



**JULY 27, 2023**

# **RESEARCH FINDINGS: FOODSERVICE PACKAGING RECOVERY**



# HOST & MODERATOR

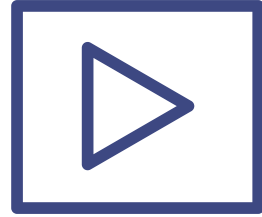
## **ASHLEY ELZINGA**

*Director, Sustainability & Outreach  
Foodservice Packaging Institute*

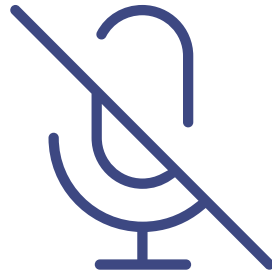
[www.RecycleFSP.org](http://www.RecycleFSP.org)  
[www.FPI.org](http://www.FPI.org)



# HOUSEKEEPING ITEMS



Webinar is being recorded.



All attendees are muted.



Use Q&A to submit questions.



# TODAY'S AGENDA

- FPI Introduction
- Plastics Recovery
- Paper Cup Recovery
- Food Residue Impact
- Question & Answer

# ABOUT FPI

## ESTABLISHED IN 1933

- Only industry trade association in North America solely focused on all single-use foodservice packaging products
- Members include:
  - Converters and their raw material and machinery suppliers (represents about 85% of the industry)
  - Foodservice distributors and operators

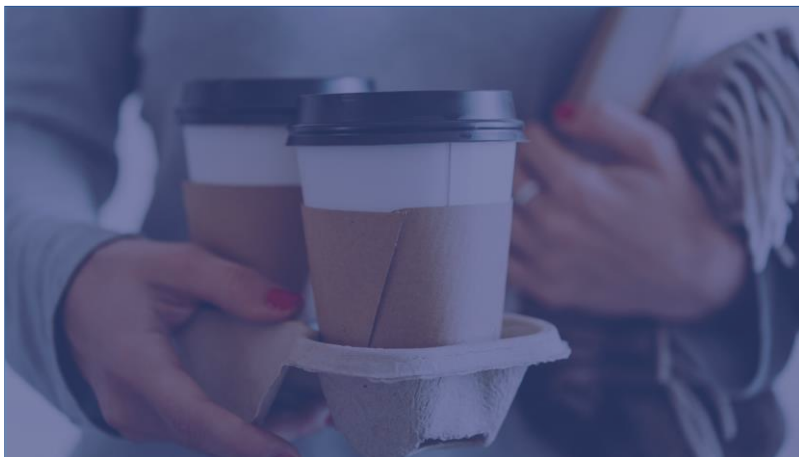


# FOODSERVICE PACKAGING

Single-use foodservice ware and packaging used by foodservice establishments

**Specifically, our work focuses on:**

- Cups (including sleeves)
- Containers
- Boxes
- Paper bags



# FPI'S RECOVERY GROUPS

Paper Recovery Alliance  
(PRA)

Plastics Recovery Group  
(PRG)



Foam Recycling Coalition  
(FRC)

Paper Cup Alliance  
(PCA)

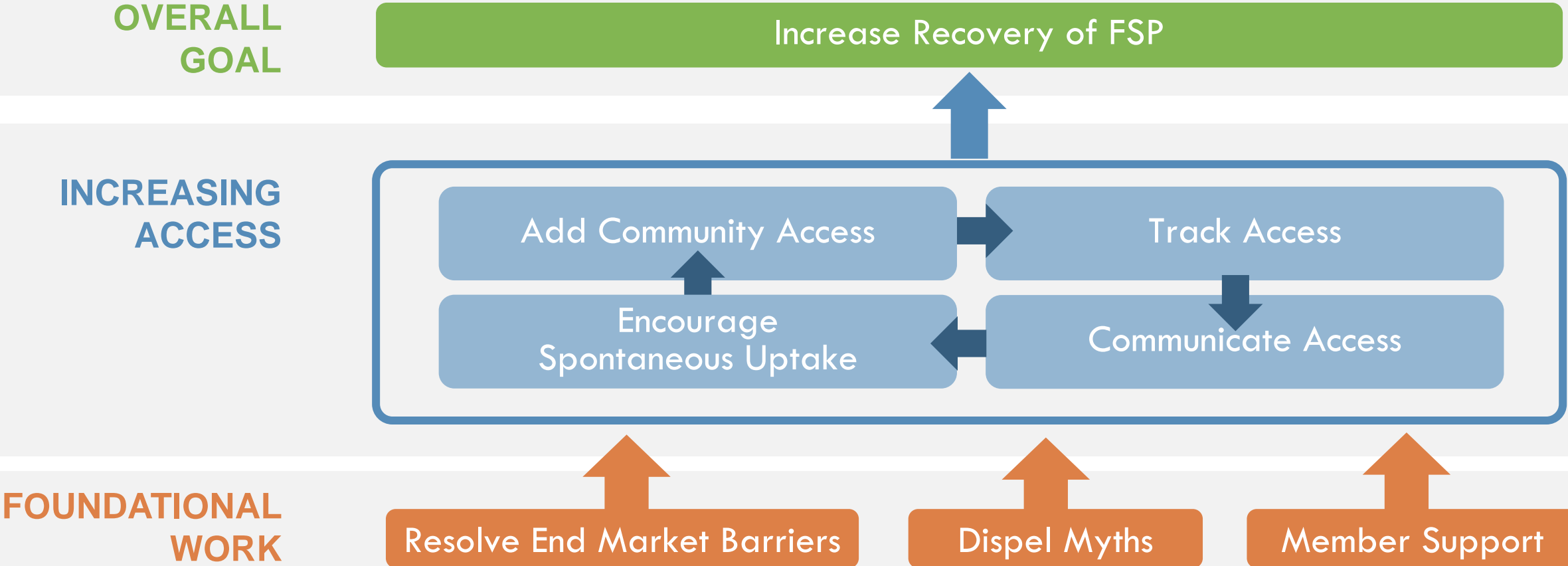


# CURRENT PRA/PRG MEMBERS





# OVERVIEW OF APPROACH



# QUESTIONS WE'VE ANSWERED

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
<p><b>How much material is available?</b> Estimated material generation</p>	<p><b>Who's recycling FSP?</b> Conducted MRF Benchmarking Study</p>	<p><b>Are there end markets for FSP?</b> Published end markets map</p>	<p><b>What are the access rates for FSP?</b> Co-sponsored SPC Centralized Study on the Availability of Recycling</p>	<p><b>Where are domestic end markets for Paper FSP?</b></p> <ul style="list-style-type: none"> <li>• Surveyed mills, 4 accepting paper FSP</li> <li>• 16 markets at end of 2018</li> <li>• 21 markets at end of 2019</li> <li>• 30 confirmed markets at end of 2020</li> <li>• 33 confirmed markets</li> </ul>							<p><b>Joint Declaration by 8 Mill Companies</b></p>	<p><b>Paper Cup Recycling white paper released</b></p>
<p><b>Where is the material available to be collected?</b> Learned curbside had greatest volume for collection</p>	<p><b>Is food residue a problem?</b></p> <ul style="list-style-type: none"> <li>• Food Residue Study (Boston)</li> <li>• Food Residue Study (Delaware)</li> </ul> <p>Found little to no difference between FSP versus other commonly recycled food packaging</p>	<p><b>How will FSP impact the bale?</b> Estimated impact</p>	<p><b>How much FSP arises in bales?</b></p> <ul style="list-style-type: none"> <li>• Analyzed mixed paper bales in Seattle and NYC</li> <li>• Co-sponsored Rigid Plastics Bale Audit</li> </ul>	<p><b>What messaging is clearest for residents?</b> Conducted National Resident Messaging Survey</p>	<p><b>How to add FSP to city's materials?</b> Developed image library, flyers, ads, video, best practice language</p>	<p><b>How does compostable FSP contribute as a feedstock?</b> Found compostable FSP provided the same benefit as traditional carbon / bulking materials</p>	<p><b>Where are North American end markets for Plastic FSP?</b> Surveyed PET, PP, and PS end markets</p>	<p><b>How can plastic FSP be made more recyclable?</b> Partnered with APR to develop Design Guide for Foodservice Plastics Recyclability</p>	<p><b>How much FSP arises in bales?</b></p> <ul style="list-style-type: none"> <li>• Mixed paper bale audit (1 MRF) corroborated 2015 findings</li> <li>• Mixed plastic bale audit corroborated 2015 findings</li> </ul>	<p><b>How much FSP arises in bales?</b> Mixed paper bale audits from partner MRFs (pending)</p>		
				<p><b>Which cities and composters accept FSP?</b> Co-sponsored BioCycle residential study and surveyed composters</p>				<p><b>How can more PET be recycled?</b> Spearheaded PET Thermoforms Collaboration</p>		<p><b>Best capture opportunities for paper cups?</b> Paper cup flow studies (4 MRFs) corroborated 2015 results on % to container line</p>		
										<p><b>What are current access rates?</b> Co-sponsored cup access study with NextGen (pending)</p> <p>Other studies planned / underway</p>		

# FPI IMPACT ON RECOVERY

## AUTHORITATIVE RESEARCH

FPI's extensive research and collaborations have enabled the industry to clarify and quantify the opportunities to recover more foodservice packaging.

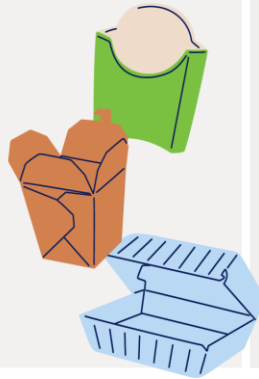
**MRF Survey:** 70% MRFs accept pizza boxes; 50% accept rigid plastic cups or takeout containers

**MRF Flow Studies:** Identified best opportunities to capture foodservice packaging

**National Resident Survey:** Identified clearest messaging; informed toolkit design

**Bale Studies:** Determined how much foodservice packaging arises in bales

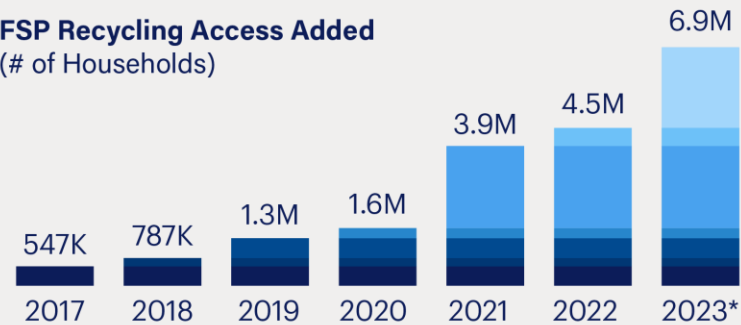
**Food Residue Study:** Found little to no difference between foodservice packaging versus other commonly recycled food packaging



## GROWING RECYCLING ACCESS

FPI works with communities and MRFs to add foodservice packaging to recycling programs.

### FSP Recycling Access Added (# of Households)



### IMPACT

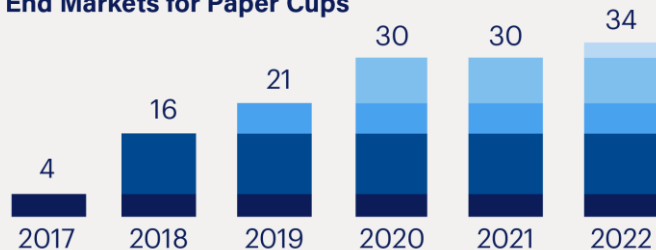
Foodservice packaging can be recycled by **6.9 MILLION ADDITIONAL HOUSEHOLDS**

\*Jan-June 2023

## END MARKET DEVELOPMENT

FPI engages with stakeholders to expand end markets for recovered foodservice packaging materials.

### End Markets for Paper Cups



### IMPACT

Paper cups are now accepted by mills representing over **75% OF U.S. & CANADIAN MIXED PAPER DEMAND**

## SHARING RESOURCES

Resident education toolkit, best practices, case studies, and other resources are available on [www.RecycleFSP.org](http://www.RecycleFSP.org)



### IMPACT

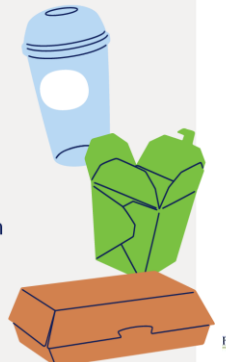
**100s OF COMMUNITIES** impacted by FPI supported resident education campaigns



## INFLUENCE & LEAD

From published articles to expert quotes to research references, FPI is at the center of FSP recovery discussions.

- GreenBiz
- Packaging World
- Plastics Today
- Recycling Product News
- Recycling Today
- Resource Recycling
- Sustainable Packaging Coalition
- Waste Dive
- Waste Management World
- Waste360





# PANELIST

## **KATY RICCHI**

*Consulting Engineer*  
*RRS*

[www.recycle.com](http://www.recycle.com)



FOODSERVICE PACKAGING  
INSTITUTE®



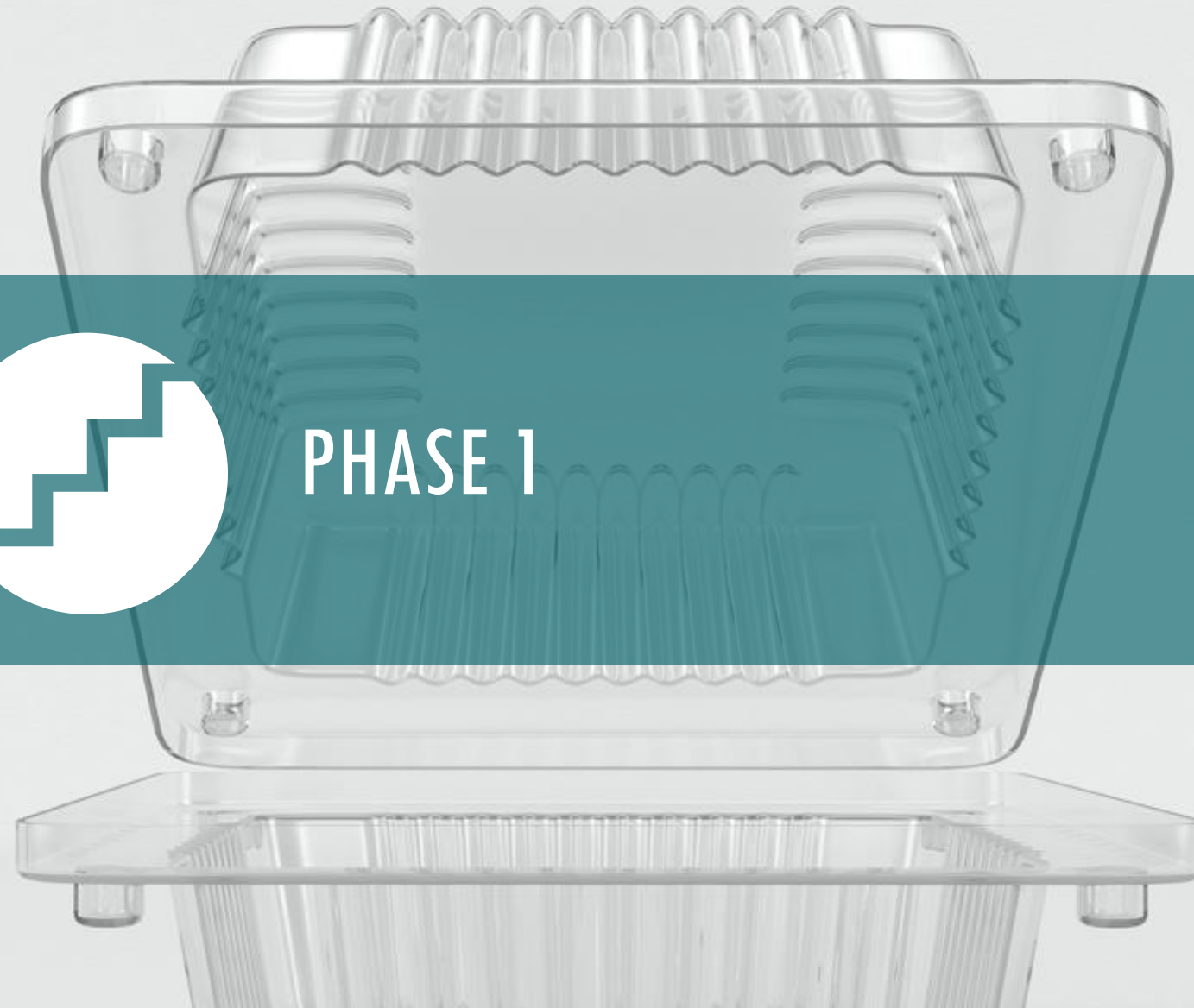
# PET THERMOFORM RECYCLING COST & MATERIAL FLOW ANALYSIS PHASE 1 & 2

July 27, 2023

# OVERVIEW OF PET THERMOFORM RECYCLING EFFORTS

	Scope & Goals	Collaboration Partners
<b>Phase 1 – Foundational Inquiry</b>	<ul style="list-style-type: none"><li>• Quantify material volumes and flows</li><li>• Identify potential recovery routes &amp; costs</li><li>• Survey key stakeholders (MRFs and reclaimers) to understand needs &amp; concerns</li></ul>	Spearheaded by FPI, convened by RRS, and funded by 13 associations and companies
<b>Phase 2 – Investigating Interventions</b>	<ul style="list-style-type: none"><li>• Determine interventions required to enable greater collection, sorting, processing and recycling of PET thermoforms</li><li>• Evaluate the costs and technical factors related to those interventions</li><li>• Prioritize types of opportunities for investment in Phase 3</li></ul>	Spearheaded by FPI, convened by RRS  14 project sponsors
<b>Phase 3 - Scaling</b>	<ul style="list-style-type: none"><li>• Evaluate specific opportunities for investment</li><li>• Invest funds to scale up PET Thermoform recycling</li><li>• Measure impacts of interventions</li></ul>	Housed under TRP PET Recycling Coalition





PHASE 1

# DATA ANALYSIS AND ESTIMATES



## PET Thermoforms in MRFs

- Data and surveys indicate ranges of PET thermoform content in bottle bales from 2% to 12%, with spot reports of higher
- RRS estimates 5-10% of a typical curbside bale is PET thermoforms
- NAPCOR lists 139 mm lbs of PET thermoforms recovered\* (2018) – increase of ~50% over 2017
- ~0.25-0.75% of total MRF throughput

\*Thermoforms recovered, as reported by NAPCOR, represents the amount collected for recycling and sold to reclaimers.



## PET Thermoform Generation

- Waste-related data sets yield estimate of 1.3-1.4B lbs of PET thermoforms generated annually
- Partner data indicates that generation may be higher
- RRS suggests working estimate of 1.4 billion lb (range 1.4 – 1.5 billion lb) in the US
- Canadian generation is estimated at 0.1 billion lbs
- No clear regional variation for gross generation of PET thermoforms, though some end uses (e.g., produce) demonstrate regional differences



# PATHWAY OPTIONS

**OPTION 1:** Status Quo. The MRF sorts PET into a mixed PET thermoform/bottle bale (up to 10% of bale weight). The PET bale is sent to the reclaimer and processed into flake or pellet.

**OPTION 2:** The MRF sorts all PET into a mixed PET thermoform/bottle bale. The PET bale is sorted at the reclaimer into separate thermoform and bottle streams and thermoforms are separately processed into flake or pellet on-site.

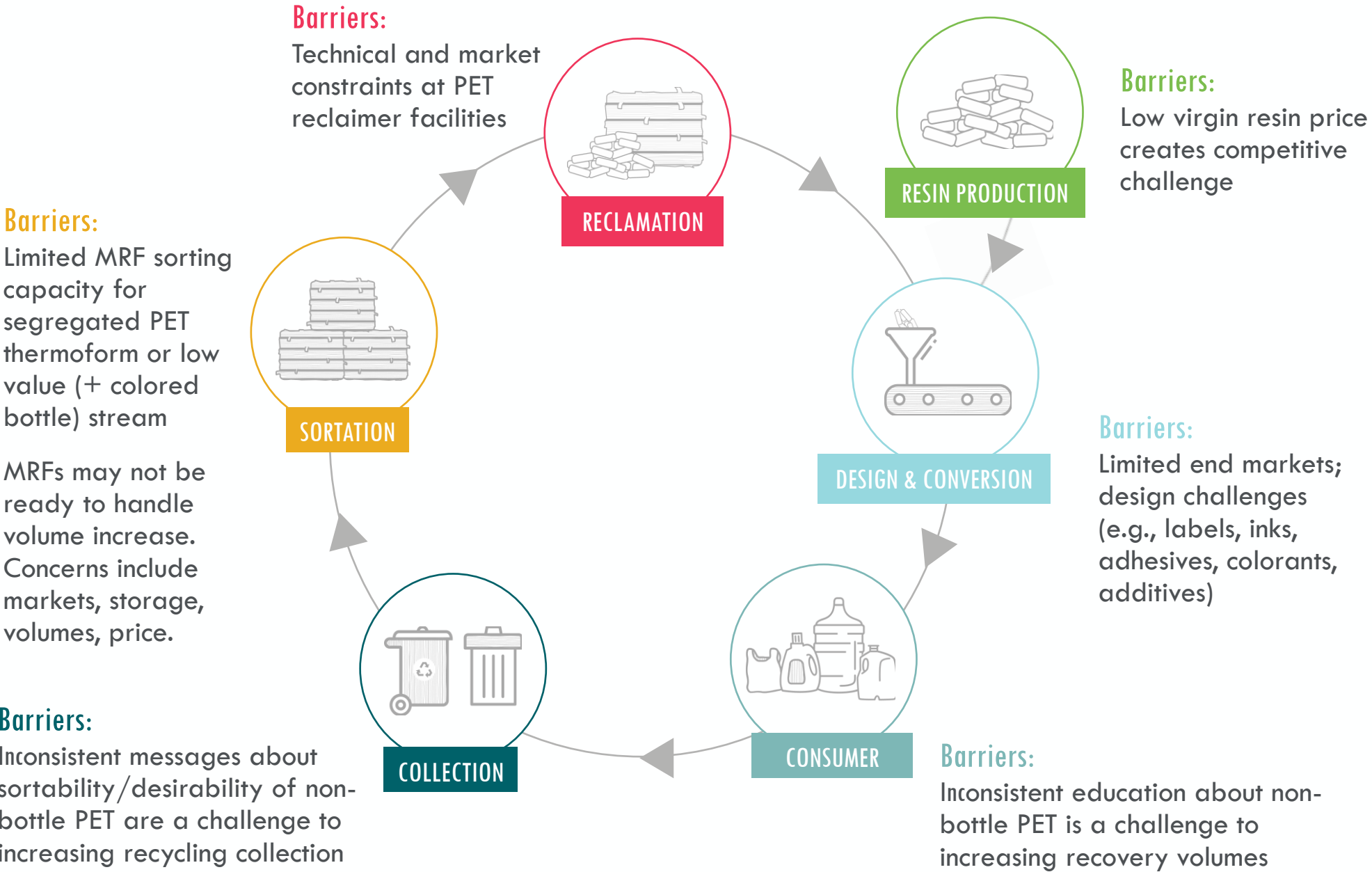
**OPTION 3:** The MRF sorts all PET into a mixed PET thermoform/bottle bale. The PET bale is sorted at the reclaimer into separate thermoform and bottle streams. The thermoform stream is baled and sent to thermoform-only recycling.

**OPTION 4:** The MRF sorts and bales PET bottles and PET thermoforms separately. The PET thermoform bales are sent directly to PET thermoform-only recycling markets.

**OPTION 5:** The MRF sorts PET thermoforms in a mixed plastic bale. The mixed plastics bale is sent to a PRF or mixed plastic recycler. The PRF / mixed plastic recycler sorts and bales a PET thermoform-only stream and sends to reclaimer for further processing or PET thermoform-only recycling markets.



# BARRIERS IN THE PET THERMOFORM RECOVERY SUPPLY CHAIN





# PHASE 1 FINDINGS

## KEY FINDINGS RELATED TO MRF RECOVERY CHANNEL INCLUDE:

- Inconsistent acceptance by PET reclaimer markets limits MRF openness to greater access / education efforts
- Difficult to “make to order” to meet specific reclaimer thermoform percentage tolerances in PET bottle bales so MRFs generally process / bale what they receive

## KEY FINDINGS RELATED TO RECLAIMER RECOVERY CHANNEL INCLUDE:

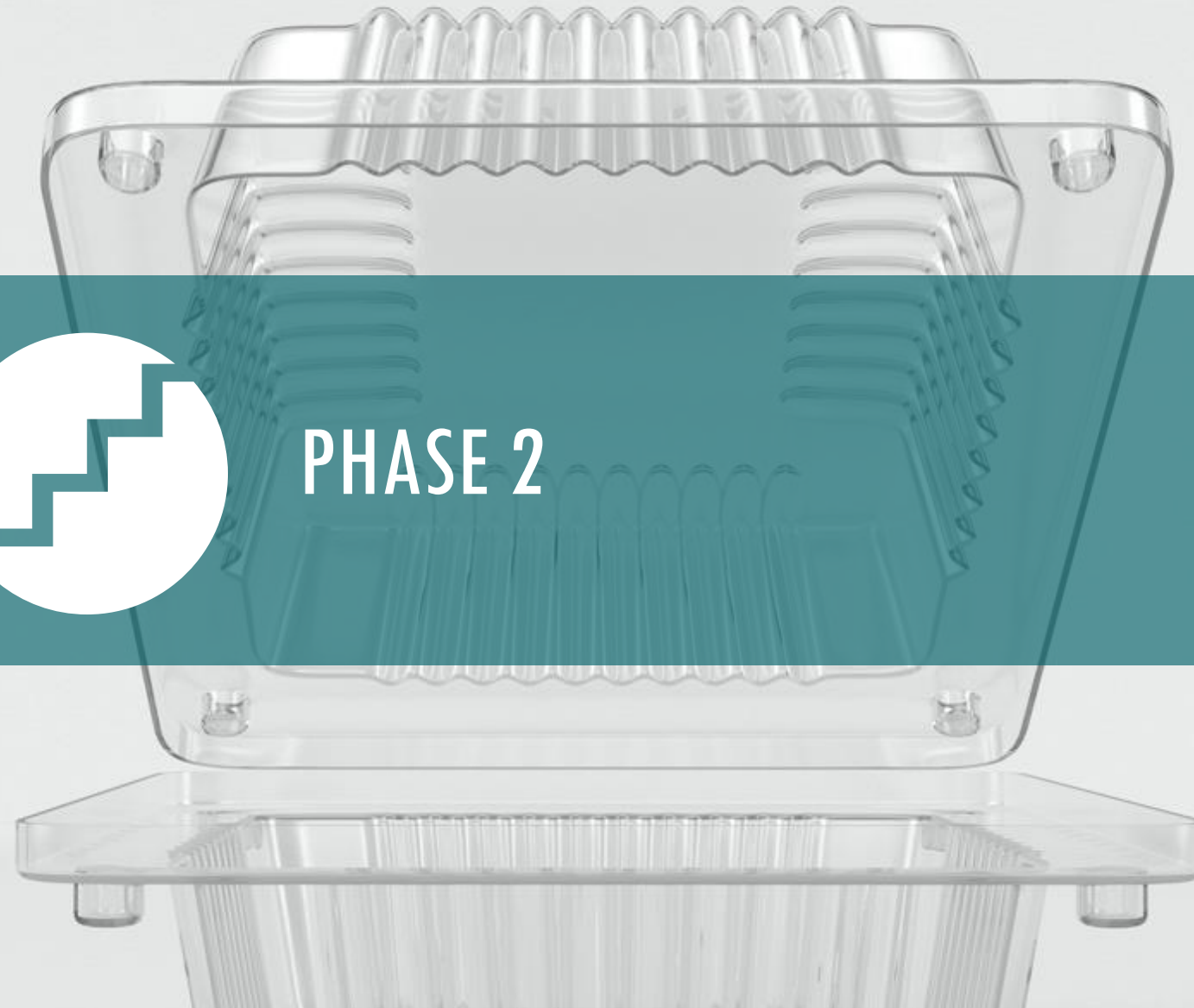
- Current acceptance often capped at ~10% of bale weight (combined with bottles) due to process constraints\*
- Limited interest in sorting PET thermoform-only stream at front end for separate processing, or to remarket\*\*

## KEY FINDINGS RELATED TO PRF RECOVERY CHANNEL INCLUDE:

- Main value in current mixed plastic bale is olefins; may consider sorting and / or processing PET thermoforms with proper market signals

\* Some reclaimers have no tolerance for thermoforms; others accept 100% thermoform bales

\*\*Several California PET reclaimers purchase sorted PET Thermoform-only bales, processing to rPET for sheet / thermoform markets.

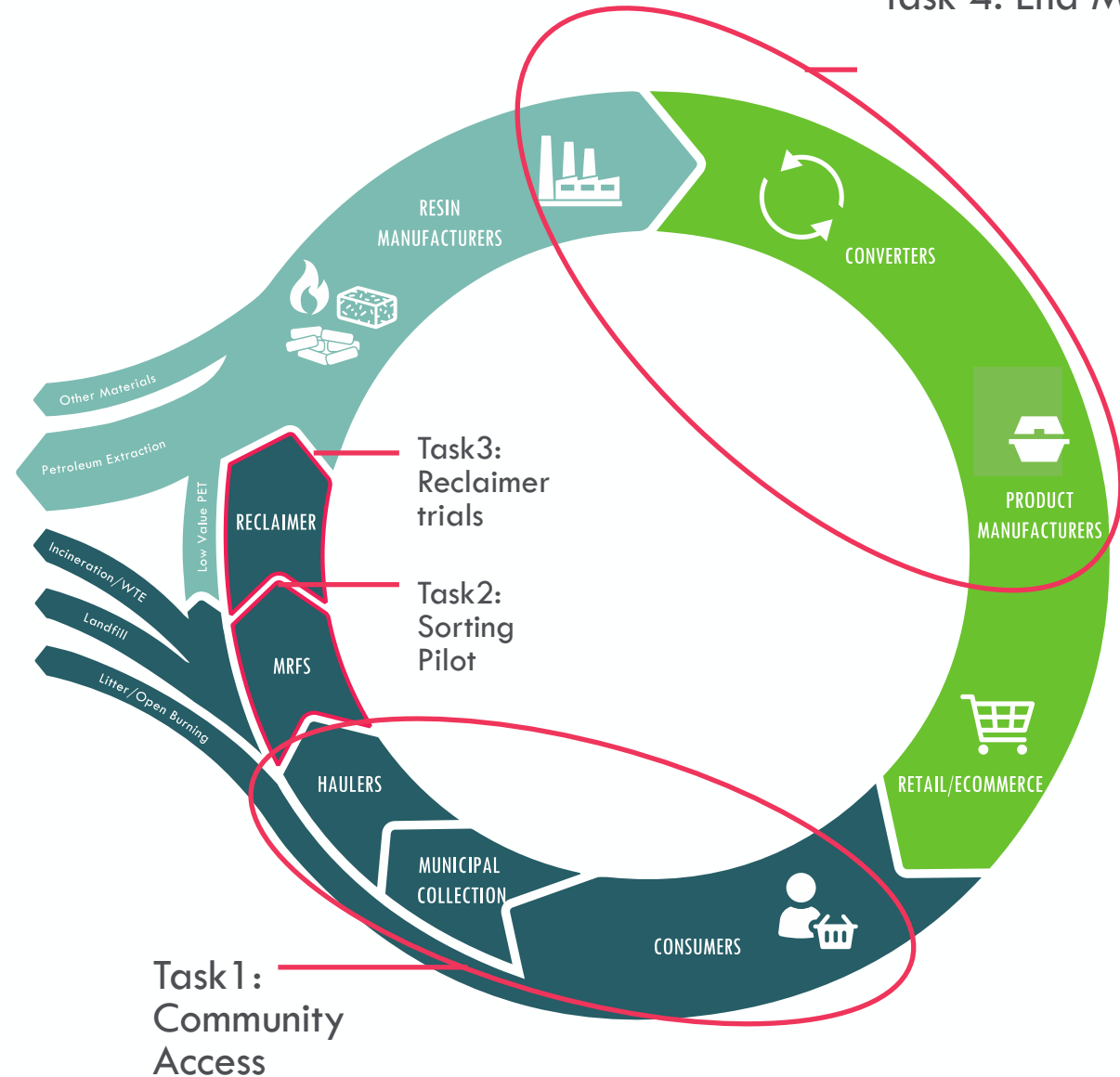


PHASE 2

# PHASE 2 SUPPLY CHAIN PILOT PROJECT

Engage key players in the supply chain to demonstrate and document PET thermoform recovery methods and gather data to define and prioritize the interventions required to expand the collection, recycling and end market acceptance of PET thermoformed packaging

## Task 4: End Markets





# CA MRF AUDITS

## FINDINGS:

- Interviews and site visits to various California MRFs revealed that only 15% of CA MRFs reported sorting and selling PET thermoform only bales in the last two years with several facilities reducing the number or moving away from sorting these bales.
- Offtake of PET thermoform-only bales is waning, primarily due to limited processing capabilities (reclamation) and end markets.

## RECOMMENDATIONS:

- Establish PET Thermoform Demand Champions program to send direct market signal to support the production of rPET derived from PET thermoforms
- Enact a legislative amendment to clarify that PET thermoforms should not be included in PET bottle bales subject to the CRV comingled rate
- Target equipment grant funds to transition CA MRFs to sorting PET Thermoform-only bales





# RECLAIMER TRIAL RESEARCH OBJECTIVE & KEY QUESTIONS

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## OBJECTIVE:

- Understand flow of PET thermoforms through a curbside PET reclamation facility and the key areas of yield loss

## KEY QUESTIONS:

- Where is the largest source of yield loss in the reclaimer?
- Is the level of yield loss impacted by the amount of thermoforms present in a curbside PET bale?
- Are there any interventions that could reduce this yield loss?



# TEST PLAN

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- PET bales sourced from Monterey County, California
  - This MRF was chosen due to the level of thermoforms present in the stream and ability to produce the mixes needed
- Test executed at Indorama's Dallas PET reclamation facility
  - Chosen to represent "typical" reclaimer of curbside PET materials including some thermoform
- One truckload of typical curbside material with low thermoform content (~2%) was processed for comparison
- 3 trials were completed, each utilizing a full truckload of material averaging:
  - ~15% thermoform, 85% bottle
  - ~25% thermoform, 75% bottle
  - ~40% thermoform, 60% bottle
- Each truckload was run through the reclaimer line using standard settings and procedures
- All system outputs were emptied prior to each run and all points of yield loss were measured for each run

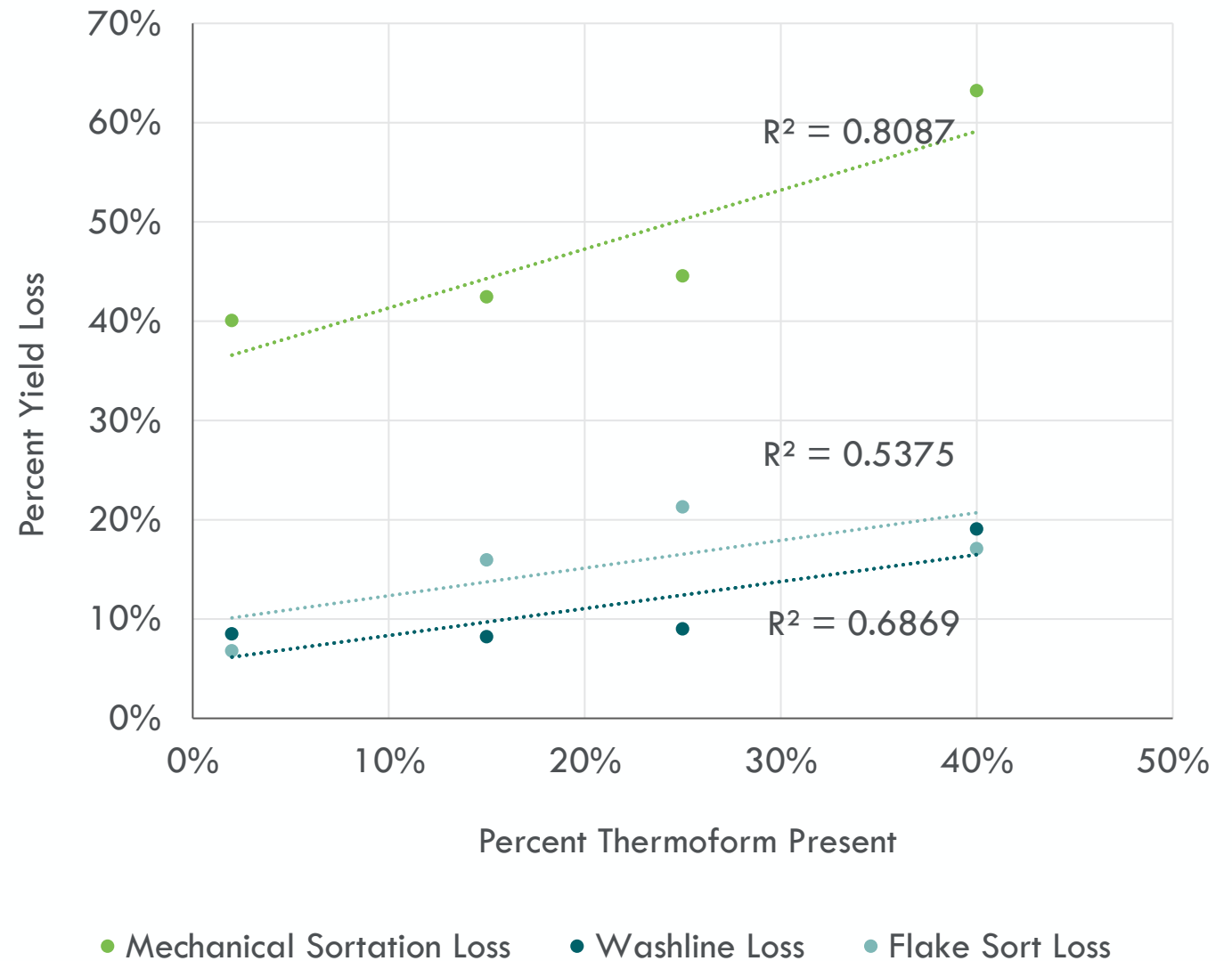
# TRIAL RESULTS ISOLATED BY SECTION

As thermoform percentages in bales increased, yield loss also increased. This additional yield loss meant less material was going through the later stages in the process, resulting in the loss in the wash and flake line to appear less significant.

To determine correlation between thermoform content and material loss at each stage, RRS performed an analysis of the material loss in each section, as a percentage of the material actually present in the system at that stage. (I.e. material lost in mechanical sortation was removed from the denominator in calculating the washline loss). This adjustment resulted in a stronger correlation between percent thermoform in the bale and material loss at each stage.

	Low thermo curbside	15% thermo	25% thermo	40% thermo
<b>Mechanical Sortation Loss</b>	40%	42%	45%	63%
<b>Washline Loss</b>	8.50%	8.21%	9.00%	19.06%
<b>Flake Sort Loss</b>	6.79%	15.94%	21.28%	17.08%

## TRIAL LOSS BASED ON MATERIAL ENTERING EACH SYSTEM



Higher  $R^2$  values show stronger correlation between the percent of thermoform present in the bales and percent of yield loss





# KEY FINDINGS

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- Overall yield decreased as the percentage of thermoforms present increased, suggesting that as PET thermoforms increase in prevalence in the recycling stream, it may be more efficient to segregate them from bottles for recycling in dedicated batches / lines optimized for thermoform recovery.
- Key areas of yield loss occur as collateral loss (the loss of clear PET / flake in the process of sorting out color and other contaminants) when other contaminant streams are removed
  - Aluminum
  - Other polymers
  - Color
  - Green PET
  - Reject flake





# End Market Testing

- Variables one, two and three were sourced from a MRF in California. All variables were processed at Indorama.
- Incoming flake was spiked with various percentages of thermoforms:
  - Control: 0%
  - Test 1: 15%
  - Test 2: 25%
  - Test 3: 40%
- PFE preformed flake, pellet, plaque and various end market application testing.



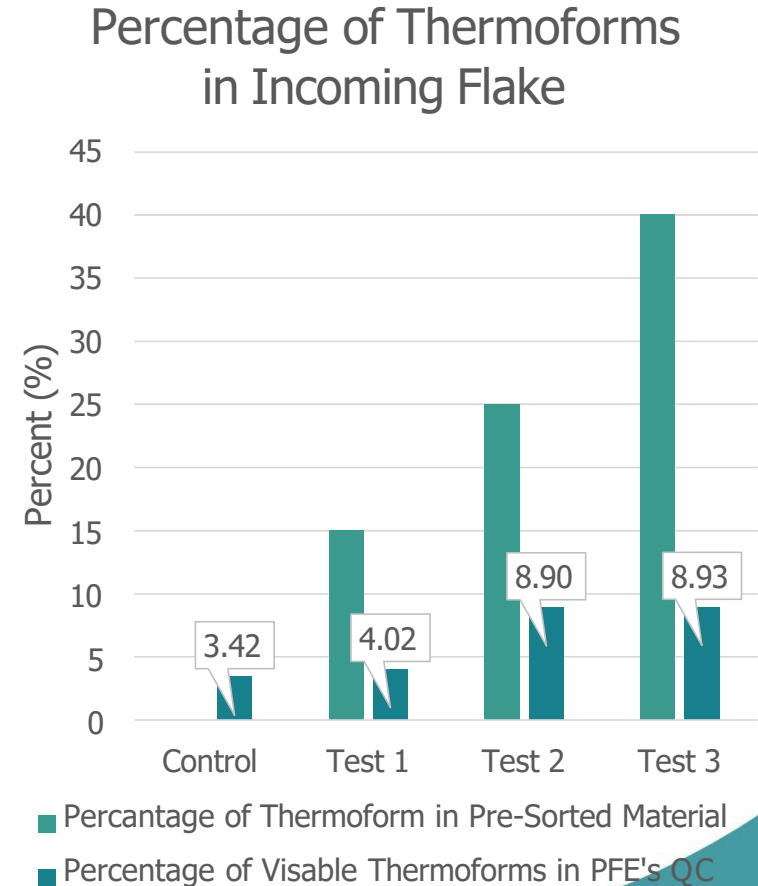
# Tests Performed by PFE

- Flake Testing
  - QC
    - Visual Percentage of Thermoforms
    - Pre-Bake Visual
    - Post Bake Visual
  - Particle Distribution
  - Solution IV
    - Bottle Flake
    - Thermoform Flake
  - Bulk Density
  - Clumping
- Pellet Testing
  - Melt IV
  - Solution IV
  - Solid Stating
  - Colors
- Plaques
  - Colors
  - Haze
- End Market Applications
  - Preforms
    - AA
    - SIV
    - Black specs and inclusions
  - Bottles
    - DSC
    - Black specs and inclusions
    - Colors
    - Dimensions and Weights
    - Capacity
    - Burst Strength
    - Top Load
    - Drop Impact
  - Sheets and Thermoforms
    - Impact
    - SIV
  - Fiber
    - Florescence
    - Tensile
  - Strapping



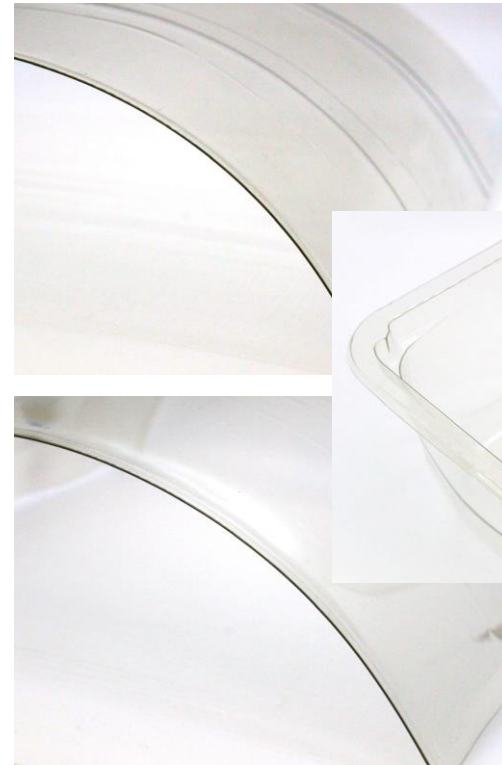
# Accepted Flake: Percent Thermoforms

- PFE performed a visual QC to determine the amount of thermoforms present in the accepted flake after mechanical sortation.
- The control and test one seem to have comparable amounts of thermoforms.
- There is a clear increase from control to tests two and three.
- Test three was anticipated to have a higher percentage of thermoforms; however, due to yield loss at the reclaimer, the lower value is not surprising.



# Production Testing

- Converting partners for preform and bottle, sheet and thermoform, and fiber markets state no concerns regarding any of the test results



Based on the flake analysis, pellet data and the end market applications, PFE did not observe a significant impact on the result due to the thermoform presence. Although there is an obvious reduction in thermoform presence from the initial flake to the accepted material.





# PP CUPS AS CONTAINERS



# 2023 SURVEY OVERVIEW

4

NATIONAL MRF  
SURVEYS

- Major national MRF operators surveyed
- No operator specified specific exclusion of PP cups over any other rigid PP format

3

LOCAL / REGIONAL  
MRF SURVEYS

- Community messaging specifying all PP accepted
- PP cups sorted with all other rigid PP in stream in either mixed rigid or PP only bales

- *Survey respondents representing 45% of MRF throughput in the US*



THANK YOU!

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# PANELIST

## **BILL MOORE**

*President*

*Moore & Associates*

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# FPI Research Findings Webinar: Paper Cup Recycling End Markets

July 2023

MOORE

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*& Associates*



# Summary

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- Paper cups are found in the two residential recovered paper grades:
  - Residential Mixed Paper (RMP – subgrade of #54 Mixed Paper) and
  - Sorted Residential Paper & News (#56 SRPN)
- Paper cups can also be found in poly-coated deinking pack
- Global and US use of Mixed Paper/RMP is increasing as it is a large source of un-recovered paper, but there are concerns about its quality
- Global and US use of Old Newspaper Grades (including SRPN) is declining due to the worldwide decline in the use of newsprint/newspapers
- The composition of RMP and SRPN are not significantly different
- Domestic mill consumption of RMP exceeds exports, but RMP exports are still large
- Exports of SRPN exceed domestic consumption by a large amount
- More mills are interested in using paper cups as part of their furnish



# For Volume Perspective – Cups Compared to Some Other Paper Package Types

- Molded fiber products (gray, brown & white) are the largest category among this group of package types and has the highest growth rate over the past three years
- Paper cups and Cartons have similar volumes. Cups declined sharply in 2020 but began to gain volume back in 2022.
- Cartons have experienced a gradual decline.
- SBS had substantial growth in 2020 which slowed in 2021 and declined slightly in 2022.

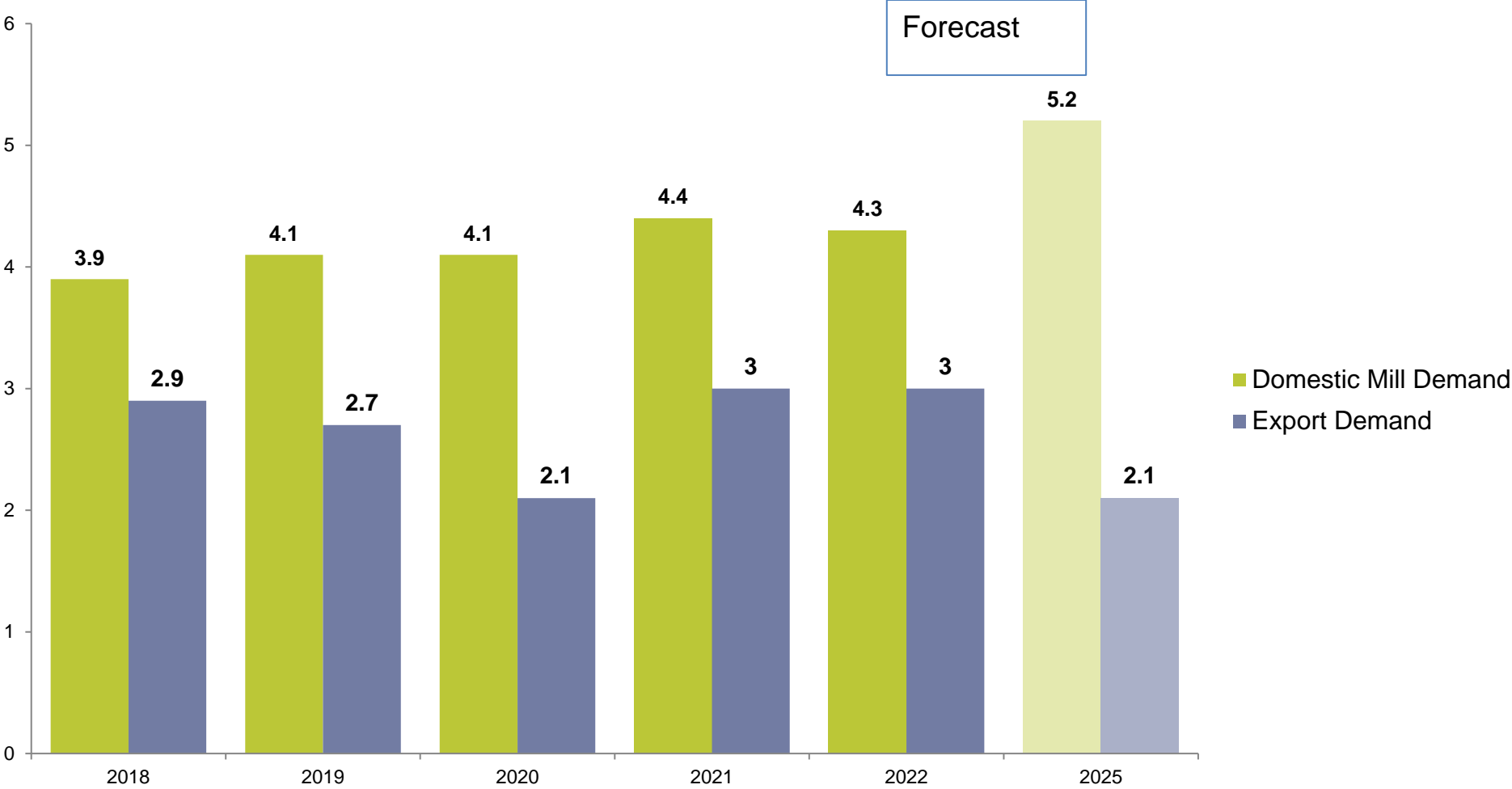
	<b>2019 Volume</b> (Short tons)	<b>3 Year Growth</b> (%)	<b>2022 Volume</b> (Short tons)
Paper cups	683,000	-8.0%	628,000
Aseptic & gabletop cartons	630,000	-3.5%	608,000
Molded fiber packaging/protective	700,000	7.1%	860,000
SBS food packaging (frozen, dairy, bakery, meat)	562,000	4.0%	570,000

# Paper Cups in Residential Recovered Paper (RCP)

- Paper cups when recovered from residential recycling are found in two of the Institute of Scrap Recycling Industries (ISRI) grades:
  - Residential Mixed Paper (RMP) – a sub-grade of the ISRI grade #54 Mixed Paper
  - Sorted Residential Paper and News (SRPN) – ISRI grade #56
- In practice the composition of these two grades don't vary significantly
- The primary differences in the two grades are that #56 SRPN is supposed contain more newsprint, less Prohibitives (contaminants), lower amounts of unbleachables (brown and gray paperboards), and a higher price than RMP
- SRPN is more likely to be produced by dual stream programs vs single stream curbside collection
- All RMP & SRPN will have some level of paper cups in it: more if the collection program explicitly includes paper cups

# US Mixed Paper Category Consumption Market Size

Million Tons



# Cups in Recovered Paper

- Post-consumer cups may be found in several of ISRI's (Institute of Scrap Recycling Industries) standard grade designations, including:
  - #37 Sorted Office Paper (SOP)
  - #52 Aseptic Packaging and Gabletop Cartons (Cartons)
  - #54 Mixed Paper (specifically Residential Mixed Paper (RMP))
  - #56 Sorted Residential Paper & News (SRPN)



- Volume of paper cups used in the US: about 628,000 tons/year
- For comparison, annual generation of ISRI grades shown to the left (US, 2022):
  - #54 Residential Mixed Paper- 4,450,000 tons
  - #37 SOP - 2,930,000 tons
  - #56 SRPN - 1,100,000 tons



# Technical Considerations in Cup Recycling

- SBS fibers are among the highest quality paper materials available for recycling.
- Recovery rates for all paper grades continue to rise in the US, while supply declines, especially printing-and writing papers.
- The majority of paper cups are used for hot beverages and have a poly coating on 1 side. The poly coating allows the cup to withstand high temperatures without breaking down.
- The challenge for mills in using cups and other polycoated paper packaging has always been the time required in the hydro-pulper to remove the paper fiber from the poly layer and adequate cleaning/screening equipment





# Cups Acceptance - Mill Market Research Over Time

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- Moore & Associates has been surveying North American recycle mills on their use/potential use of paper cups for five years now
- We currently are in the midst of surveying approximately fifty mills that are not on the current FPI list of paper cup consuming operations
- The results of the survey to date are encouraging – there may be as many as 15 new end user paper mills for cups
- The tenure of the current research survey has had the most favorable results of our work – especially noteworthy because the overall recovered paper markets are soft
- All the efforts on being put forth on many fronts on paper cup recycling is working well!

# Export Markets



- Exports of recovered paper have declined from their peak in the past decade, and Mixed Paper exports at a faster rate.
  - In 2022 almost 35% of recovered paper collected in the US was exported to Mexico, Canada, Asia, and other parts of the world, down from 37% in 2019.
  - In 2022, 42% of Mixed Paper was exported: the peak year for Mixed Paper exports were ~57%
  - In 2022, 44% of SRPN was exported.
- Mexico and Asia are the most important export markets for recovered paper grades containing paper cups, with Korea, India, Vietnam, and Thailand the largest country buyers.
- Primary use of grades containing cups in Asia and Mexico is for tissue and towel.
- Export of recovered paper is a specialized part of the paper recycling business and a large percentage of it is handled by export brokers. There are a number of export brokers that handle poly-coated paperboards and have expressed an interest in handling recovered paper cup grades.



# Export Markets Specific for Cups

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- Fiber quality continues to be a high priority. Customs and receiving mills both assess imports.
- US suppliers are consistently using ISRI Paperstock Industries (PSI) Grade standards for Mixed Paper and SRPN.
- Most SE Asia mills follow ISRI PSI grade specifications. Some mills may allow slightly more lenient standards on Prohibitives and moisture. Some countries have stricter standards.
- No SE Asia mills specifically identify post-consumer polycoated paper cups as “allowable”.
- However, small quantities of cups are being shipped and accepted in the two grades.



Thank You

**Bill Moore**

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MOORE

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*& Associates*

# PANELIST

## **HOLLY HALLIWILL**

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# FOOD RESIDUE STUDY



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# BACKGROUND & PURPOSE

## PURPOSE

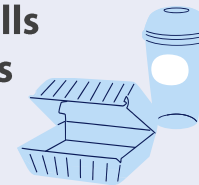
- **Main question:** how contaminated is foodservice packaging vs. other types of commonly recycled food contact packaging at MRFs?
- The 2022 study served as a refresh audit meant to update 2013 and 2014 baseline data

## PREVIOUS STUDIES

- Fall 2013 in Boston, MA
- Summer 2014 in the State of Delaware
- The two studies represented different program profiles in terms of overall residue levels, housing patterns, demographics, etc.
- Both found no significant difference between foodservice packaging and other food contact packaging

# FOOD CONTACT VS. FOODSERVICE

CATEGORY	FOOD CONTACT	FOODSERVICE
Corrugated Packaging	Bulk produce boxes, Frozen pizza rounds	Pizza boxes, Corrugated paper clamshells
Paper and Paperboard	Dry food boxes (without liner), Frozen food boxes (without liner), Paper ice cream tubs	Hot coffee cup, Paper bowl/tub for frozen yogurt, Single slice pizza box, Bakery box
Molded Fiber	Egg cartons	Cup holder trays, Clamshells
Plastic Containers	Yogurt cups and tubs, Peanut butter jars, Hummus tubs, Berry containers, Condiment bottles, Leafy greens containers, Cupcake trays	Cold cups, Clamshells without labels, Tubs without labels
Aluminum	Cat food cans, Single-use trays and pie plates	Round trays with fold-over edge to secure a lid
Steel	Food cans	Steel is not used in foodservice packaging



**Foodservice Packaging:** packaging that was used by restaurants, fast food chains, and similar establishments for take-out meals, typically holding food intended for immediate consumption

**Food Contact Packaging:** packaging that was used for pre-packaged food sold at stores that came into direct contact with food, typically for longer term containment of foods

# 2022 STUDY APPROACH

## RECYCLE THESE ITEMS

CLEAN, EMPTY & LOOSE (NOT BAGGED OR BUNDLED)

### CARDBOARD & PAPER



### PLASTIC BOTTLES, CUPS & CONTAINERS

Rigid plastics #1-7; no foam or flexible plastics



### GLASS BOTTLES & JARS



### METAL CANS, BOTTLES & FOIL



### MILK, JUICE & SOUP CARTONS



If the cap/lid and container are the same material, keep them attached. If they're different materials, detach and recycle separately.

- Audit conducted November 2022 at a MRF in Michigan over two days
- MRF processes mainly residential material and accepts pizza boxes, paper cups, paper bags, plastic cups, plastic clamshell containers, and aluminum trays. The MRF uses 'clean & empty' messaging.
- Differences between the 2013/2014 studies at the 2022 study:
  - Molded fiber was distinguished from paper and paperboard
  - Egg cartons moved from foodservice to food contact

# METHODOLOGY – SAMPLING

- Residential loads were selected at random for sampling, with no more than one sample taken per truck
- 13 200-pound samples were sorted into the material categories (e.g. molded fiber, plastic containers, etc.), with foodservice and food contact subcategories
- The following weights were noted per sample:
  - Total foodservice packaging
  - Total food contact packaging
  - Other recyclables
  - Residue





# METHODOLOGY - RATINGS

## VISUAL RATING SYSTEM

Each foodservice and food contact package was visually rated as one of the following:

1. clean packaging, no food residue
2. clean packaging, though some crumbs or staining from oils
3. no large pieces of food present but visible food remnants
4. food residue or heavy staining
5. heavy food residue



Plastic food contact packaging reflecting ratings of 1 (top) to 5 (bottom)



OCC – Foodservice packaging reflecting ratings of 5 (left) to 1 (right)

# FOOD RESIDUE STUDY - RESULTS

## FOOD CONTACT AND FOODSERVICE PACKAGING GENERALLY CLEAN

- The vast majority of both food contact and foodservice items were relatively clean (rated 1 or 2).
- For paper and paperboard and plastic containers, both food contact and foodservice categories had similar, extremely low rates of significant residue:
  - For paper and paperboard, ratings of 4 and 5 totaled 0%, regardless of foodservice/food contact
  - For plastic containers, ratings of 4 and 5 totaled 2% regardless of foodservice/food contact.
- Across all materials and uses, the only categories that had more than 10% significant residue (ratings of 4 and 5) were OCC Foodservice with 17% and Molded Fiber Foodservice with 23%.



# FOOD RESIDUE STUDY - RESULTS

## FOOD CONTACT AND FOODSERVICE PACKAGING GENERALLY CLEAN

- The category with the largest difference in food residue between food contact and foodservice packaging was molded fiber, with the foodservice subcategory significantly more frequently observed to contain food residue.
- This is both due to some common foodservice molded fiber applications (e.g. bowls, plates) being prone to residue, as well as the most common food contact application (egg cartons) being exceptionally clean.



Molded Fiber – Food contact item rated 2 and Foodservice item rated 4



# FOOD RESIDUE STUDY - CONCLUSIONS

## FINDINGS CORROBORATE PREVIOUS STUDIES

- The findings of this audit are generally consistent with the findings of the two previous studies
- An exception is molded fiber, which was broken out and categorized differently in this study.
- Broad generalizations should not be made from this study, since sampling was performed only at one facility and also due to the low numbers of observed packages in some categories
- Several categories also contained zero packages rated as either a 4 or 5 (significant residue). These included OCC Food contact, Paper and Paperboard Food Contact and Foodservice, and Molded Fiber Food Contact.



**THANK YOU!**

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# QUESTIONS



# WEBINAR SERIES

## WEBINAR #3: COMPOSTABLE PACKAGING

Explore the findings of the CompostAble Chicago study and learn about the role of compostable packaging in composting. **Sept 2023**

## WEBINAR #4: RESIDENT MESSAGING

Learn about findings from a nationwide resident messaging survey that gauged the effect of images and language in communicating with residents about recycling foodservice packaging. **Nov 2023**



**THANK YOU!**

[www.RecycleFSP.org](http://www.RecycleFSP.org)

