



# Oregon Recycling Modernization Act Commingled Recycling Processing Facility Technical Workgroup

Meeting #5

Aug. 14, 2023



# Agenda

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- Project updates
- Contamination in inbound/outbound commingled recycling studies
- Discussion – Performance standards, contamination rates
- Discussion – Customer facing contamination reduction
- Discussion – Responsible end markets - benchmarking certifications
- Public Input
- Adjourn

# Project updates

- Broker roundtable discussions wrapped up
- Jan. 1, 2028 is the new phase-in date for permit-related performance standards.



Pic courtesy of Justin Gast





# Commingled Recycling Before and After Sorting: a preliminary analysis at the halfway-point

Commingled Recycling Processing Facility Technical Workgroup  
Aug. 14, 2023



# History: waste / recycling composition

- ORS 459A.035 requires DEQ to do a study at least every 6 years
- Can include recycling composition study
- 9<sup>th</sup> Waste composition study since 1992
- 3<sup>rd</sup> recycling collection study
  - 2004-2005 study of residential setouts
  - 2009-2010 study of recycling received at processors
- Outbound recycling: 2009-2010 study



2004-2005 Recycling Setout Study

# Current studies

- Disposal study: 1046 samples at more than 50 disposal sites
- Inbound recycling study: 365 samples at 34 facilities
  - Determine how much recycling, contamination is covered product
  - Determine baseline contamination and composition information
- Outbound recycling study: 50 to 60 samples at each of 8 facilities
  - Baseline information for sorting effectiveness and contamination in outbound recycling commodities



WM helping capture sample



# Who is participating in the studies

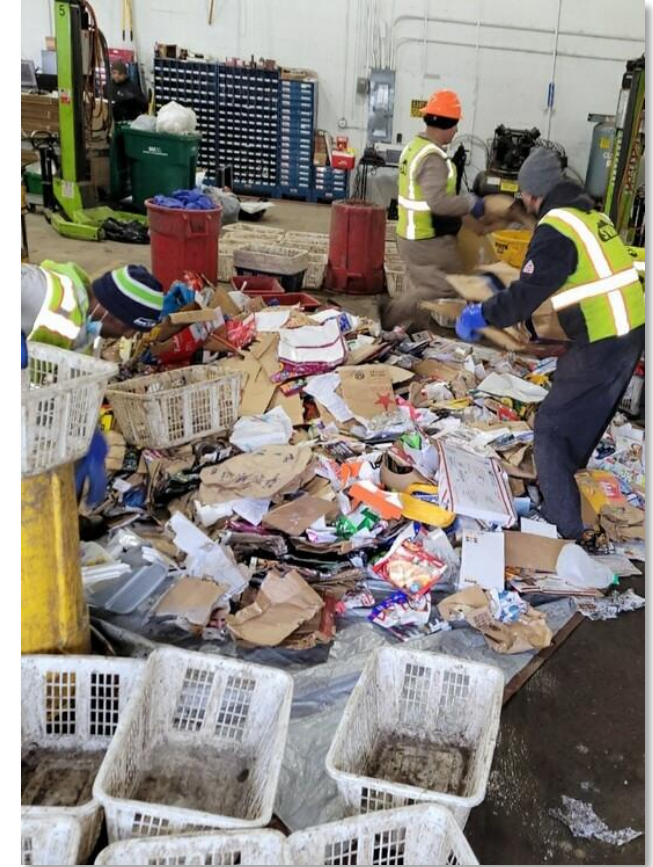
- Work being done by Sky Valley Associates, with Cascadia Consulting and Stina as subcontractors
- Metro and Marion, Lane, and Deschutes Counties also participating in study, with some additional work for Washington County
- Great assistance from many disposal sites and commingled recycling processors and transfer facilities
- Great assistance from many haulers in coordinating samples from their trucks



Sky Valley moving a recycling sample

# Methodology: inbound recycling study

- DEQ randomly pre-selects trucks based on data on trucks unloading at facility 2 weeks earlier
- Sky Valley pulls a 200+ pound sample from each pre-selected truck
- Crew hand-sorts the sample into 87 material categories and weighs each
- Bagged garbage is weighed and disposed as a single category
- Bagged recyclables are weighed in the bag and then dumped back in the pile to be sorted
- Contamination base on Metro list, not local lists



Sorting in WM's shop



# Overall preliminary results (18 samples)

- Contamination of commingled recyclables significantly higher than in 2004-2005 or 2009-2010
  - 2004-2005 Bins: < 3% contamination
  - 2004-2005 Roll Carts: 9.8% contamination
  - 2009-2010 Overall: 8.9% contamination
  - 2023 preliminary: 14.5% contamination
- 90% of commingled recycling as collected is covered product
  - 97.2% of commingled recyclable material is covered product
  - 44.8% of commingled contamination is covered product (excluding bagged garbage)

# Changes in paper – percent basis

Paper category	2023	2009	2009 90% conf. int.
Gable top beverage	0.32%	0.30%	0.26-0.34%
Aseptic drink boxes	0.12%	0.03%	0.02-0.04%
Corrugated cardboard + brown paper	<b>52.32%</b>	<b>25.33%</b>	23.18-27.49%
Newspaper	<b>2.87%</b>	<b>23.48%</b>	22.03-24.93%
Magazines	<b>3.27%</b>	<b>8.23%</b>	7.54-8.92%
Other recyclable paper	18.29%	24.90%	
<b>Nonrecyclable paper</b>	<b>3.17%</b>	<b>2.00%</b>	<b>1.76-2.25%</b>
<b>Total paper</b>	80.36%	84.27%	83.27-85.27%

# Sample #2 – residential – 42% OCC



Pic courtesy of Sky Valley



# Changes in plastic – percent basis

Plastic category	2023	2009	2009 90% conf. int.
Plastic deposit beverage	0.38%	0.44%	
Plastic no-deposit beverage	1.81%	1.95%	1.81 – 2.09%
Other plastic bottles	1.89%	1.56%	1.43 – 1.69%
Curb-acceptable tubs & buckets	0.84%	0.60%	0.53 – 0.67%
Tubs & buckets, not curb acceptable	1.16%	0.47%	0.43 – 0.52%
Other rigid plastic, not curb acceptable	1.52%	1.38%	1.08 – 1.67%
Film plastic, not curb acceptable	1.13%	1.05%	

Contaminant category	2023	2009	2009 90% conf. int.
Bagged garbage	1.84%	1.22%	0.94-1.51%
Non-curbside paper	3.17%	2.00%	1.76-2.25%
Non-curbside rigid plastic	2.89%	1.85%	
All film plastic	1.13%	1.05%	0.65-1.45%
Glass	1.92%	1.01%	0.81-1.21%
Food	0.89%	<0.48%	
Wood	0.56%	with food	
Yard debris	0.04%	with food	
Diapers	0.12%	in other NR	
Other textiles	0.71%	in other NR	
Non-curbside metal	0.45%	0.29%	0.14-0.44%
All hazardous materials	0.05%	0.05%	0.01-0.07%
Other nonrecyclables	0.69%	1.43%	1.06-1.81%
Total	14.47%	8.90%	
Bagged recyclables	0.59%	0.48%	

# Outbound recycling study

- Purpose – determine sorting effectiveness overall for Oregon facilities
- Being conducted at 8 commingled recycling processing facilities
- Visiting each facility 2 times to collect 25-30 samples each time, including residue samples
- Concentrating on materials that are negatively sorted – more likely to contain contaminants
- Field work 50% completed, but more analysis needed



Pic courtesy of Justin Gast



# Cardboard & kraft paper – outbound

Study year	2023	2009
Number of samples	30	22
Acceptable Cardboard & Kraft Paper	84.60%	83.75%
Other recyclable fiber	12.46%	13.76%
Nonrecyclable paper	1.05%	1.60%
Plastic	1.13%	0.63%
Metal	0.29%	0.10%
Glass	0.01%	0.00%
All other material	0.46%	0.15%
Total unacceptable	2.94%	2.48%

# Mixed scrap paper – outbound

Study year	2023 MSP	2009 ONP
Number of samples	70	88
Acceptable mixed paper	86.59%	96.51%
Other recyclable fiber	2.47%	0.16%
Nonrecyclable paper	1.79%	0.66%
Plastic	5.26%	1.74%
Metal	2.08%	0.66%
Glass	0.19%	0.04%
All other material	1.61%	0.24%
Total unacceptable	10.93%	3.33%

# Plastic containers – outbound

Plastic Resin	Natural HDPE	Colored HDPE	PET	3- 7
Number of samples	6	7	7	7
Acceptable plastic containers	98.29%	92.95%	89.25%	43.10%
Marginal plastics	0.71%	3.38%	8.01%	50.31%
Nonrecyclable plastics	0.07%	0.24%	0.26%	1.58%
Paper	0.74%	1.90%	1.64%	2.19%
Metal	0.04%	0.40%	0.52%	1.84%
Glass	0.02%	0.00%	0.00%	0.14%
All other material	0.13%	1.13%	0.32%	0.84%
Total unacceptable	1.00%	3.68%	2.74%	6.59%



# Metal – outbound

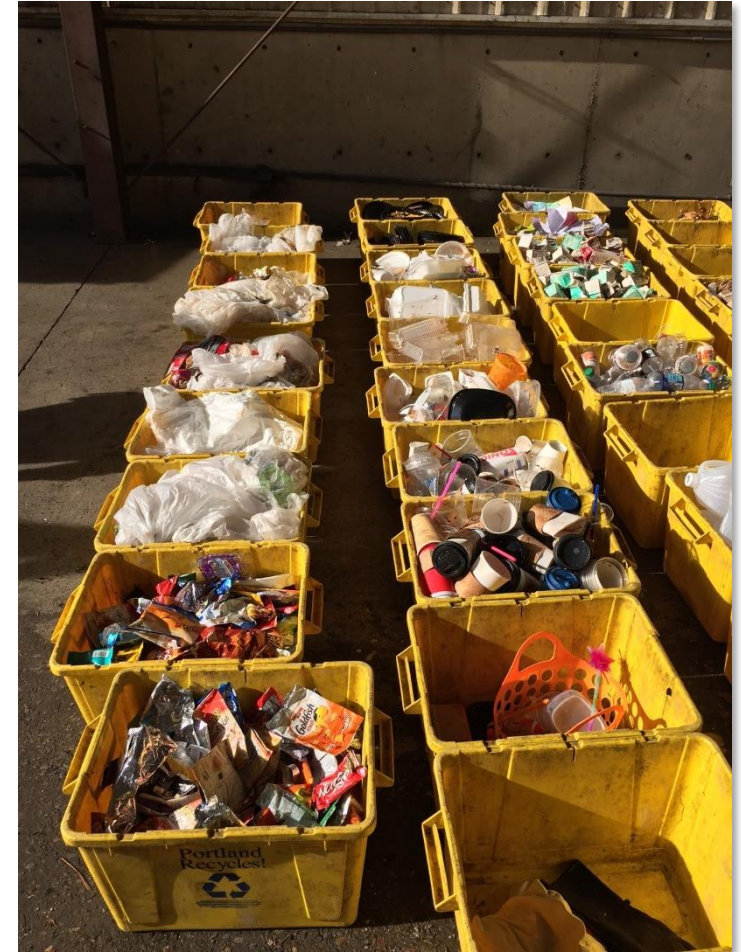
Metal grade	Aluminum	Tinned cans	Scrap metal
Number of samples	7	8	8
Acceptable for metal grade	90.10%	94.30%	96.39%
Marginal for metal grade		2.32%	
Not acceptable for metal grade	1.77%	0.58%	
Paper	5.86%	1.54%	0.67%
Plastic	2.08%	0.91%	0.87%
Glass	0.00%	0.08%	0.01%
All other material	0.19%	0.26%	2.06%
Total unacceptable	9.90%	3.38%	3.61%

# Large garbage, excluding fines

Material	Total	OK commingled	Not OK commingled
Number of samples	20	20	20
Paper	37.56%	33.11%	4.45%
Rigid Plastic	11.29%	5.26%	6.03%
Film plastic	17.45%	0.00%	17.45%
Metal	3.18%	3.18%	0.00%
Glass	0.48%	0.00%	0.48%
Other	30.05%	0.00%	30.05%
Total	100.00%	41.55%	58.45%

# Current status of studies

- Disposal study
  - 50% of field work done – wrap up field work in late January 2024
- Plastic Resin Disposal study
  - In initial phase
- Inbound Recycling study
  - 50% of field work done. Wrap up field work in early January 2024
- Outbound Recycling study
  - 50% of field work done. Just starting preliminary analysis. Wrap up field work in late October 2023
- Thanks again for all of you who have helped or will help with the studies.

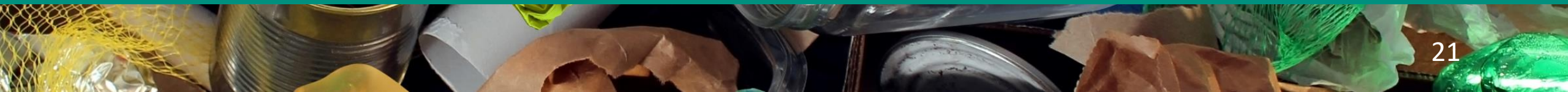


Pic courtesy of Justin Gast



# Discussion – Performance Standards Contamination Rates

Commingled Recycling Processing Facility Technical Workgroup  
Aug. 14, 2023





# Contamination Rates

- As of July 1, 2025, no bale made from the processing of USCL-related material **can include more than 5% contaminants**, by weight, with contaminant adhering to the definition provided under ORS 459A.863(4)(b).
- As of January 1, 2028, no bale made from the processing of USCL-related material **can include more than 2% contaminants**, by weight, with contaminant adhering to the same ORS 459A.863(4)(b) definition.
- All fiber bales must meet moisture content requirements, as established by the Institute of Scrap Recycling Industries' Scrap Specifications Circular.



Pic courtesy of Justin Gast



# Discussion – Customer facing contamination reduction

Commingled Recycling Processing Facility Technical Workgroup  
Aug. 14, 2023





# Topics

- New RMA obligations
  - ORS 459A.929
  - ORS 459A.959
- Statewide contamination goals
- Evaluating contamination
- Next steps



Pic courtesy of Justin Gast

# New obligations for DEQ

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1. Establish statewide goals
2. Evaluate cost-effectiveness of different methods for reducing inbound contamination
3. Establish list of approved contamination reduction program elements
4. Establish forms and procedures for recycling processors and reload facilities to evaluate inbound contamination
5. Evaluate effectiveness every four years



# New obligations for local governments

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- Local governments (>4000 people) must implement program that:
  - Ensures recycling contamination is evaluated
  - Includes goals consistent with established statewide goals
  - Uses DEQ-approved program elements
  - Is reviewed every five years
- Implementation only required as PRO funding is provided

# New obligations for processing facilities

- Follow DEQ-established forms and procedures for evaluating and describing inbound contamination
  - **CRPFs** comply with permit requirements
  - Local governments that provide opportunity to recycle must ensure **reload facilities** follow DEQ-established forms and procedures. Local governments are eligible to receive PRO funding for required evaluation.

# How RMA defines contamination

## **Contaminant** means:

- (a) A material set out for recycling collection that is not properly prepared and on the list of materials accepted for recycling collection by a recycling collection program; or
- (b) A material shipped to a recycling end market that is not accepted or desired by that end market.

*ORS 459A.863(4)*

**Contamination** means the presence of one or more contaminants in a recycling collection or commodity stream in an amount or concentration that negatively impacts the value of the material or negatively impacts a processor's ability to sort that material.

*ORS 459A.863(5)*

# Contaminants of concern

- Lithium batteries
- Pressurized gas containers
- Sharps
- Diapers
- Pet waste
- Other biohazards
- Plastic film
- Tanglers
- Big or bulky items





# Statewide contamination reduction goals

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# Statewide contamination reduction goals

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## For Discussion:

How would we know if we made progress towards reducing contamination? What changes would we observe?

# Statewide contamination reduction goals

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## For Discussion:

How much progress is needed to realize those benefits?

2004-2005 Bins:	< 3% contamination
2004-2005 Roll Carts:	9.8% contamination
2009-2010 Overall:	8.9% contamination
2023 preliminary:	14.5% contamination



# Evaluating contamination

- Two approaches
  - Hand sort similar to waste composition analysis
  - Faster / easier method to provide ongoing feedback



Pic courtesy of Arianne Sperry



# Fast / easy evaluation method

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## For Discussion:

What type of feedback about contamination is important for local governments and service providers to receive?

# Fast / easy evaluation method

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## For Discussion:

What should Cascadia & team keep in mind when designing a measurement method for facility workers to conduct regularly?

# Next steps

- Follow-up interviews
- Fall testing
  - Facilities and workers



Pic courtesy of Bigstock Photo



# Break

The meeting will resume at approximately 1:53 p.m.







# Discussion – Responsible End Markets

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Aug. 14, 2023



# Three segments of today's presentation

- PRO Rules on Responsible End Markets and their application to CRPFs
- REM Rule Concepts for Rulemaking #2
- REM Certification



# PRO rules / 1<sup>st</sup> rulemaking

- 1) “End market” Definition
- 2) 4-prong “responsible” standard
- 3) Implementation pathways
- 4) Reporting and Auditing
- 5) “Practicability”

*Draft REM rules applying to PRO obligations*

# Application of these rules to CRPFs

## Apply the following rules to CRPFs as well as PROs:

- End market definition
- “Responsible” standard
- Self-attestation requirement
- Deadlines for self-attestation (program start)
- Reporting: all certification/verification/attestation documentation submitted as part of quarterly reporting

## These rules would apply only to PROs:

- Verification pathway
- Auditing (including random bale tracking)
- Practicability





# Questions

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*Questions on how the PRO rules would be applied to the CRPFs?*

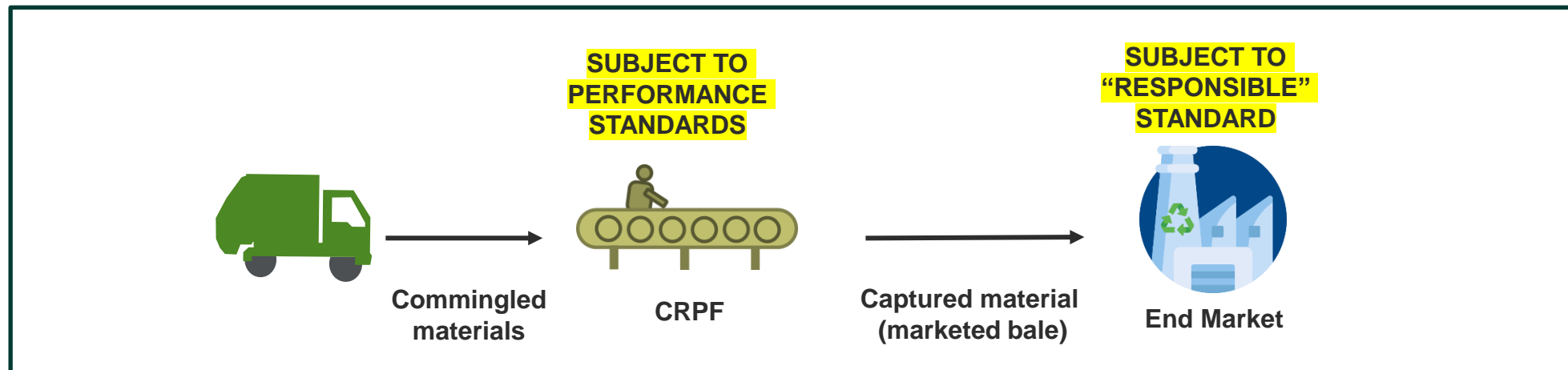
# Rules specific to CRPFs / 2<sup>nd</sup> rulemaking

- 1) Intersection of performance standards with REM standards
- 2) Non-mechanical recycling: pre-step
- 3) Only one self-attestation/verification/certification needed per market (avoiding duplication)
- 4) Quarterly disposition reporting



# How the performance and REM standards intersect

- Both are CRPF permit requirements
- Performance standards apply at CRPF
- REM standards apply downstream
- Point of intersection requiring clarification in rule – capture rate & verifying yield of materials within a bale



# Yield-capture rate intersection: rule concept



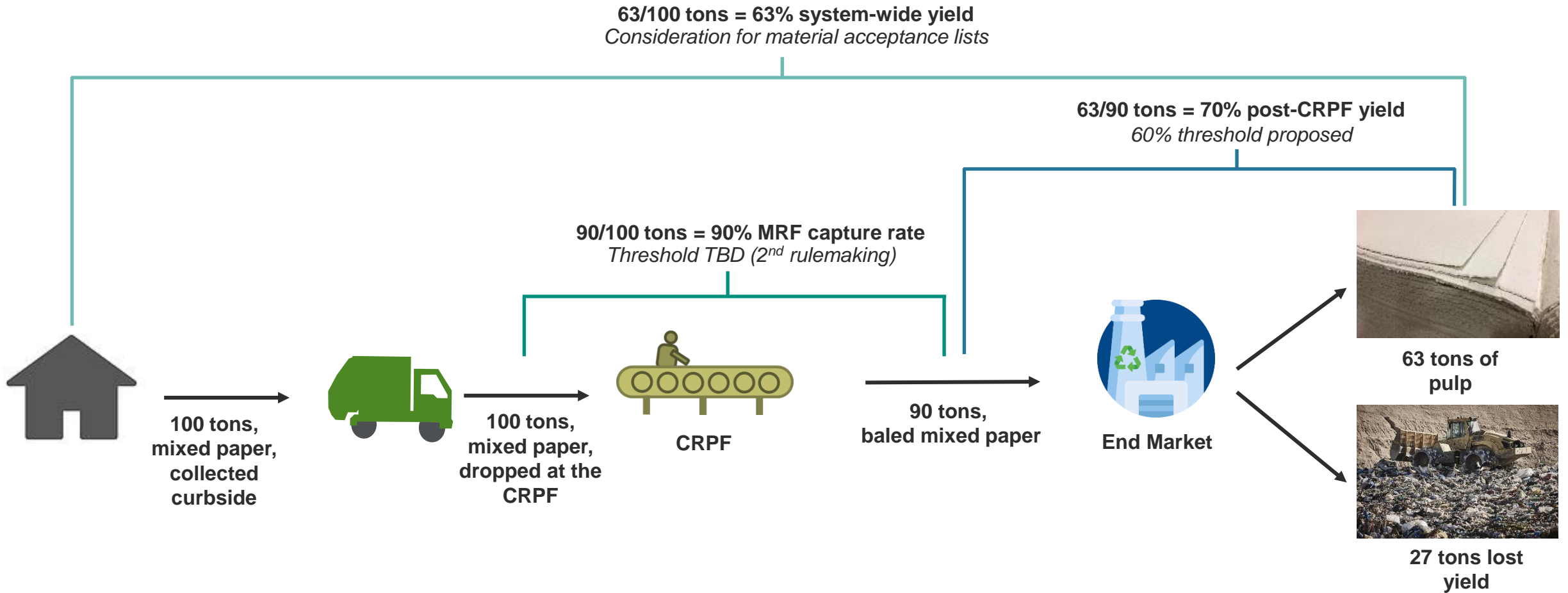
Pics courtesy of Bigstock Photos



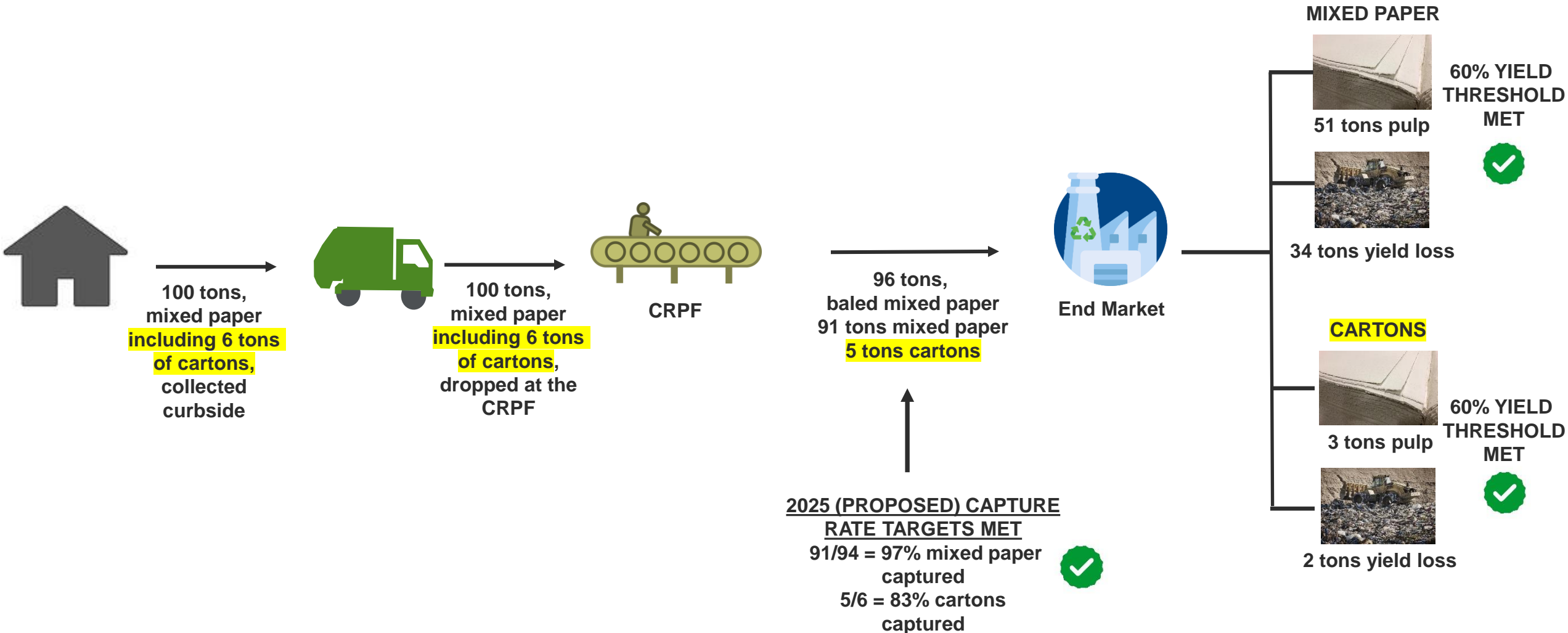
- Only materials that are counted toward meeting capture rates will be subject to REM yield verification within a bale.
- Potential ramifications: an end market could be:
  - Responsible in the context of one supply chain but not in another.
  - Responsible in an initial phase of capture rate targets but not the next.



# Yield example from RAC 5: mixed paper

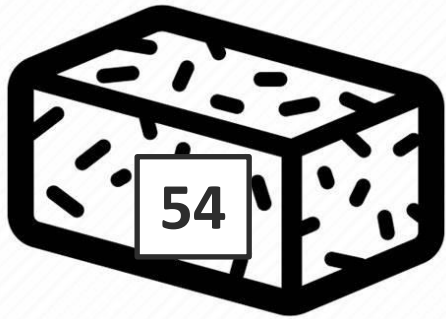


# Yield example from RAC 5: mixed paper + cartons

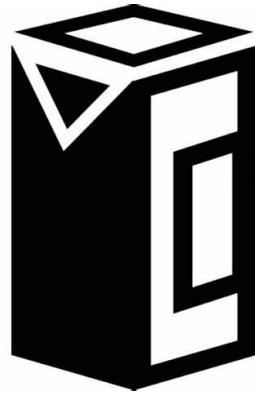


# The real world is more complex.....

## Bale Types



## Capture Rates (Proposed)



### Cartons

2025: 78%

2028: 88%

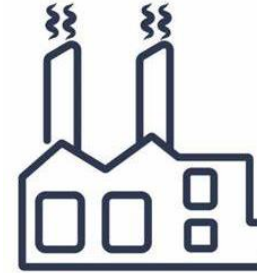


### Mixed Paper

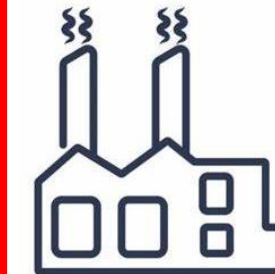
2025: 96%

2028: 97%

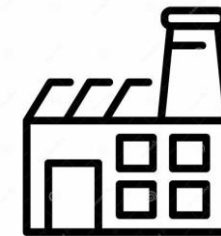
## End Markets



Paper mill  
processing cartons



Paper mill not  
processing cartons



Other end market  
(e.g. tissue  
producer)

# REM “pre-step” for non-mechanical recycling

**ORS 459A.875(2)(a)(I) (PRO Program Plan Requirements)** Ensure that any material that will be marketed for use through a method other than mechanical recycling will be transferred to a responsible end market, including:

- (i) A description of how the proposed method will affect the ability of the material to be recycled into feedstock for the manufacture of new products;
- (ii) A description of how the proposed method will affect the types and amounts of plastic recycled for food and pharmaceutical-grade applications;
- (iii) A description of any applicable air, water and waste permitting compliance requirements; and
- (iv) An analysis of the environmental impacts for the proposed method compared to the environmental impacts of mechanical recycling, incineration and landfill disposal as solid waste.



# Avoiding duplication of effort

For each recycling supply chain entity, only one

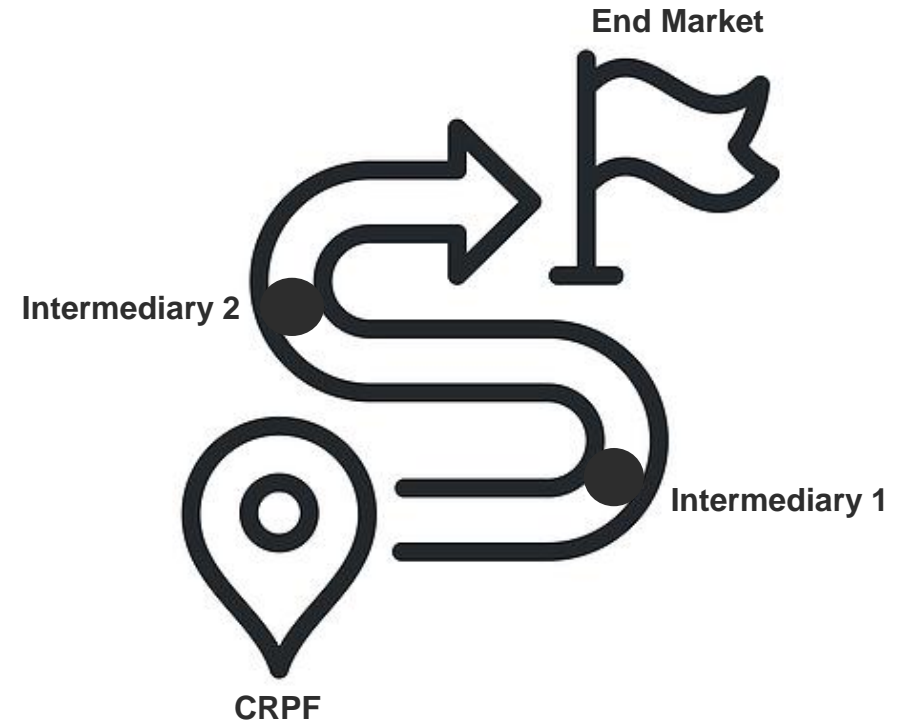
- Self attestation,
- Verification or certification,
- Annual audit
- Non-mechanical recycling pre-check

is needed to comply with the responsible end market obligation



# Disposition Reporting

1. Who reports
2. Reporting calendar (when is the first quarterly report due)
3. Any accounting rules (TBD)



# Questions

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*Questions on REM rules proposed for Rulemaking 2?*

# Benchmarking certifications





# Relevant statutory language

## ORS 459A.955(2)

A disposal site permit issued to a commingled recycling processing facility must require the facility to:

(b) Market materials to responsible end markets or to another commingled recycling processing facility, provided that the permittee complies with the requirements for a commingled recycling reload facility under ORS 459A.905;

(h) For all materials held by the processor:

(A)(i) Accurately report the final end market of the materials; or

(ii) Obtain a certification that the responsible end markets for the materials meet standards for environmental and social sustainability established by a program approved by the commission under subsection (3) of this section.

# Certification

## CPRFs: Statutory Language

### ORS 459A.955(3)

The commission shall prescribe by rule the requirements for a permit issued under ORS 459.205 and this section...Rules adopted under this section may include:

(b) The identification of approved programs for certifying the environmental and social sustainability of responsible end markets.

## PROs: Draft Rule Language

A PRO must ensure that materials collected for recycling go to responsible end markets...by completing the following two steps successively:

(A) First, a PRO must conduct an initial screening assessment and receive written verification from each end market and intermediary supply chain entity meets the responsible standard

(B) Next a PRO must conduct a more detailed assessment...either through a verification by the PRO...or through third-party certification from a commission-approved program.

# Steps toward EQC approval of a certification

1. Benchmark existing certifications against Oregon's "responsible" standard

2a. Propose strong performer(s) on the benchmarking for EQC approval.

Individual certification(s) that can be used to meet the entire obligation

Individual certification(s) that can be used to meet the entire obligation for particular materials

A packet of certifications that each cover certain aspects of the "responsible" standard

2b. If no certifications benchmark strongly, propose no certification for EQC approval now and begin the program with self-verification only.

3. Through PRO collaboration with an auditor, a new standard could be born and approved by EQC in a later rulemaking.

# List of benchmarked certifications

- Aluminum Stewardship Initiative (ASI) Chain of Custody and Performance Standards
- Association of Plastic Recyclers (APR) PCR Certification
- Forest Stewardship Council (FSC) Chain of Custody Certification
- Global Recycled Standard (GRS) & Content Claim Standard (CCS)
- GreenCircle “packet” (Recycled Content Certification, Closed Loop Product Certification Waste Diversion from Landfill, Certified Environmental Facts Certification)
- International Sustainability and Carbon Certification PLUS (ISCC+)
- ISO “packet” (ISO 9001, 14001, and 45001)
- Recycling Industry Operating Standard (RIOS)
- Recycled Material Standard (RMS)
- SCS certification “packet” (SCS Recycled Content and Responsible Source Standards)
- Sustainable Forestry Initiative (SFI)
- UL certification “packet” (UL ECVP 2809 on recycled content, UL ECVP 2799 on Zero Waste to Landfill and UL ECVP 1397 Net-Zero Water)



# Benchmarking results

	ASI	APR	FSC	GRS-CCS	GreenCircle	ISCC+	ISO packet	RIOS	RMS	SCS packet	SFI	UL packet
Scope	(Al)		(paper)	(all)	(all)	(plastic, paper)	(all)	(all)	(plastic)	(plastics & metals)	(paper)	(all)
Compliance												
Chain of Custody												
Env. Soundness												
Yield												

# Recommendation and next steps

- **DEQ proposes no 3<sup>rd</sup>-party certifications at present for use to fulfill the responsible end market obligation.**
- DEQ will:
  - 1) Inform all benchmarked standards of the results and opportunity for approval in a subsequent rulemaking
  - 2) Set up a longer process for approving a certification:
    - More detailed benchmarking
    - DEQ observes an on-site audit
    - Attestation to meeting organizational criteria:
      - Adequate standard documentation
      - Rigorous approach to updating standard
      - Sufficient accreditation requirements for verifiers / certification bodies
      - Sufficient professional liability insurance
      - Policies for prevention of conflict of interest

# Aluminum Stewardship Initiative

*Documents reviewed:*

- ASI Performance Standard & Guidance v 3.1
- ASI Chain of Custody Standard & Guidance v 2.1

Element of Responsible Standard	Benchmarking Result
Scope	(AI)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

- Re-melters of aluminum anywhere in the world can be certified. Suppliers are checked for due diligence only.
- Re-melter's system for managing compliance is verified (not a full compliance audit). Performance criteria for labor, occupational health and safety, environment included in standard.
- Input into and output from re-melter is documented. As for suppliers, only a due diligence check is required. Mass balance accounting rules are applied when materials mix. No chain of custody required for diversions of material to landfills.
- Criteria for GHG emissions, water and air emissions, spills, waste management included in standard.
- Yield at the re-melter calculable from supply chain documentation, but due diligence check only required for suppliers, not full CoC documentation

# Association of Plastic Recyclers PCR Content Cert.

Documents reviewed:  
 - *Eunomia Comparative Assessment of Standards...for Verifying Recycled Content in Plastic Products*  
 - Documentation posted to [The Association of Plastic Recyclers | APR PCR Certification \(plasticsrecycling.org\)](https://www.plasticsrecycling.org)

Element of Responsible Standard	Benchmarking Result
Scope	(Plastics)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

⇒ Plastics reclaimers anywhere in the world can be certified. Scope does not extend to the next product, and inclusion of brokers is unclear.

⇒ Compliance auditing is not included.

⇒ Chain of custody verified from source to reclaimer. Mass balance accounting rules are applied when materials mix. No chain of custody required for diversions of material to landfills.

⇒ Auditing of environmental performance is not included.

⇒ Yield calculable across recycling supply chain but not verified within bales.



# Forest Stewardship Council % Recycled CoC Certification

Documents reviewed:  
- Chain of custody certification 40-004 V 3.1

Element of Responsible Standard	Benchmarking Result	
Scope	(Paper)	⇒ Scope covers all entities that take ownership of the product up through the producer of the next product.
Compliance		⇒ Compliance auditing is not included for the recycled claim certification.
Chain of Custody		⇒ Chain of custody verified from source to pulp mill. Mass balance accounting rules (“percentage system”) applied when materials mix. No chain of custody required for diversions of material to landfills.
Env. Soundness		⇒ Auditing of environmental performance is not included in the recycled claim certification.
Yield		⇒ Yield calculable across recycling supply chain but not verified within bales.

# Global Recycled Standard – Content Claim Standard (CoC)



*Documents reviewed:*

- Global Recycled Standard V 4.0 and Implementation Manual V 4.2
- Content Claim Standard 3.1
- Policy for Alternative Volume Reconciliation V 3.0

Element of Responsible Standard	Benchmarking Result
Scope	(All)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

⇒ Scope covers all entities that take ownership of the product up through the producer of the next product. Brokers can be certified but do not need to in certain cases.

⇒ Compliance is audited. Organizations are held to the higher of a) comprehensive environmental and social performance criteria and b) what is required under the law and applicable treaties.

⇒ Chain of custody verified from source to product. Controlled blending accounting rules (“composition calculations”) apply when materials mix. **No chain of custody required for diversions of material to landfills.**

⇒ Comprehensive environmental requirements are included in the GRS standard.

⇒ Certificate holders must self-attest yields and investigate when actual yields diverge from estimates. **Unclear whether or not yield is verified within bales or during on-site audits.**



# GreenCircle Certification Packet



*Documents reviewed:*

- Recycled Content Certification March 2023
- Closed Loop Product Certification March 2023
- Waste Diversion from Landfill Certification January 2023
- Certified Environmental Facts Certification November 2022

Element of Responsible Standard	Benchmarking Result
Scope	(All)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

- ➡ Certifications cover all materials, are international in scope, and can cover all entities post-MRF in the recycling supply chain.
- ➡ Compliance auditing is not included.
- ➡ Closed Loop Product Certification audits complete chain of custody for all nodes in supply chain including final product and disposition of any non-recovered materials. No requirement to document penalties, violations or regulatory orders..
- ➡ Auditing of environmental performance is not included.
- ➡ For the Recycled Content and Waste Diversion from Landfill certifications, GreenCircle will collect material weights in order to perform a mass balance. Info to calculate yields of materials within a bale is requested as needed.

# International Sustainability & Carbon Certification PLUS

*Documents reviewed:*

- List of material eligible for ISCC PLUS certification, July 17, 2023
- ISCC PLUS v 3.4
- ISCC EU 102, 201, 202-5, 203

Element of Responsible Standard	Benchmarking Result
Scope	(paper, plastic, some glass)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

- ➡ Scope extends to end market and is inclusive of brokers.
- ➡ While ISCC+ can be used to comply with some specific policies, mostly in Europe in the energy space, it does not entail a complete auditing of facility compliance with all applicable laws. There is a voluntary add-on for verification of social criteria for potential ocean-bound plastic.
- ➡ Sustainability declarations are mandatory for delivery of materials and are used for traceability of material. Diversions to landfill are captured.
- ➡ There is a GHG emissions add-on but there are not otherwise comprehensive environmental performance criteria for waste recycling operations.
- ➡ Yield is calculated, but not verified independently for materials within a bale.



# ISO 9001, 14001, & 45001

*Documents reviewed:*

- ISO 9001:2015
- ISO 14001:2015
- ISO 45001:2018

Element of Responsible Standard	Benchmarking Result
Scope	(paper, plastic, some glass)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

⇒ Any facility can be certified against these ISO standards.

⇒ ISO 14001 entails a compliance audit with applicable environmental laws, and ISO 45001 with occupational health and safety laws.

⇒ Individual facilities are certified against these standards rather than a chain of custody among them.

⇒ 14001 does not state specific environmental performance criteria but guides the Development of an Environmental Management System that will likely address the issues of concern.

⇒ Calculation of yield is not part of certification to these standards.

# Recycling Industry Operating Standard (RIOS)



Documents reviewed:  
- RIOS:2016

Element of Responsible Standard	Benchmarking Result
Scope	(all)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

→ Scope covers all materials and types of recycling, but does not include brokers (facility-based).

→ A QEH&S compliance audit is part of the RIOS certification process, prepared by the facility and verified in auditing.

→ Does not include chain-of-custody certification. Has been teamed with R2 CoC certification in the e-waste space to provide this coverage.

→ The RIOS Standard does not state specific environmental performance criteria but guides the evaluation of potential environmental impacts and development of monitoring and evaluation approaches.

→ Recording inbound and outbound weights is not a required part of the standard, but general recordkeeping is verified as part of the quality criterion.



# Recycled Material Standard (RMS)

Documents reviewed:

- RMS Framework
- RMS Plastics Module

Element of Responsible Standard	Benchmarking Result
Scope	(plastic only, paper coming)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

→ Covers all types of recycling, but with scope limited to North America. Broker certification possible but optional.

→ RMS does not entail an auditing of facility compliance with all applicable laws. Compliance is self-attested to through the *good practice principles*.

→ From the point of transformation through to final production, everyone must be audited to carry a certified recycled material claims. Diversion to landfill not tracked, nor penalties and violations in the supply chain.

→ There are not environmental performance criteria, as RMS certifies recycled content.

→ Data needed for calculating yield is recorded, but not verified in site visits or independently for two materials within a bale.

# Scientific Certification Systems (SCS) Certification Packet

*Documents reviewed:*

- *Responsible Source Standard v.1.0*
- *Recycled Content v. 8.0*

Element of Responsible Standard	Benchmarking Result
Scope	(plastics & metals only for Responsible Source standard)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

- ➔ Chain of Custody scope covers full supply chain and all types of recycling. Responsible Source Standard applies to reclaimers and end markets only.
- ➔ Compliance with certain applicable regulations (wastewater and labor) must be demonstrated in the context of the Responsible Source Standard.
- ➔ SCS Recycled Content Standard requires a mass balance calculation to verify material input/output. Optional to the manufacturer is the tracking of material through transaction certificates. Responsible Source Standard requires recordkeeping of regulatory violations for three years.
- ➔ Responsible Source Standard includes seven environmental impact categories, including particulate matter, climate change and energy resource depletion.
- ➔ Yield is calculated, but not verified in site visits.

# Sustainable Forestry Initiative (SFI) CoC

Documents reviewed:  
- SFI Chain of Custody Standard 2022

Element of Responsible Standard	Benchmarking Result	
Scope	(Paper)	⇒ Scope covers all entities that take ownership of the product up through the producer of the next product.
Compliance		⇒ Comprehensive compliance auditing is not included.
Chain of Custody		⇒ Chain of custody verified from source to pulp mill. Mass balance accounting rules applied when materials mix. No chain of custody required for diversions of material to landfills.
Env. Soundness		⇒ Auditing of environmental performance is not included.
Yield		⇒ Yield calculable from input/output data but not verified in site visits or for materials within bales.



# UL Certification Packet



Documents reviewed:

- UL ECVP 2809 on recycled content
- UL ECVP 2799 on Zero Waste to Landfill
- UL ECVP 1397 Net-Zero Water

Element of Responsible Standard	Benchmarking Result
Scope	(all)
Compliance	
Chain of Custody	
Env. Soundness	
Yield	

➡ Scope extends to end market and is inclusive of brokers.

➡ No auditing of legal compliance is included. A self-attestation of compliance may be required as part of the process.

➡ Materials are tracked through the supply chain but diversions to landfill are not tracked.

➡ Sustainable use of inputs is part of the Net-Zero water certification and Zero Waste to Landfill, but there are not comprehensive environmental performance criteria.

➡ Yield is calculated, but not verified independently for materials within a bale. A previous method to measure recycling efficiency was retired due to lack of demand, but could be revived.



# Questions and Comments

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(on the benchmarking results and anything else from the presentation)



# Public Input

Commingled Recycling Processing  
Facility Technical Workgroup  
Aug. 14, 2023

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