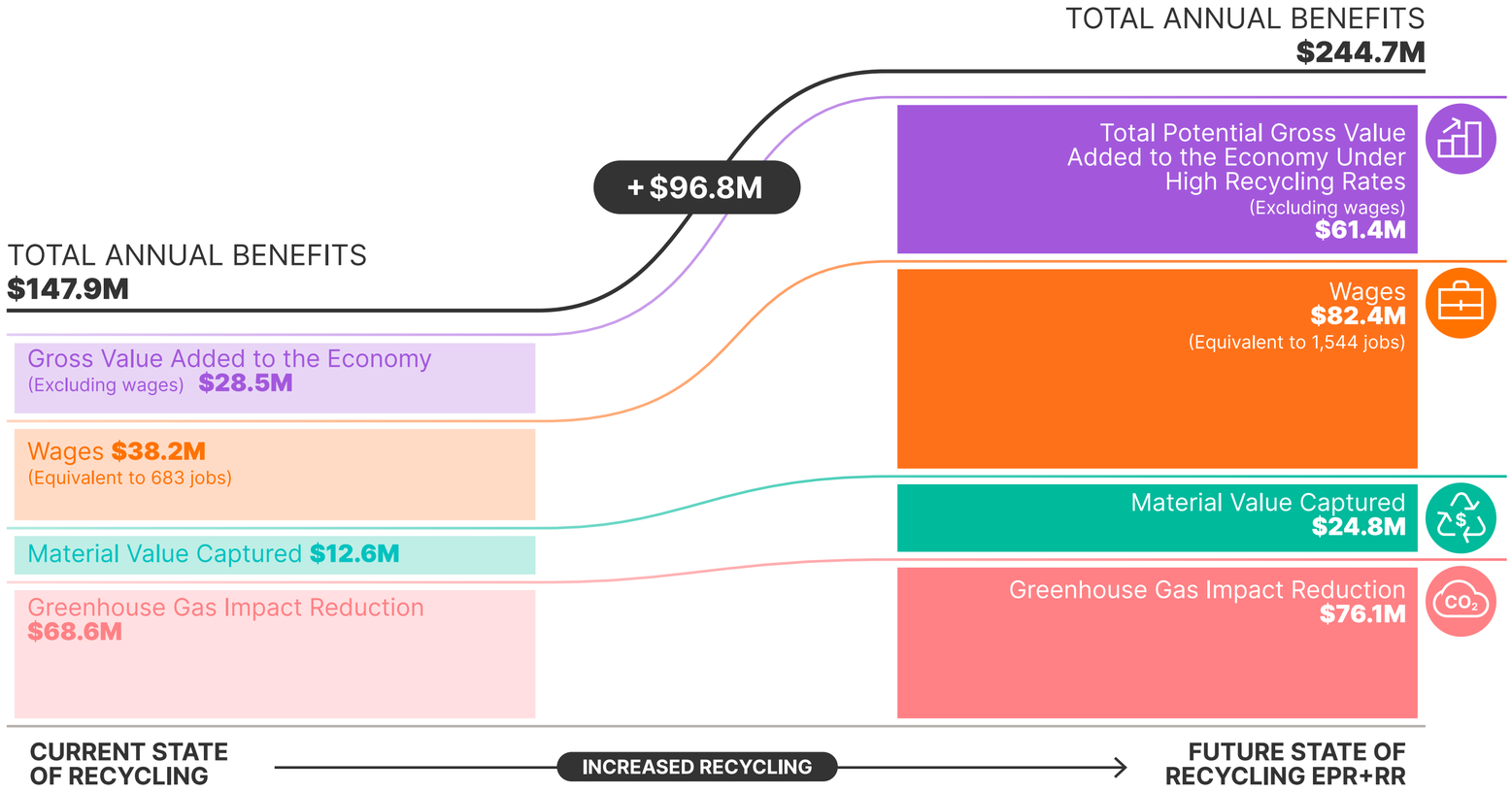
- Increase recycling related jobs from 700 to 1,500.
- Place $25 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 400,000 MTCO2e annually.

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



FLORIDA

17% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #27

RECYCLING RANK 2018 #27 =

POPULATION
21,828,069

CENSUS SUB REGION
SOUTH ATLANTIC

RECYCLING REFUND STATE
NO

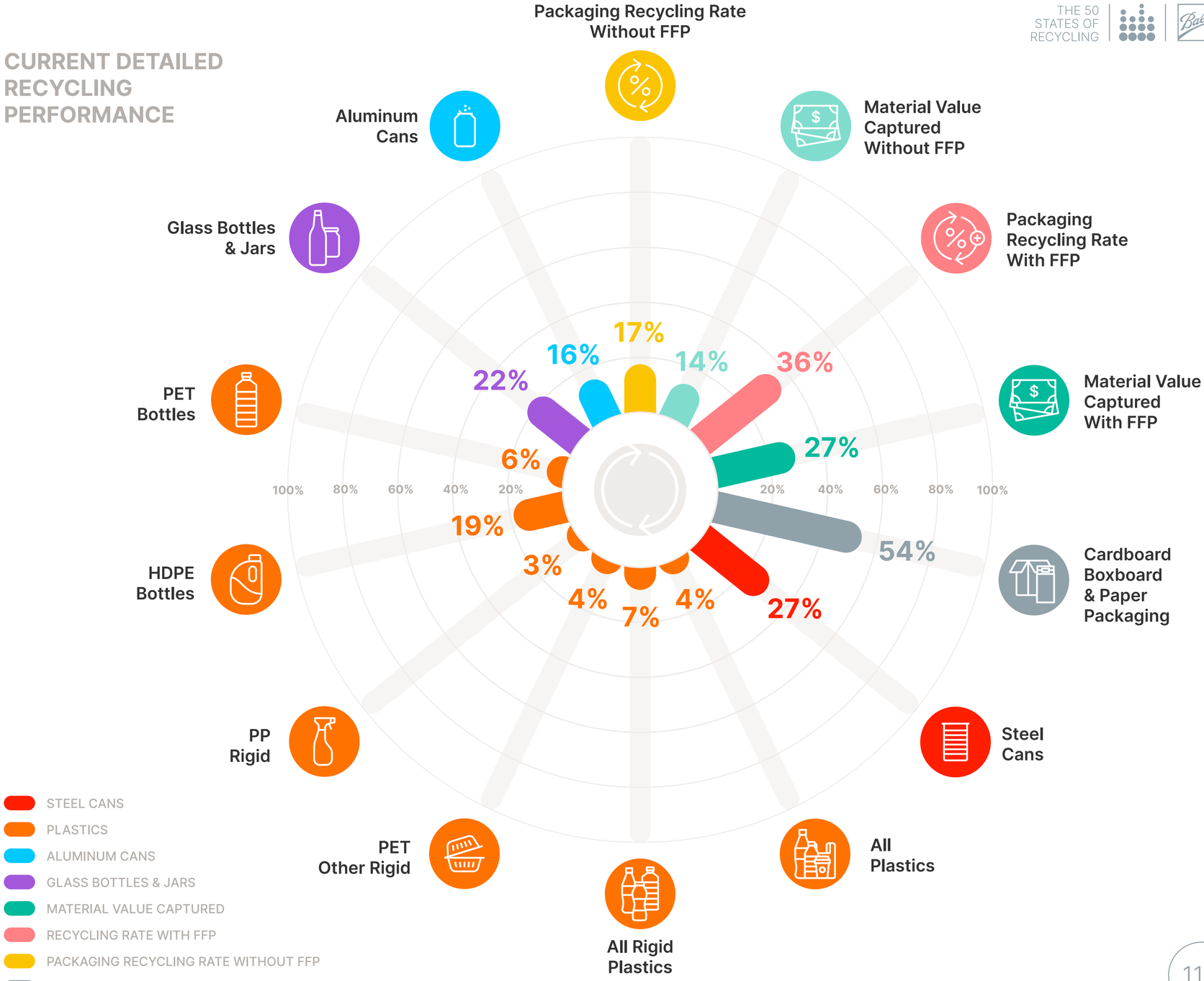
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Florida mandates recycling programs for solid waste in each county. The Wrap Recycling Action Program (WRAP) aims to enhance plastic bag and film recycling, increase recycled plastics demand, and educate Florida communities on film recycling benefits. Florida's ambitious 75% weight-based recycling goal for 2020 wasn't met, mainly due to low participation rates, despite 92% and 68% accessibility to curbside recycling for single-family and multi-family households, respectively, per Florida DEP data.

CURRENT DETAILED RECYCLING PERFORMANCE



FLORIDA

CURRENT STATE OF RECYCLING

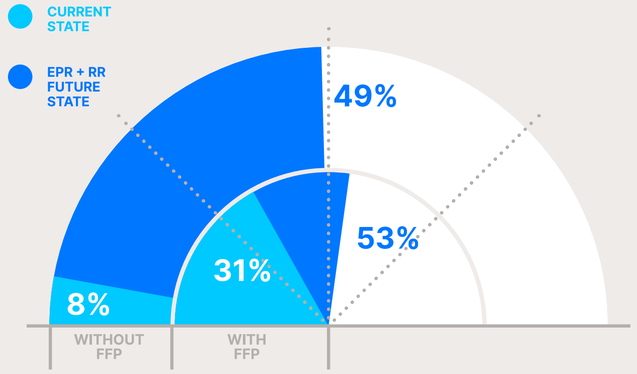
- In 2021, Florida recycled approximately 17% of packaging materials without FFP. This recycling performance increases to 36% when considering materials with FFP.
- The value of the material captured for recycling was $214 million, just 27% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 5.6 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

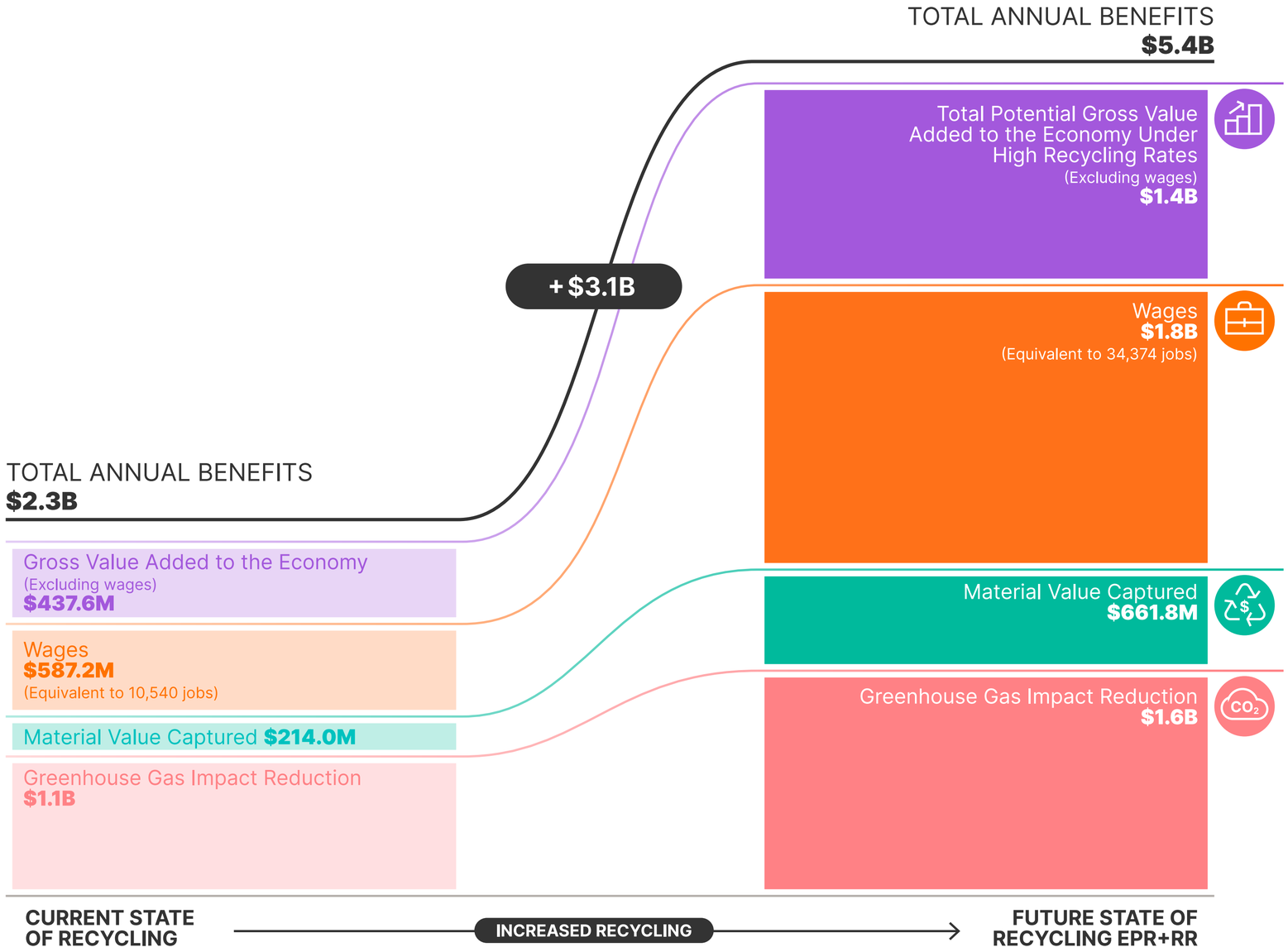
- Increase recycling related jobs from 10,500 to 34,400.
- Place $662 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 8.4 million MTCO2e annually.

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



GEORGIA

14% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#31
RECYCLING RANK 2018	#32

+1

POPULATION
10,788,029

CENSUS SUB REGION
SOUTH ATLANTIC

RECYCLING REFUND STATE
NO

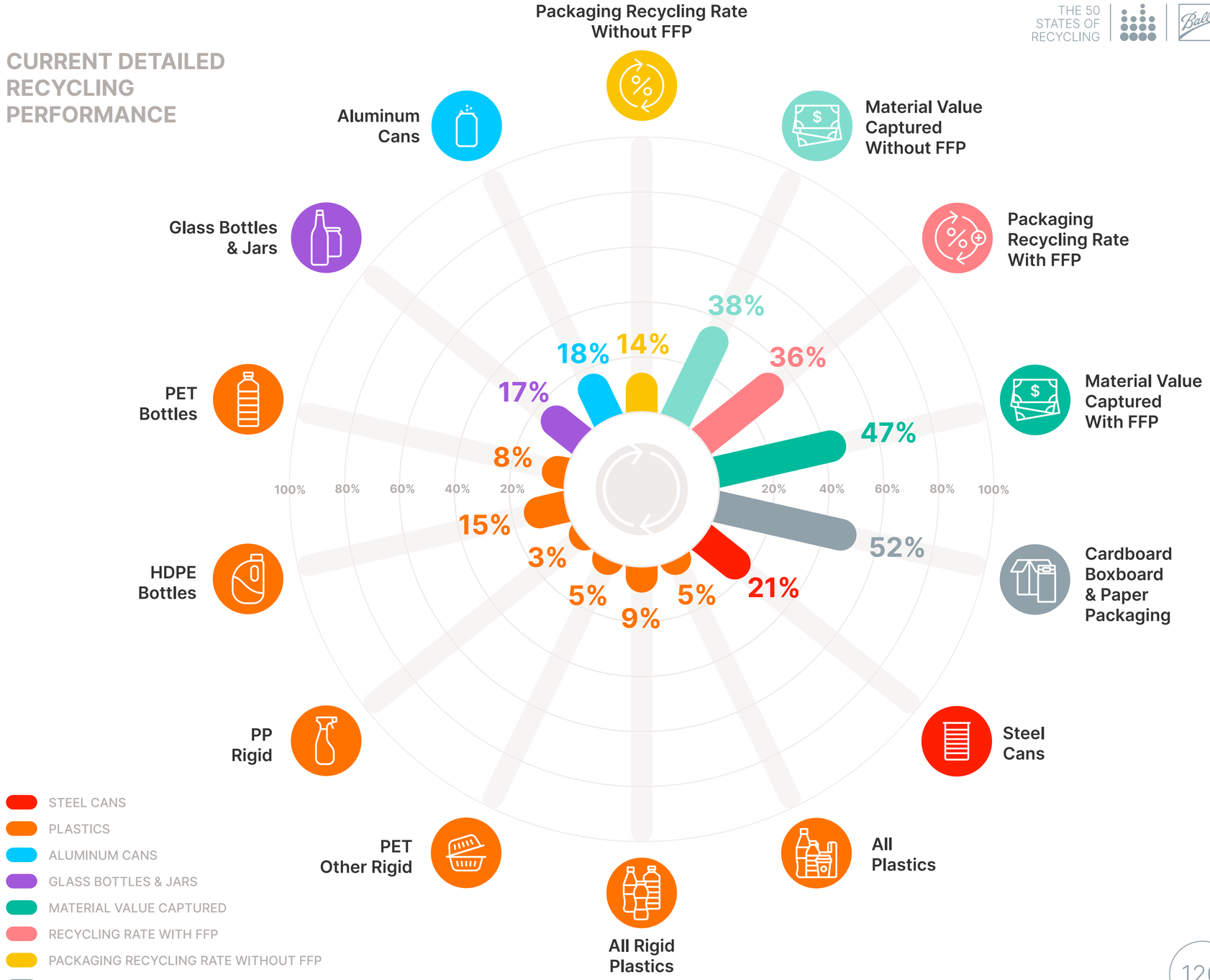
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Land Protection Branch of the Georgia Environmental Protection Division (EPD) manages the disposal and treatment of solid waste through permitting municipal and industrial solid waste landfills. Its Recovered Materials Unit (RMU) encourages and provides technical assistance on reduction, recycling, and reuse of materials. The state currently has no overarching legislation regarding the management of post-consumer packaging.

CURRENT DETAILED RECYCLING PERFORMANCE



GEORGIA

CURRENT STATE OF RECYCLING

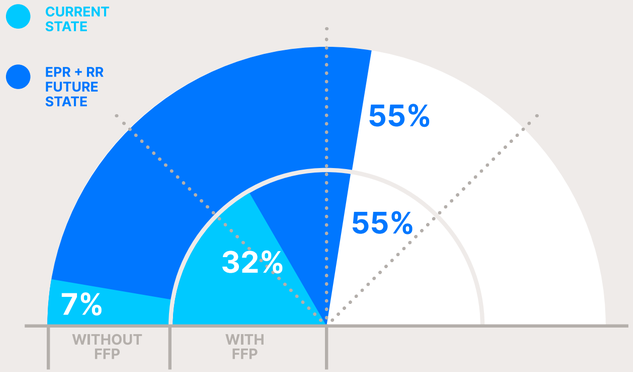
- In 2021, Georgia recycled approximately 14% of packaging materials without FFP. This recycling performance increases to 36% when considering materials with FFP.
- The value of the material captured for recycling was $100 million, just 29% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 2.6 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 4,700 to 15,100.
- Place $293 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 4 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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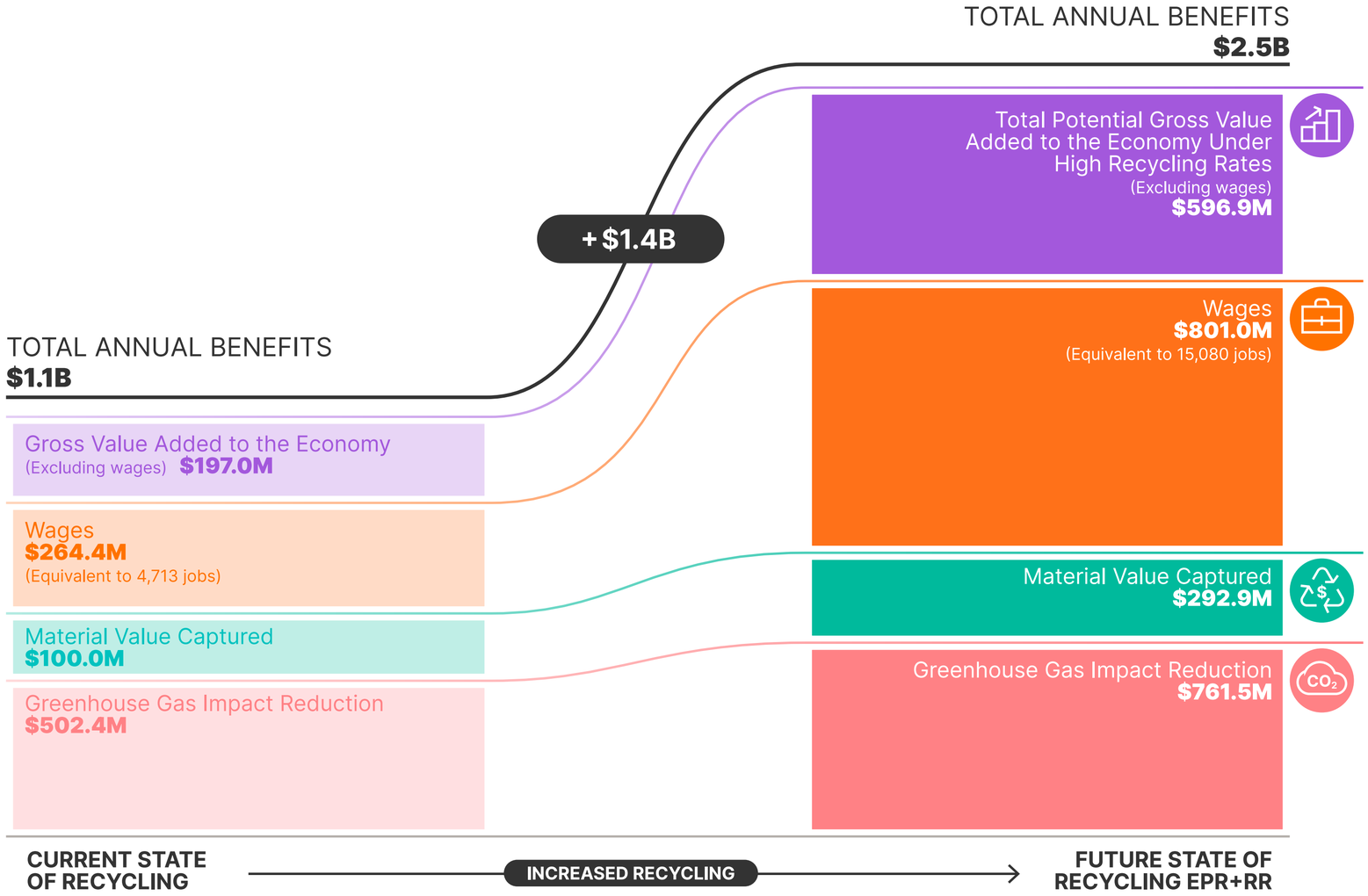
EPR assumes an overall recycling rate of 65% for residential packaging and RR assumes a 90% recycling rate for beverage containers



HAWAII

22% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#20	-3
RECYCLING RANK 2018	#17	

POPULATION
1,447,154

CENSUS SUB REGION
PACIFIC

RECYCLING REFUND STATE
YES

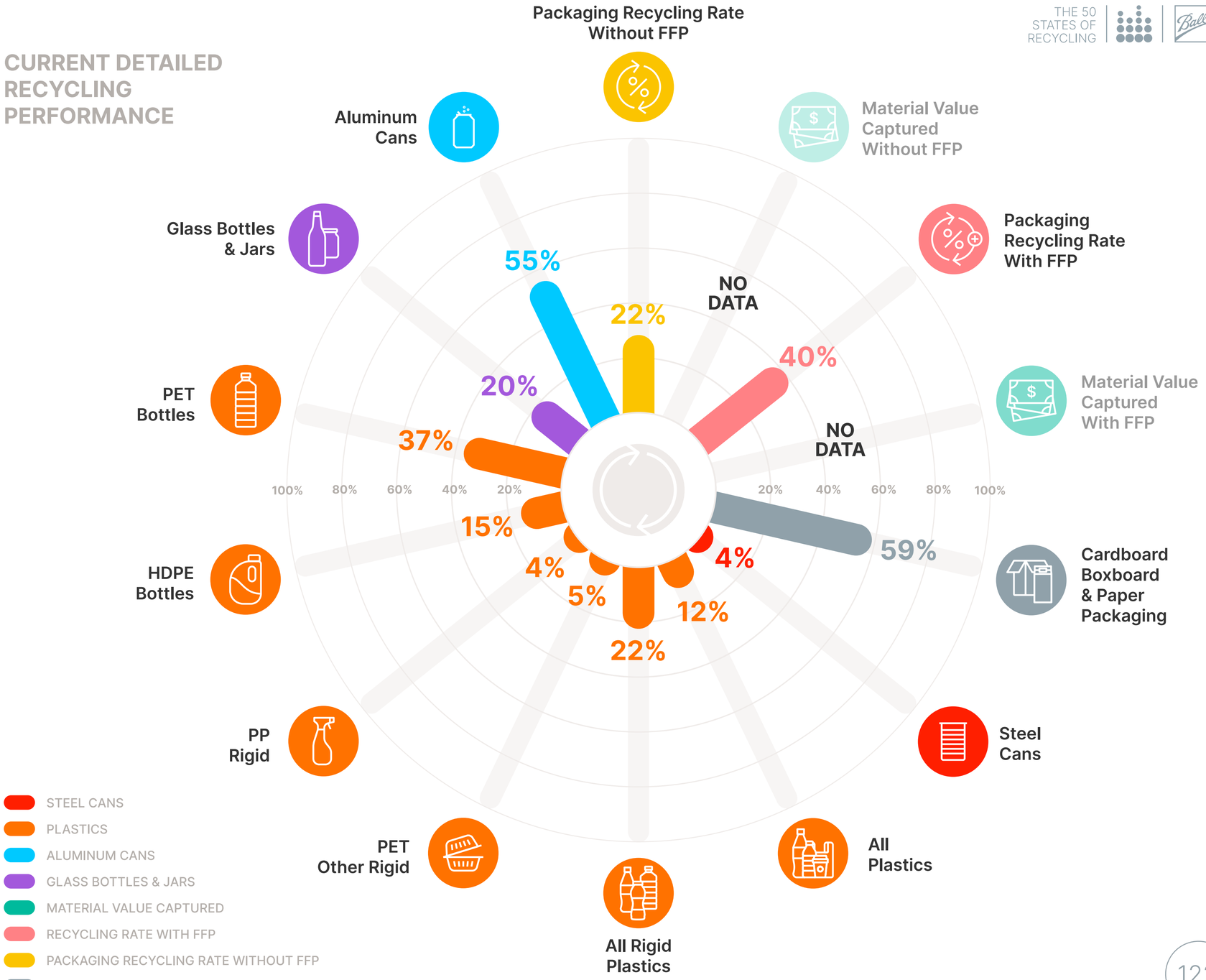
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Every county in Hawaii operates under the umbrella of the health department (DOH) and is required to have an integrated solid waste management plan, which the health department must approve. The DOH is expected to submit an annual report on the state's progress toward its waste reduction goals. However, the last report was published in March 2020, and previously not since 2015. Hawaii has had a Recycling Refund in place since 2005 and uses redemption centers as return points.

CURRENT DETAILED RECYCLING PERFORMANCE



HAWAII

CURRENT STATE OF RECYCLING

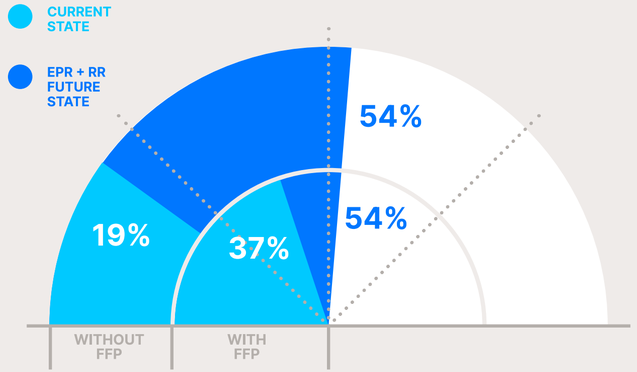
- In 2021, Hawaii recycled approximately 22% of packaging materials without FFP. This recycling performance increases to 40% when considering materials with FFP.
- The gross value added (GVA) to the economy is $98 million in the form of jobs.
- Recycling in the state avoided GHG emissions of 420,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

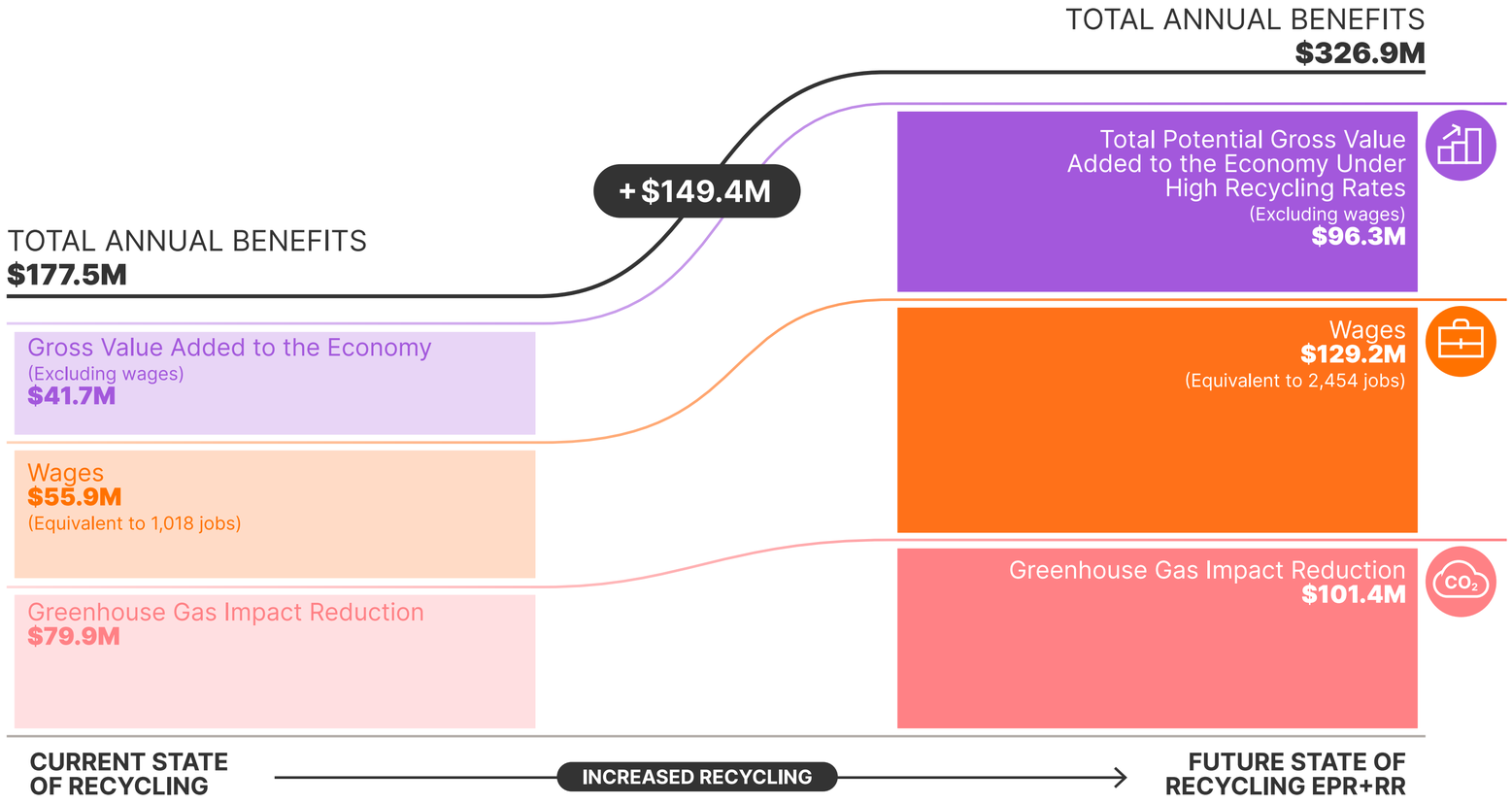
- Increase recycling related jobs from 1,000 to 2,500.
- Increase GVA to $226 million in the form of jobs to the economy.
- Avoid emissions of 530,000 MTCO2e annually.

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



IDAHO

13% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#33	+1
RECYCLING RANK 2018	#34	

POPULATION
1,904,314

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

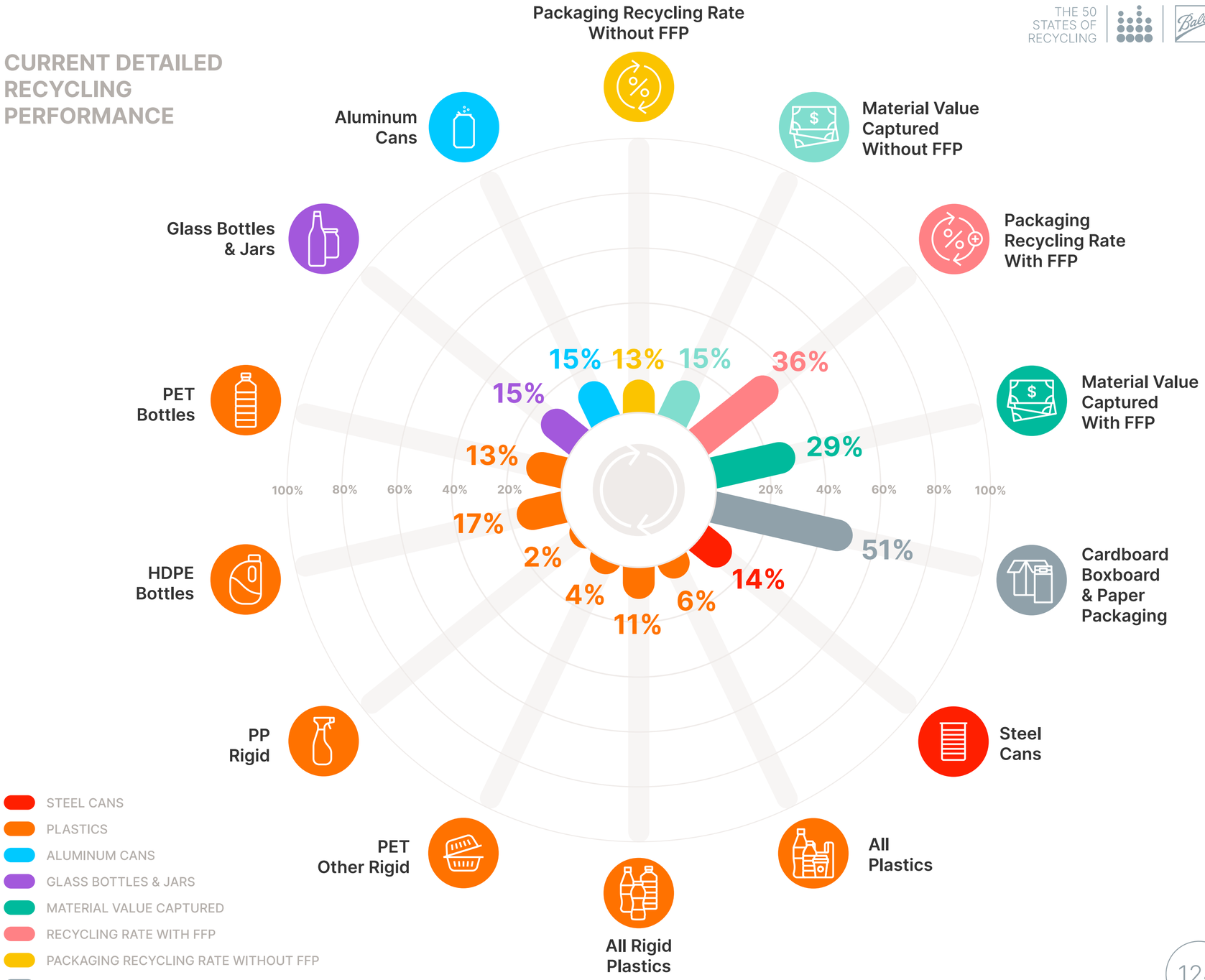
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Idaho has no mandated waste diversion goal. Both recycling and garbage collection are optional services provided at the discretion of local governments or by private recycling companies. Compared to other states, recycling in Idaho is largely limited, largely due to the relatively low cost of disposal. This is influenced by Idaho's low population density compared to most US states and therefore ample landfill space.

CURRENT DETAILED RECYCLING PERFORMANCE



IDAHO

CURRENT STATE OF RECYCLING

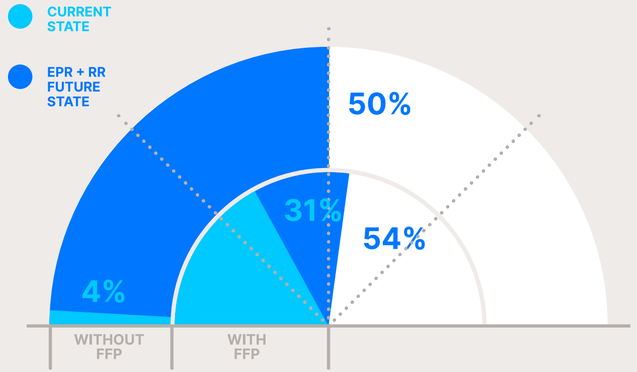
- In 2021, Idaho recycled approximately 13% of packaging materials without FFP. This recycling performance increases to 36% when considering materials with FFP.
- The value of the material captured for recycling was $12 million, just 27% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 440,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

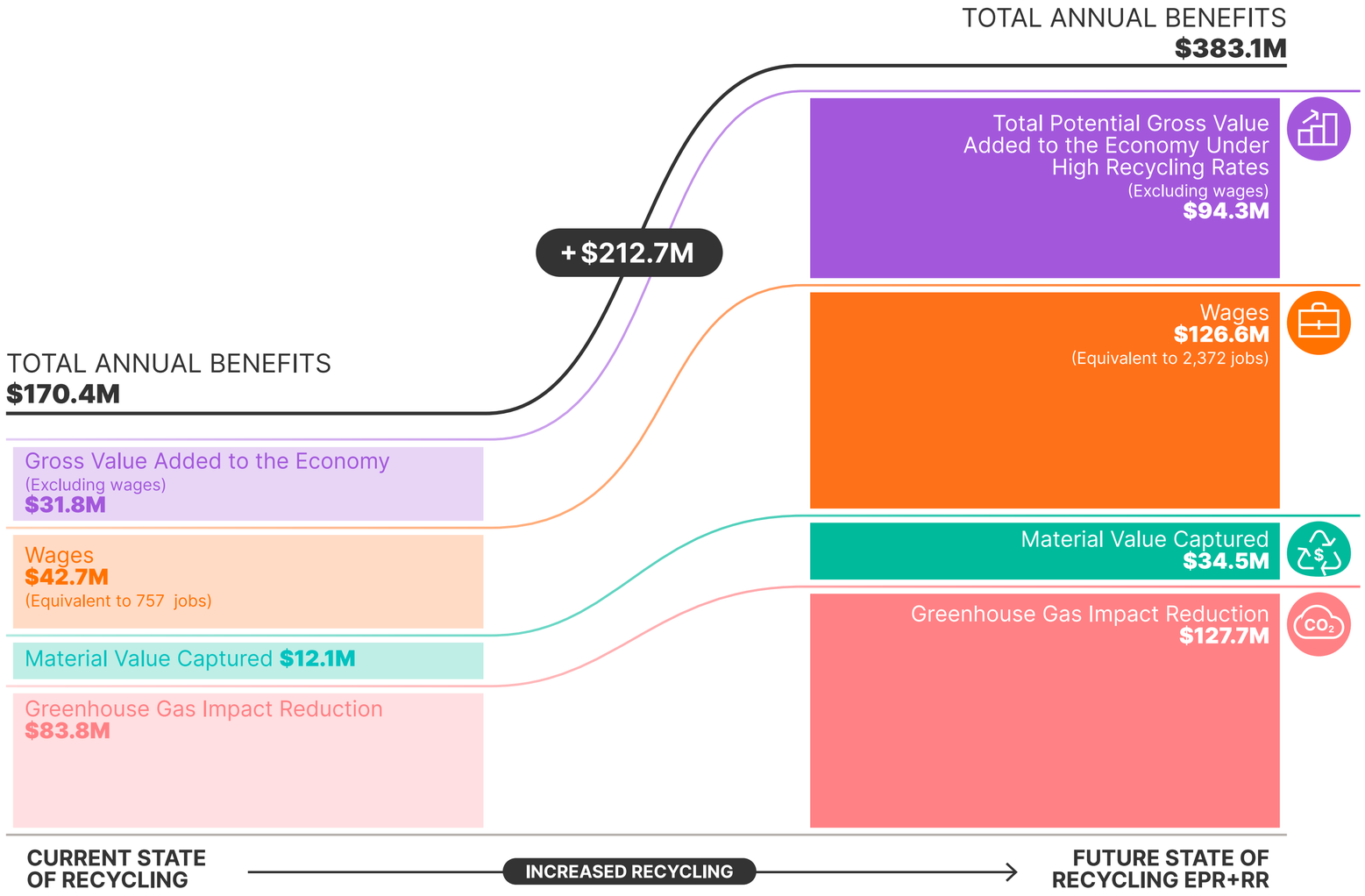
- Increase recycling related jobs from 760 to 2,400.
- Place $34 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 670,000 MTCO2e annually.

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



ILLINOIS

19% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #24 +4

RECYCLING RANK 2018 #28

POPULATION
12,686,469

CENSUS SUB REGION
EAST NORTH CENTRAL

RECYCLING REFUND STATE
NO

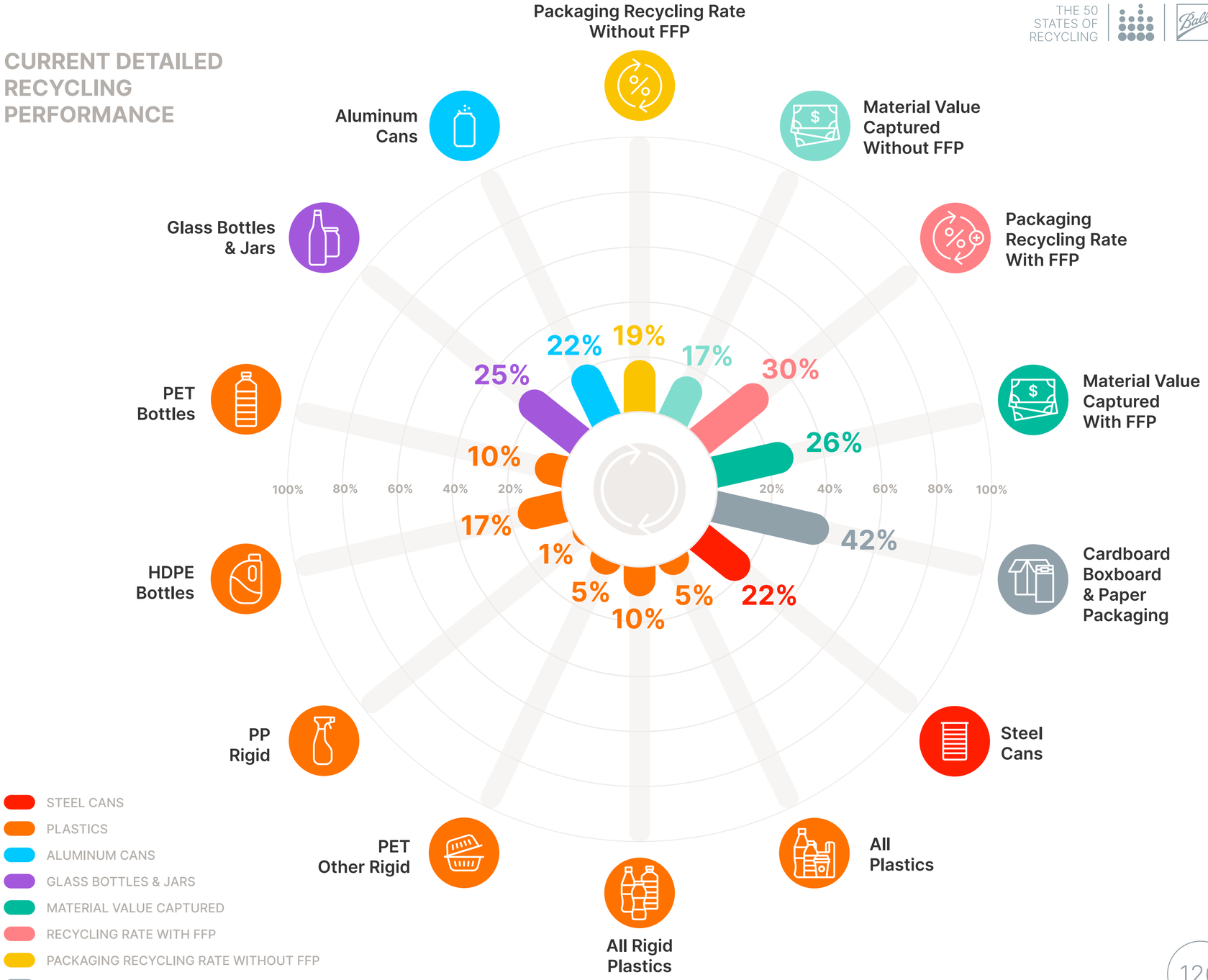
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Illinois Environmental Protection Agency (IEPA) is responsible for overseeing compliance with state and federal environmental laws and regulations through a system of permits, inspections, and enforcement activities. Illinois runs a unique risk of running out of landfill space; therefore, in-state waste management solutions are likely to become increasingly important soon. This is exemplified by the recent passing of SB1555 that mandated a needs assessment for the state.

CURRENT DETAILED RECYCLING PERFORMANCE



ILLINOIS

CURRENT STATE OF RECYCLING

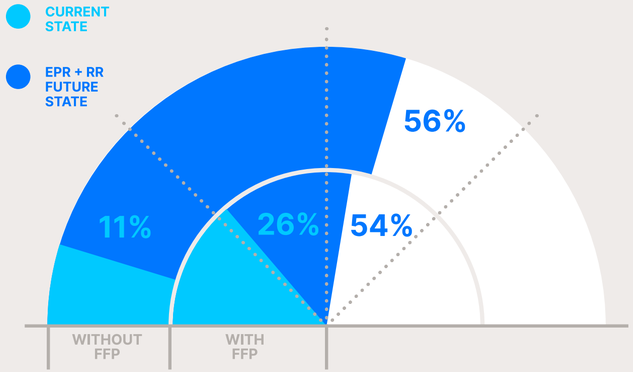
- In 2021, Illinois recycled approximately 19% of packaging materials without FFP. This recycling performance increases to 30% when considering materials with FFP.
- The value of the material captured for recycling was $110 million, just 26% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 2.7 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 5,800 to 18,500.
- Place $351 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 4.9 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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

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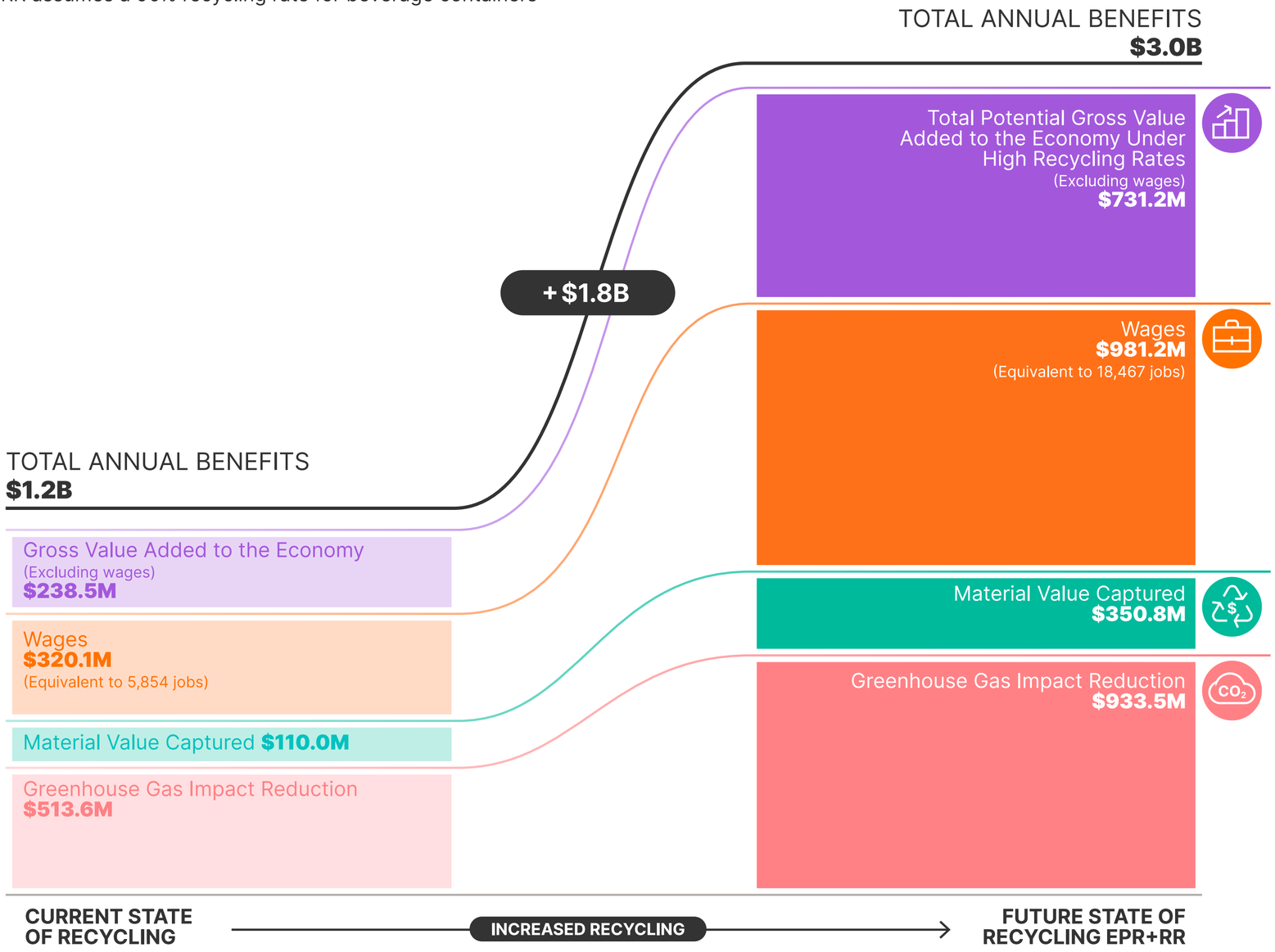


INDIANA

24% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #16 (+8)

RECYCLING RANK 2018 #24

POPULATION
6,813,532

CENSUS SUB REGION
EAST NORTH CENTRAL

RECYCLING REFUND STATE
NO

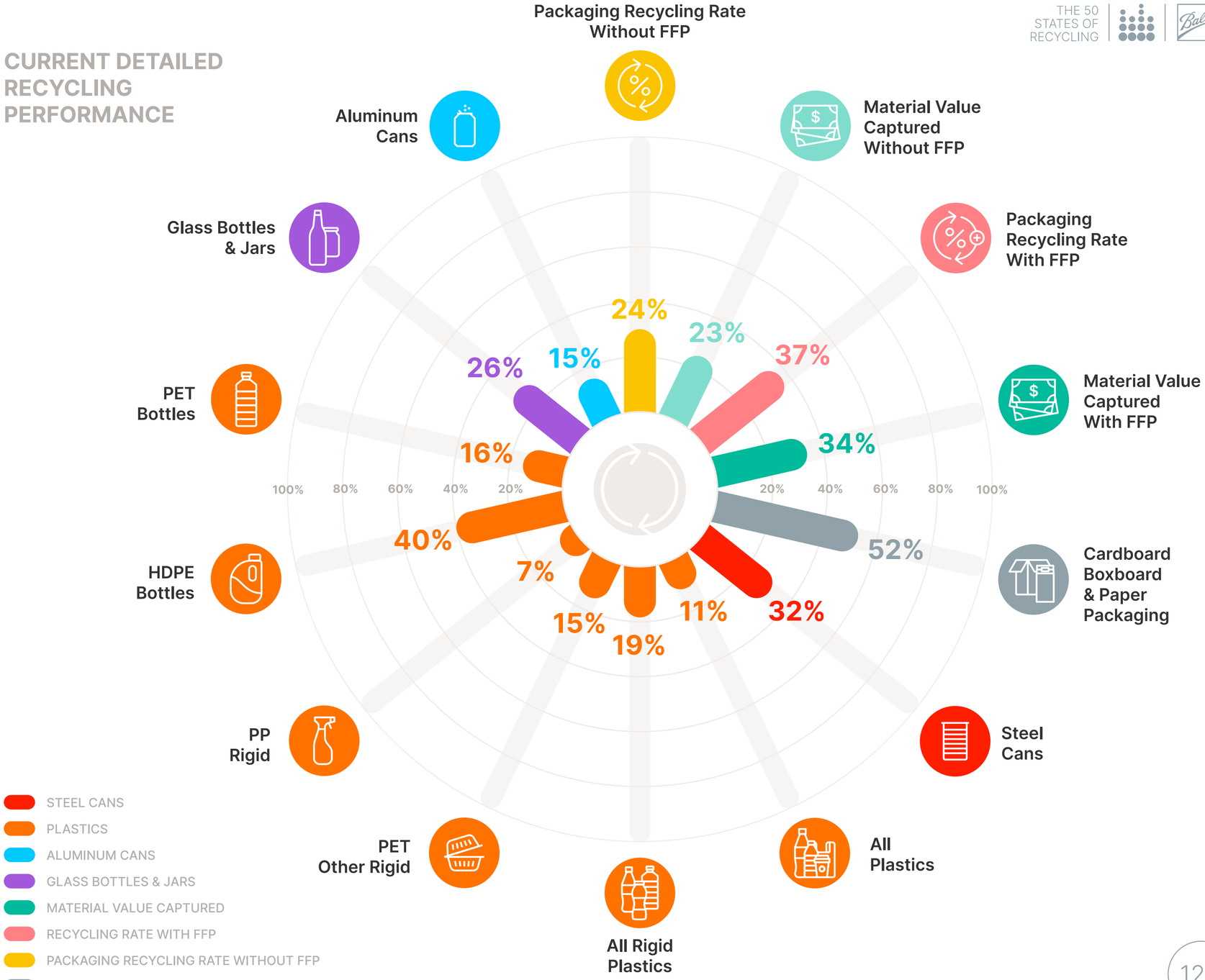
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Recycle Indiana is a branch of the Indiana Department of Environmental Management (IDEM) that works with partners across the state to promote and provide technical assistance with recycling. IDEM also administers a Recycling Market Development Program that provides grants to develop recycling markets across the state. In 2014, the state passed recycling legislation (HB 1182) that required annual reporting of recycling rates and set a goal to reach and sustain a recycling rate of 50%.

CURRENT DETAILED RECYCLING PERFORMANCE



INDIANA

CURRENT STATE OF RECYCLING

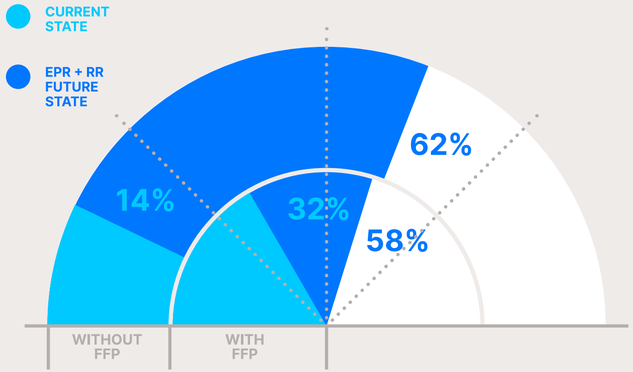
- In 2021, Indiana recycled approximately 24% of packaging materials without FFP. This recycling performance increases to 37% when considering materials with FFP.
- The value of the material captured for recycling was $67 million, just 34% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.6 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 3,900 to 11,200.
- Place $171 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.5 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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

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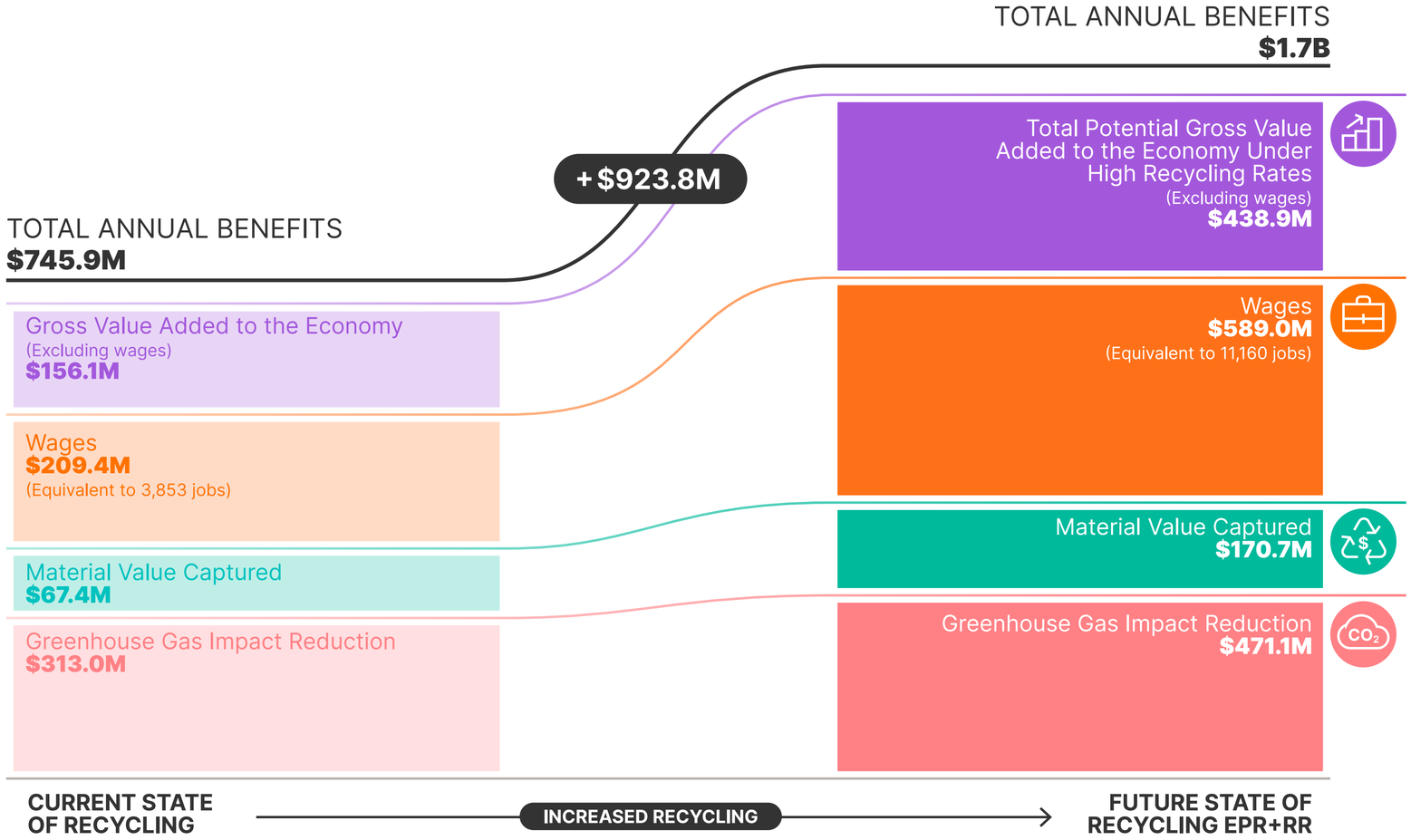


IOWA

45% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #4

RECYCLING RANK 2018 #10

+6

POPULATION
3,197,689

CENSUS SUB REGION
WEST NORTH CENTRAL

RECYCLING REFUND STATE
YES

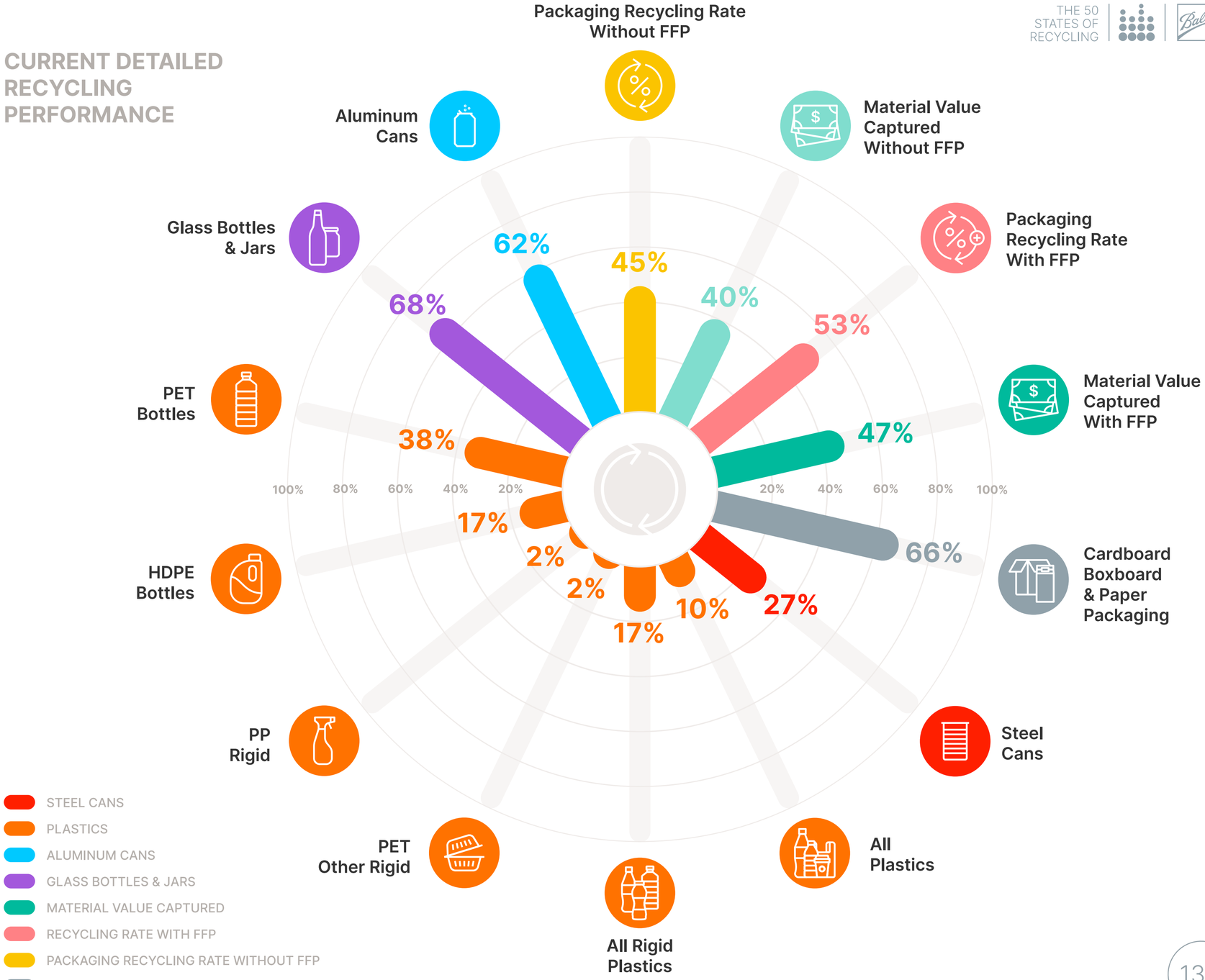
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Iowa does not keep track of annual tons recycled and does not have many laws regarding packaging recycling. One exception is Iowa's Recycling Refund (IAC Chapter 567-107), which was enacted in 1978 and requires a 5 cents refundable deposit to be placed on certain beverage containers. Iowa cities and counties are responsible for developing comprehensive solid waste reduction programs in collaboration with their landfills or other waste facilities. No statewide targets guide these comprehensive plans.

CURRENT DETAILED RECYCLING PERFORMANCE



IOWA

CURRENT STATE OF RECYCLING

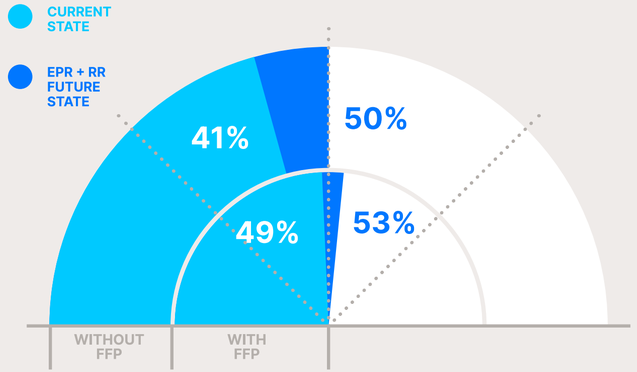
- In 2021, Iowa recycled approximately 45% of packaging materials without FFP. This recycling performance increases to 53% when considering materials with FFP.
- The value of the material captured for recycling was $61 million, just 47% of the total value of material that could be captured for recycling.
- 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 3,100 to 4,700.
- Place $90 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.3 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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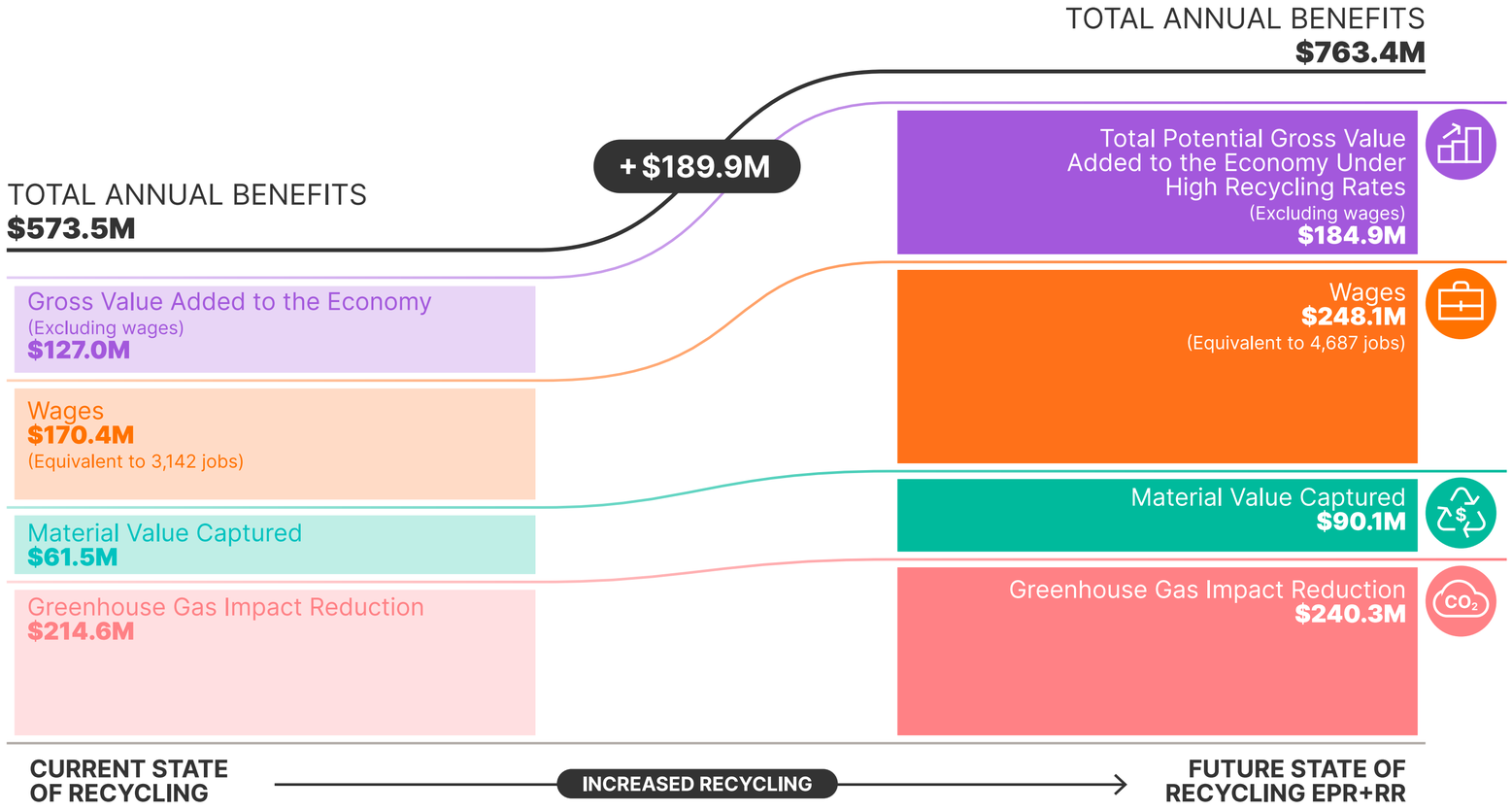


KANSAS

23% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#18	+3
RECYCLING RANK 2018	#21	

POPULATION
2,937,922

CENSUS SUB REGION
WEST NORTH CENTRAL

RECYCLING REFUND STATE
NO

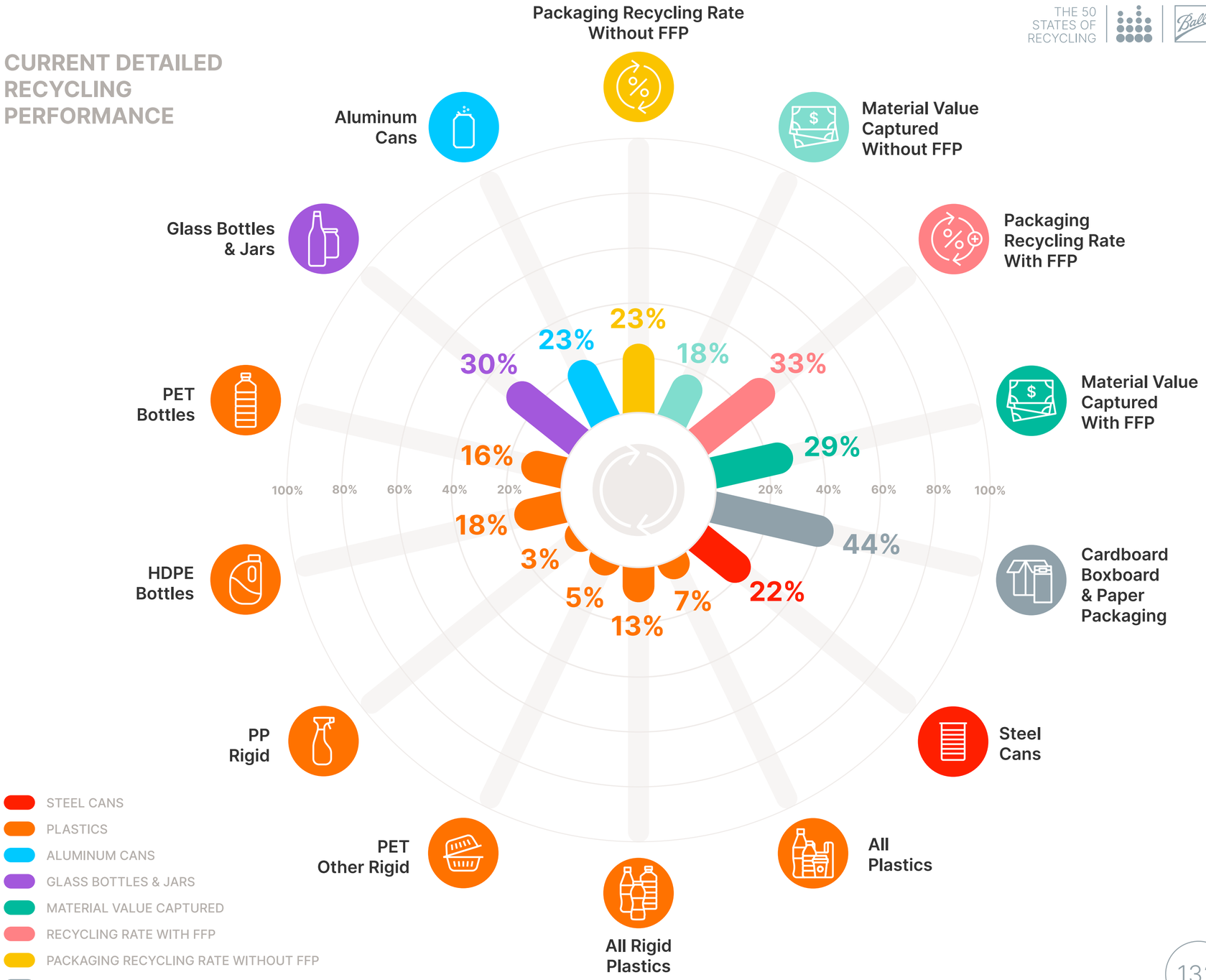
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Kansas Department of Health and Environment (KDHE) is the state agency responsible for Kansas' environmental sustainability. Many individuals, private companies, and local governments contribute to managing of solid waste in Kansas including those involved in planning, consulting, collection, processing, monitoring, and disposal. State law does not currently mandate recycling.z

CURRENT DETAILED RECYCLING PERFORMANCE



KANSAS

CURRENT STATE OF RECYCLING

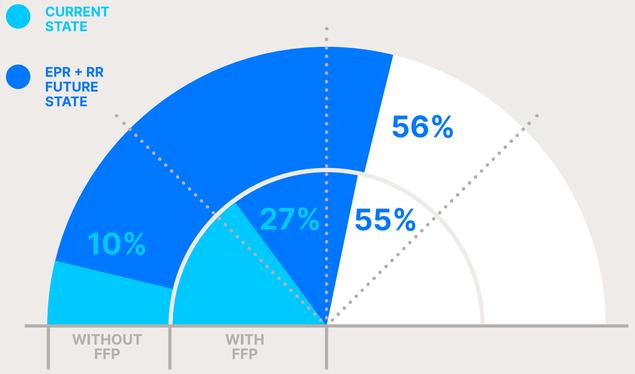
- In 2021, Kansas recycled approximately 23% of packaging materials without FFP. This recycling performance increases to 33% when considering materials with FFP.
- The value of the material captured for recycling was $25 million, just 29% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 610,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 1,400 to 4,100.
- Place $74 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.1 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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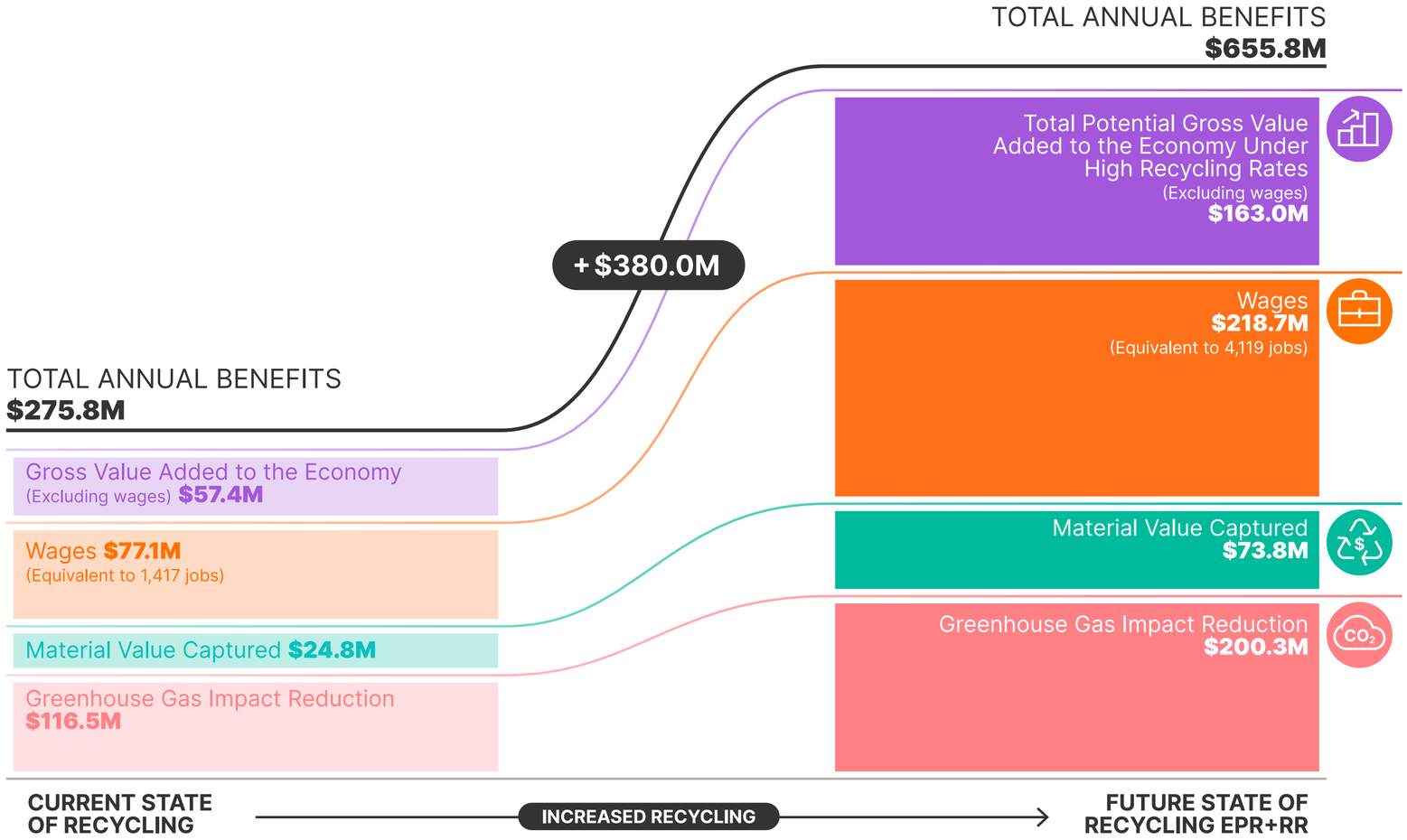


KENTUCKY

11% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#40	-1
RECYCLING RANK 2018	#39	

POPULATION
4,506,589

CENSUS SUB REGION
EAST SOUTH CENTRAL

RECYCLING REFUND STATE
NO

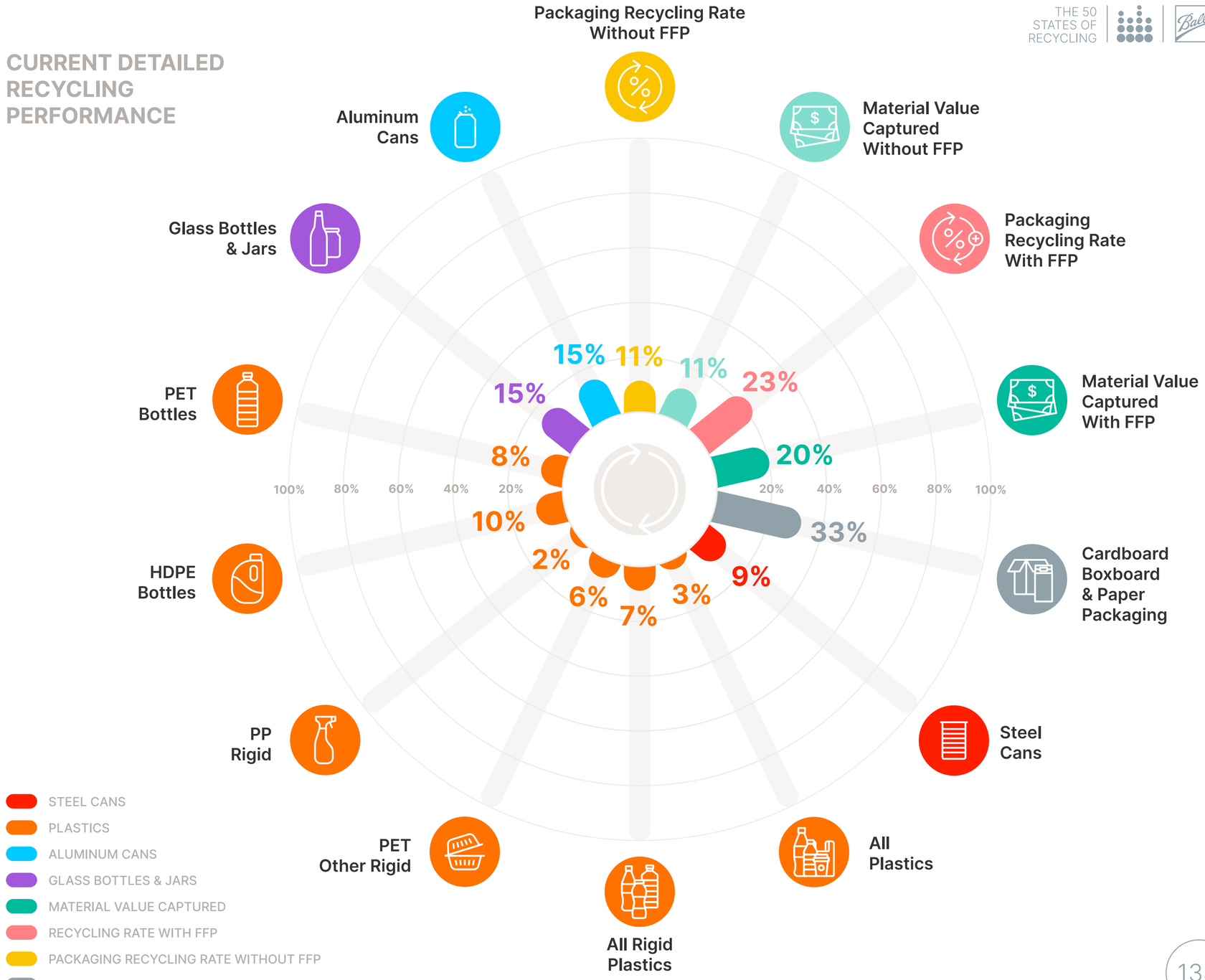
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Kentucky has historically had strict laws regarding illegal dumping. Statute § 224.43-505, for instance, requires waste haulers to register and report on tonnages in each county where they provide service. Following the passage of this law in 2002, the next landmark piece of statewide legislation was KRS 224.43-315, that requires recyclers to report their annual collected tons for recycling to the counties which they serve. However, the overall recycling rate has remained flat over the past few years.

CURRENT DETAILED RECYCLING PERFORMANCE



KENTUCKY

CURRENT STATE OF RECYCLING

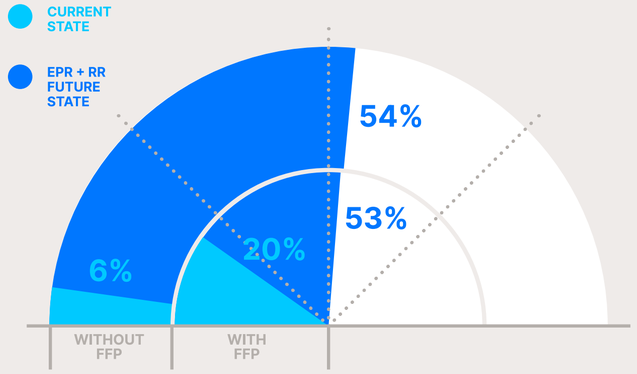
- In 2021, Kentucky recycled approximately 11% of packaging materials without FFP. This recycling performance increases to 23% when considering materials with FFP.
- The value of the material captured for recycling was $26 million, just 20% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 690,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 1,300 to 5,700.
- Place $107 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.6 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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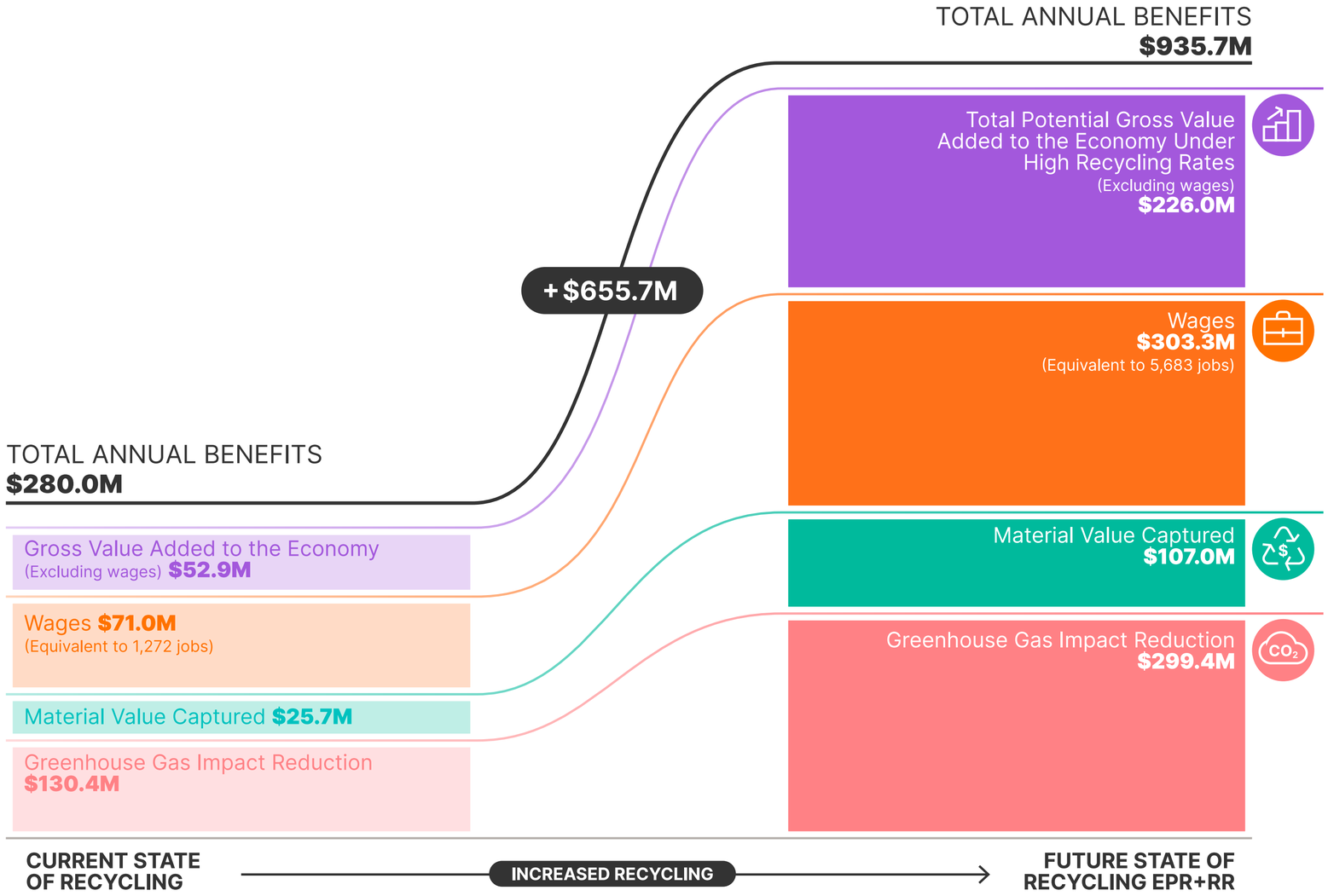


LOUISIANA

4% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #49 =

RECYCLING RANK 2018 #49

POPULATION
4,627,098

CENSUS SUB REGION
WEST SOUTH CENTRAL

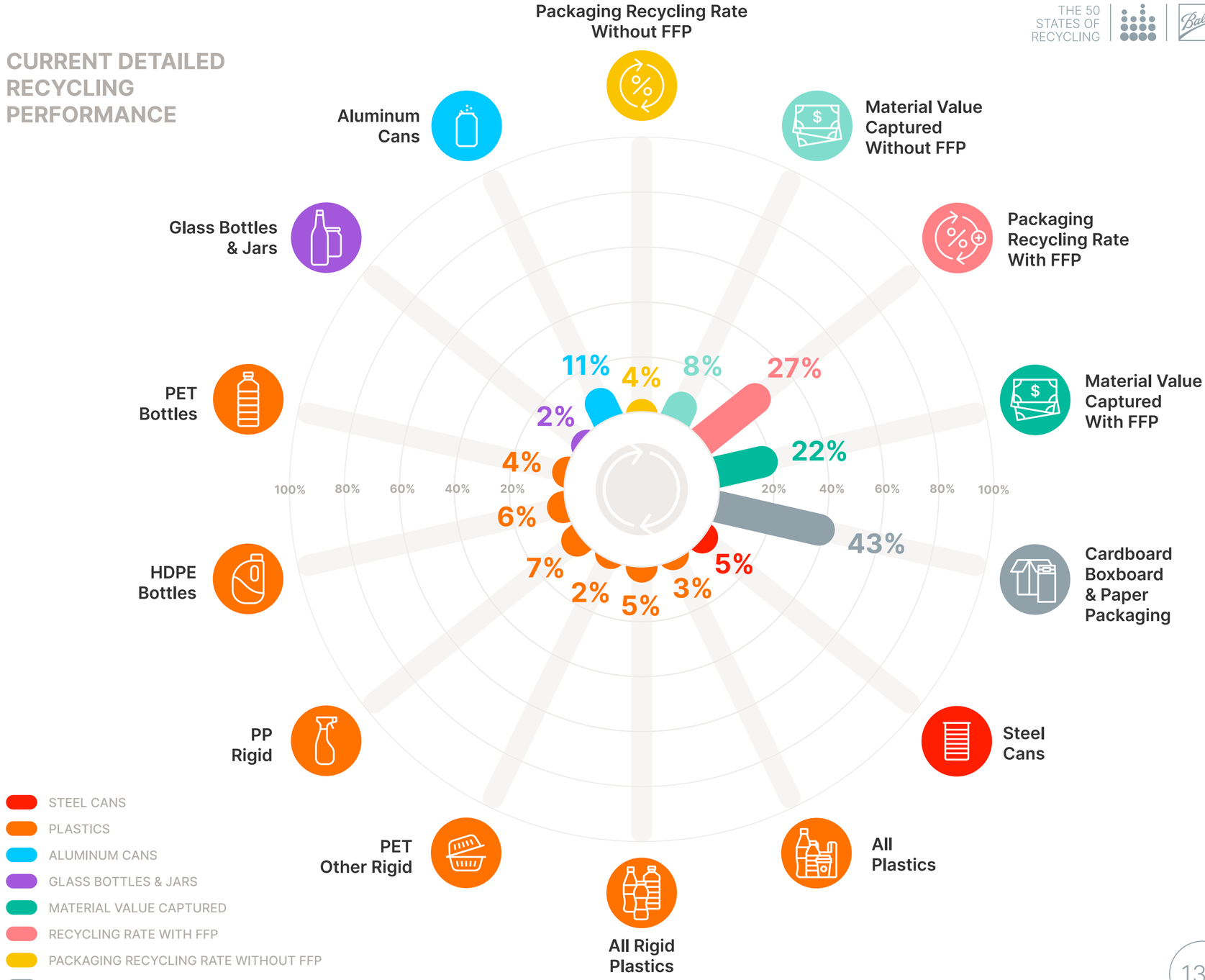
RECYCLING REFUND STATE
NO

DATA QUALITY

OVERVIEW

Louisiana State law L.R.S 30:2413 requires that the Department of Environmental Quality (DEQ) report annually to the state Senate regarding its progress and findings from the past year. The DEQ requests voluntary reports from solid waste planners on their tons and activities. Louisiana has attempted to increase recycling rates through economic incentive plans. Through its Corporate Recycling Tax Credits program, Louisiana offers a 14.4% tax credit to entities who purchase qualified new recycling equipment.

CURRENT DETAILED RECYCLING PERFORMANCE



LOUISIANA

CURRENT STATE OF RECYCLING

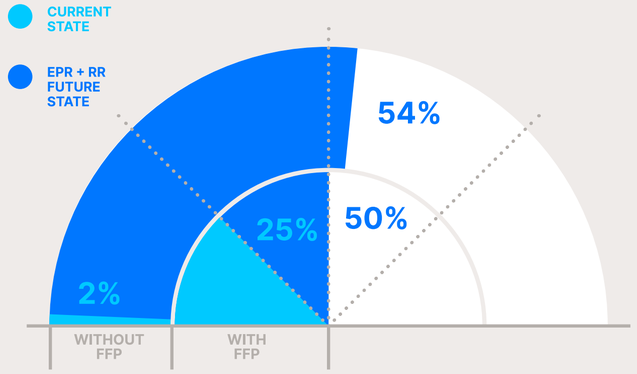
- In 2021, Louisiana recycled approximately 4% of packaging materials without FFP. This recycling performance increases to 27% when considering materials with FFP.
- The value of the material captured for recycling was $30 million, just 22% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 860,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 1,200 to 5,700.
- Place $110 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.6 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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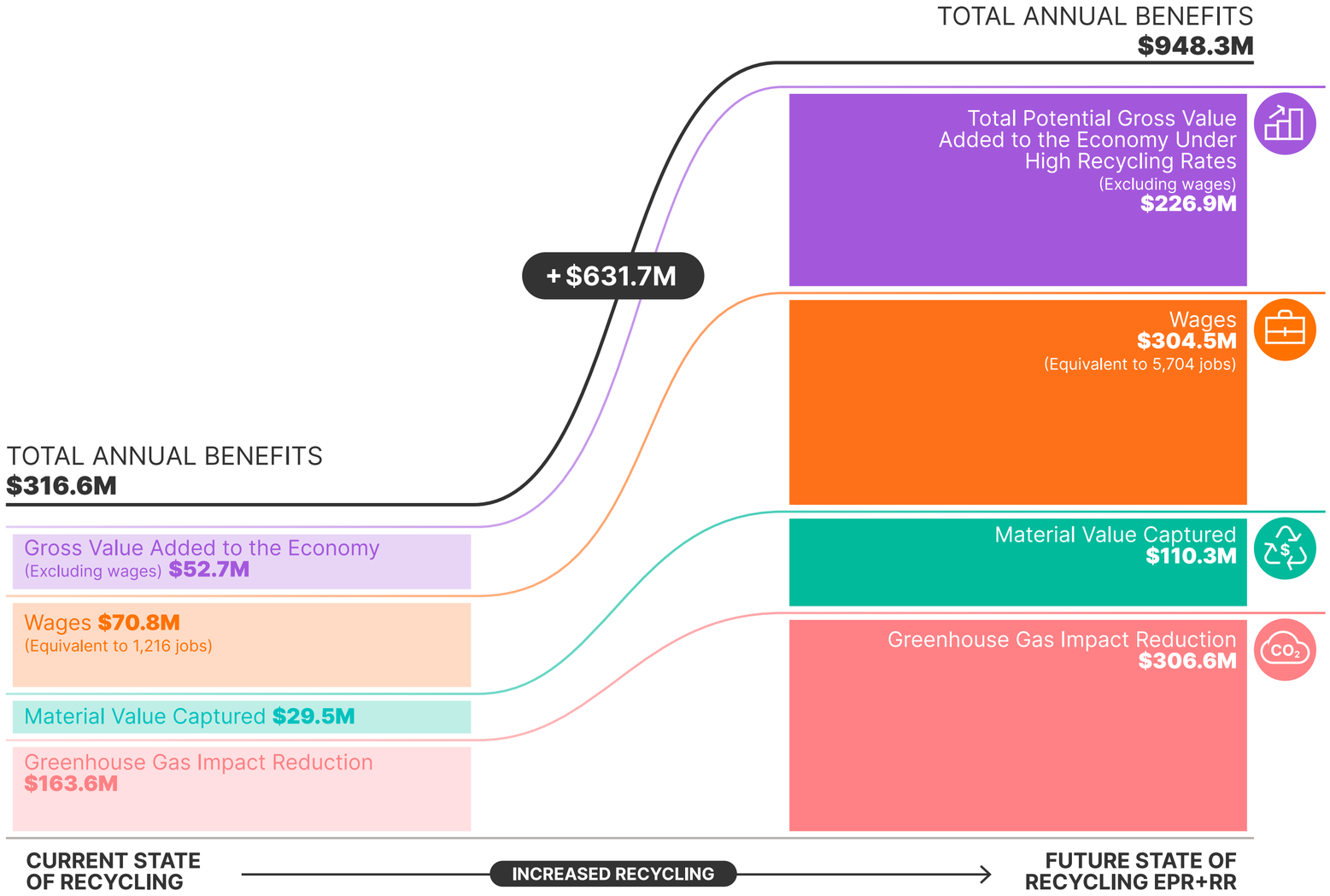


MAINE

65% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #1

RECYCLING RANK 2018 #1 =

POPULATION
1,377,238

CENSUS SUB REGION
NEW ENGLAND

RECYCLING REFUND STATE
YES

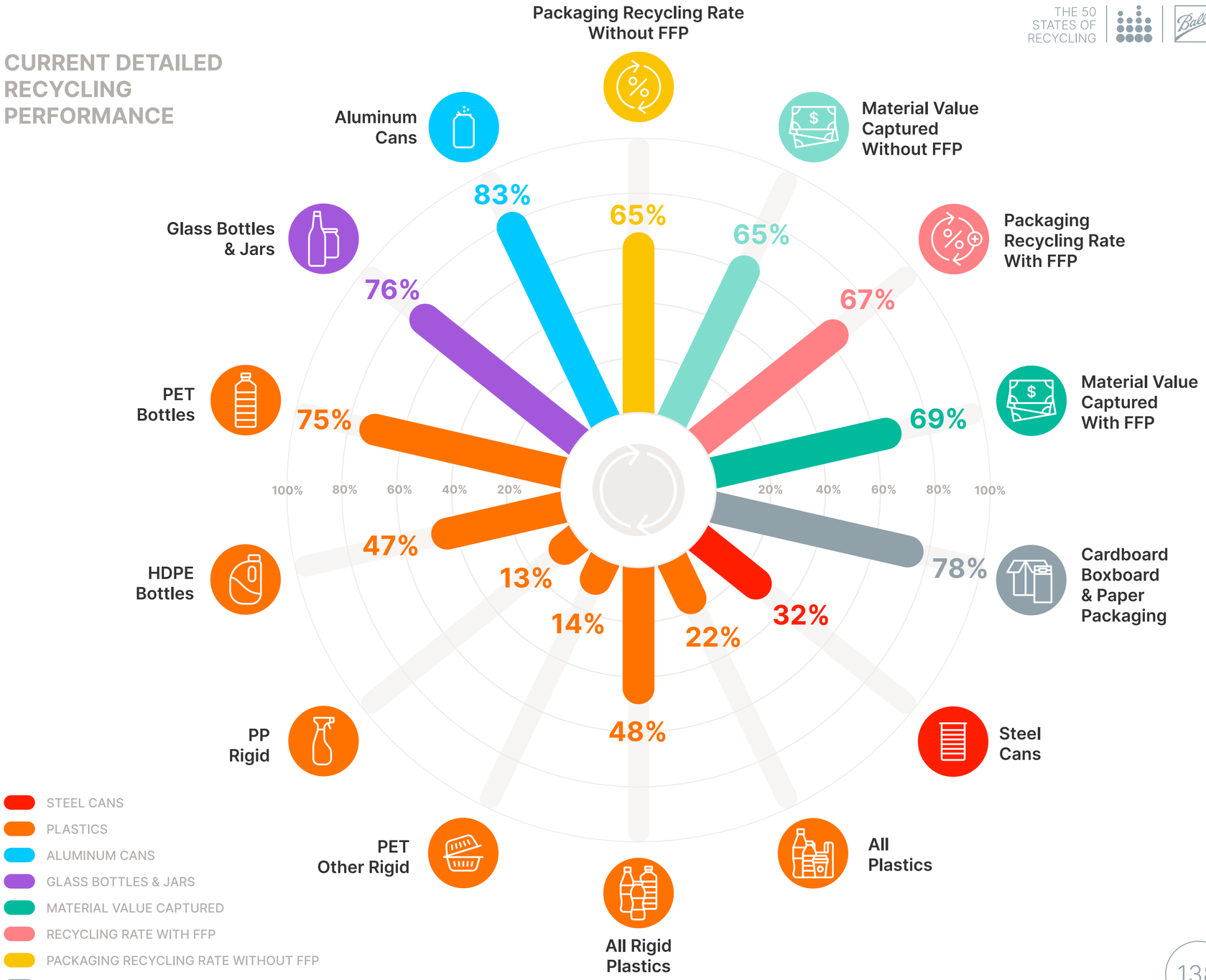
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Maine has been a leader in recycling legislation, adopting some of the most progressive laws in the country. These include the nation's first electronics recycling bill and bans on single-use plastic carrier bags and expanded polystyrene (EPS) food containers. Maine's system is one of the most comprehensive, covering the widest range of beverages of any DRS in the US. In 2020, Maine considered a bill on EPR for packaging, but progress stalled due to the coronavirus pandemic.

CURRENT DETAILED RECYCLING PERFORMANCE



MAINE

CURRENT STATE OF RECYCLING

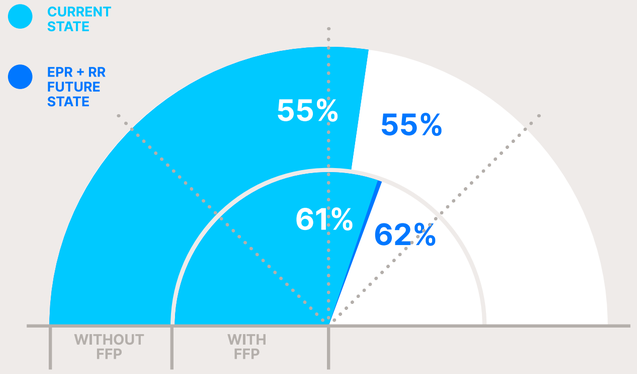
- In 2021, Maine recycled approximately 65% of packaging materials without FFP. This recycling performance increases to 67% when considering materials with FFP.
- The value of the material captured for recycling was $26 million, 69% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 515,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 1,500 to 1,600.
- Place $28 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 520,000 MTCO2e annually.

CLOSED-LOOP IMPACTS



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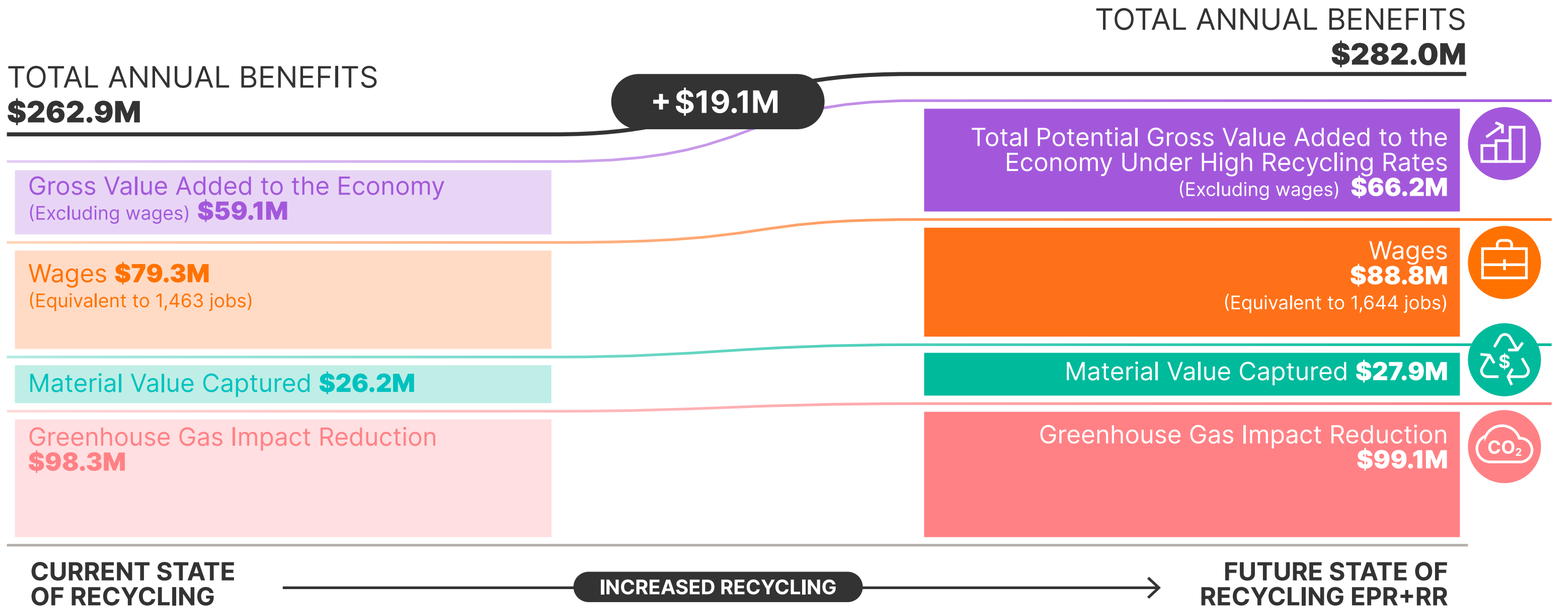


MARYLAND

33% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#12	+1
RECYCLING RANK 2018	#13	

POPULATION
6,174,610

CENSUS SUB REGION
SOUTH ATLANTIC

RECYCLING REFUND STATE
NO

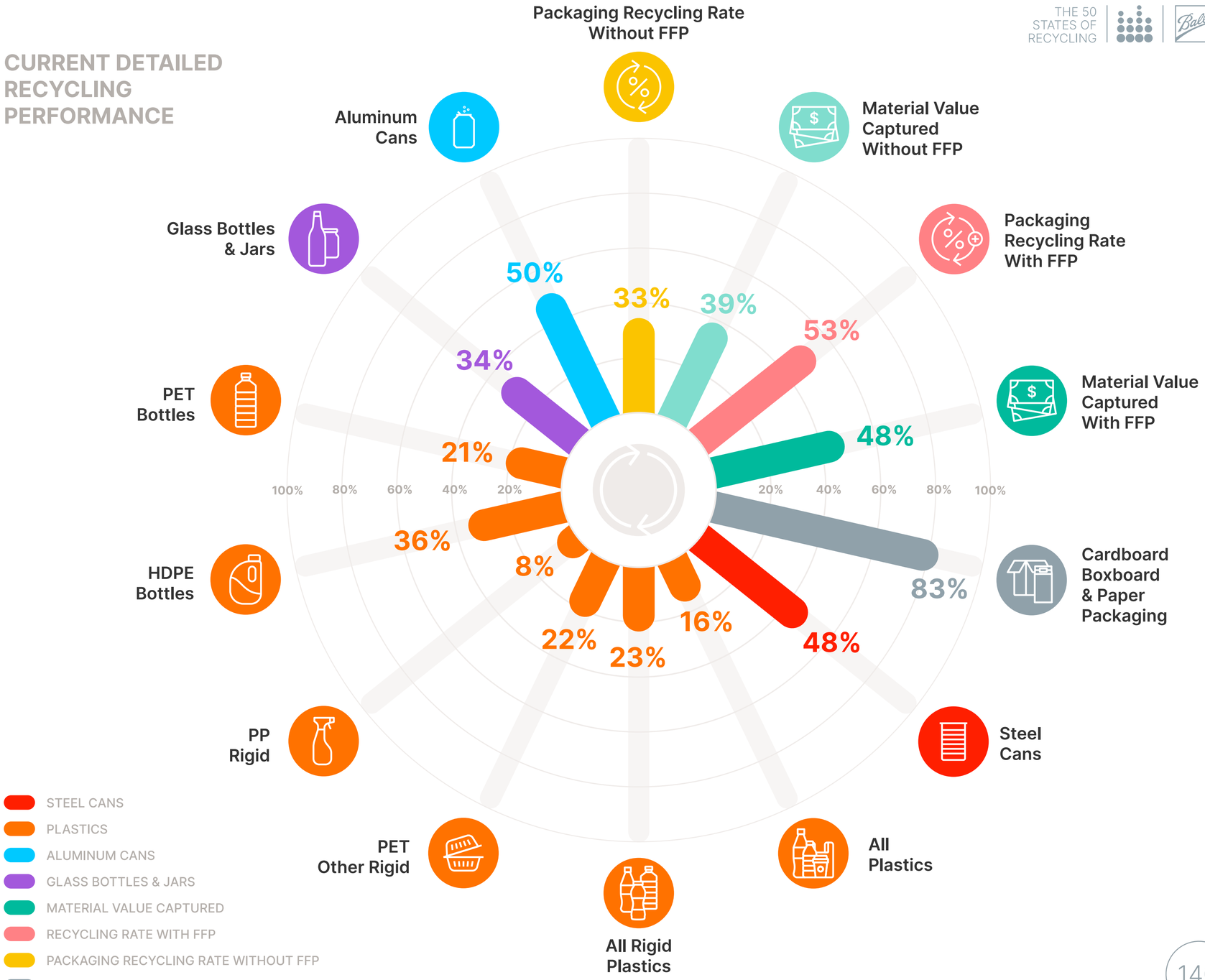
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The basis for Maryland's current recycling system is the Maryland Recycling Act of 1988, which authorized the Maryland Department of the Environment to reduce the disposal of solid waste in the state. In 2012, the law was updated to require state agencies to implement a recycling plan with a 30% recycling rate mandate. Additionally, for jurisdictions with populations greater than 150,000, it mandated that those jurisdictions reach 35% recycling targets.

CURRENT DETAILED RECYCLING PERFORMANCE



MARYLAND

CURRENT STATE OF RECYCLING

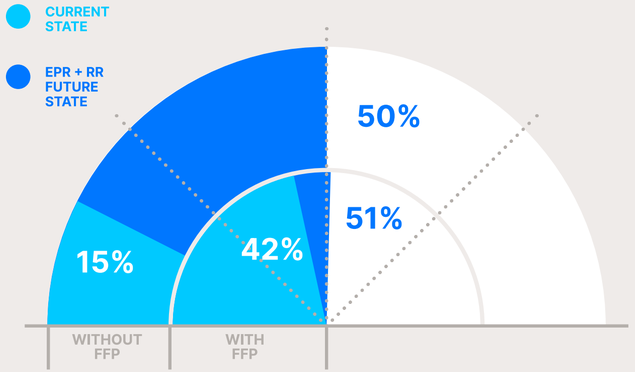
- In 2021, Maryland recycled approximately 33% of packaging materials without FFP. This recycling performance increases to 53% when considering materials with FFP.
- The value of the material captured for recycling was $99 million, just 48% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.8 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 5,300 to 9,300.
- Place $184 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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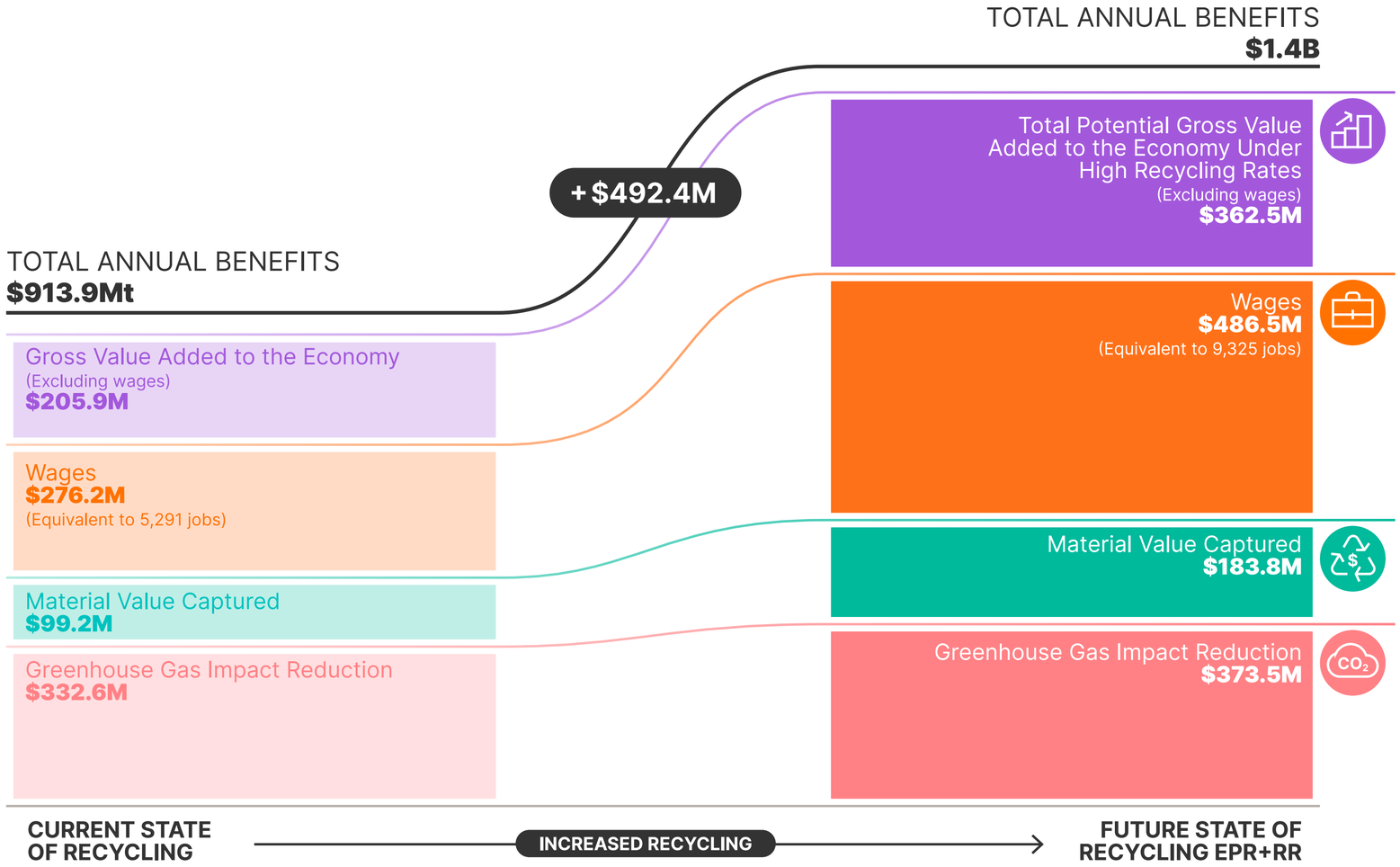


MASSACHUSETTS

48% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#3
RECYCLING RANK 2018	#3

=

POPULATION
6,989,690

CENSUS SUB REGION
NEW ENGLAND

RECYCLING REFUND STATE
YES

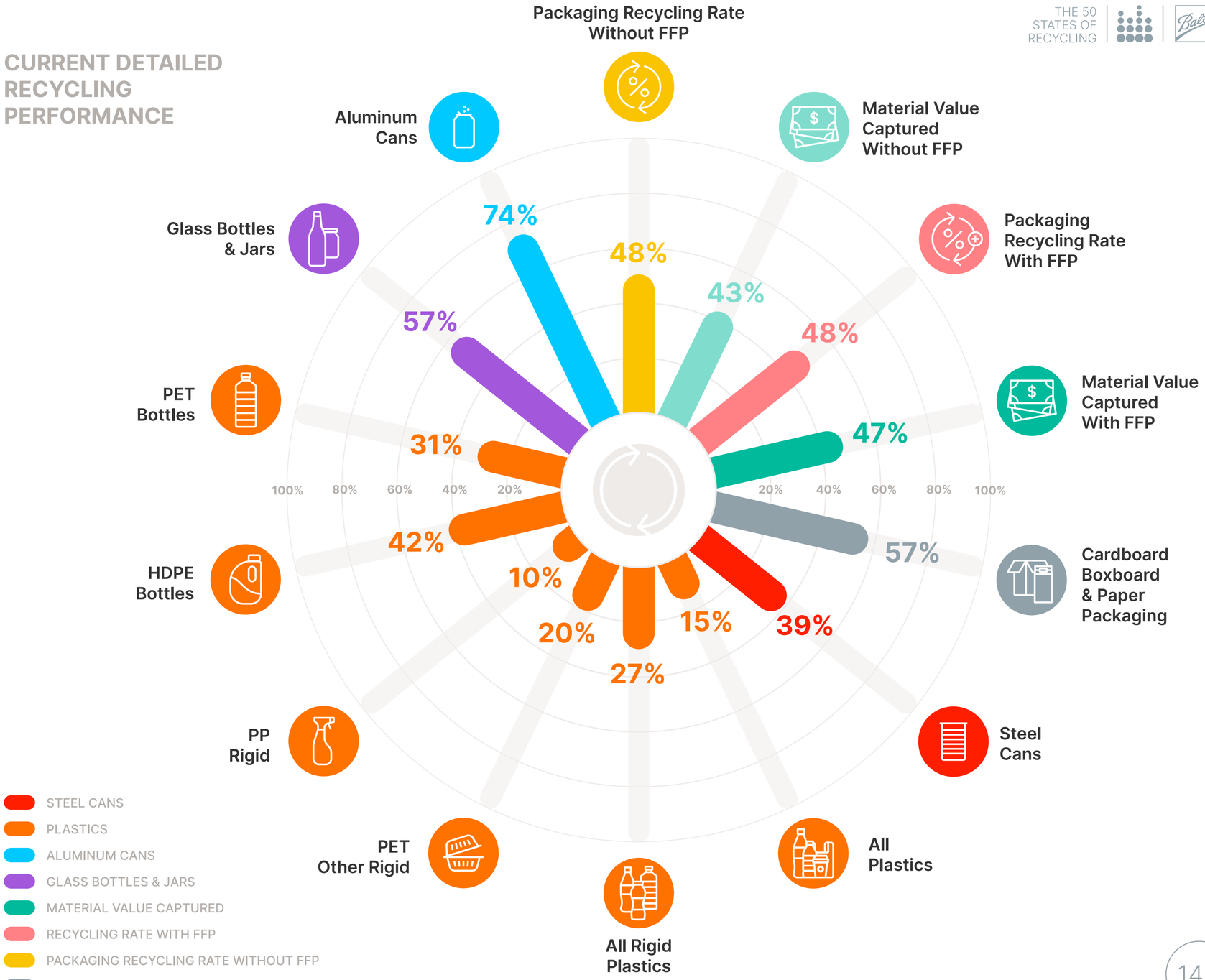
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

MassDEP oversees state waste services, promoting waste hierarchy programs. It offers grants for swap shops, tool libraries, and zero waste days. A "reduce and reuse" working group aids in their MassDEP Strategic Reduce and Reuse Action Plan as outlined in its 2030 Solid Waste Master Plan. MassDEP bans landfilling certain recyclables, including glass, metal, some plastics, and cardboard. The Beverage Container Redemption Law has required a 5 cents deposit on select containers since 1983.

CURRENT DETAILED RECYCLING PERFORMANCE



MASSACHUSETTS

CURRENT STATE OF RECYCLING

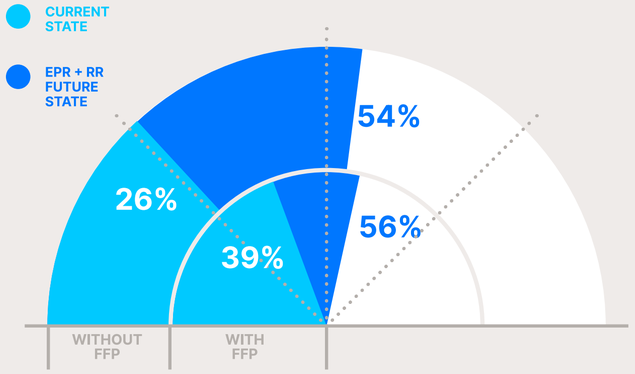
- In 2021, Massachusetts recycled approximately 48% of packaging materials without FFP. This recycling performance remains at 48% when considering materials with FFP.
- The value of the material captured for recycling was $103 million, just 47% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 2 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

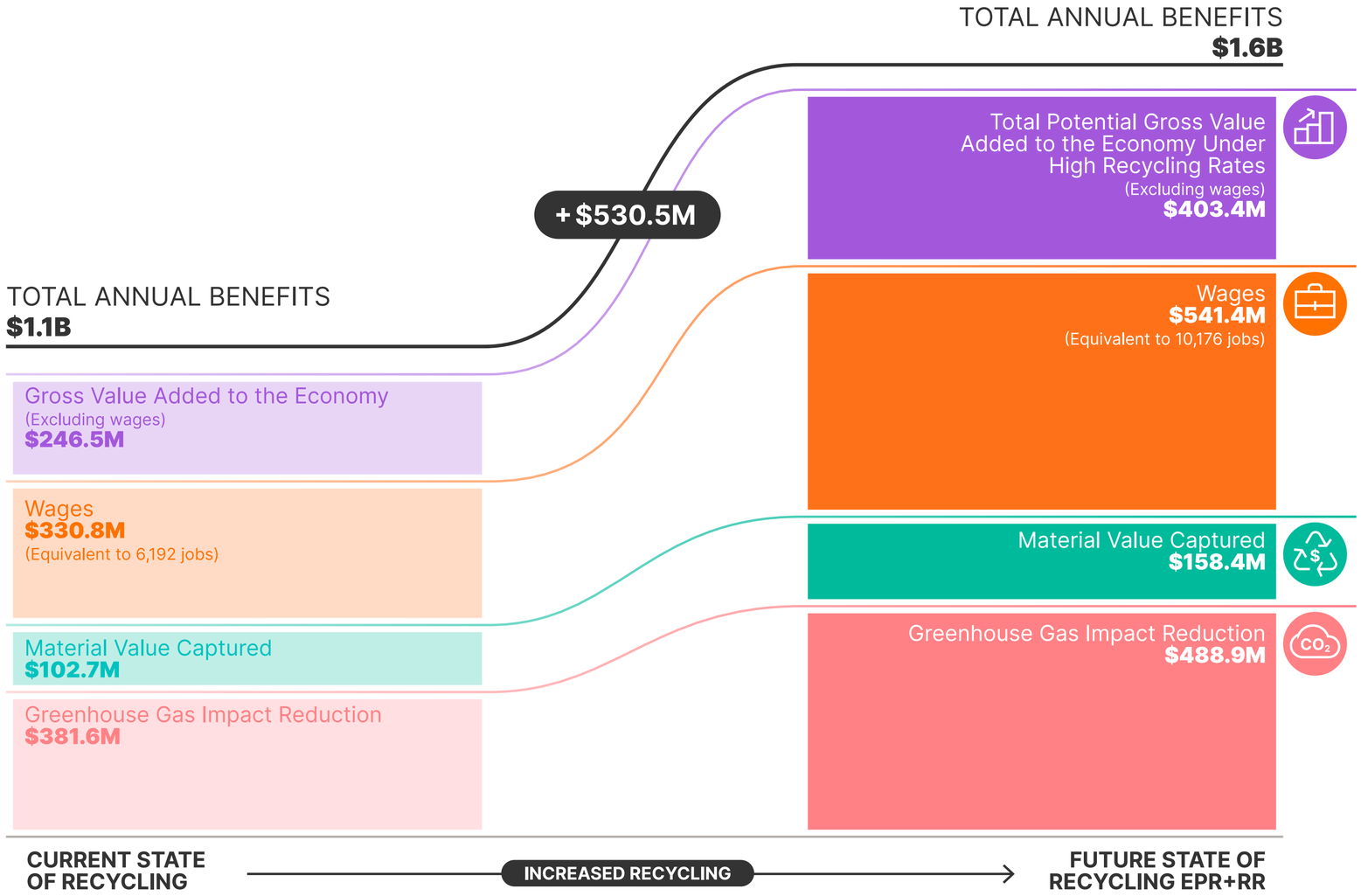
- Increase recycling related jobs from 6,200 to 10,200.
- Place $158 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.6 million MTCO2e annually.

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



MICHIGAN

40% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#8
RECYCLING RANK 2018	#8

=

POPULATION
10,037,504

CENSUS SUB REGION
EAST NORTH CENTRAL

RECYCLING REFUND STATE
YES

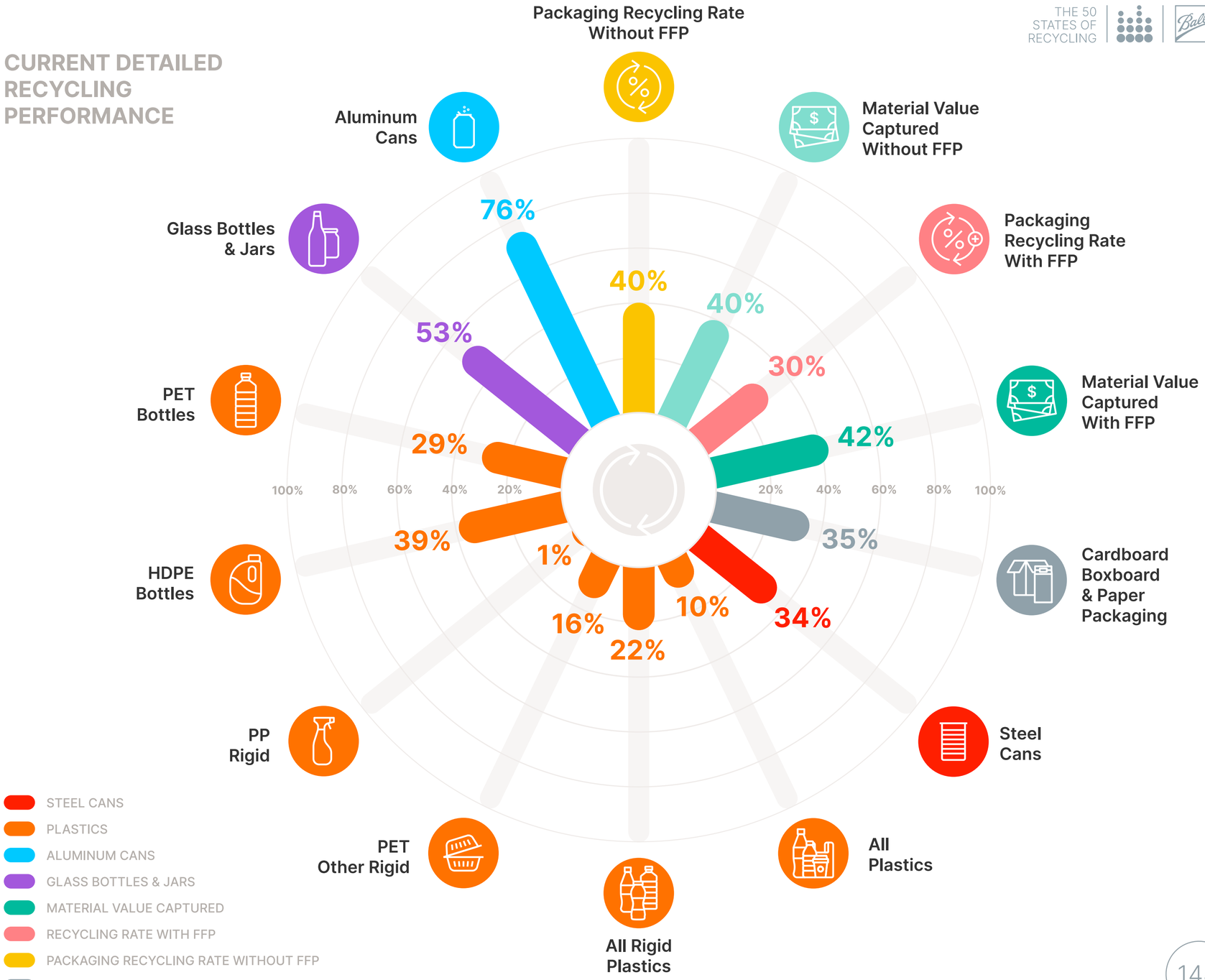
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Michigan's Solid Waste Policy of 2017 establishes several goals, including finding uses for 50% of Michigan's MSW by 2025. A 2024 amendment to the Natural Resources and Environmental Protection Act prohibited certain items. It is unclear if this rule is enforced. Michigan provides programs for recycling of electronics and scrap tires and offers grants for a variety of local recycling programs. The Michigan Beverage Container Deposit Law was implemented in 1978.

CURRENT DETAILED RECYCLING PERFORMANCE



MICHIGAN

CURRENT STATE OF RECYCLING

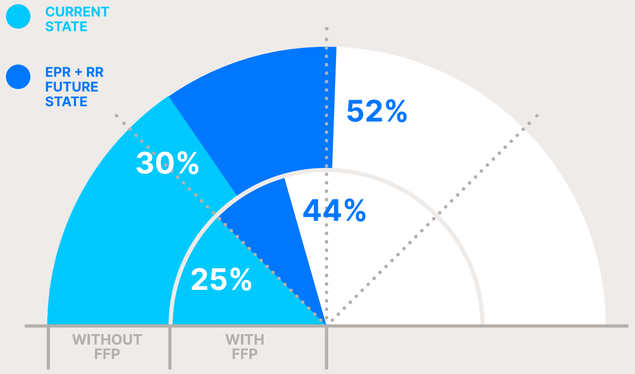
- In 2021, Michigan recycled approximately 40% of packaging materials without FFP. This recycling performance decreases to 30% when considering materials with FFP due to lower performance of cardboard recycling.
- The value of the material captured for recycling was $108 million, just 40% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

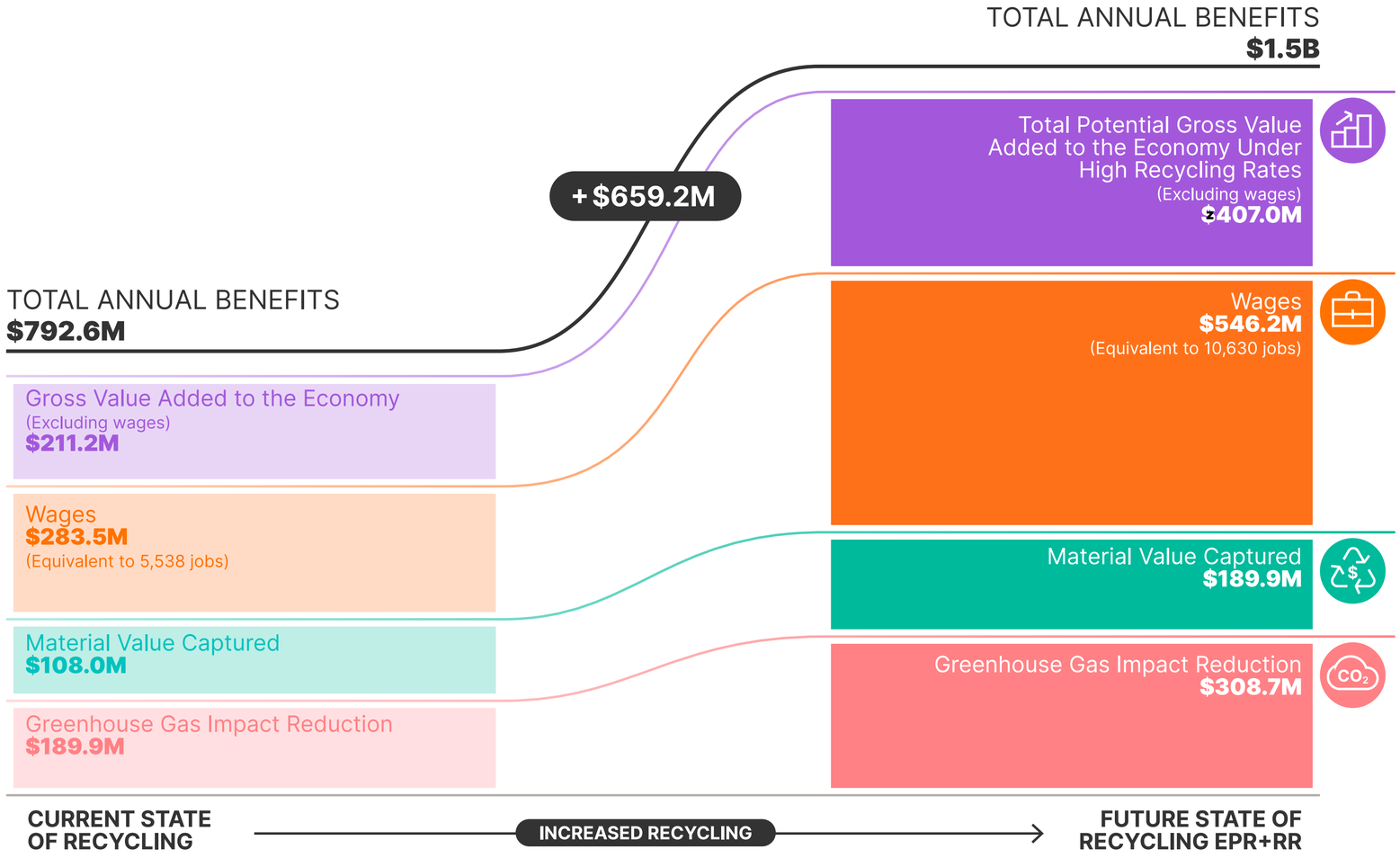
- Increase recycling related jobs from 5,500 to 10,600.
- Place $190 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.6 million MTCO2e annually.

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



MINNESOTA

37% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #11

RECYCLING RANK 2018 #7

-4

POPULATION
5,711,471

CENSUS SUB REGION
WEST NORTH CENTRAL

RECYCLING REFUND STATE
NO

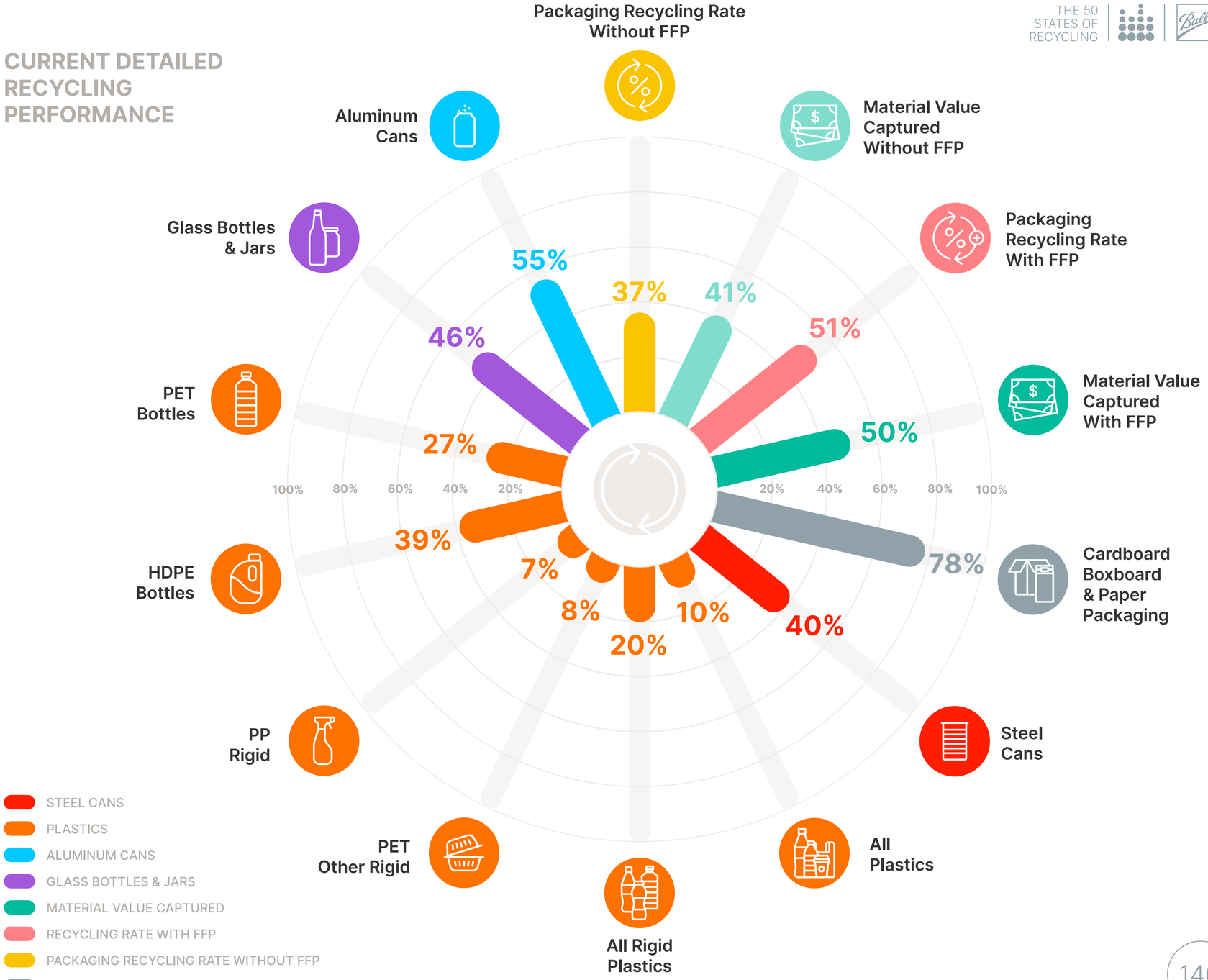
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The 2014 Minnesota Legislature increased the recycling goal for the seven-county metro area from 50% to 75% of the MSW they generate by 2030. A 2016 law (§115A.151) requires commercial businesses to recycle at least three material types. The Minnesota Pollution Control Agency (MPCA) supports local efforts and provides information on recycling, composting and solid waste management for the state, including managing reporting requirements. MPCA helps businesses develop uses for recycled materials by offering technical, financial, and marketing assistance.

CURRENT DETAILED RECYCLING PERFORMANCE



MINNESOTA

CURRENT STATE OF RECYCLING

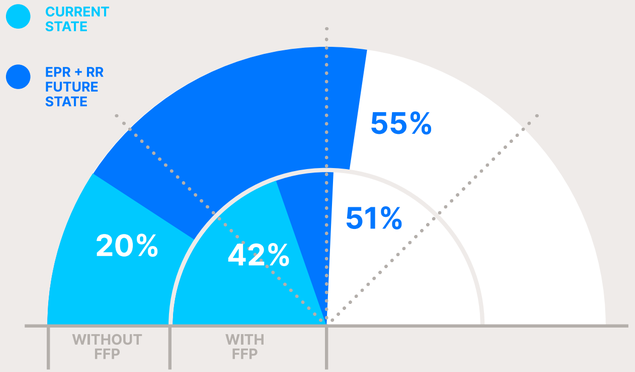
- In 2021, Minnesota recycled approximately 37% of packaging materials without FFP. This recycling performance increases to 51% when considering materials with FFP.
- The value of the material captured for recycling was $68 million, just 50% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.4 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

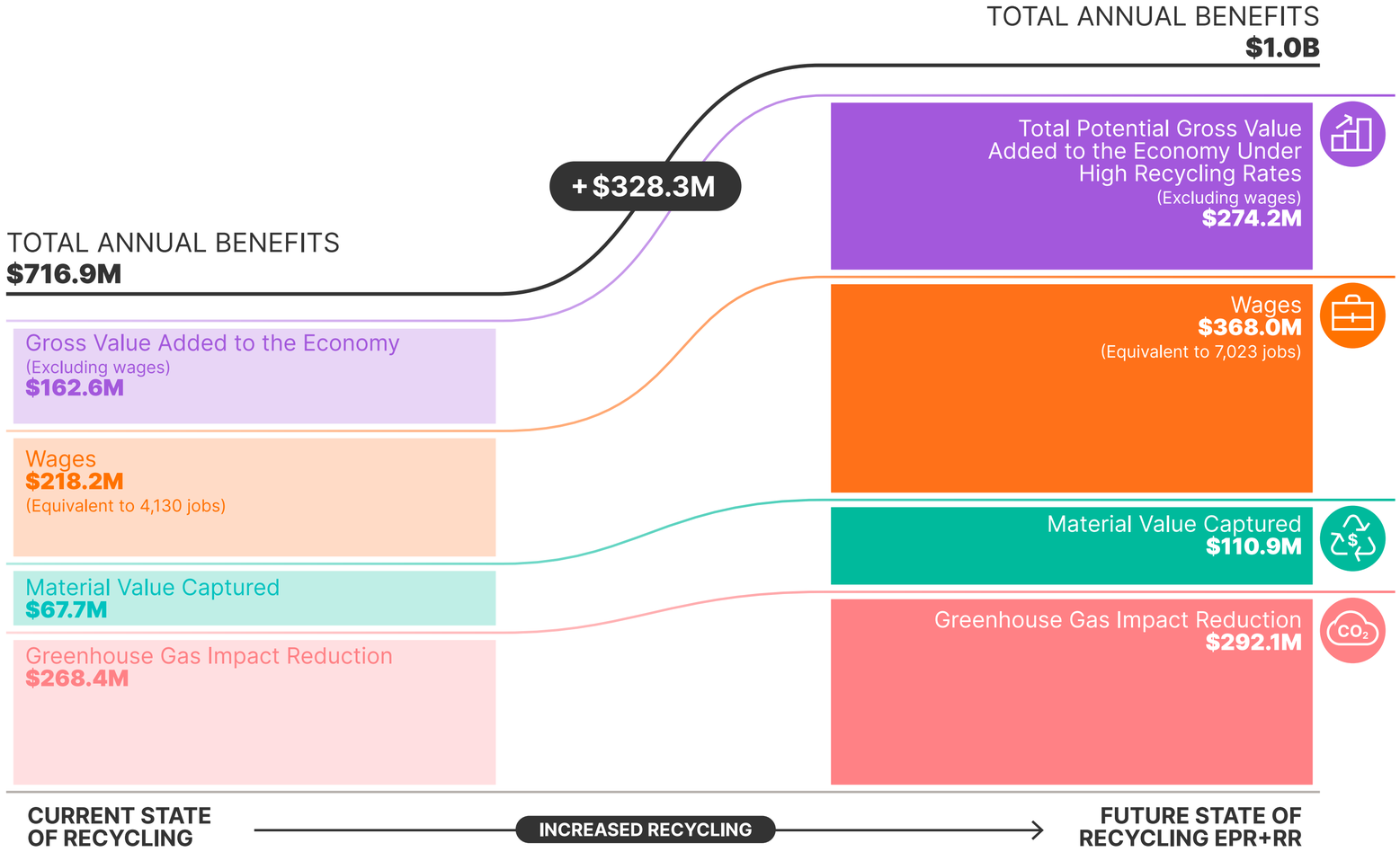
- Increase recycling related jobs from 4,100 to 7,000.
- Place $111 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.5 million MTCO2e annually.

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



MISSISSIPPI

6% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#45 =
RECYCLING RANK 2018	#45

POPULATION
2,949,586

CENSUS SUB REGION
EAST SOUTH CENTRAL

RECYCLING REFUND STATE
NO

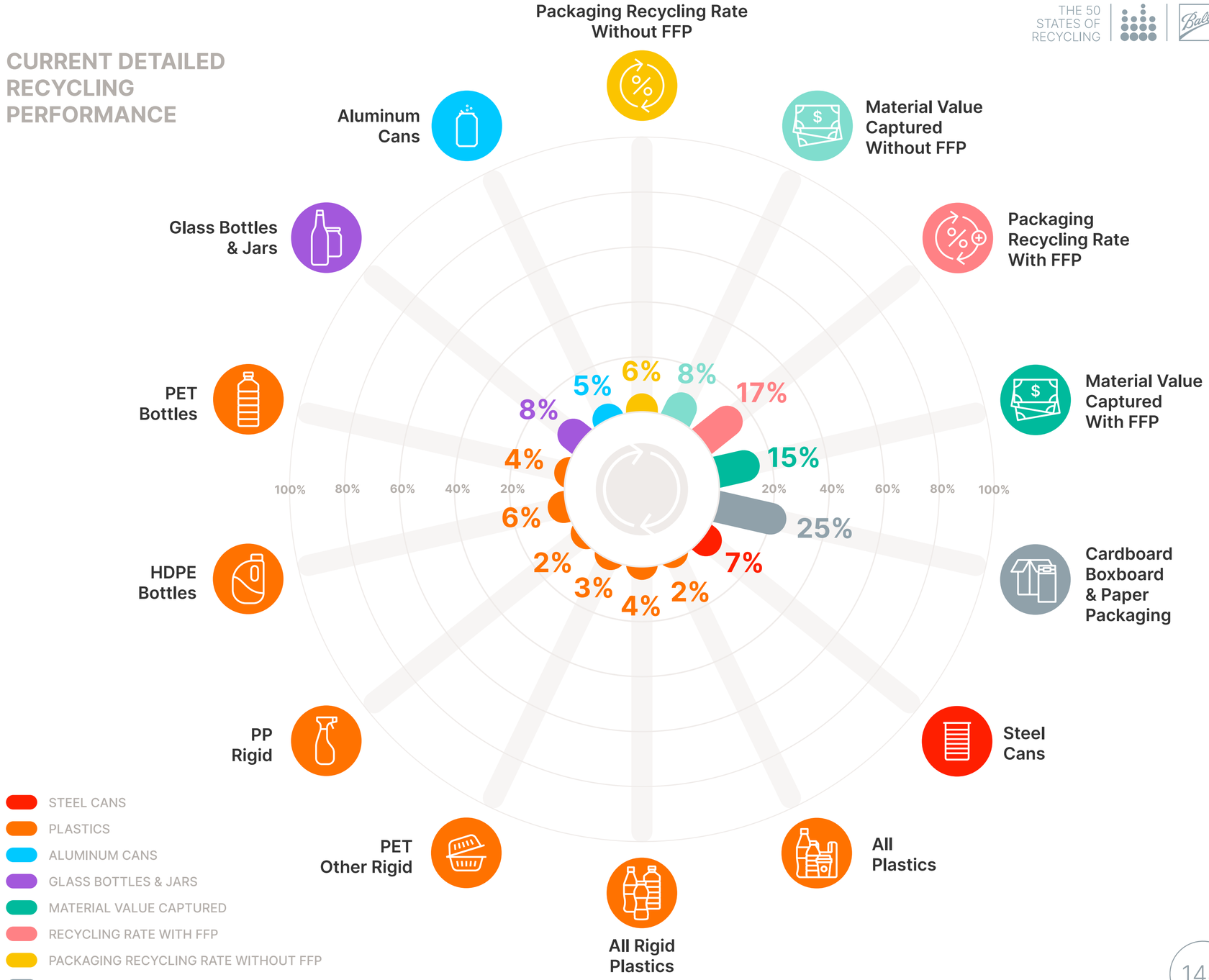
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Solid Waste Policy, Planning & Special Programs Branch of the Mississippi Department of Environmental Quality (MDEQ) oversees solid waste facilities statewide. The MDEQ's Office of Pollution Control manages recycling and waste reduction in the state. Approximately 46% of counties in Mississippi do not currently have access to community recycling programs.

CURRENT DETAILED RECYCLING PERFORMANCE



MISSISSIPPI

CURRENT STATE OF RECYCLING

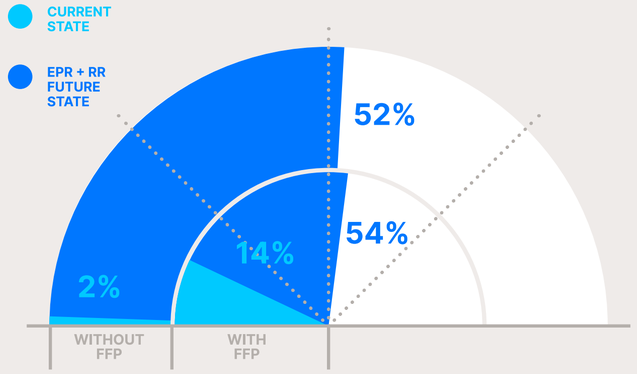
- In 2021, Mississippi recycled approximately 6% of packaging materials without FFP. This recycling performance increases to 17% when considering materials with FFP.
- The value of the material captured for recycling was $12 million, just 15% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 320,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

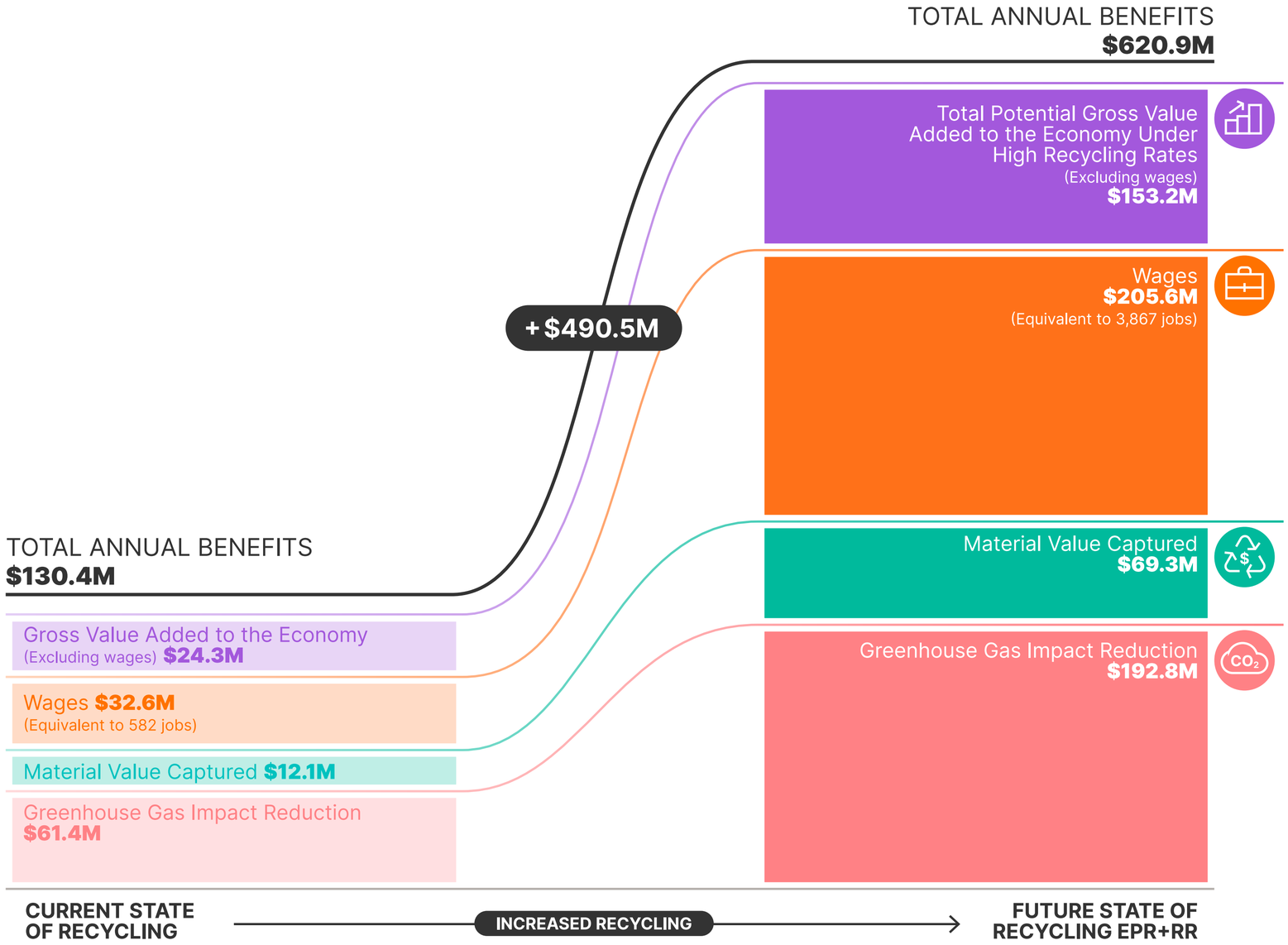
- Increase recycling related jobs from 580 to 3,900.
- Place $69 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1 million MTCO2e annually.

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



MISSOURI

22% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #21 +1

RECYCLING RANK 2018 #22

POPULATION
6,169,823

CENSUS SUB REGION
WEST NORTH CENTRAL

RECYCLING REFUND STATE
NO

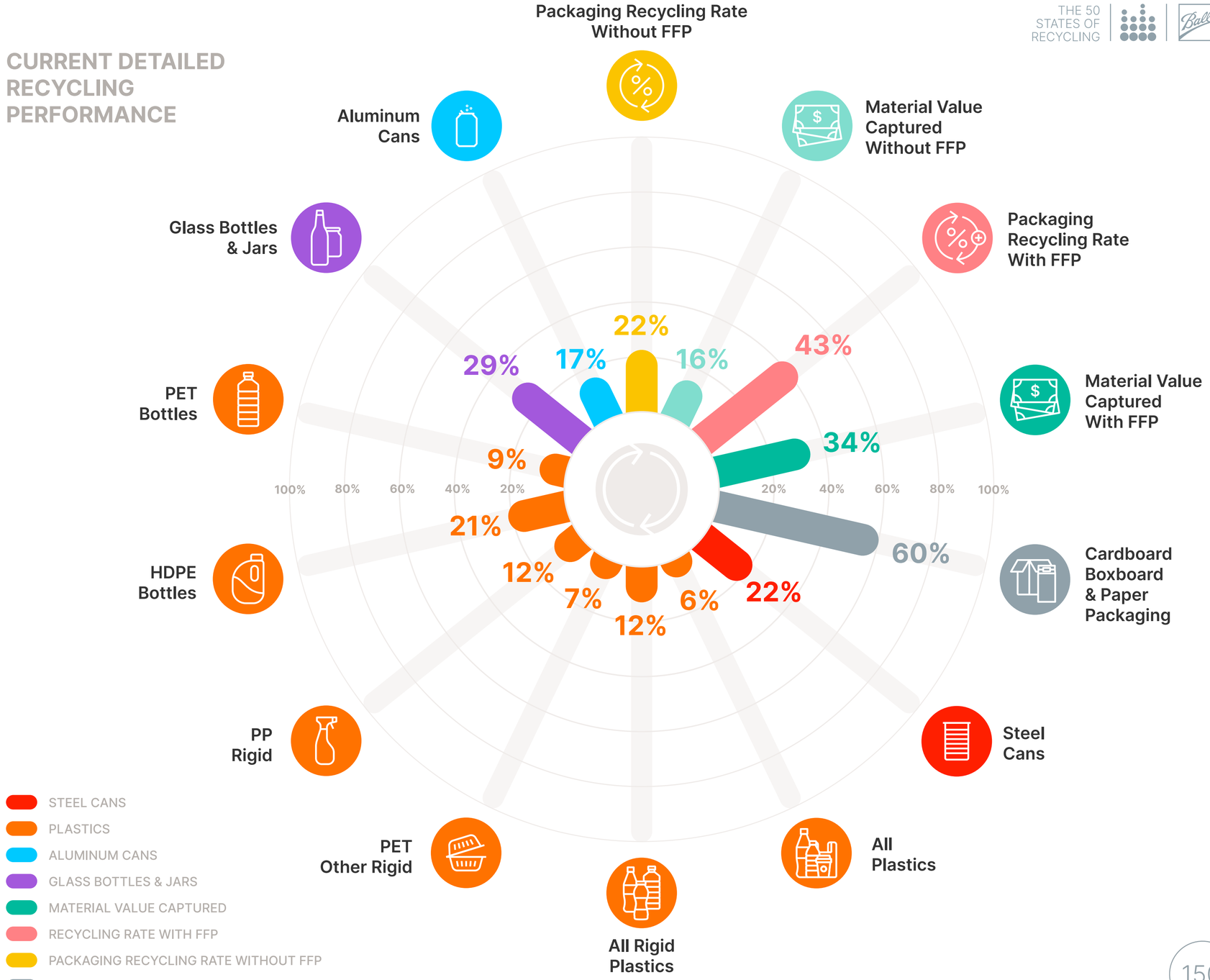
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Missouri Department of Natural Resources (DNR), specifically the Division of Environmental Quality (DEQ), oversees zwaste management in the state. The Waste Management Program helps residents better manage their solid waste through the cooperative efforts of businesses, industry, and government. Missouri House Bill 722, preemptive legislation passed in 2015, prohibits local government entities from imposing bans or fees on paper and plastic bags.

CURRENT DETAILED RECYCLING PERFORMANCE



MISSOURI

CURRENT STATE OF RECYCLING

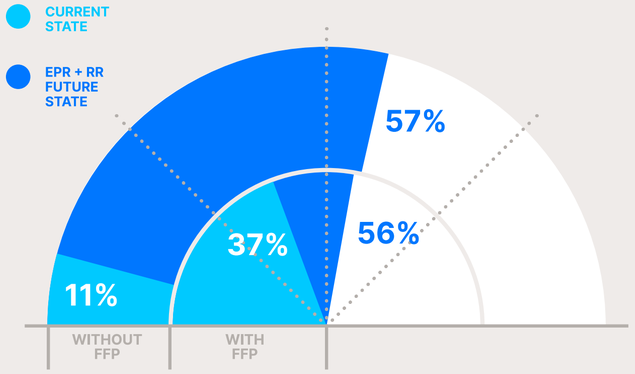
- In 2021, Missouri recycled approximately 22% of packaging materials without FFP. This recycling performance increases to 43% when considering materials with FFP.
- The value of the material captured for recycling was $60 million, just 34% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.7 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

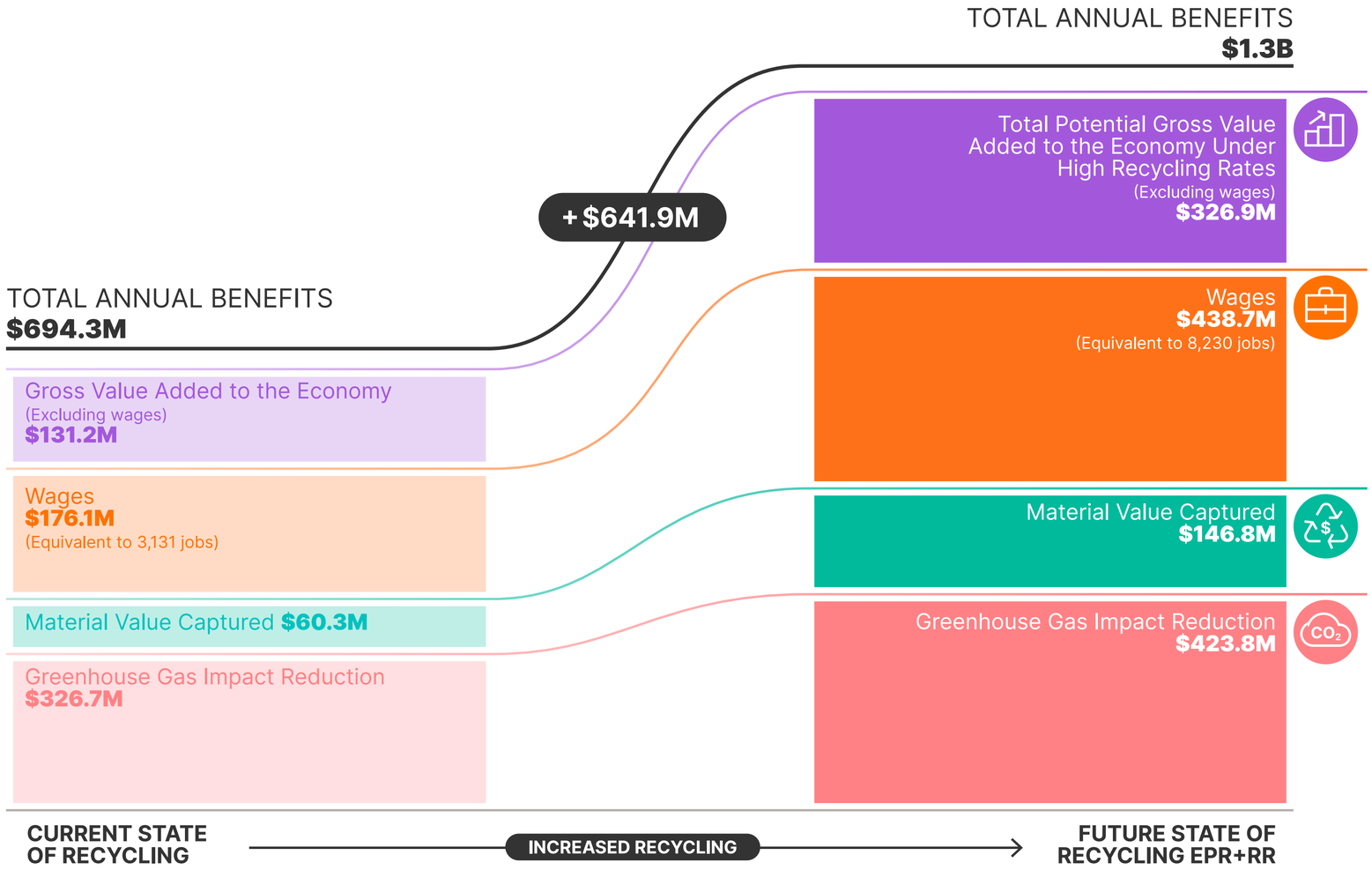
- Increase recycling related jobs from 3,100 to 8,200.
- Place $147 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.2 million MTCO2e annually.

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



MONTANA

12% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#35	+1
RECYCLING RANK 2018	#36	

POPULATION
1,106,227

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

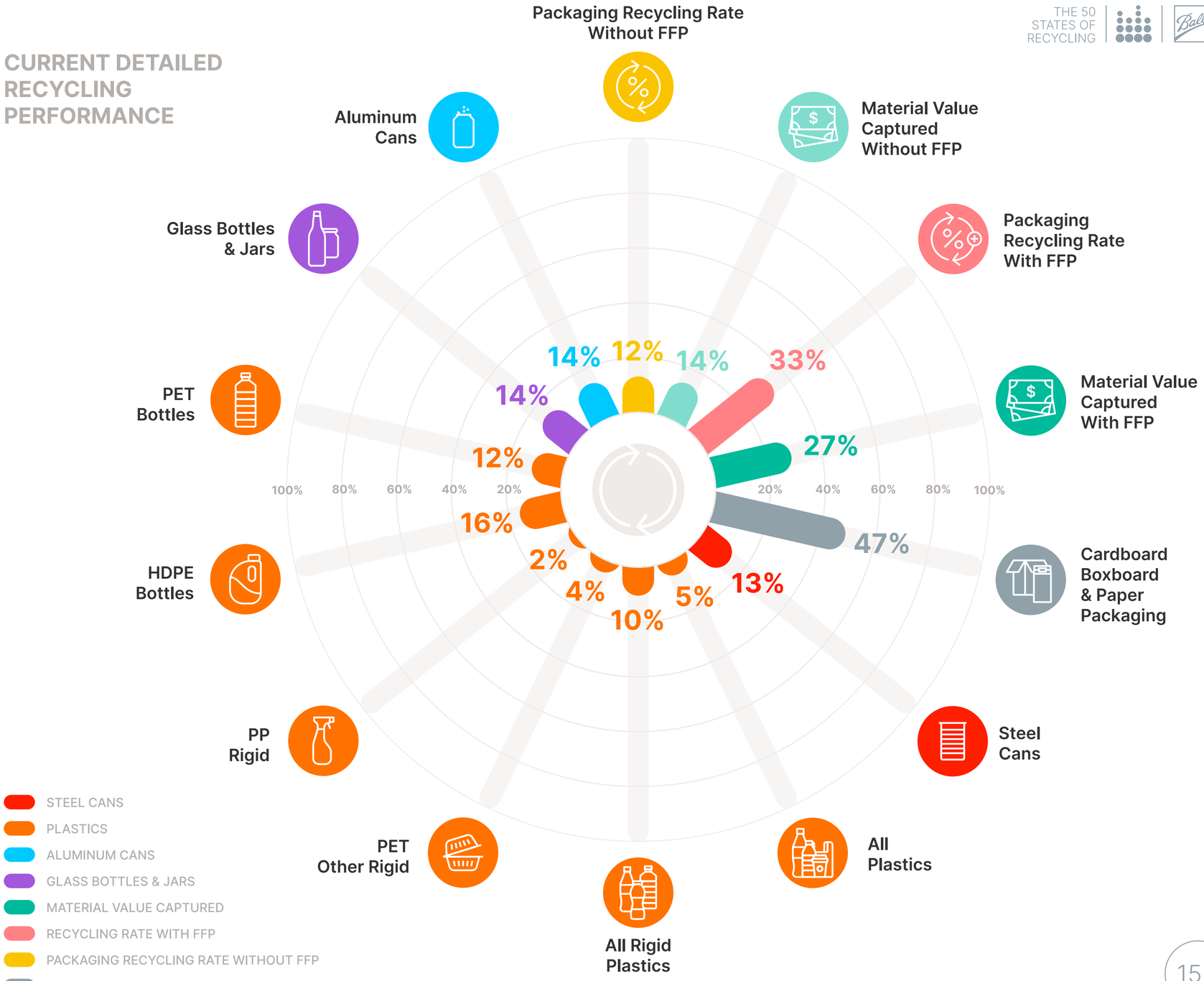
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Montana Department of Environmental Quality (DEQ) manages the state's solid waste facilities and programs, including community recycling. The Integrated Waste Management Plan sets a diversion rate target of 22%; however, as of 2016, the state has only reached a 17% diversion rate. To increase recycling, particularly in rural communities, the DEQ is promoting the hub and spoke model.

CURRENT DETAILED RECYCLING PERFORMANCE



MONTANA

CURRENT STATE OF RECYCLING

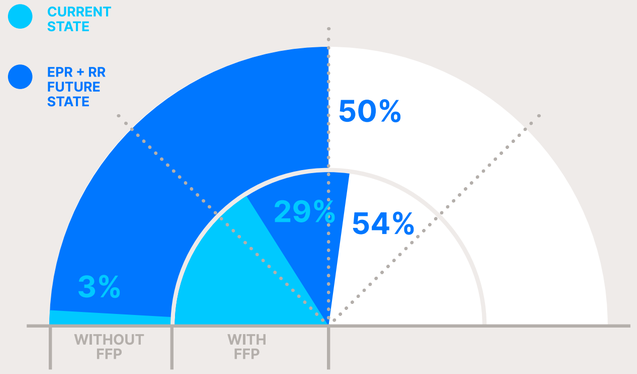
- In 2021, Montana recycled approximately 12% of packaging materials without FFP. This recycling performance increases to 33% when considering materials with FFP.
- The value of the material captured for recycling was $8 million, just 27% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 230,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

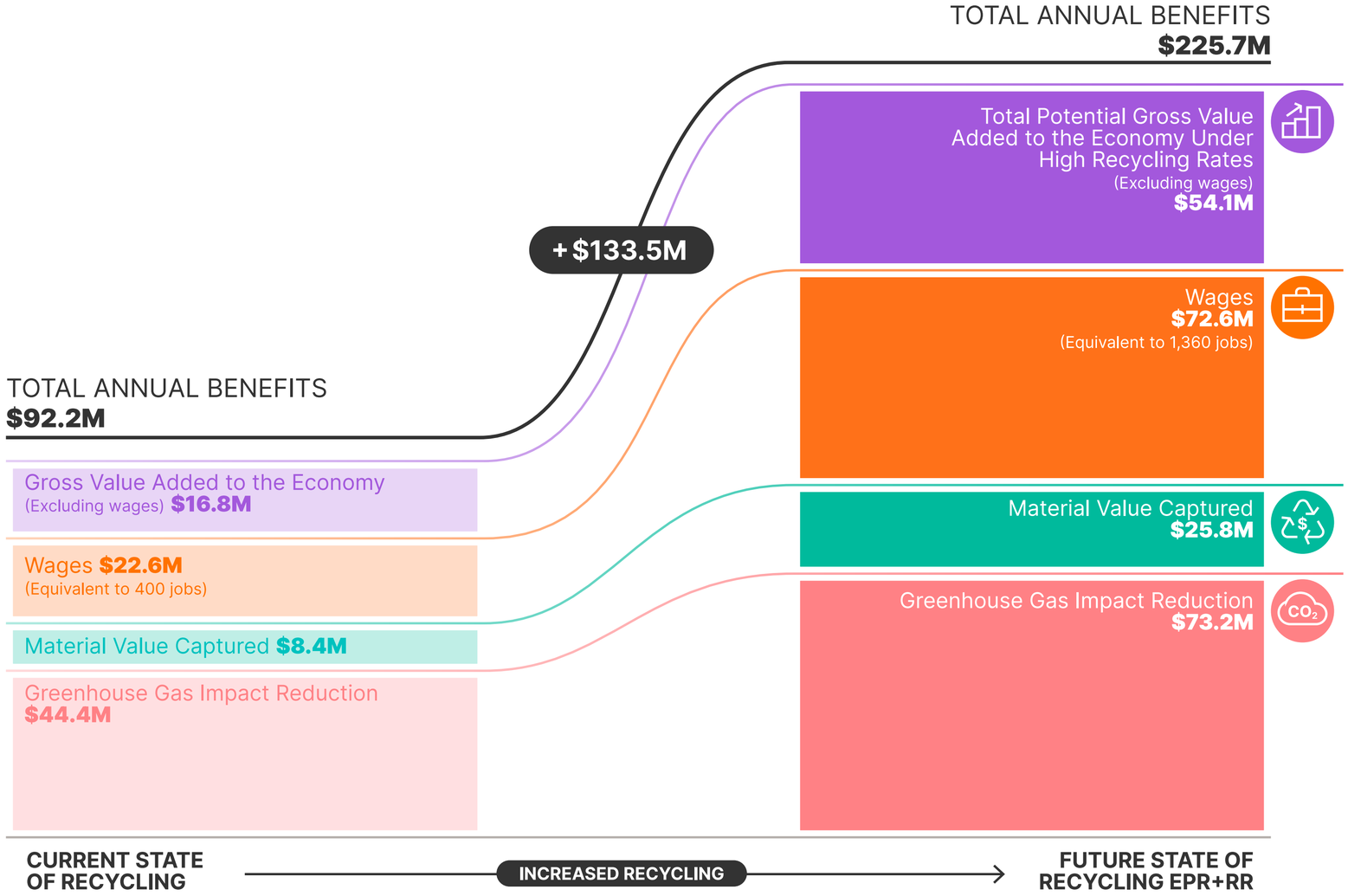
- Increase recycling related jobs from 400 to 1,400.
- Place $26 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 390,000 MTCO2e annually.

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



NEBRASKA

11% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#38	+2
RECYCLING RANK 2018	#40	

POPULATION
1,963,554

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

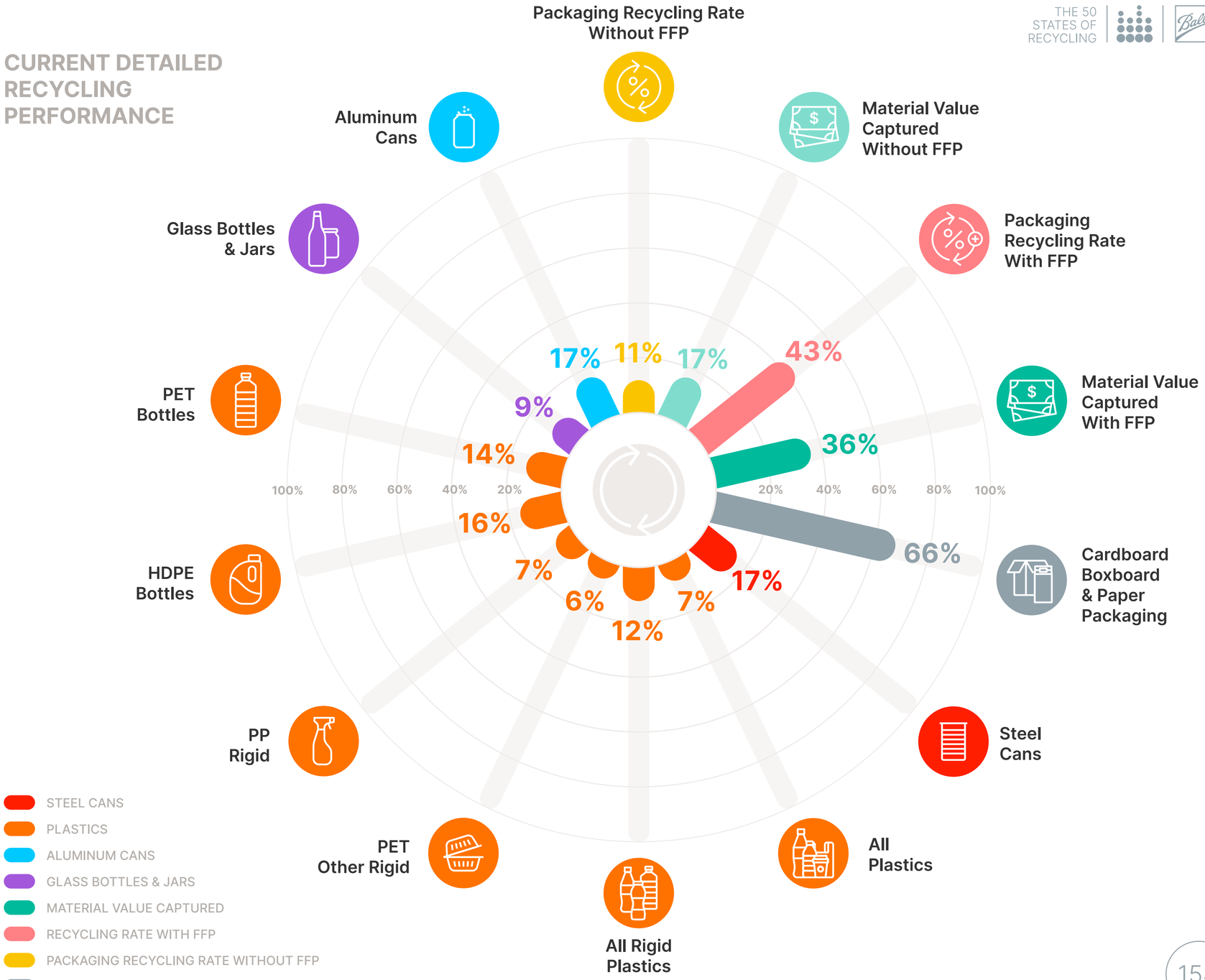
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Nebraska Department of Environment and Energy (DEE) manages solid waste facilities in the state. The state established voluntary waste diversion goals in 1992, aiming for 50% diversion by 2002. However, specific strategies to accomplish these goals were never set. In 2015, approximately 66% of households in Nebraska had access to recycling collection or drop off within 30 miles, while only 19.6% of communities had access to curbside pickup.

CURRENT DETAILED RECYCLING PERFORMANCE



NEBRASKA

CURRENT STATE OF RECYCLING

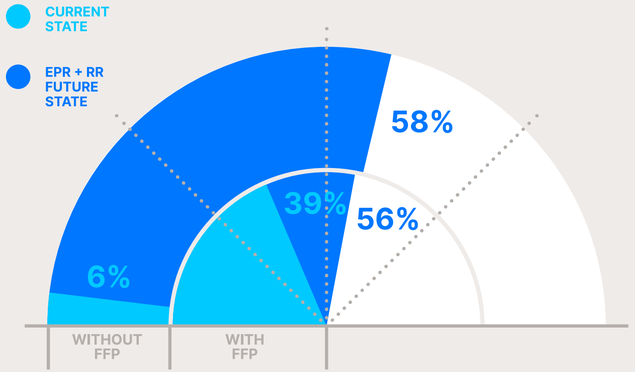
- In 2021, Nebraska recycled approximately 11% of packaging materials without FFP. This recycling performance increases to 43% when considering materials with FFP.
- The value of the material captured for recycling was $21 million, just 36% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 600,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

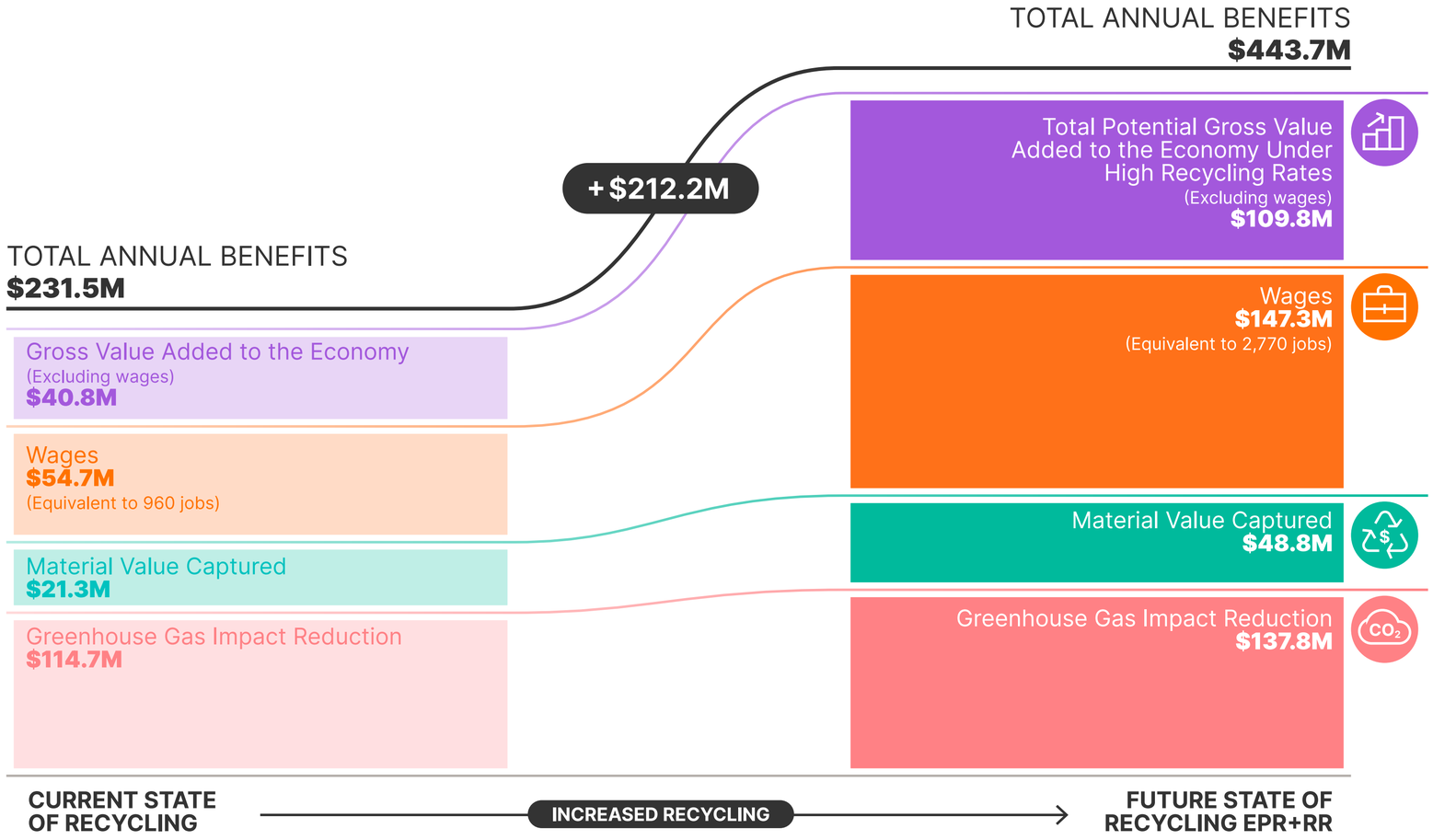
- Increase recycling related jobs from 1,000 to 2,800.
- Place $49 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 730,000 MTCO2e annually.

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



NEVADA

12% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#37
RECYCLING RANK 2018	#30

-7

POPULATION
3,146,402

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

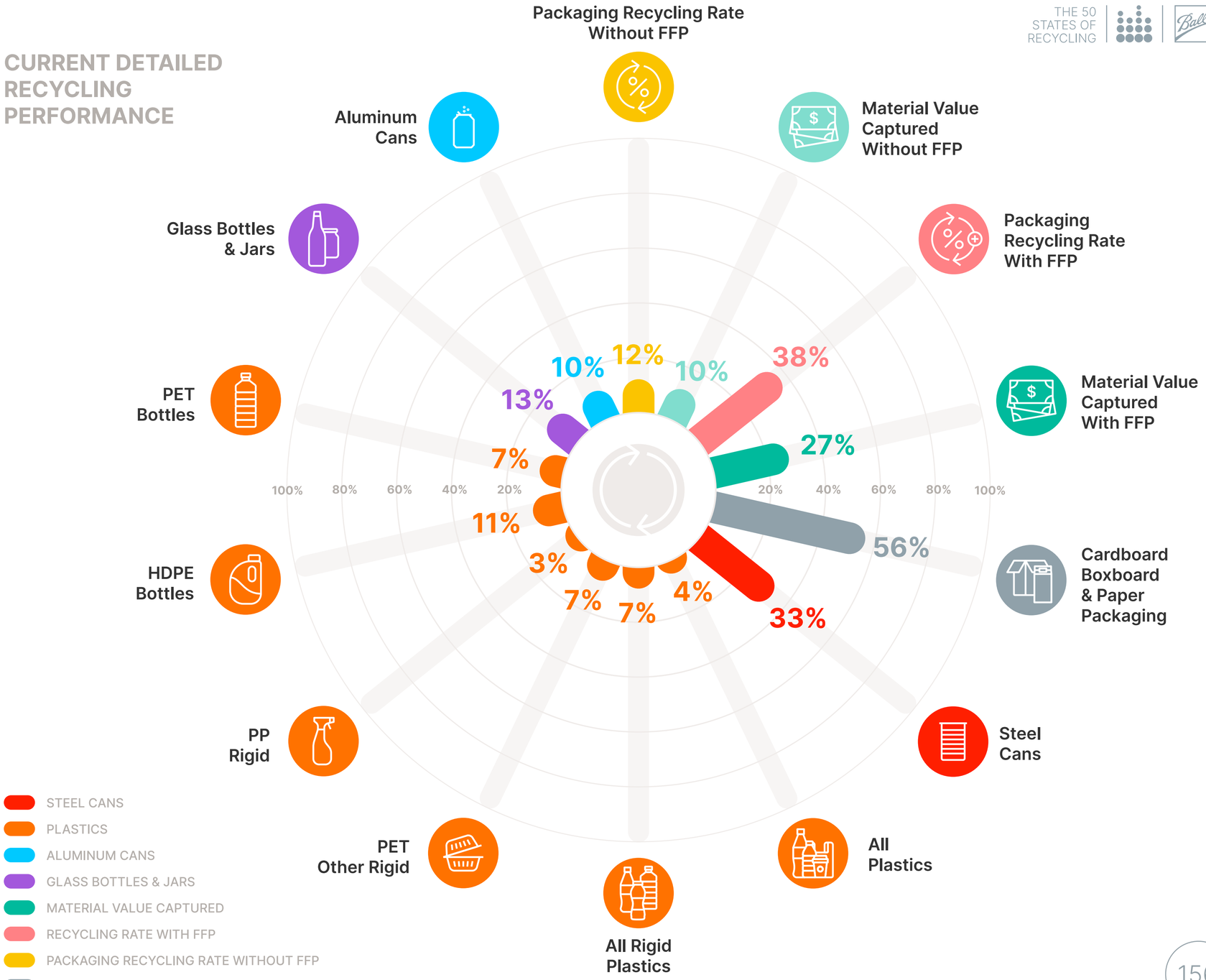
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Nevada Division of Environmental Protection's (NDEP) Bureau of Sustainable Materials manages waste permitting and compliance programs in the state. In 1991, the Nevada Legislature adopted a recycling goal of 25%. Approximately 66% of households in Nevada had access to curbside recycling programs in 2019.

CURRENT DETAILED RECYCLING PERFORMANCE



NEVADA

CURRENT STATE OF RECYCLING

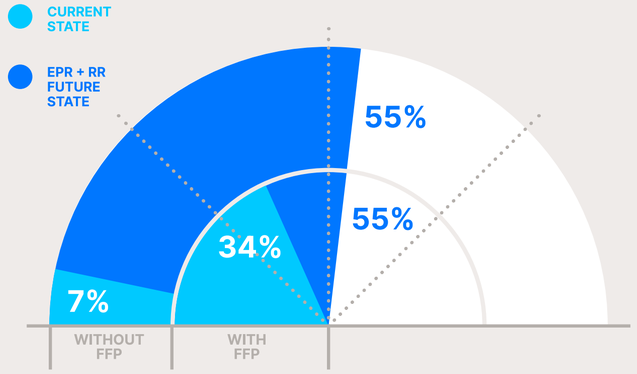
- In 2021, Nevada recycled approximately 12% of packaging materials without FFP. This recycling performance increases to 38% when considering materials with FFP.
- The value of the material captured for recycling was $20 million, just 27% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 770,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

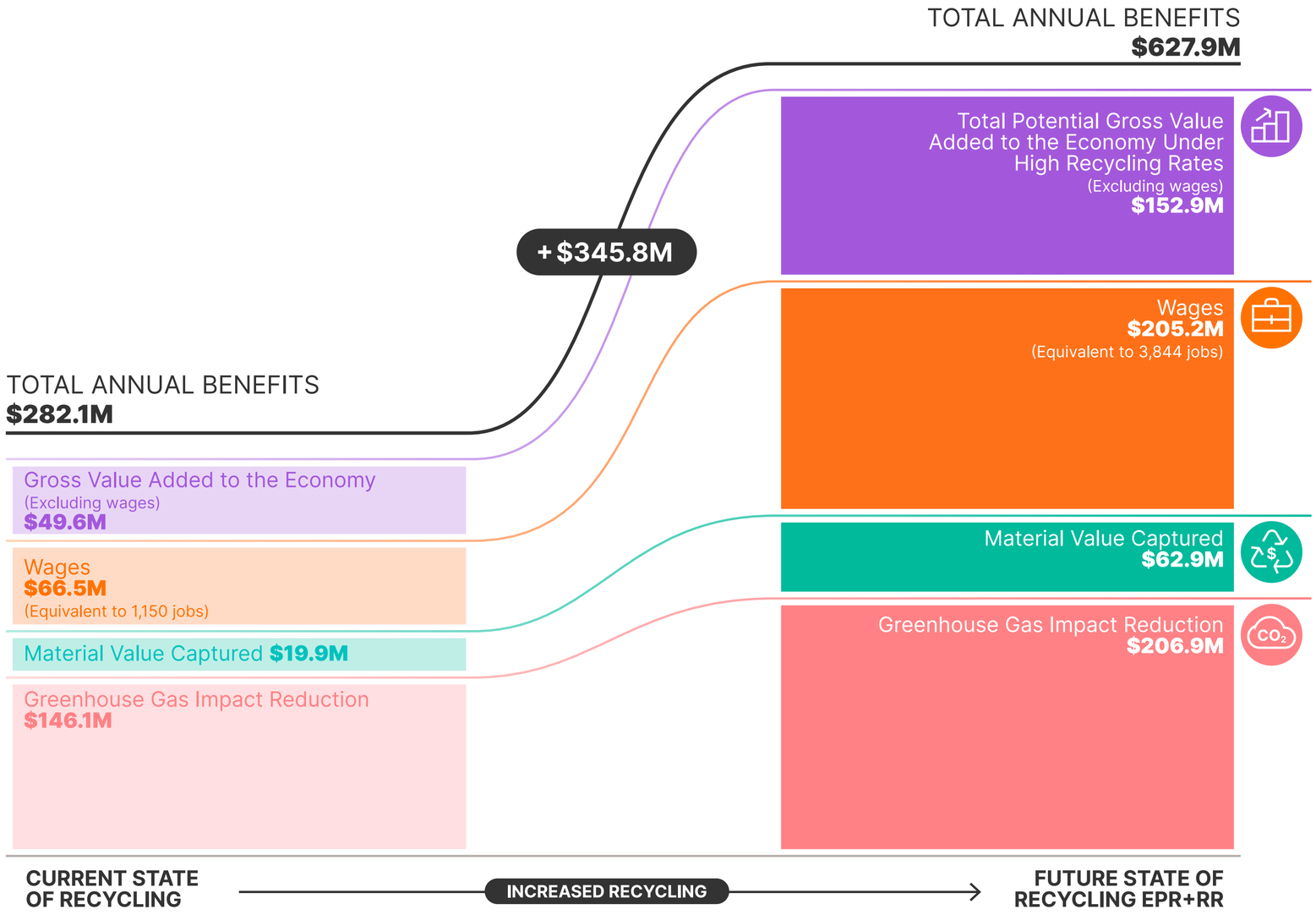
- Increase recycling related jobs from 1,200 to 3,800.
- Place $63 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.1 million MTCO2e annually.

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



NEW HAMPSHIRE

23% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#17	+2
RECYCLING RANK 2018	#19	

POPULATION
1,387,505

CENSUS SUB REGION
NEW ENGLAND

RECYCLING REFUND STATE
NO

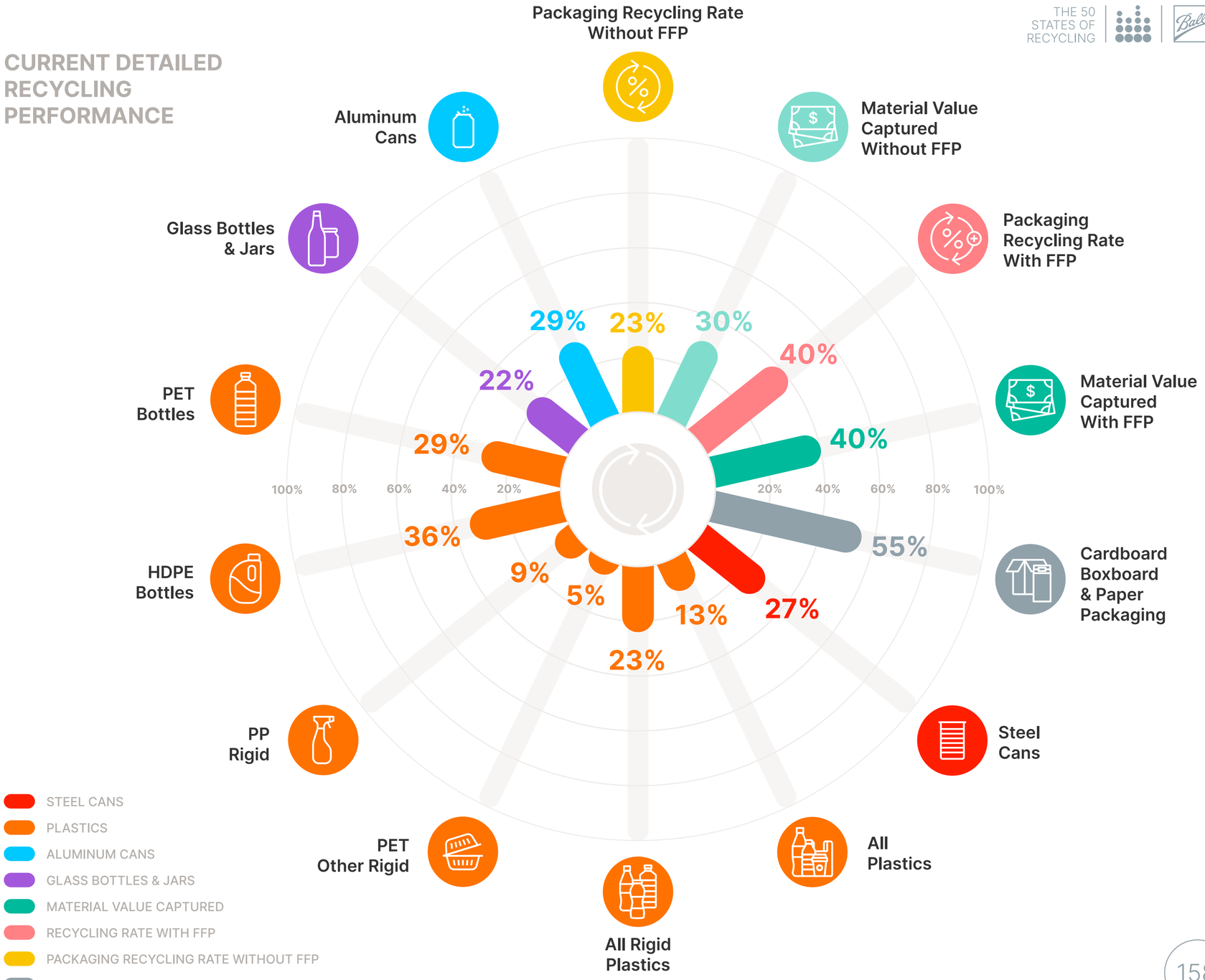
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The New Hampshire Department of Environmental Services (NHDES) oversees the management of solid waste through a combination of permitting, training and compliance programs. There are no major statewide programs to enable recycling or waste diversion. There is little information on recycling tonnages or composition as there are no MRFs in New Hampshire. All recycling is treated out-of-state.

CURRENT DETAILED RECYCLING PERFORMANCE



NEW HAMPSHIRE

CURRENT STATE OF RECYCLING

- In 2021, New Hampshire recycled approximately 23% of packaging materials without FFP. This recycling performance increases to 40% when considering materials with FFP.
- The value of the material captured for recycling was $16 million, just 40% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 370,000 MTCO2e.

OUTCOMES EPR+RR

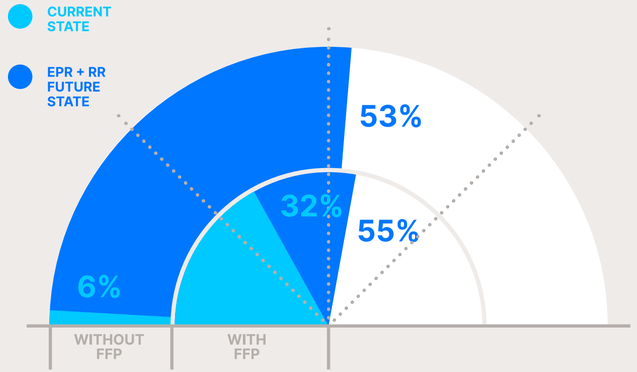
Extended Producer Responsibility and Recycling Refund policy together could:

Increase recycling related jobs from 800 to 2,000.

Place $33 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.

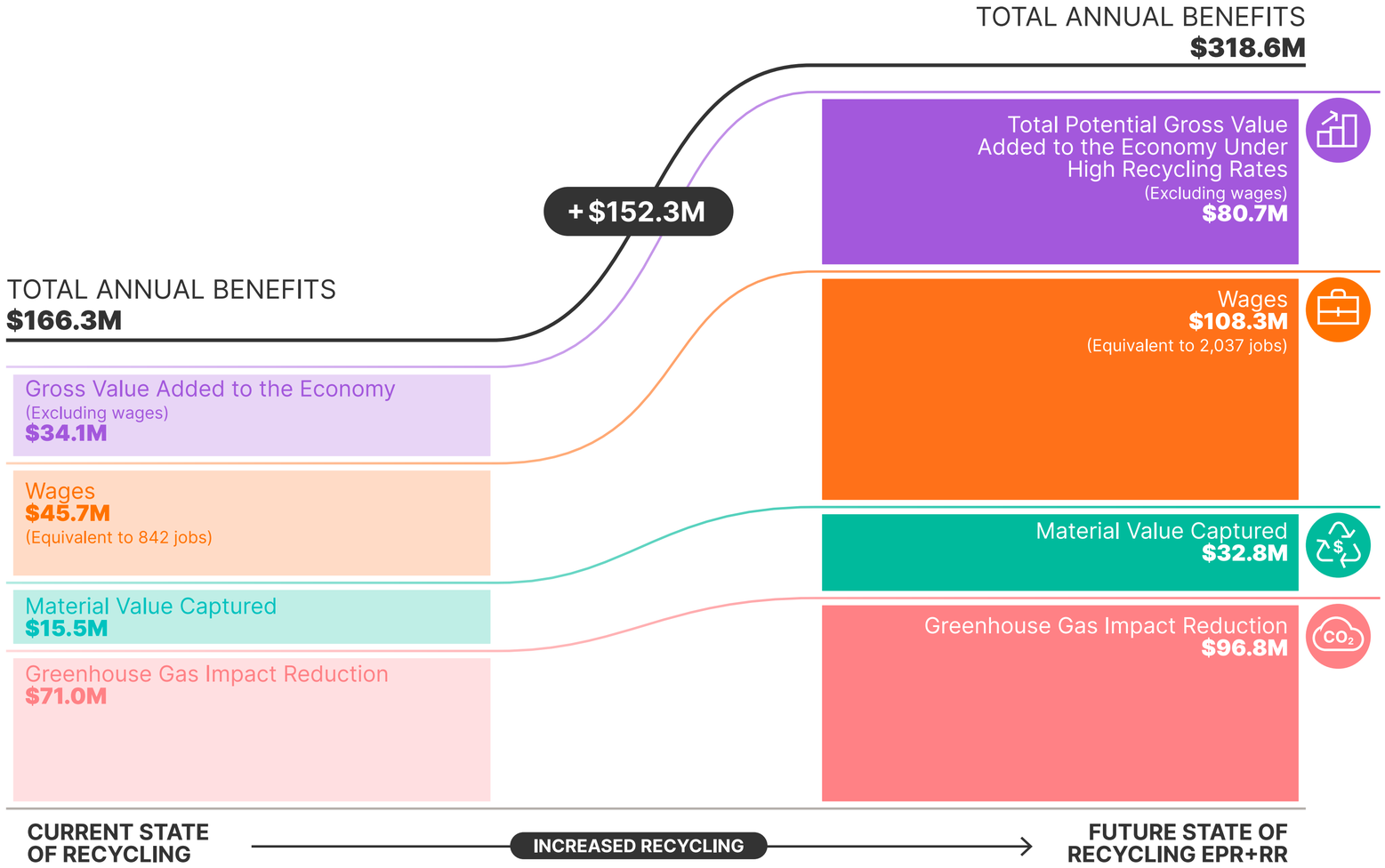
Avoid emissions of 510,000 MTCO2e annually.

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



NEW JERSEY

39% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#9
RECYCLING RANK 2018	#9

=

POPULATION
9,267,961

CENSUS SUB REGION
MIDDLE ATLANTIC

RECYCLING REFUND STATE
NO

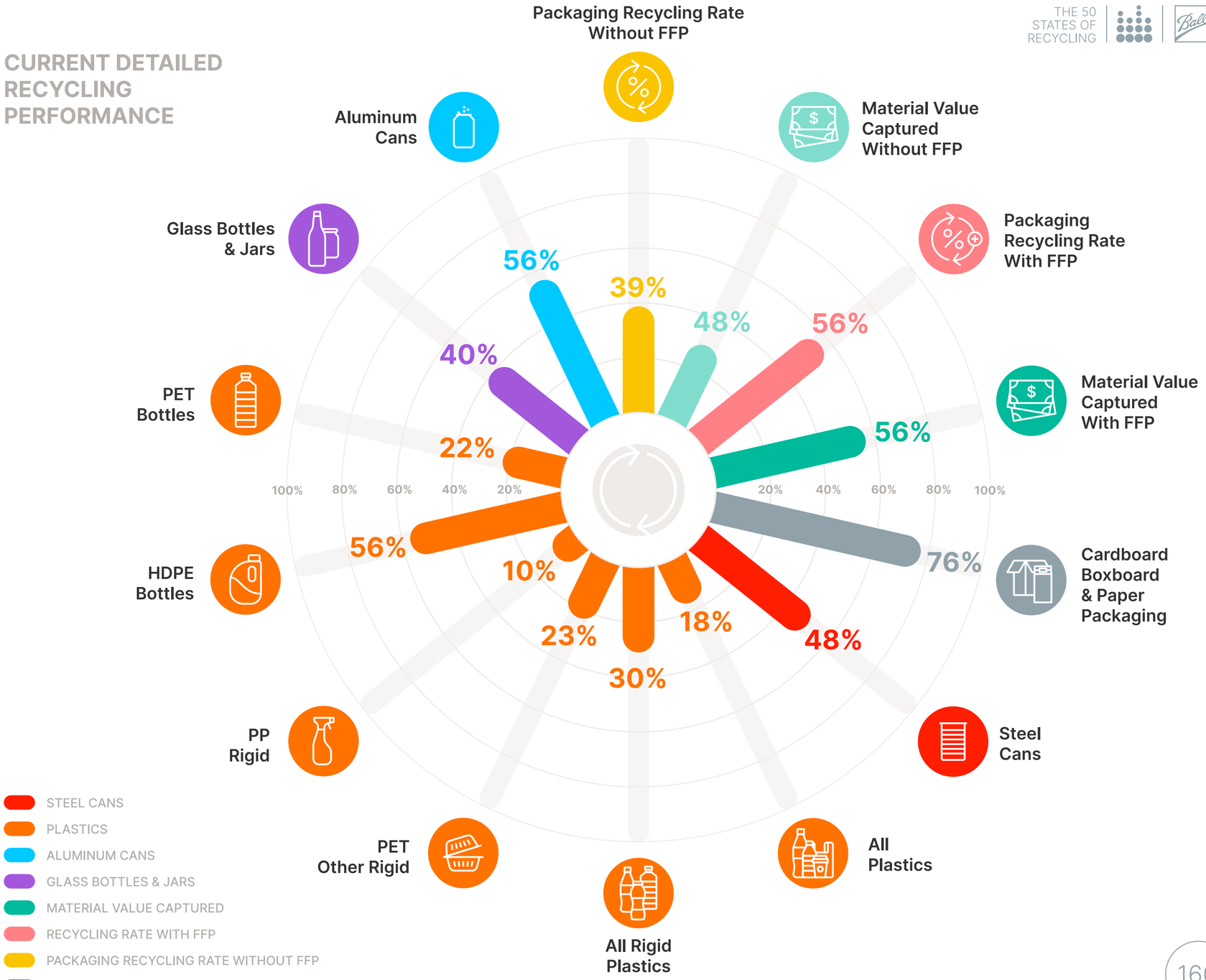
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The New Jersey Statewide Mandatory Source Separation and Recycling Act of 1987 set MSW recycling goals that were updated in later years. The state also established a tax of $1.50 per ton on waste disposed at landfills and transfer stations. The state recently passed recycled content mandates and bans or limits to the distribution of single-use plastic carryout bags, single-use paper carryout bags, polystyrene foam food service products and single-use plastic straws.

CURRENT DETAILED RECYCLING PERFORMANCE



NEW JERSEY

CURRENT STATE OF RECYCLING

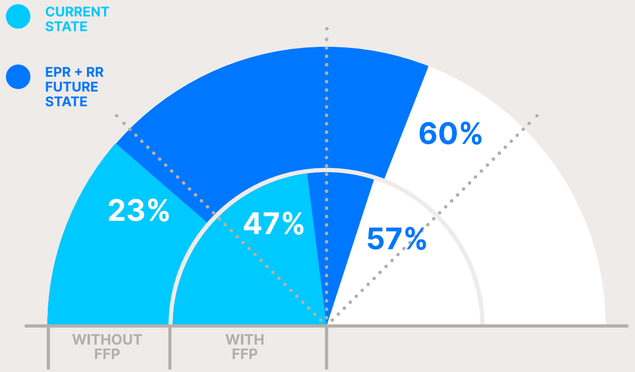
- In 2021, New Jersey recycled approximately 39% of packaging materials without FFP. This recycling performance increases to 56% when considering materials with FFP.
- The value of the material captured for recycling was $190 million, just 56% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 3.7 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

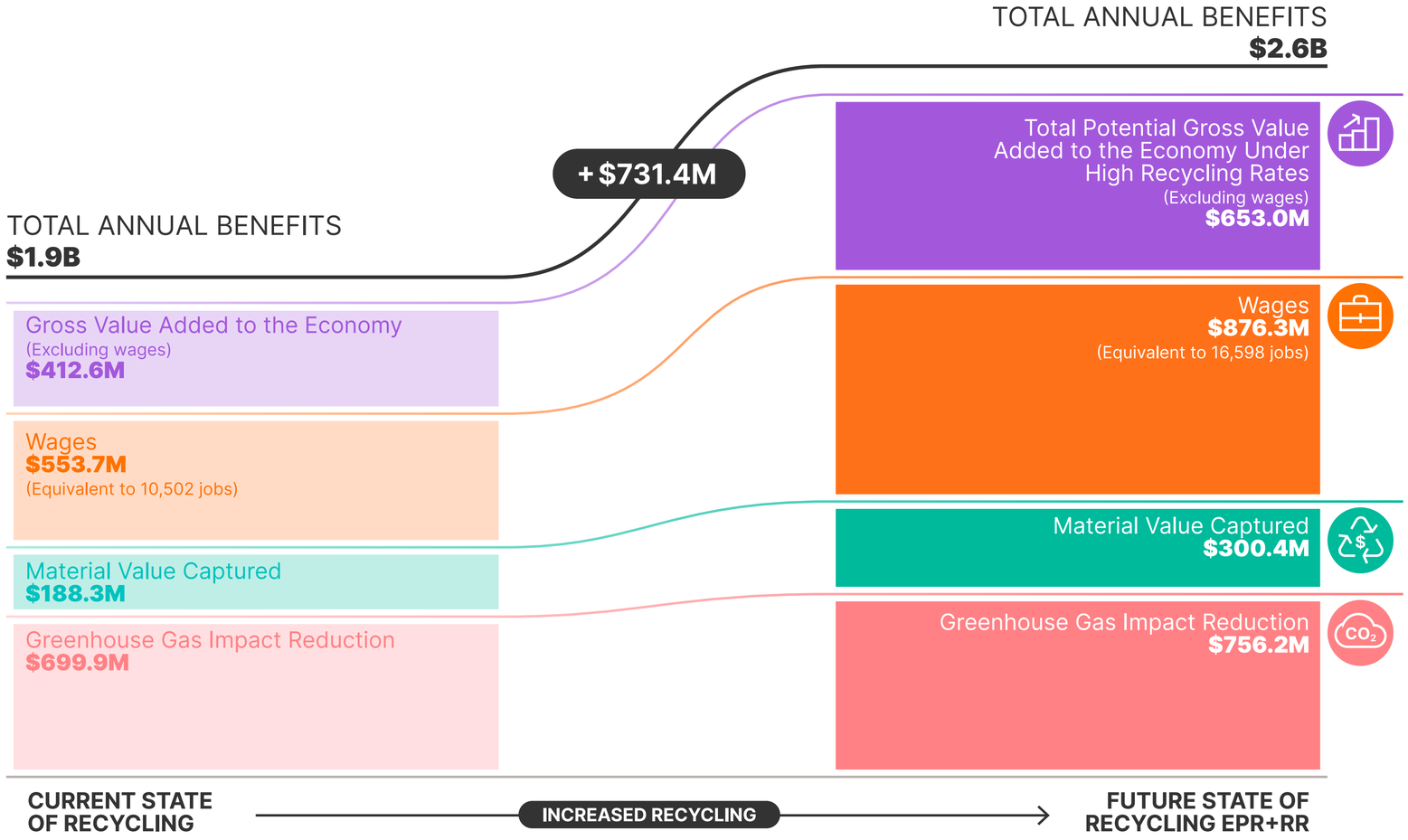
- Increase recycling related jobs from 10,500 to 16,600.
- Place $300 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 4 million MTCO2e annually.

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



NEW MEXICO

16% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#29	+12
RECYCLING RANK 2018	#41	

POPULATION
2,116,677

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

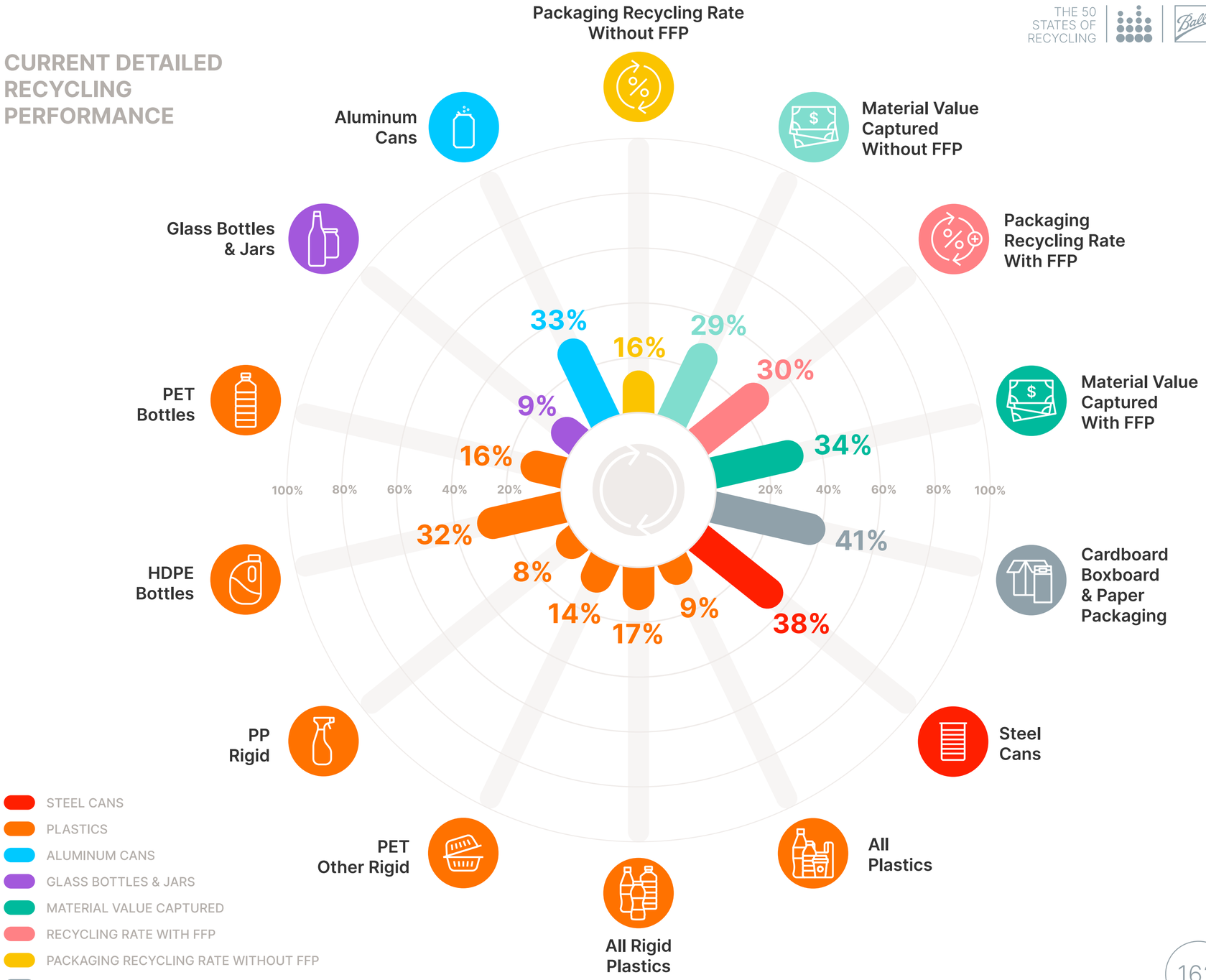
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Solid Waste Bureau of the New Mexico Environment Department regulates solid waste facilities and operations in the state. For rural areas, the state operates a hub and spoke collection model, and as of 2015, all but 16 communities had recycling collection, or a drop-off point within 30 miles. The 1990 New Mexico Solid Waste Act called for the creation of a Solid Waste Management Plan to set recycling goals.

CURRENT DETAILED RECYCLING PERFORMANCE



NEW MEXICO

CURRENT STATE OF RECYCLING

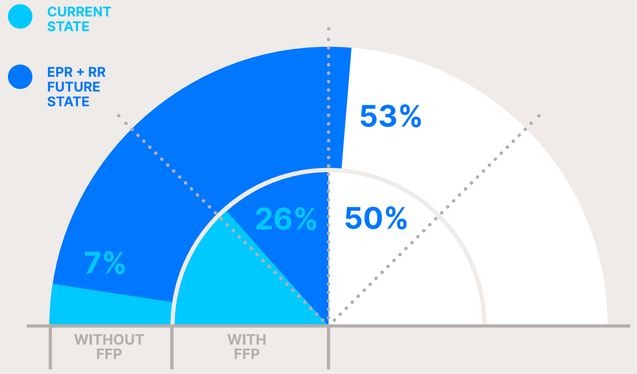
- In 2021, New Mexico recycled approximately 16% of packaging materials without FFP. This recycling performance increases to 30% when considering materials with FFP.
- The value of the material captured for recycling was $20 million, just 34% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 400,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

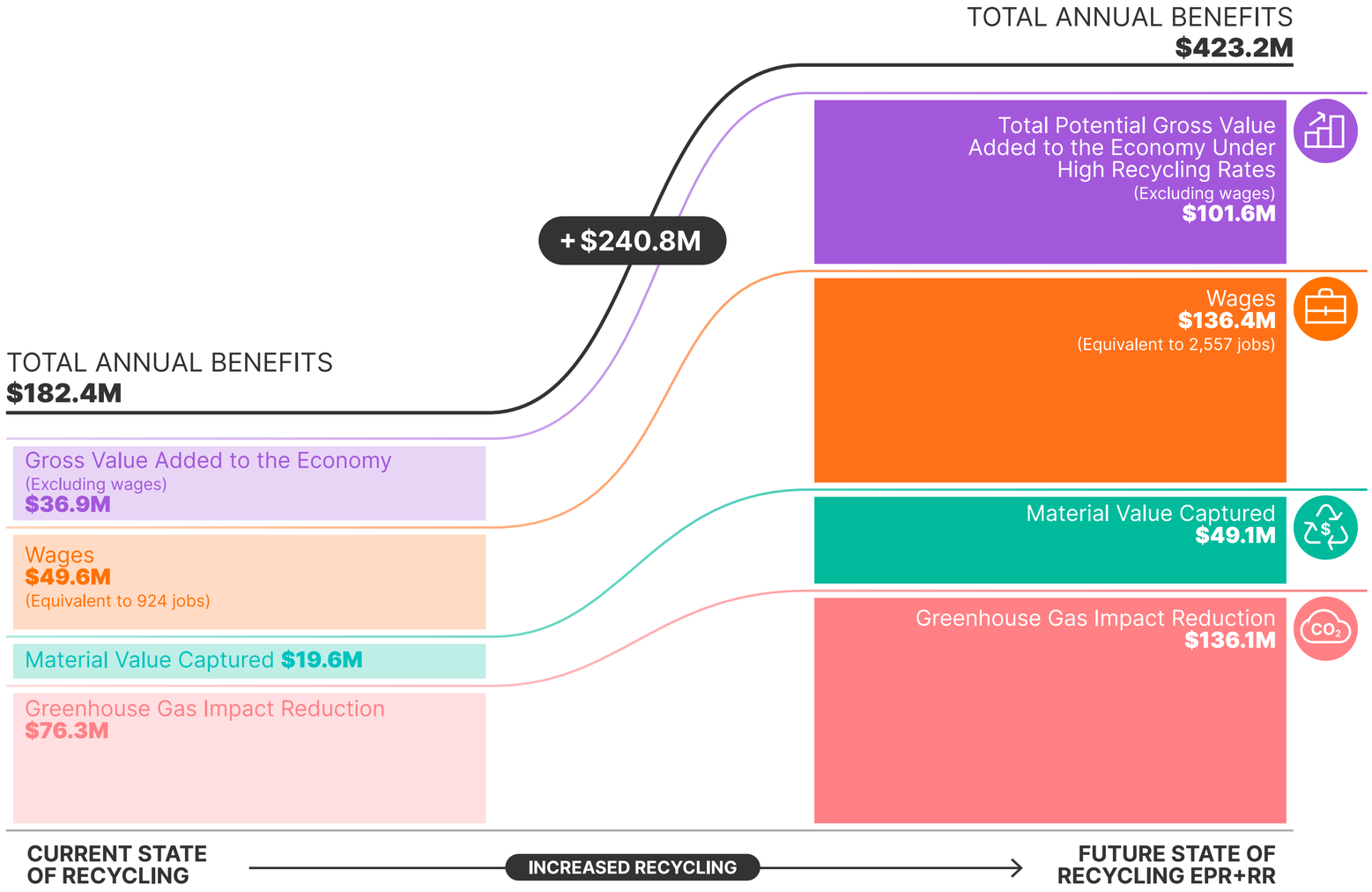
- Increase recycling related jobs from 900 to 2,600.
- Place $49 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 700,000 MTCO2e annually.

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



NEW YORK

44% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#6
RECYCLING RANK 2018	#6

=

POPULATION
19,857,492

CENSUS SUB REGION
MIDDLE ATLANTIC

RECYCLING REFUND STATE
YES

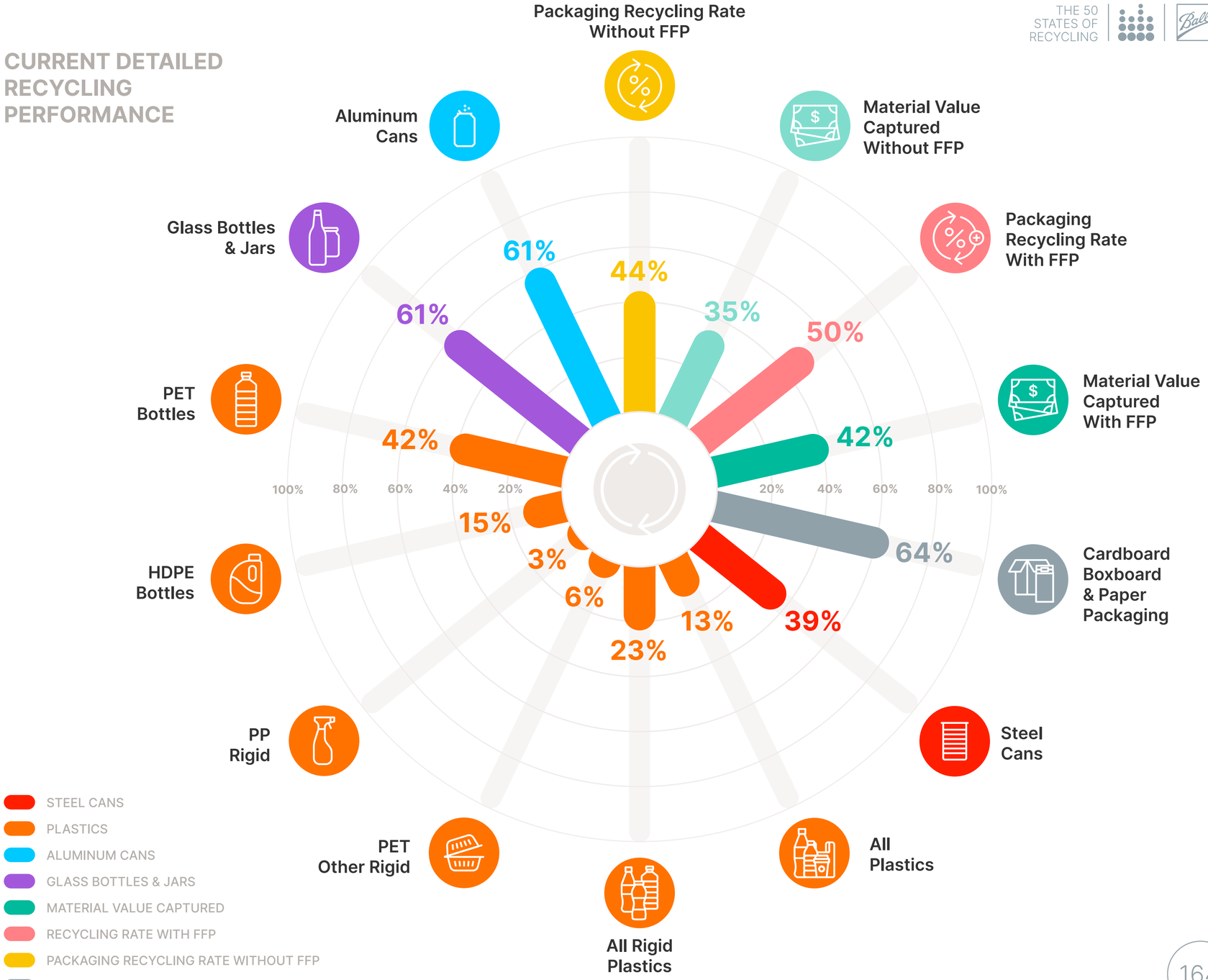
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

New York State has multiple laws that mirror product stewardship principles. It currently has product stewardship programs in place for electronics and batteries and has a declaration to pursue extended producer responsibility (EPR) programs. The New York Returnable Beverage Container Act of 1982 requires a refundable deposit of 5 cents to be placed on eligible beverage containers made of plastic, metal and glass.

CURRENT DETAILED RECYCLING PERFORMANCE



NEW YORK

CURRENT STATE OF RECYCLING

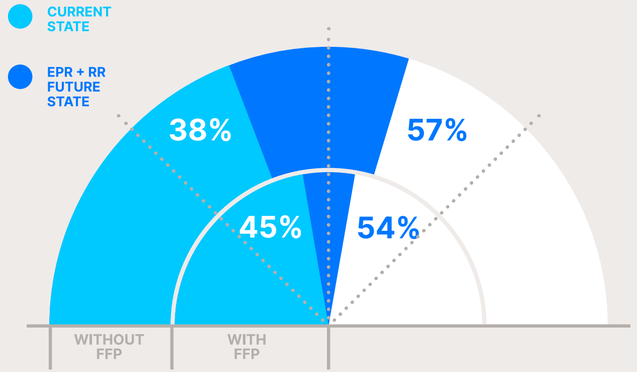
- In 2021, New York recycled approximately 44% of packaging materials without FFP. This recycling performance increases to 50% when considering materials with FFP.
- The value of the material captured for recycling was $251, million just 42% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 4.5 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

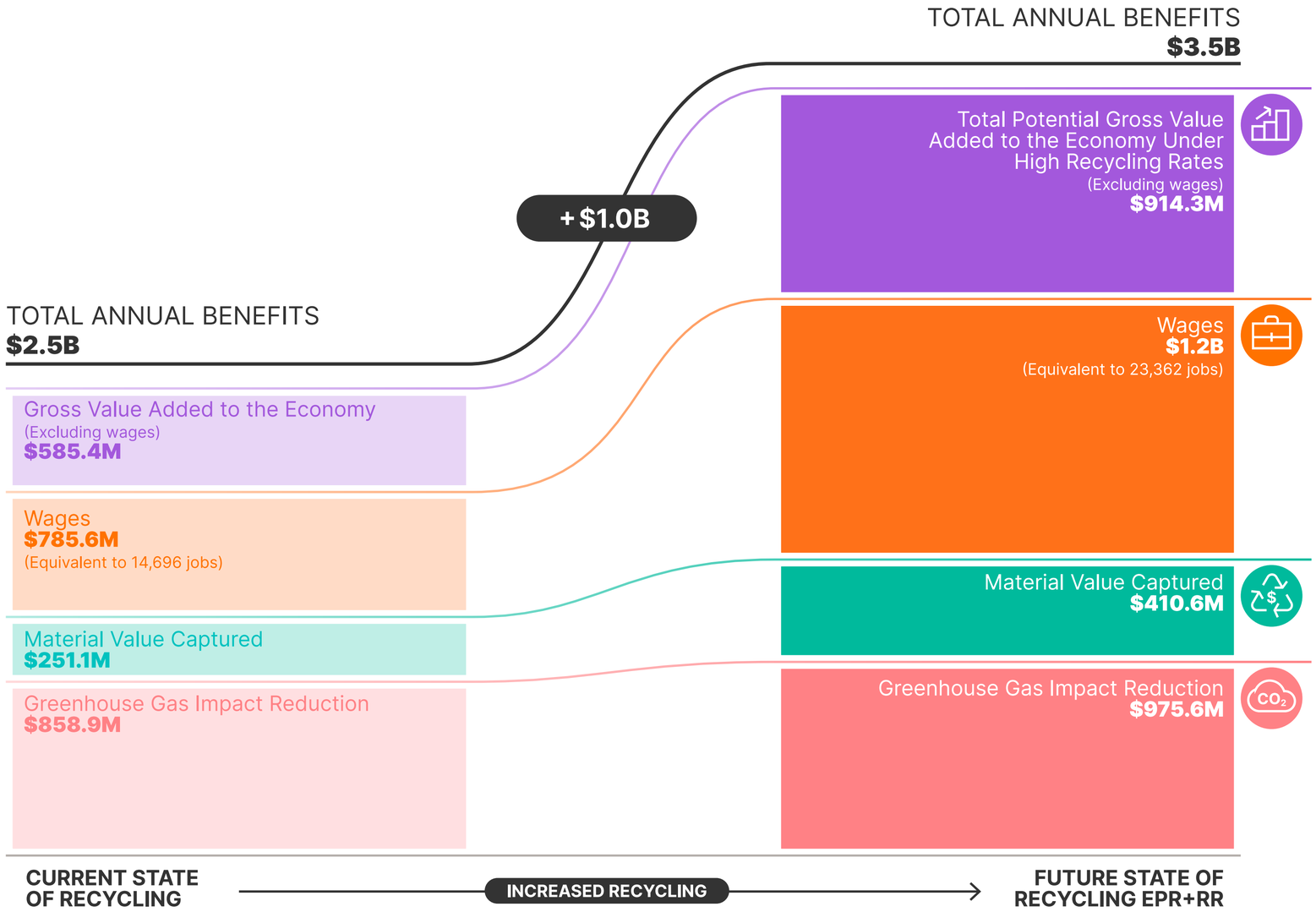
- Increase recycling related jobs from 14,700 to 23,400.
- Place $411 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 5.1 million MTCO2e annually.

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



NORTH CAROLINA

17% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#28	-2
RECYCLING RANK 2018	#26	

POPULATION
10,565,885

CENSUS SUB REGION
SOUTH ATLANTIC

RECYCLING REFUND STATE
NO

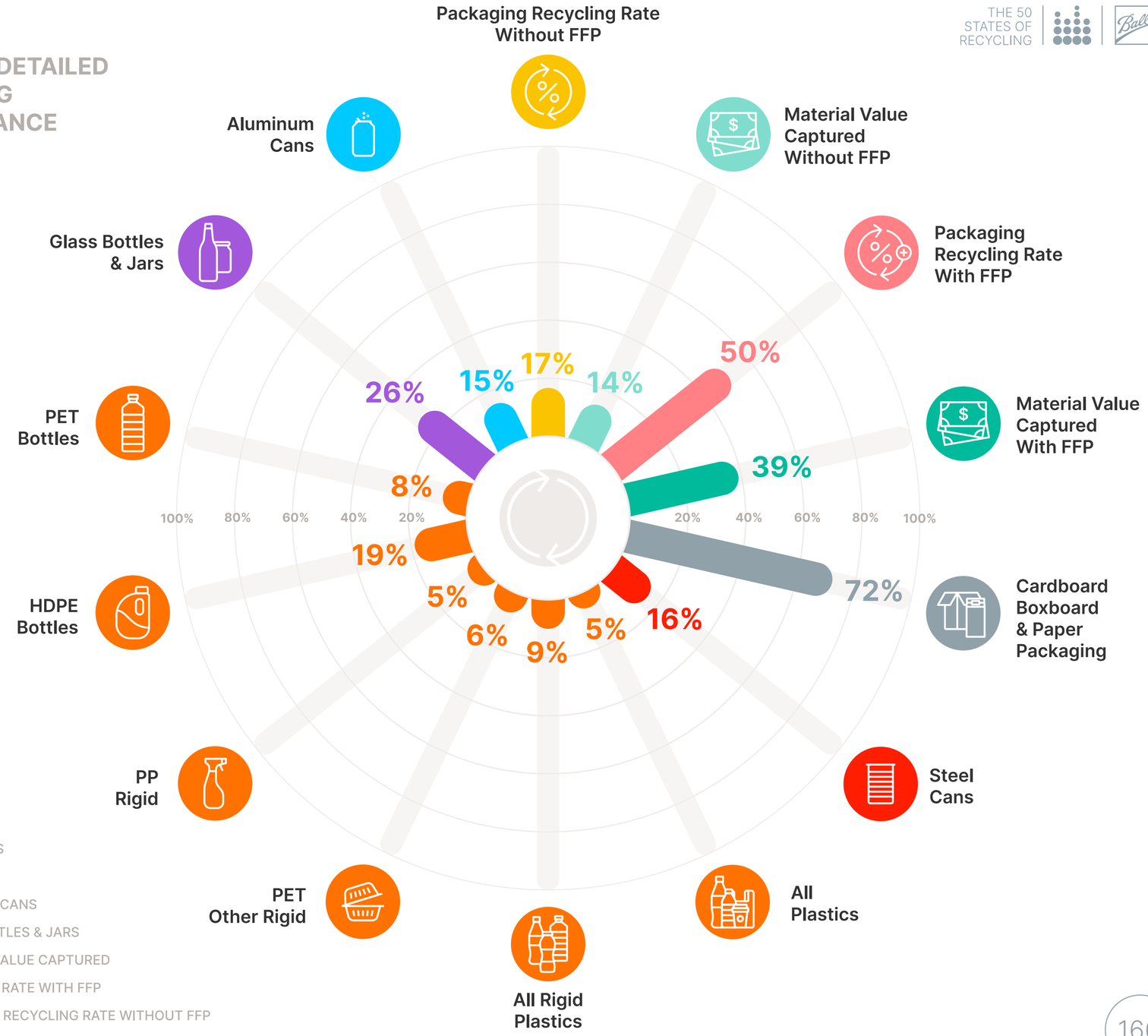
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The North Carolina Department of Environmental Quality's (NCDEQ) Waste Management Division helps to ensure the proper management of solid waste through the implementing of solid waste programs and providing technical assistance. In fiscal year 2016-2017, North Carolina's recycling system achieved a low overall recovery rate of 14.9%. The 2014-2024 Solid Waste Management Plan is in the process of being updated.

CURRENT DETAILED RECYCLING PERFORMANCE



NORTH CAROLINA

CURRENT STATE OF RECYCLING

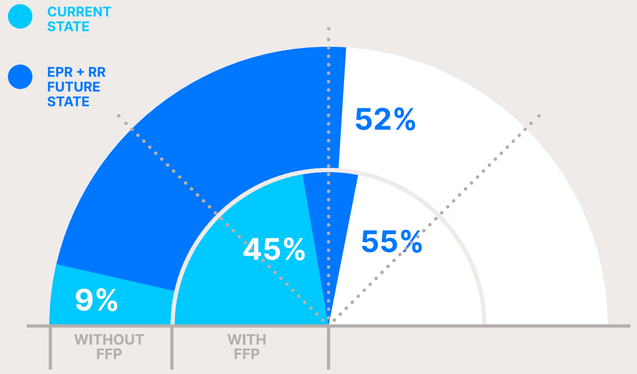
- In 2021, North Carolina recycled approximately 17% of packaging materials without FFP. This recycling performance increases to 50% when considering materials with FFP.
- The value of the material captured for recycling was $113 million, just 39% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 3.3 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

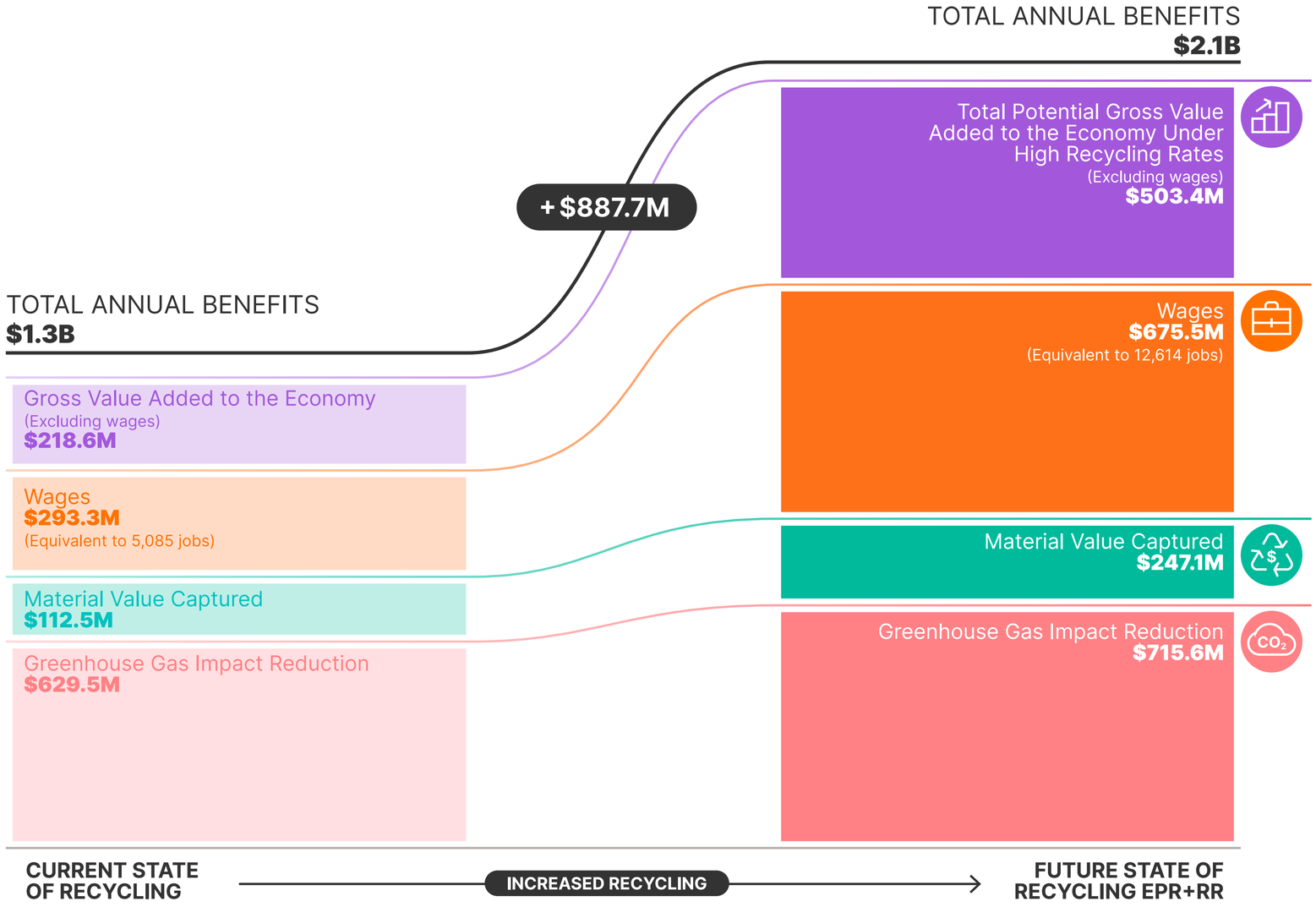
- Increase recycling related jobs from 5,100 to 12,600.
- Place $247 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 3.8 million MTCO2e annually.

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



NORTH DAKOTA

21% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#22	+1
RECYCLING RANK 2018	#23	

POPULATION
777,934

CENSUS SUB REGION
WEST NORTH CENTRAL

RECYCLING REFUND STATE
NO

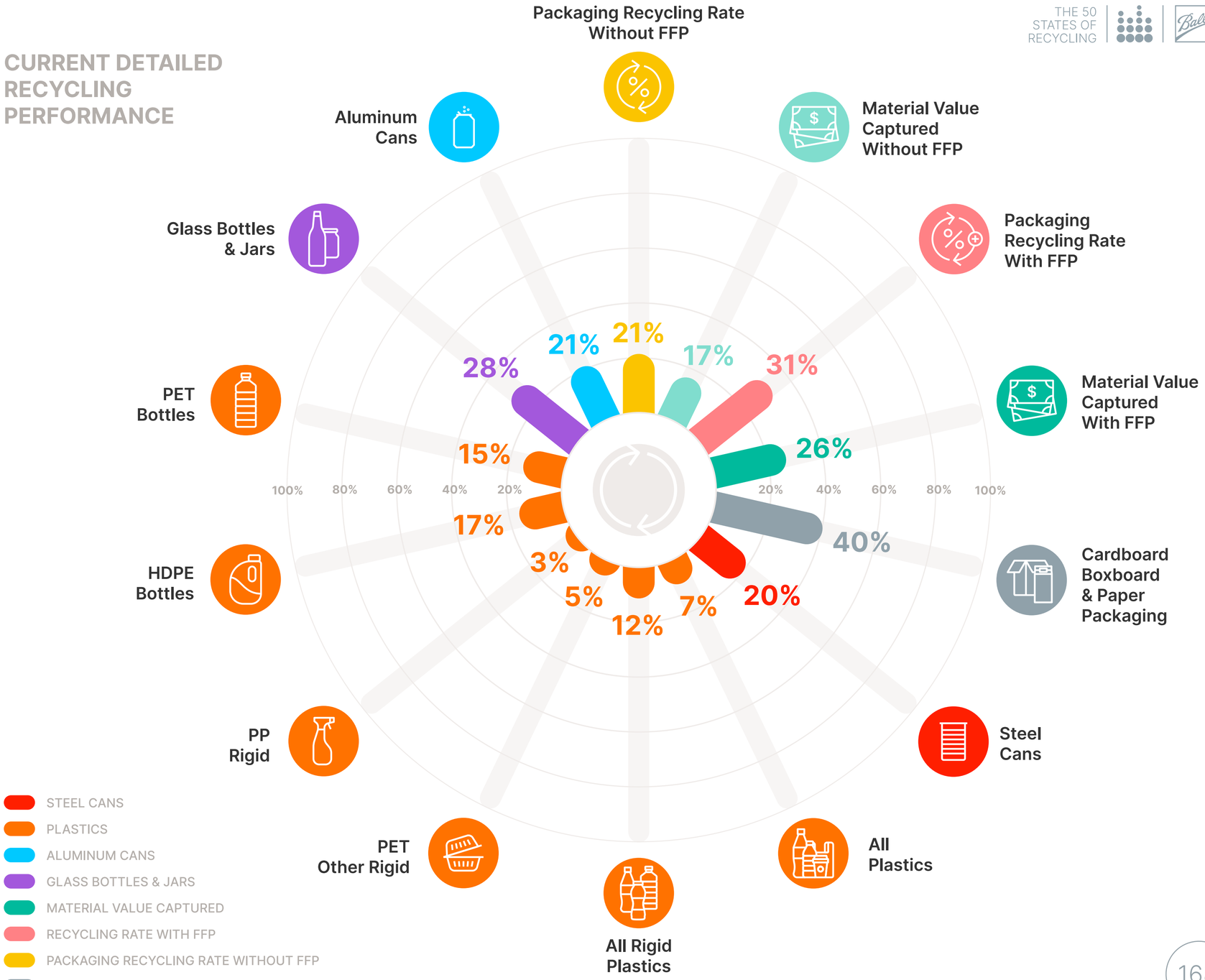
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The North Dakota Department of Environmental Quality's (DEQ) Division of Waste Management enforces state and federal waste management law in North Dakota. There is no overarching legislation in the state regarding post-consumer packaging recycling.

CURRENT DETAILED RECYCLING PERFORMANCE



NORTH DAKOTA

CURRENT STATE OF RECYCLING

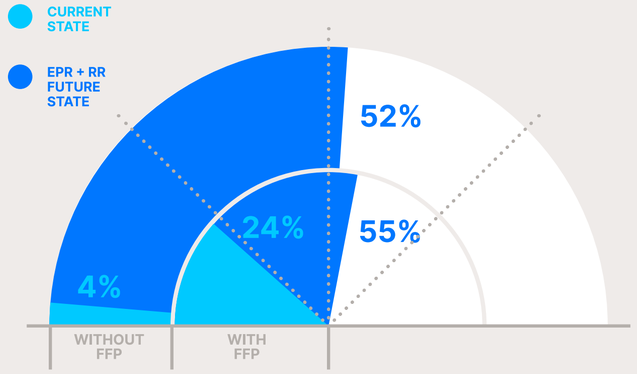
- In 2021, North Dakota recycled approximately 21% of packaging materials without FFP. This recycling performance increases to 31% when considering materials with FFP.
- The value of the material captured for recycling was $6 million, just 26% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 160,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

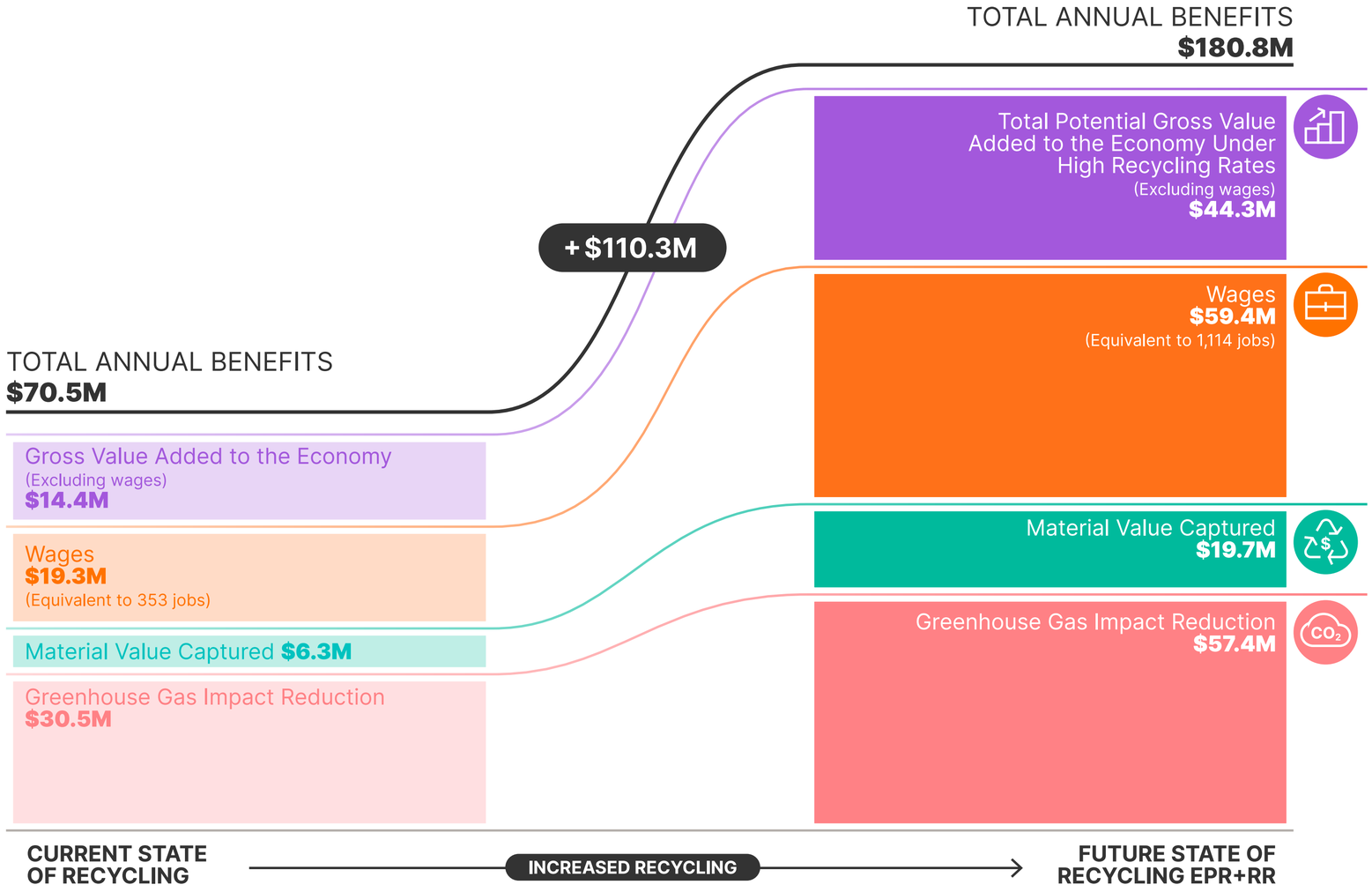
- Increase recycling related jobs from 350 to 1,100.
- Place $20 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 300,000 MTCO2e annually.

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



OHIO

16% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#30	-1
RECYCLING RANK 2018	#29	

POPULATION
11,764,342

CENSUS SUB REGION
EAST NORTH CENTRAL

RECYCLING REFUND STATE
NO

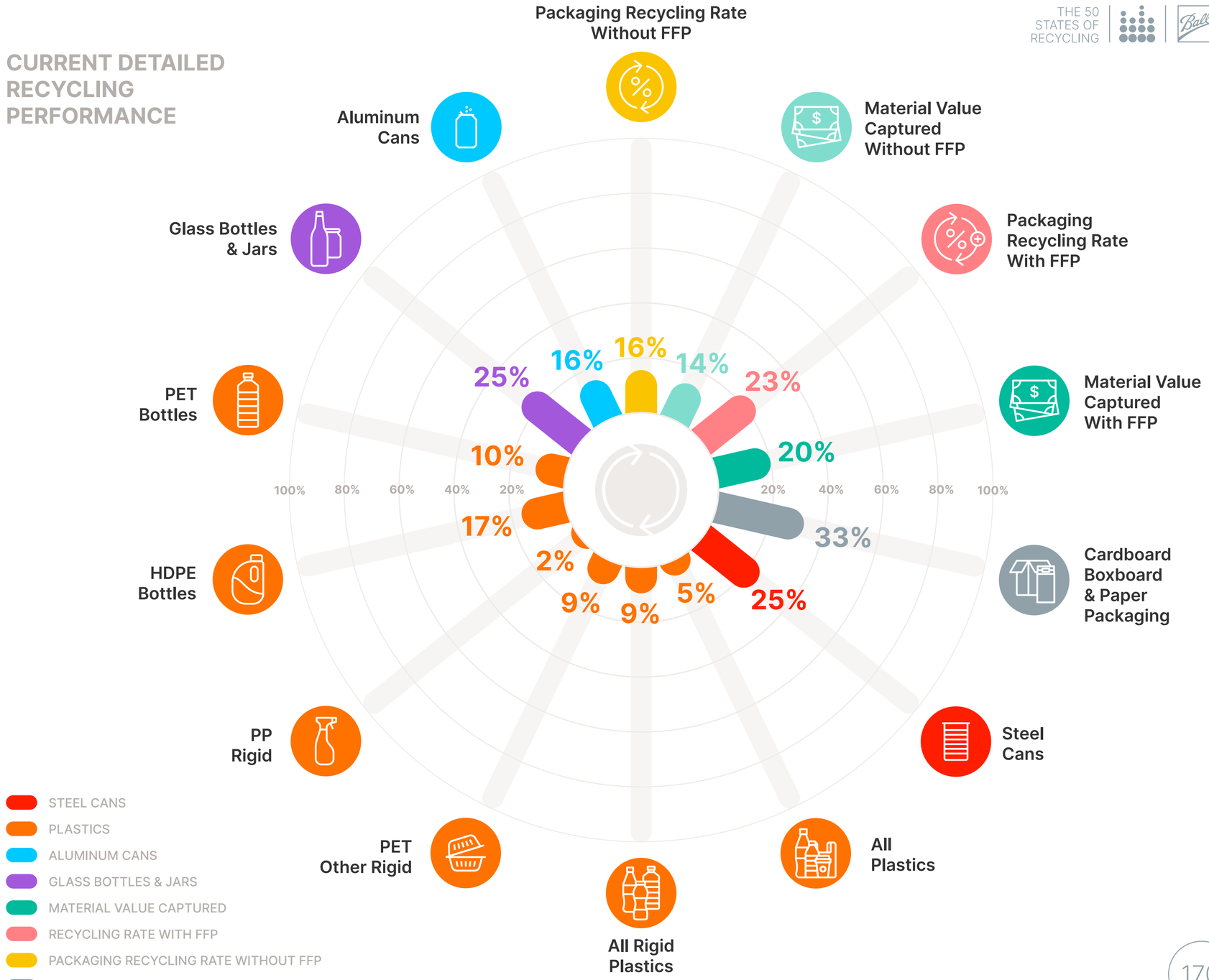
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Ohio Environmental Protection Agency (EPA) and the individual Solid Waste Management Districts (SWMD) within Ohio are responsible for implementing statewide waste reduction and recycling programs. Each SWMD must report high-level total tons disposed and recycled annually to the Ohio EPA in the form of an Annual District Report (ADR) as specified in Goal #6 of the 1995 State Solid Waste Management Plan.

CURRENT DETAILED RECYCLING PERFORMANCE



OHIO

CURRENT STATE OF RECYCLING

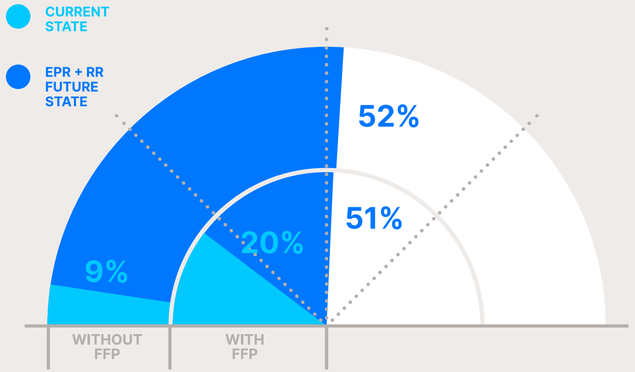
- In 2021, Ohio recycled approximately 16% of packaging materials without FFP. This recycling performance increases to 23% when considering materials with FFP.
- The value of the material captured for recycling was $58 million, just 20% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.3 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

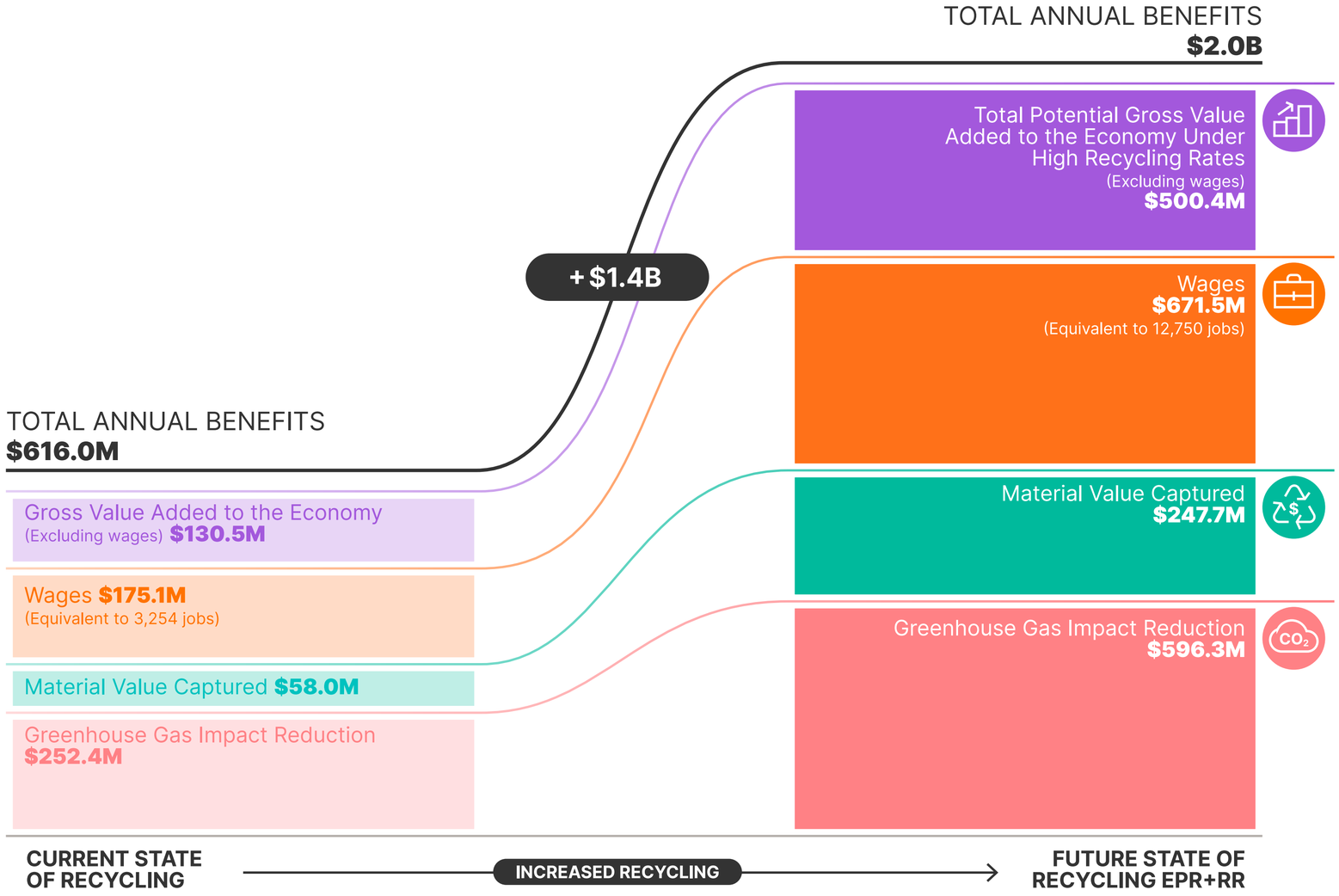
- Increase recycling related jobs from 3,300 to 12,800.
- Place $248 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 3.1 million MTCO2e annually.

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



OKLAHOMA

8% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #44 =

RECYCLING RANK 2018 #44

POPULATION
3,991,225

CENSUS SUB REGION
WEST SOUTH CENTRAL

RECYCLING REFUND STATE
NO

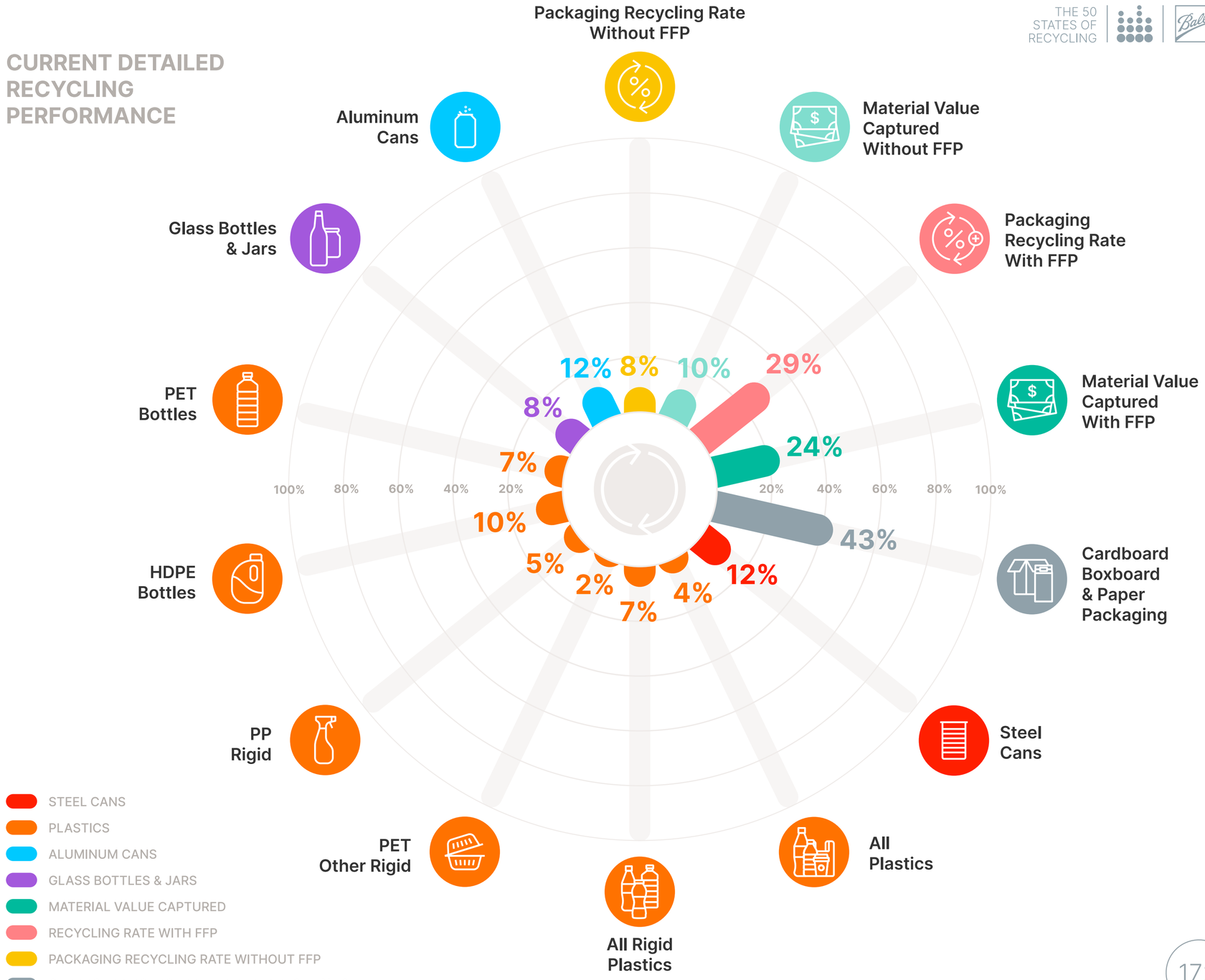
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Oklahoma Department of Environmental Quality's (ODEQ) Land Protection Division has two primary functions in waste management: solid waste permitting and solid waste compliance. ODEQ also maintains databases of recyclers in Oklahoma and market prices for recyclables.

CURRENT DETAILED RECYCLING PERFORMANCE



OKLAHOMA

CURRENT STATE OF RECYCLING

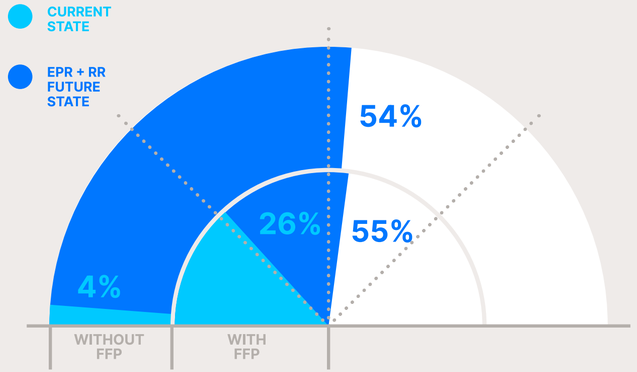
- In 2021, Oklahoma recycled approximately 8% of packaging materials without FFP. This recycling performance increases to 29% when considering materials with FFP.
- The value of the material captured for recycling was $27 million, just 24% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 760,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 1,200 to 4,900.
- Place $95 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.4 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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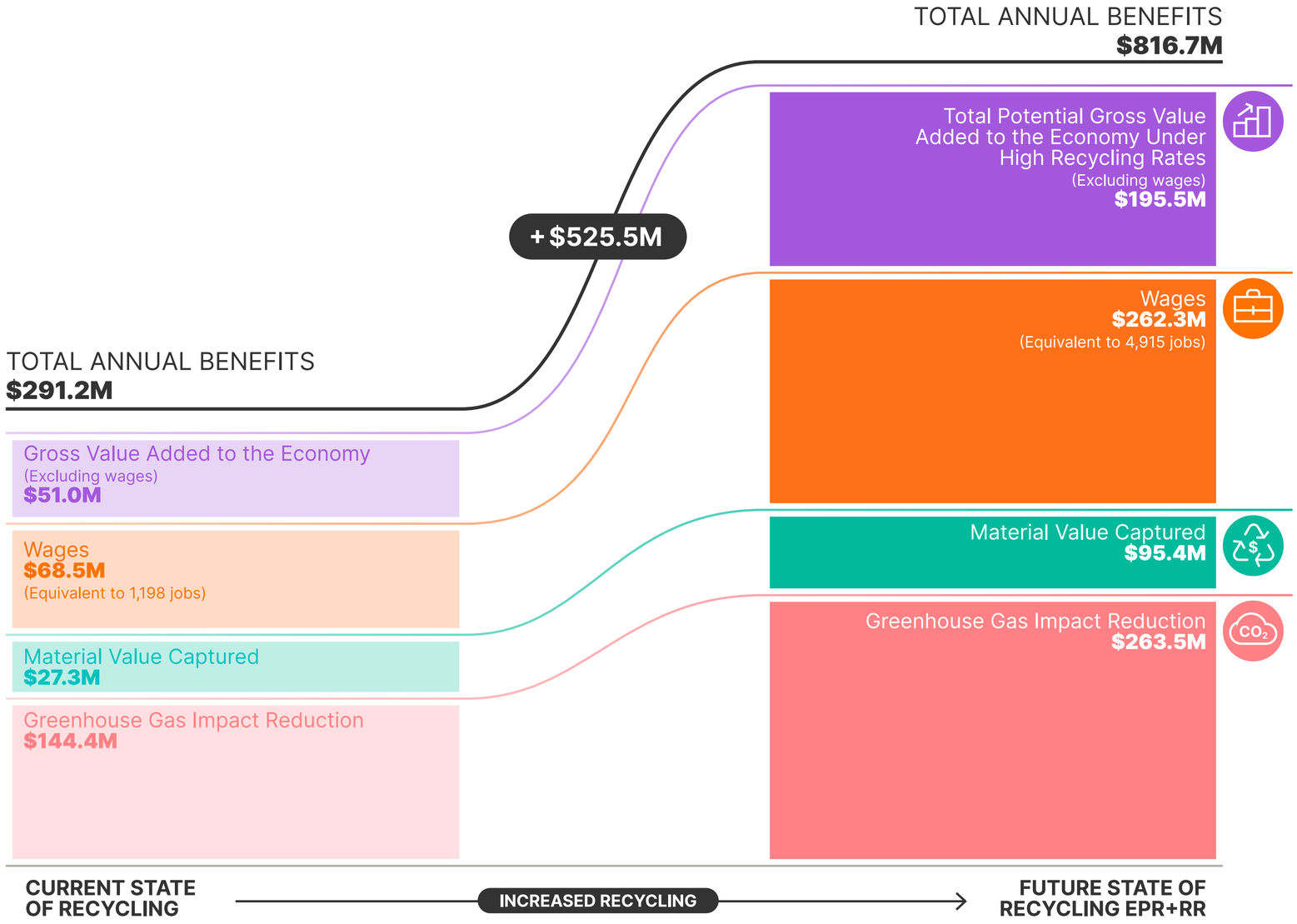
EPR assumes an overall recycling rate of 65% for residential packaging and RR assumes a 90% recycling rate for beverage containers



OREGON

45% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #5

RECYCLING RANK 2018 #4

+1

POPULATION
4,256,301

CENSUS SUB REGION
PACIFIC

RECYCLING REFUND STATE
YES

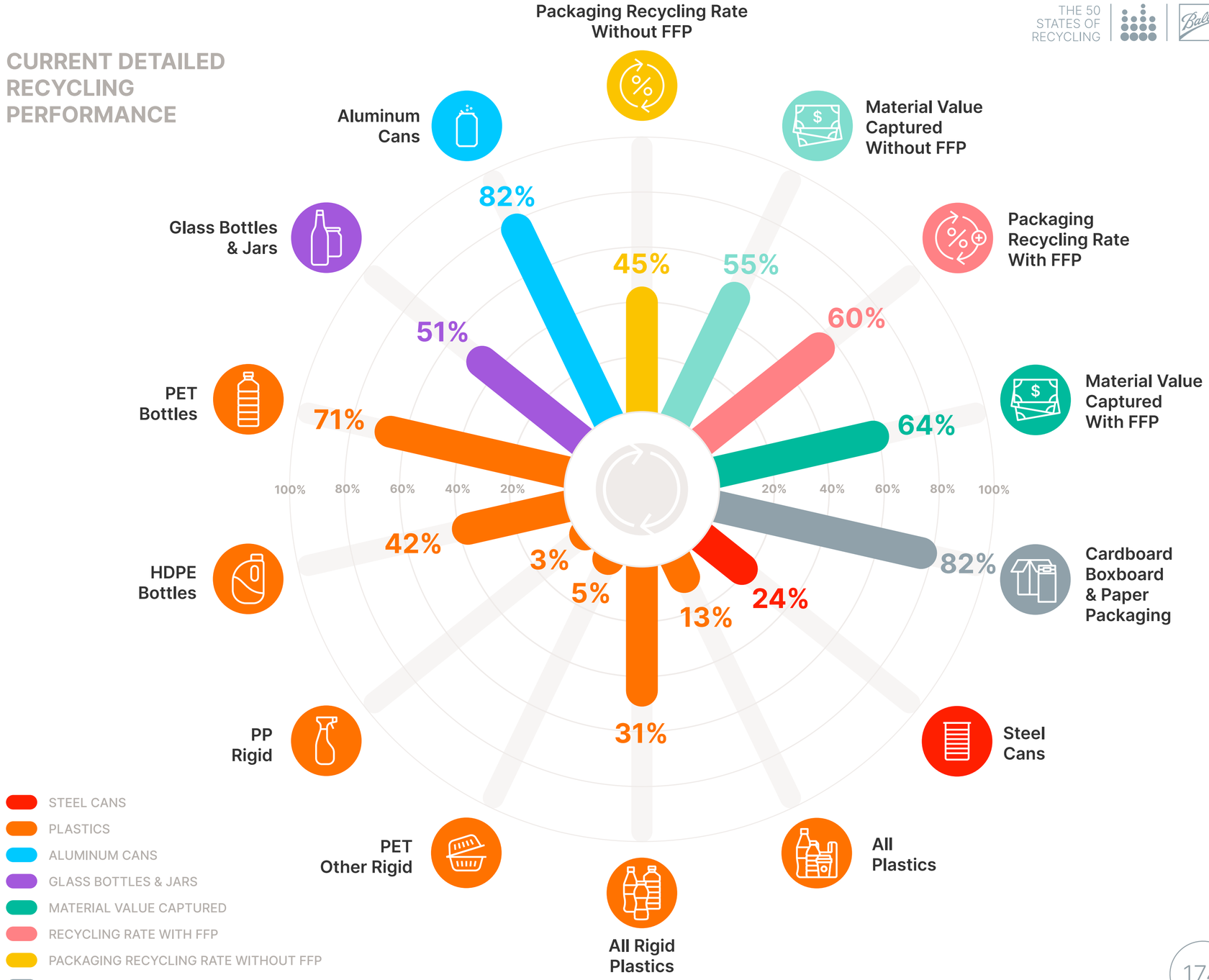
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Under Oregon law, all cities with at least 4,000 people must provide recycling services. Oregon has set a 2020 recycling rate target of 52% for the general solid waste stream. In addition to mandating recycling in certain cities, Oregon has one of the nation's oldest Recycling Refund programs, which was implemented in 1972, the first in the US. It is noteworthy that the state recently increased the level of the deposit on beverage containers from 5 cents to 10 cents.

CURRENT DETAILED RECYCLING PERFORMANCE



OREGON

CURRENT STATE OF RECYCLING

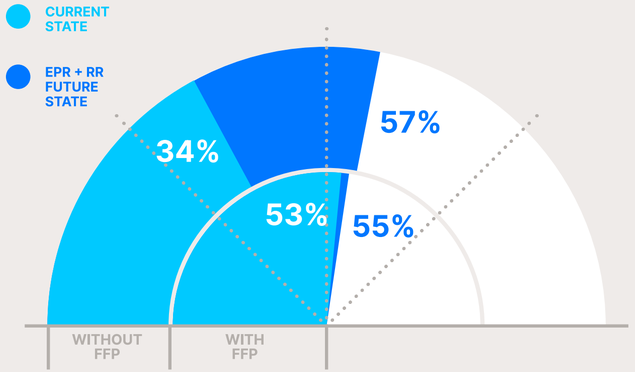
- In 2021, Oregon recycled approximately 45% of packaging materials without FFP. This recycling performance increases to 60% when considering materials with FFP.
- The value of the material captured for recycling was $61 million, just 64% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.6 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 3,900 to 5,800.
- Place $72 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.65 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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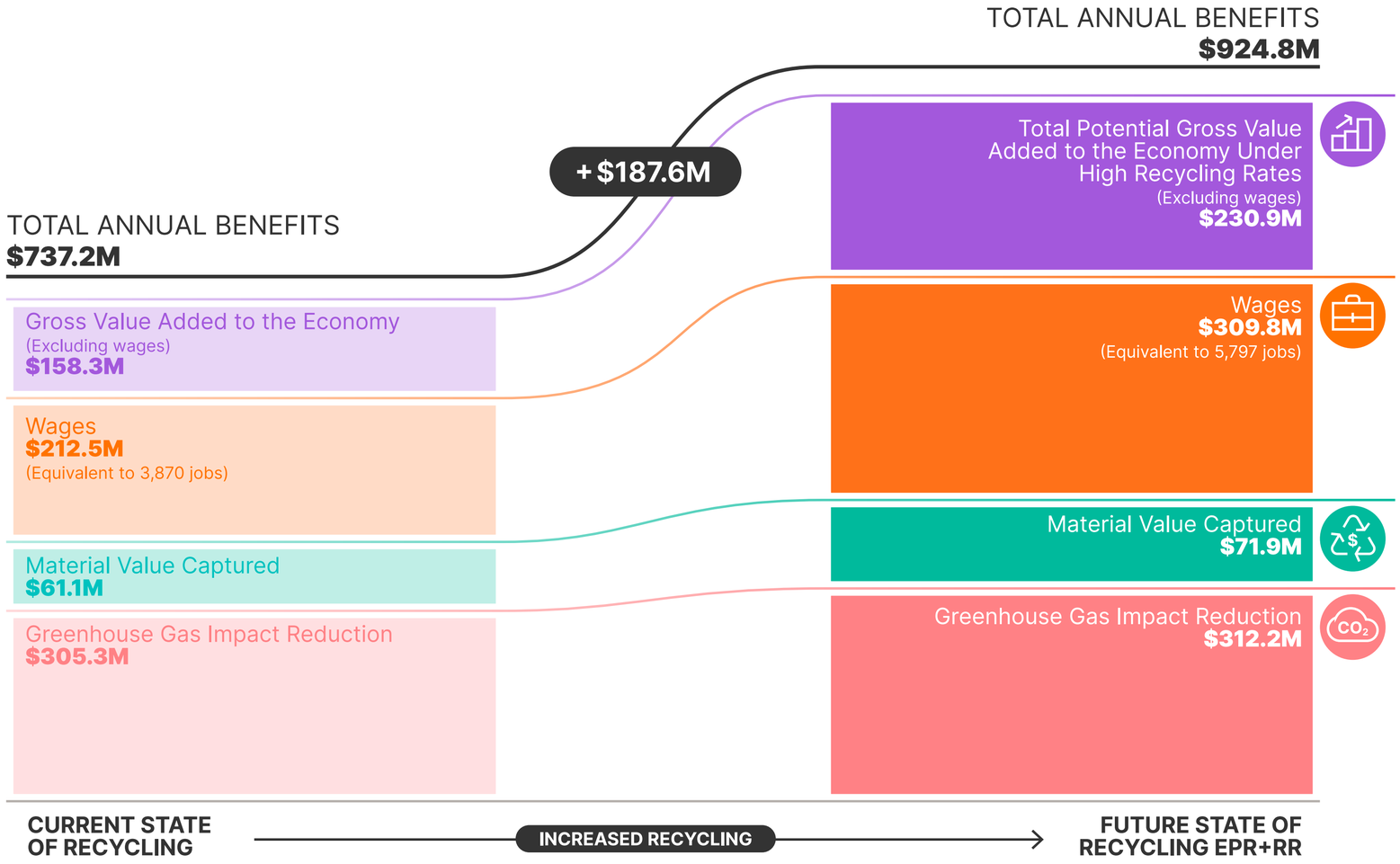
EPR assumes an overall recycling rate of 65% for residential packaging and RR assumes a 90% recycling rate for beverage containers



PENNSYLVANIA

20% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#23	-5
RECYCLING RANK 2018	#18	

POPULATION
13,012,059

CENSUS SUB REGION
MIDDLE ATLANTIC

RECYCLING REFUND STATE
NO

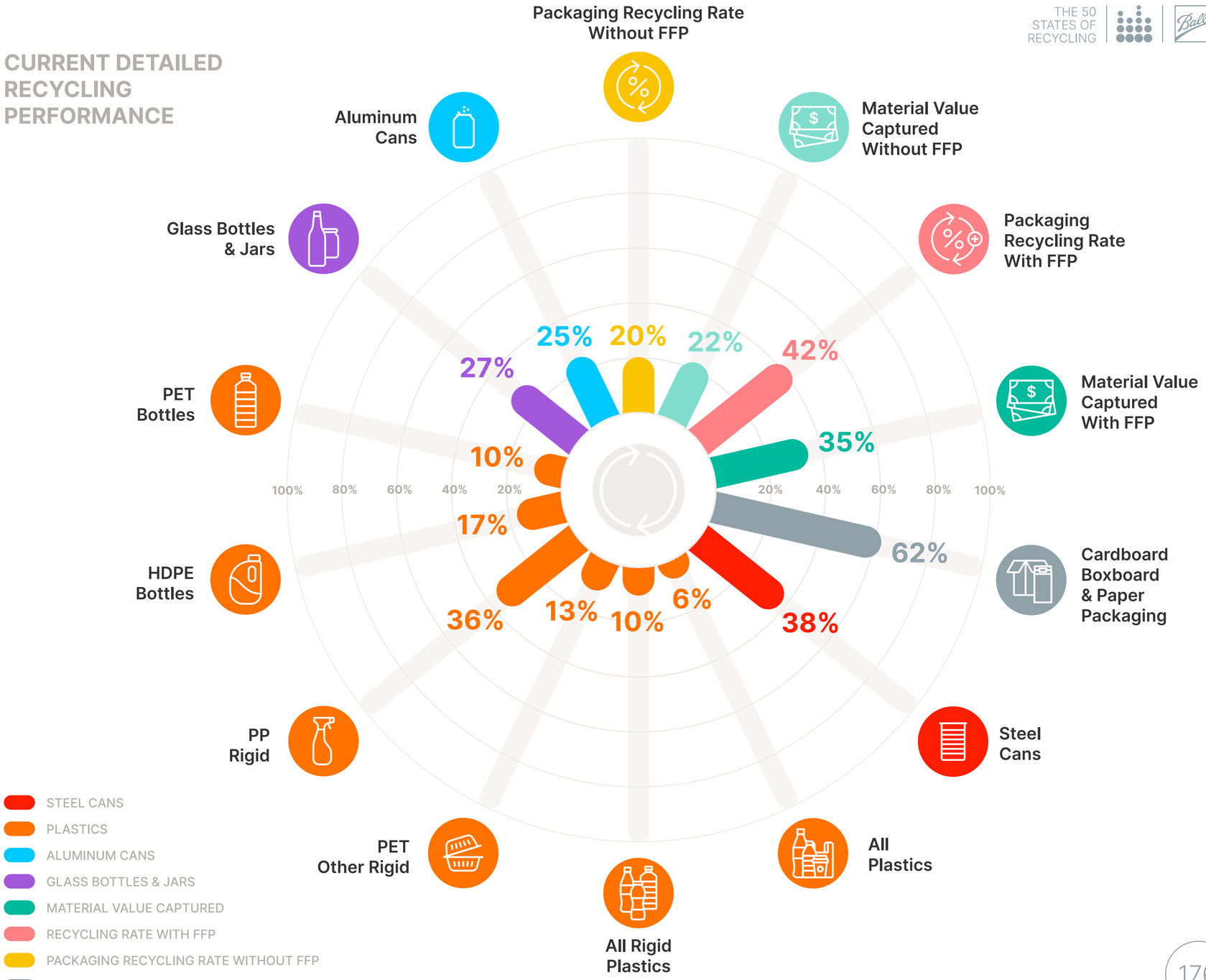
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Municipalities and counties in Pennsylvania report annual tons recycled (for both the residential and commercial sectors) to the Pennsylvania Department of Environmental Protection (DEP). Currently, 94% of the state has access to recycling services via curbside or drop-off, while 79% of the population has curbside access. Pennsylvania Act 101 mandates that all municipalities develop a solid waste management plan.

CURRENT DETAILED RECYCLING PERFORMANCE



PENNSYLVANIA

CURRENT STATE OF RECYCLING

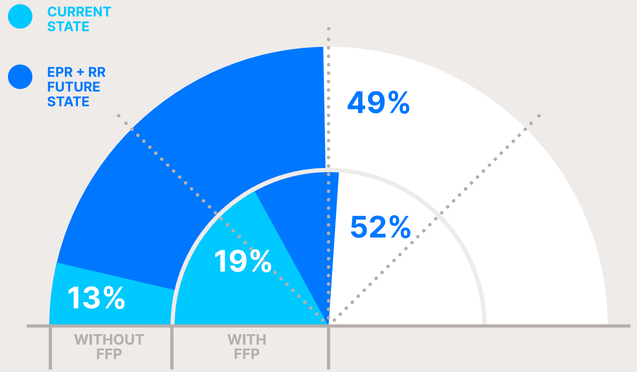
- In 2021, Pennsylvania recycled approximately 20% of packaging materials without FFP. This recycling performance increases to 42% when considering materials with FFP.
- The value of the material captured for recycling was $140 million, just 35% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 3.6 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 7,000 to 17,900.
- Place $330 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 4.5 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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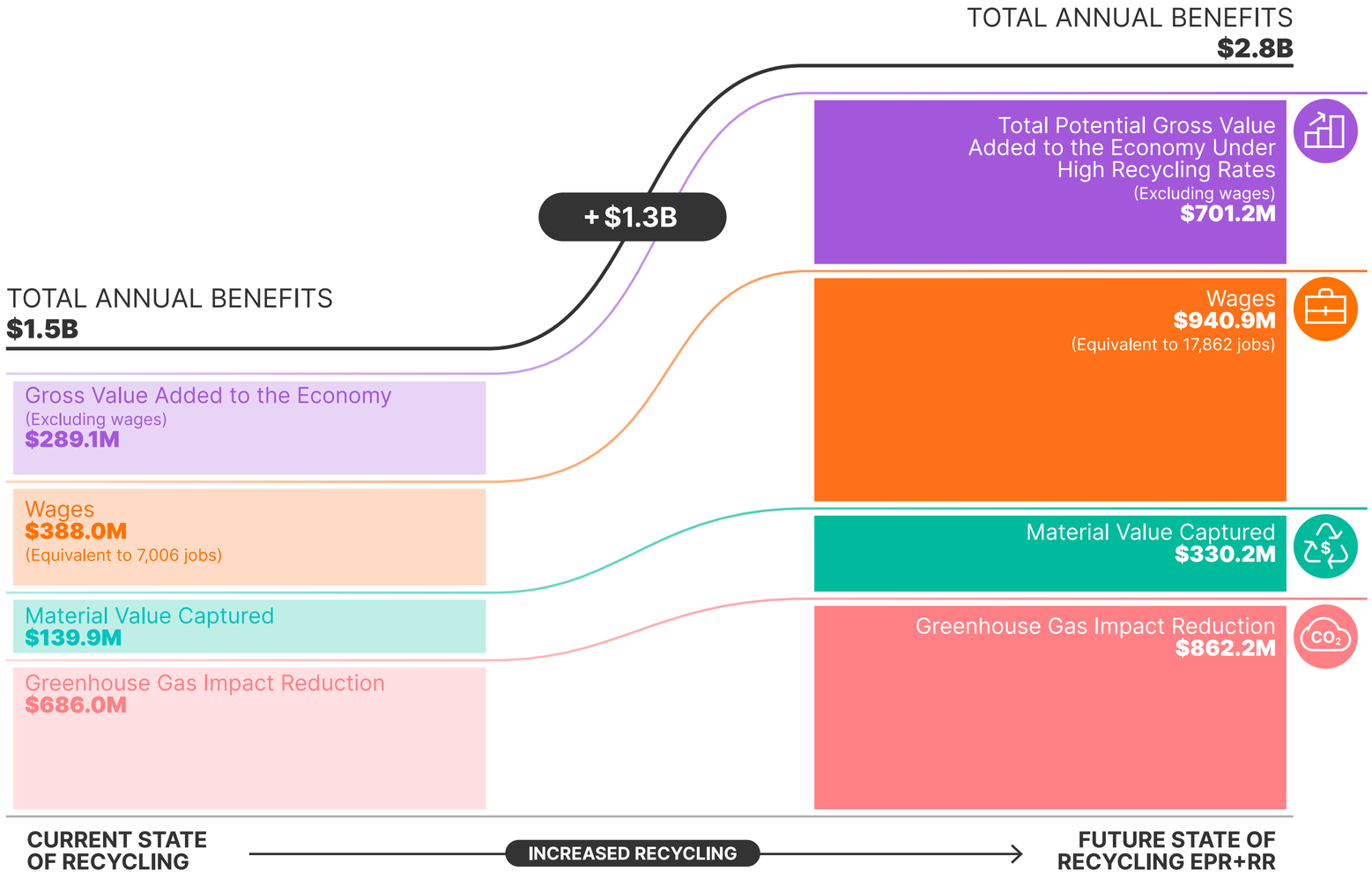
EPR assumes an overall recycling rate of 65% for residential packaging and RR assumes a 90% recycling rate for beverage containers



RHODE ISLAND

17% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#26	-10
RECYCLING RANK 2018	#16	

POPULATION
1,096,985

CENSUS SUB REGION
NEW ENGLAND

RECYCLING REFUND STATE
NO

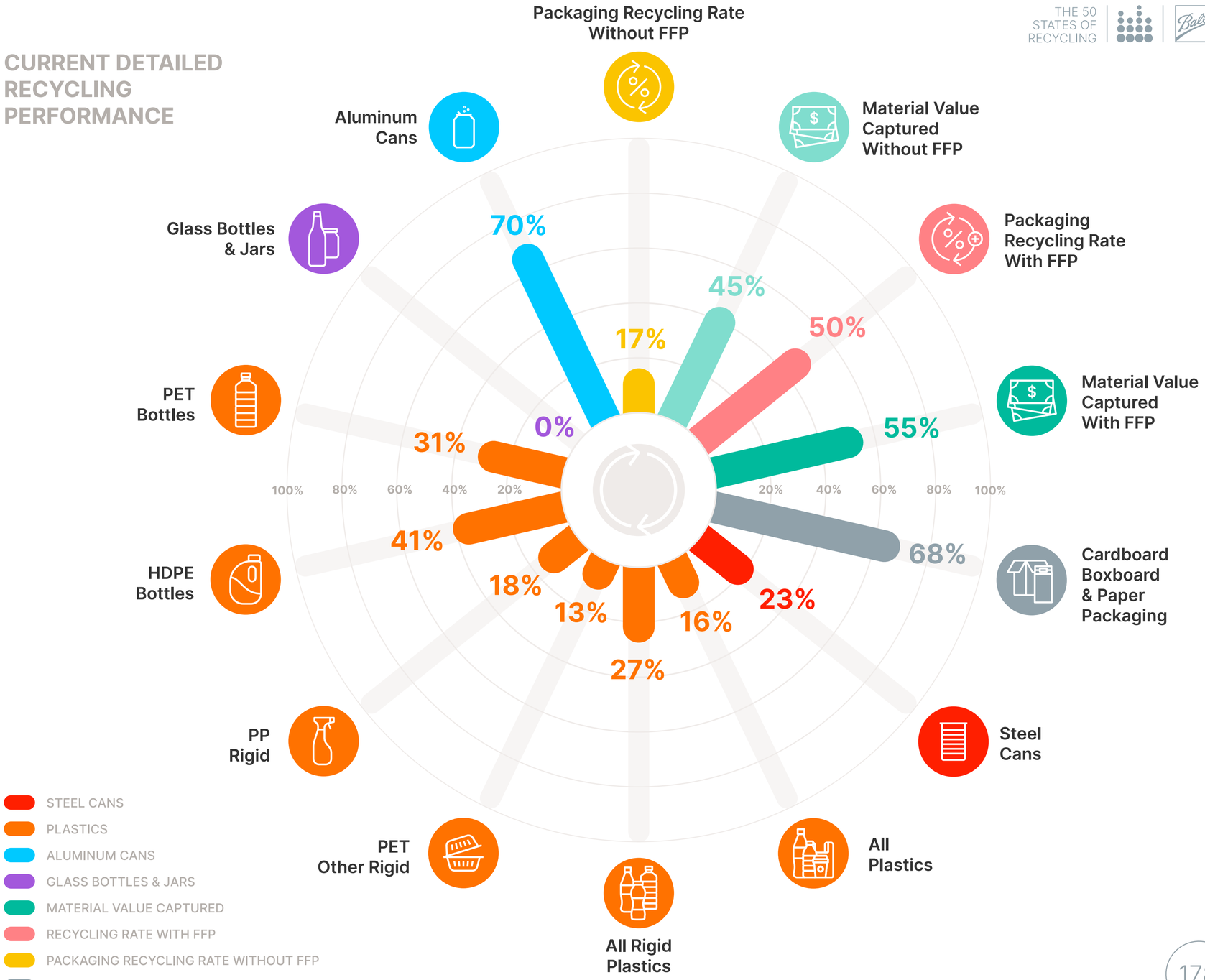
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Rhode Island has a very progressive set of legislation mandating both recycling targets and consumer access to recycling. The Rhode Island Resource Recovery Corporation (RIRRC) works in conjunction with state government entities to oversee solid waste management. The state has set a target to recycle no less than 35% of the solid waste generated in the state. Additionally, there is a requirement that all solid waste generated from residential and commercial establishments be separated into recyclable and nonrecyclable components. Unfortunately none of the glass bottles and jars are recycled in Rhode Island, instead the MRF glass is used as alternative daily cover at landfills.

CURRENT DETAILED RECYCLING PERFORMANCE



RHODE ISLAND

CURRENT STATE OF RECYCLING

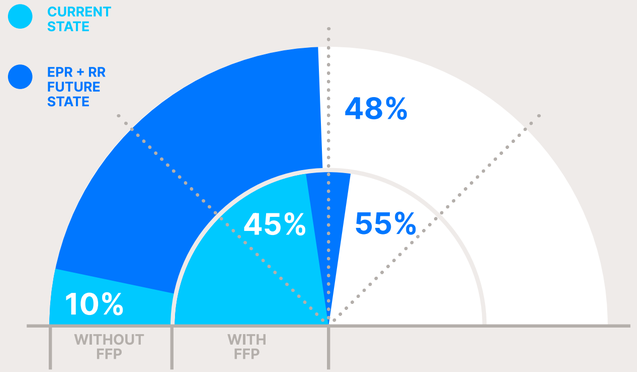
- In 2021, Rhode Island recycled approximately 32% of packaging materials without FFP. This recycling performance increases to 54% when considering materials with FFP.
- The value of the material captured for recycling was $14 million, just 55% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 350,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

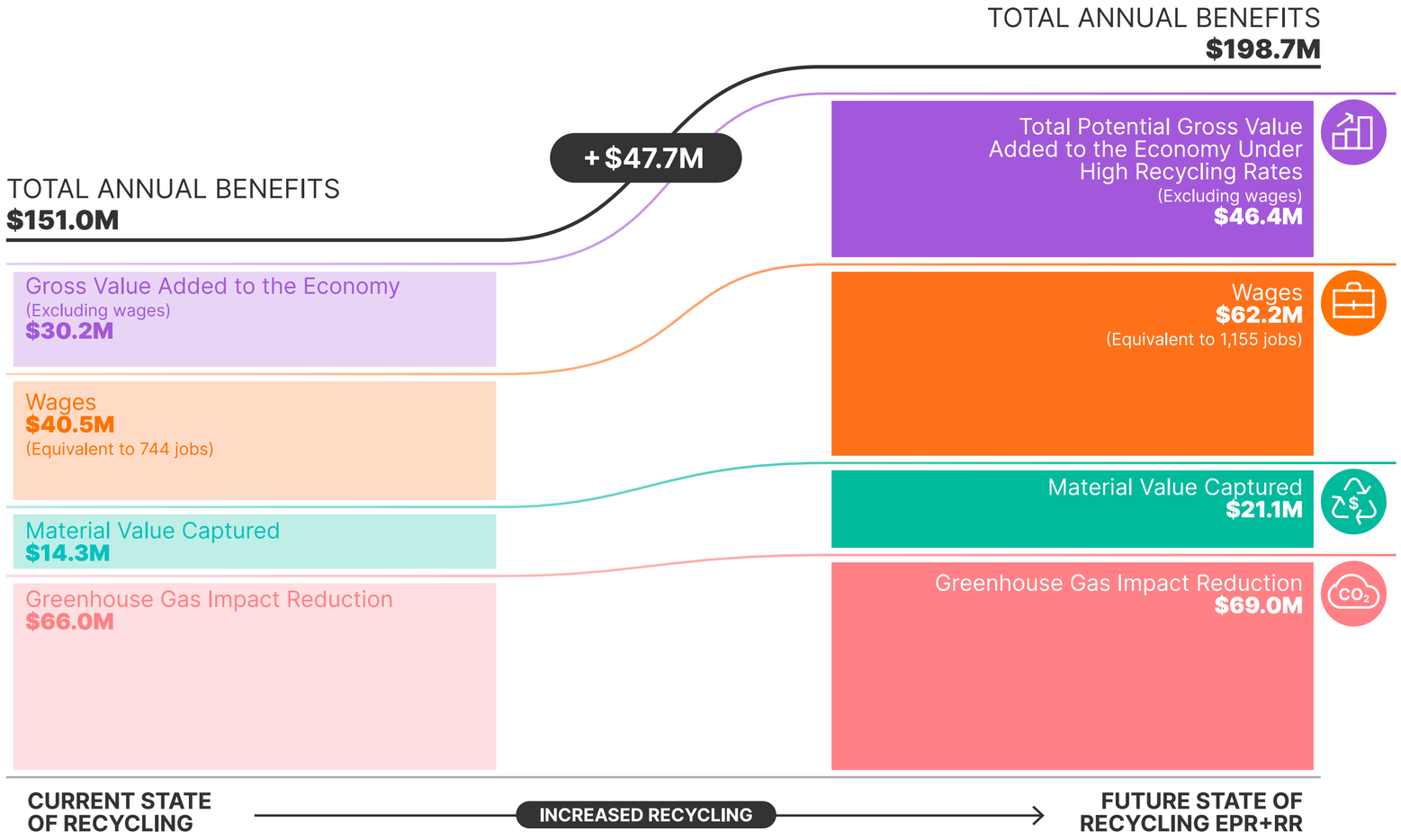
- Increase recycling related jobs from 740 to 1,200.
- Place $21 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 360,000 MTCO2e annually.

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



SOUTH CAROLINA

6% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #46

RECYCLING RANK 2018 #46 =

POPULATION
5,193,266

CENSUS SUB REGION
SOUTH ATLANTIC

RECYCLING REFUND STATE
NO

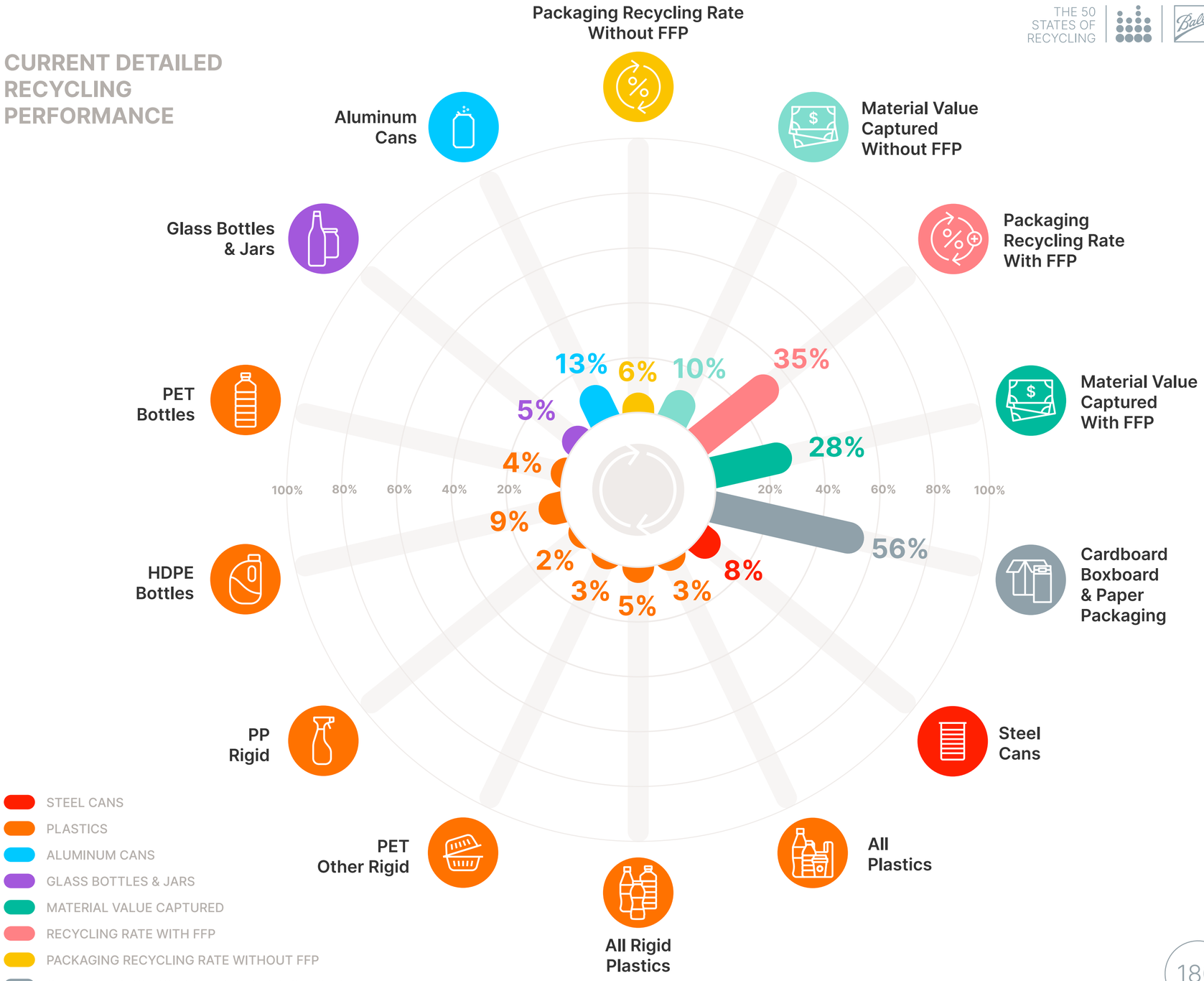
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The South Carolina Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling is required by the S.C. Solid Waste Policy and Management Act of 1991 to produce annual reports. The state's current goals are to recycle at least 40% of its MSW and to reduce MSW disposal to 3.25 lbs./person/day.

CURRENT DETAILED RECYCLING PERFORMANCE



SOUTH CAROLINA

CURRENT STATE OF RECYCLING

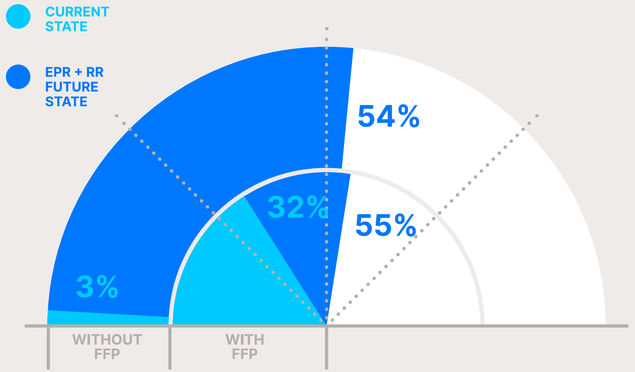
- In 2021, South Carolina recycled approximately 6% of packaging materials without FFP. This recycling performance increases to 35% when considering materials with FFP.
- The value of the material captured for recycling was $43 million, just 28% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.3 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

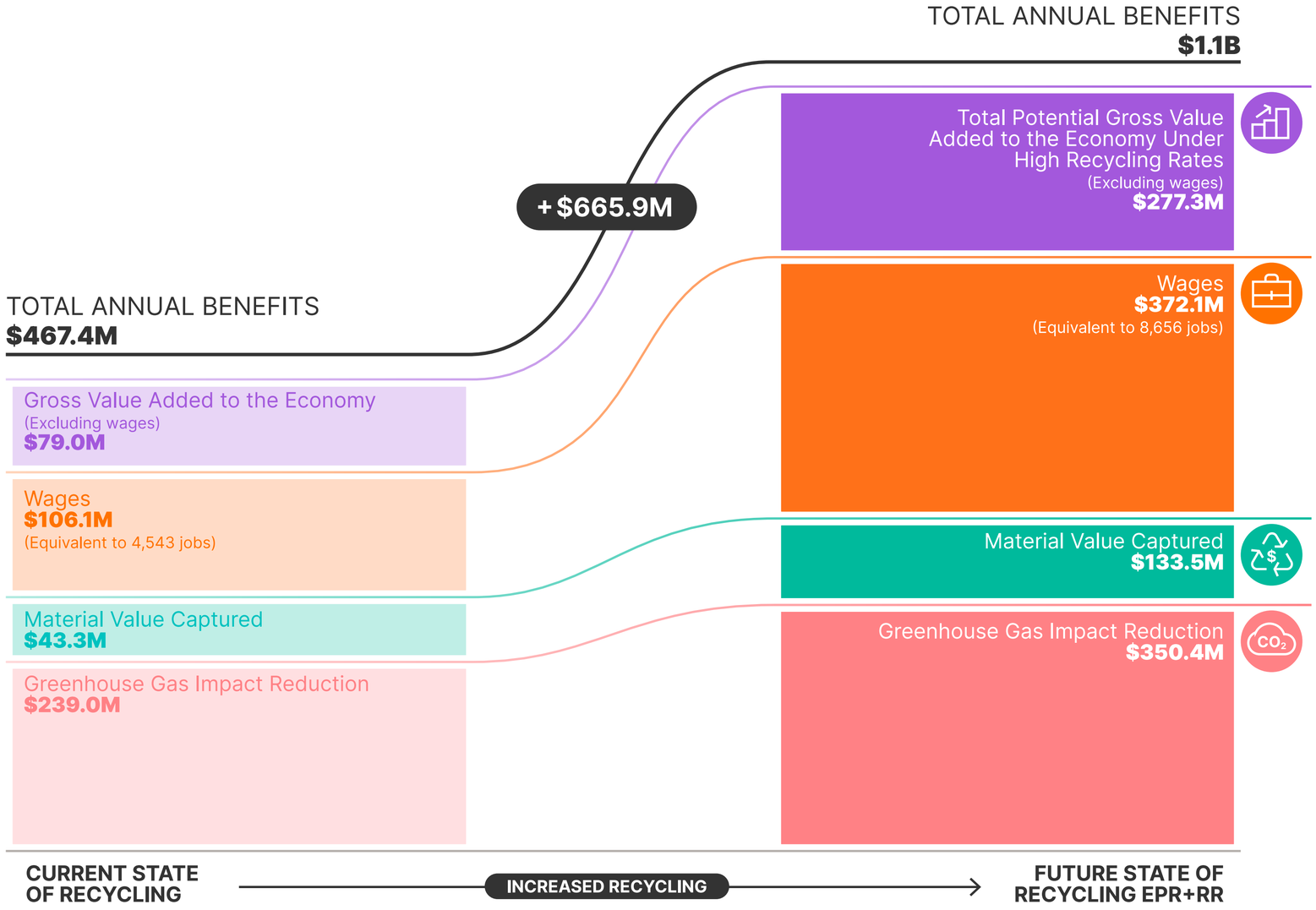
- Increase recycling related jobs from 1,800 to 7,000.
- Place $133 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.8 million MTCO2e annually.

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



SOUTH DAKOTA

23% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #19 +1

RECYCLING RANK 2018 #20

POPULATION
896,164

CENSUS SUB REGION
WEST NORTH CENTRAL

RECYCLING REFUND STATE
NO

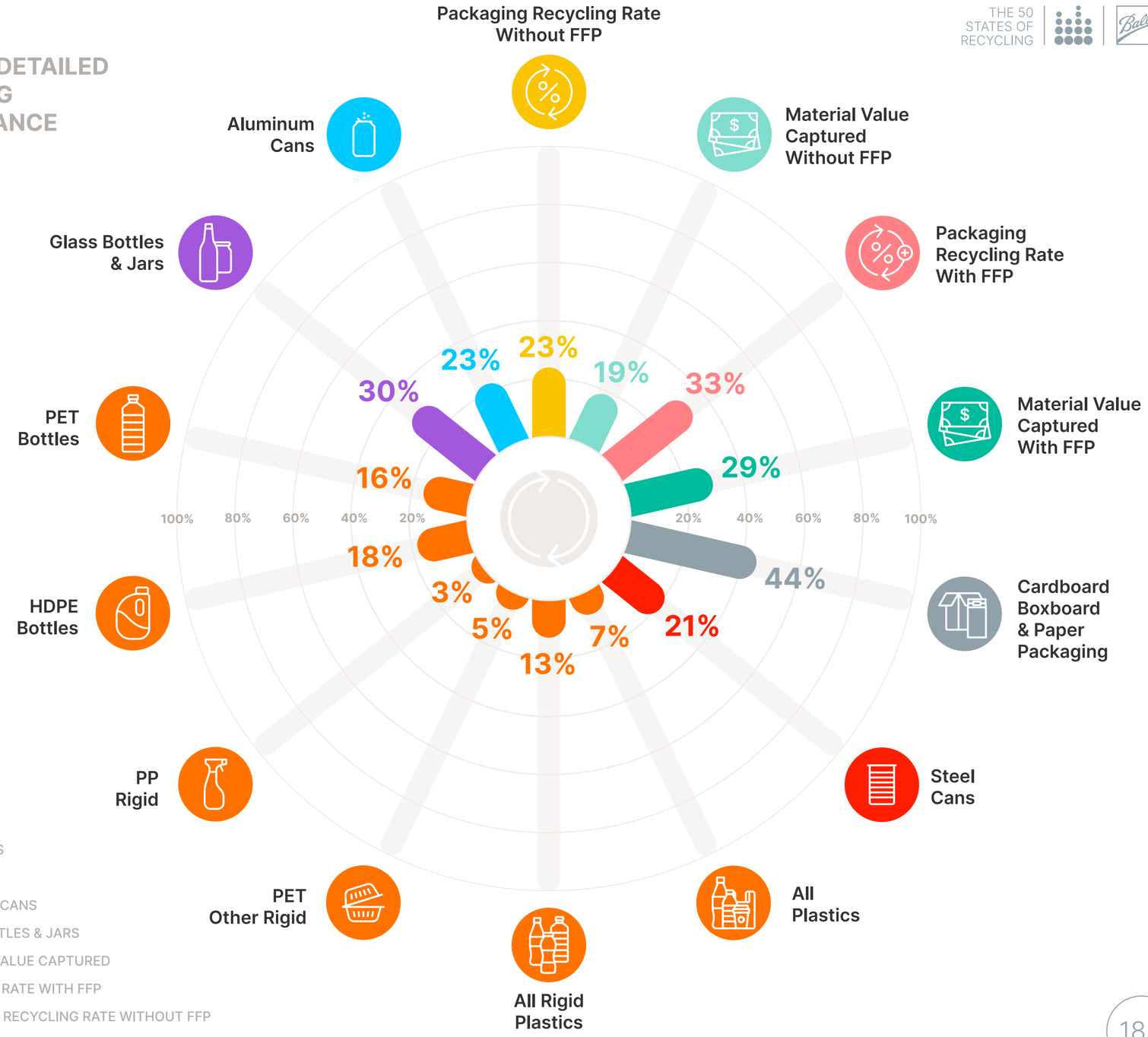
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The South Dakota Department of Environment and Natural Resources (DENR) is responsible for overseeing waste management in the state. There is no overarching legislation in the state regarding post-consumer recycling.

CURRENT DETAILED RECYCLING PERFORMANCE



SOUTH DAKOTA

CURRENT STATE OF RECYCLING

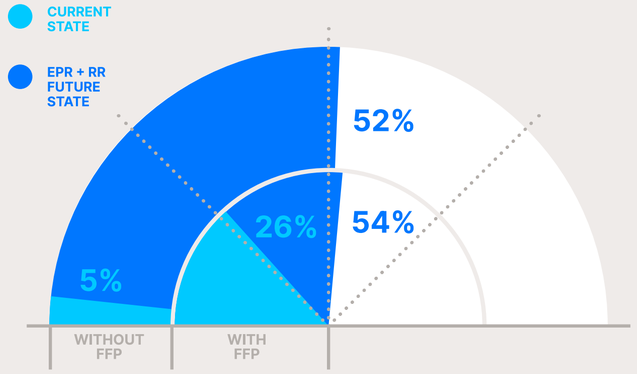
- In 2021, South Dakota recycled approximately 23% of packaging materials without FFP. This recycling performance increases to 33% when considering materials with FFP.
- The value of the material captured for recycling was $7 million, just 29% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 190,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

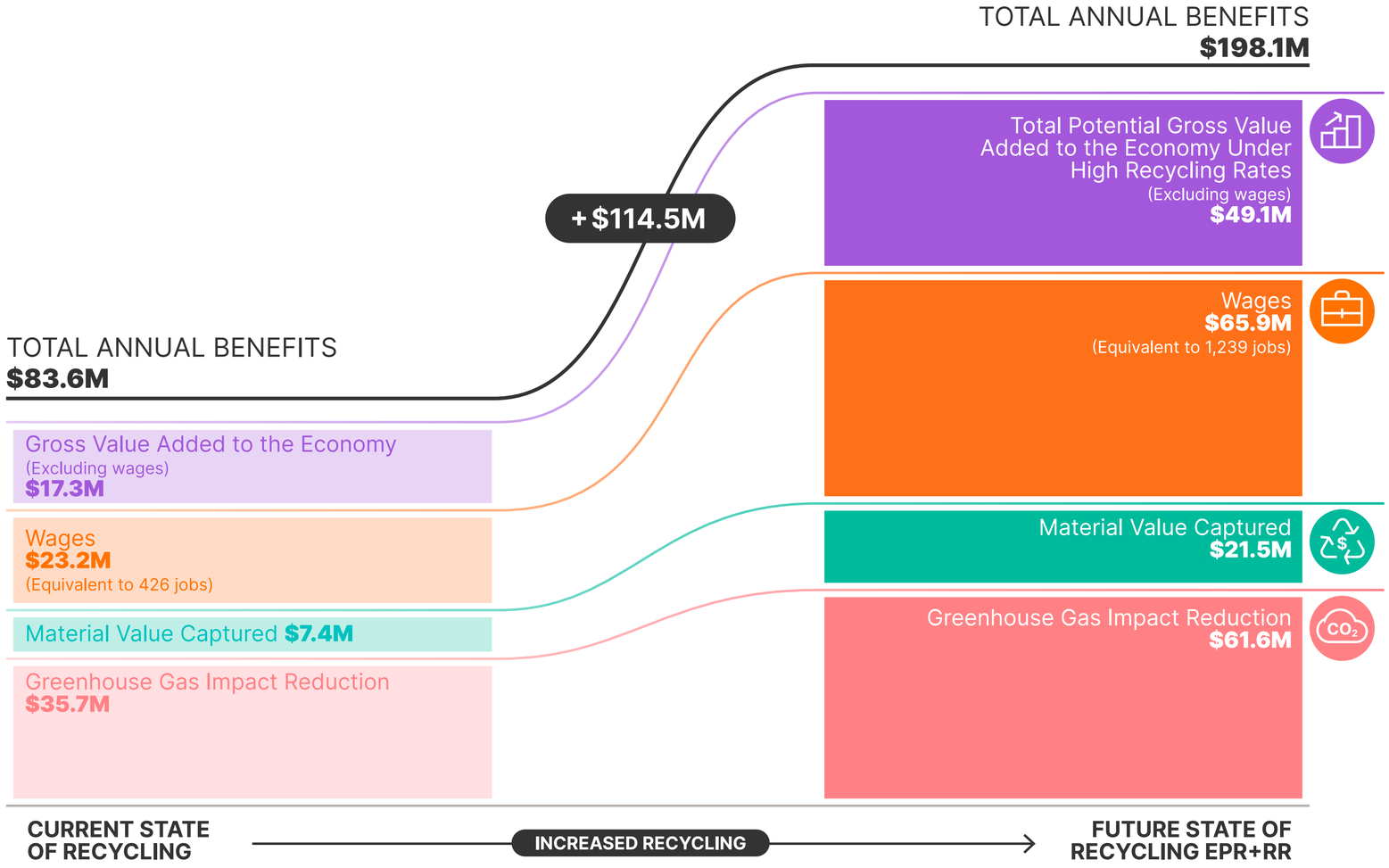
- Increase recycling related jobs from 430 to 1,200.
- Place $22 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 320,000 MTCO2e annually.

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



TENNESSEE

5% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#48	-1
RECYCLING RANK 2018	#47	

POPULATION

6,968,351

CENSUS SUB REGION

EAST SOUTH CENTRAL

RECYCLING REFUND STATE

NO

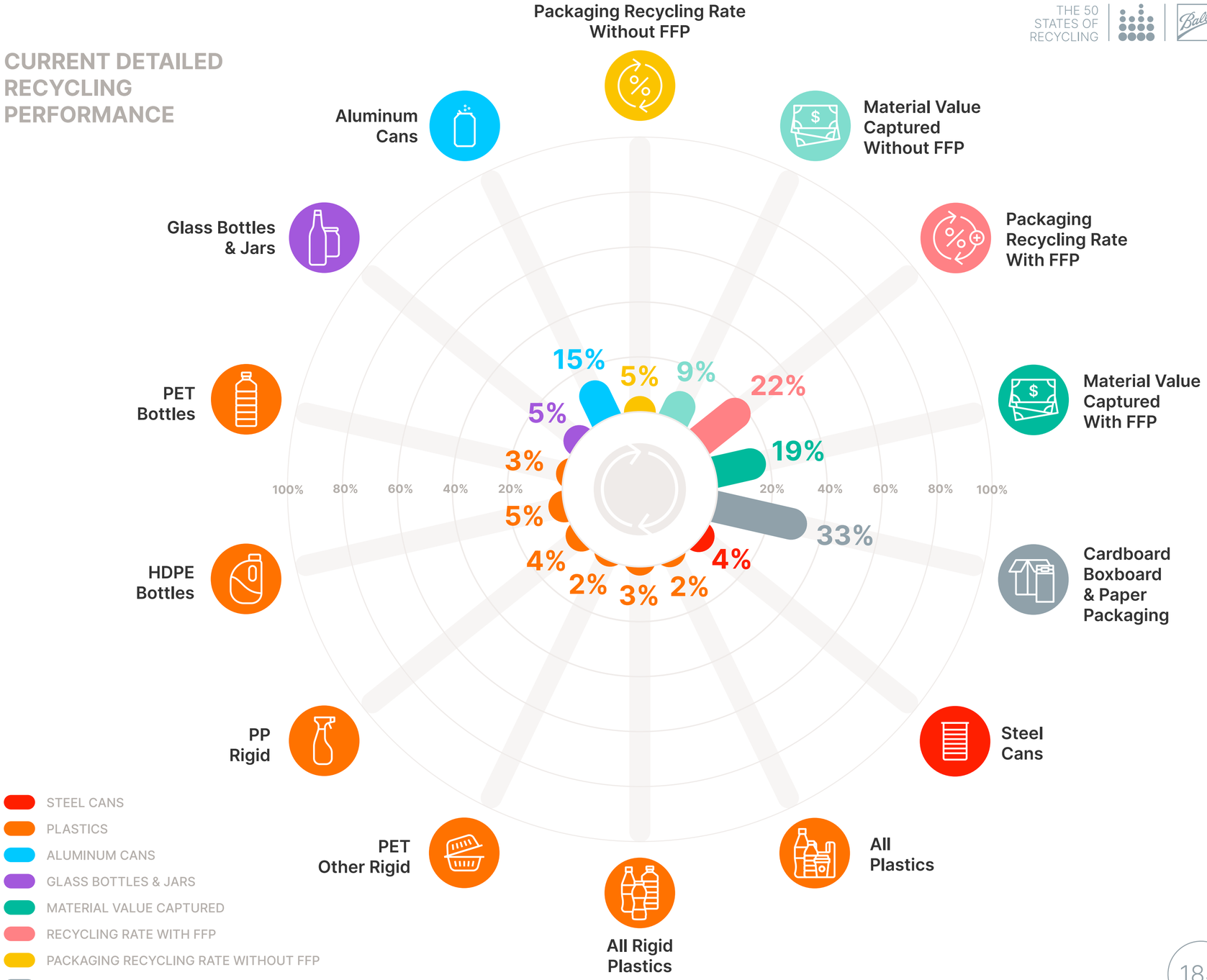
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Tennessee's Division of Solid Waste Management (DSWM) has oversight of waste management activities in Tennessee. The Solid Waste Program, operating under the authority of the Solid Waste Management Act of 1991, ensures safe and sanitary processing and disposal of solid waste in the state. DSWM's objectives, described in the 2021-2025 Solid Waste and Materials Management Plan, include establishing more robust waste management goals and improving the accuracy of measurement while increasing access to and participation in recycling.

CURRENT DETAILED RECYCLING PERFORMANCE



TENNESSEE

CURRENT STATE OF RECYCLING

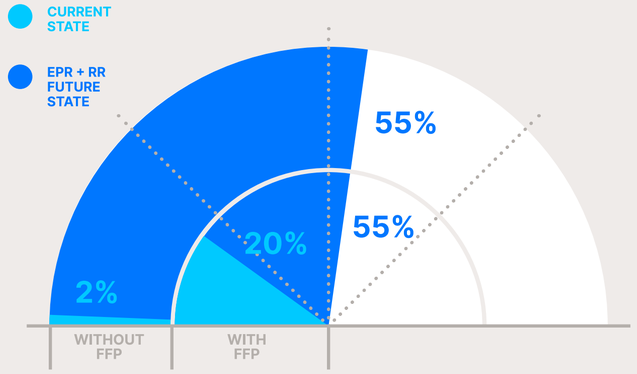
- In 2021, Tennessee recycled approximately 5% of packaging materials without FFP. This recycling performance increases to 22% when considering materials with FFP.
- The value of the material captured for recycling was $38 million, just 19% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.1 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

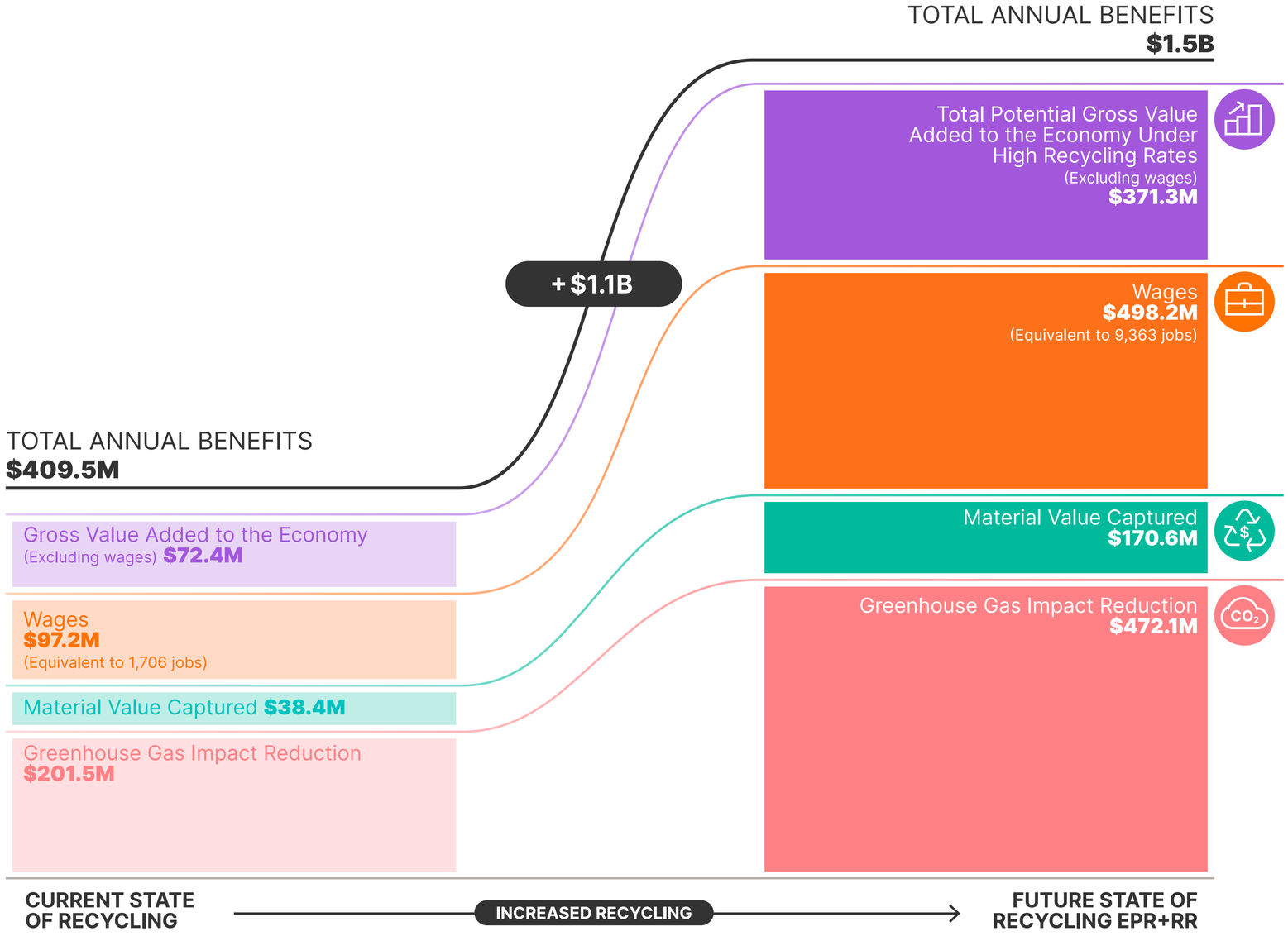
- Increase recycling related jobs from 1,700 to 9,400.
- Place $171 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.5 million MTCO2e annually.

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



TEXAS

8% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #42

RECYCLING RANK 2018 #42 =

POPULATION
29,558,864

CENSUS SUB REGION
WEST SOUTH CENTRAL

RECYCLING REFUND STATE
NO

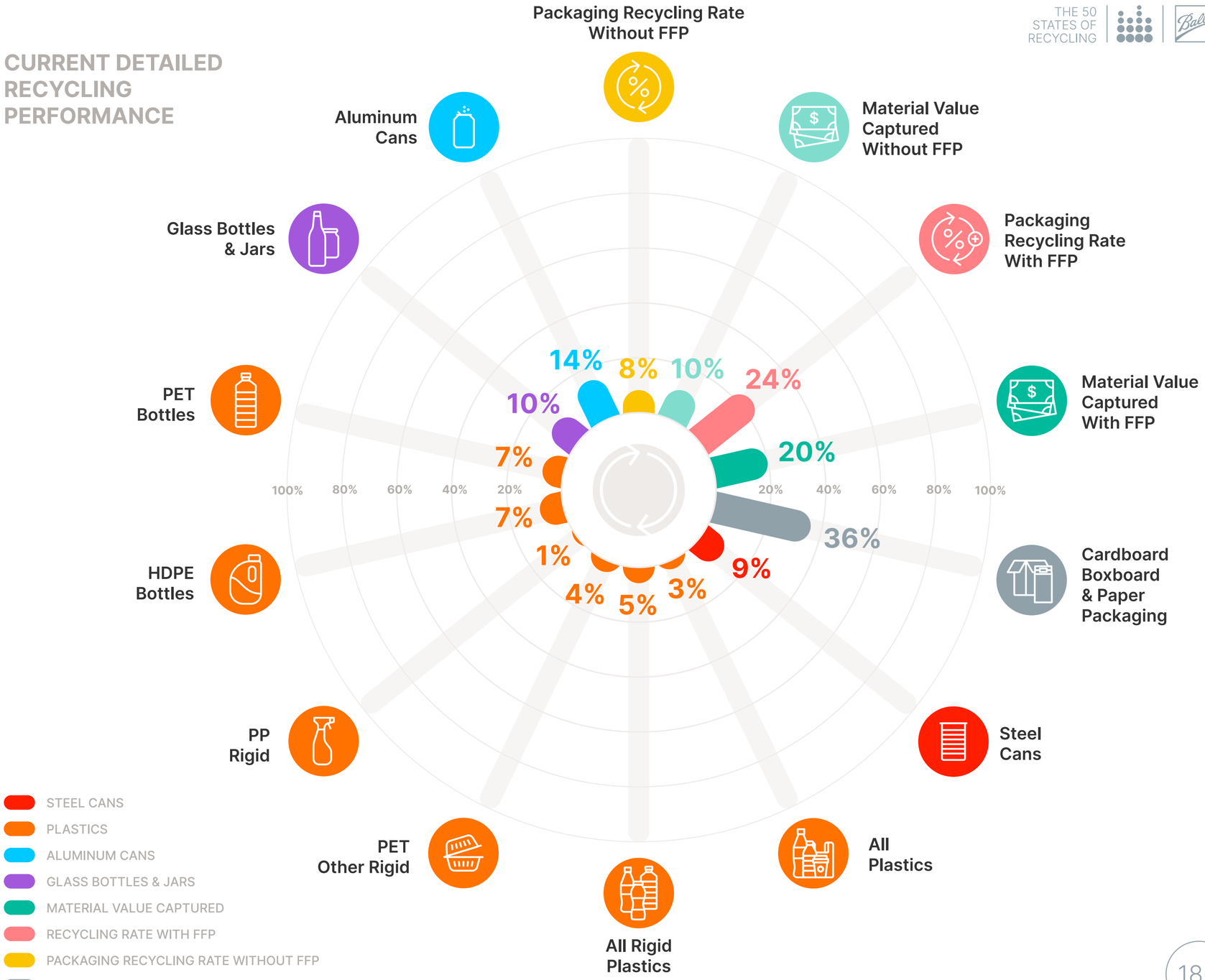
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Texas Commission on Environmental Quality (TCEQ) has oversight of solid waste management and is responsible for compliance and enforcement in the state. Owners and operators of recycling facilities that have not been granted an exemption from reporting (due to size or other factors) must keep records of the amounts of material recycled or transferred and make them available upon request to the TCEQ.

CURRENT DETAILED RECYCLING PERFORMANCE



TEXAS

CURRENT STATE OF RECYCLING

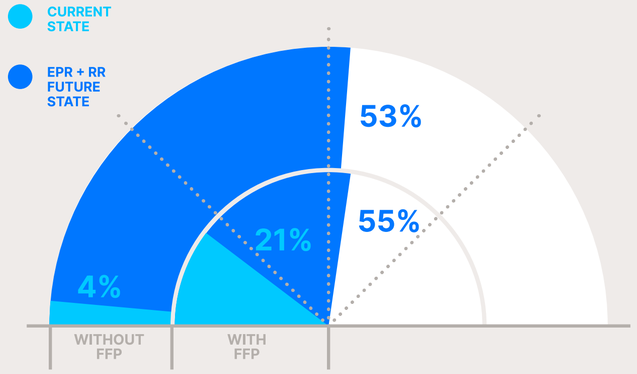
- In 2021, Texas recycled approximately 8% of packaging materials without FFP. This recycling performance increases to 24% when considering materials with FFP.
- The value of the material captured for recycling was $192 million, just 20% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 5 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

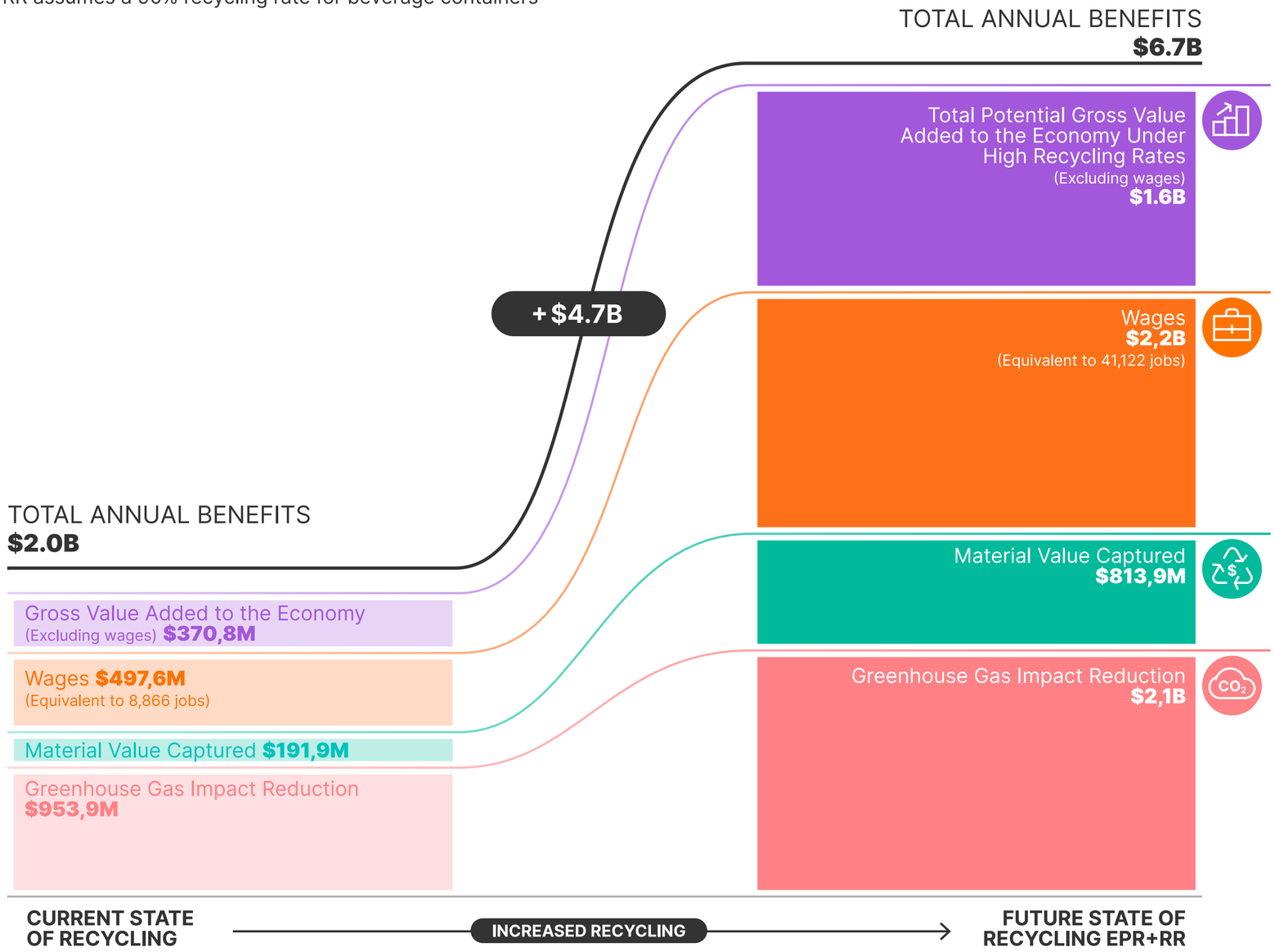
- Increase recycling related jobs from 8,900 to 41,100.
- Place $814 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 11 million MTCO2e annually.

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



UTAH

14% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#32	-1
RECYCLING RANK 2018	#31	

POPULATION
3,339,113

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

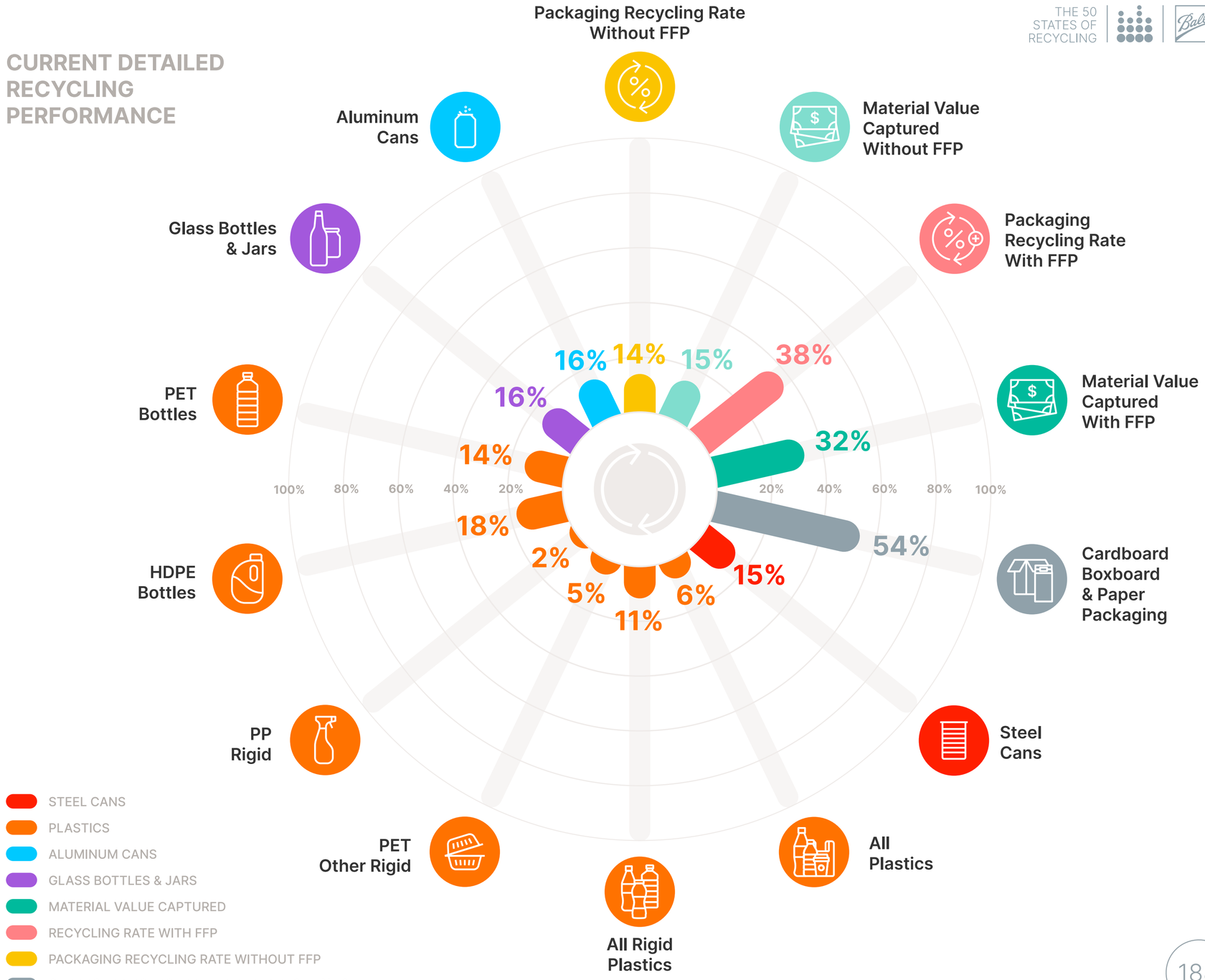
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Regulations in Utah are set at a county level. Recycling facilities are required to report annual tons to the Department of Environmental Quality (DEQ). The data on reported tons is limited as the source and composition of material is unable to be determined.

CURRENT DETAILED RECYCLING PERFORMANCE



UTAH

CURRENT STATE OF RECYCLING

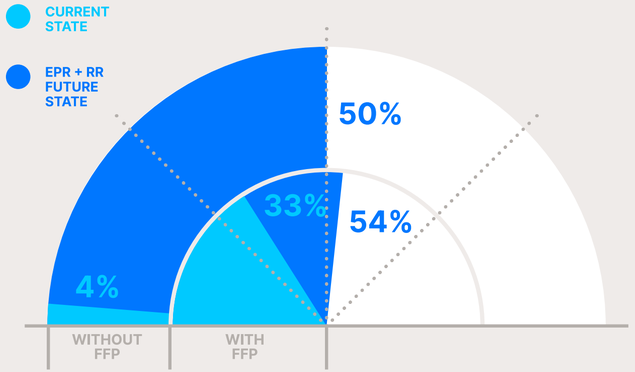
- In 2021, Utah recycled approximately 14% of packaging materials without FFP. This recycling performance increases to 38% when considering materials with FFP.
- The value of the material captured for recycling was $31 million, just 32% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 840,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

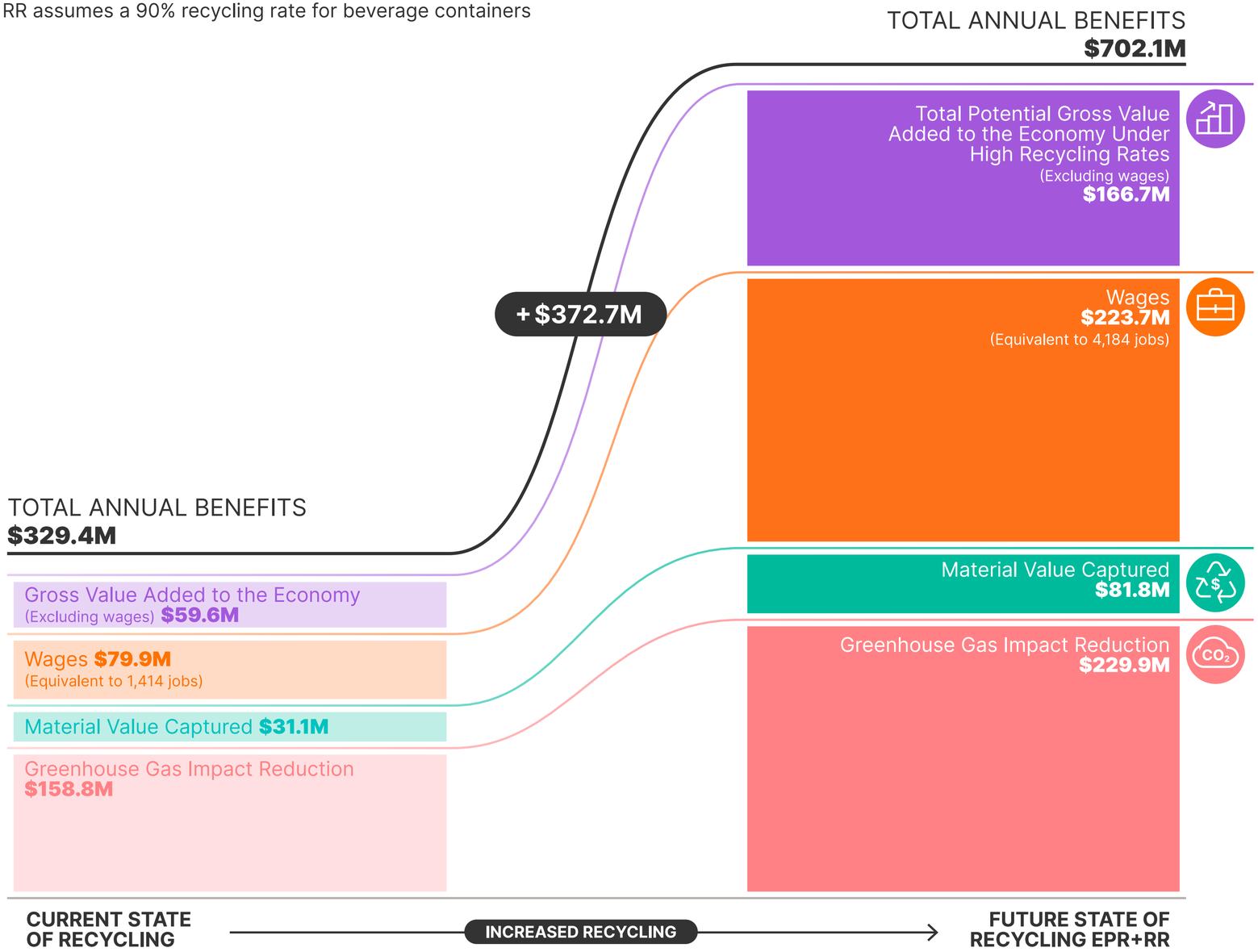
- Increase recycling related jobs from 1,400 to 4,200.
- Place $82 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.2 million MTCO2e annually.

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



VERMONT

51% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#2
RECYCLING RANK 2018	#2

=

POPULATION
646,972

CENSUS SUB REGION
NEW ENGLAND

RECYCLING REFUND STATE
YES

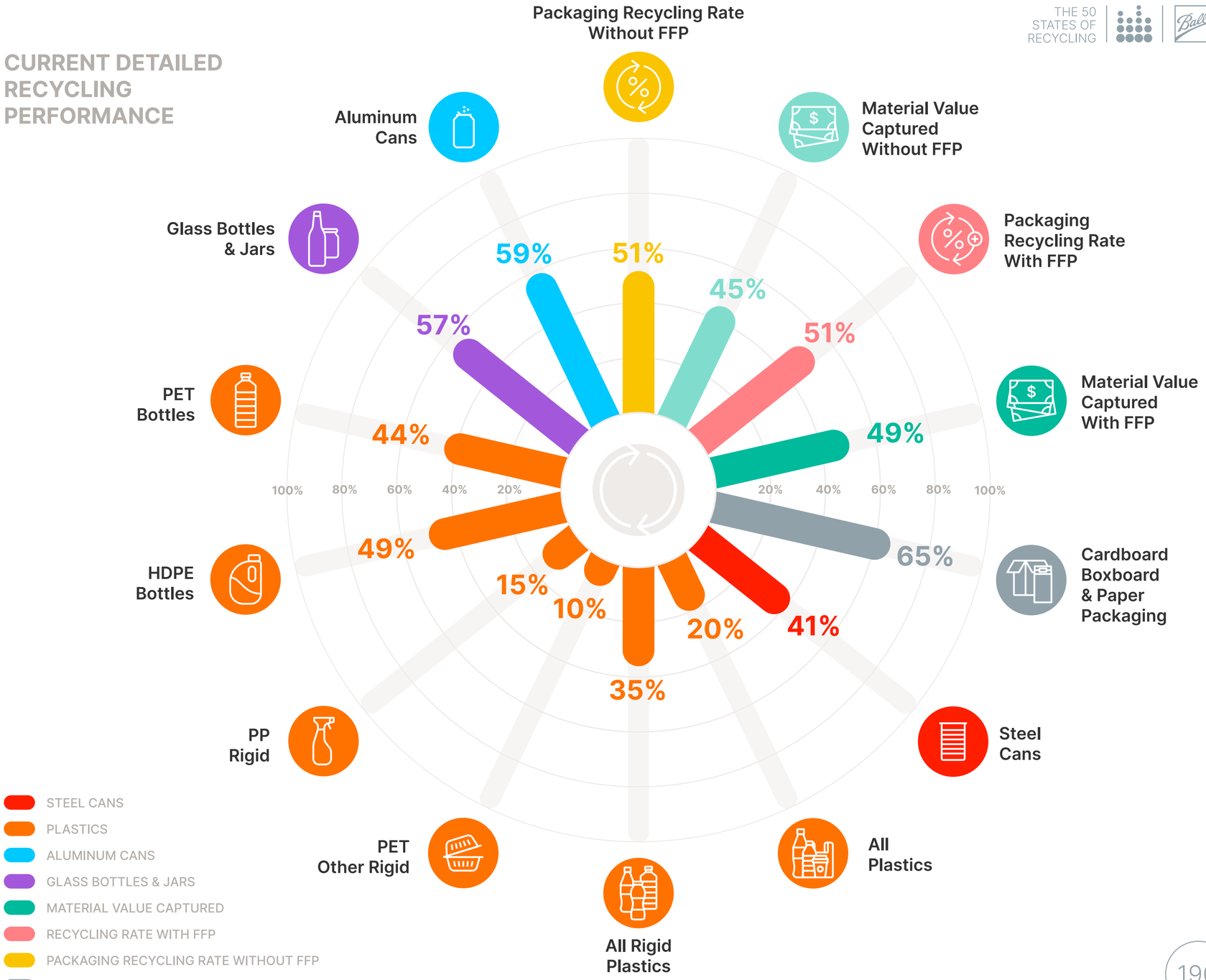
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

In 2012, Vermont passed its Universal Recycling Law Act 148, which banned curbside recyclables from being disposed of in residents' trash bins. In 2015, the impact of the law's major provisions was seen when residential trash charges started being based on the volume and weight of trash bags, and recyclables were banned from landfills. Vermont has reported that since this bill was enacted, recycling rates across the state have begun to rise. In addition to this law, Vermont has a Recycling Refund program.

CURRENT DETAILED RECYCLING PERFORMANCE



VERMONT

CURRENT STATE OF RECYCLING

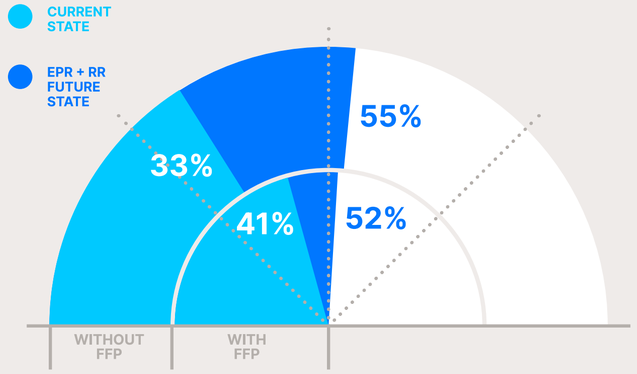
- In 2021, Vermont recycled approximately 51% of packaging materials without FFP. This recycling performance is the same at 51% when considering materials with FFP.
- The value of the material captured for recycling was $10 million, just 49% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 140,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

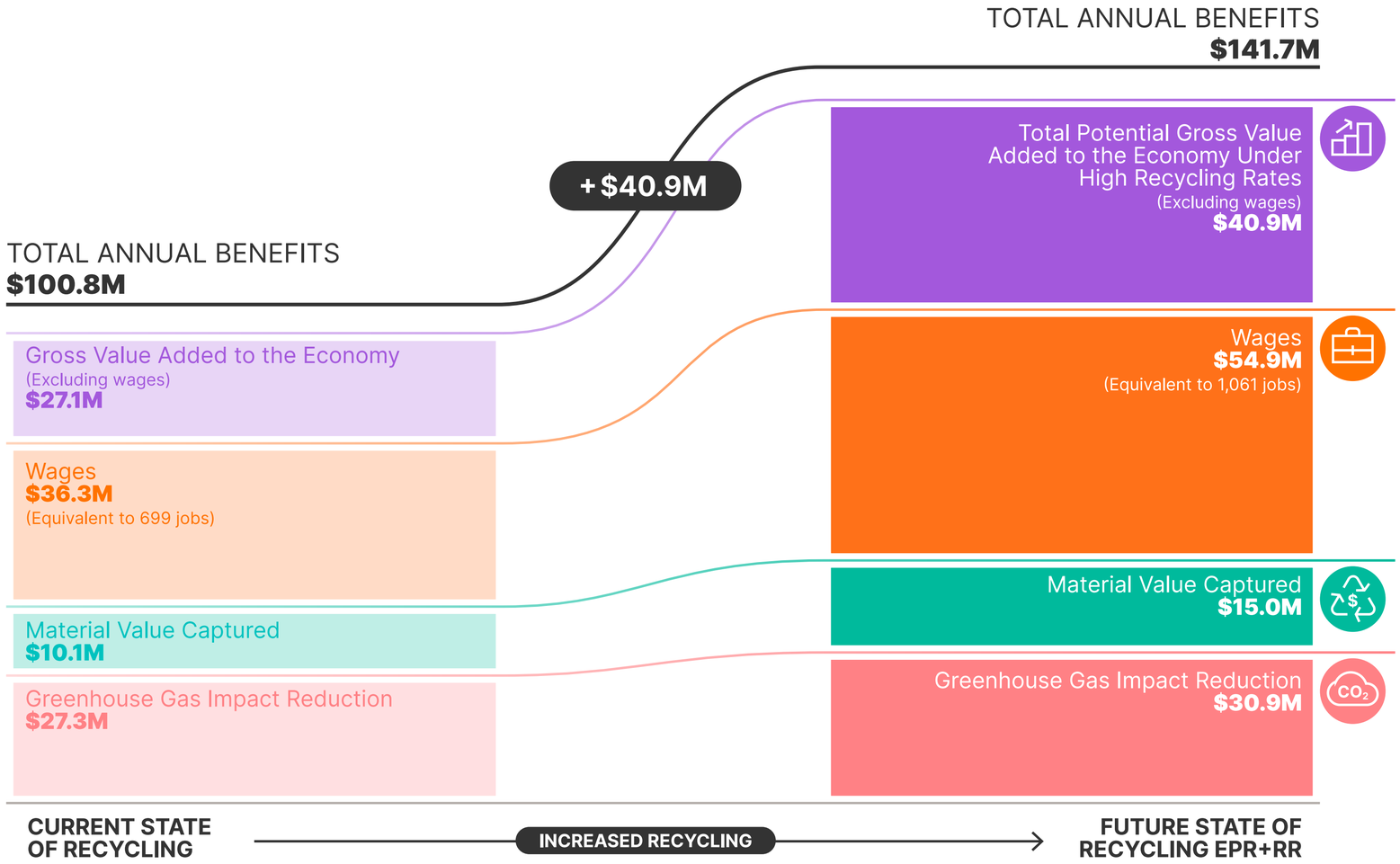
- Increase recycling related jobs from 700 to 1,100.
- Place $15 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 160,000 MTCO2e annually.

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



VIRGINIA

18% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK	2021	#25
RECYCLING RANK	2018	#25

=

POPULATION
8,657,365

CENSUS SUB REGION
SOUTH ATLANTIC

RECYCLING REFUND STATE
NO

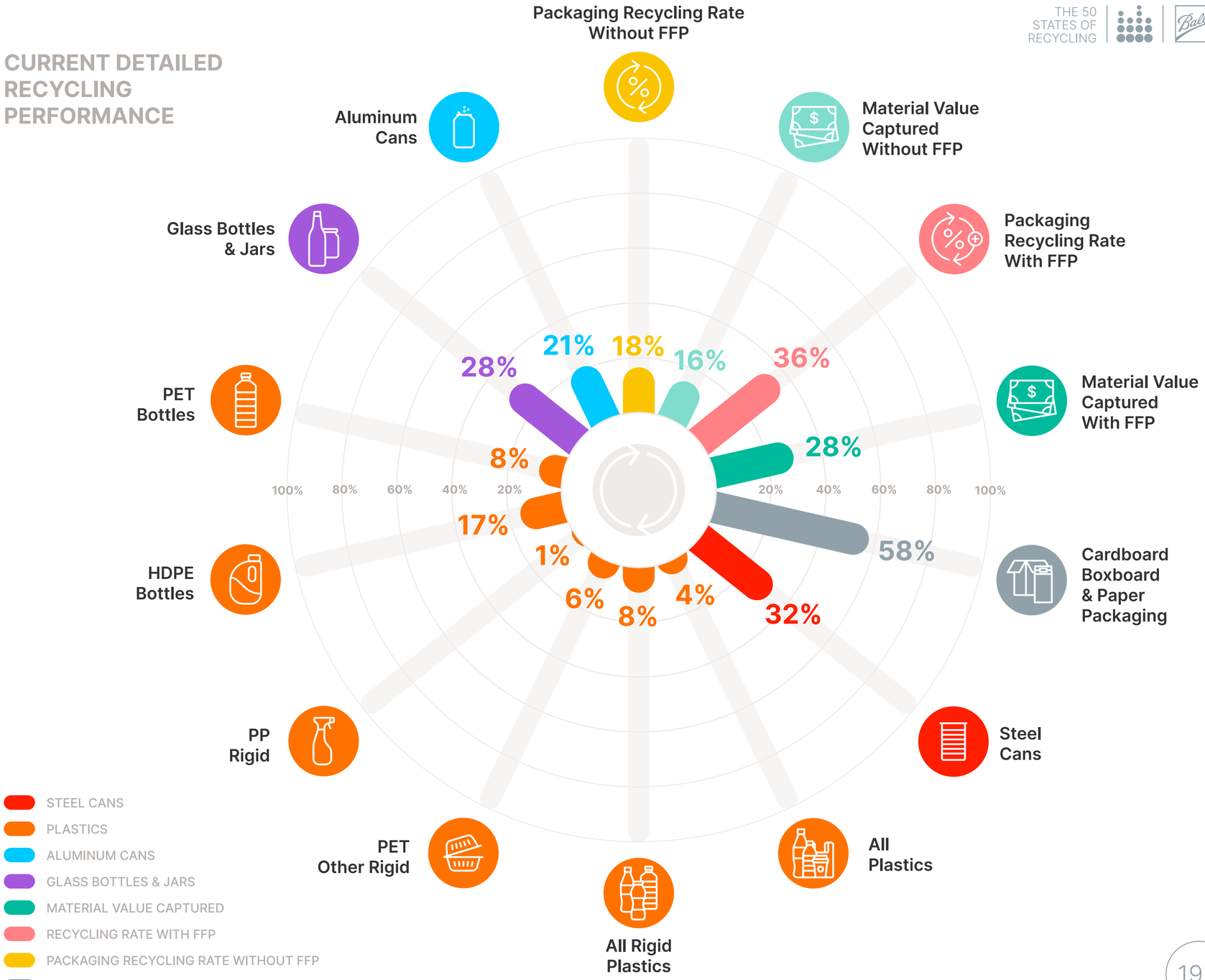
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

In recent years, Virginia has passed multiple laws aimed at increasing the supply of recycled material. Its Department of Environmental Quality (DEQ) monitors current recycling rates and advocates for more beneficial use end-of-life strategies. The DEQ is focusing on increasing economic incentives, including recycling credits and tax incentives, for recyclers over the next 10 years. As of 2017, Virginia calculates its own recycling rate as 42.8% based on a subset of data from 75% of its population.

CURRENT DETAILED RECYCLING PERFORMANCE



VIRGINIA

CURRENT STATE OF RECYCLING

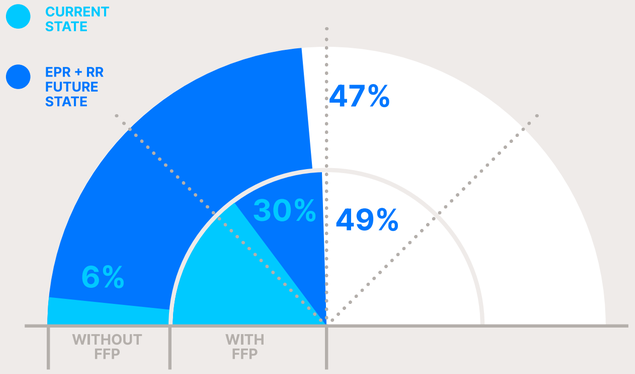
- In 2021, Virginia recycled approximately 18% of packaging materials without FFP. This recycling performance increases to 36% when considering materials with FFP.
- The value of the material captured for recycling was $69 million, just 28% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.8 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

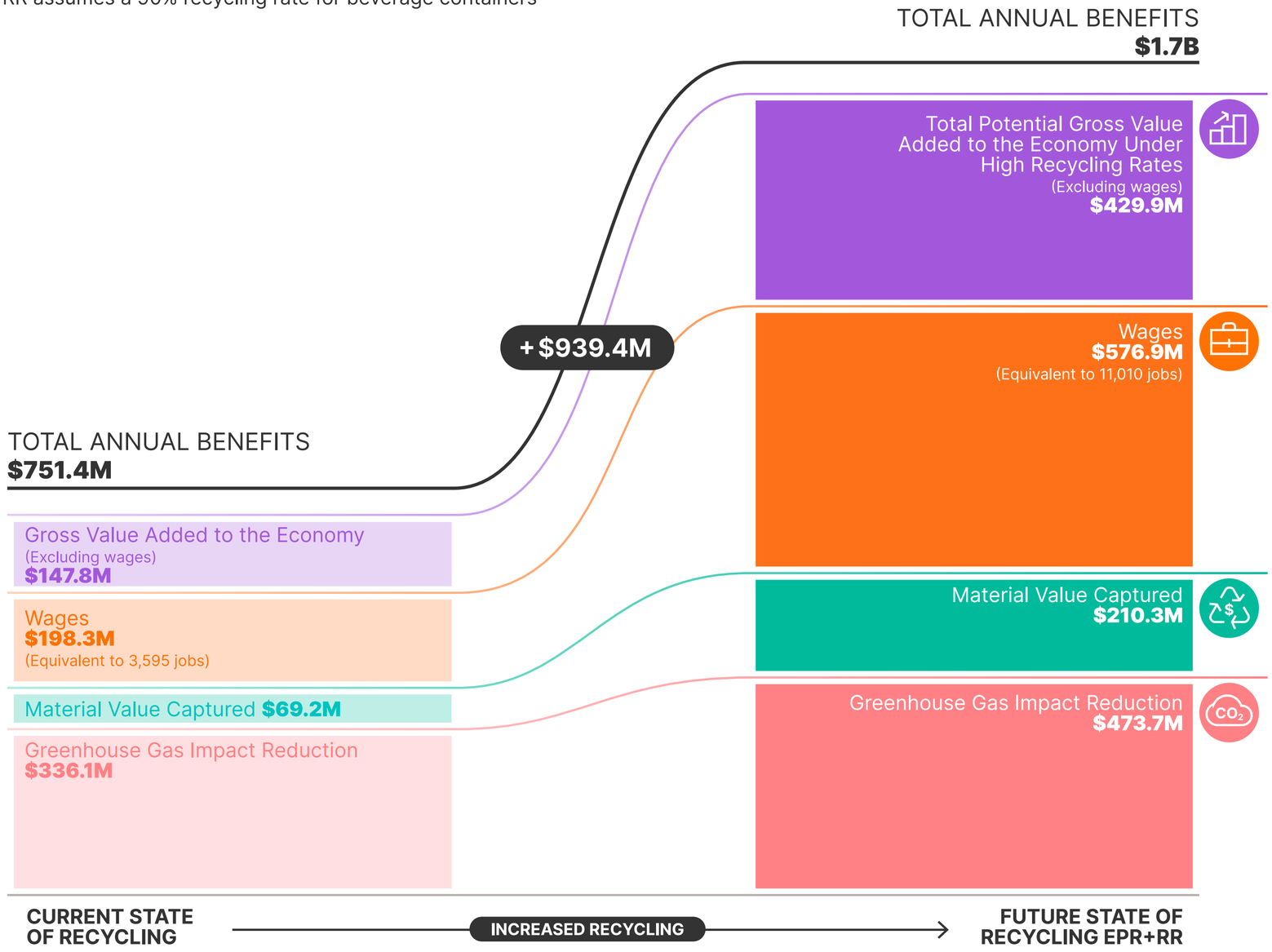
- Increase recycling related jobs from 3,600 to 11,000.
- Place $210 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.5 million MTCO2e annually.

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



WASHINGTON

25% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK	2021	#15
RECYCLING RANK	2018	#15

=

POPULATION
7,740,745

CENSUS SUB REGION
PACIFIC

RECYCLING REFUND STATE
NO

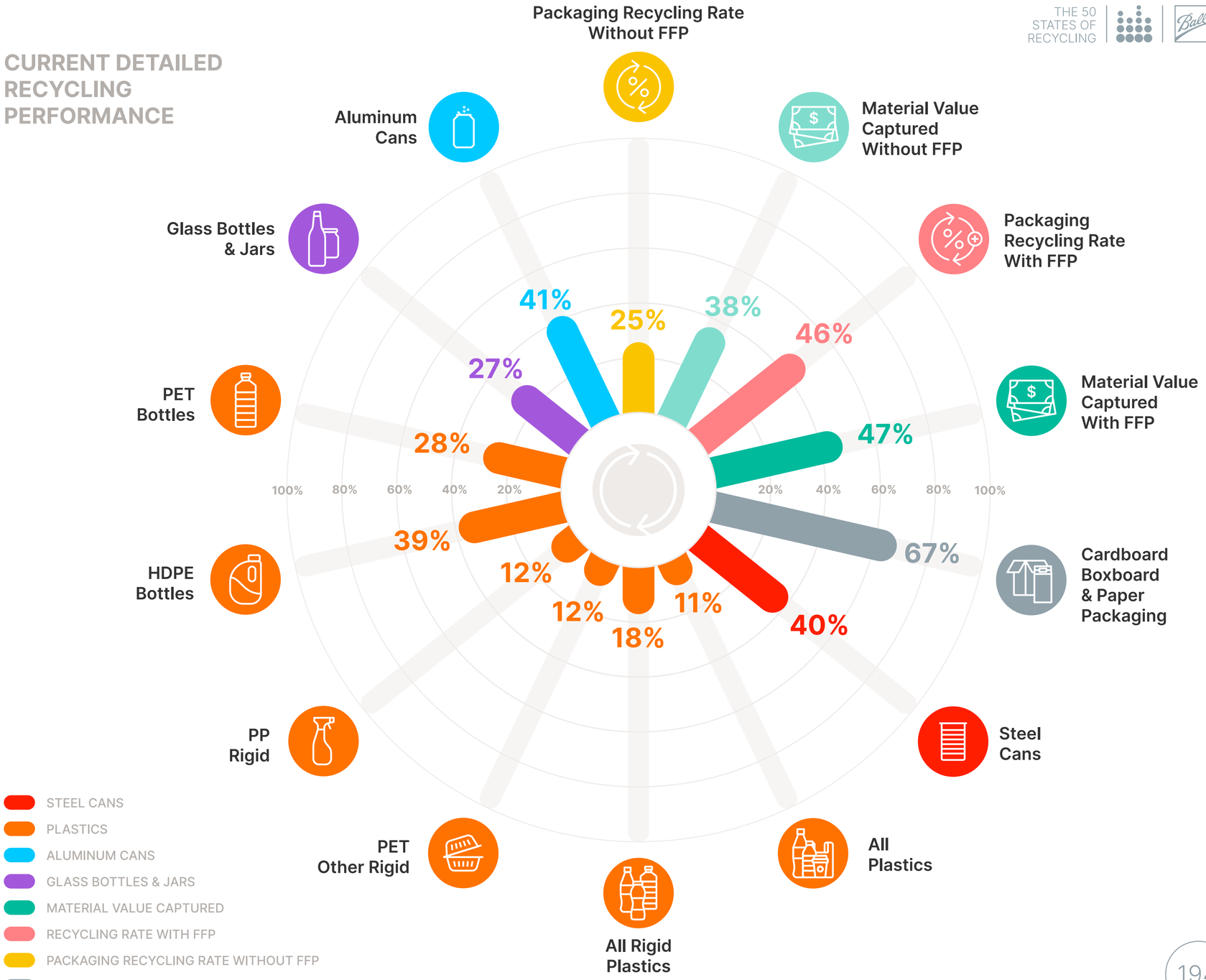
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

Recycling services in Washington are offered through contracted haulers, municipal programs, and services managed by the Washington Utilities and Transportation Commission. Unlike Oregon and California to the south, Washington lacks a beverage container recycling refund program.

CURRENT DETAILED RECYCLING PERFORMANCE



WASHINGTON

CURRENT STATE OF RECYCLING

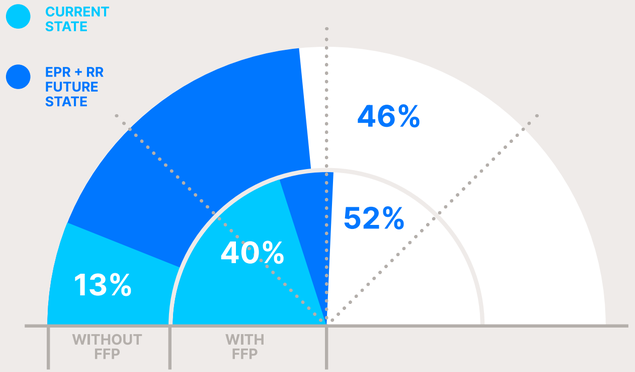
- In 2021, Washington recycled approximately 25% of packaging materials without FFP. This recycling performance increases to 46% when considering materials with FFP.
- The value of the material captured for recycling was $69 million, just 47% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 2 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

- Increase recycling related jobs from 4,500 to 8,700.
- Place $117 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 2.2 million MTCO2e annually.

CLOSED-LOOP IMPACTS



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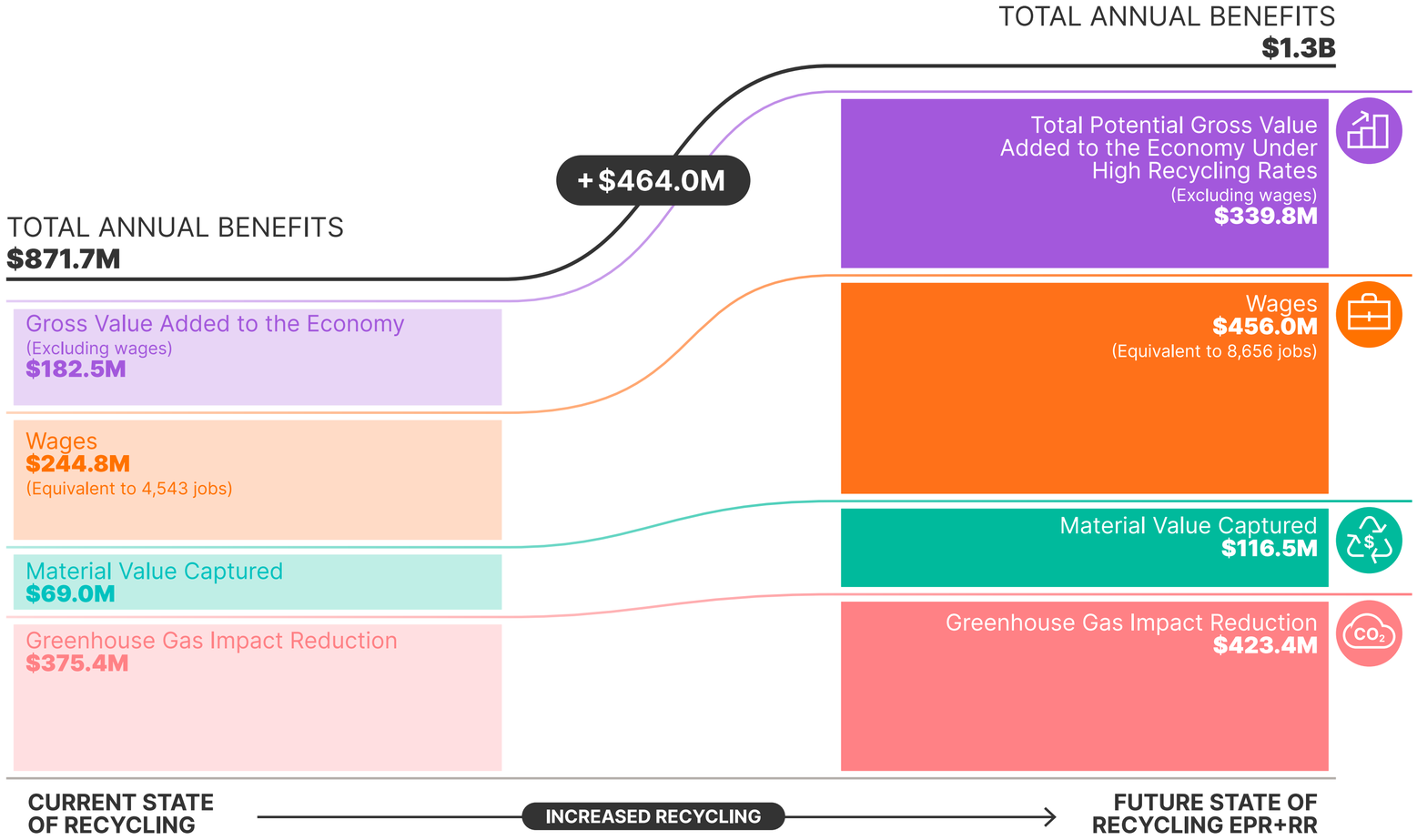
EPR assumes an overall recycling rate of 65% for residential packaging and RR assumes a 90% recycling rate for beverage containers



WEST VIRGINIA

2% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021 #50 =

RECYCLING RANK 2018 #50

POPULATION
1,785,526

CENSUS SUB REGION
SOUTH ATLANTIC

RECYCLING REFUND STATE
NO

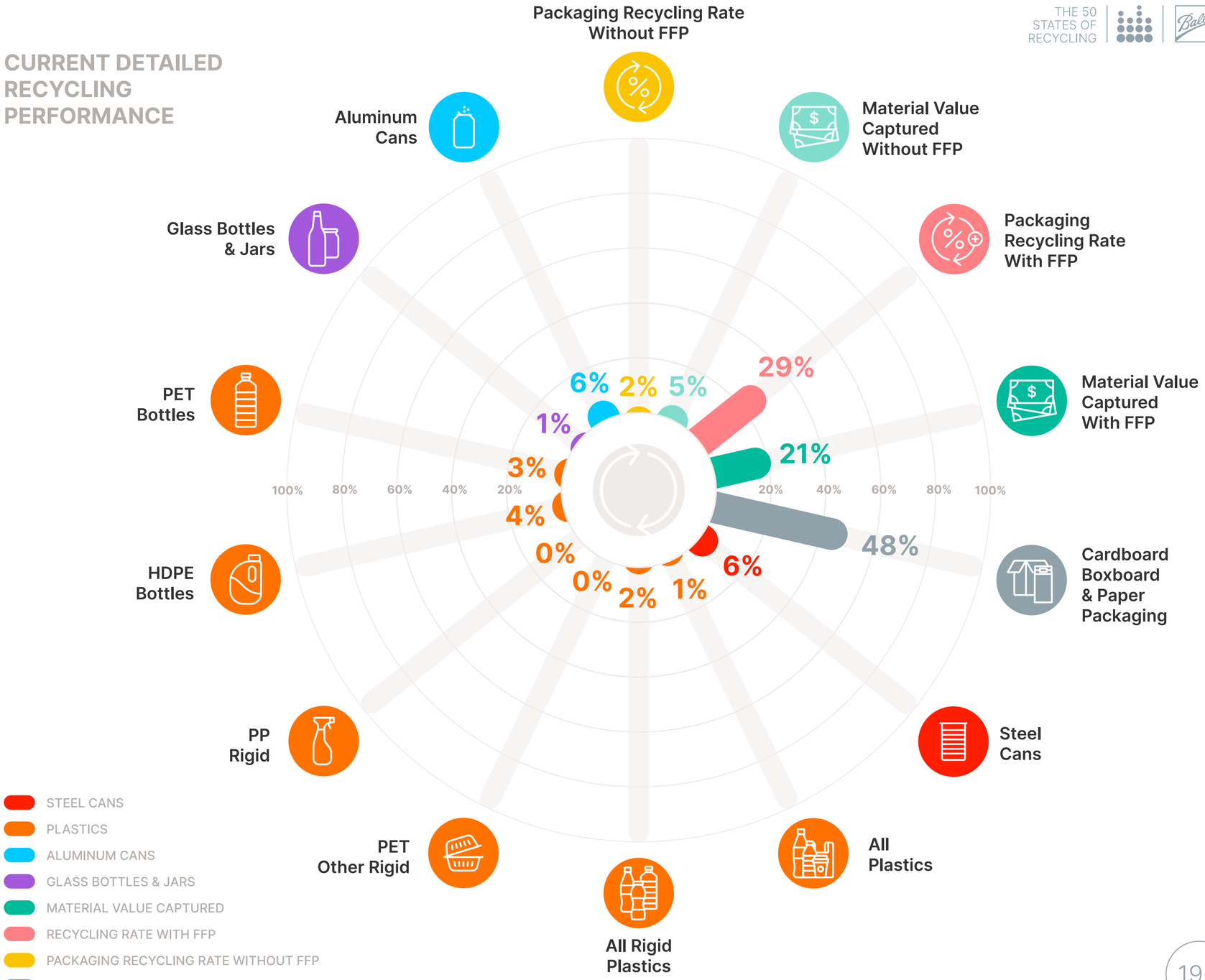
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The West Virginia Department of Environmental Protection manages the permitting for all waste facilities in the state. The West Virginia Solid Waste Management Board (SWMB) facilitates solid waste planning statewide and publishes a biennial Solid Waste Management Plan.

CURRENT DETAILED RECYCLING PERFORMANCE



WEST VIRGINIA

CURRENT STATE OF RECYCLING

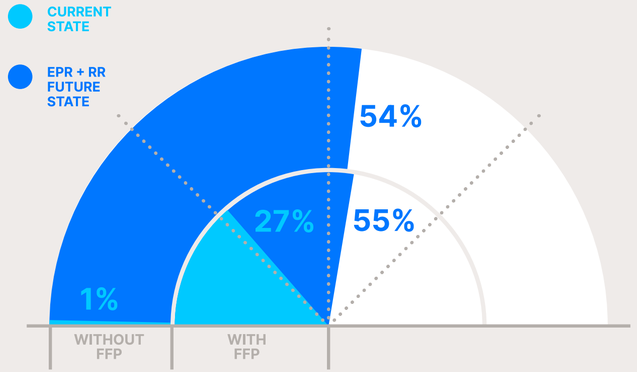
- In 2021, West Virginia recycled approximately 2% of packaging materials without FFP. This recycling performance increases to 29% when considering materials with FFP.
- The value of the material captured for recycling was $11 million, just 21% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 360,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

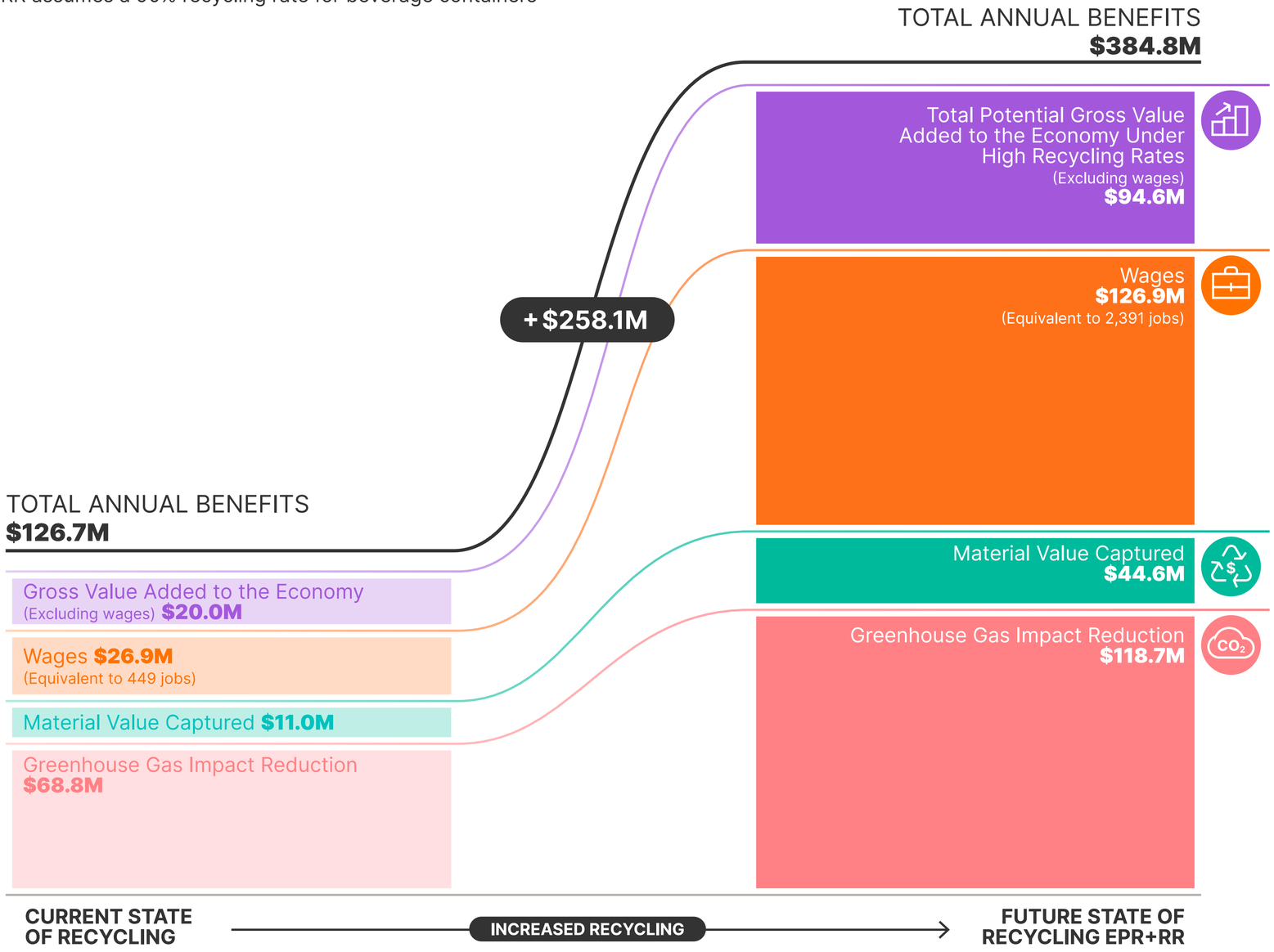
- Increase recycling related jobs from 450 to 2,400.
- Place $45 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 630,000 MTCO2e annually.

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



WISCONSIN

26% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#13	-1
RECYCLING RANK 2018	#12	

POPULATION
5,880,101

CENSUS SUB REGION
EAST NORTH CENTRAL

RECYCLING REFUND STATE
NO

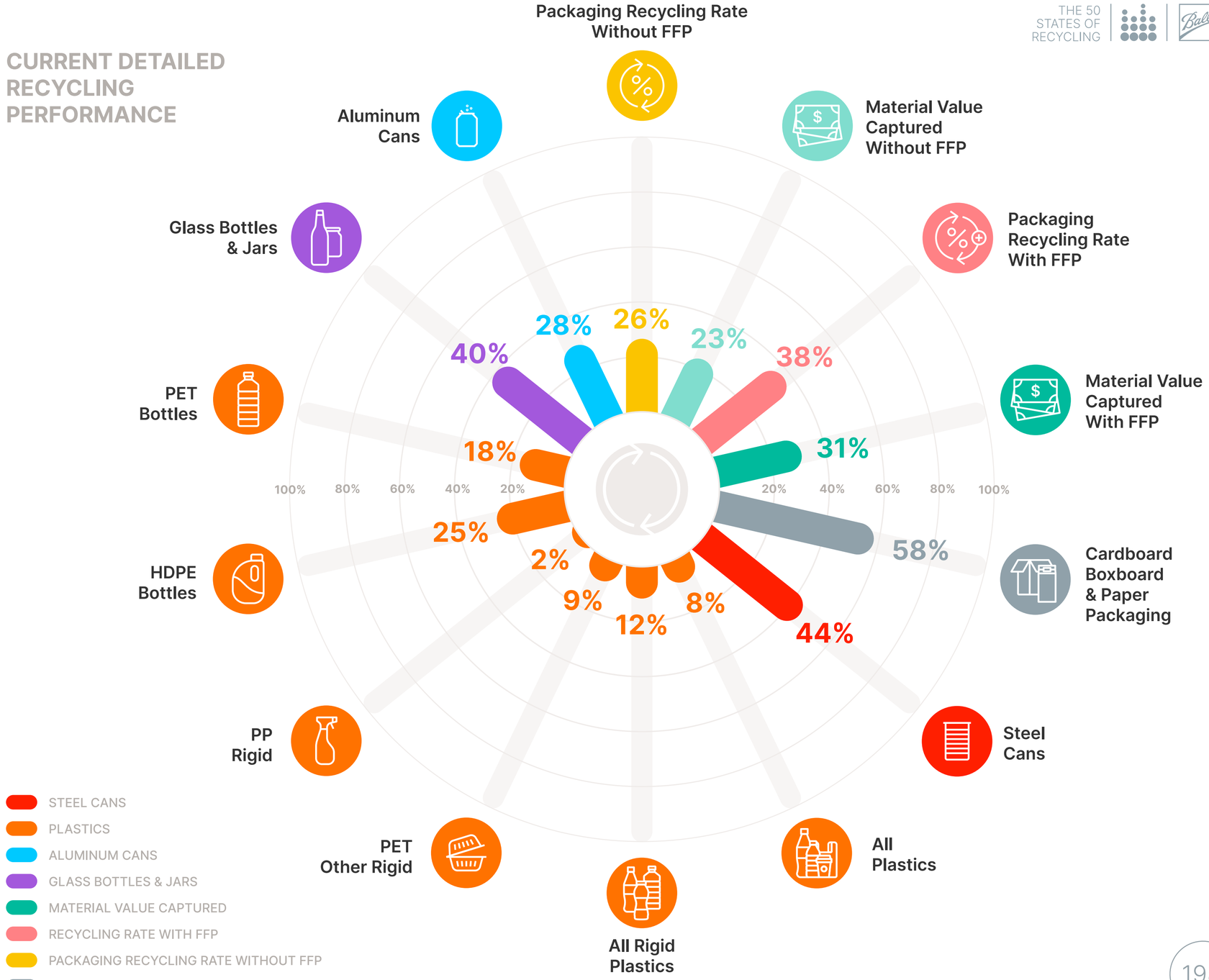
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Wisconsin Department of Natural Resources manages solid waste facilities in the state. According to Wisconsin's 1990 recycling law, all residents must have access to a curbside recycling program or drop-off centers within easy access.There are 208 local units of government (responsible units or RUs), such as counties or municipalities, that maintain municipal recycling programs to ensure that residents and businesses comply with state and local recycling requirements.

CURRENT DETAILED RECYCLING PERFORMANCE



WISCONSIN

CURRENT STATE OF RECYCLING

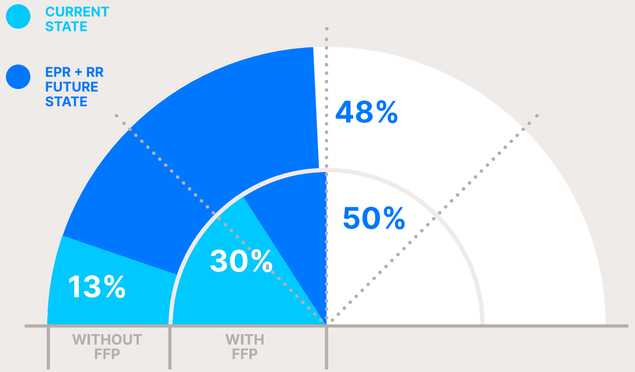
- In 2021, Wisconsin recycled approximately 26% of packaging materials without FFP. This recycling performance increases to 38% when considering materials with FFP.
- The value of the material captured for recycling was $56 million, just 31% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 1.1 million MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

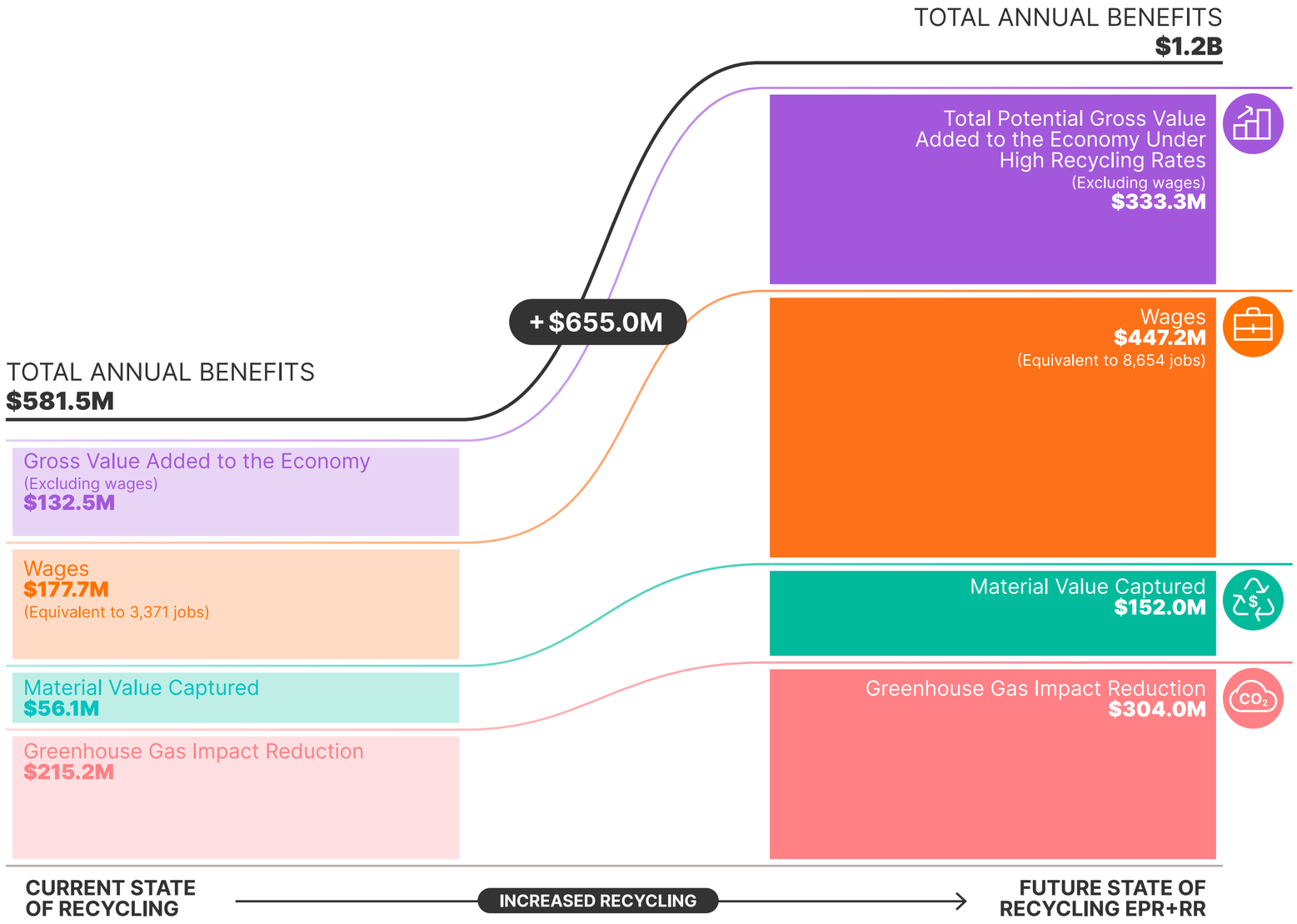
- Increase recycling related jobs from 3,400 to 8,700.
- Place $152 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 1.6 million MTCO2e annually.

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



WYOMING

12% RECYCLING RATE

WITHOUT FIBER AND FLEXIBLE PLASTICS (FFP)

RANKING

RECYCLING RANK 2021	#36	+1
RECYCLING RANK 2018	#37	

POPULATION
579,483

CENSUS SUB REGION
MOUNTAIN

RECYCLING REFUND STATE
NO

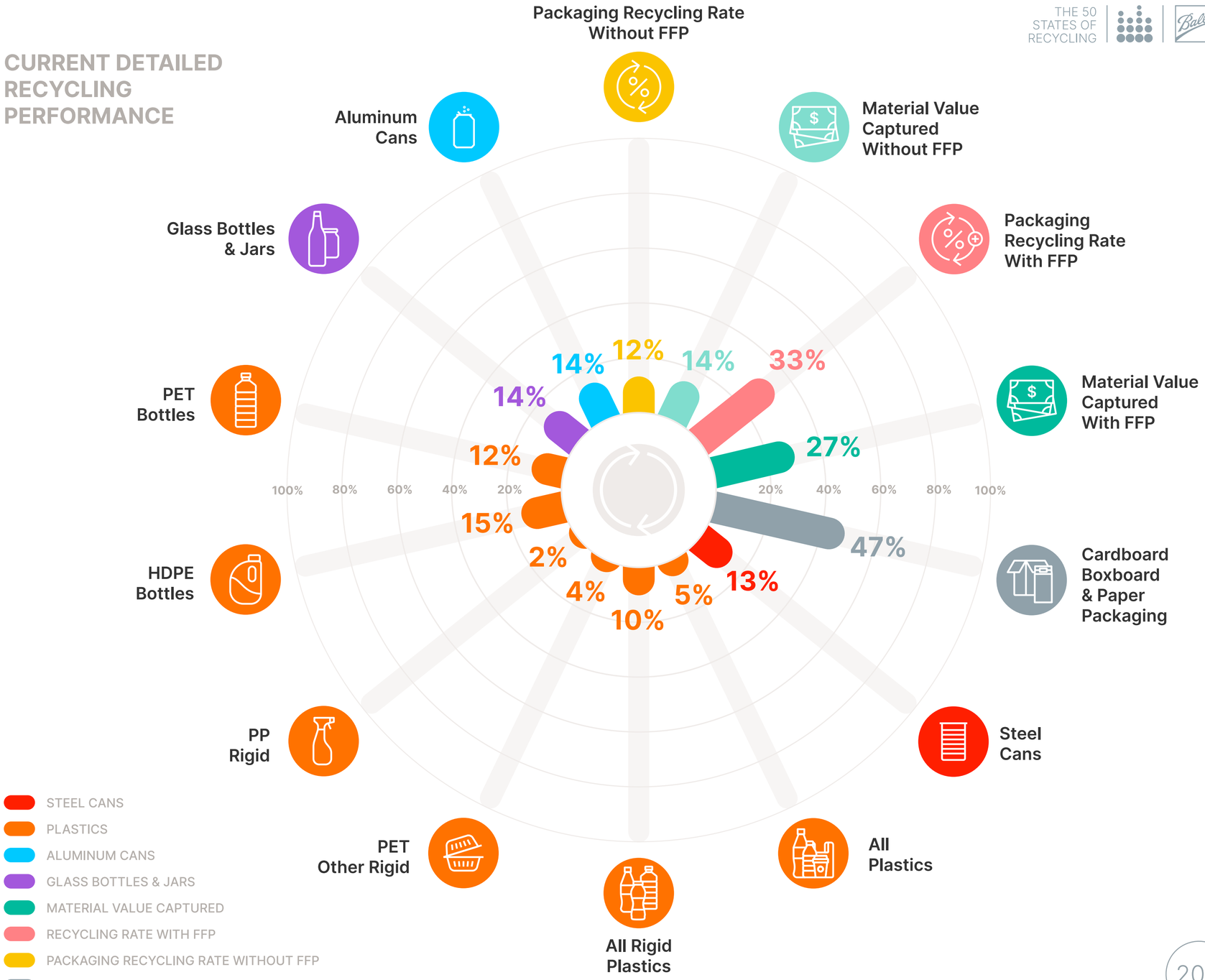
DATA QUALITY

GOOD — FAIR — LIMITED

OVERVIEW

The Wyoming Department of Environmental Quality's (WDEQ) Solid and Hazardous Waste Division oversees the Recycling Program. Its Integrated Solid Waste Management Program, begun in 2006, mandates local governments maintain a plan for disposing, treating or recycling solid waste. There is currently no statewide legislation regarding post-consumer packaging in Wyoming.

CURRENT DETAILED RECYCLING PERFORMANCE



WYOMING

CURRENT STATE OF RECYCLING

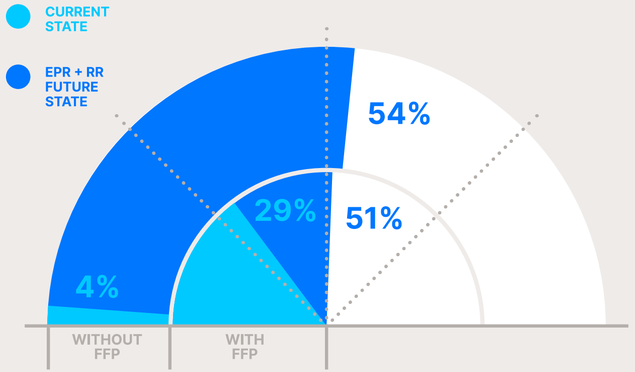
- In 2021, Wyoming recycled approximately 12% of packaging materials without FFP. This recycling performance increases to 33% when considering materials with FFP.
- The value of the material captured for recycling was $4 million, just 27% of the total value of material that could be captured for recycling.
- Recycling in the state avoided GHG emissions of 120,000 MTCO2e.

OUTCOMES EPR+RR

Extended Producer Responsibility and Recycling Refund policy together could:

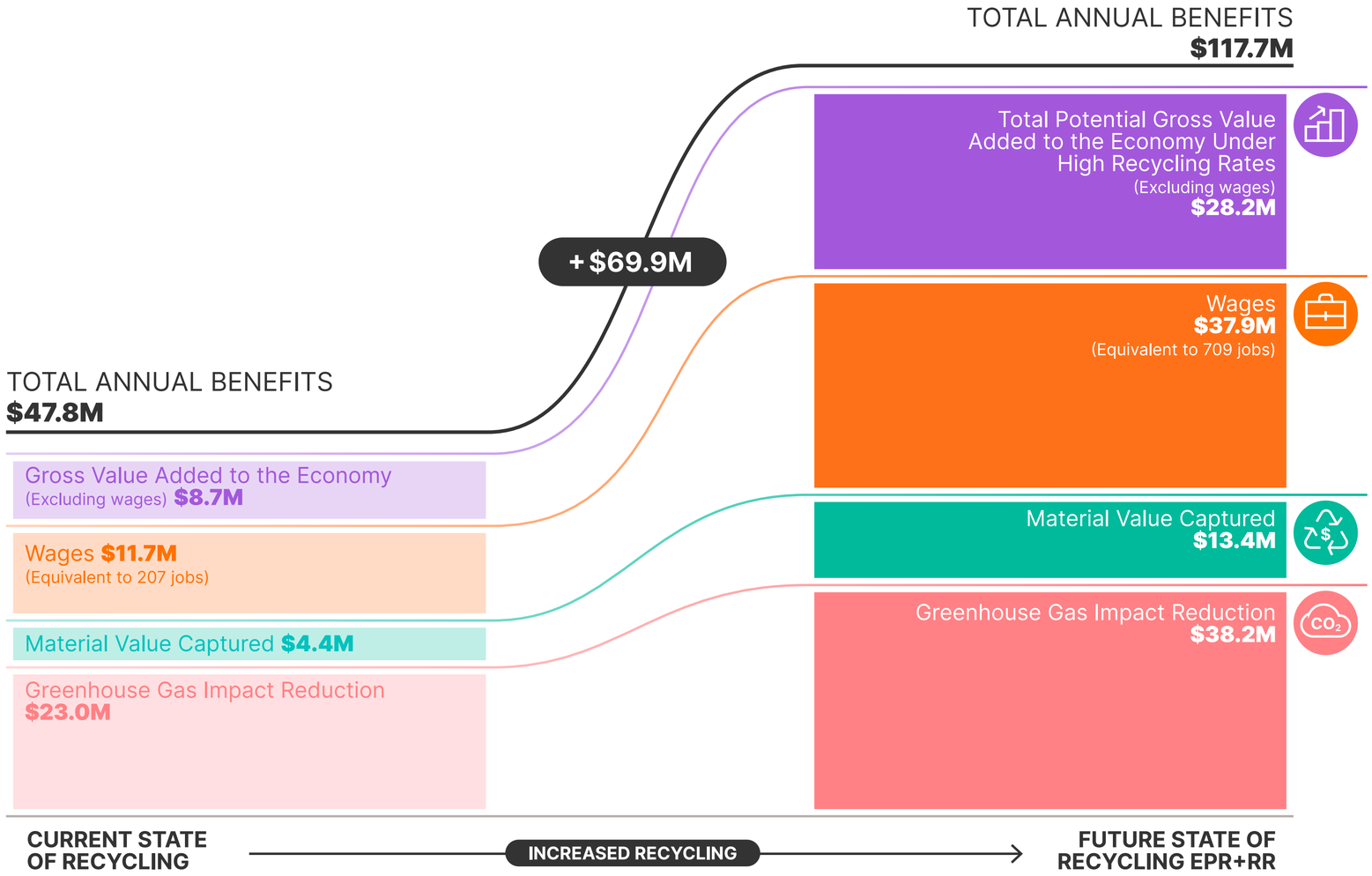
- Increase recycling related jobs from 200 to 700.
- Place $13 million of recycled material back in the market to support a circular economy and reduce the need for virgin material.
- Avoid emissions of 200,000 MTCO2e annually.

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



Appendix

A.1.0 KEY TERMS

Closed-Loop Recycling	Any end-of-life management of material where the recycling process maintains the quality and utility of the material to enable it to be fed multiple times into the system and which continues to allow the material to be recycled.
Commercial Waste	Waste generated from private businesses, industrial operations and institutions.
Contamination	Unaccepted or non-target material in a recycling stream that must be sorted from recyclables as well as non-recyclable material that leads to yield loss such as food or beverage remnants, adhesives, moisture, etc.
Disposed	Material that is either landfilled or incinerated.
Environmental Justice	The fair treatment and meaningful involvement of all people regardless of ethnicity, race, color, culture, national origin, income and educational levels with respect to the development, implementation and enforcement of protective environmental laws, regulations and policies. (U.S. EPA, 2020)
Environmental Justice Community	Minority, low-income, tribal, or indigenous populations or geographic locations in the United States that potentially experience disproportionate environmental harms and risks. This disproportionality can be due to greater vulnerability to environmental hazards, lack of opportunity for public participation or other factors. Increased vulnerability may be attributable to an accumulation of negative or lack of positive environmental, health, economic or social conditions within these populations or places. The term describes situations where multiple factors, including both environmental and socio-economic stressors, may act cumulatively to affect health and the environment and contribute to persistent environmental health disparities. (U.S. EPA, 2020)
Extended Producer Responsibility (EPR)	A mandatory type of product stewardship policy that includes, at a minimum, a requirement that the manufacturer's responsibility for its product and/or packaging extends to the post-consumer end-of-life stage. There are two key features of EPR policy: (1) shifting the financial and/or operational responsibility for a product's or packaging's end-of-life management from the public sector to the manufacturer, with state government oversight; and (2) providing incentives to manufacturers to incorporate environmental considerations into the design of their products and packaging.

A.1.0 KEY TERMS

Generated	The total amount of material that is collected for recycling and disposed. Generated = Recycled + Disposed
Greenhouse Gas (GHG)	A gas that contributes to the greenhouse effect by absorbing infrared radiation (e.g., carbon dioxide, methane and chlorofluorocarbons).
High-density polyethylene (HDPE)	A strong, durable, lightweight and chemically resistant plastic material popular for a variety of applications, including rigid plastics. Coded as plastic resin #2.
Landfill	A specially engineered site for disposal of solid waste by burying in the ground. The waste is generally spread in thin layers, which are then covered with soil or other materials.[36]
Lbs.	Pounds, a measure of weight.
Low-density polyethylene (LDPE)	A soft, flexible, lightweight plastic material. It is often used for sandwich bags and cling wrap. Coded as plastic resin #4.
Material Value	The value of material after it has been collected, sorted and bailed.
Material Recovery Facility (MRF)	A facility where recyclables are sorted into specific categories and processed, or transported to processors, for remanufacturing. (U.S. EPA, 1994d)

A.1.0 KEY TERMS

Municipal Solid Waste (MSW)	Municipal Solid Waste, as defined by the Environmental Protection Agency, means discards from residential and commercial sources that does not contain regulated hazardous wastes. (U.S. EPA National Measurement Workgroup, 2013)
Polyethylene Terephthalate (PET)	A clear, strong and lightweight plastic that is widely used for packaging food and beverages, especially convenience-sized soft drinks, juices and water. Coded as plastic resin #1.w
Polypropylene (PP)	A thermoplastic used in a variety of applications, including packaging for consumer products like yogurt pots, margarine containers and many plastic bottle caps. Coded as plastic resin #5.
Packaging Material	Packaging generated from residential and commercial sectors, which this study has defined in such a way to cover the main types of packaging for which data was available to calculate a recycling rate. Includes: • Cardboard, Boxboard and Paper Packaging • Rigid plastics • PET bottles • PET other rigid plastics • HDPE bottles • PP • Rigids #3-#7 • All Plastics (Rigid plastics in addition to films and flexible packaging) • Glass bottles and jars • Aluminum cans • Steel cans
Fiber and Flexible Plastics (FFP)	Includes cardboard, boxboard, paper packaging, plastic films and plastic flexible packaging.

A.1.0 KEY TERMS

Primary Material	Material used to manufacture packaging that is made from virgin resources.
Processor	Also called a reclaimer, these companies purchase post-consumer or post-industrial recycled commodities and process them into resin feedstock to sell to manufacturers. For plastics processors, end products include pellet, flake and other resin products. Some vertically integrated processors also have manufacturing operations and may use the recycled feedstock they reprocess in the production of their own products.
Producer	A brand owner, first importer or franchisor that supplies designated packaging and paper products to consumers in a jurisdiction where producer responsibility obligations have been regulated. A manufacturer is not necessarily a producer in the context of EPR. In the case of a plastic bottle, for example, the producer is the company that uses the plastic bottle as packaging and sells it under its own brand, whereas the manufacturer is the company that makes the plastic bottle.
Recovery	In the context of this study, material that is diverted from the solid waste stream for the intended purpose of recycling.
Residues	Remnants of the product that remain in the container or on the packaging that is being recycled, e.g., dried yogurt remaining in yogurt cups, liquid in beverage containers, etc.
Recycling Rate	One indicator of a recycling system's performance. The greater percentage of packaging recycled, the less disposed. The recycling rates presented in this study are calculated based on the tons used by processors (not the amount collected for recycling) divided by the amount of material generated.
Recycling Refunds	Also called deposit return systems, container deposit systems or "bottle bills," these programs place a refundable deposit on beverage containers that is returned to consumers when they bring back empty containers for recycling and/or reuse at a redemption location.

A.1.0 KEY TERMS

Residential Waste	Waste generated from single-family and multi-family households.
Secondary Material	Material used to manufacture packaging made from resources that have previously been recycled.
Single Stream	A system in which multiple recyclable materials are combined for collection with no sorting required by the generator (residential, commercial, or industrial). Sorting is performed at a central location, such as an MRF.
Sorting Facility	Also sometimes called a recycling processor or material recovery facility (MRF), an establishment primarily engaged in sorting fully or partially mixed recyclable materials into distinct categories and preparing them for shipment to recycling markets.
Tipping Fee	Fee paid by haulers to dump loads of trash or recycling at a landfill, incineration or recycling facility.
Waste Diversion	The act of redirecting waste away from landfill disposal and incineration into recycling or other beneficial uses.
Waste Stream	The flow of solid waste from its source, such as households or businesses, through to recovery, recycling or final disposal.

A.2.0 ADDITIONAL GRAPHICS

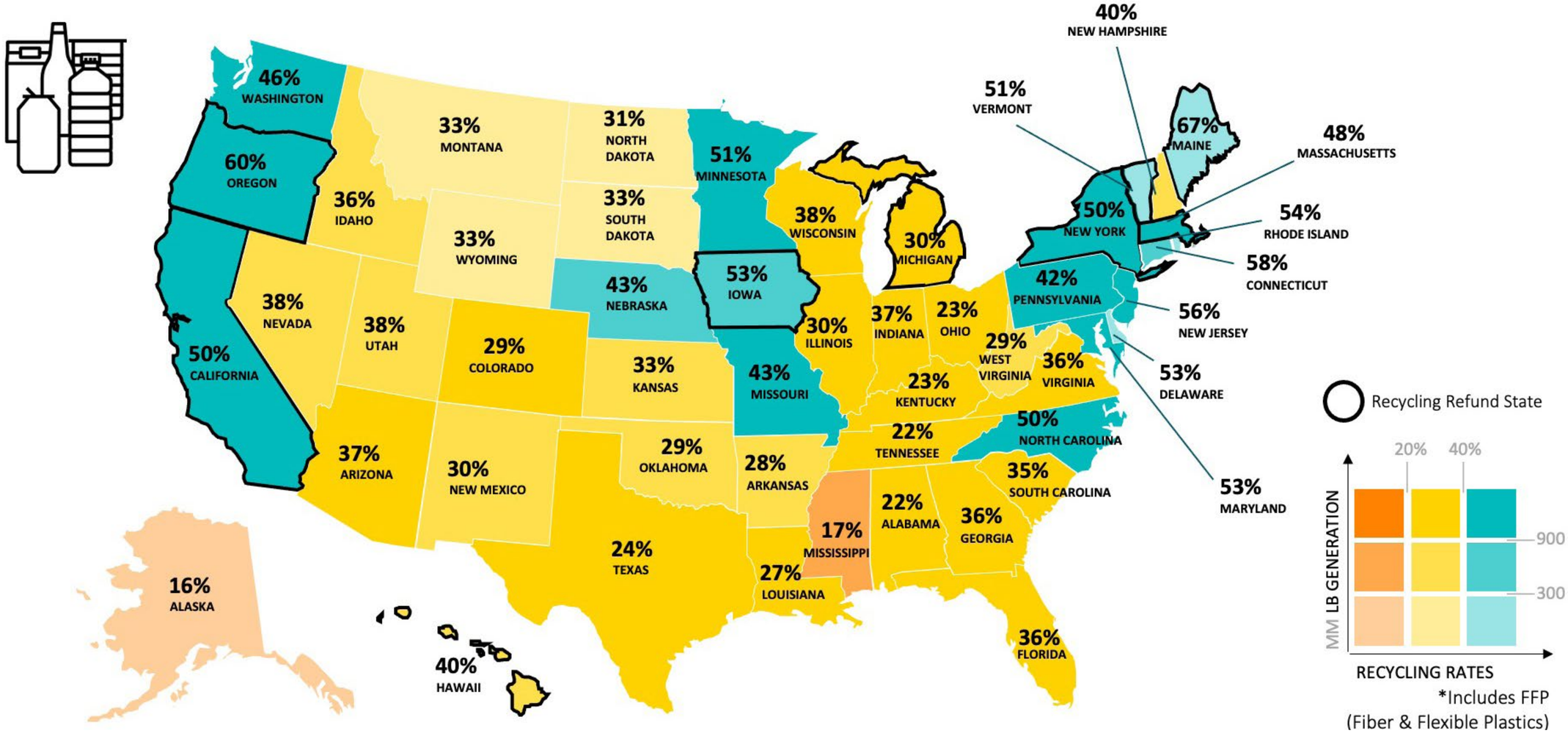
STATE RECYCLING RANKINGS: INCLUDES FIBER AND PLASTIC FILMS - TOP 10 & BOTTOM 10

RANKING: TOP 10	STATE	RECYCLING RATE	RECYCLING REFUND
#1	Maine	67%	Yes
#2	Oregon	60%	Yes
#3	Connecticut	58%	Yes
#4	New Jersey	56%	No
#5	Delaware	53%	No
#6	Iowa	53%	Yes
#7	Maryland	53%	No
#8	Vermont	51%	Yes
#9	Minnesota	51%	No
#10	California	50%	Yes

RANKING: BOTTOM 10	STATE	RECYCLING RATE	RECYCLING REFUND
#41	Oklahoma	29%	No
#42	Arkansas	28%	No
#43	Louisiana	27%	No
#44	Texas	24%	No
#45	Ohio	23%	No
#46	Kentucky	23%	No
#47	Alabama	22%	No
#48	Tennessee	22%	No
#49	Mississippi	17%	No
#50	Alaska	16%	No

A.2.0 ADDITIONAL GRAPHICS

US RECYCLING RATES PER STATE: INCLUDES FIBER & FLEXIBLE PLASTICS



A.2.0 ADDITIONAL GRAPHICS

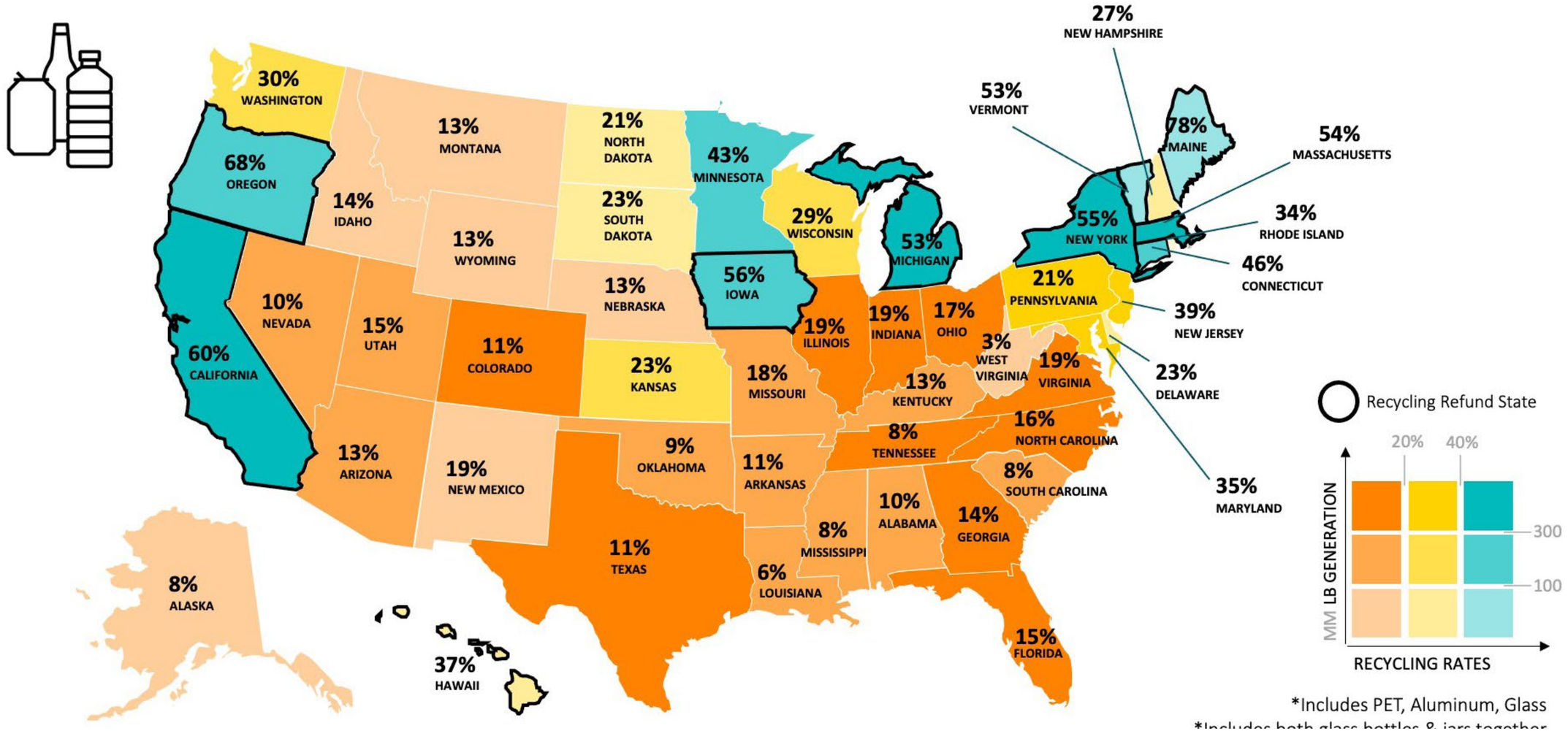
STATE RECYCLING RANKINGS: EXCLUDES FIBER & FLEXIBLE PLASTICS - TOP 10 & BOTTOM 10

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

A.2.0 ADDITIONAL GRAPHICS

US PACKAGING RECYCLING RATES BY STATE: EXCLUDES FIBER & FLEXIBLE PLASTICS



A.2.0 ADDITIONAL GRAPHICS

STATE RECYCLING RANKINGS: BEVERAGE CONTAINERS* - TOP 10 & BOTTOM 10

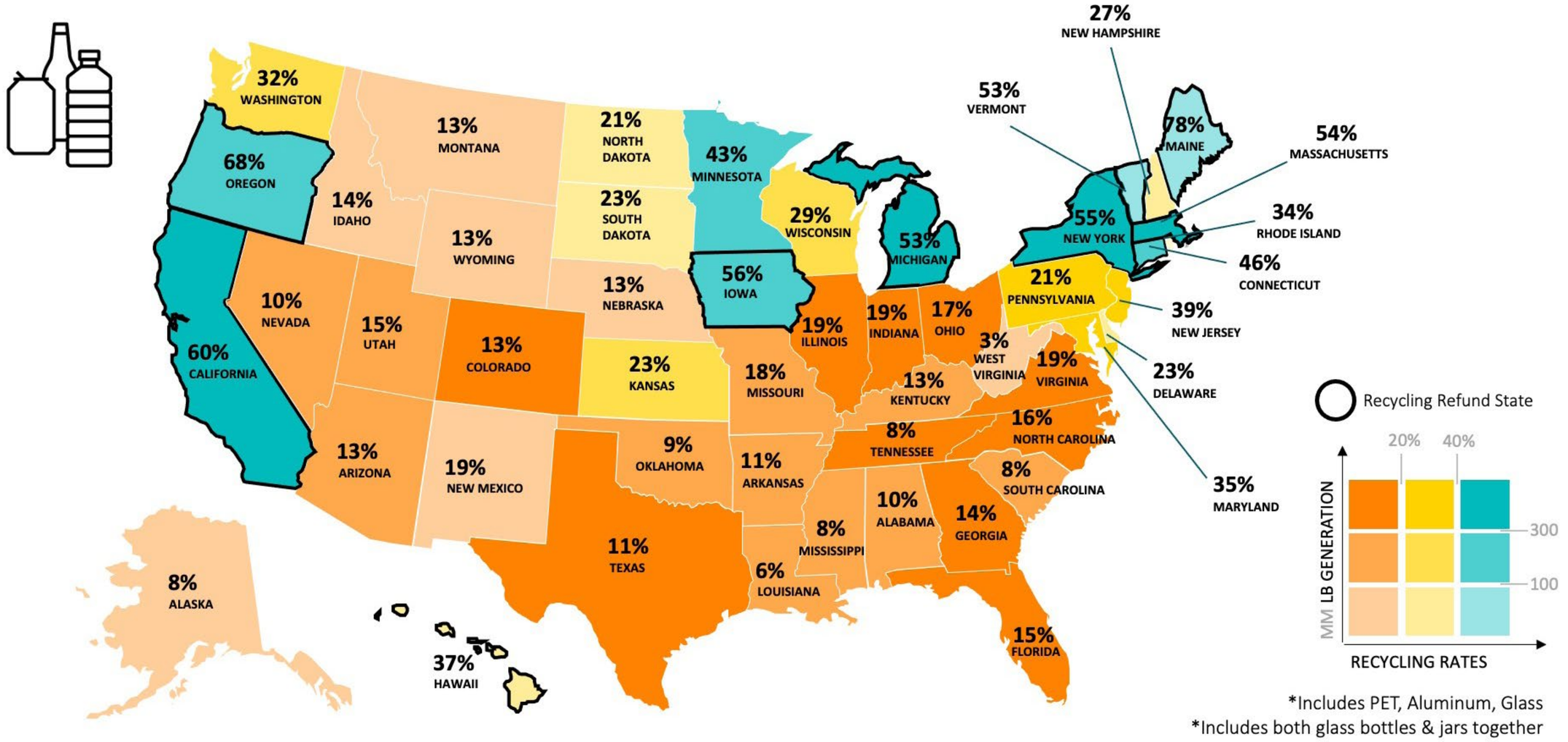
RANKING: TOP 10	STATE	RECYCLING RATE	RECYCLING REFUND
#1	Maine	78%	Yes
#2	Oregon	68%	Yes
#3	California	60%	Yes
#4	Iowa	56%	Yes
#5	New York	55%	Yes
#6	Massachusetts	54%	Yes
#7	Vermont	53%	Yes
#8	Michigan	53%	Yes
#9	Connecticut	46%	Yes
#10	Minnesota	43%	No

RANKING: BOTTOM 10	STATE	RECYCLING RATE	RECYCLING REFUND
#41	Texas	11%	No
#42	Nevada	10%	No
#43	Alabama	10%	No
#44	Oklahoma	9%	No
#45	Tennessee	8%	No
#46	Mississippi	8%	No
#47	Alaska	8%	No
#48	South Carolina	8%	No
#49	Louisiana	6%	No
#50	West Virginia	3%	No

*Includes PET, Aluminum, Glass

A.2.0 ADDITIONAL GRAPHICS

US BEVERAGE CONTAINERS* RECYCLING RATES BY STATE



*Includes PET, Aluminum, Glass
*Includes both glass bottles & jars together

A.2.0 ADDITIONAL GRAPHICS

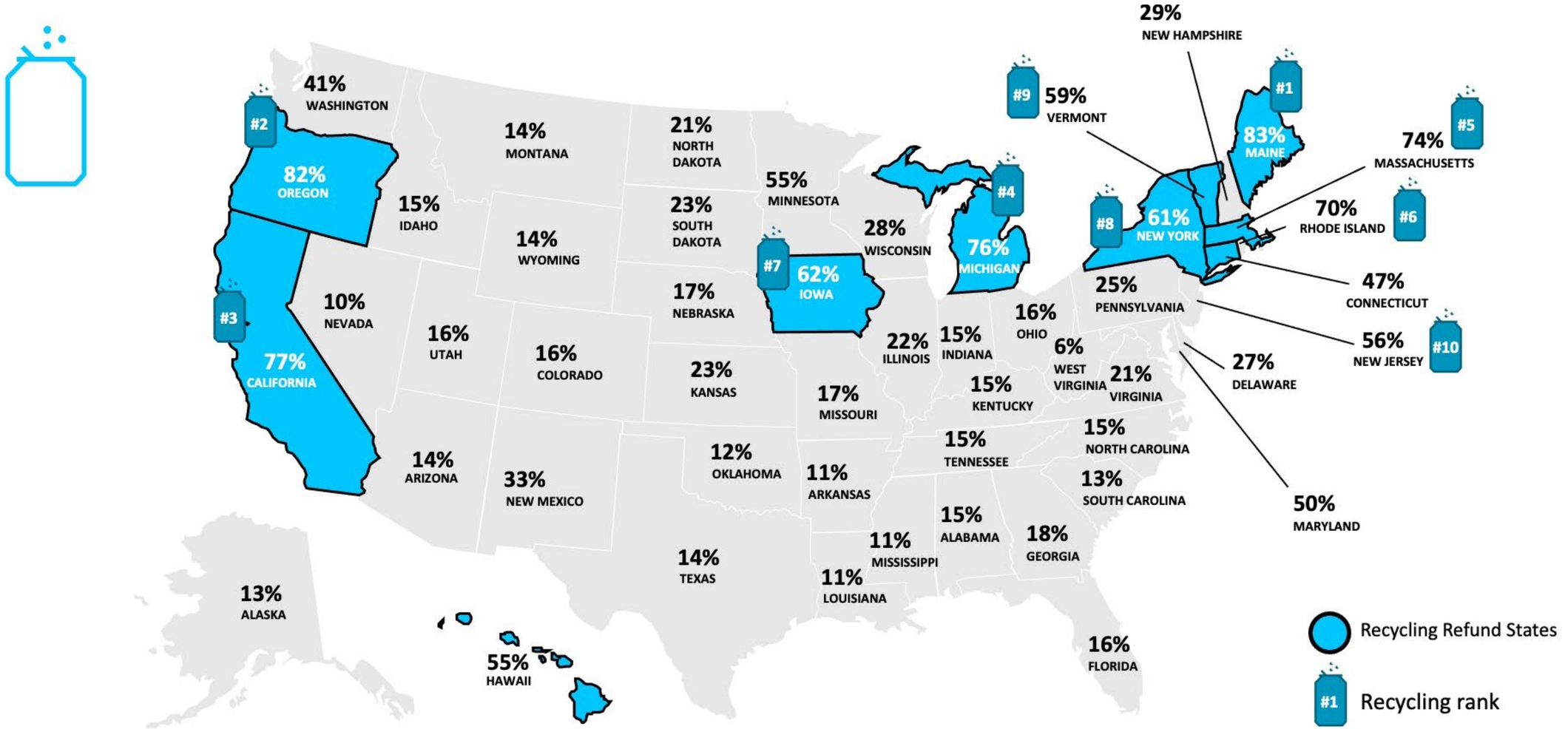
STATE RECYCLING RANKINGS: ALUMINUM CANS - TOP 10 & BOTTOM 10

RANKING: TOP 10	STATE	RECYCLING RATE	RECYCLING REFUND
#1	Maine	83%	Yes ✓
#2	Oregon	82%	Yes ✓
#3	California	77%	Yes ✓
#4	Michigan	76%	Yes ✓
#5	Massachusetts	74%	Yes ✓
#6	Rhode Island	70%	Yes ✗
#7	Iowa	62%	Yes ✓
#8	New York	61%	Yes ✓
#9	Vermont	59%	Yes ✓
#10	New Jersey	56%	No ✗

RANKING: BOTTOM 10	STATE	RECYCLING RATE	RECYCLING REFUND
#41	Wyoming	14%	No ✗
#42	Arizona	14%	No ✗
#43	South Carolina	13%	No ✗
#44	Alaska	13%	No ✗
#45	Oklahoma	12%	No ✗
#46	Arkansas	11%	No ✗
#47	Mississippi	11%	No ✗
#48	Louisiana	11%	No ✗
#49	Nevada	10%	No ✗
#50	West Virginia	6%	No ✗

A.2.0 ADDITIONAL GRAPHICS

US ALUMINUM CAN RECYCLING RATES BY STATE



Source: Eunomia/Ball - The 50 States of Recycling (refresh)

A.2.0 ADDITIONAL GRAPHICS

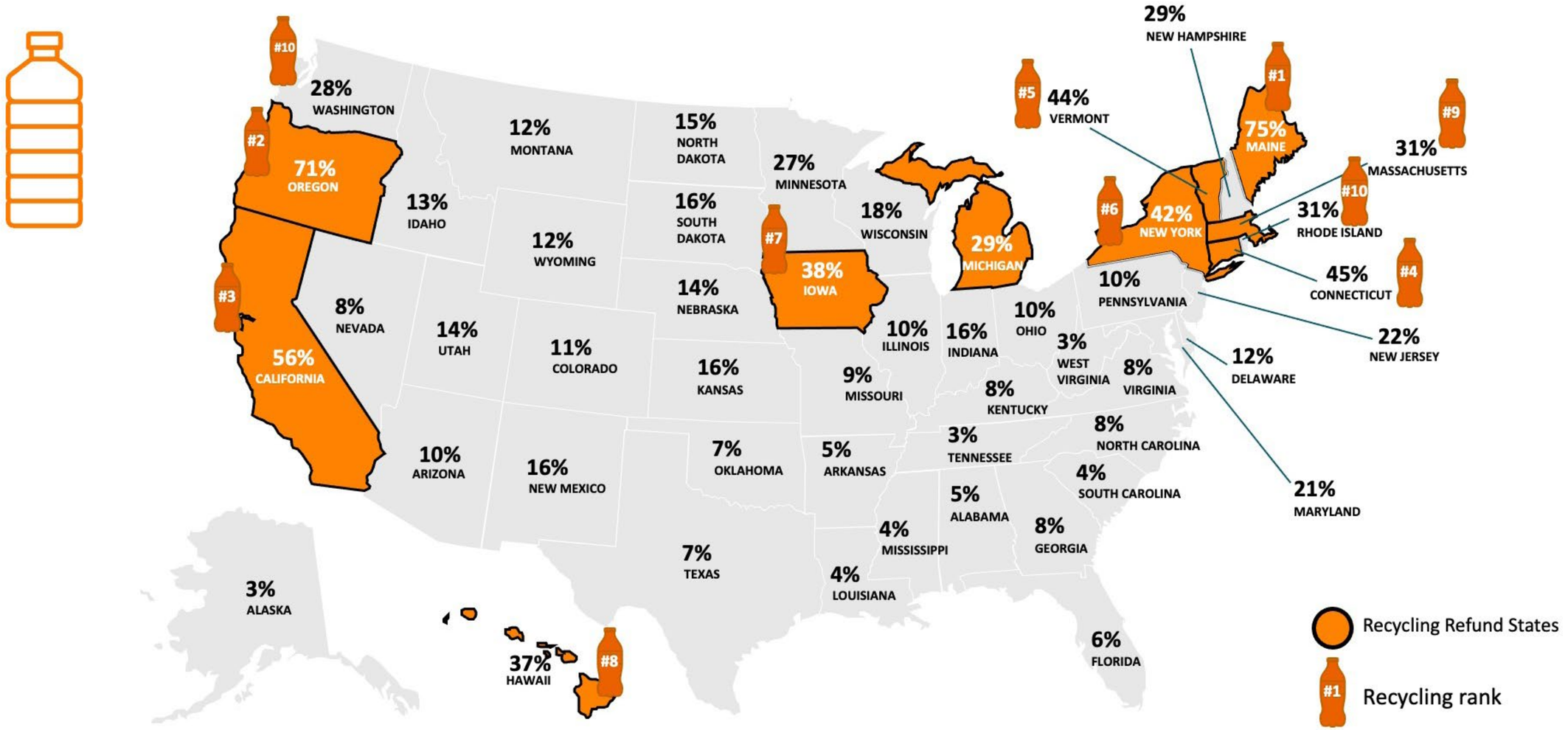
STATE RECYCLING RANKINGS: PET BOTTLES - TOP 10 & BOTTOM 10

RANKING: TOP 10	STATE	RECYCLING RATE	RECYCLING REFUND
#1	Maine	**75%**	Yes ✓
#2	Oregon	**71%**	Yes ✓
#3	California	**56%**	Yes ✓
#4	Connecticut	**45%**	Yes ✓
#5	Vermont	**44%**	Yes ✓
#6	New York	**42%**	Yes ✓
#7	Iowa	**38%**	Yes ✓
#8	Hawaii	**37%**	Yes ✓
#9	Massachusetts	**31%**	Yes ✓
#10	Washington	**28%**	No ✗

RANKING: BOTTOM 10	STATE	RECYCLING RATE	RECYCLING REFUND
#41	Oklahoma	**7%**	No ✗
#42	Florida	**6%**	No ✗
#43	Alabama	**5%**	No ✗
#44	Arkansas	**5%**	No ✗
#45	Mississippi	**4%**	No ✗
#46	Louisiana	**4%**	No ✗
#47	South Carolina	**4%**	No ✗
#48	Alaska	**3%**	No ✗
#49	Tennessee	**3%**	No ✗
#50	West Virginia	**3%**	No ✗

A.2.0 ADDITIONAL GRAPHICS

US PET BOTTLES RECYCLING RATES BY STATE



Source: Eunomia/Ball - The 50 States of Recycling (refresh)

A.2.0 ADDITIONAL GRAPHICS

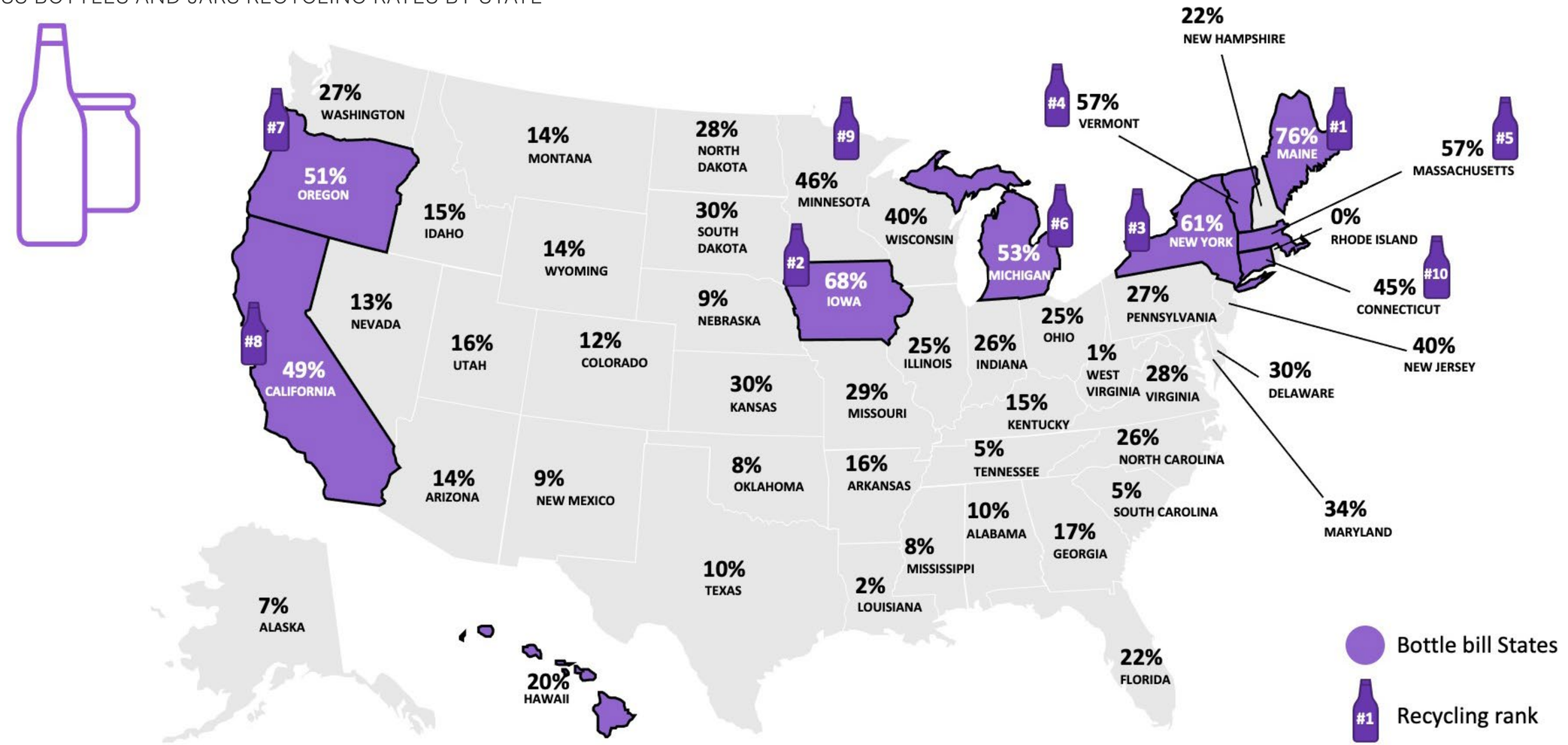
STATE RECYCLING RANKINGS: GLASS BOTTLES AND JARS - TOP 10 & BOTTOM 10

		RECYCLING RATE		
#1	Maine	76%	Yes	✓
#2	Iowa	68%	Yes	✓
#3	New York	61%	Yes	✓
#4	Vermont	57%	Yes	✓
#5	Massachusetts	57%	Yes	✓
#6	Michigan	53%	Yes	✓
#7	Oregon	51%	Yes	✓
#8	California	49%	Yes	✓
#9	Minnesota	46%	No	✗
#10	Connecticut	45%	Yes	✓

		RECYCLING RATE		
#41	Nebraska	9%	No	✗
#42	New Mexico	9%	No	✗
#43	Oklahoma	8%	No	✗
#44	Mississippi	8%	No	✗
#45	Alaska	7%	No	✗
#46	South Carolina	5%	No	✗
#47	Tennessee	5%	No	✗
#48	Louisiana	2%	No	✗
#49	West Virginia	1%	No	✗
#50	Rhode Island	0%	No	✗

A.2.0 ADDITIONAL GRAPHICS

US GLASS BOTTLES AND JARS RECYCLING RATES BY STATE



Source: Eunomia/Ball - The 50 States of Recycling (refresh)

A.2.0 ADDITIONAL GRAPHICS

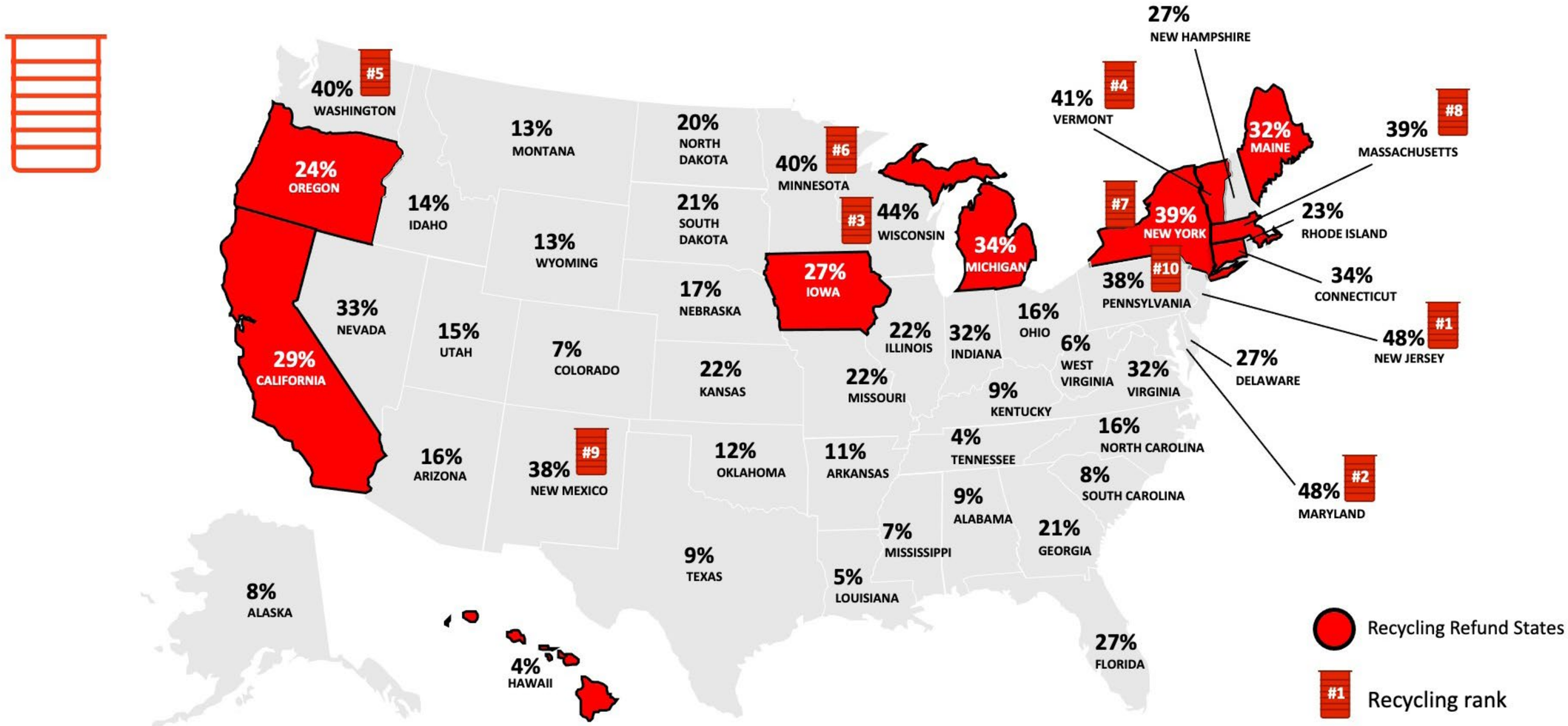
STATE RECYCLING RANKINGS: STEEL - TOP 10 & BOTTOM 10

RANKING: TOP 10	STATE	RECYCLING RATE
#1	New Jersey	48%
#2	Maryland	48%
#3	Wisconsin	44%
#4	Vermont	41%
#5	Washington	40%
#6	Minnesota	40%
#7	New York	39%
#8	Massachusetts	39%
#9	New Mexico	38%
#10	Pennsylvania	38%

RANKING: BOTTOM 10	STATE	RECYCLING RATE
#41	Kentucky	9%
#42	Alabama	9%
#43	South Carolina	8%
#44	Alaska	8%
#45	Colorado	7%
#46	Mississippi	7%
#47	West Virginia	6%
#48	Louisiana	5%
#49	Tennessee	4%
#50	Hawaii	4%

A.2.0 ADDITIONAL GRAPHICS

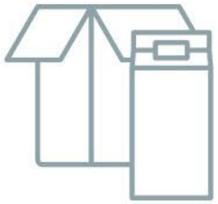
STEEL CANS RECYCLING RATES BY STATE



Source: Eunomia/Ball - The 50 States of Recycling (refresh)

A.2.0 ADDITIONAL GRAPHICS

STATE RECYCLING RANKINGS: FIBER - TOP 10 & BOTTOM 10

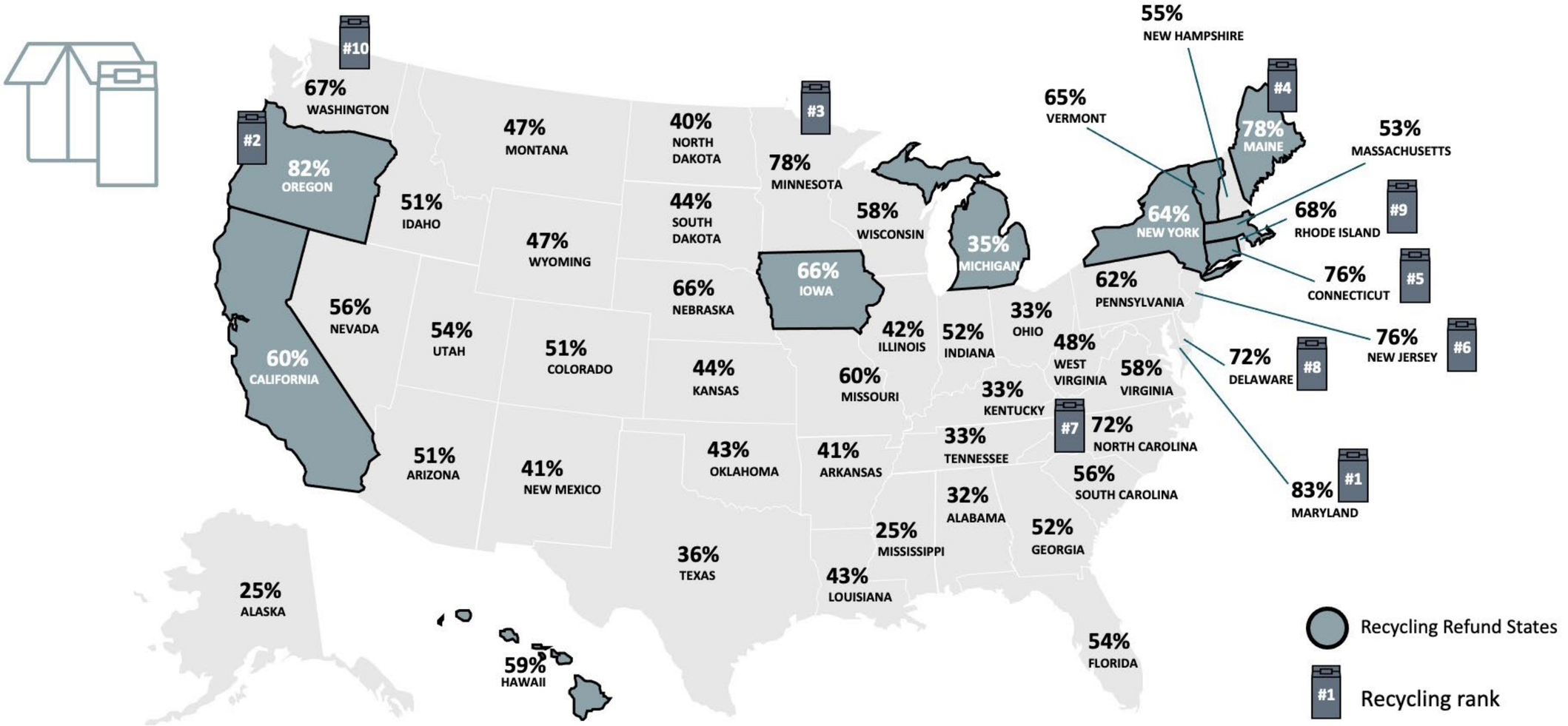


RANKING: TOP 10	STATE	RECYCLING RATE %
#1	Maryland	**83%**
#2	Oregon	**82%**
#3	Minnesota	**78%**
#4	Maine	**78%**
#5	Connecticut	**76%**
#6	New Jersey	**76%**
#7	North Carolina	**72%**
#8	Delaware	**72%**
#9	Rhode Island	**68%**
#10	Washington	**67%**

RANKING: BOTTOM 10	STATE	RECYCLING RATE %
#41	Arkansas	**41%**
#42	North Dakota	**40%**
#43	Texas	**36%**
#44	Michigan	**35%**
#45	Tennessee	**33%**
#46	Kentucky	**33%**
#47	Ohio	**33%**
#48	Alabama	**32%**
#49	Mississippi	**25%**
#50	Alaska	**25%**

A.2.0 ADDITIONAL GRAPHICS

US CARDBOARD/BOXBOARD RECYCLING RATES PER STATE



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