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RECYCLINGPARTNERSHIP.ORG

Response to Request for Information: Oregon Statewide Material Recycling Collection List

The Recycling Partnership
3/18/2022

The Recycling Partnership is pleased to submit this response to Oregon DEQ's Request for Information (<https://www.oregon.gov/deq/recycling/Documents/MaterialList-Rfl.pdf>) regarding a statewide material recycling collection list. This response provides detailed information on polypropylene packaging and additional general input on three other materials: PET thermoform packaging, pizza boxes, and paper cups.

Thank you for the opportunity to submit this information. Any questions or needed clarifications regarding The Recycling Partnership's input can be addressed to Scott Mouw at smouw@recyclingpartnership.org or Liz Bedard at ebedard@recyclingpartnership.org

Material Focus: Polypropylene

Based on the technical criteria submitted below, The Recycling Partnership urges Oregon DEQ to include polypropylene container packaging on its statewide recycling collection list. Polypropylene (PP) is an established and growing packaging material used in a variety of formats. PP containers are generated at levels comparable to other common recyclables and are proven to be sortable at MRFs. PP also has proven domestic markets, which will be further strengthened by the market dynamics of brand company content goals and state-level content requirements. Our technical input for Section 22 criteria is presented below:

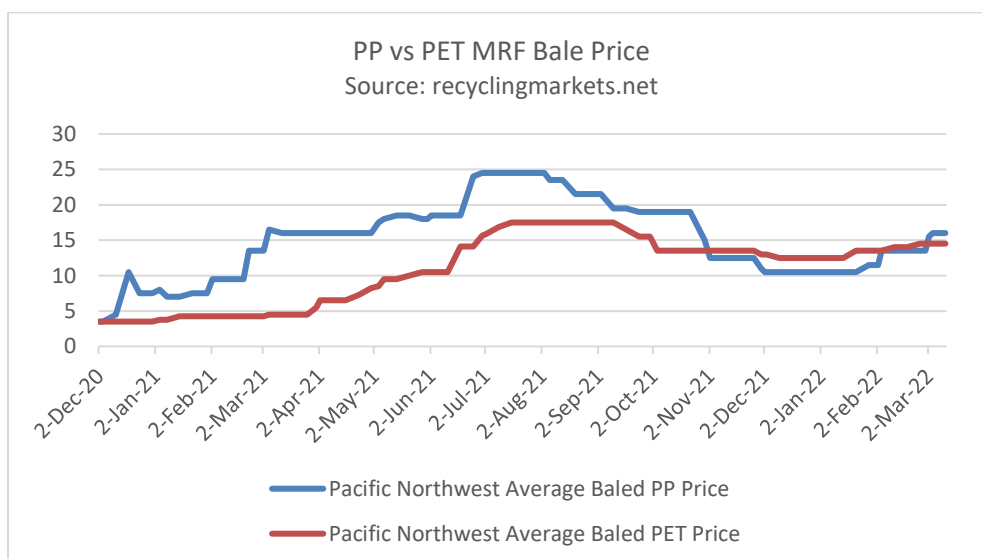
(a) The stability, maturity, accessibility, and viability of responsible end markets

Market price data is an important indicator of a material’s recyclability status. Price data from recyclingmarkets.net displays a notable and sustained rise in pricing for sorted and baled PP since December 2020. Although West Coast pricing lags stronger pricing for other regions, Pacific Northwest regional pricing provides solid evidence of market demand.

Figure 1 below compares PP pricing with PET for the Pacific Northwest. We recognize that much of PET is collected through deposit in Oregon, but for the PET that does go through MRF processing, PP prices track positively with this established commodity, in most months exceeding PET pricing. It is important to bear in mind that recyclingmarkets.net reports prices as “picked up” (freight-on-board at MRFs) so it encompasses the price effects of freight. PP has enjoyed an average market price \$300/ton over the last 14 months, well exceeding typical MRF processing costs of around \$90/ton and providing a robust return-on-investment case for the sortation of this material.

As with all recyclable commodities, PP could see price swings over the coming years. However, long-term market fundamentals, in particular regarding brand commitment to recycled content in PP packaging (discussed further below), provide a foundation of market value for PP.

Figure 1: Pacific Northwest PP vs PET MRF Bale Price



Oregon does not have in-state PP reclamation capacity and in general West Coast domestic recycling capacity for PP is not currently as well developed as it is in other parts of the U.S. However, that could change as PP becomes a mainstream acceptable plastic on par with PET and HDPE and as supply grows that in turn spurs and justifies PP reclamation investment. Some West Coast reclaimers for PP are indicating plans to add equipment to accommodate more PP feedstock and other recent developments demonstrate additions of reclamation capacity in Western states.¹ If PP feedstock is not available because of exclusion from Oregon or other West Coast collection lists, it could undermine potential reclamation development.

It is important to also note that PP is a commodity with established national market specifications. The Institute of Scrap Recycling Industries (ISRI) includes a marketable commodity standard for PP that incorporates quality considerations in its Scrap Specifications Circular: <http://www.scrap2.org/specs/40/>

(b) Environmental health and safety considerations

The Recycling Partnership has no technical input on this criteria.

(c) The anticipated yield loss for the material during the recycling process

As with any other material, PP can be lost in MRF processing when it is not targeted as a sortable commodity. However, applicant submittals to The Recycling Partnership’s Polypropylene Recycling Coalition grant program show that PP yield loss to residue or to lower value mixed plastics can be effectively addressed.² Figure 2 displays data on four of the first PP Recycling Coalition grant recipients that provides strong evidence of success in establishing PP as a specific sorted material.

Figure 2: Creation of Sorted PP Tonnage by Polypropylene Recycling Coalition Grant Recipients

MRF	PP Loss Pre-Grant Project	Technology/Approach Deployed to Address PP Loss	Annualized tonnage of new PP capture
MRF 1	PP not formally accepted; 40% of incidental PP sorted to low value mixed plastic and 60% lost to disposal	PP now formally accepted; Robotics applied on new plastic conveyor line	564 tons per year of sorted PP
MRF 2	PP sorted to low value mixed plastic	Optical sorter dedicated to PP sortation	563 tons per year of sorted PP
MRF 3	PP not formally accepted; incidental PP lost to disposal	PP formally accepted; Robotics applied on retrofitted conveyor	447 tons per year of sorted PP
MRF 5	PP treated as a contaminant and discarded in residue	Optical sorter dedicated to PP sortation	260 tons per year of sorted PP

¹ An indication of positive momentum in olefin reclamation investment in the West is found in the announcement of a Polymer Center by Republic Services, which also operates the MRF in Bend, OR: <https://resource-recycling.com/plastics/2022/03/01/republic-services-moves-to-vertically-integrate-in-plastics/>

² The Polypropylene Recycling Coalition is an industry collaboration bringing together stakeholders across the polypropylene (PP) value chain – resin suppliers, manufacturers, consumer packaged goods, and recycling processors – to improve polypropylene recovery and recycling in the United States and further develop the end-market of high-quality recycled polypropylene. The Coalition has released \$5.33 million in total funding committed to date in 17 grants covering 18 MRFs, with a projected increase in national PP recycling access rate of 6.4%.

The PP Recycling Coalition continues to offer grants to facilitate MRF PP sortation. To date, 18 facilities have received funding and projects are underway. We anticipate grantee reports will continue to demonstrate that investment in PP sortation equipment can effectively address MRF yield loss and deliver solid economic returns.

Little data is available on reclaimer yield loss. As with PET, reclaimers received commodity bales that contain materials that will not be converted to a final “pure” flake or pellet. Private estimates indicate reclamation bale yield loss for PP to be around 33%, which is comparable to PET. It must be noted that maximizing yield is in the business interest of reclaimers and even with this yield loss, the recycling of PP is economically proven.

(d) The material’s compatibility with existing (Oregon) recycling infrastructure

A review of Web-posted information by Oregon-based MRFs reveals mixed results for PP acceptability currently. One Portland area MRF accepts “plastic containers” that includes “#5 – Plastics – Dairy tubs.” Indirectly, community acceptance lists indicate MRF acceptance of PP in the Bend/Deschutes County area. Although most other Oregon-based MRFs focus acceptance on “bottles only” or “bottles and jugs,” acceptance by two MRFs indicates strong potential for broader PP acceptance, which is reinforced by PP acceptance at the MRF in West Vancouver, WA (significantly, 80% of Washington state MRFs show PP acceptance).

These data points demonstrate a baseline level of compatibility for PP with existing recycling infrastructure in Oregon and the Pacific Northwest. As The Recycling Partnership has found with its PP Recycling Coalition grant program, compatibility is dynamic and can be built through capital interventions in MRFs that did not previously have PP sortation capability. PP was largely incompatible with the State of Ohio’s recycling infrastructure until Coalition granting created a change in MRF sorting capacity that now makes PP accepted across the majority of households in the state.

The Recycling Partnership has created a Web-search platform that tracks and characterizes material acceptance in recycling programs across the U.S. A review of the information in this database indicates that PP is already accepted in geographic areas covering 60 percent of single family Oregon households. While there is little reference to PP or #5 plastics specifically, formats described in text and imagery demonstrate that main PP formats are accepted. This is another indicator of baseline compatibility for PP with Oregon’s recycling infrastructure. A review of the database for the State of Washington reveals 72 percent PP acceptance for single family homes, a clear sign of regional compatibility. With this level of baseline acceptance, failure to add PP to the state list will confuse consumers who are already enjoying access, potentially undermining public trust in the recycling system.

(e) The amount of the material available

The Recycling Partnership conducts capture studies examining parallel samples of waste and recycling streams that allow us to project commodity-specific household material generation. PP is a common consumer packaging material that is present in household generation at levels comparable to or exceeding other plastic materials commonly accepted for recycling.

Figure 3 provides the overall averages from capture study data ranking plastic containers in single family households on a per household basis. The Figure further uses this data to extrapolate tonnage for Oregon based on the state’s single family household numbers. It shows that PP packaging ranks second among common plastic recyclables in pounds/household and in projected tonnage for the State of Oregon. It ranks highest of materials

not typically covered by deposit and is generated at rates 69% higher than HDPE natural bottle and 26% higher than colored HDPE bottles.

Figure 3: National Average Single Family Household PP Generation Rates Compared to PET and HDPE

Material	Average Pounds/Household/Year	Extrapolated Tonnage for Oregon Single Family Households
PET Bottles	54.8	33,839
Polypropylene Packaging	19.8	12,226
HDPE Colored Bottles & Jars	15.7	9,695
Non-bottle PET packaging	11.7	7,225
HDPE Natural Bottles & Jars	11.7	7,225

If half of the estimated PP were captured and marketed as bales from Oregon MRFs, using 15 cents/pound a base price, it would equate to \$1.83 million in MRF commodity revenue per year.

In 2019, The Recycling Partnership supported a capture study for the Portland Metro area that included detailed sortation of PP packaging types. Figure 4 presents this data, showing a per household number smaller than indicated above but still within range, comparing favorably to HDPE bottle plastics and in line with PP and HDPE ratios in Figure 3.

Figure 4: PP Household Generation in Portland Metro Region

	Pounds/Household/Year	Extrapolated Tonnage for Oregon Single Family Households
PP (#5) Bottles & Jars (> 6 oz < 2 gals)	0.61	378
PP (#5) Bottles & Jars (<6 oz)	0.62	381
PP Tubs (> 6 oz < 2 gals)	3.20	1,977
PP Tubs (< 6 oz)	1.05	648
PP Other Rigid containers and packaging (< 2gals, >2")	8.93	5,516
PP rigid non-packaging (< 2gals, >2")	0.85	526
TOTAL – ALL PP	15.26	9,425
HDPE Natural Bottles	6.38	3,940
HDPE Colored Bottles	9.42	5,817

As the data shows, PP is available in quantities almost equal to natural and colored HDPE bottles combined in the Portland Metro region. Attachment A to this document show product examples of PP packaging use, indicating the materials widespread use across a variety of products. These images underscore the established presence of PP packaging in household consumption.

PP use in packaging appears to be growing and will likely benefit from resin replacement for other packaging, especially those that have been deemed problematic and unnecessary by the U.S. Plastics Pact.³ Moreover, PP has qualities that are not replicable by PET and HDPE, and so can be expected to continue filling key packaging categories for many common consumer products that those resins cannot.

(f) The practicalities of sorting and storing the material

As discussed in the example of PP Recycling Coalition grantees above and as can be found true for many other MRFs across the country, standard MRF optical and robotic equipment available on the market today successfully sorts PP. As a specified material, PP can be sorted into regular truckload quantities and moved quickly to market like any other established commodity at scale. For PP Recycling Coalition grantees to date, dedicated pre-baling storage capacity has been established to manage PP and all are moving baled material into outbound trucks in a manner similar to PET and HDPE.

(g) Contamination

There is no indication that PP packaged products are less cleanable for recycling preparation by households than other plastics packaging. PP packaging also tends not to have extraneous materials or any kind of composite makeup that is substantially different than many common PET and HDPE recyclable formats.

PP can certainly be perceived as an inbound contaminant from the perspective of a MRF with no capacity for PP sortation, but that capacity can be created. MRFs can expect market demand for spec PP bales will be consistent and further supported by the dynamic of brand and statutory content targets.

(h) The ability for waste generators to easily identify and properly prepare the material

In a section above and in Appendix A, we demonstrated the established nature of PP as packaging across a wide array of products and as present in household generation at levels facilitating collection and processing. As a recyclable material specified to households as a tub, cup or container, households and others waste generators can easily comprehend the material is recyclable (especially, as needed, if reference to the #5 Resin Identification Code is included in outreach information).

Basic recycling outreach can convey through words and imagery that PP is recyclable. Appendix B provides examples of outreach materials that describe clearly to households that PP is accepted in its main packaging formats. The examples include one community in the U.S. that recently added PP collection under a PP Coalition Grant, one from the Seattle area, and three from Oregon. The latter are further indication that PP is already a successfully accepted and sorted material in Oregon, which also further shows that MRF acceptance has an established baseline in the state. As we have discussed above, grant and technical interventions can also create sorting and acceptance capacity in MRFs where it is not already in place.

(i) Economic factors

Recycled content commitments by brand companies that package in PP, bolstered by recycled content mandate activity by states, can be expected to spur recycled domestic PP demand (a factor not previously in play when PP

³ <https://usplasticspact.org/problematic-materials/>

was typically sorted into mixed plastic bales often reliant on export markets). Commitments to recycled content in packaging is especially important when recognizing that most recycled PP is currently used in established non-packaging products such as automotive and construction products. Although market uses may shift, it is likely that recycled PP packaging demand will be *additive* on top of these current uses.

Activities within U.S. Plastics Pact provides insight into the potential market demand from recycled content commitments.⁴ Comparing current baseline content to the Pact's 30% content target by 2025, it is clear that a substantial supply gap needs be closed. Pact Activators with PP bottle and rigid container formats will need an estimated additional 200 million pounds per year of recycled PP to meet the recycled content target, which is equivalent to a 45 percent increase in the current national PP bottle and rigid container recycling rate.

It is important to remember two factors in this analysis: 1) not all brands packaging in PP are members of the Pact and additional r-PP demand will come from non-Pact members, and 2) assuming a 33% yield loss through MRF and reclaimer processing, the actual amount of PP needing to be collected to close the Pact Activator content gap would be 266 million pounds. At typical capture rates, this would be equivalent to the curbside collection of PP from 35 million single family homes, or about 35 percent of all U.S. single family households.

The Ocean Conservancy's recent Recommendations for Recycled Content report shows the interplay of recycled content scenarios and supply.⁵ From a baseline estimate of 0% for 2019/2020 in PP packaging recycled content, the report finds that 10% PCR by 2030 is only possible under significant growth in recycling collection and modest technological innovation. A content rate of 15% is feasible only when supply is boosted by national supply-side policy (EPR and Bottle Bill), technical intervention, and design-for-recycling improvements.

Brands are already subject to recycled content targets through publicly stated commitments (in part through the U.S. Plastics Pact) and to incipient State-level requirements. The Ocean Conservancy's report shows that supply side interventions are necessary to make those content levels achievable. This underscores the importance for PP to be included in universal collection. As noted in the report, "...one of the barriers to increased use of recycled plastics is the lack of available supply – there is not enough postconsumer plastic being collected in the recycling system to meet voluntary corporate commitments and industry demand."

(j) Environmental factors from a life cycle perspective

The Recycling Partnership has no technical input on this criteria.

(k) The policy expressed in Oregon Revised Statutes 459.015 (2)(a) to (c), as amended by Section 46 of the Recycling Modernization Act.

The Recycling Partnership has no technical input on this criteria.

Conclusion

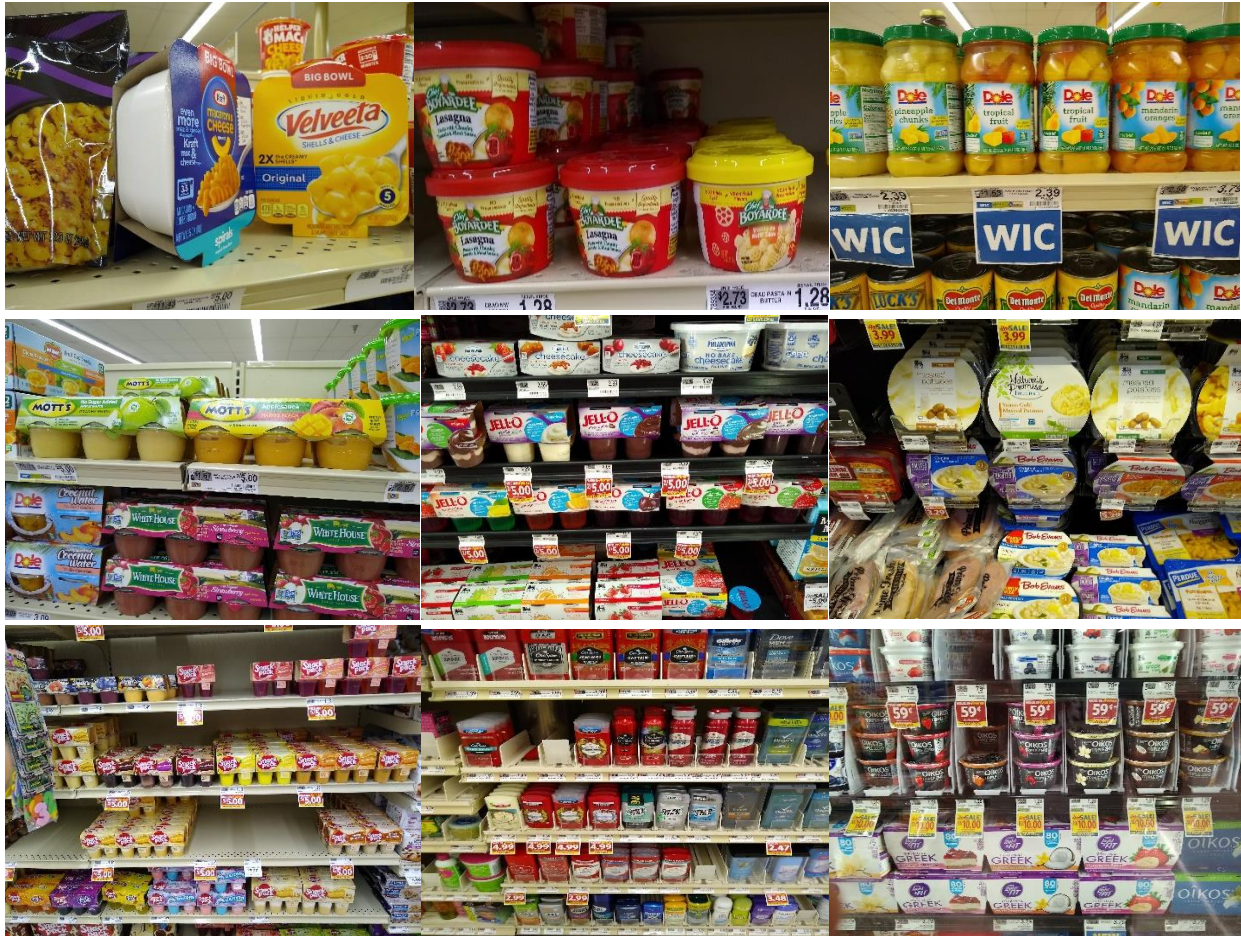
Thank you for the opportunity to submit this technical information. In summary, we believe it presents a compelling case for PP to be included in Oregon's statewide recycling collection list.

⁴ The U.S. Plastics Pact Baseline Report displays current levels of PP and other resin recycling content as reported by brand Pact Activators: <https://usplasticspact.org/baseline-reader/>

⁵ <https://oceanconservancy.org/blog/2022/02/16/recycled-content-standards/>

Appendix A: Imagery of PP Packaging on Store Shelves

PP is used in a wide variety of refrigerated, shelf-stable, microwavable and personal care products consumed in scaled quantities in U.S. households.



Appendix B: Imagery of Outreach Materials Conveying PP Recyclability

In response to the technical criteria regarding the ability for waste generators to easily identify and properly prepare the material, examples below show simple, effective imagery and communications that facilitate understanding of PP recyclability.

Example 1: Generic TRP mailer used in regions served by MRF recipients of PP Coalition Grants where PP was not originally accepted in collection programs



Example 2: WM imagery accessible on-line for areas served by the company’s MRFs (including State of Washington). Imagery accompanied by text directions to “Recycle plastics by shape: bottles, jars, jugs and tubs.”



Example 3: Imagery on Portland Metro material collection list, accompanied by text directions to recycle:
 “**Round plastic containers** that can hold 6 ounces or more, with a wider rim than base, and typically contain products such as salsa, margarine, cottage cheese, hummus, etc. (no drink cups)”



Example 4: Imagery on City of Gresham OR material collection list



Example 5: Imagery and wording from Republic Services City of Bend Recycling Guide



Plastic

(remove caps/lids & rinse clean)

- Plastic bottles & tubs (6 oz. or larger)
- Rigid plastic containers (such as yogurt & margarine tubs)
- Rigid plastic plant pots (4" or larger)
- Plastic buckets (5 gallons or less)
- Plastic milk jugs

Material Focus: PET Thermoforms

In lieu of providing detailed information in step with DEQ's technical criteria, The Recycling Partnership offers general input on PET thermoforms below.

Our National Database indicates a strong base level of acceptance in Oregon for "plastic clamshells," a common surrogate for PET thermoforms, with community collection lists covering 492,671 single family households (nationally, the number is 43.8 million). Many community programs and MRFs are ambiguous regarding their acceptance of thermoforms. In part, this reflects ambiguity in the PET reclamation sector toward thermoforms, with its much higher focus on bottles and a set of yield issues regarding thermoform processing.

However, recent thermoform-specific reclamation investments in the U.S. and Mexico demonstrate that the material has a growing market pathway that is separate from PET bottles (and alongside bottles, as well, in some instances). Secondary processors (often referred to as "PRFs") in some parts of the U.S. are also having success in extracting and marketing thermoforms from mixed MRF plastics. In addition, one entrepreneurial collector in Oregon is producing and marketing thermoform bales. We would further note that ISRI does have a PET thermoform bale specification in its Scrap Specifications Circular: <http://www.scrap2.org/specs/40/>. These are signs that thermoforms are emerging as a distinct recyclable commodity and that there is baseline return-on-investment in thermoform reclamation.

The broader context for these developments is the overall shortfall of recycled PET to meet brand and statutory content targets. Greater collection and processing acceptance of thermoforms is seen as one key strategy to address that shortfall.⁶

Relatedly, there is indication that thermoforms are growing faster than bottles in terms of generation. Current Recycling Partnership data indicates a 5:1 ratio of PET bottle to non-bottle PET generation in single family household but industry growth statistics and some key trends could push that ratio to 4:1 by 2030. A number of factors could encourage greater PET thermoform usage and generation, including resin substitution in products like cups, egg packaging, and other packaging that currently uses PS and PVC, which are identified as problematic and unnecessary by the U.S. Plastics Pact. Capture study data indicates non-bottle PET is already generated at levels equal to Natural HDPE (11.7 pounds per household per year) – under universal collection acceptance and strong capture rates, PET thermoforms could produce a quantity of MRF bales similar to HDPE.

In short, PET thermoforms are an established packaging format with recycling market demand that has grown and is expected to grow more. Many industry stakeholders are working to address technical and other issues that pose recycling challenges (e.g., detrimental labels). A pathway for PET thermoform acceptance could help catalyze conversion of non-PET clamshell packaging away other resins and thereby reduce contamination in the recycling system from look-alike materials. With these factors in mind, if PET thermoforms are not included in an initial material acceptance list, we encourage Oregon DEQ to be open to their inclusion in the future.

⁶ From NAPCOR 2020 PET Recycling Report, p.23, emphasis added by The Recycling Partnership: "As noted in a December 2020 report by Foodservice Packaging Institute (prepared by Resource Recycling Systems), some PET reclaimers will accept PET thermoforms as part of a curbside PET bale, but acceptance is capped at approximately 10 percent of bale weight. NAPCOR has found that this upper limit varies; *given the tight supply of RPET in the market, tolerance for thermoforms in bottle bales has increased by necessity in 2021.*"

Material Focus: Pizza Boxes

In lieu of providing detailed information in step with DEQ's technical criteria, The Recycling Partnership offers general input on Pizza Boxes.

Data from The Recycling Partnership's National Database of community program material acceptance indicates that pizza boxes are already included in program collection lists covering 76 percent of Oregon single family households. Pizza boxes are a readily identifiable discard for generators, who can be successfully instructed on how to prepare the boxes for recycling by excluding food or other extraneous materials. The Recycling Partnership provides resources to help communities communicate effectively about pizza boxes:

<https://recyclingpartnership.org/pizzaboxes/>

Pizza boxes sort effectively in MRFs into corrugated cardboard or mixed paper commodity bales. Paper industry acceptance of pizza boxes is well documented by industry sources (for example, see

<https://www.afandpa.org/news/2020/afpa-and-industry-partners-aim-set-record-straight-pizza-boxes-are-recyclable-grease-and>)

In sum, with no market or sortation barriers, and with the ability of recycling programs and haulers to effectively communicate about pizza box acceptance and how to avoid contamination, we urge Oregon DEQ to include the material on its statewide collection list.

Material Focus: Paper Cups

In lieu of providing detailed information in step with DEQ's technical criteria, The Recycling Partnership offers general input on Paper Cups.

Our review of publicly available MRF information and data from our National Database of community program material acceptance does not indicate a clear picture for paper cup acceptance in Oregon. However, industry sources show growing mill acceptance of paper cups and work continues to expand overall MRF and community program acceptance: <https://www.recyclefsp.org/paper-cup-alliance>. As documented in a recent white paper, paper cups are allowed in four different paper grades, all associated with substantial mill capacity and demand in the U.S.:

<https://static1.squarespace.com/static/5e8221dbc8b11929c3f7eef7/t/61fd9d504264206ae6406d4e/1644010833194/The+State+of+Paper+Cup+Recycling+-+Moore+and+Associates+2022.pdf>

As a sign of general regional acceptance and a demonstration of how generators can easily be instructed that paper cups are recyclable, see the City of Seattle's information: <http://www.seattle.gov/utilities/your-services/collection-and-disposal/where-does-it-go#/item/paper-cup> In similar regional vein and again, indicative of the status of regional market and mill acceptance, British Columbia's program also accepts paper cups and communicates clearly how generators should prepare the materials:

<https://www.crd.bc.ca/service/waste-recycling/recycle/myrecyclopedia/products/paper-cups#:~:text=Residential%20paper%20cups%20are%20accepted,accepted%20in%20the%20blue%20bag>

In short, paper cups are showing signs of steady progress in mill, MRF, and community acceptance, with the backing of industry stakeholders helping to improve cup recyclability. This progress provides compelling evidence that paper cups are beyond just "technical recyclability" and are now experiencing practical success as communities, MRFs, and mills find alignment and as perceived barriers to cup recycling are overcome. If paper cups are not included in an initial statewide acceptance list, we encourage Oregon DEQ to be open to their inclusion in the future. Paper cups contain valuable fiber which should ideally not be lost to landfill disposal.