



GLOBAL POUCH FORUM

May 29-31st, 2024



Considerations for Widely Recyclable Pouches

Flexible Packaging Team



Jake Branyon

Director of R&D, Global
Flexible Packaging

Jake Branyon is the Director of R&D for Sonoco Global Flexible Packaging and is based at the company's corporate headquarters in Hartsville, SC. In this role, Jake works to define the development and business strategies for next generation and new to the world flexible packaging solutions. Today, much of the work is focused on sustainability related initiatives. Prior to this role Jake has worked in various product development and procurement positions throughout his 16-year career with Sonoco. He holds a BS in Packaging Science from Clemson University.

Agenda

Enabling Widespread Recyclability for Pouches



01

A Brief Introduction to
Sonoco



02

The Innovation Journey:
Curbside Recyclable Flexible
Packaging



03

The Path to
Commercialization

Sonoco Products Company

Sonoco, founded in 1899, is committed to creating sustainable products, services and programs for our customers, employees and communities that support our corporate purpose of **Better Packaging. Better Life.**

\$6.8 Billion

2023 Revenue

300+

Operations

22,000+

Global Teammates

32

Countries



Consumer



Industrial



Protective



Healthcare



Sonoco Consumer Packaging



Rigid Paper Containers



Flexible Packaging



Metal Packaging



Rigid Plastics





Our Curbside Innovation Story

EnviroFlex® Paper Journey

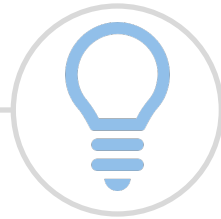


Goal: Develop a **recyclable** structure that retains the key **performance** attributes of traditional multi-material laminates



Performance Challenges

Strength vs. Thickness
Barrier – Eliminate Foil
Machinability
Seal Strength & Integrity



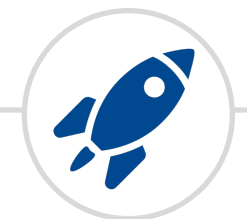
Accelerated Innovation

New Barrier Testing Protocol
Developed internal repulp/recycle screening test
Open Innovation



Industry Influence

Chemicals of Concern (PFAS/PVDC)
Push for reduced virgin plastic use and recyclability
Recycling Methodology
Standardization



Commercialization



EnviroFlex® Paper Journey

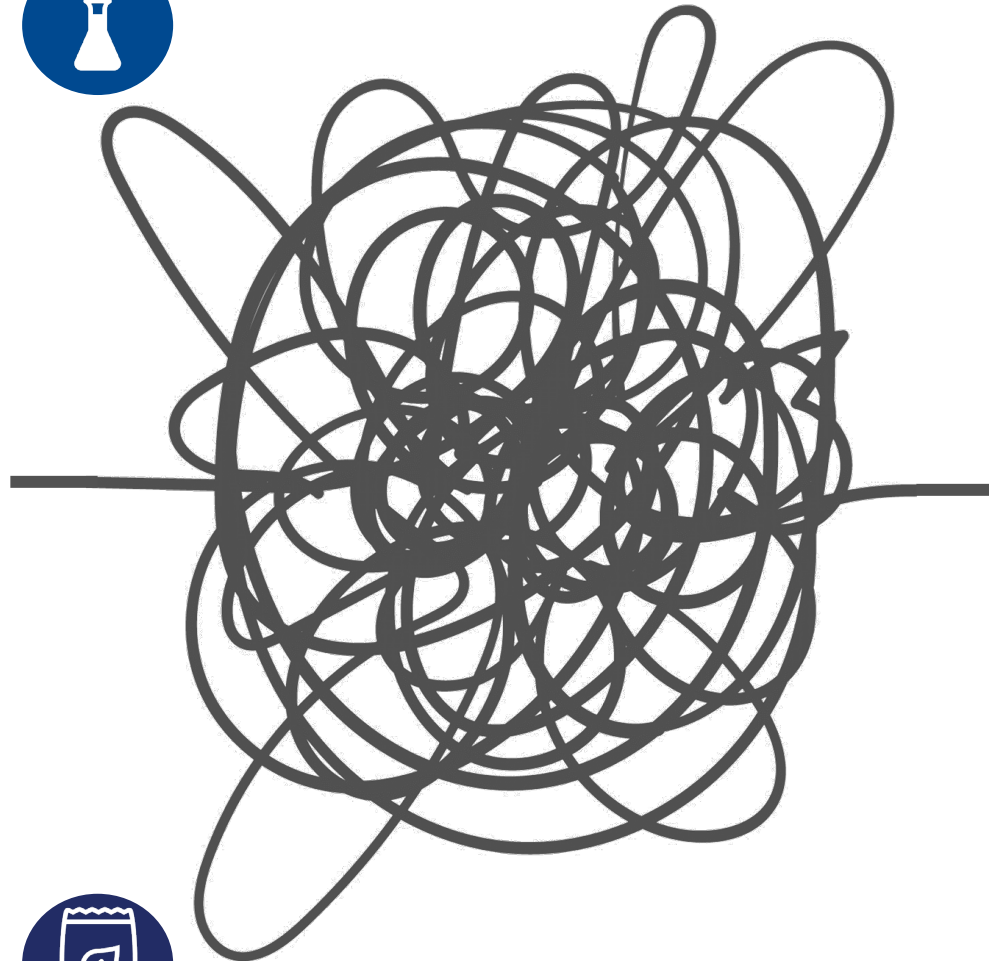
2011: Barrier and Functional Coating Development and Research



2018: Functional paper for use in a rigid paper can



2020: Recyclable paper based flexible packaging



EnviroFlex® Paper

Sonoco Recycling Infrastructure



125 Years of Paper

50 Years of Recycling



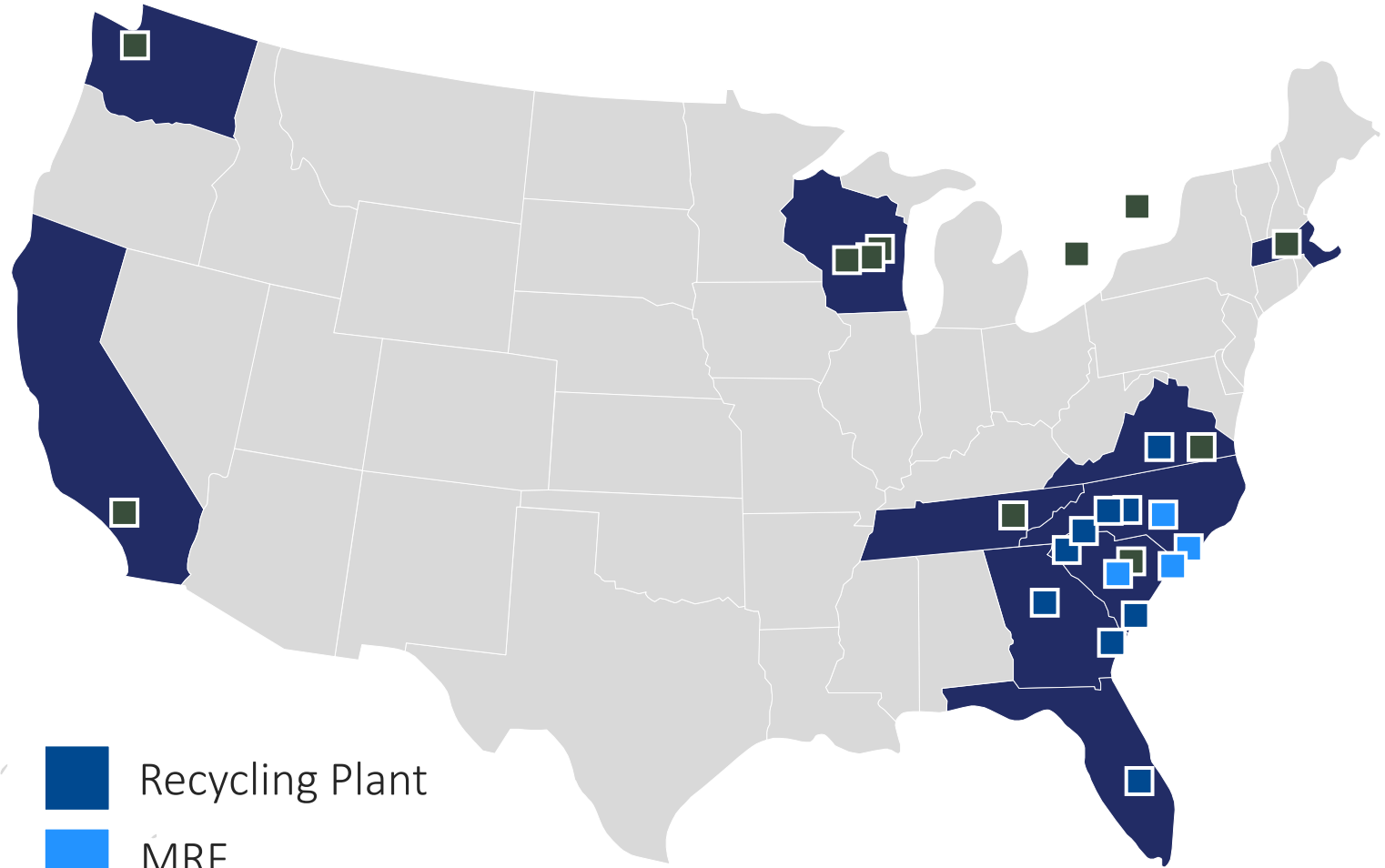
2.6 Million Tons per Year

70% OCC, in addition to Paper, Plastic and Metal



Top 10 U.S. Recycler

16 Commercial Recycling Plants
5 Material Sorting Facilities



- Recycling Plant
- MRF
- Paper Mill

How Does Recycling Drive Innovation?



A Recyclers Perspective

The more non-recyclable options, the more potential contaminates



Recycling Yields

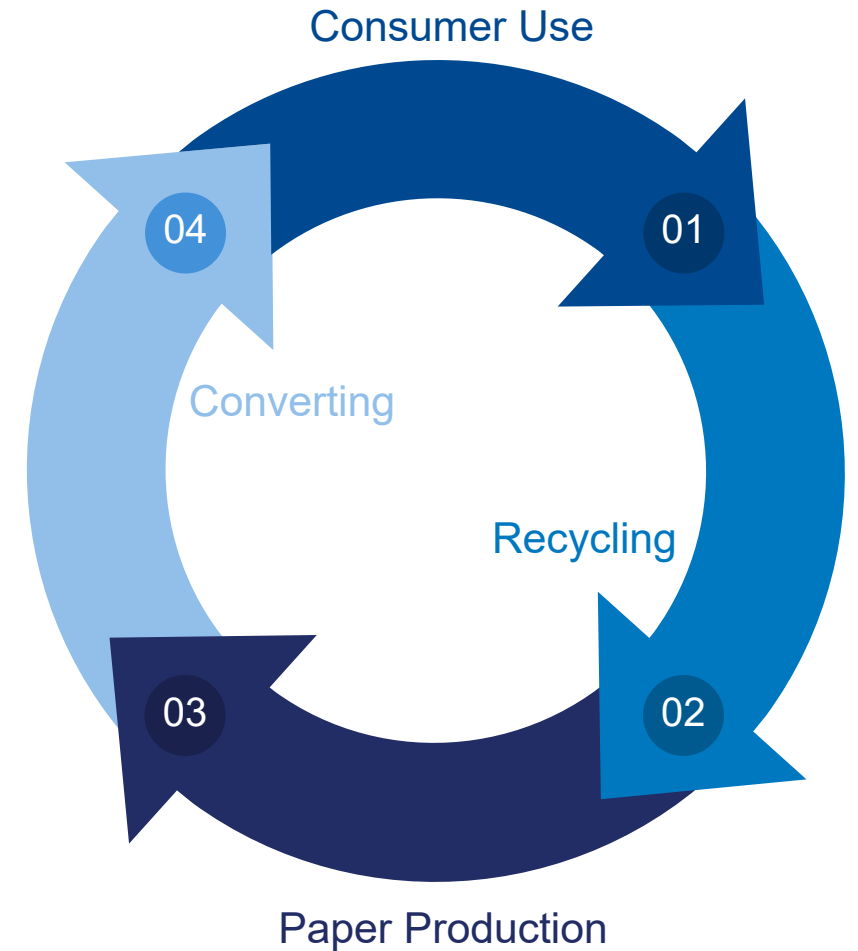
We want products that positively impact the recycling stream and yields



Product Development

Ability to test in paper laboratory and on MRF equipment

Cradle to Cradle Integration



U.S. Flexible Packaging Sustainability



All Rigid Packaging

Recovery Rates

Paper: **81%**

Steel: **74%**

Aluminum: **35%**

Plastic: **14%**



Flexible Packaging

4% of residential Store Drop off is recovered

Approximately **0%** is recovered from all types



Flexible Sustainability

Rigid to Pouch Study:
62% Less GHG Emissions

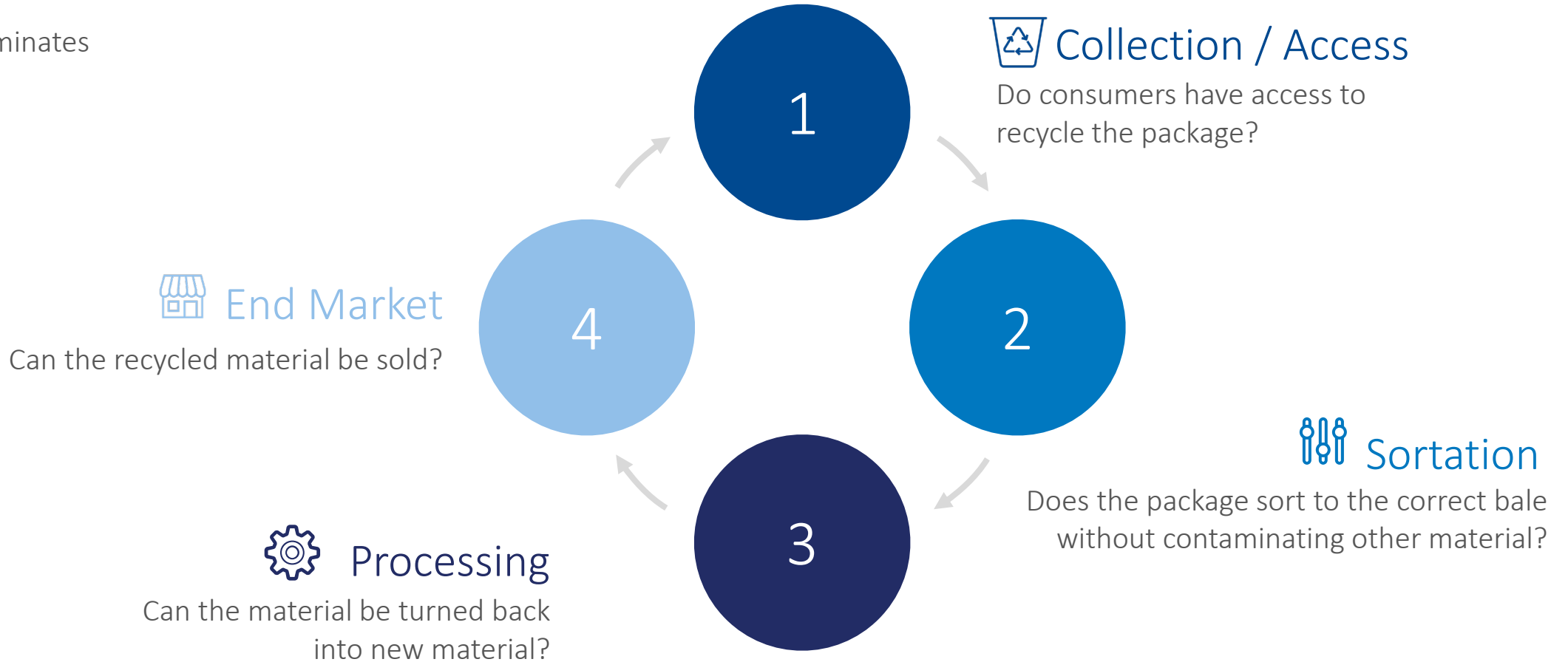
77% Less Water Usage

58% Less Fuel Usage

The 4 Elements of Packaging Recyclability

Flexible Packaging Example

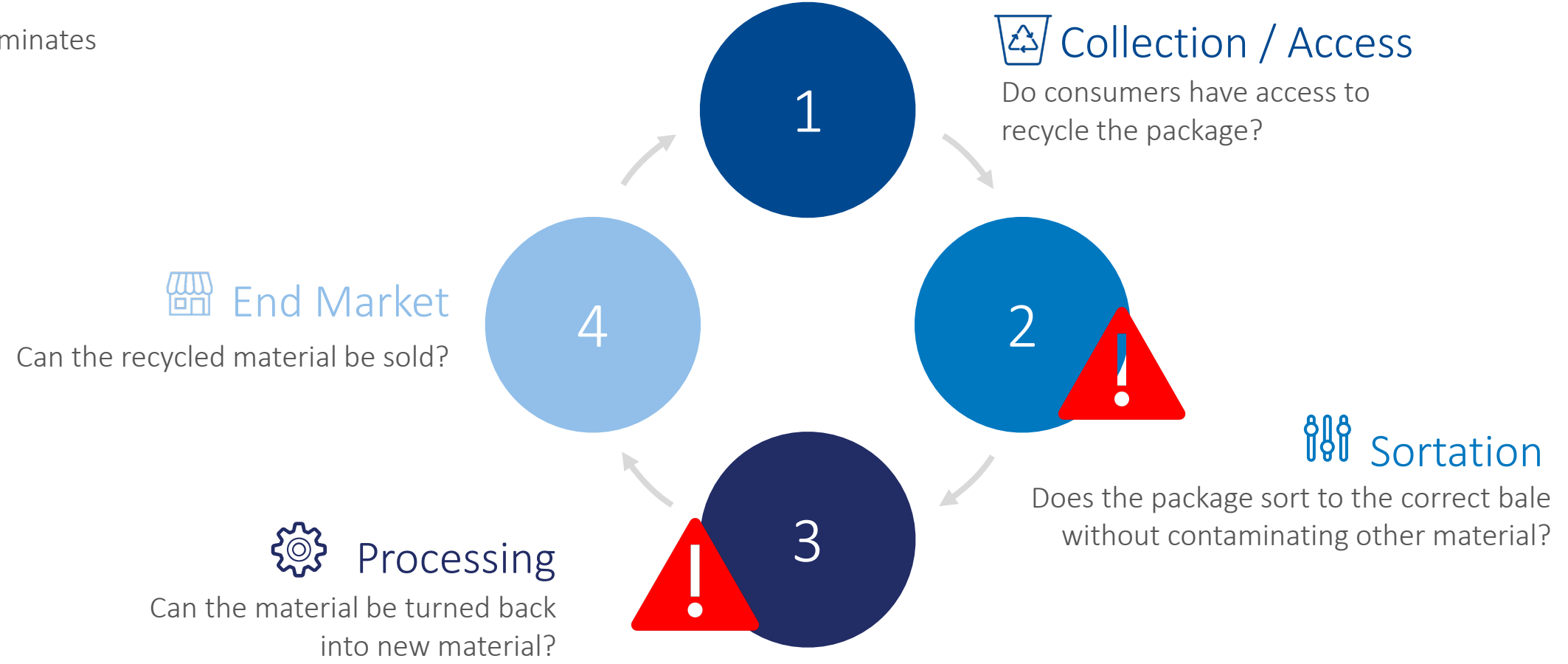
● Traditional Laminates



The 4 Elements of Packaging Recyclability

Flexible Packaging Example

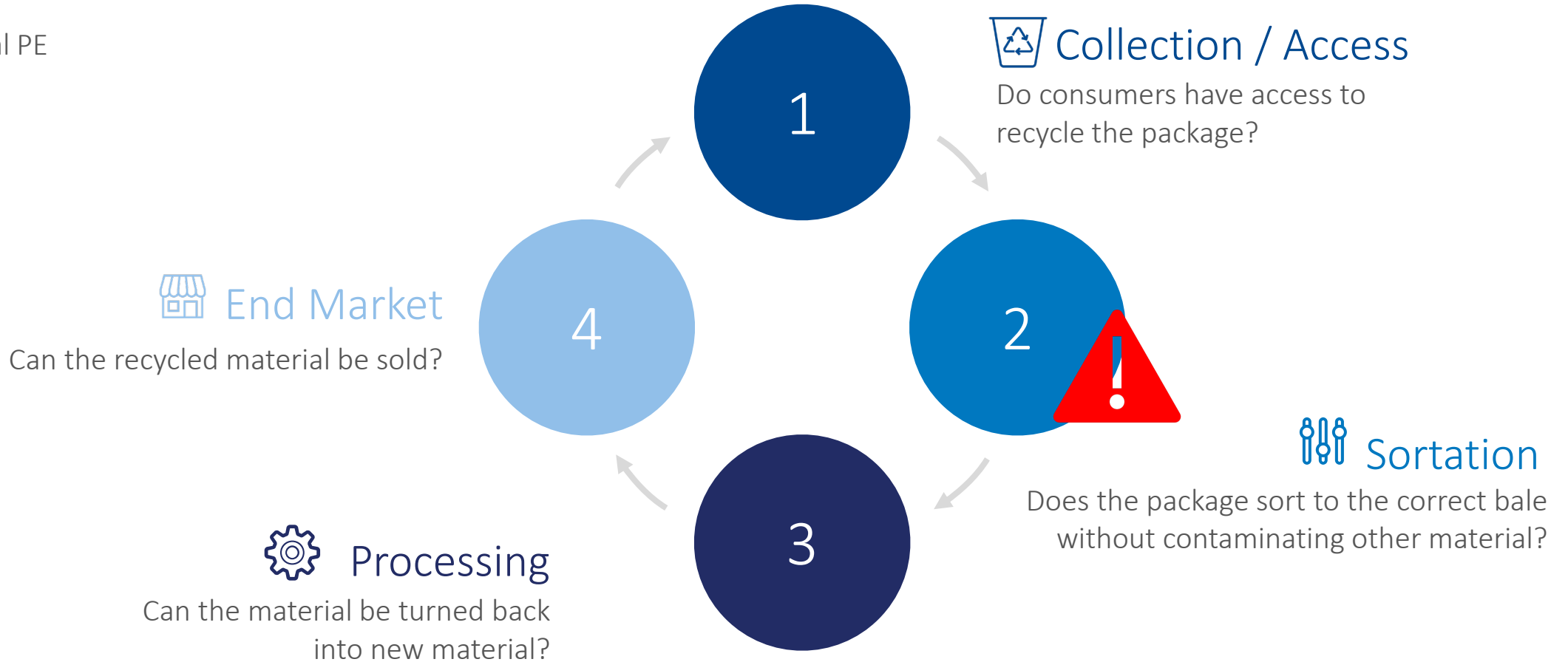
● Traditional Laminates



The 4 Elements of Packaging Recyclability

Flexible Packaging Example

● Mono-Material PE



The 4 Elements of Packaging Recyclability

Flexible Packaging Example

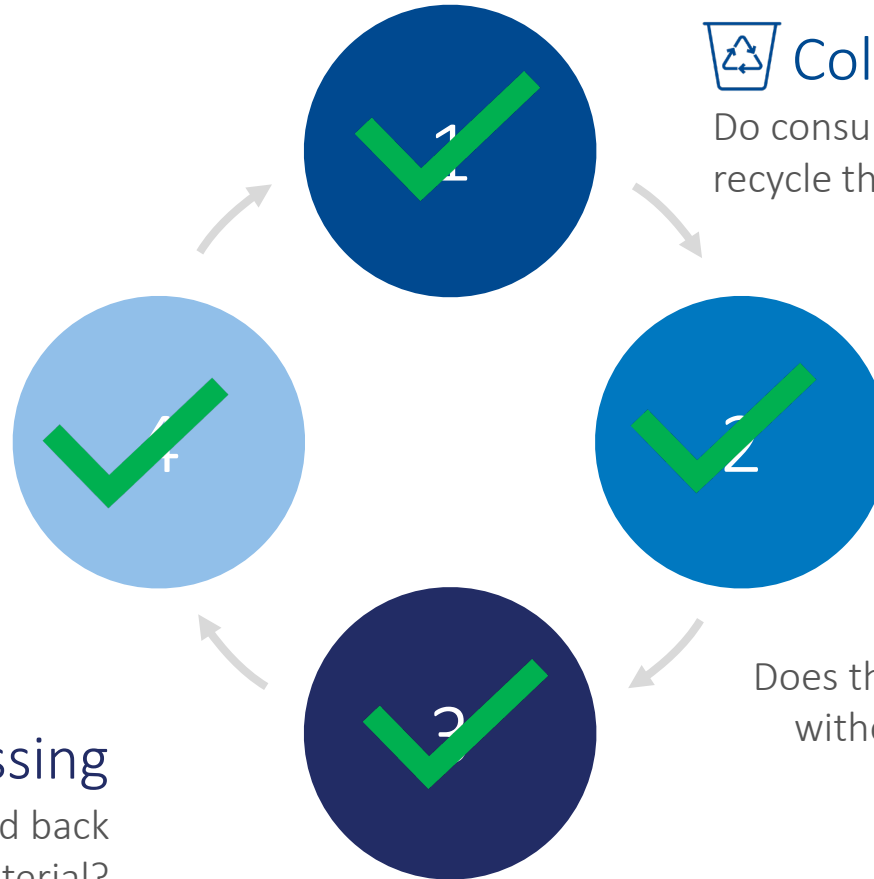
● Mono-Material PE



 End Market

Can the recycled material be sold?

 Processing
Can the material be turned back into new material?



 Collection / Access

Do consumers have access to recycle the package?



 Sortation

Does the package sort to the correct bale without contaminating other material?

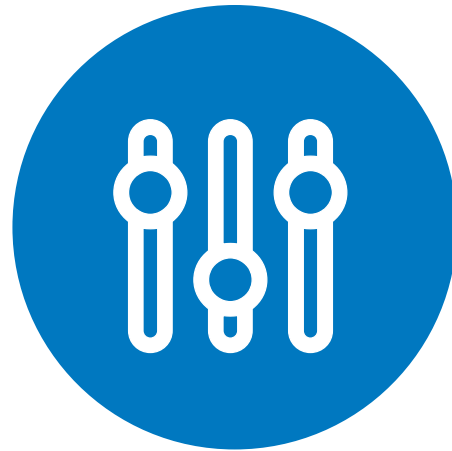
Required Data and Work

Working backwards



Collection/ Access

Community Outreach
Recycling Guides
Access Studies



Sortation

Size Sortation
Optical Sorters
MRF Flow Studies



Processing

APR Critical Guidance Testing
Fiber Box Association
Repulability
Bale Specifications



End Market

Demand for Recycled Content



End Market

Recycled Paper Market

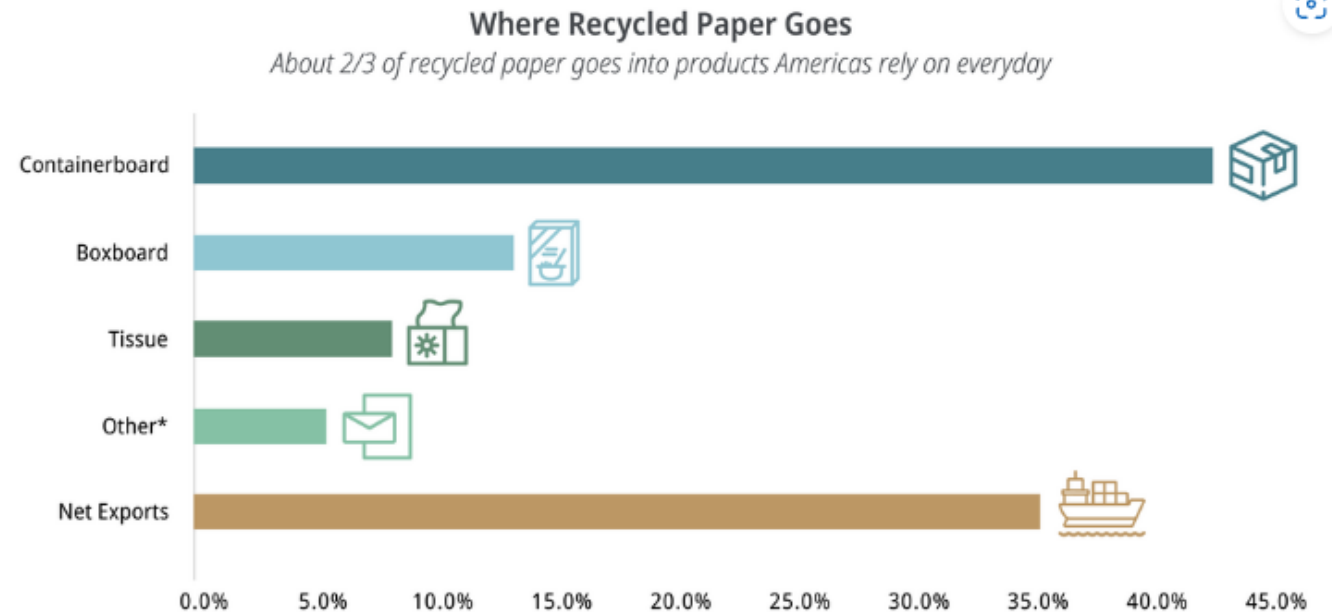
Paper Recycling is a Success Story

In 2022, the paper recycling rate was nearly 68%, which held approximately steady to the 2021 rate. Nearly half of recycled paper went into manufacturing containerboard – the material used to make cardboard boxes.

Recycled paper is also used to make boxes for dry foods like cereal or pasta, tissue products like toilet paper and paper towels, as well as newspapers.

About 80% of U.S. paper mills use some recycled paper to make new and innovative products! Recycled paper is also exported. It's used in paper mills around the world to manufacture new products.

As one of the most recycled materials in the U.S., paper is a practical and sustainable choice.



* Other includes newsprint, printing-writing, Kraft packaging and Industrial converting, construction paper and board, and molded pulp

Source: AF&PA Statistics and U.S. Census Bureau

State EPR Legislation



U.S. Congress

In 2022 – Two Bills under consideration with EPR language



2021-2022 New Laws



2022-2023 Legislations



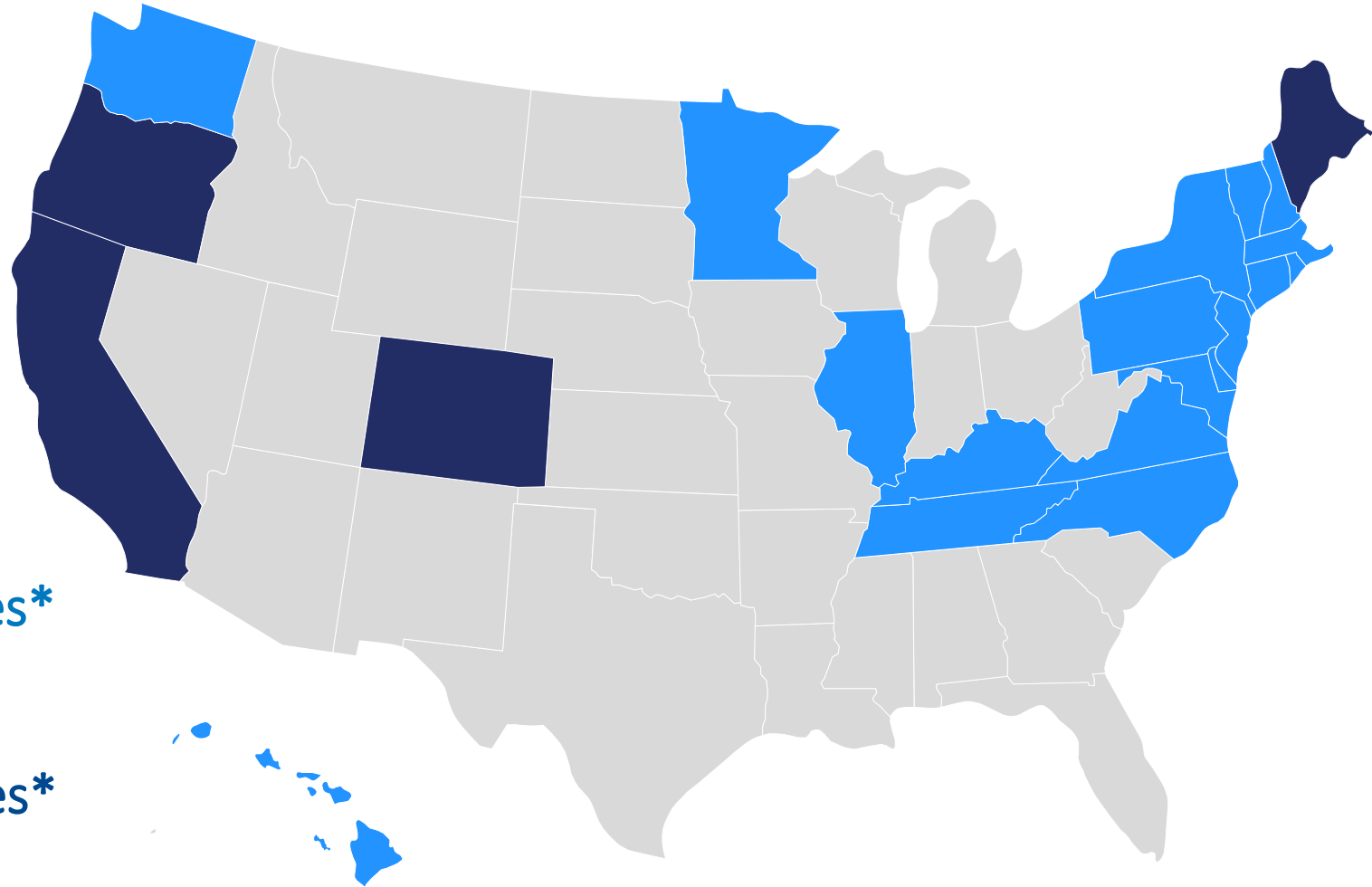
19% Reduction in EPR Fees*

By moving from traditional multi material laminates to All-PE



70% Reduction in EPR Fees*

By moving from traditional multi material laminates to Paper



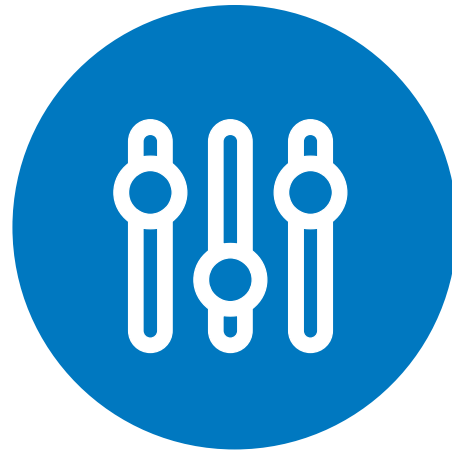
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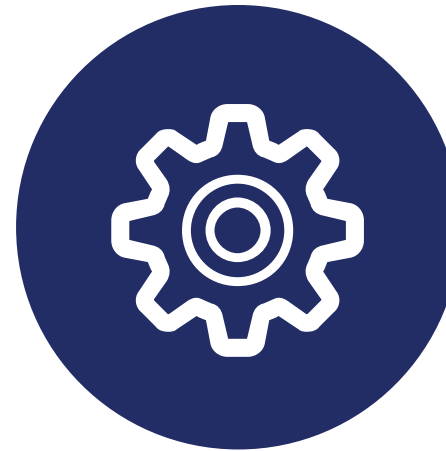
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End Market

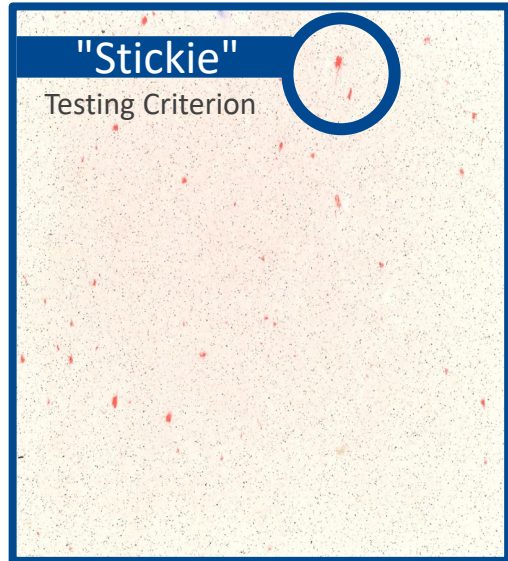
Demand for Recycled Content



Processing

Paper Processing

3rd Party Testing:



In-House Repulp/Recycle Test

Adherence to voluntary Standard for
Repulpability and Recyclability:
Acceptable yield >80%



FIBRE BOX ASSOCIATION

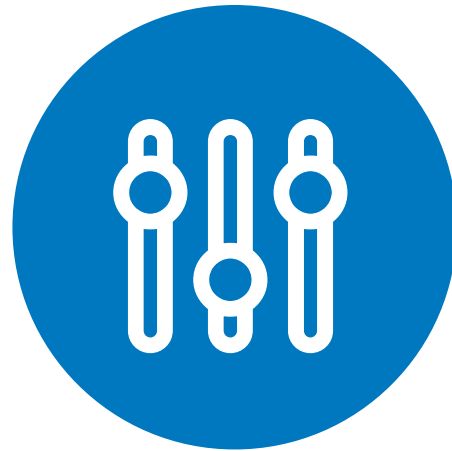
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Demand for Recycled Content



Sortation

Why perform a sortation study?



“A product or package should not be marketed as recyclable unless it can be collected, **separated**, or otherwise recovered from the waste stream through an established recycling program for reuse or use in manufacturing or assembling another item.”

- Federal Trade Commission Green Guides

Questions We Wanted to Answer



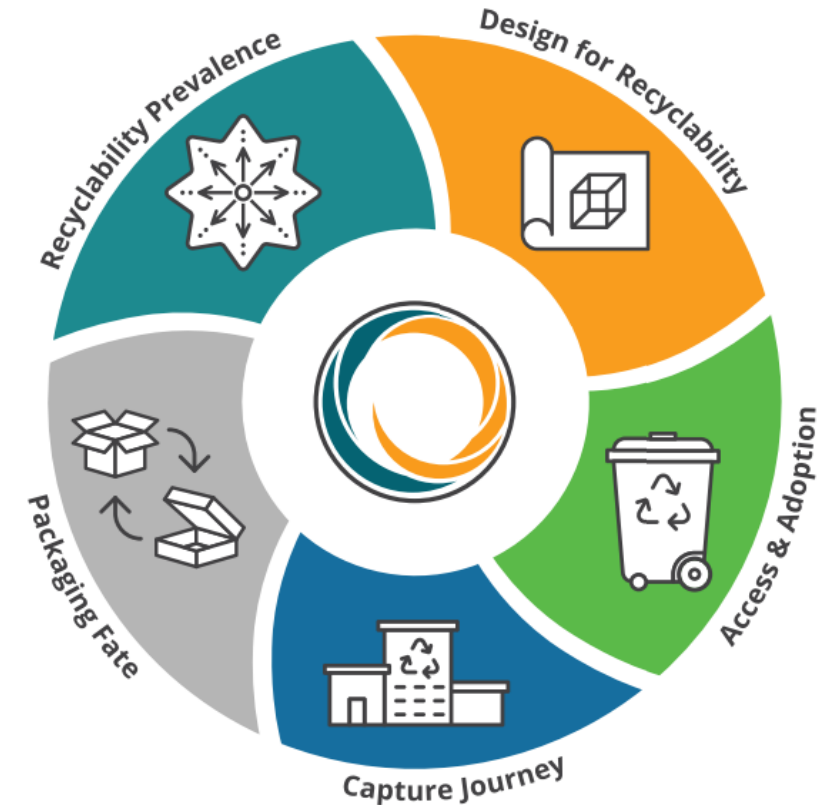
Where do flexible paper packages flow in a material recovery facility?



What percentage of packages are flowing to the correct bunkers?



What impacts the sortation of flexible paper packages?



Circular Packaging Assessment Tool

EnviroFlex® Paper Variables



ULT 1.0

Stand Up Pouch

5.25" x 6.50"

BW = 78.5 lbs./ream



GP 1.0

Three-Side Seal Pouch

5.00" x 6.00"

BW = 52.0 lbs./ream



ADV 4.0 CS

Bar Wrap

5.50" x 2.25"

BW = 50.5 lbs./ream



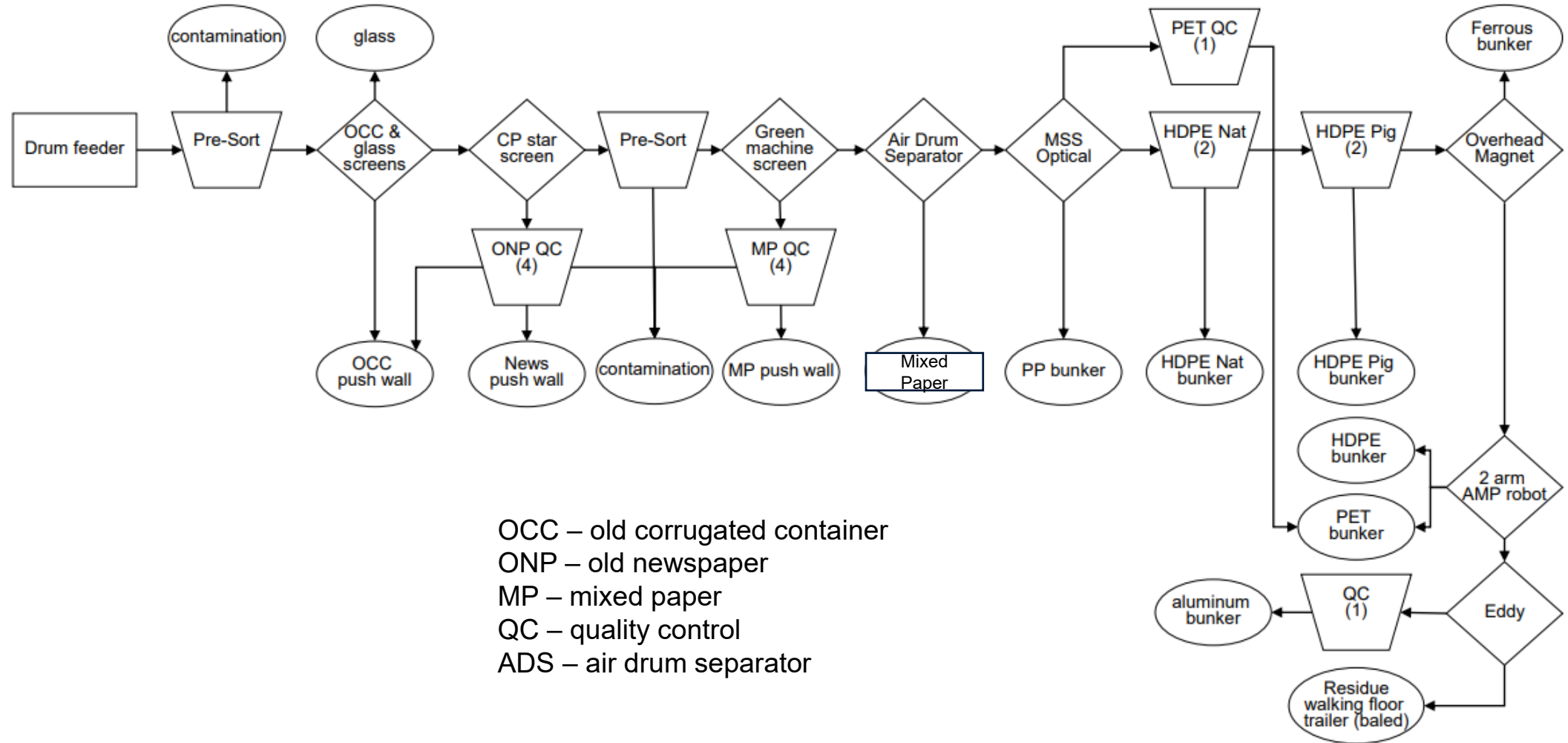
GP 4.0 CS

Snack Pouch

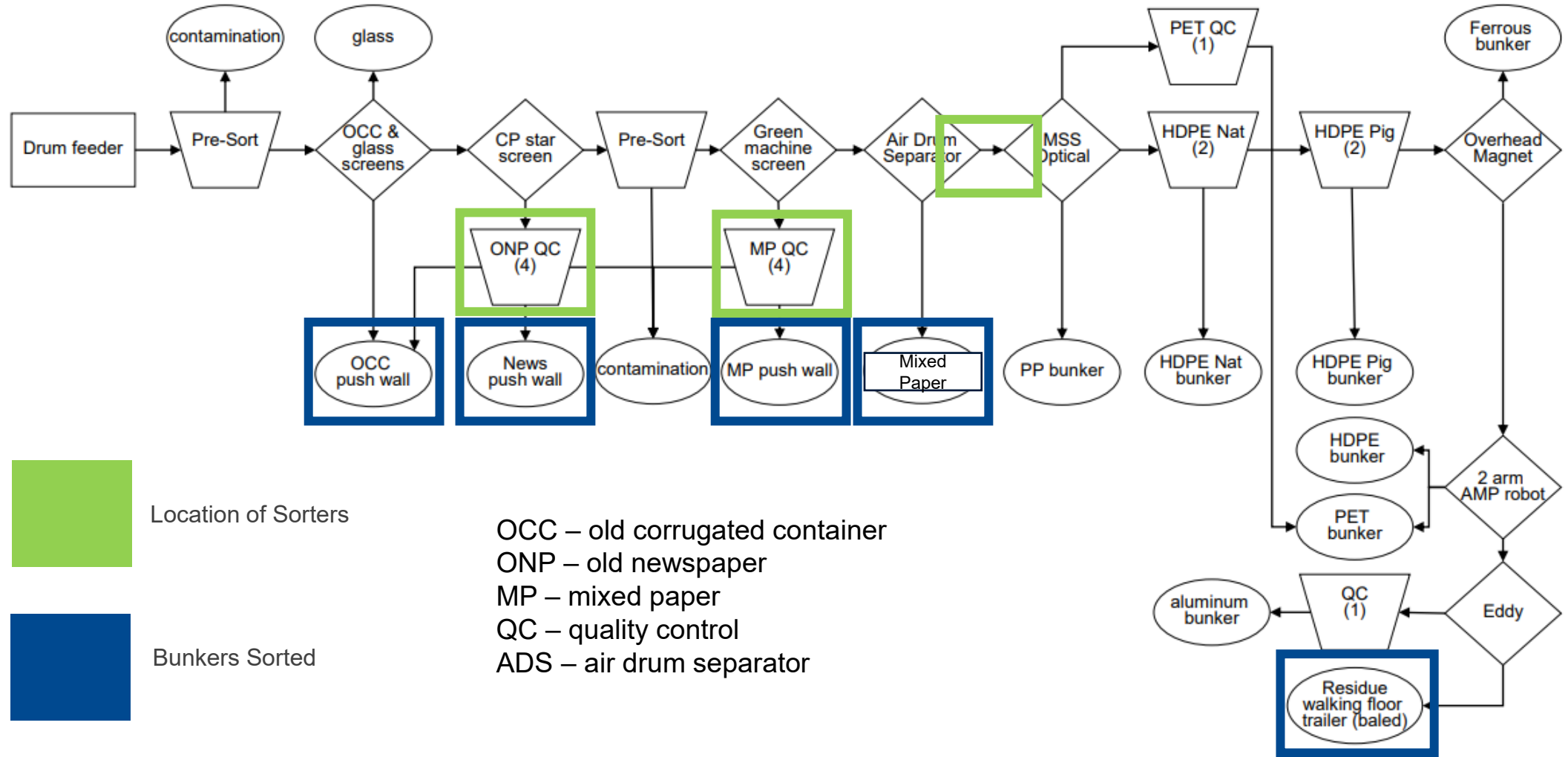
4.00" x 2.875"

BW = 30.5 lbs./ream

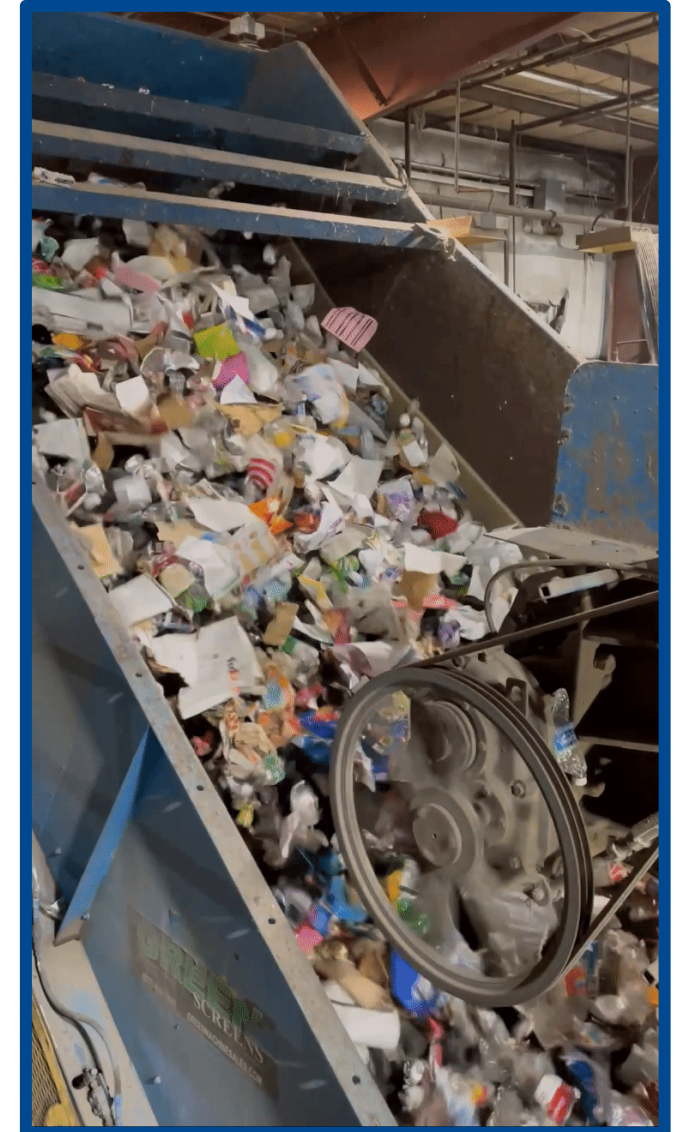
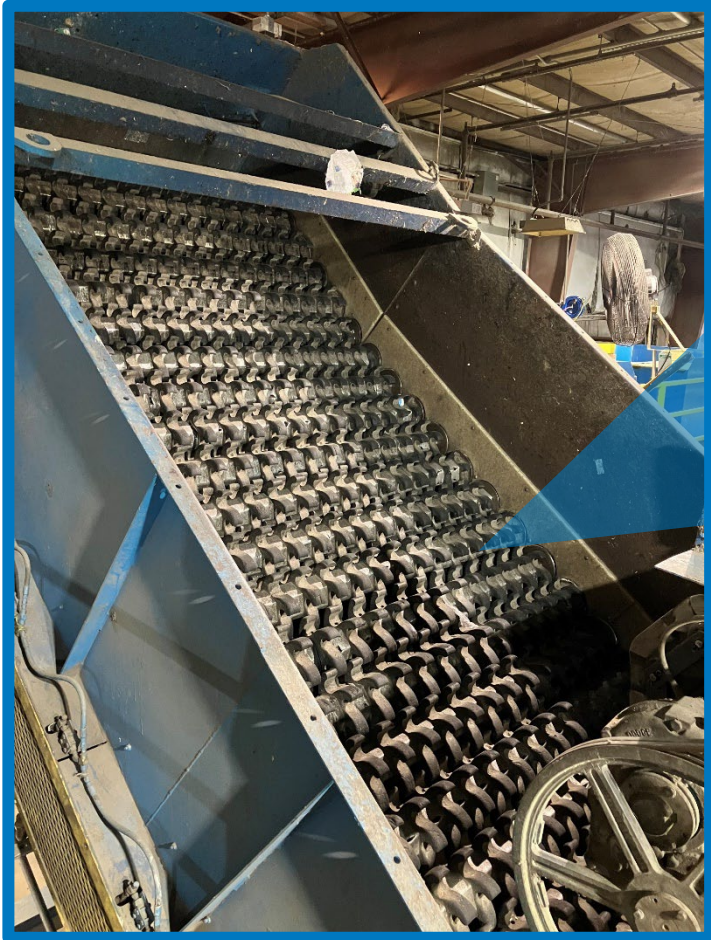
MRF Process Diagram (Columbia, SC)



MRF Process Diagram (Columbia, SC)



Fiber Screens



Trial Results

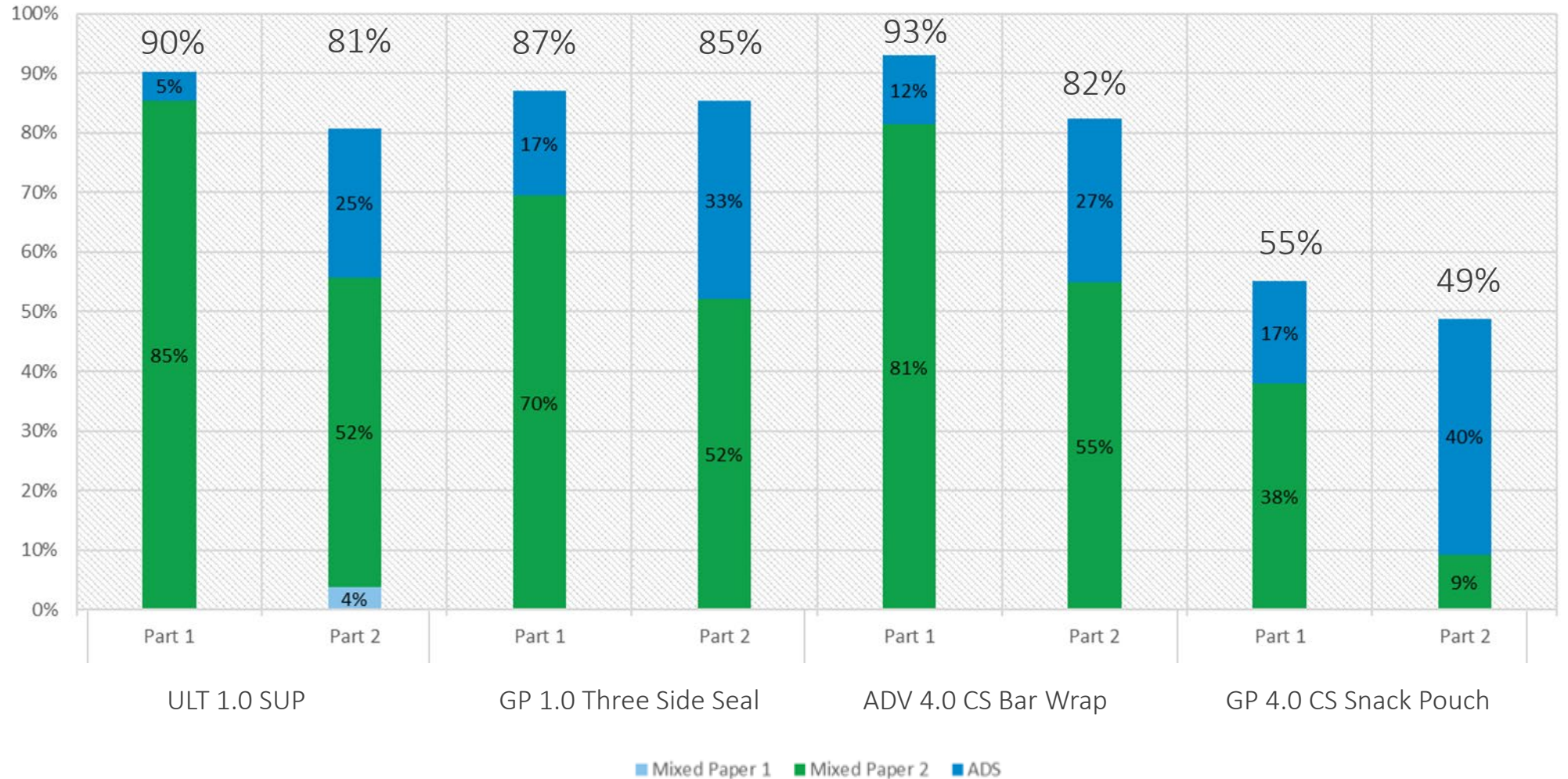
Some Context is needed: What's considered enough?

PET Bottles:
86.7%

HDPE Bottles:
83.5%

Cartons:
93%

Percent to Mixed Paper Stream

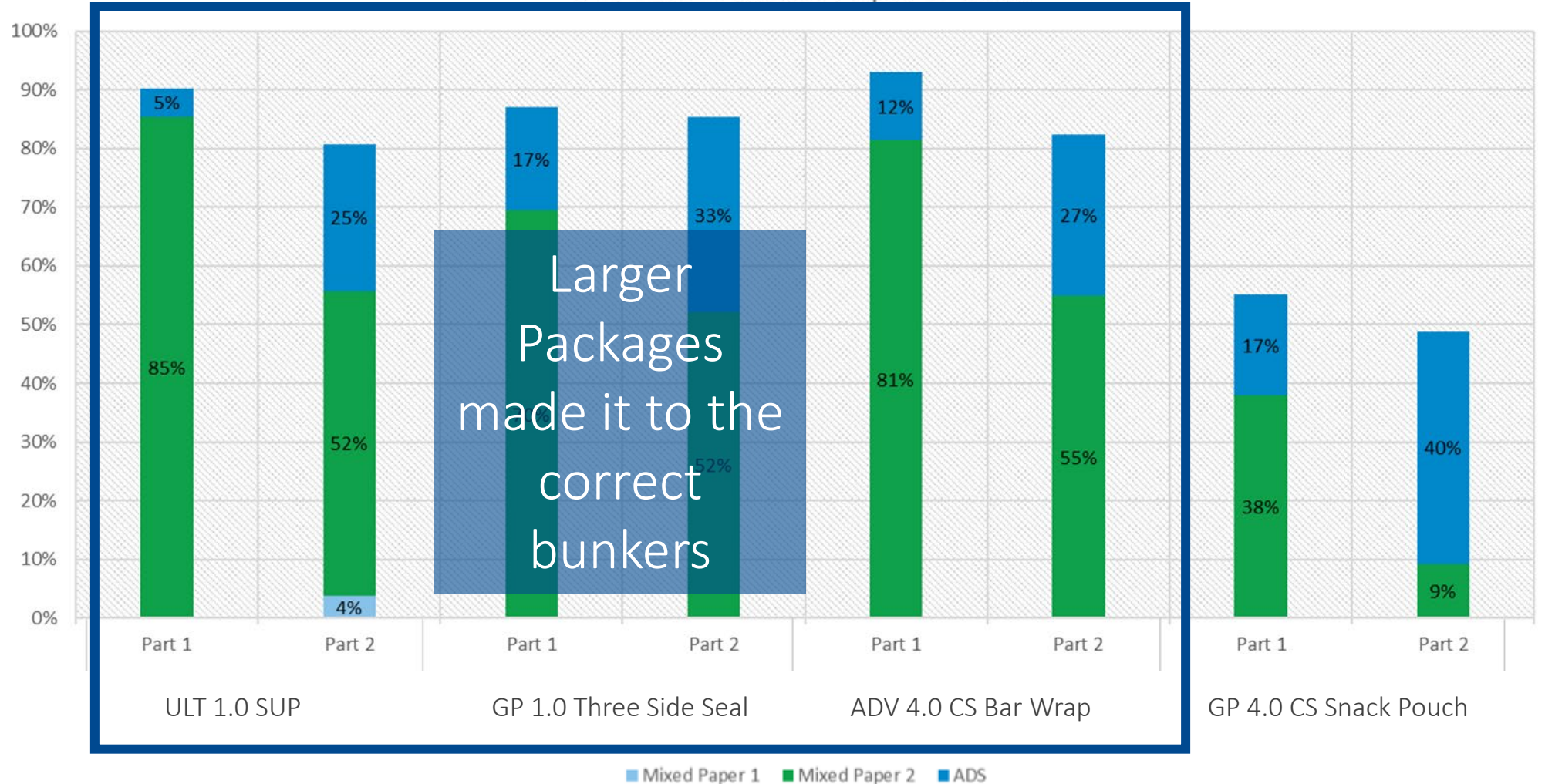


Trial Results

Conclusion:
Larger formats
were recovered
at high rates

Investment
needed for
small format

Percent to Mixed Paper Stream



Required Data and Work

Working backwards



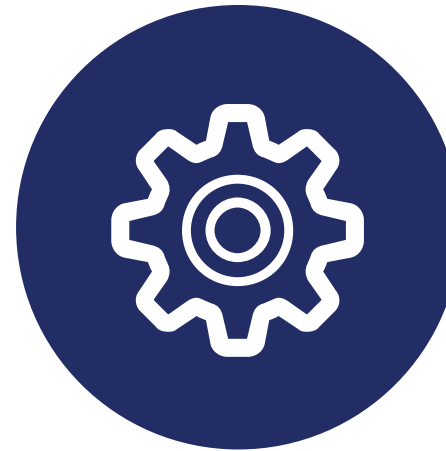
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Collection/Access

Access: On Pack Labeling



Widely Recyclable

For packages that are accepted in the curbside or drop-off programs of at least the majority of Americans (60%) or Canadians (50%), and the package is not meaningfully challenged in sortation, reprocessing or end markets.



***Not recycled in all communities**

Sometimes Recyclable

Not recycled in all communities. For packages that are accepted in curbside or drop-off recycling programs of at least 20% of the population but fewer than 60% (US) or 50% (Canada). Or, the package is widely collected but encounters some type of meaningful challenge in sortation, reprocessing or end markets.



Not Yet Recyclable

For packages that are accepted in recycling programs of fewer than 20% of the population. Or, where more than 20% live in communities that accept the item but it is significantly challenged in sortation, reprocessing or end markets.



Store Drop-off

For packages that can only be recycled via Store Drop-Off. This applies to polyethylene bags, wraps and films that are not meaningfully challenged in sortation, reprocessing or end markets.

How2Recycle® Pre-Qualifications

Product	Purpose	Status	
EnviroFlex® Paper GP 4.0 CS	Low Barrier Cold Seal Structure	Pre-Qualified (Widely Recyclable)	Nov-22
EnviroFlex® Paper ULT 1.0	High Barrier Heat Seal Structure	Pre-Qualified (Widely Recyclable)	Jan-23
EnviroFlex® Paper ADV 7.0	Medium Barrier Heat Seal Structure	Pre-Qualified (Widely Recyclable)	Mar-23
EnviroFlex® Paper ADV 4.0	Medium Barrier Heat Seal Structure	Pre-Qualified (Widely Recyclable)	Apr-23
EnviroFlex® Paper ADV 4.0 CS	Medium Barrier Cold Seal Structure	Pre-Qualified (Widely Recyclable)	Apr-23
EnviroFlex® Paper ULT 1.0 CS	High Barrier Cold Seal Structure	Pre-Qualified (Widely Recyclable)	May-23
EnviroFlex® Paper ULT 2.0	Thinner, High Barrier Heat Seal Structure	Pre-Qualified (Widely Recyclable)	Feb-24
EnviroFlex® Paper ULT 2.0CS	Thinner, High Barrier Heat Seal Structure	Pre-Qualified (Widely Recyclable)	Mar-24



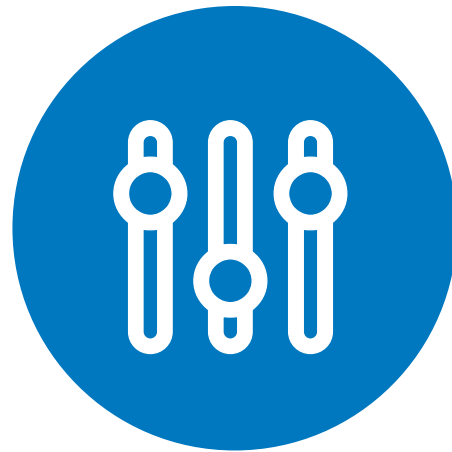
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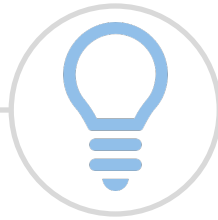
CPG Commercialization Journey

Our Perspective: Commercializing Paper



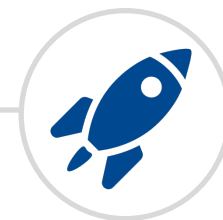
Product Fit

- Product type: (dry, semi-moist, liquid)
- Barrier requirements



Machinability

- Premade, HFFS, VFFS
- Willing to make line modifications?



Consumer Acceptance

- Features, Form and Function

What Can Flexible Paper Enable?



Products

Confections, cookies & crackers, salty snacks, pet, coffee



Formats

Sachets, SUP, Flow Wrap and Cold Seal



Printing

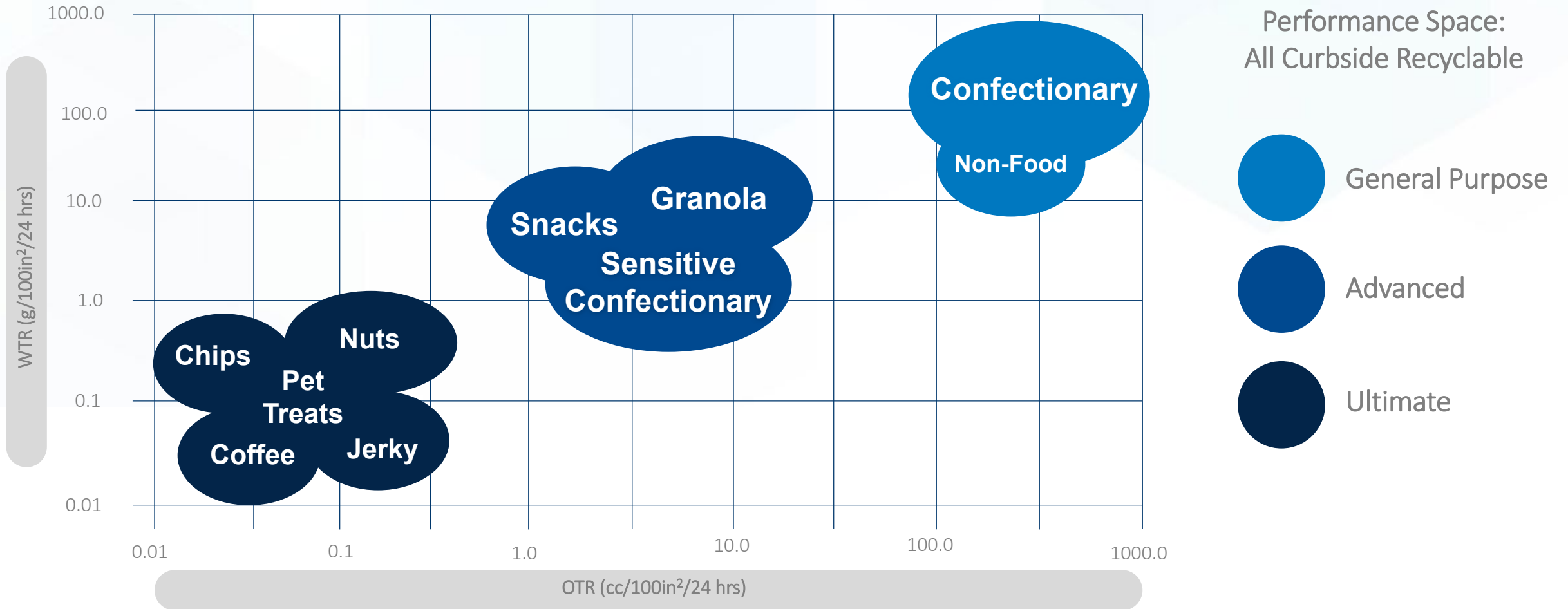
Matte, Gloss, Hybrid





ENVIROFlex[®] PAPER Markets

EnviroFlex[®] Paper Barrier Performance



Opportunities for Continued Innovation



Product Attributes

Heavy Products, Liquids



Features

Windows and Closures



Recycled Content

Supply of PCR for food grade papers is limited

Heavy Products

Limits: Seal strength



Fitments

Limits: Machinability and sealing



Liquids

Limits: Compatibility



Machinability



Tooling

Forming Box, Forming Collar & Seal Bars



Throughput

Product type, size and baseline



Process Type

HFFS, Premade, VFFS



Bar Wrap > Mixed Nuts (SUP) > Powder (stick pack)



Transition Complexity

CPG Launch Strategy



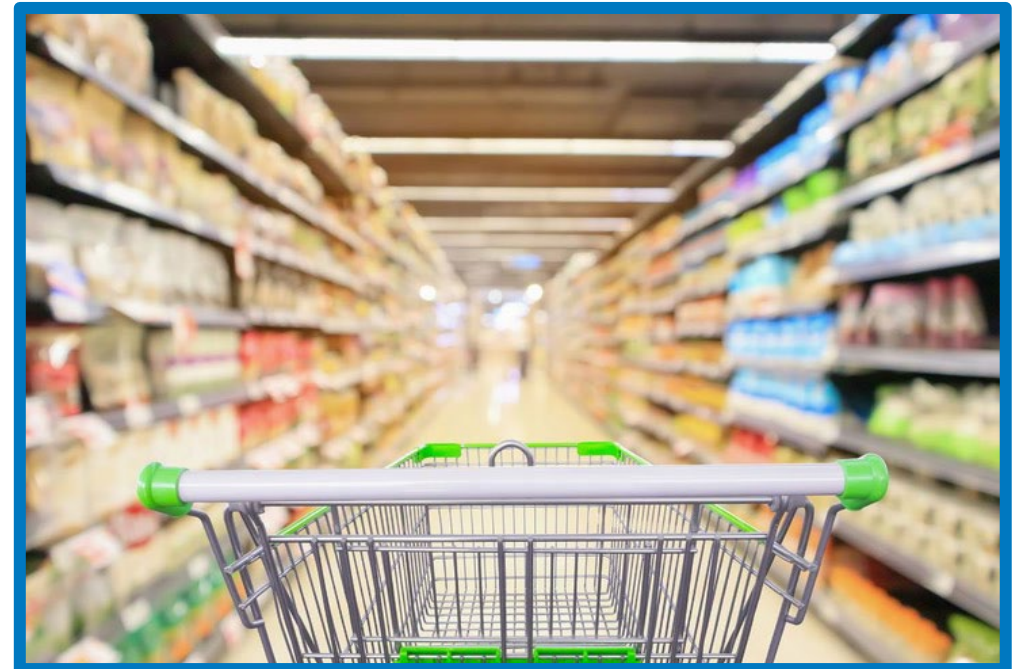
Research

Focus groups to understand the change



Public Launch

Consumer education, soft launch





ENVIROFlex®



ENVIROFlex® PE

Designed for store drop-off recycling



ENVIROFlex® PAPER

Designed for curbside recycling



ENVIROFlex® RECYCLED CONTENT

rPET and rPE based films to reduce virgin plastic use



ENVIROFlex® COMPOSTABLE

Designed for difficult to recycle formats





Q&A

Upcoming Events to Connect



June 9-11th

IDDBA



Aug 14-16th

SuperZoo



Nov. 3-6th

Pack Expo



Thank You!