

# Digging Deep on Mass Balance for Chemical Recycling

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# Topics for today's webinar

- Quick review of chain of custody
- Defining eligible inputs
- Temporal and physical system boundaries
- Allocation rules and accounting for losses
- Voluntary commitments and regulatory compliance
- Claims and labels

In case you missed it:



Slides and recording are available  
at [RMSCertified.com](https://www.RMSCertified.com)



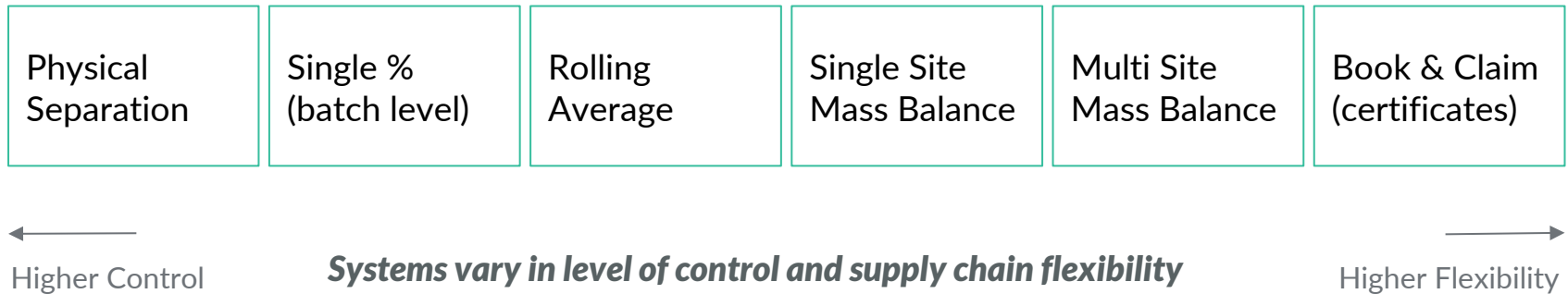
# Chain of custody

An unbroken chain of organizations, **independently certified**, covering every change in legal ownership – from the point of origin up to the point where a product is finished (and labeled if desired).





# Accounting systems defined in standard





# Mass balance allocation

Mass balance allocation accounts for the portion of inputs (or feedstocks) and assigns claims to particular outputs (or products)

20 virgin +  
5 recycled  
25 total units



**Average content claim:**  
5 units each with  
20% recycled content

- OR -



allocation

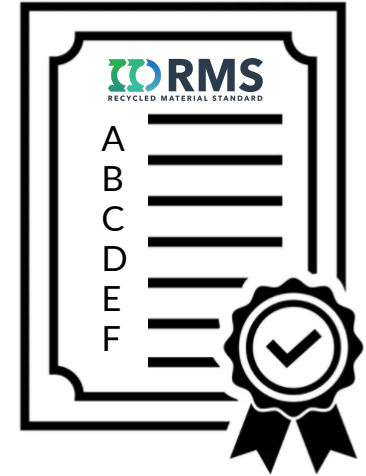
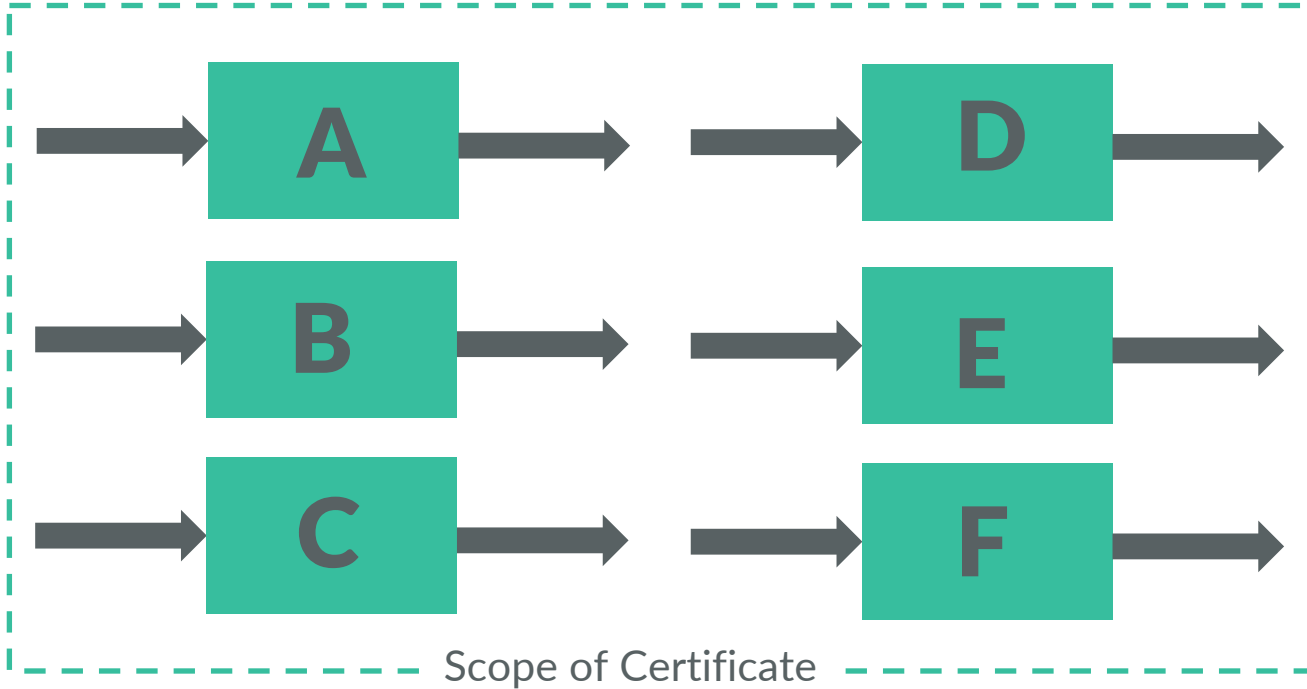


**Mass balance claim:**  
1 unit 100% recycled status  
4 units with no status



# Multi - Site Certification

A single certificate covers multiple facilities under the same ownership  
This lowers cost of participation and can reduce audit fatigue

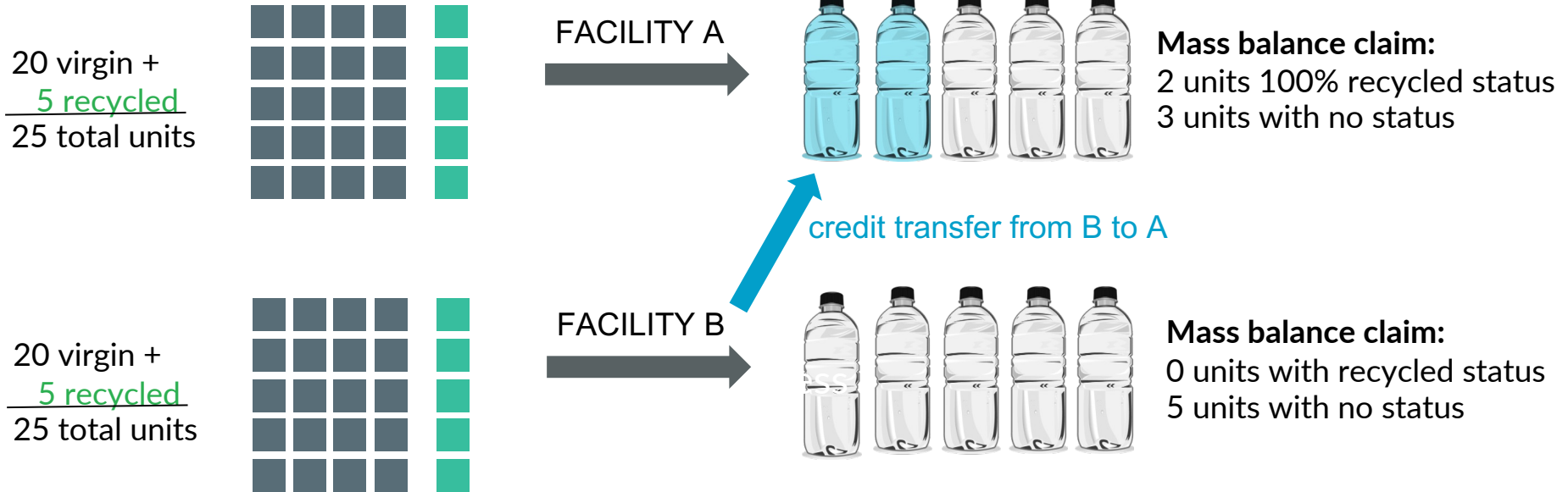




# Multi - Site Mass Balance

The RMS allows for **credit transfers** between sites making the same product

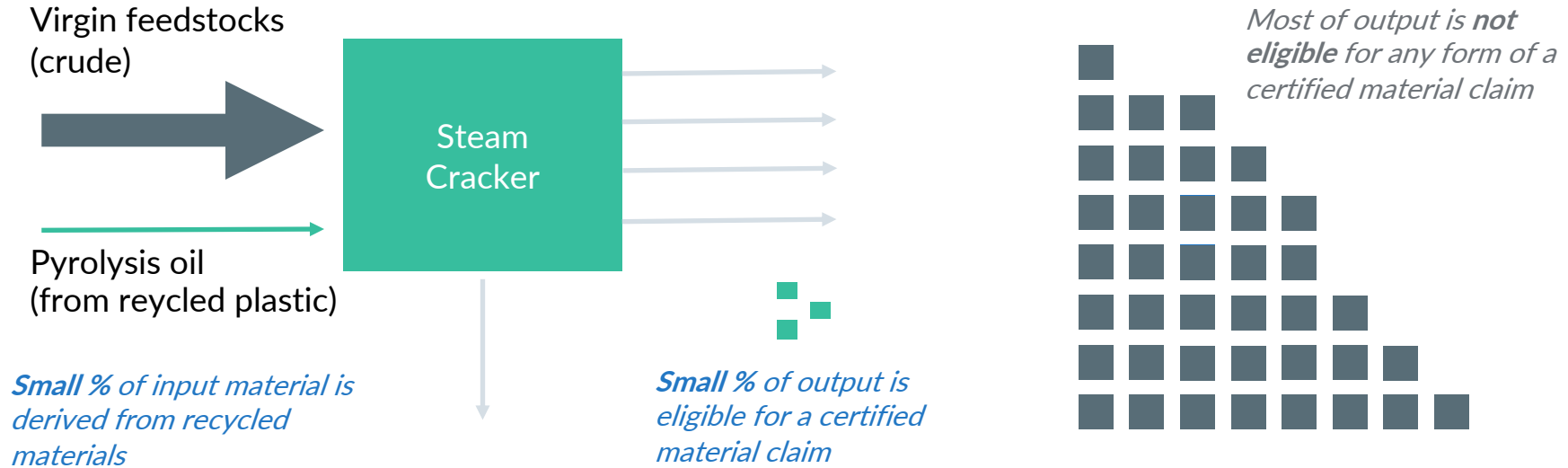
This can eliminate the need to ship materials or products long distances to satisfy a sale





# Critical enabler

Mass balance certification systems will be a critical enabler for *some* chemical recycling pathways





# Eligible inputs

Recycled status (PC or PI) is assured by the processor using risk-based due diligence for evaluating supply

- Certified inputs = low risk
- Known suppliers = medium risk
- Transformed materials = high risk

Beyond the processor, only RMS certified materials can support an RMS claim





# Temporal and physical boundaries

- Allocation reconciliation periods shall not exceed three months
- Balance can not exceed inputs over prior 24 months
- The RMS is currently limited to North American supply chain participants
- There are no geographic constraints for multi-site transfers within N. America





# Overview of allocation methods

Proportional

Non-fuels

Free

It is important to understand what type of allocation method is used for co-products

Existing standards for recycled materials use different methods:

- Proportional allocation is the “strictest” methodology – (RMS preferred)
- ISCC+ allows free allocation
- RMS has adopted a compromise for chemical recycling (deducting for fuels)



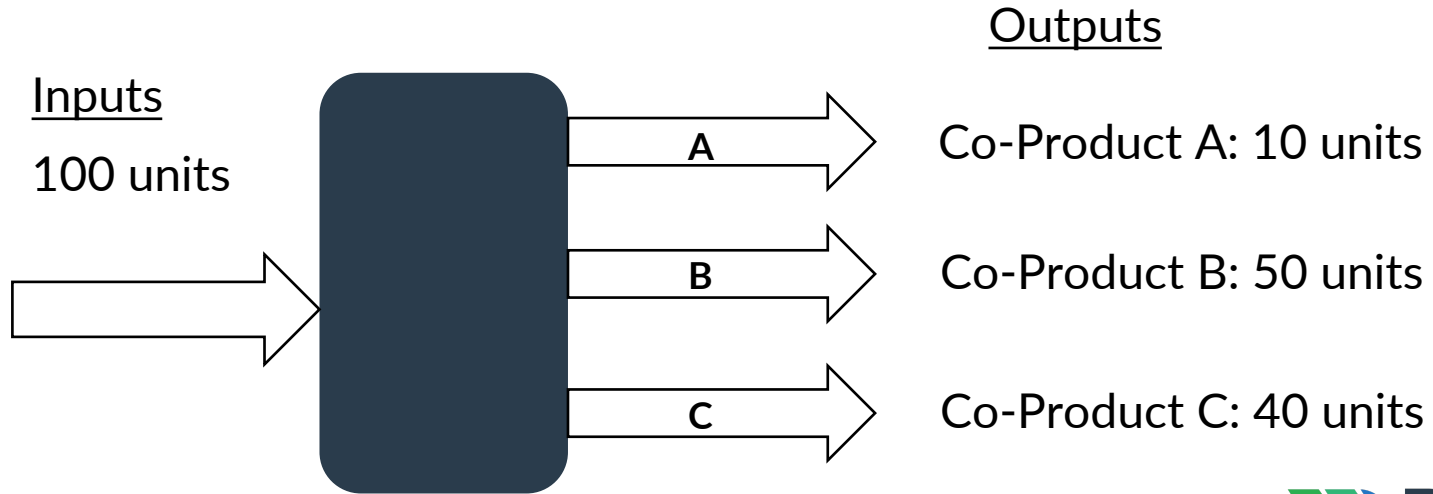
# Our baseline for co-products:

The process simultaneously converts materials to three **co-products** as illustrated below.

Each of the three co-products is produced in known proportions

- 10% Product A
- 50% Product B
- 40% Product C

For simplicity, it is assumed there are zero losses from the system

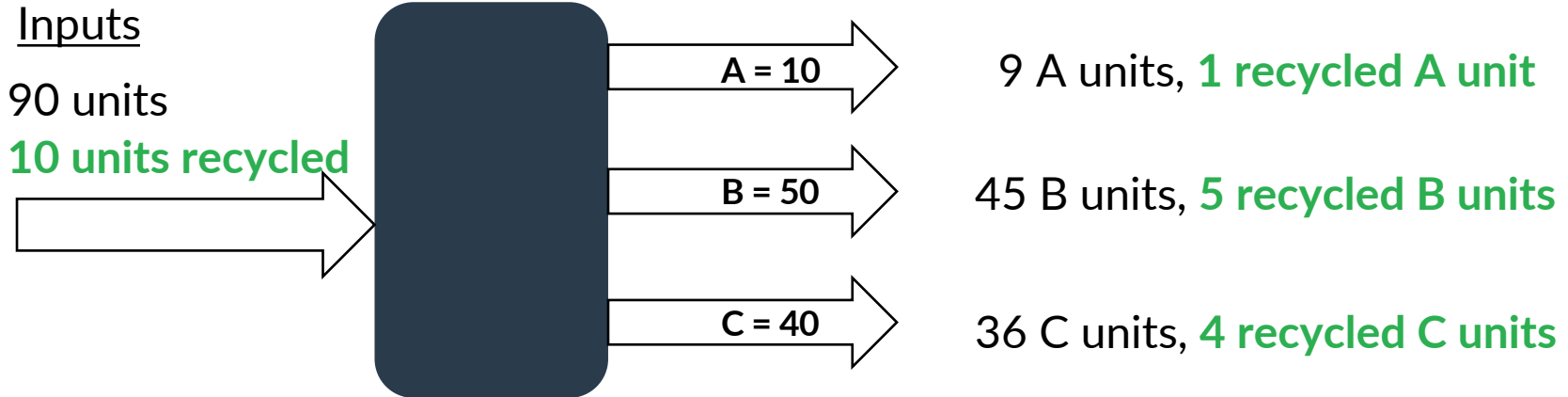




# Proportional allocation

The system is fed **10% recycled** inputs which flow in direct proportion to the co-products

Claims of recycled material are made in the same proportion as product outputs



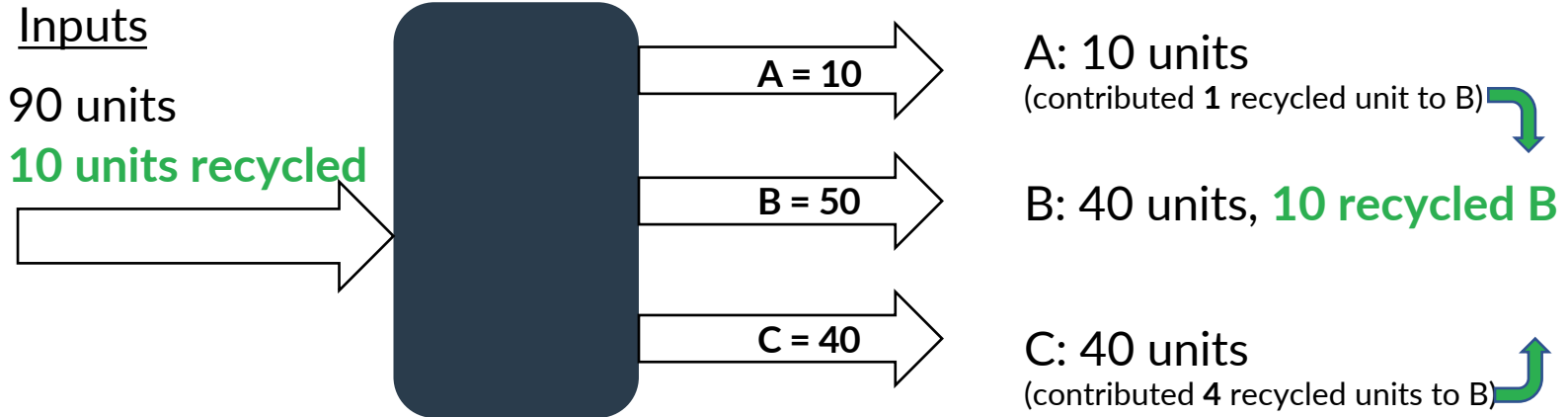


# Non-proportional allocation (a.k.a. free allocation)

The system is fed 10% recycled inputs which flow in direct proportion to the co-products

With free allocation, **the recycled outputs may be allocated to any co-product**; in essence co-products are contributing claims to other products made by the process from the same inputs

In this example, the participant **chooses to allocate all recycled material to product B**



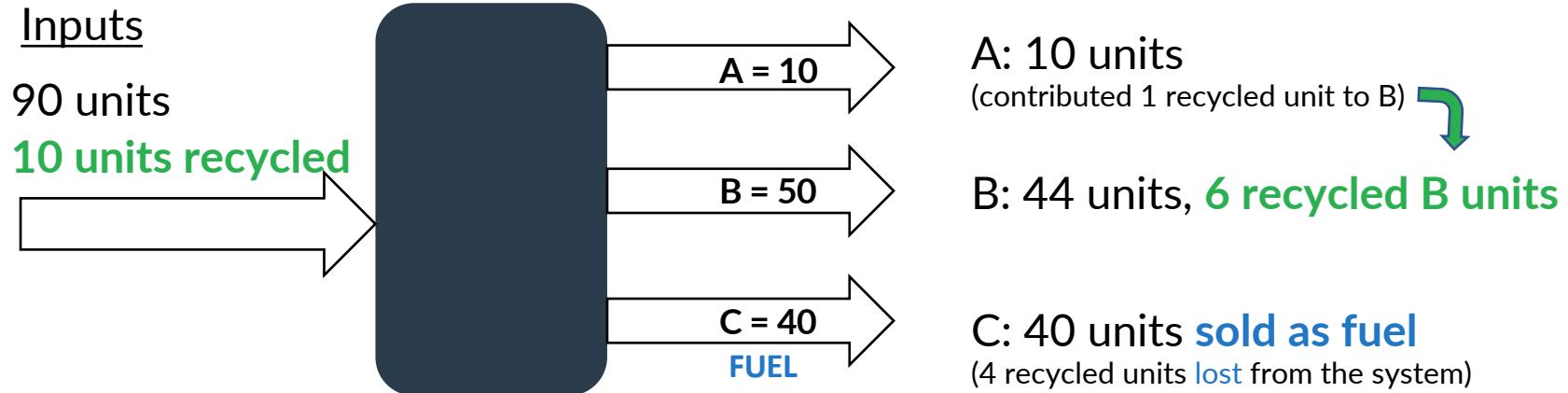


# Non-proportional allocation with a deduction for fuels

The RMS does not recognize fuels as a recycled material; therefore **any portion that is sold or consumed as fuel can not be allocated to another co-product**

In this example, **product C is a fuel** and the 4 recycled units from that stream are treated as losses

In this example, the participant **chooses to allocate the remaining 6 recycled material units to product B**





# Many organizations have established principles related to certification and mass balance

Consumer Goods Forum (CGF)



American Chemistry Council (ACC)

Association of Plastics Recyclers (APR)

Ellen MacArthur Foundation (EMF)

Zero Waste Europe (ZWE)

European Chemical Industry Council (CEFIC)

“...the share of plastic waste input that is used to generate energy at any stage of the end-to-end process or that is sold as fuel cannot be counted in the allocation of feedstock to material output”

“Chemical Recycling in a Circular Economy for Plastics”, CGF, April 2022, p. 15



# The US Plastics Pact Roadmap to 2025

The US Plastics Pact aims to:

Develop a clear position with respect to verification, certification and credit trading systems for recycled content

Support policies that require or incentivize certification of post-consumer recycled content

Outcomes and Activities Under Target 4

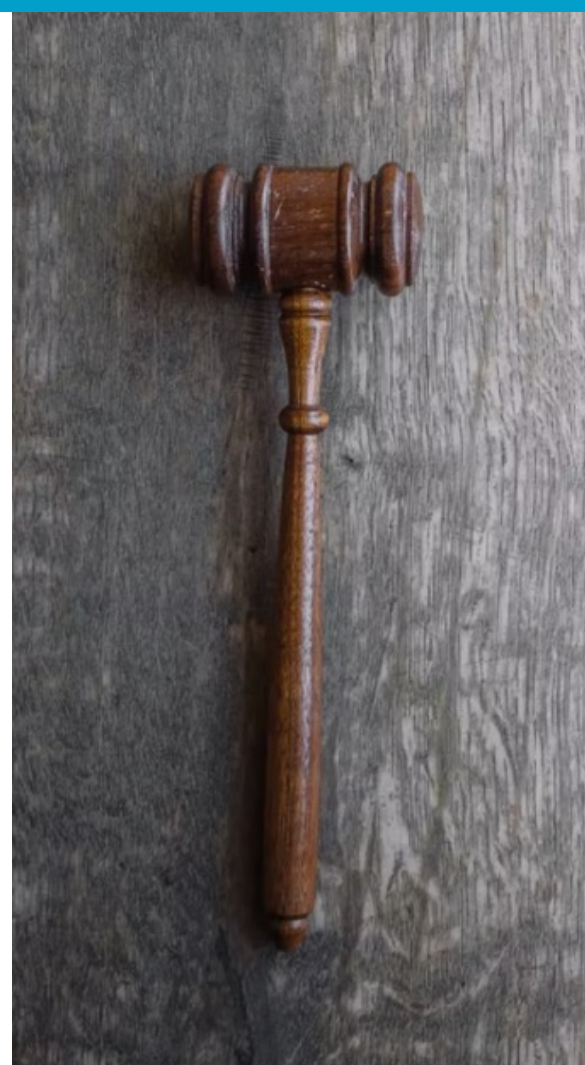


# Standards can support regulations

As agencies look to bolster recycling through policy, third party certification for recycled materials can offer:

- Transparency, clarity & consistency of definitions
- Verification of claims
- Support for responsible end markets

It will be challenging for brands to achieve voluntary goals or demonstrate regulatory compliance without the support of robust standards and third party certification for recycled materials





Types of policies that should clarify the role of certification include:

- Recycled content mandates
- EPR – with eco-modulation for recycled content
- Product bans (e.g. bag bans like CA SB 270)

“New policy requirements should take advantage of existing systems to appropriately document claims and certify recycled content”

*“Recommendations for Recycled Content Requirements for Plastic Goods and Packaging”*; RRS and Ocean Conservancy; Feb 2022





## Mass balance claims require clear documentation between certified participants

- Requires specific information to support the chain of custody
- Invoices & Shipping Documents
- RMS allows mass balance claims between certified participants at any percentage level
- Consumer labeling is optional and has a threshold for eligibility

<p>Shipper:  <b>PRESTON FORWARDER QUOTE ONLINE USA</b>          601 South Figueroa Street          4050          Angeles, CA 90017</p> <p>Consignee (If "On Order" see inside):  <b>PRESTON FORWARDER QUOTE ONLINE AUSTRALIA</b>          LVL 2, 44 Market Street          NSW 2000</p>		<p>Bill/Lading Number: <b>900158002</b></p> <p>EXPRESS BELL OF LADING</p> <p><b>BILL OF LADING</b></p> <p>EXPRESS</p> <p>US    <b>FREIGHT FORWARDER</b>          QUOTEONLINE.COM</p> <p>Received by the Carrier, the Goods as specified below in apparent good order and condition, unless otherwise stated, to be transported to such place as appears, authorized or permitted herein and subject to all the terms and conditions appearing on the front and reverse of this Bill of Lading, to which the Merchant agrees by accepting this Bill of Lading, any used packages and documents hereon.</p> <p>The particulars given below as stated by the shipper and the weight, measure, quantity and contents and value of the Goods are unknown to the Carrier.</p> <p>IN WITNESS whereof one (1) original Bill of Lading has been signed if not otherwise stated, the same being accomplished the authority. It may be noted, if returned by the Carrier, one (1) original Bill of Lading must be surrendered only enclosed in exchange for the Goods or delivery order.</p>	
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# Claims shown on labels are tied to the accounting system



Average Content



Mass Balance



ARC Certificates



# Mass balance claims to avoid

we use  
... in

contains

made  
with



# Many standards use a “Mix” claim

*Products that bear this label are made using a mixture of materials from FSC-certified forests, recycled materials, and/or FSC controlled wood.*



[FSC Labels](https://www.fsc.org)

*For RSB compliant material produced under the “Mass Balance” chain of custody models, the RSB short claim shall be: “Product mix contains RSB certified material”*



[RSB Procedure for Claims](#)

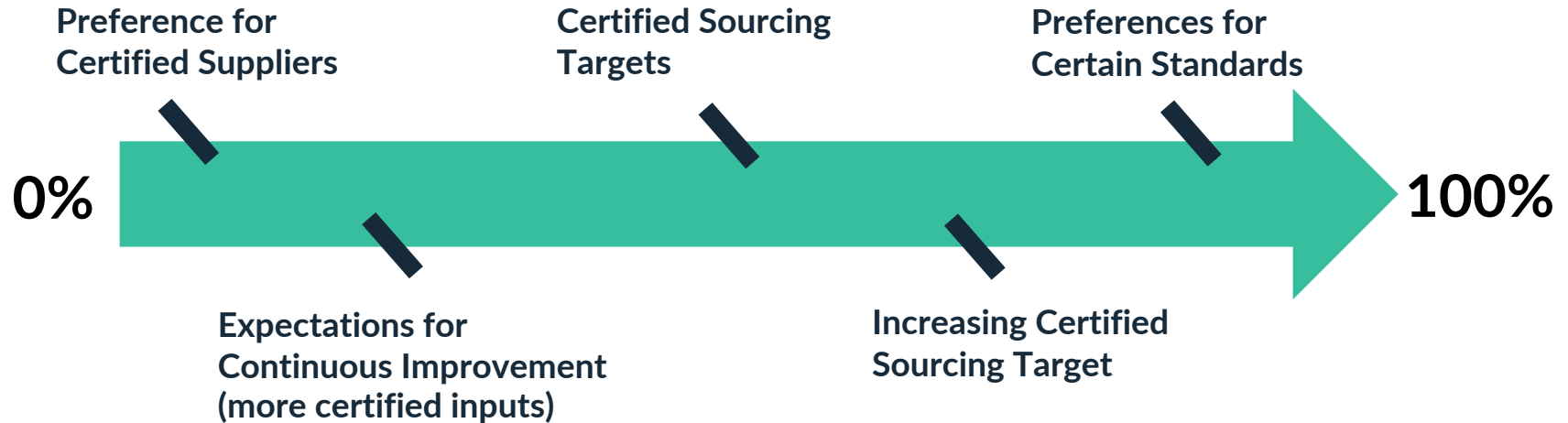
*In the case of recycling or reuse of materials the following on-product logo can be used for mass balance supply chains:*



[ISCC System Logos and Claims](#)



# Goals related to certification often evolve over time



**Standards also evolve over time**



Q & A





## *Contact Information*

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