



REPUBLIC
SERVICES

We'll handle it from here.®



Plastics Recovery Program Review

We work for Earth.®

Republic Services: Advancing Plastics Recycling through Investment, Innovation and Education

Introduction

At Republic Services, we are passionate about our role as stewards of our nation's waste. We have been making significant investments in recycling for several years, and we are looking to increase our momentum. To that end, we commissioned Resource Recycling Systems (RRS), an independent third-party research firm that specializes in assessing recycling programs across a number of sectors and industries, to conduct research, gather data, and review our operations. We plan to leverage their input as we continue improving our recycling processing infrastructure, and education and outreach initiatives, specifically focusing on efforts to improve the recovery of plastics and enhance plastic material solutions.

This report is designed to highlight the critical steps we are taking to increase plastics recycling across our nationwide footprint, as well as provide context around some of the challenges that are limiting growth in plastics recycling in the United States. The charts contained within this report contain independently compiled and verified national data by RRS and company specific data provided by Republic Services.

Committed to Lead

Republic employs 36,000 team members, all of whom are fiercely dedicated to protecting our planet. We work to increase recycling, generate renewable energy, and help our customers and communities be more resourceful. As an industry leader, we must also lead by example, continuously improving our own footprint through decreased vehicle emissions, innovative landfill technologies, community engagement, and employee growth and development.

We strongly believe that the circular economy reduces the need for raw materials, which mitigates their associated environmental and social burden. Therefore, we're focused on extending the life of the materials we recover from the waste stream by recycling key commodities and extracting more biogas from our landfills to use as a renewable energy source. Both add value to the economy while benefitting our Company and the environment.

For additional information about how we are advancing our sustainability goals and practices, please read our [2019 Sustainability Report](#) and [2019 GRI Report](#).

Size of the Challenge

The world's consumption of raw materials is expected to nearly double by the year 2060 as the global economy expands and living standards rise. This dramatic increase would place twice the pressure on the environment than is experienced today. Further, some studies estimate that our population already consumes resources 50% faster than they can be replaced.

This means that the resourceful handling of waste and extraction of as much value from the waste stream as possible have never been more important. We handle roughly 114 million tons of material each year*, and much of this material still has value prior to being disposed of in a landfill. We are continuously evaluating ways to extract more value from this material using processing and diversion systems and programs. Whether it's through reuse, recovery, refurbishment, or recycling – we're actively contributing to a circular economy.

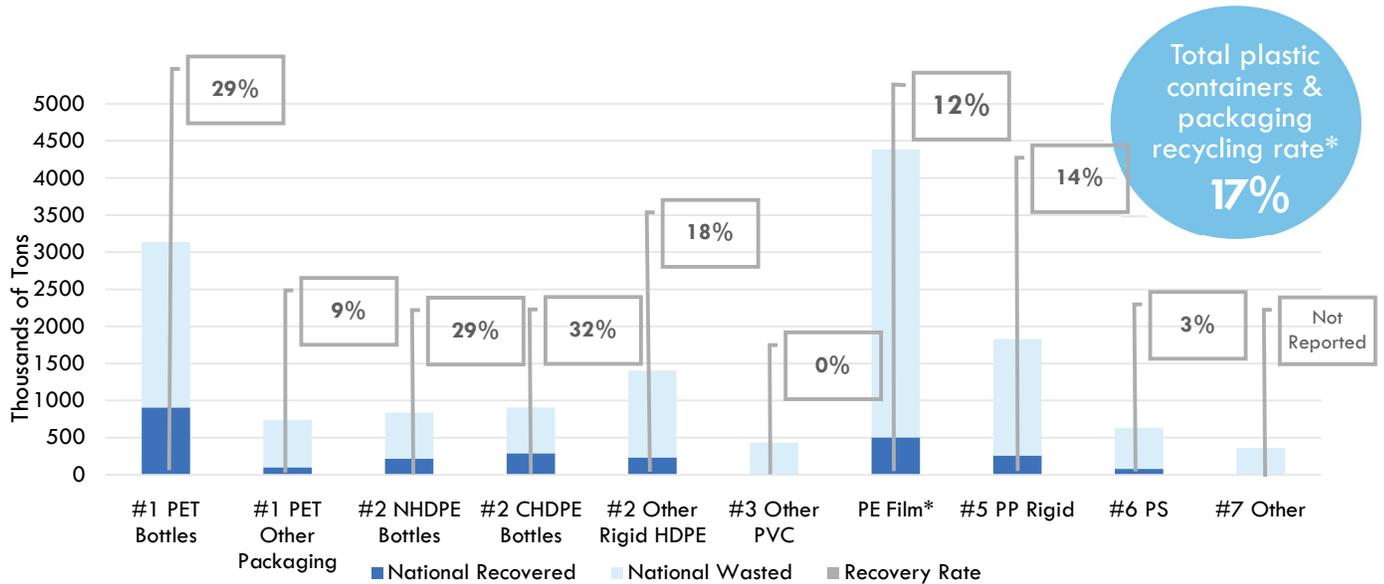
By extending the life of the materials we handle, we help reduce the environmental and societal burden of the growing use of raw materials. Our experience, passion and ethical standards guide our vigorous pursuit of opportunities to deliver recovered and renewable materials and energy back into the economy, and we are proud of our 2019 and 2020 achievements.



*Please view our 2019 Sustainability Accounting Standards Board (SASB) Report at [RepublicServices.com/Sustainability](https://www.republicservices.com/Sustainability) for additional information.

The State of US Recycling Today

The starting point shows how vast the opportunity is. In 2018, the most recent year for which US Environmental Protection Agency (EPA) data is available, only 17% of plastic containers and packaging were recycled. The most commonly recycled plastics, PET and HDPE bottles, increase the average with rates in the 30% range (Figure 1). Below is a more granular look at recycling data, all compiled by RRS, through a variety of lenses:

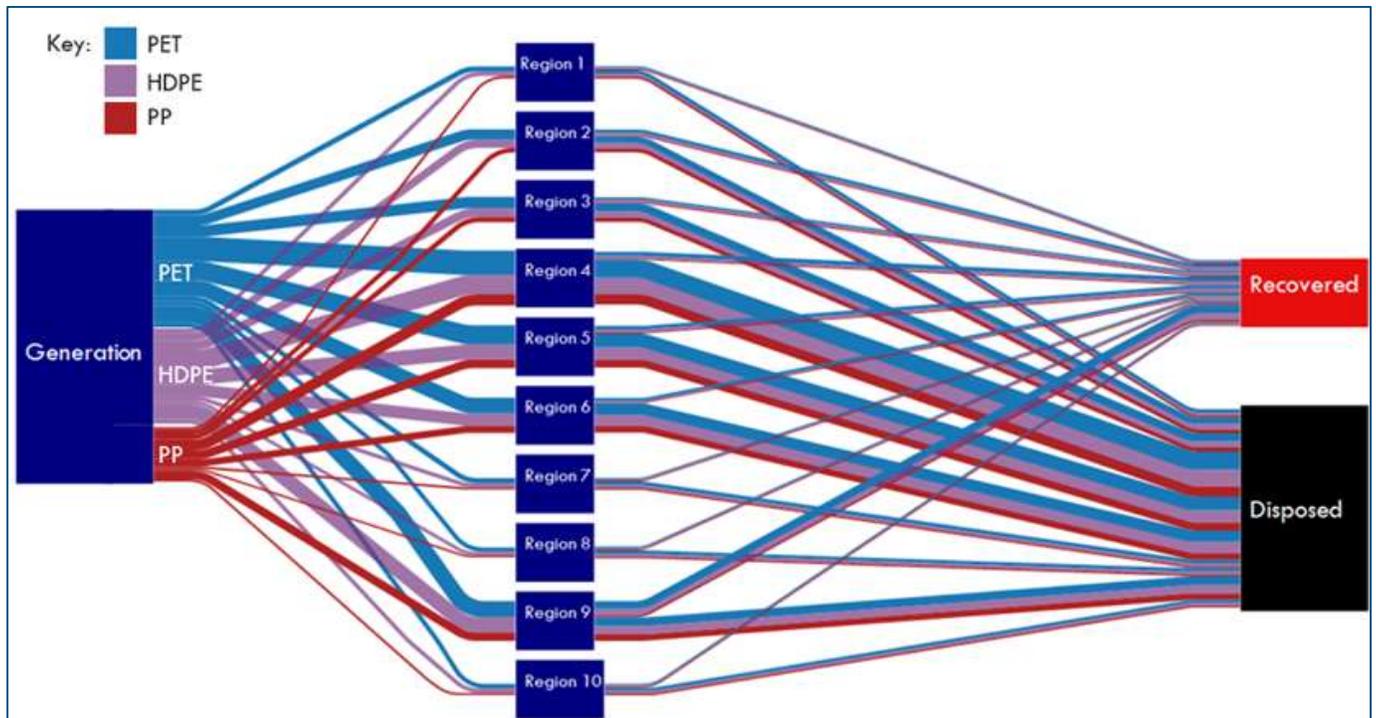


KEY: PET = Polyethylene Terephthalate | NHDPE = Natural High-Density Polyethylene | CHDPE = Colored High-Density Polyethylene
 PVC = Polyvinyl Chloride | PE = Polyethylene | PP = Polypropylene | PS = Polystyrene

*Includes all municipal solid waste as defined by EPA including commercial materials (not post-industrial)

Figure 1. U.S. Containers and Packaging Recovery by Resin Type, 2018 Snapshot
 Source: 1) U.S. Environmental Protection Agency 2) American Chemistry Council 3) National Association for PET Containers Resources 4) RRS

While plastics are recycled across the country, the highest recovery rates occur in EPA Region 9 (California, Arizona and Nevada), with the next highest performing regions being Region 2 (NY, NJ), Region 4 (the Southeast) and Region 5 (the Midwest) (Figures 2 through 8).



Unit: thousand tons

Region	Population	PET Containers and Packaging Generation	PET Containers and Packaging Recovered	PET Containers and Packaging Disposed	HDPE Containers and Packaging Generation	HDPE Containers and Packaging Recovered	HDPE Containers and Packaging Disposed	PP Containers and Packaging Generation	PP Containers and Packaging Recovered	PP Containers and Packaging Disposed
NE	14,853,290	176	51	124	139	42	97	80	14	66
NY/NJ	28,335,751	336	108	228	265	88	177	152	29	123
Mid-Atl	30,855,684	365	68	297	289	95	194	165	31	135
SEast	66,780,184	791	147	644	625	87	538	358	28	329
Grt Lks	52,464,745	621	124	497	491	95	395	281	31	250
SCen	42,919,307	508	95	414	401	43	358	230	14	216
MidWest	14,123,370	167	37	130	132	40	92	76	13	63
MtnPln	12,183,876	144	27	117	114	17	97	65	6	60
PacSW	51,245,823	553	272	281	479	210	270	274	68	206
PacNW	14,297,252	150	40	110	134	45	89	77	14	62
TOTAL	328,059,282	3,812	969	2,843	3,068	762	2,306	1,757	247	1510

Figure 2. National PET, HDPE, and PP Material Flows (2018)*

Source: RRS

*Region numbers correspond to region names.

Generation and Recovery

Note: Generation refers to consumption, consistent with EPA. Recovery refers to area where material is collected and processed.

National PET Generation and Recovery

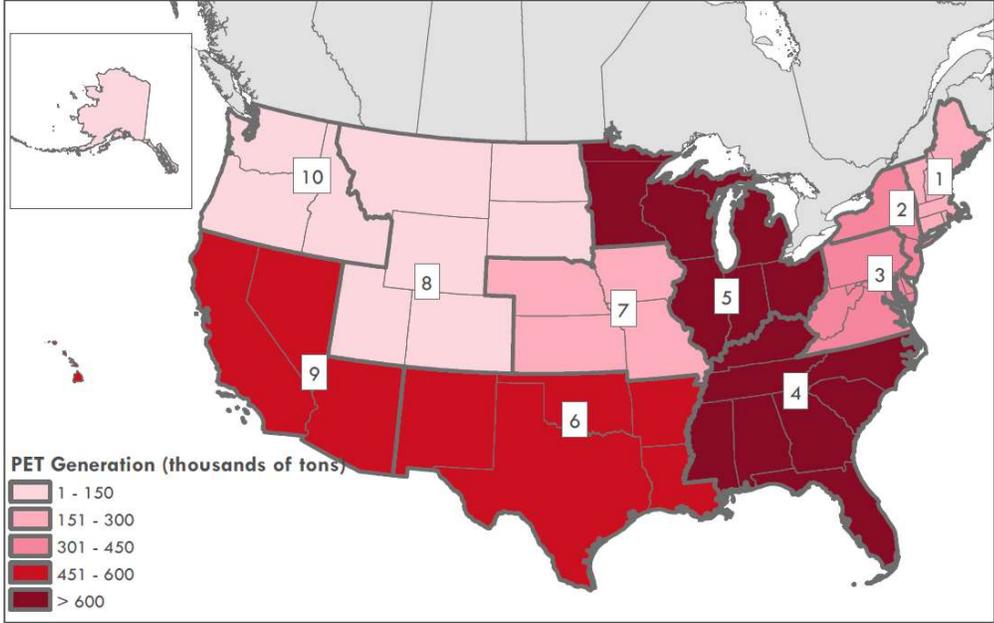


Figure 2. PET Generation (in thousands of tons) by Region, 2018
Source: RRS

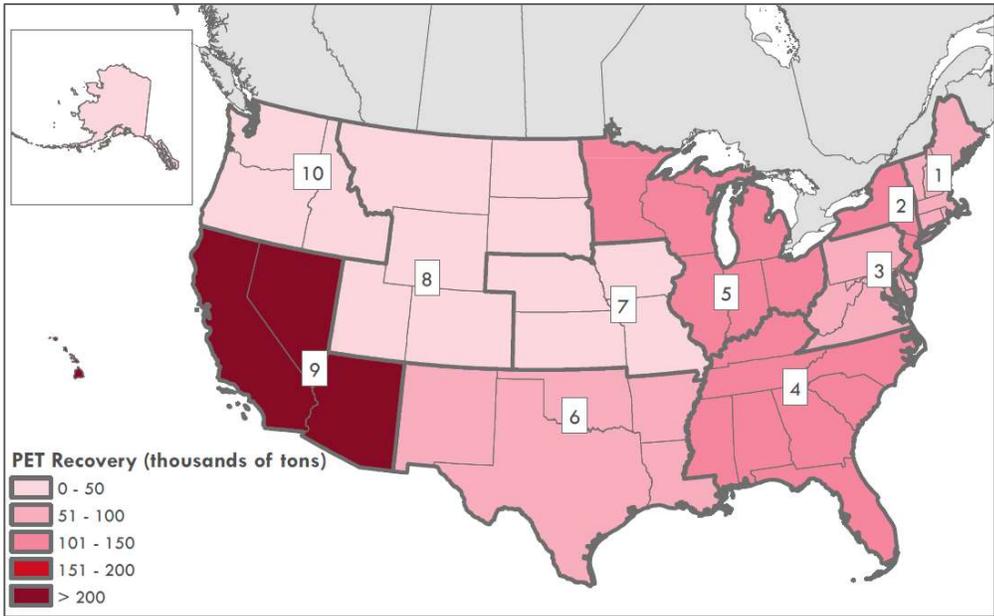


Figure 3. PET Recovery (in thousands of tons) by Region, 2018
Source: RRS

National HDPE Generation and Recovery

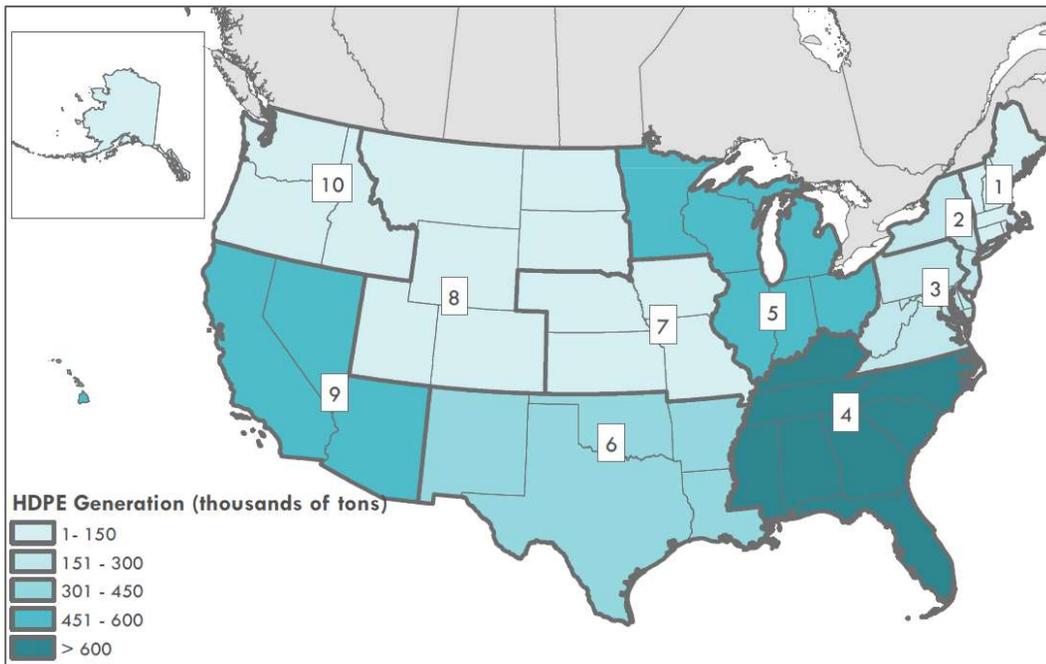


Figure 4. HDPE Generation (in thousands of tons) by Region, 2018

Source: RRS

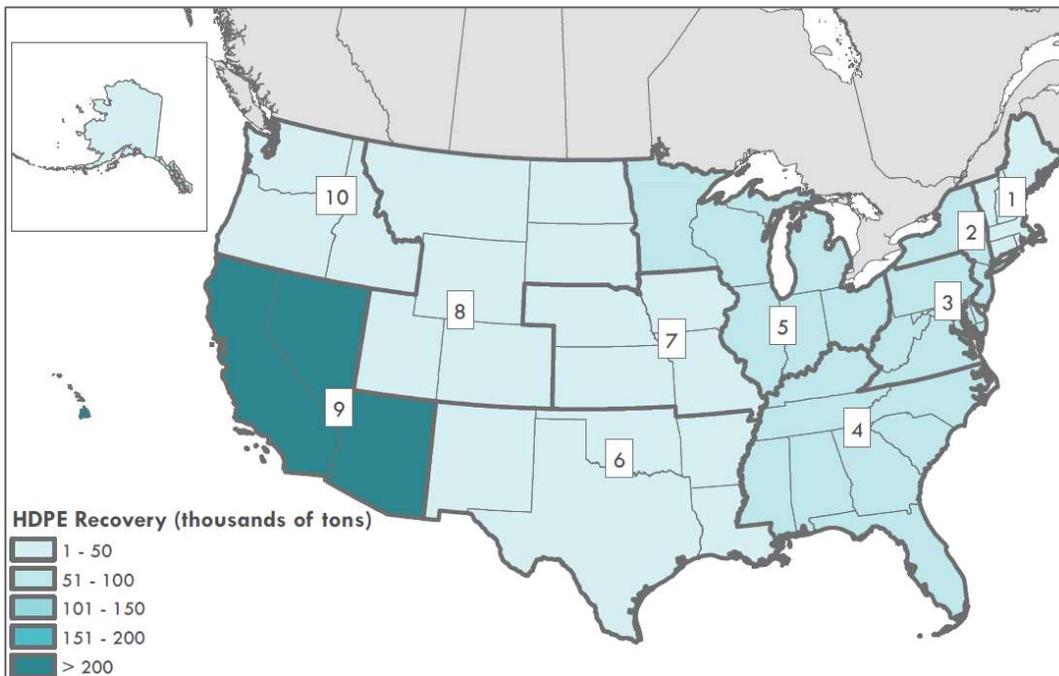


Figure 5. HDPE Recovery (in thousands of tons) by Region, 2018

Source: RRS

National PP Generation and Recovery

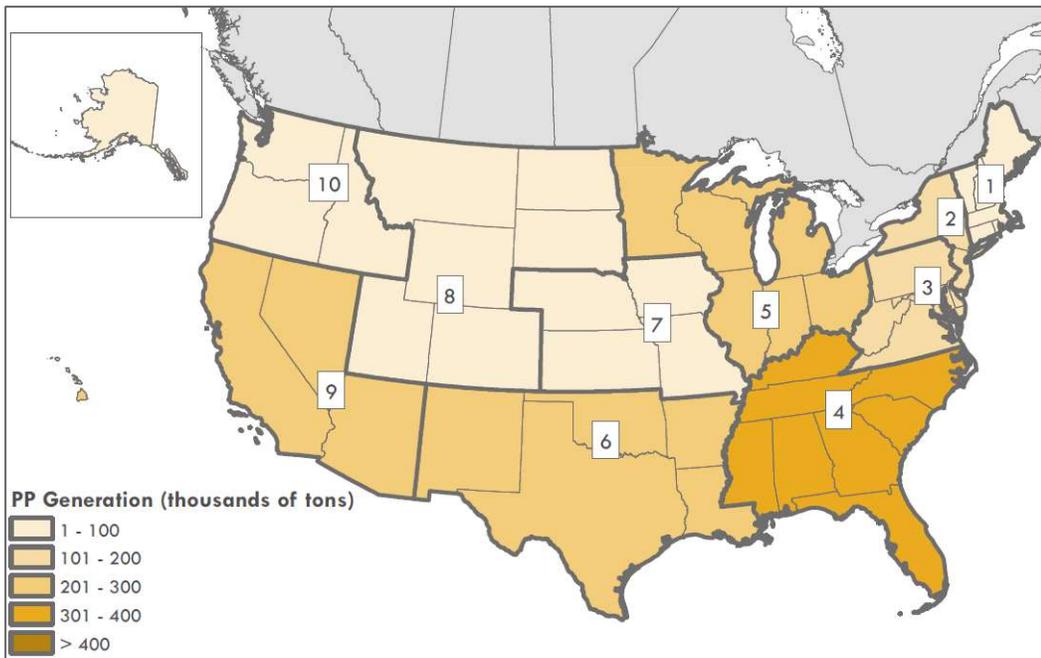


Figure 6. PP Generation (in thousands of tons) by Region, 2018
Source: RRS

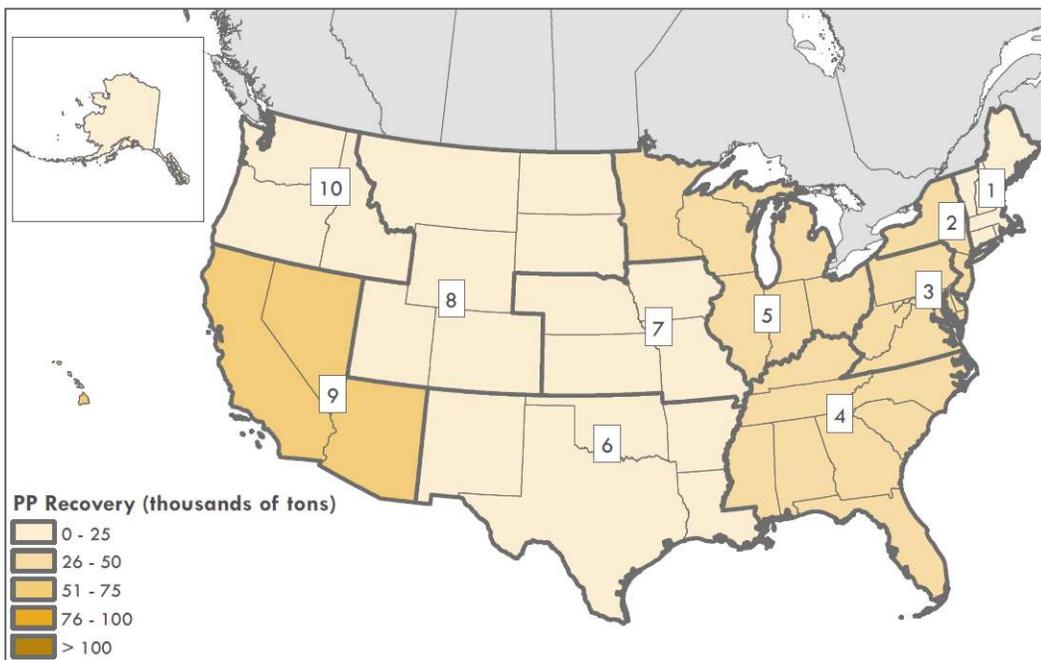


Figure 7. PP Recovery (in thousands of tons) by Region, 2018
Source: RRS

Republic Services' Leadership Position

Republic is a major contributor to plastics recycling collection nationally and provides significant feedstock to domestic reclamation capacity. Our contributions to plastics collection and feeding reclamation capacity are reflected in the following maps below, and the movement of plastics tonnage is reflected in Figure 15.

While it is natural that plastics generation is highly correlated to population centers, recovery rates do vary by geography, largely as a function of variation in regulatory frameworks and access to curbside recycling programs.

National PET Recovery by Republic Services

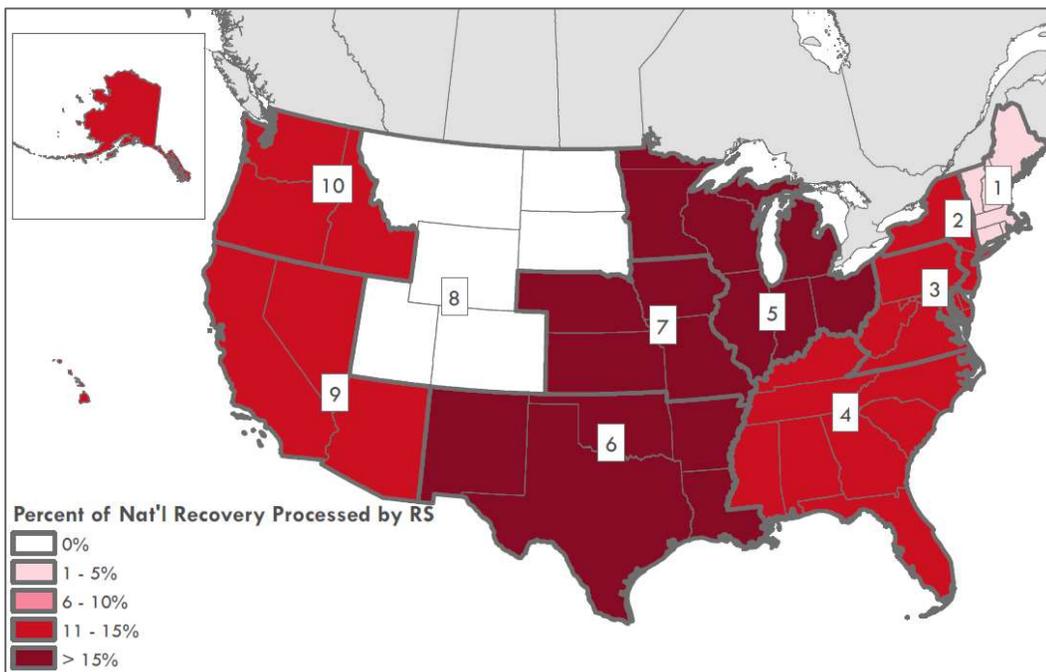


Figure 8. Percent of National PET Material Republic Services is Recovering by Region
Source: RRS

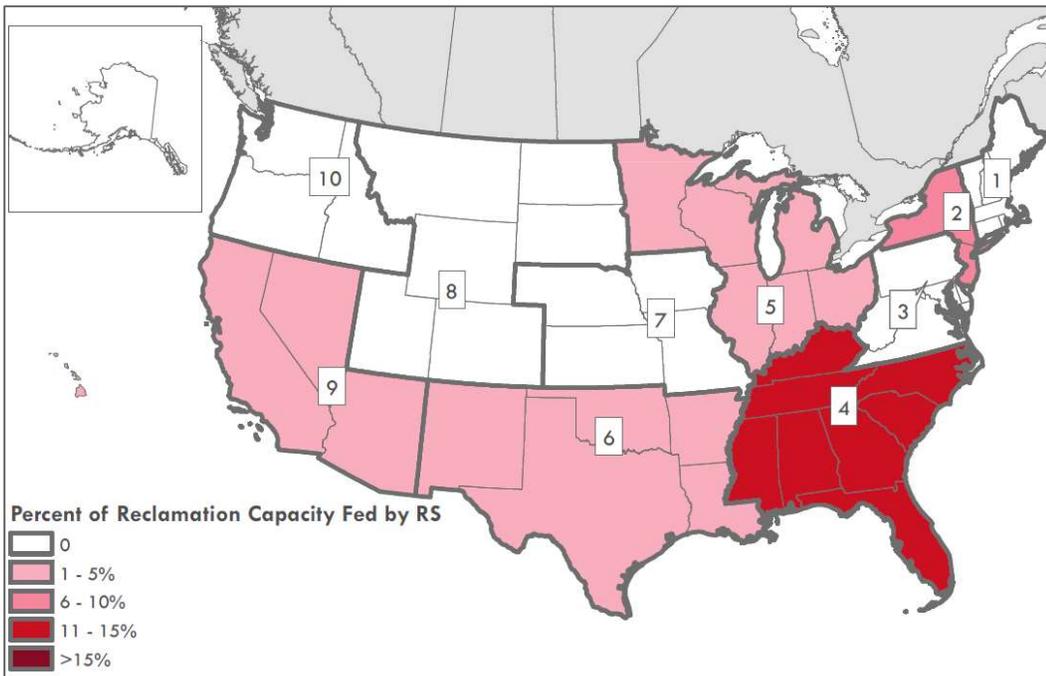


Figure 9. Percent of Total PET Reclamation Capacity That is Supplied by Republic Services
Source: RRS

National HDPE Recovery by Republic Services

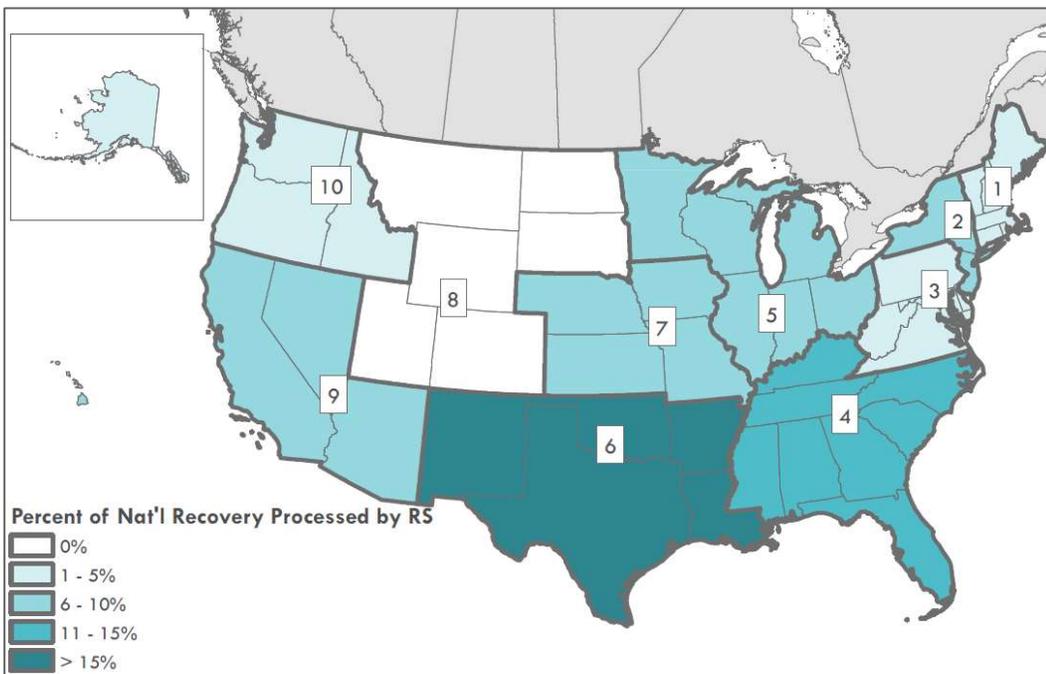


Figure 10. Percent of National HDPE Material Republic Services is Recovering by Region
Source: RRS

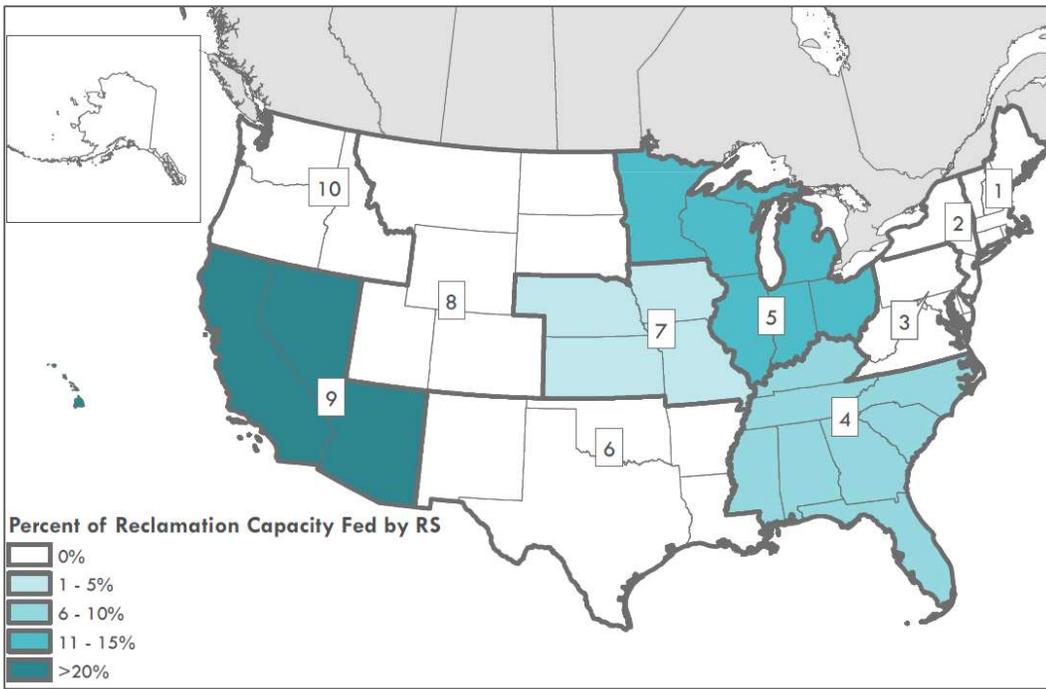


Figure 11. Percent of total HDPE Reclamation Capacity that is supplied by Republic Services
Source: RRS

National PP Recovery by Republic Services

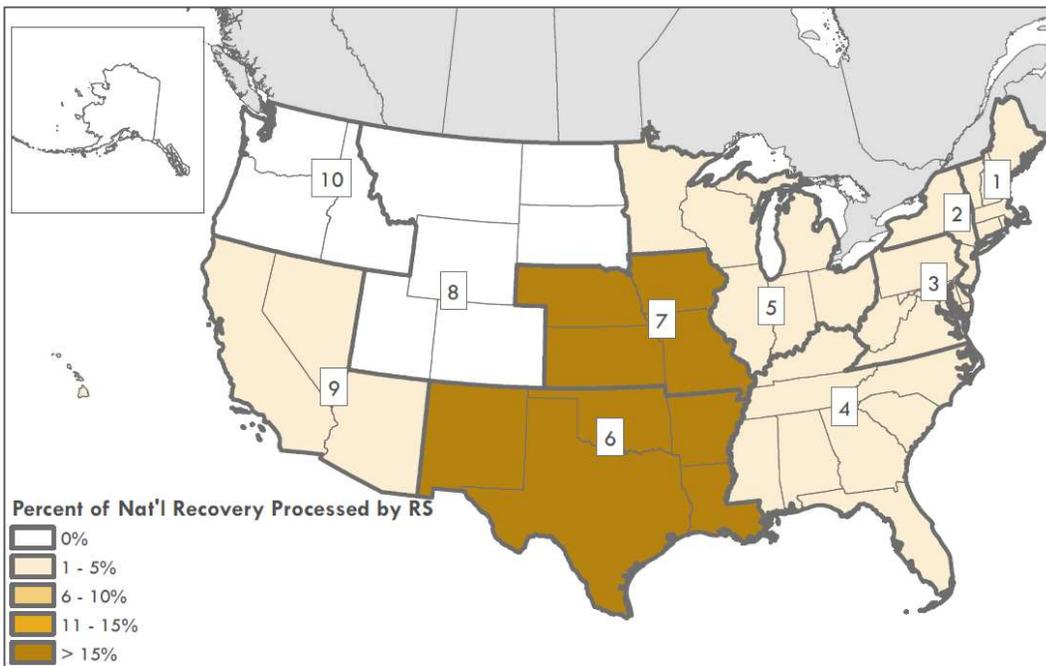


Figure 12. Percent of National PP Material Republic Services is Recovering by Region
Source: RRS

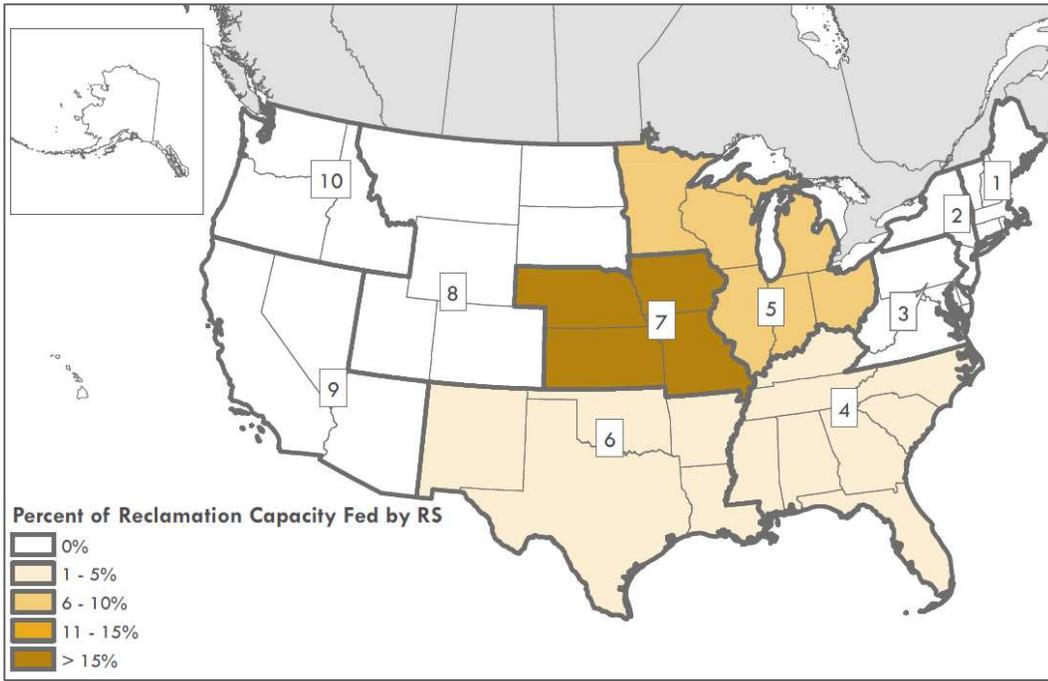


Figure 13. Percent of total PP Reclamation Capacity that is supplied by Republic Services
 Source: RRS

Plastic Material Flows (2019) by Republic Services

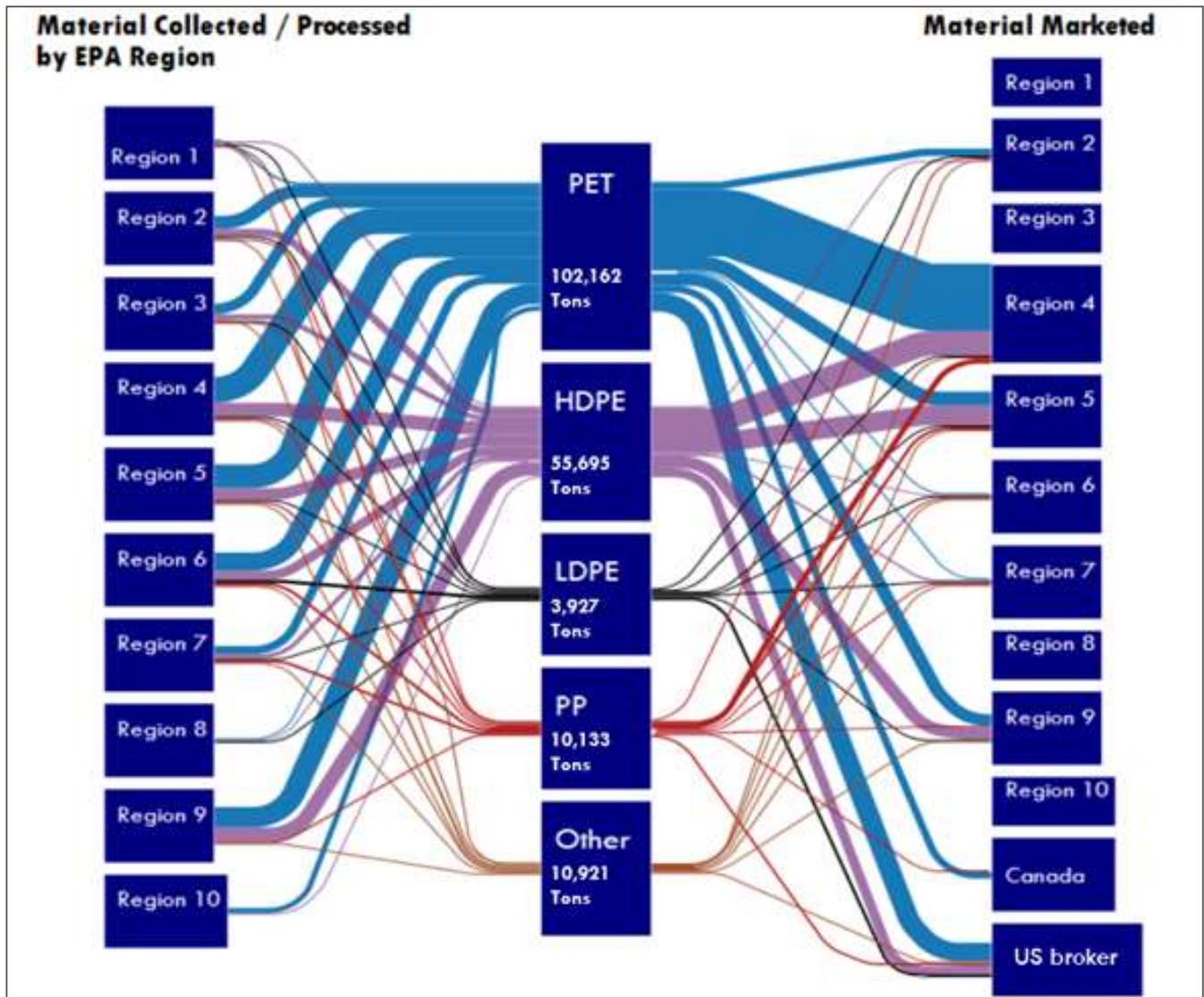


Figure 15. Republic Services Plastic Material Movement, 2019

Source: RRS

Challenges to Improving Plastics Recycling

One of our greatest responsibilities as a leading recycling and waste disposal company is managing a very complex and diverse waste stream. There are a number of barriers we, and other industry players, must overcome to do a better job of recovering, recycling, reusing, refurbishing and repurposing material in an effort to advance a circular economy. Specifically, efforts to successfully recover plastics from our nation's waste face systemic challenges – which are largely responsible, we believe, for the low figure of 17% plastic containers and packaging being recycled nationally.

Four primary factors continue to inhibit growth in plastics recycling in the United States, and additional context is provided on the following pages.

- Even before our collections work begins, consumers and users of recyclable materials must be able and willing to participate in the recycling process. We know some consumers who would very much like to participate are not given the opportunities to do so for a variety of reasons:
 - Recycling collection programs vary in their availability
 - Home-based recycling programs may miss single-use plastics that consumers use when away from home
 - Other consumers may lack the time, education, or interest to participate in recycling programs. Republic Services, as well as other players, cannot recycle what we cannot obtain.
- Governmental involvement in recycling is critically important. Municipal programs and guidelines can inhibit recycling not just by failing to provide programs, but by maintaining provisions that make them impractical, such as including acceptable materials that are known to have limited or no end markets. In addition, inconsistencies among jurisdictions make it harder for companies to create recycling facilities that rely on economies of scale and uniformity across locations, which results in higher operational costs.
- Demand for products made with recycled materials is still lower than would be ideal to fully ramp up programs. Limited end market and low bale prices could be addressed with more mandated use of recycled products. We support minimum recycled content policy and believe, particularly for plastic packaging, that recycled content standards are imperative to creating robust and durable end markets. Further, we support tiered implementation of recycled content standards, similar to California's recently passed AB 793 (Ting), which mandates 15% post-consumer content by 2022, 25% by 2025, and 50% by 2030. These levels of recycled content are consistent with other leading initiatives, such as the EU and UK Plastics Pacts, and many leading CPG voluntary goals.
- Without mandated recycled content in packaging, recovered materials need to compete with inexpensive virgin plastics, primarily produced from natural gas.

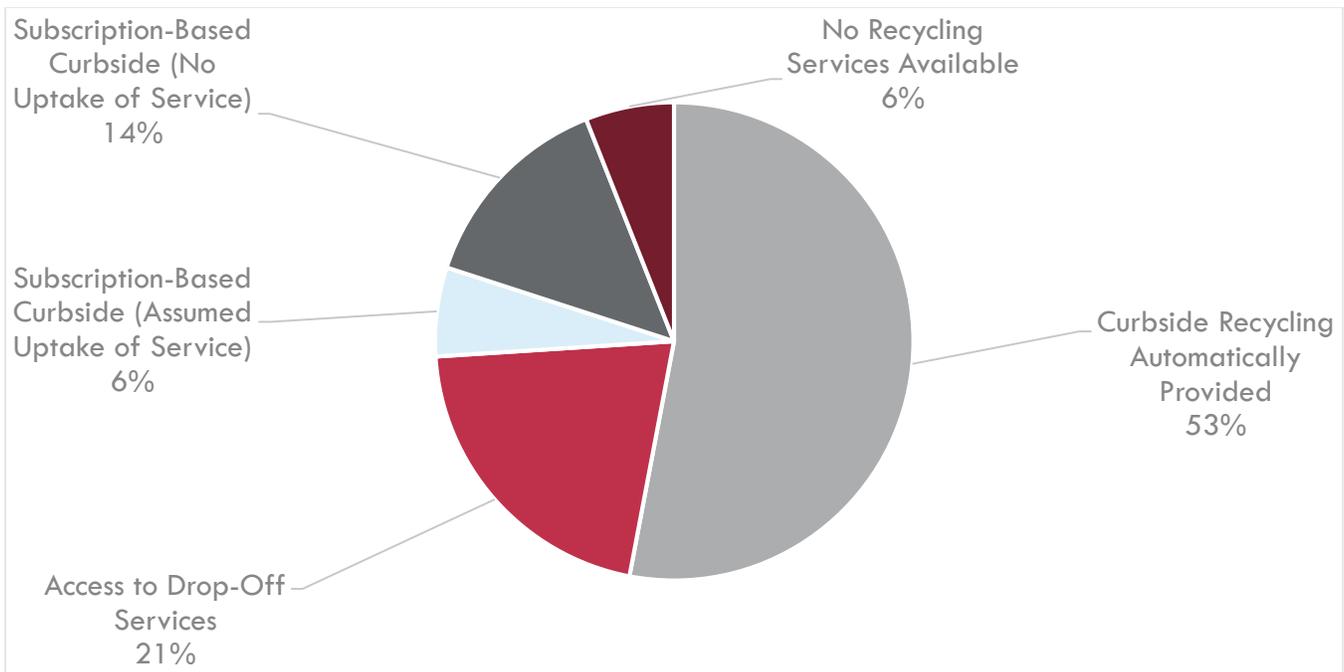


Figure 16. U.S. Household Access to Curbside Recycling
 Source: RRS/SPC 2015-2016

Across our industry, plastics recycling is inhibited by market and infrastructure gaps along the supply chain:

1. The first step in the post-consumer recycling supply chain is the resident who must have access to a recycling program, and then makes the choice to put the recyclable material in the correct bin. **Unfortunately, only 59% of U.S. households have direct access to recycling collection programs**, and not all of those with access are motivated to participate (Figure 16). Further, 20% of households have no service, or do not choose to subscribe, and 21% of households have access to drop-off programs only.
2. The supply chain can be constrained by end-market challenges. PET and HDPE bottles have numerous and consistent domestic markets; however, market demand for all but the highest grades are challenged to compete with virgin resin prices which are at historic lows (Figures 16 through 21). Domestic markets for other resins are limited, or simply do not exist. Some types of plastics require end markets that are within close proximity to points of origin – there simply is not enough value in certain grades to support transport of materials over extended distances (Figure 22).
3. While numerous end markets for PET do exist, it is most common for PET bottles to be converted to polyester fibers for use in carpet and textile manufacturing. Creating food-grade PET resins from recovered bottles is inherently more expensive than creating non-food-grade fibers. Without mandated post-consumer content in packaging, markets will typically solve for lowest-cost option (Figure 18).

4. For similar reasons, there is virtually no food-grade resin produced from recovered HDPE. It is most common for recovered HDPE to be converted into non-food grade bottles, such as home health and beauty packaging, and construction materials, such as piping and decking (Figure 20).
5. Historically, it had been common to export low-grade and low-value plastics to Southeast Asia. However, many countries in the developing world lack the necessary solid waste management infrastructure to adequately deal with such material. **Republic does not believe it is good public policy to export recovered plastic material to the developing world and is committed to not doing so.**

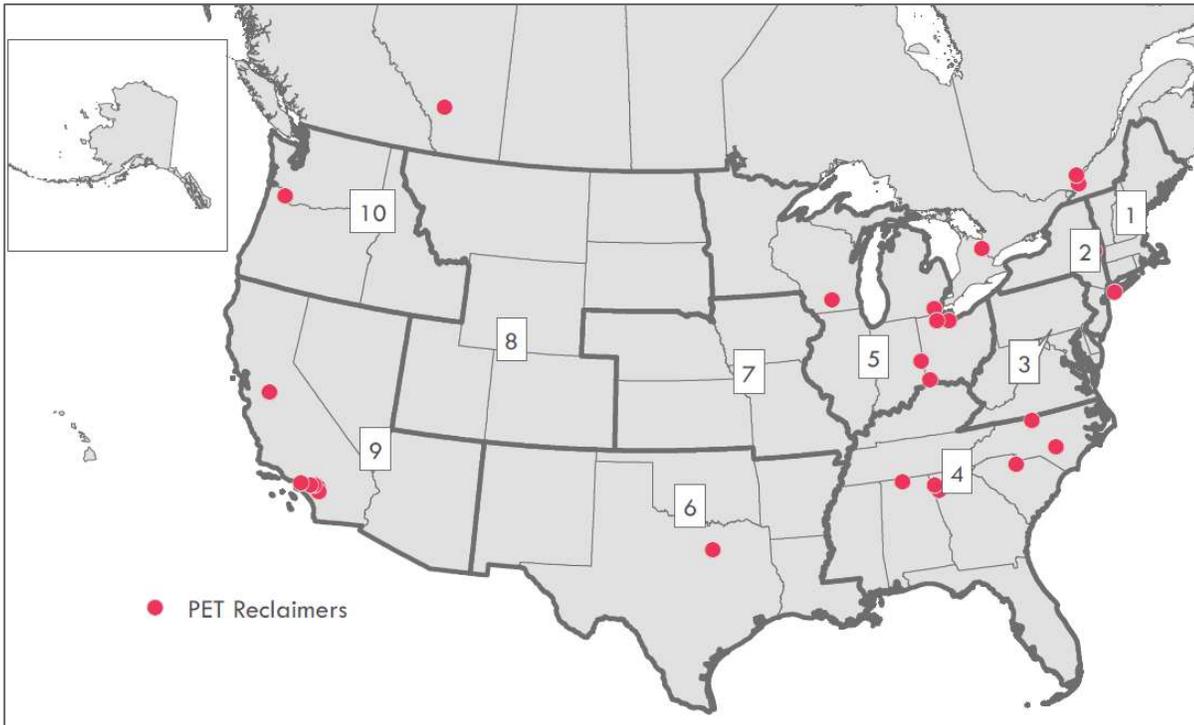


Figure 17. PET Reclaimers

Source: RRS

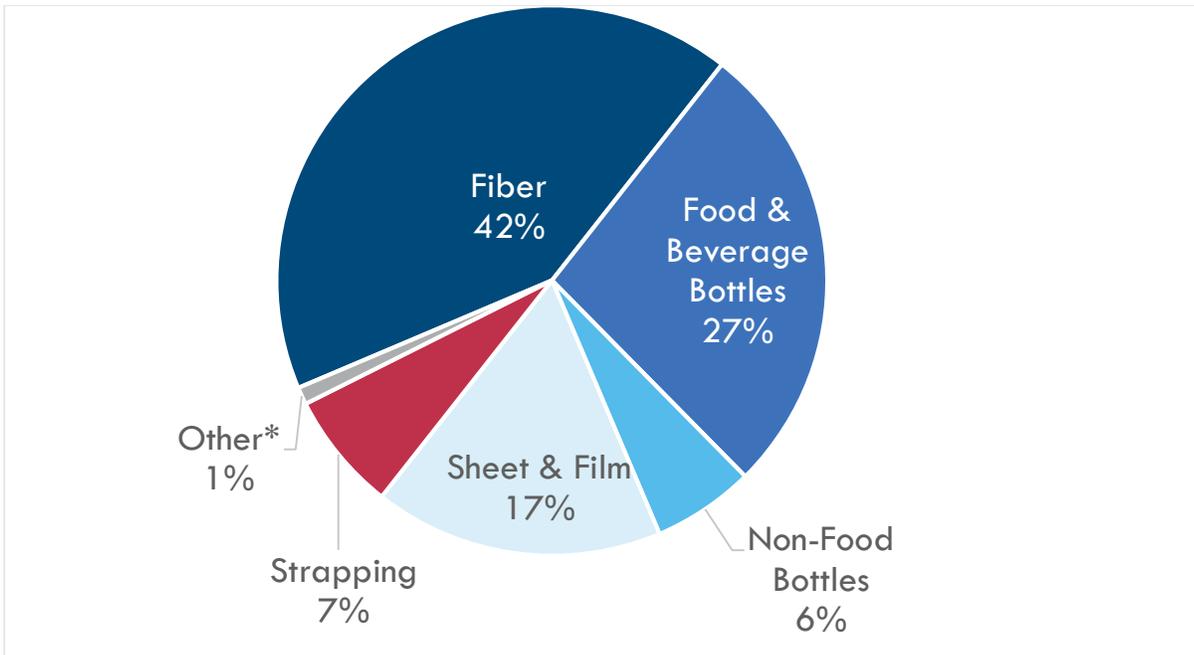


Figure 18. PET End Markets
Source: RRS

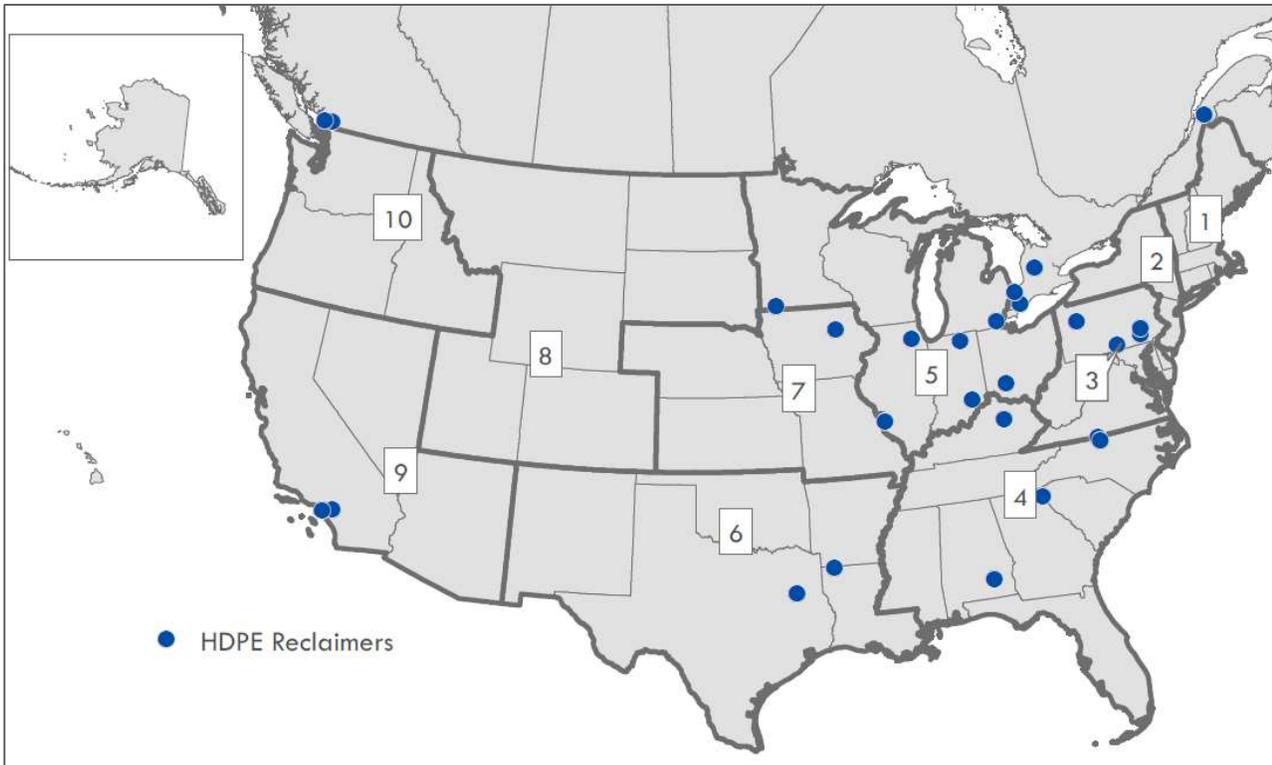


Figure 19. HDPE Reclaimers
Source: RRS

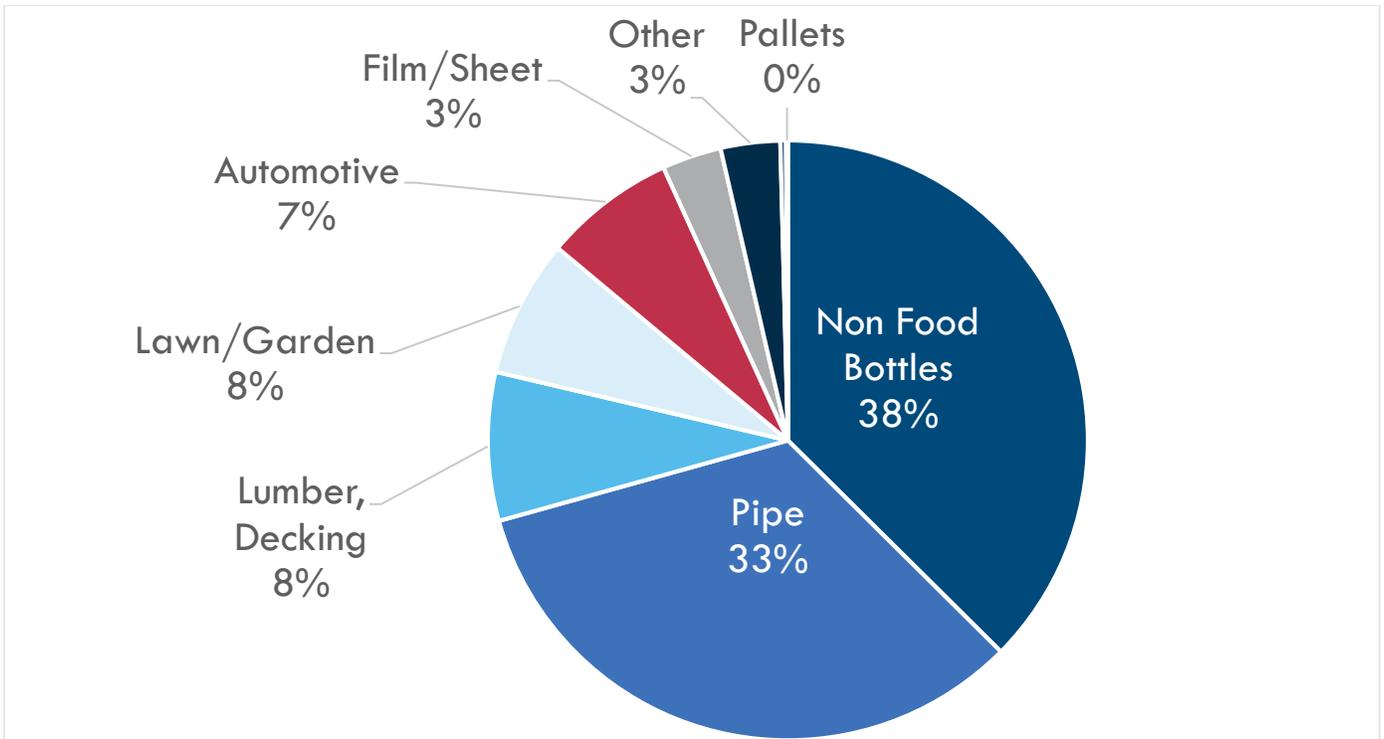


Figure 20. HDPE End Markets
Source: RRS

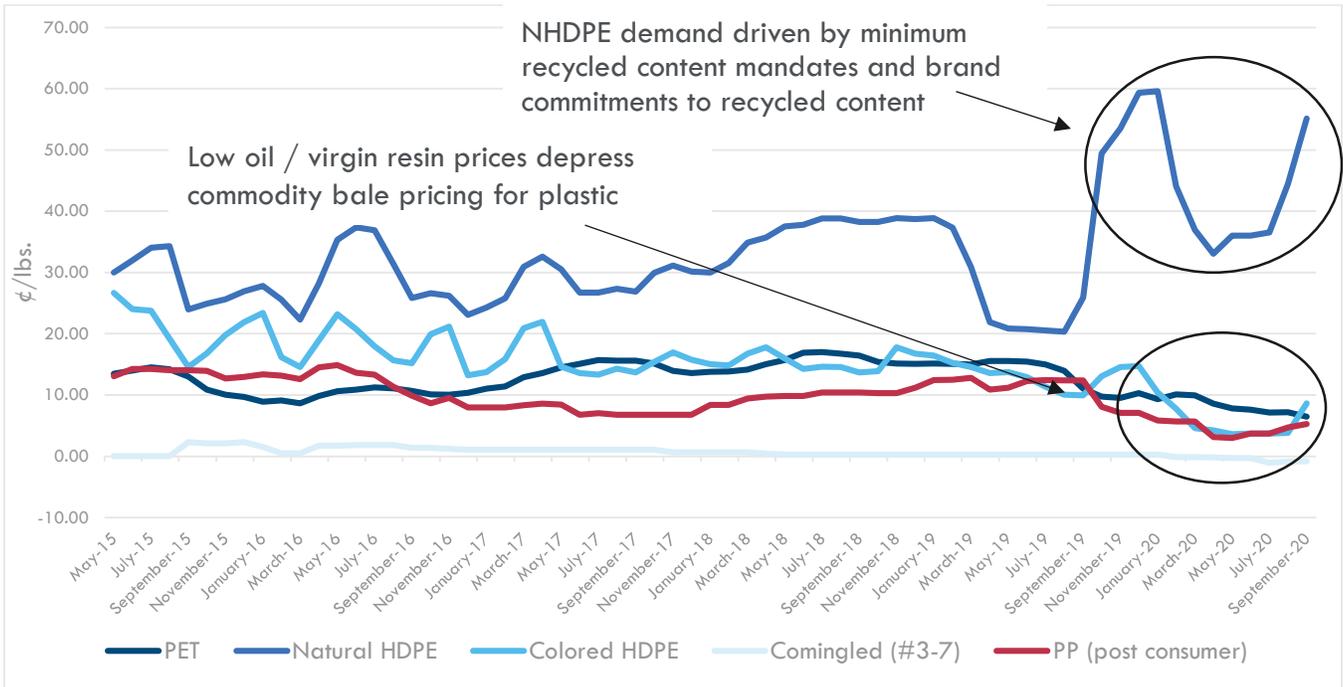


Figure 21. Recovered Plastic Commodity Prices
Source: RRS

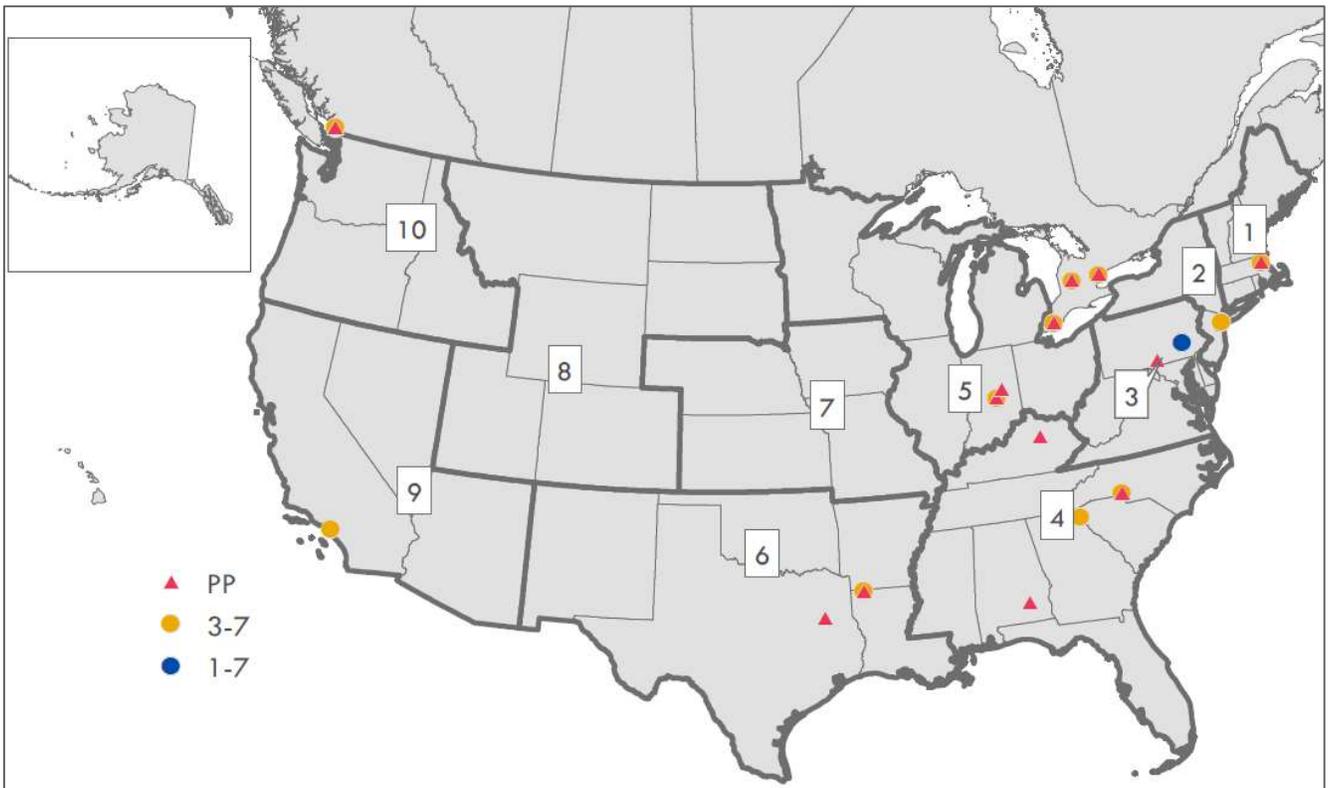


Figure 22. Limited Market Outlets for PP and #3-7 Plastics (refer to Fig. 17 for PET reclaimers and Fig. 19 for HDPE reclaimers)

Source: RRS

Driving Toward a Solution

In the face of limited consumer participation, conflicting and constricting regulations, and limited demand for recycled products, we are taking decisive actions to advance our sustainability goals and lead the finding and implementation of solutions. Our efforts are focused on **enhancing our recycling processing infrastructure, driving the circular economy through materials management, empowering the public with educational resources to support positive recycling behaviors, and supporting legislation to increase recycling.**

Enhancing Our Own Recycling Processing Infrastructure

From landfills and vehicles to equipment and buildings, we use our extensive assets to provide essential and valuable services to thousands of communities across the country. Whenever possible, we are committed to reducing our carbon footprint through the use of alternative and renewable fuels*, extracting resources from the waste stream and designing programs that help support the circular economy. In fact, in 2019, we were the first in the industry to have an approved science-based, greenhouse gas (GHG) emissions target to ensure we're doing our part to combat global warming.

Republic is committed to recycling for the long term, and we continue to invest in technology that increases efficiencies and maximizes the recovery of higher quality recyclables.

We are continually evolving our facilities to address consumer trends, including changing package designs and unprecedented levels of contamination. In 2019, Republic invested \$34 million in technology and equipment upgrades at 39 of our recycling facilities. We now have 79 recycling facilities, down from 91 the previous year, as we've consolidated the processing of nearly 6 million tons of recyclables to fewer and more advanced facilities to achieve better quality materials for our end-market customers.

Historically, the cardboard received at recycling facilities consisted of larger shipping cartons from commercial customers

With the rise in online shopping, our facilities have seen an influx of smaller boxes — referred to as the “Amazon Effect.” We're addressing this shift by installing new machinery that better captures smaller cardboard shipping boxes while also increasing separation and capture efficiency of containers, including plastic packaging.

We also continue to increase our use of optical sorters to scan and separate paper or plastics in milliseconds.

These optical units use near-infrared technology, like that used in night vision, along with digital cameras to identify recyclable materials and sort them quickly and more accurately than a manual process. We installed 19 optical scanners in our facilities in 2019. In Seattle, the addition of two optical sorters has already resulted in more high-quality paper recovered while ensuring the capture of other high-value materials such as aluminum and PET.

*More information about our fleet fuel management program may be found in our [2019 SASB Report](#)



Our Plano Recycling Center in Texas opened in 2019 and was recognized as the Recycling Facility of the Year by the National Waste & Recycling Association. This 77,000-square-foot, state-of-the-art facility serves more than 510,000 residents and 2,500 commercial customers. Highly advanced sorting technologies — including optical scanners and robots which recognize specified material in milliseconds — are used to process 350 tons of recyclable materials per day.

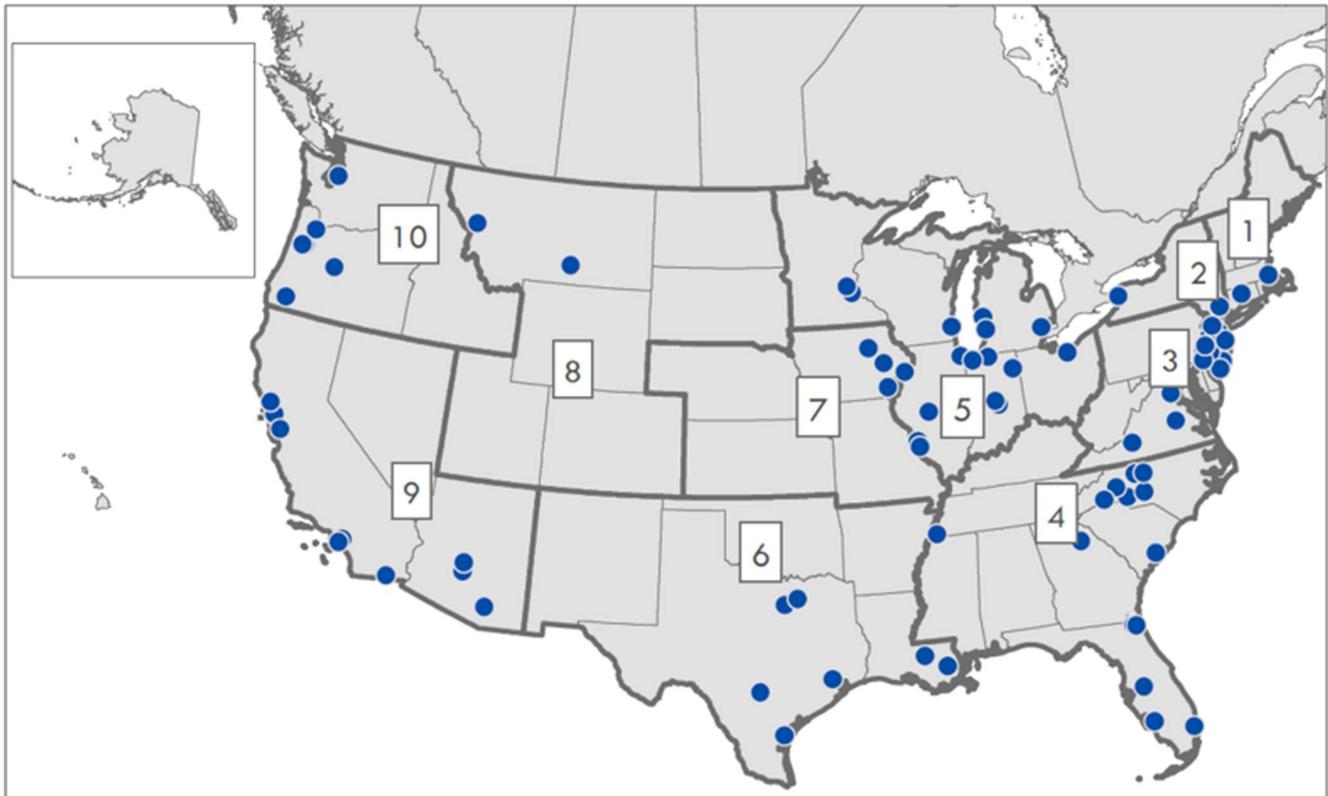


Figure 23. Republic Services Facilities by U.S. EPA Region
Source: RRS

Materials Recycling Facility Flow Analysis

Material Recovery Facilities consist of a variety of sorting and baling equipment to prepare recyclables for end market consumption. Recycling centers are categorized into the following tiers for this analysis:

- **Tier 1: State of the art recycling centers** which incorporate best available sorting equipment and configuration to maximize material recovery and implement advanced quality control to capture misdirected materials.
- **Tier 2: Recently upgraded recycling centers** that have installed optical sorting and advanced screening technologies to maximize materials recovery.
- **Tier 3*: Recycling centers to be upgraded in the next 2-3 years**
- **Tier 4**: Other recycling centers**

* Tier 3 planned investment does not necessarily denote a future Tier 1 or 2 facility

** Tier 4 centers primarily serve as aggregation points and are not subject to technology upgrades due to insignificant volumes

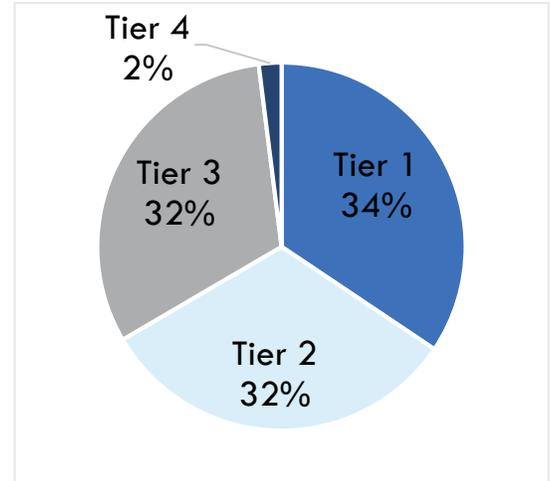


Figure 24. Republic Services 2019 Inbound Tons by Tier Source: RRS

Republic’s materials flow is fairly evenly split between facilities in Tiers 1, 2 and 3, with only a small amount (2 % of throughput) flowing through Tier 4 facilities. A breakdown of the volumes by Tier is provided in Figure 24, and by Tier in each EPA region is provided in Figure 25.

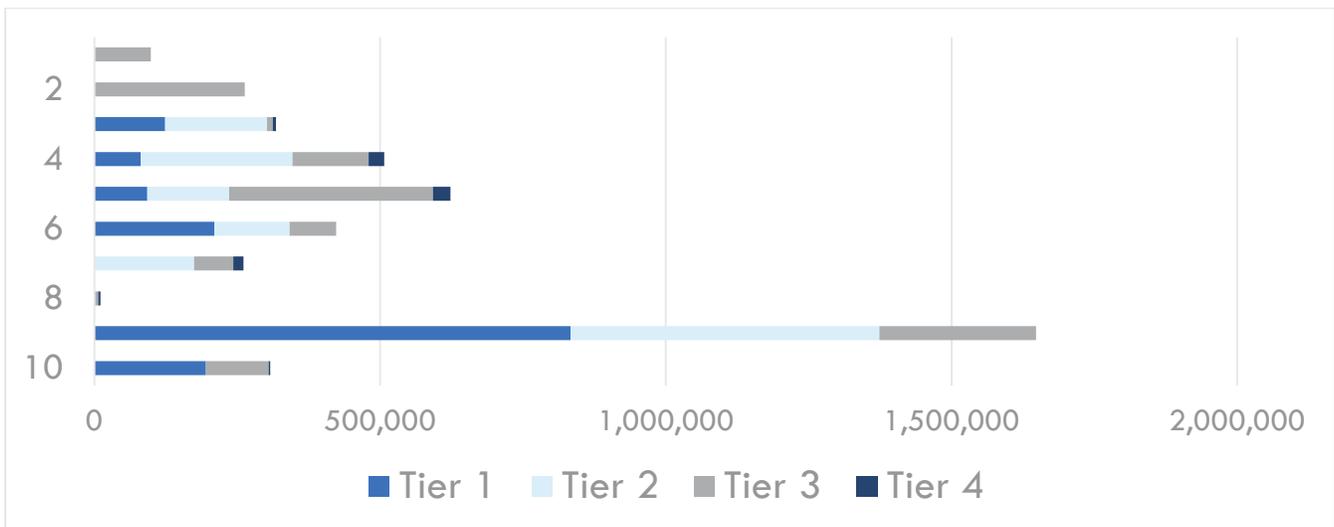


Figure 25. Republic Services 2019 Inbound Volume by Region and Tier Source: RRS

Republic Services' Significant Investments to Improve Plastics Recycling

Our recycling facilities provide the infrastructure and market reach to make a substantial impact on the recovery of valuable materials from the ever-evolving waste stream. Excluding temporary extenuating circumstances (such as weather impacts), we process all of the volume we collect as recyclable material. This totals roughly 6.0 million tons of recyclable materials per year, making us one of the largest processors of recovered residential and commercial recyclables in the world. By recycling these recovered commodities, we are helping reduce lifecycle greenhouse gas emissions. Today, recovery of these materials amounts to approximately 18 million metric tons of avoided carbon dioxide equivalents (MTCO₂e) per year. But the challenge is larger than greenhouse gas emissions.

The mining and growing of raw materials, combined with the processing, manufacturing, and distribution of products from these various materials to markets worldwide, results in a wide range of additional harmful environmental and human health impacts. These include water and air pollution, energy and land use, and habitat destruction. When coupled with the population's increasing global resource consumption, the positive benefits of recycling become even more significant.

Republic made nearly \$63 million in investments in 91 projects that improved the recovery of plastics in 26 facilities in the years 2017, 2018, 2019, and 2020 (through August). Our investments in recyclable plastic comprised more than 30% of our total recycling facility capital investments during those years.

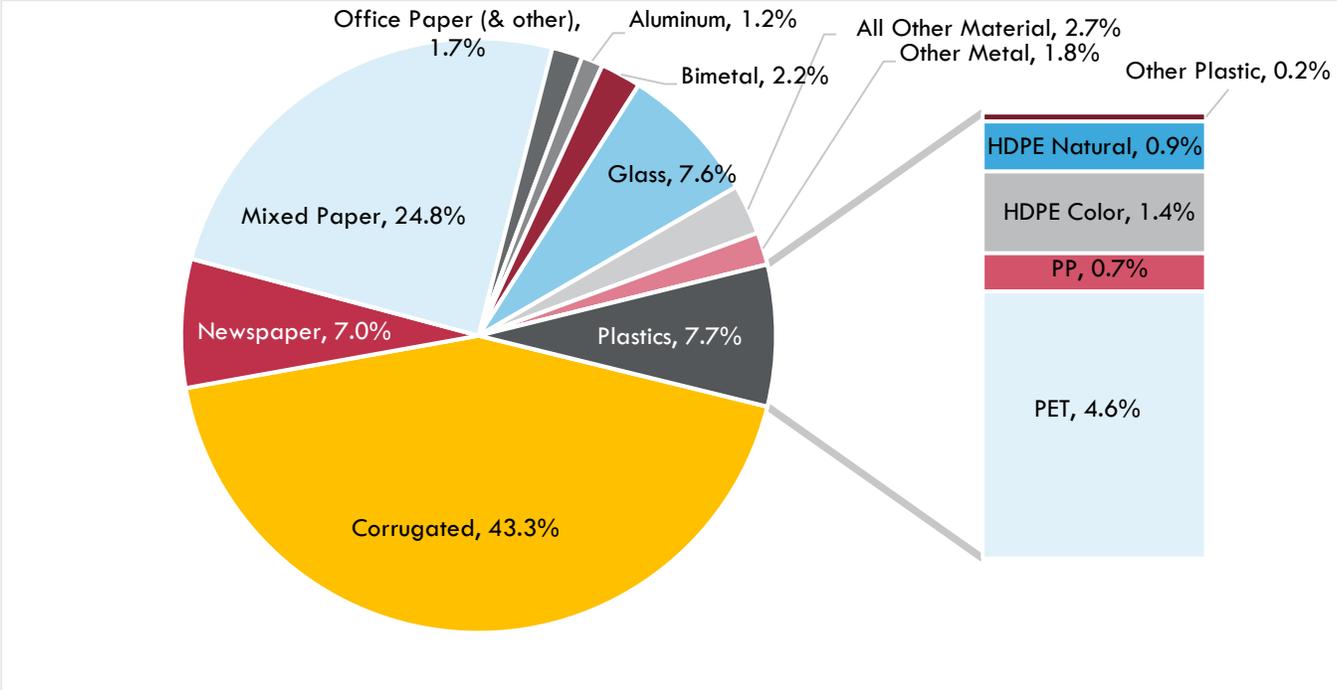


Figure 26. Republic Services Commodity Sales Composition (refer to Figs. 18 and 20 for End Market Uses)
Source: RRS

More than 58 percent of Republic's plastics-related investments during this time were in the Tier 1 facilities that handle one-third of the company's throughput (Figure 27).

Our investments fall into the following categories:

- **Processing System Improvements**, including overall line improvements to maximize recovery and minimize material loss, including, but not limited to drum feeders for uniform material flow, larger conveyor belts for greater visual recognition, and upgraded control packages for real-time system tuning.
- **OCC Screens** that more efficiently remove containers and other fibers from OCC.
- **Fiber Screens** that more efficiently remove containers from paper.
- **Container Sorting Equipment**, including optical and robotic sorters, to more effectively sort containers.
- **Additional Capacity**, such as new balers or tip floor expansions, to facilitate additional throughput.

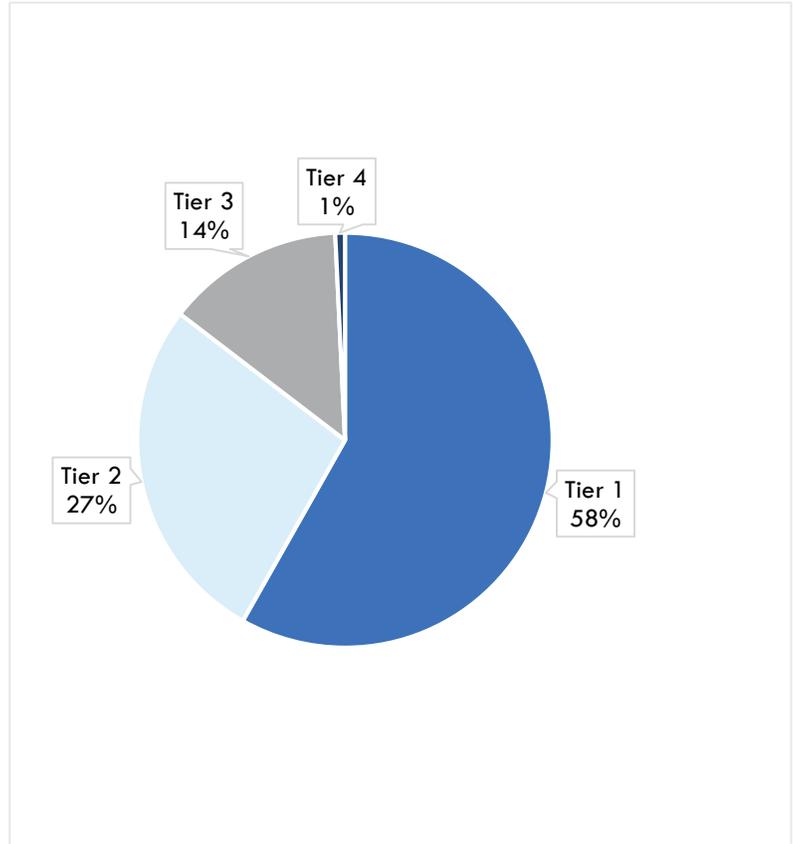


Figure 27. 2019 Inbound Tons by Tier
Source: RRS

Process system improvements make up the largest category of plastics-related investments, followed by container sorting and fiber screen investments largest.

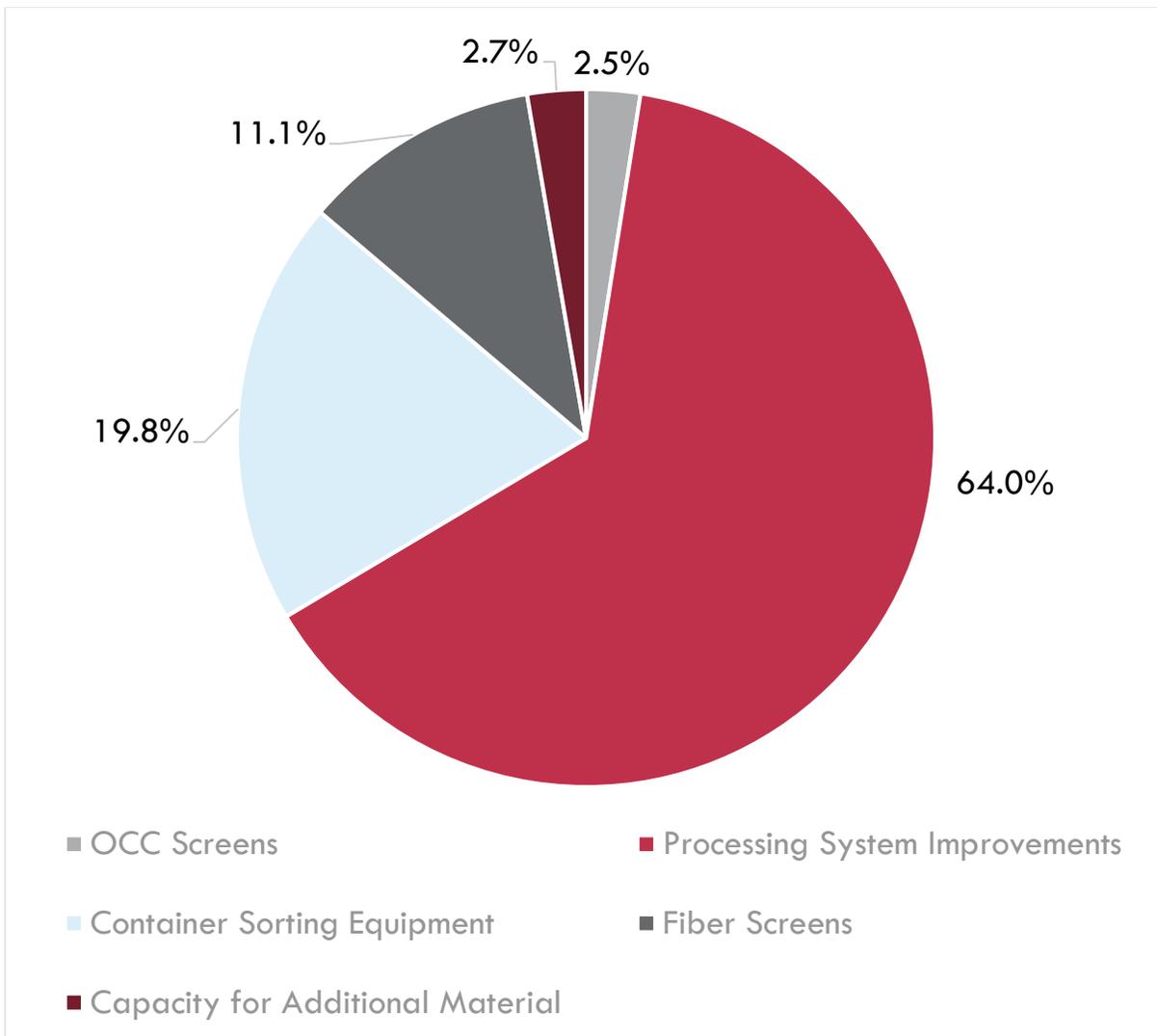


Figure 28. Plastics recovery investment by type
 Source: RRS

Republic is steadily investing in technology that is able to separate and capture plastic material at high rates with high precision.

Through our efforts, we successfully increased the recovery and resale of targeted commodities (cardboard, metals, plastics, organics, biogas and oil) to over 4.5 million tons last year, a notable achievement given the difficult market drivers for recycling in 2019. This marks a 2.5% increase in recycling since 2017. We accomplished this in part by increasing our focus on food and yard waste recovery and ramping up our investment in traditional recycling to improve the quality of recovered materials.

One of our long-term sustainability goals is to increase recovery of key materials, including plastics, by 40 % on a combined basis by 2030 (2017 baseline). Through the achievement of this goal we hope to:

- Increase the amount of recovered commodities available for remanufacturing;
- Mitigate the associated negative impacts of virgin materials;
- Reduce upstream impacts of drilling through oil recovery technologies; and
- Significantly reduce lifecycle greenhouse gas emissions associated with recovered commodities.

More information about this sustainability goal, in addition to our oil recovery technologies, can be found in our 2019 Sustainability Report at republicservices.com/sustainability.

Changing international market demand for recycled commodities has caused severe volatility in commodity prices since 2018. Despite the international policy changes that have severely curtailed exporting materials to several foreign markets during this time, we have utilized innovation to help sharpen our focus on recycling key commodities to drive the circular economy.

As a result, we've optimized and improved our efficiency in recovering materials, selling 2.2 million tons of recyclable materials in 2019, excluding glass and organics (which accounted for an additional 975,000 tons). We also collected and delivered an additional 2.2 million tons of materials to third parties for processing during this time. It is worth noting that average residential curbside recycling contamination rates in the United States hover around 20%. Please refer to the section below regarding our public education and outreach efforts to reduce contamination.

On a positive note, investment in domestic paper mills is occurring for the first time in decades, creating a need for high quality cardboard and mixed paper in North America to feed manufacturing. For the past two decades, China has been the largest importer of recovered commodities from around the globe. Today, Republic exports less than 1% of our processed materials, which is entirely cardboard, to China.

Plastics Account for Approximately 8% of the Total Recyclables We Sell

While most of the plastics Republic recovers have historically been sold to domestic commodity buyers, we eliminated the export of plastics to all overseas markets in late 2019. This means we only have direct sales relationships with reputable North American customers. Keeping recovered materials within our country has many sustainability and economic benefits, from reducing the carbon footprint of overseas shipments to bolstering domestic jobs and production.

Of the total recyclables we sell, only 7.7% are plastics, and 88% of these plastics are #1 polyethylene terephthalate (PET), #2 high-density polyethylene (HDPE), and #5 polypropylene (PP), which have durable end markets. The remaining 12% (plastics #3, #4, #6 and #7) are "end of the line" plastics that currently have limited or no end markets, and we believe the most responsible form of management, particularly from a climate perspective, is landfill.

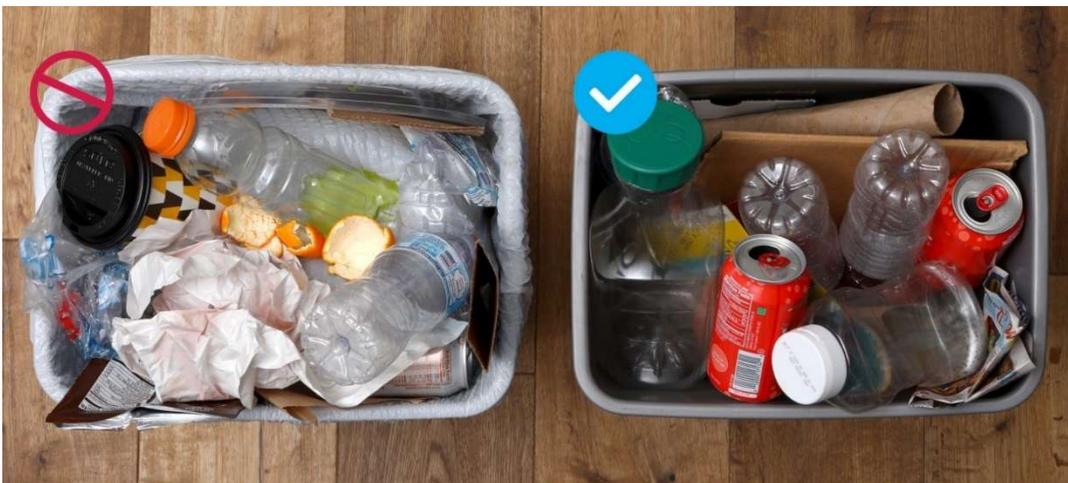
Due to our size and scope, Republic is in a unique position to play an important role in addressing concerns around plastic waste. We are actively analyzing multiple business models to help drive higher recovery and circularity and will disclose additional information in the future as these programs mature.

Working to Achieve Better Access to—and Participation In— Recycling Programs and Greater Demand for Recycled Materials

As much effort as we put into being a leader in recycling practices, we cannot achieve the progress we'd like without greater consumer participation and consistent demand for recycled material. Therefore, we leverage our expertise and our policy platform to make a positive difference to these important externalities.

Public Education and Outreach to Increase Plastics Recovery and Recycling

Recycling *Simplified*



Launched in 2018, Republic's *Recycling Simplified* consumer education campaign ([RecyclingSimplified.com](https://www.RecyclingSimplified.com)) promotes positive recycling behaviors and provides many educational resources for customers. The campaign won the 2019 Best Recycling Public Education Program Award from the National Waste & Recycling Association, which recognizes innovators and leaders in the industry who have made substantial contributions to American recycling through partnerships, public education and innovations in recycling facilities. Winners were selected by a panel of judges who are professionals in the waste and recycling industry as well as from other technology and education organizations.

After the launch of the Recycling Simplified initiative and a supporting national public relations campaign, we executed a \$2 million multichannel marketing campaign in 2019 in six cities to further reduce contamination rates by focusing on what and how to recycle correctly. The local campaigns employed radio ads, billboards and social media to reach residents. In two of the markets, pre- and post-campaign audits were conducted on

residential recycling routes to gauge the effectiveness of the marketing. Contamination rates decreased significantly in both communities.

In addition to Recycling Simplified, we have implemented targeted education campaigns to test approaches to reduce contamination and shared the outcomes of those campaigns with municipal partners.

To further help our stakeholders better understand how Republic Services responsibly manages recycling and non-hazardous solid waste, we have developed educational infographics that illustrate and explain the different processes related to our business, published in our 2019 Sustainability Report.

Engaging with Our Customers, Communities, Municipalities, and Organizations

In addition to our educational outreach, we work with our customers and communities to further our recycling and sustainability initiatives. We actively listen to our customers to anticipate and respond to their wants and needs. For example:

- We make on average 5 million pickups per day across the United States. These range from multi-national companies with multiple sites across the U.S., to “mom and pop” local businesses; from large municipalities representing millions of residents to single, rural homeowners. Each and every customer is encouraged to directly engage with Republic to share feedback through various publicly available communication channels. In addition, we proactively seek input directly through our sales and customer service channels.
- We actively participate in industry organizations, including the National Waste & Recycling Association, Institute of Scrap Recycling Industries, Environmental Research and Education Foundation, and many other national, state and local governmental and non-governmental organizations (NGOs).
- We routinely solicit feedback and reflection through focused interviews with select customers to better understand their perspective on key sustainability issues for Republic and their communities.

Bottom line, we’re committed to every customer we serve, and that commitment is strengthened through our collaborative partnerships with local municipalities serving the interests of their communities. We are able to enhance our understanding of both local and global trends impacting our business, customers, and communities around the world through these partnerships and programs.

We also reach out to NGOs, who often are leading the charge with scientific expertise on various sustainability issues. These include, but are not limited to, the National Waste & Recycling Association and Solid Waste Association of North America. It is important to us to understand these issues through the broader perspective that NGOs typically bring, as well as the deep dive that they are able to offer on specific issues. We look to partner with NGOs where interests align.

Working with our Supply Chain Partners

We believe it is important to engage with both downstream and upstream supply chain partners to help us better understand risks and opportunities for us as well as our stakeholders. It also provides us with an

opportunity to influence and educate our partners when and where we see gaps in sustainability activities. When possible or needed, we engage with our supply chain partners to mitigate risks, take advantage of opportunities and/or strengthen our partnerships.

Supporting Legislation to Increase Recycling

Many collective recycling goals that we and others would like to achieve are dependent on both governmental support and the removal of governmental barriers. We routinely analyze and look to support legislative and regulatory changes that are designed to encourage and facilitate more recycling programs, support greater use of post-consumer content in products and packaging, and fund more recycling education. In many cases we do this by maintaining collaborative relationships with legislators, regulators, and other public policymakers, and sharing information as appropriate for the greater good. We intentionally focus on substantive content, avoiding partisan politics as much as possible. In general, we support initiatives that:

- Fund research on the creation of more and more-easily recycled materials;
- Increase public education on how consumers can recycle and why they should want to do so;
- Encourage governmental bodies, as purchasers themselves, to favor post-consumer content;
- Create minimums for post-consumer recycled content for fiber, glass, metal and plastic packaging that align with those proposed by the Ellen MacArthur Foundation, including:
 - All major packaging components should be 100% recyclable, reusable or compostable.
- Encourage content levels that align with progressive existing policies, such as California's AB 793:
 - Plastic packaging should contain a minimum of 25% post-consumer content by 2025 and 50% by 2030.
- Consider favorable tax treatment for companies using post-consumer content;
- Encourage 'Design for Recycle' and harmonization of material substrates and package forms, as well as consistent labeling.

Extended Producer Responsibility (EPR) Programs

The potential for extended producer responsibility programs as a possible alternative funding mechanism has become a hot topic in the industry, yet there are a multitude of forms an effective EPR program could take. Republic Services believes any EPR program must be considered within the context of overall recycling programs, and we are engaging in discussions about its potential with a number of stakeholders. We - support the EPR concept with the following qualifications:

1. Programs that support and strengthen existing systems, including funds for infrastructure;
2. Consideration of end-market development, including minimum recycling content standards;
3. State and local control of recycling programs, EPR programs should not put other elements of existing recycling programs at economic or operational peril;
4. Application of design for recycle principles in all acceptable materials;
5. Manufacturers/brands are responsible to fund programs, not municipalities or consumers;
6. EPR Programs should be administered by a Stewardship Responsibility Organization (SRO) consisting of government, recycling collectors, recycling processors, producers, and brands. The SRO should distribute funds to local governments to support recycling programs.
7. Legislation should place responsibility on SRO for harmonizing lists of recyclable materials, encouraging investment in end-market infrastructure, coordinating education and enforcement, and enhancing existing programs.

Filling the Gaps and Moving Forward

As the multi-faceted programs summarized in this section reflect, we are making capital investments to innovate and enhance our ability to sort, recycle, and repurpose the material we collect. But we are doing more than that. We are also working on many fronts to fill the gaps and remove the barriers to our society's overall recycling efforts by:

- Helping to educate, motivate and incentivize consumers;
- Working closely with supply chain entities and other partners;
- Encouraging best practices by entering into long-term contracts with parties that share our focus on recycling;
- Informing governmental deliberations and encouraging provisions that effectively and reasonably support recycling; and
- Working collaboratively with appropriate partners to strengthen end markets.

Some of our notable achievements are highlighted below.

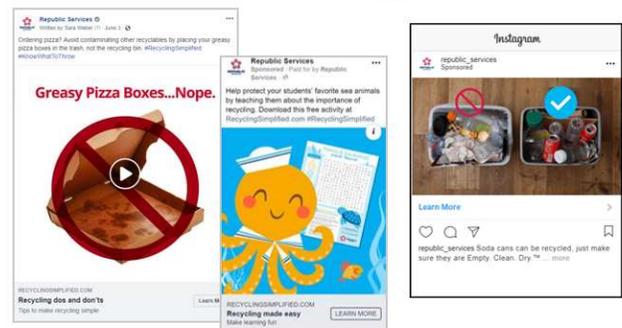
Recycling Education PR and Digital Marketing

National and Local Media



- Over 2B impressions
- National media: Time, Reader's Digest, Huffington post
- Local Media in key target markets

Facebook and Instagram Ads



- Over 8M impressions
- Ads targeting millennials, gen Z and educators
- Engagement rate 4x greater than previous year

Out-of-Home and K-12 Education

Billboards, Radio, PBS TV



- Over 30 million impressions
- 75 billboard locations and 33 radio stations
- 164 PBS TV commercials (:15)

Lesson Plans for Every Grade



- PreK-12 recycling education plans
- Meets curriculum standards for Science, Social Studies and English
- Available on RecyclingSimplified.com

Recycling Education Collateral

New Simplified Cart Label



Educational Cart or Door Tags



We've also developed several other types of educational collateral with similar messaging:

- Postcards
- Refrigerator magnets
- Newsletter articles
- Emails templates
- Posters
- Brochures
- Bill inserts
- Small wastebasket labels
- Print ads

We invite you to share your ideas with us and set your own best practice standards to join us in supporting these continued efforts.