Circular Packaging Assessment Tool

Pathway to Circularity for Packaging
THE RECYCLING PARTNERSHIP

Disclaimer: For full functionality please open this document with Adobe Acrobat or Adobe Acrobat Reader. This Circular Packaging Assessment Tool ("Tool") is intended to provide stakeholders with general information related to packaging circularity challenges in order to bring clarity and solutions to navigate and advance the circular economy for packaging. The Tool does not address every aspect of packaging circularity and related issues. While The Recycling Partnership considers the information set out in the Tool essential to navigate and advance the circular economy for packaging, the Tool does not take into account each individual circumstance. Moreover, the Tool does not provide and is not intended to be construed as providing legal advice and should not be considered a substitute for legal advice. Stakeholders should not act on the information in the Tool without considering, among other things, individual circumstances, applicable legal requirements, industry standards and procedures and the advice of a competent legal professional. All liability with respect to the Tool is hereby expressly disclaimed.

Pathway to Circularity for Packaging
THE RECYCLING PARTNERSHIP

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Introduction

Navigating the recycling system has historically been challenging, in part due to the lack of industry-wide accepted recyclability standards. The Recycling Partnership set out to bring clear, industry-informed guidelines with The Pathway to Circularity Residential Recyclability Framework (Framework) brought to life through publication of this Circular Packaging Assessment Tool (Tool). This Tool provides step-by-step instructions to help companies understand packaging recyclability and identify challenges that need to be addressed to achieve the circular system of the future.

According to the Federal Trade Commission (FTC) Green Guides, "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."[i] This Tool, informed by industry needs, desires, and practicalities, introduces a definitive and broadly supported standard for determining recyclability that is transparent and action-oriented.

The Framework (accessed via this Tool) provides a single source for determining the recyclability of a package. The Framework reduces confusion for:

- packaging manufacturers who develop recyclable packaging,
- brands that select packaging types and develop recyclability claims, and
- communities and MRFs that decide which package types to accept for recycling, and
- policymakers and stakeholders considering approaches to improve the accuracy of recyclability claims and recycling overall.

The Framework can reach far beyond assessment alone; it can also inform and support an effective path to recyclability for innovative packages. By using this Framework, packaging manufacturers, brands, retailers, and others can determine package recyclability and, for packaging that is not yet recyclable, discover opportunities for improvement, and how to successfully address them. By identifying specific areas of concern and associated challenges, it paves the way for industry stakeholders to address shared issues and system change through dialogue and investment. Creating a recyclable future for innovative packages is possible and is already happening at scale through initiatives such as The Recycling Partnership's **Film and Flexibles**, PET, Aluminum, and **Polypropylene** Recycling Coalitions.

Introduction

The Framework is a living document, evolving over time as necessary, to meet the needs of a growing recycling system while still providing stability for long-term decisions. The Framework roots the industry in reality while pushing toward a more innovative and circular future by assessing recyclability through a series of "building blocks" or criteria that a package must meet to be considered recyclable.

Some existing as well as innovative packages may struggle to immediately align with the Pathway to Circularity Framework requirements. Therefore, The Recycling Partnership is developing an on-ramp to recognize packages that are in active transition toward widespread recyclability. The Recycling Partnership recently announced its National Recycling Database, a comprehensive, real-time source for local recycling information in the U.S. When combined with this Framework, it enables a future where the recyclability of packages can be communicated to people in real-time. While these features will be introduced at a later date, the Framework is being released now, on a simple pass/fail basis, to provide direction to those seeking clarity.

Passing through the Framework is a necessary step for recyclability at scale, providing the best existing way to assess whether a package is set up for success in the U.S. recycling system. Consistent with the Ellen MacArthur Foundation's definition of recyclable, The Recycling Partnership considers a package to be recyclable at scale if post-consumer recycling rates for that package reach 30% in either the U.S. market and/or multiple regions representing at least 400 million inhabitants. However, since the Framework's building blocks represent the ingredients supporting recyclability at scale over time, the Framework provides that necessary first step. While recyclability claims for individual packages might be made based on passing through the Framework, meaningful progress toward the circular system of the future will only be realized through recyclability at scale.

Introduction

The Recycling Partnership is collaborating with **The Circularity Council**, a group of 35 industry leaders from across different sectors, materials, and parts of the recycling system, whose input and discussion were pivotal in the development of the thresholds and scoring approaches used in this Framework. The Circularity Council consulted with a wide range of industry participants to develop an understanding of the issues, to remove barriers to recyclability, and to catalyze system change.
The Partnership is also working with industry associations, including the Aluminium Association, the American Forest & Paper Association (AF&PA), the Association of Plastic Recyclers (APR), the Carton Council of North America (CCNA), the Can Manufacturers Institute (CMI), the Glass Packaging Institute (GPI) and the Institute of Scrap Recycling Industries (ISRI), to reference existing design guides and protocols, in order to build a consistent approach for the recycling industry. As highlighted in this document, several industry organizations have done an effective job of bringing design guides for materials to the industry.

The following principles guided the development of the Framework:

- That it be free and applicable to all;
- That it includes all factors that play a role in determining recyclability—from package design to the resale of recycled material; and
- That its development be informed by real industry knowledge and experience with a transparent process and aimed at streamlining, not duplicating resources. Consequently, the Framework it has drawn heavily on:
  - Existing recyclability sources, including FTC Green Guides, the Walmart Playbook, and material-specific industry design guides;
  - Ongoing industry input, in particular from The Circularity Council; and
  - A 2021 public comment period.

The Recycling Partnership thanks the 35 inaugural Circularity Council members, leaders from across the recycling value chain whose input and expertise were pivotal to setting thresholds, definitions and protocols that address industry challenges and remove barriers to recyclability.

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APR

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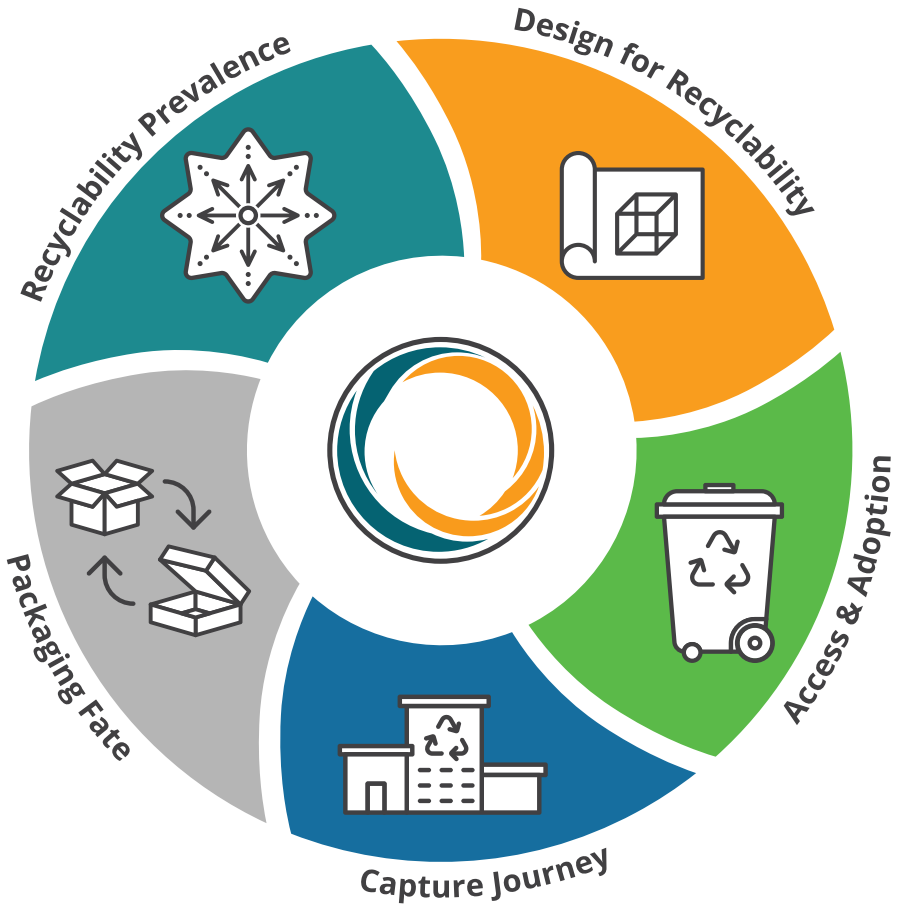
Circular Packaging Assessment Tool



Click any building block to see scope requirements and recommendations

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Scope

The Framework assesses "Residential Recyclability" for packaging that will be marketed in the U.S. "Residential" is defined as municipal recycling collection services, including curbside and drop-off, for both single and multifamily residences, where the collected recyclables are processed by Materials Recovery Facilities (MRFs). In-store drop-off programs are currently not in scope for this Framework.

The focus of the Framework is to determine whether a package, in its expected condition after use by consumers, including all packaging components (labels, lids, closures, etc.), can meet all the necessary criteria for it to be effectively recycled. A package is deemed recyclable if its main packaging material (components and constituents) representing >95% of the entire packaging weight, passes through all the Framework's requirements, and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components.

Primary, secondary, and tertiary packaging items, even when serving to protect the same product, must be assessed as individual packages, not in combination since that is the way each will enter the system.

User Guide

While terms like "design" or "access" can determine one portion of recyclability, for scaled success the whole system must be addressed. That is why Framework consists of five building blocks, all of which must be met for a package to be deemed recyclable. Each building block contains one to two mandatory requirements. In addition to the requirements, the Framework includes some recommendations to improve the circular potential of packaging.

With the Circular Packaging Assessment Tool, users can take new or existing packages through the building block requirements and supporting protocol(s) to determine recyclability. If the requirements are not met, the Framework suggests actions such as package redesign, or participation in or formation of material stakeholder coalitions that can serve to exponentially speed up progress toward recyclability.

If the material composition of packaging changes in any substantive way—for example through a product relaunch, rebranding, or line extension—the user will need to reassess the performance of that package through the Framework.

How to assess and advance a package's recyclability:

1. Review the Framework's building blocks, which begin on the next page
2. After reviewing the building blocks, use the interactive **Tool** on page 30 to select the various building blocks for which the package successfully meets the requirements. Clicking on the green check mark will turn the building block green, indicating your package successfully meets the requirements in that building block. Clicking on the yellow question marks will reset the building blocks.
3. For any unmet requirements, click the red "X" and then review the potential actions to take.[ii]
4. Email pathway@recyclingpartnership.org with any questions.
5. Make sure to document decisions and save the data to back up any potential claims, considering recent legislative activity and the potential requirements of future applicable law.
6. **Don't forget:** Meaningful changes to the recycling system will only be realized by striving for recyclability at scale. Successfully meeting the requirements of this Framework is a necessary first step in this process.

Note: Some existing packages and/or innovative packages may struggle to immediately align with the Framework requirements. Therefore, The Recycling Partnership is developing and testing an on-ramp option to enable recognition for packages that are in transition toward recyclability. The on-ramp will provide real-time recyclability information linked to The Recycling Partnership's **National Recycling Database**, which will become accessible through a series of digital tools and community resources.

Building Block 1:
Design for Recyclability

Required Pathway Criteria

Does the package follow the applicable industry's design guide?

A package must be designed for recyclability. While the body of a package may be easily recyclable, companies must also ensure that package components and constituents—such as labels, lids, additives, and liners—do not hinder the recyclability of the package. Including contaminants in packaging composition results in value loss throughout the system, decreases availability of recycled content, and at times even reduces the quality of recycled content.

How to check if a package passes this requirement:

To check that a package's design is compatible with existing recycling and processing capabilities, refer to the Design Guide issued by the industry organization associated with the primary material composition of the package. These resources provide guidelines to achieve optimum sorting, reprocessing, and recoverability.

The Recycling Partnership references materials guidelines for the following materials:

ALUMINUM
CARTONS
GLASS
PAPER
PLASTICS
STEEL

Click a material above to learn more

Building Block 1:
Design for Recyclability

For example:

An aluminum beverage can with a non-removable plastic shrink sleeve label: According to the Aluminum Association's Container Design Guide, the addition of plastic shrink sleeves (particularly when not easily removable and labeled as such) creates significant challenges in the aluminum recycling system. Therefore, an aluminum beverage can featuring a plastic shrink sleeve or similar contaminants is not considered optimal for recycling.

An HDPE bottle with a paper label: According to the APR Design® Guide, paper labels used in conjunction with HDPE containers cause problems in the recycling process and are deemed "detrimental to recycling." This falls short of the requirement to reach "preferred" status in the APR Design® Guide and would mean that this package would fail the Design for Recyclability requirement. However, switching to polypropylene or polyethylene labels would be in line with preferred guidance and would allow the HDPE bottle to pass this requirement.

Building Block 1: Design for Recyclability

Recommended Pathway Criteria

Incorporate post-consumer recycled material in the package.

While the inclusion of post-consumer recycled material is not a requirement for passing through this Framework, it is an important element to add value to the recycling system and improve the circularity of a package.

In the past few years, many companies have made public recycled content goals to reach sustainability targets or accelerate commitments, like the U.S. Plastics Pact target for plastic packaging to use an average of 30% recycled content by 2025.[iii] As well as being an important driver for circularity by stimulating demand for recycled material, the inclusion of post-consumer recycled material may also be a way to prepare for future legislation in this area.

Post-consumer material from residential sources represents a vast volume of system material and in practice this means that the use of such material can create a dramatic system demand-pull, ultimately leading to system investments and economies of scale. Therefore, the use of post-consumer material from residential sources is strongly encouraged.

Resources to help align a package with this recommendation:

If you are looking for ways to incorporate recycled content—or increase the recycled content—here are some resources to help you take action:

- The Association of Plastic Recyclers' **Demand Champions Program** and Post-Consumer Resin (PCR) **product vendors list**
- Plastic IQ **Solutions Database**
- The Sustainable Packaging Coalition's **Design for Recycled Content Guide**
- The U.S. Environmental Protection Agency's **Comprehensive Procurement Guideline (CPG) Program**

Building Block 2: Access & Adoption

Required Pathway Criteria

Do 60% of U.S. consumers have access to recycle the package?

The FTC Green Guides require an item to achieve majority access (a 60% threshold) to be considered recyclable.[iv] According to the FTC, this means that 60% of U.S. consumers must have access to a recycling program that recovers the item from the waste stream and reuses it or uses it in manufacturing.

Community and MRF adoption of a package or material is required to achieve access. The Recycling Partnership is working toward a toolkit for adoption to help influence and educate MRFs and communities on innovations that pass through The Pathway to Circularity Framework.

How to check if a package passes this requirement:

Currently, this Framework recommends evaluating access to recycling using the most widely accepted resources:[v]

- The Sustainable Packaging Coalition's (SPC) **2020-21 "Centralized Study on Availability of Recycling"**
- The American Forest & Paper Association's (AF&PA) **2021 Access to Recycling Study** (specifically for paper formats)

The Recycling Partnership's **National Recycling Database**, will be a valuable resource in the future to evaluate access. It will provide insight into how individual recycling programs are conducted, what materials are accepted at the local level, and ultimately how to improve packaging recyclability.

SPC defines access as: A resident having access to either one or more of the following services at their place of residence: curbside recycling provided automatically or on an opt-in or subscription basis to their home by public or private providers; or a publicly or privately operated drop-off recycling location within their municipality or a drop-off location to which their municipality or county directs them to bring their recyclables.[vi]

AF&PA defines access as: Curbside and drop-off community recycling programs provided through municipal or county governments, organized via contract or franchised through a private hauler, or available to residents via subscription services or privately operated drop-offs.

Building Block 2:
Access & Adoption

For example:

Aluminum Beverage Cans (see SPC study on page 18): According to SPC's study, aluminum beverage cans reach a total of 89% acceptance (without deposits), which exceeds the required 60% threshold. Therefore, aluminum beverage cans can be considered to pass this requirement.

Pizza Boxes (see 2021 AF&PA Access to Recycling Study Executive Summary on page 11): According to AF&PA's study, pizza boxes have a total acceptance rate of 82%, which also exceeds the 60% threshold. Therefore, pizza boxes can be considered to pass this requirement.

Polyethylene Terephthalate (PET) Cups (see SPC study on page 17): According to SPC's study, PET cups have a total acceptance rate of 52%, which falls short of the 60% threshold. Therefore, PET cups can be considered to not yet pass this requirement so action needs to be taken.

Building Block 2: Access & Adoption

Recommended Pathway Criteria

Use accurate consumer recyclability labeling/messaging on the package.

Accurate recyclability messaging should be prominently displayed on packages whenever possible. It is one of the most important touch points to remind people to recycle and help them understand when packages should or should not be recycled. Accurate, easy-to-understand on-pack recyclability labels have the potential to improve trust, increase recycling and reduce contamination.

While labels are critical for communicating recyclability to consumers, they do not determine a package's recyclability; rather, they communicate the determination. It is critical to first determine how packaging should be disposed of at the end of its life using industry-accepted guidance and best practices. This Framework is intended to provide the clarity needed to help inform label accuracy as well as the actions needed to improve label status. The Framework is also being integrated into other industry guidance wherever possible to build consistency. As recyclability claims and labels continue to be an active topic in policy, this Tool may be a guide to help companies determine recyclability and inform their decisions on claims and recycling. However, as set out more fully in the disclaimer, the Framework it is neither legal guidance nor is it currently tailored to meet the specific circumstances of individual users or particular companies, so use of the Tool should be accordingly limited. Users should maintain appropriate documentation of recyclability determination to fulfill substantiation requirements.

Once recyclability is determined, labels should be placed on packaging in a highly visible location. Messaging should be simple and easy-to-read. Labels also need to be consistent. Using standardized labeling systems, such as SPC's How2Recycle, can help improve the ability of consumers to recognize the label. Ultimately, the goal is to have dynamic data-based information that provides people with locally-specific recycling instructions. The Recycling Partnership's **recently announced National Database** opens the door to this opportunity by capturing what is accepted in individual communities. When combined with the Framework, it will allow for the recyclability of these packages to be communicated in real-time to consumers.

While it is incredibly important, a label is not a requirement for a package to be considered recyclable: it is a means to help consumers know how to recycle it, which is why this is currently a recommendation as opposed to a requirement. The Framework strongly recommends the use of labelling to help consumers understand how to recycle packaging.

Building Block 2:
Access & Adoption

Resources to help align a package with this recommendation:

If you're looking for ways to implement accurate recyclability labeling, here are some resources to help you take action:

- Federal Trade Commission's Green Guides
- The Sustainable Packaging Coalition's How2Recycle Label Program

Building Block 3: Capture Journey

Required Pathway Criteria

Requirement: Does the package sort at a 90% MRF capture rate OR at a capture rate that is within a 5% range of the capture rate of the target commodity?

To be considered recyclable, a package must successfully sort at a MRF. Items that are not designed to successfully sort will not be captured for recycling. Instead, they may be sent from the MRF to the landfill with other unsortable "residue" material.

Setting a robust threshold gives consumers confidence that packages are actually going to be recycled and decreases waste in the process, resulting in more recycled content. Including a target commodity helps set a bar of what is possible today. Council members representing MRFs, industry associations and local governments as well as other industry experts are currently in the process of developing a testing protocol, described briefly below, that is sufficient for evaluating the MRF sortation of a package.

How to check if a package passes this requirement:

Given the challenges of real-world testing, including significant variability of MRFs across the U.S., replicability, and exposure and risk to MRFs, real-world MRF testing is currently not practical. The Circularity Council acknowledged these challenges and made an industry-informed decision to support the shift to simulated MRF testing. Therefore, adherence to this requirement should be measured using simulated MRF tests. Exact protocol to perform these tests is currently in development by APR and being aligned with industry practices. This Tool will be updated with the protocol as soon as they are available.

In order to meet this requirement, the completion of all applicable tests for the target package format must result in:

- The package's MRF capture rate meeting the 90% capture rate threshold, OR
- The package's MRF capture rate being within 5% of current capture rate capabilities of the target commodity (i.e., the control format).

Building Block 3:
Capture Journey

Material	Size	Control Format
PET	Smaller than 3"x3"	8 oz. PET water bottle
	Larger than 3"x3"	Standard 16.9 fl. oz. PET water bottle
HDPE	Smaller than 3"x3"	Shampoo bottle
	Larger than 3"x3"	92 oz. laundry detergent bottle
PP	Smaller than 3"x3"	6 oz. yogurt cup
	Larger than 3"x3"	Whipped cream tub
Paper 3D (packaging that does not compress)	All	Carton
Paper 2D (packaging that manually breaks down/collapses compresses, and flows wtih 2D)	All	Magazines/standard papers
Corrugated Boxes (corrugated box and packages that can be broken down)	All	Cardboard box
Aluminum	All	Standard UBC
Steel	All	Soup can

Building Block 4: Packaging Fate

Required Pathway Criteria

Requirement: Does the package format fall into the relevant Institute of Scrap Recycling Industries (ISRI) specifications?

An important step to determine if a package may be accepted by the industry for recycling is to know if the specific package format is included in a common specification. **Institute of Scrap Recycling Industries (ISRI) specifications** are used in this Framework due to their broad acceptance in the recycling industry.

How to check if a package passes this requirement:

Adherence to this requirement can be assessed by ascertaining whether the package is included in the relevant Institute of Scrap Recycling Industries (ISRI) specifications.

The current specifications can be found here: **http://www.scrap2.org/specs/**

For example:

Aseptic Packaging and Gable-Top Cartons (see ISRI Specs, page 33)
If an aseptic package or gable-top carton aligns with the following description (and excludes prohibitive materials), it would be deemed to have passed this requirement: "Consists of liquid packaging board containers including empty, used, polyethylene (PE)-coated, printed one-side aseptic and gable-top cartons containing no less than 70% bleached chemical fiber and may contain up to 6% aluminum foil and 24% PE film."

Colored HDPE Bottles (see ISRI Specs, page 37)
If an HDPE bottle aligns with the following description and excludes the named contaminants—e.g. Polyvinyl Chloride (PVC, #3)—it would be deemed to have passed this requirement: "Any whole, blow-molded, High-Density Polyethylene (HDPE #2) bottle containing the ASTM D7611 "#2, HDPE" resin identification code that is pigmented and opaque, and was generated from a curbside, drop-off, or other public or private recycling collection program."

Building Block 4: Packaging Fate

Required Pathway Criteria

Requirement: Are end markets for the material sufficient?

For a package to be considered recyclable, it must have a viable path to becoming something else. Through an iterative and industry-informed process, The Circularity Council End Market Subcommittee[vii] created a matrix that can be used to score end markets for a material. This subcommittee had representation from all material types as well as the entire value chain. The iterative process resulted in this scoring system which assesses end market sufficiency based on the presence of eight key attributes of any material. See a detailed description of the End Market Scoring Matrix and its methodology on the following page.

How to check if a package passes this requirement:

The eight attributes for evaluating a material's end market are:

- Supply/Demand Balance
- National Access to Markets
- Material Value
- Market Diversity
- Quality/Yield
- Material End Use
- Market Specifications
- Export Dependence

And these should be scored as follows:

A. Each attribute has three levels of scoring: low, medium, high (1, 5, and 9)

B. Each attribute has a predetermined weighted factor

C. Each attribute's weighted score is the product of the level scoring and the weighted factor

A x B = C

The total of all attribute scores is the End Market score (%) for that material.

Building Block 4:
Packaging Fate

If the total score is 70% or above, then the material is deemed to have sufficient end markets. However, if the total score is below 70%, then the end markets cannot yet be deemed sufficient and there is opportunity for improvement.

Each attribute has three levels of scoring (1, 5, and 9) with descriptions for each numerical score. The End Market Subcommittee ranked the importance of each attribute individually, from 1-8 (1 being the most important, 8 being the least important). The scores were averaged for each attribute and inverted. The attribute with the highest score represents the highest importance. These scores are the weighting factors which are multiplied by the standard attribute score to give a weighted attribute score. The total of all the weighted attribute scores, calculated as a percentage of the highest possible score, is the End Market score for that material.

For example:

According to the Resource Recycling quarterly releases of RecyclingMarkets.net material prices, steel cans are consistently positively priced scrap commodities, meaning they would score a "9" on Material Value with a weighted score of 48.6. To calculate the total End Market Score for steel cans, the user would need to determine a weighted score for the other seven attributes and determine the sum total.

Building Block 4:

End Market Scoring Matrix

End Market Attributes/Scoring Criteria	Scoring Option		Weighted Factor	Score	Weighted Score
Supply/Demand Balance Balance between demand and marketplace supply	100%+	9	6.4		0
	50 - 100%	5			
	Less than 50%	1			
National Access to Markets How easy/widespread it is to market the material across the U.S.	National-scale market: Material marketable to outlets covering the entire geography of the U.S.	9	5.8		0
	Strong & widespread regional markets: Material marketable to outlets covering most regions of the U.S.	5			
	Highly regional markets: Material marketable to outlets covering only a few states or regions of the U.S.	1			
Material Value Marketplace value of material after collection and/or sortation	At least two consecutive years of consistent positive commodity value, or one year with supporting information demonstrating values very unlikely to decrease in forthcoming year	9	5.4		0
	Less than 2 years of consistent positive commodity value with periodic (not to exceed 6 months) of negative value	5			
	Consistent limited or negative commodity value (the average national price is below $0)	1			
Market Diversity Large number and wide range of value-added/salable applications	Wide range (4 or more) of end use product applications into value added products	9	4.6		0
	Limited range (1 - 3) of end use product applications into value added products	5			
	No additional end use product applications	1			
Quantity/Yield Yield of recyclable material (versus contaminants or loss) from the package itself	80%+	9	4.6		0
	50 - 80%	5			
	Less than 50%	1			
Material End Use Likelihood of material being used in original form (closed loop) or utilized original properties	Strong & demonstrated circularity of materials back to original formats (closed loop) or utilizes original properties in practice and at scale (50% or more)	9	3.6		0
	Technical circularity of materials back to original formats or original properties but large reliance on other "open loop" product applications and other altered properties (20 - 49%)	5			
	Limited demonstration (less than 20%) of circularity back to original formats/properties; occasional reliance on disposal of materials	1			
Market Specifications Inclusion in published recycling market specifications (Ex. ISRI specifications or equivalent)	Commonly used, published recycling market specifications	9	2.9		0
	Highly regionalized or specialized recycling market specifications	5			
	No existing recycling market specifications	1			
Export Dependence Relative dependence on export (excluding Mexico & Canada) to market recyclable material	0 - 10% reliant on export materials	9	2.8		0
	10 - 30% reliant on export materials	5			
	more than 30% reliant on export materials	1			
TOTAL			324.9	0.0%	0

Building Block 4:
End Market Scoring Matrix

	Aluminum	Steel	Glass	Paper	Plastics
Supply/Demand Balance Balance between demand and marketplace supply	Industry experts indicate supply/demand balance is 100%+		Industry experts indicate supply/ demand balance is 100%	Industry experts indicate supply/ demand balance is 100%+	**PET/HDPE/PP/PE Film:** The Ocean Conservancy's Recycled Content Report Features supply/demand balance by resin type **HDPE/PP:** Industry experts indicate supply/ demand balance is 90-100% **PS:** Due to a current gap in available industry data, we ask PS stakeholders to upload documentation from their own research
National Access to Markets How easy/widespread it is to market the material across the U.S.	There is not one source of information that answers this end market attribute. Through partnership, expertise and industry outreach, it has been determined that National Access to Markets for aluminum is National-scale market: Material marketable to outlets covering entire geography of U.S.	There is not one source of information that answers this end market attribute. Through partnership, expertise and industry outreach, it has been determined that National Access to Markets for steel is National-scale market: Material marketable to outlets covering entire geography of U.S.	There is not one source of information that answers this end market attribute. Through partnership, expertise and industry outreach, it has been determined that National Access to Markets for glass is Strong and widespread regional markets: Material marketable to outlets covering most regions of states of U.S	There is not one source of information that answers this end market attribute. Through partnership, expertise and industry outreach, it has been determined that National Access to Markets for paper is below: OCC / Mixed Paper: National-scale market: Material marketable to outlets covering entire geography of U.S. Cartons: Strong and widespread regional markets: Material marketable to outlets covering most regions of states of U.S.	There is not one source of information that answers this end market attribute. Through partnership, expertise and industry outreach, it has been determined that National Access to Markets for plastics is below: PET / HDPE: National-scale market: Material marketable to outlets covering entire geography of U.S. PP: Strong and widespread regional markets: Material marketable to outlets covering most regions of states of U.S PE Film / PS: Highly regional markets: Material marketable to outlets covering only a few states or regions of U.S. (low capacity for recycling this material exists, or recyclers are buying the material at low volumes, or not at all)

Building Block 4:
End Market Scoring Matrix

	Aluminum	Steel	Glass	Paper	Plastics
Material Value Marketplace value of material after collection and/or sortation	Recyclingmarkets.net offers a paid service that determines material marketplace value				
Market Diversity Large number and wide range of value-added/ salable applications	The U.S. EPA Comprehensive Procurement Guideline (CPG) Program provides a supplier's directory listing designated products containing recovered content. Use this source to explore application options for your package.	American Iron and Steel Institute's Facts about American Steel Sustainability provides examples of steel products made with recycled content.	The U.S. EPA Comprehensive Procurement Guideline (CPG) Program provides a supplier's directory listing designated products containing recovered content. Use this source to explore application options for your package.	The U.S. EPA Comprehensive Procurement Guideline (CPG) Program provides a supplier's directory listing designated products containing recovered content. Use this source to explore application options for your package.	For plastics, review The Ocean Conservancy's Recycled Content Report for trends in post-consumer applications. U.S. EPA Comprehensive Procurement Guideline (CPG) Program, APR's Demand Champions Vendor List and Stina's Buy Recycled Products Directory also lists vendors offering products made with post-consumer resins. Review the NAPCOR 2020 PET Recycling Report for rPET uses.
Quantity/Yield Yield of recyclable material (versus contaminants or loss) from the package itself	Industry experts indicate the yield of usable recycled materials from aluminum packaging is 94%.	Industry experts indicate the yield of usable recycled materials from steel packaging is 85%.	Industry experts indicate the yield of usable recycled materials from glass packaging is >80%.	OCC / Mixed Paper: Industry experts indicate the yield of usable recycled materials from OCC and mixed paper packaging is >80%. Cartons: Industry experts indicate the yield of usable recycled materials from carton packaging is 67-100% in a Grade 52 bale and 50-60% in a mixed paper bale.	PET: Closed Loop Partners rPET Report HDPE/PP: Industry experts indicate the yield of usable recycled materials from HDPE and PP packaging is 50-89%. PE Film: Industry experts indicate the yield of usable recycled materials from film and flexible packaging ranges widely. PS: Due to a current gap in available industry data, we ask PS stakeholders to upload documentation from their own research.

Building Block 4:
End Market Scoring Matrix

	Aluminum	Steel	Glass	Paper	Plastics
Material End Use Likelihood of material being used in original form (closed loop) or utilized original properties	Aluminum Association's 2021 KPI Report provides a recycling rate, closed-loop circularity rate and recycled content for Used Beverage Cans (UBC) that can be used to determine circularity.	Can Manufacturers Institute Food Can Facts and American Iron and Steel Institute and Steel Manufacturers Association Steel Container Recycling Rates Report provide recycling rate and recycled content levels for steel food cans and containers that can be used to determine circularity.	GPI's Glass Recycling Facts and EPA Comprehensive Procurement Guideline (CPG) Program feature end uses for glass.	Industry experts identify the following end uses for OCC: cardboard, recycled paperboard, bags and sacks. Industry experts identify the following end uses for mixed paper: cardboard, recycled paperboard, bags and sacks. Sorted newspapers and "groundwood" papers can become newsprint or cellulose insulation. Industry experts identify the following end uses for cartons: building materials, tissue and toweling, de-ink pulp and mixed tissue toweling and packaging.	PET/HDPE/PP/PE Film/PS: The Ocean Conservancy's Recycled Content Report features end uses by resin type.
Market Specifications Inclusion in published recycling market specifications (Ex. ISRI specifications or equivalent}	ISRI Specifications contains market specifications for common materials.				ISRI Specifications publications contains market specifications for common materials. Find additional plastic packaging guidance using APR's Model Bale Specifications.
Export Dependence Relative dependence on export (excluding Mexico & Canada) to market recyclable material	ISRI's U.S. Scrap Exports by Commodity contains year-over-year export data.		Industry experts indicate that glass does not have dependence on export.	AF&PA's 2020 Paper and Cardboard Recycling Rates contains year-over-year export data.	ISRI's U.S. Scrap Exports by Commodity, ACC Post-Consumer Non-Bottle Rigid Plastic Recycling Report and ACC United States National Post-Consumer Plastic Bottle Recycling Report all contain year-over-year export data.

Building Block 5:
Recyclability Prevalence

Required Pathway Criteria

Requirement: Does >75% of the package category (by volume or weight) pass all other Pathway building block requirements?

Package design innovation allows companies to choose from a selection of package formats, some of which are not recyclable. Look-alike packages that comprise either uncommon materials or formats can present challenges to the recycling system by contaminating recycling streams, causing consumer confusion, and eventually eroding consumer trust. The Circularity Council developed the Recyclability Prevalence threshold to create confidence in introducing innovative packages while mitigating this issue.

Consumers are unlikely to tell different formats apart—e.g. a PET vs. polystyrene (PS) cup—and may only see the category (cup). To avoid problematic lookalikes in the recycling system, the majority (75%) of the category needs to be recyclable. The best definition of recyclable can be derived from the Pathway and the successful completion of the building blocks. **Therefore, if 75% of a category is recyclable according to all other Pathway building blocks, then all formats in that category can be deemed recyclability prevalent.**

KEY DEFINITIONS

(Package) "Category" denotes a grouping or "type" of packaging, made up of a combination of basic material and format—e.g. plastic bottle, glass jar. This is deemed to be a reasonable proxy for how most consumers might view a package.

(Package) "Format" denotes a description of a package made up of a combination of specific material and structure—e.g. PET bottle, flint/clear glass jar. This is deemed to be a reasonable proxy for how the recycling industry categorizes packages.

Note: These two definitions are closely related—a package category is typically made up of many package formats—e.g. plastic bottles includes PET bottles, HDPE bottles, and PP bottles.

Building Block 5:
Recyclability Prevalence

How to check if a package passes this requirement:

To pass this requirement, **>75% of the (package) category must be recyclable according to all other Pathway building blocks for a package format to be deemed recyclability prevalent.**

To confirm this, you need to:

1. Identify the package format and its associated package category.
2. Secure independent evidence (such as industry reports or market share data) that >75% of that package category (either by volume/ market share OR weight) is in a recyclable format—i.e. passes all other Pathway building blocks. Note: As set out more fully in the disclaimer, the Framework is not currently tailored to evaluate individual circumstances, including such independent evidence.

For example:

- If >75% of plastic bottles are recyclable according to all other Pathway building blocks, then all **formats** of plastic bottles can be deemed Recyclability Prevalent.
- According to the **ACC Post-Consumer Non-Bottle Rigid Plastic Recycling Report**, >75% (specifically, 97%) of plastic bottles produced are PET or HDPE bottles (the majority of which pass all other Pathway building blocks).
- Therefore, ALL plastic bottles pass Recyclability Prevalence (even if some **formats** such as PVC bottles would fail to pass other building blocks and therefore would not themselves be deemed recyclable).

Circular Packaging Assessment Tool

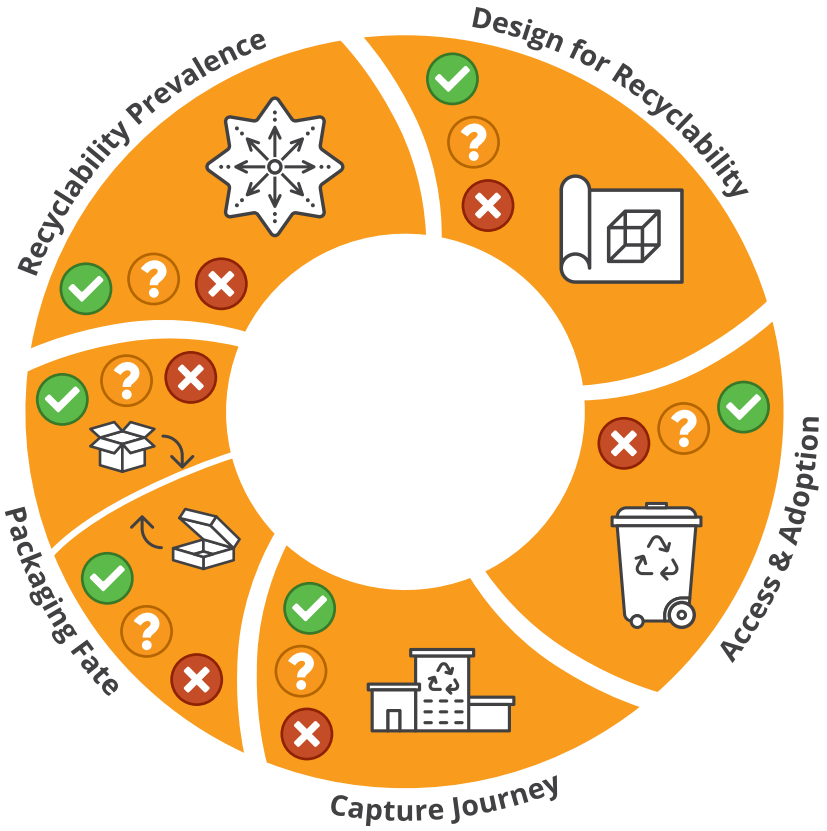
How to assess and advance a package's recyclability:

1. After reviewing the building blocks in the previous section, use the interactive Tool on the next page to select various building blocks for which the package successfully meets the requirements.
    a. Clicking on the green check mark will turn the building block green, indicating your package successfully meets the requirements in that building block.
    b. Clicking on the yellow question marks will reset the building blocks.
2. For any unmet requirements, click the red "X" and then review the potential actions to take[ii].
3. Email pathway@recyclingpartnership.org with any questions.
4. Make sure to document decisions and save the data to back up any potential claims, considering recent legislative activity and the potential requirements of future applicable law.
5. **Don't forget:** Meaningful changes to the recycling system will only be realized by striving for recyclability at scale. Successfully meeting the requirements of this Framework is a necessary first step in this process.

Note: Some existing packages and/or innovative packages may struggle to immediately align with the Framework requirements. Therefore, The Recycling Partnership is developing and testing an on-ramp option to enable recognition for packages that are in transition toward recyclability. The on-ramp will provide real-time recyclability information linked to The Recycling Partnership's National Recycling Database, which will become accessible through a series of digital tools and community resources.

Circular Packaging Assessment Tool

Does your packaging meet each requirement of the Framework?



Pathway to Circularity for Packaging
THE RECYCLING PARTNERSHIP

Potential Actions & Solutions

Design for Recyclability

If a package does not align with industry-specific design guidance, there are several possible actions to take:

- Contact the relevant industry association to identify alternative solutions and/or pursue further testing if needed. For example: In 2013, the Fibre Box Association (FBA) and the American Forest & Paper Association (AF&PA) developed a testing method now called the **Voluntary Standard for Recyclable Wax Alternatives** to confirm impacts of corrugated coating treatments on recycling. AF&PA and FBA are currently updating the Voluntary Standard to use with paper-based packaging irrespective of coatings or treatments.
- Remove contaminants and/or pursue redesign in line with guidance or pursue collaborations to find industrywide alternatives. For example:
  - The Sustainability Consortium (TSC) has launched a **small format packaging coalition** to work on addressing system challenges currently facing small formats of all material types.

Access & Adoption

If a package does not meet the 60% access threshold, there are several possible actions to take:

- Join an existing industry coalition, or express interest in establishing one,[ix] to work with others to increase access to recycling. For example:
  - **The Carton Council of North America** was formed in 2009 as an industry organization committed to growing carton recycling in the U.S. & Canada
  - The Recycling Partnership's Polypropylene Recycling Coalition **awarded grants that will improve curbside polypropylene recycling access for nearly 6% of all U.S. households**.
- Identify an alternative material and/or format for the product/application that meets both the access threshold and other requirements in this Framework to ensure recyclability

Potential Actions & Solutions

Capture Journey

If a package does not meet the necessary capture rate threshold, there are several possible actions to take:

- Remove any known contaminants that may be causing sortation issues and/or pursue redesign in line with industry guidance.
- Identify an alternative material and/or format for the product/ application that meets both the capture rate threshold and other requirements in this Framework to ensure recyclability.
- Join an existing industry coalition, or express interest in establishing one, to work with others to improve MRF sorting capabilities. For example:
  - **The Recycling Partnership's Film and Flexibles Recycling Coalition** is working to identify the most promising technological interventions and pilot new approaches to drive the recycling of films and flexibles.
  - **Closed Loop Partners' NextGen Consortium** is a multi-year, global consortium that aims to address single-use foodservice packaging waste by advancing the design, commercialization, and recovery of packaging alternatives.

Packaging Fate

If a package material does not meet the necessary threshold and criteria for Packaging Fate, there are several possible actions to take:

- Join an existing industry coalition, or express interest in establishing one, to work in partnership with others to improve the status of end markets. For example:
  - The Glass Recycling Coalition (GRC) shares insights and resources relating to the **availability of end markets for glass**.
  - The Association of Plastic Recyclers (APR) runs a **Demand Champions Program** to help stimulate the use of recycled content.
- Work with the Institute of Scrap Recycling Industries (ISRI) and/or specific end markets to seek formal inclusion for specific packaging formats into industry specifications.

Potential Actions & Solutions

Recyclability Prevalence

If a package does not meet the necessary criteria for recyclability prevalence, this Framework will help identify where gaps exist in the category's overall recyclability status. Other industry participants may share relevant experience and knowledge that could be used to secure progress toward the 75% threshold. For example:

Even if the package does meet the criteria, there are other actions to be taken to improve the circularity of the material such as:

- Investment in recycling access, education, and infrastructure is needed to improve the overall U.S. recycling system and accelerate the transition to a circular economy such as those identified in The Recycling Partnership's **Paying it Forward** report.
- Investment in efforts to understand consumer behavior and barriers to recycling.

What's Next?

This is a living Framework, the contents of which will continue to evolve with changing market conditions, advances in technology, etc. Here are the planned upcoming developments:

Next Steps	Details	Anticipated Timeline
Launch the Circular Packaging Digital Assessment Tool	This tool will provide an interactive experience of the Pathway to Circularity Residential Recyclability Framework, including the industry design guides, which will be updated live.	2022
Introduction of an "on-ramp" for innovative packages	Some existing packages and innovative packages may struggle to immediately align with the Pathway to Circularity Residential Recyclability Framework requirements. Therefore, The Recycling Partnership is developing and testing an "on-ramp" to enable recognition for packages that are in transition toward recyclability utilizing its National Recycling Database.	2022
Introduction of material health elements into design for recyclability	The Recycling Partnership is working with partners to define the parameters of material health that are applicable to this Framework.	2022

What's Next?

Next Steps	Details	Anticipated Timeline
Update assessment information based on the launch of The Recycling Partnership's National Database	The Recycling Partnership recently announced its **National Database**, comprised of research of all local U.S. recycling websites with communities of over 2,500 households (97% of the U.S. population) and a custom neural network that captures local recycling changes as they occur. The Recycling Partnership is actively working to deliver a series of digital tools that will harness the breadth and depth of the database for multiple audiences. Once complete, the Framework will be updated to reflect this new data source.	2022
Evolve the definition of recycling access to account for greater equity	As part of the launch of the **National Database**, The Recycling Partnership is committed to finding ways to reflect more "equitable access" to recycling—i.e., making recycling as easy as throwing an item into the trash. This would include only curbside recycling for communities with curbside trash pickup. For multifamily units, this would depend on-property access. In areas with drop-off only for trash, drop-off recycling would be acceptable.	2022-2023
Specify criteria and/or aligned accreditation schemes	The inclusion of post-consumer recycled material in packaging is currently recommended. However, beyond the basic definition, no specific criteria for the recycled material are provided. The Recycling Partnership is exploring including criteria and/or specified accreditation programs in this Framework in the future.	2023

Definitions

Circular packaging

Material being made into another package or product that has the potential for a future use, recycled back to original format (closed loop) or otherwise.

Control format

A known package format that has a clear, well-known fate in the recycling system and that is deemed comparable in properties to the test subject package format and can therefore be used as a benchmark against which test results are measured.

End market

A company that processes recyclable materials to prepare them for use as a feedstock, or a manufacturer that uses recycled materials as feedstock in a manufacturing process.

End market sufficiency

The Pathway to Circularity end market criteria defines a sufficient end market through a scoring system that evaluates eight attributes:

- Supply/Demand Balance
- National Access to Markets
- Material Value
- Market Diversity
- Quality/Yield
- Material End Use
- Market Specifications
- Export Dependence

Main (packaging) material (composition)

The material comprising the majority of the packaging (by weight).

Mill

A consuming facility, such as a steel mill or paper mill, that buys scrap material that has already been processed. The mill's goal is to transform these materials into a uniform stream of single commodities that can be used as raw materials in manufacturing.

Definitions

(MRF) Capture Rate

The percentage of a particular commodity that a MRF sorts into its intended bale rather than losing that commodity to residue or unintended bales.

(Package) Category

A category denotes a grouping or "type" of packaging, made up of a combination of basic material and format—e.g. plastic bottle, glass jar. This is deemed to be a reasonable proxy for how most consumers view a package.

(Package) Format

A format denotes a description of a package made up of a combination of specific material and structure—e.g. PET bottle, flint/clear glass jar. This is deemed to be a reasonable proxy for how the recycling industry categorizes packages.

Packaging

Product to be used for the containment, protection, handling, delivery, storage, transport, and presentation of goods, from raw materials to processed goods and from the producer to the user or consumer, including processor, assembler, or other intermediary.

(Packaging) Component

A packaging component is a part of packaging that can be separated by hand or by using simple physical means—for example, a cap, a lid and (non in-mold) labels. (ISO 18601)

(Packaging) Constituent

A packaging constituent is a part from which packaging or its components are made and which cannot be separated by hand or by using simple physical means—for example, a layer of a multi-layered pack or an in-mold label. (ISO 18601:2013)

Post-consumer recycled material

Material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. This can also be referred to as post-consumer recycled content. (ISO 14021)

Definitions

Primary packaging

Packaging that contains the finished or final products, sometimes called retail or consumer packaging. This packaging is used to contain, preserve, protect, and inform the end user. It is the total packaging that the end user will ultimately discard direct to reuse, recycling, landfill or other disposal routes. The primary package can be made of a number of components—e.g., for a multi-pack of water bottles, this would include the PET bottles, their caps, labels, and the plastic shrink film. Primary packaging should include all packaging up to the point of sale. It should also include retail/shopping bags and plastic produce bags.

Reclaimer/reprocessor

A commercial entity that accepts aggregated plastic materials and performs a series of operations to return them to commerce as raw materials or new finished items.

Recyclability Prevalence

When >75% of a package category is recyclable according to all other Pathway building blocks, all of that package category can be deemed recyclability prevalent.

Recyclable (recyclability)

Something is recyclable if it is collected, separated, or otherwise recovered from the waste stream through an established recycling program for reuse or use in manufacturing or assembling another item where there are established end markets. The key factors for assessing packaging recyclability are incorporated as criteria in the Pathway to Circularity.

Recyclable (recyclability) at scale

Aligned with the Ellen MacArthur Foundation's definition of "recyclable," The Recycling Partnership considers that recycling can be deemed "at scale" once post-consumer recycling rates for that packaging reach 30% in either the U.S. market and/or multiple regions representing at least 400 million inhabitants.

Residential/municipal recycling

Curbside recycling and residential drop-off recycling services provided for both single and multifamily residences. Excludes in-store drop-off programs.

Definitions

Secondary packaging

Packaging additional to the primary packaging that is used for protection and collation of individual units during storage, transport, and distribution. Secondary packaging can be used in some sectors to display primary packs on the shelf. This category also includes packaging purposely made to display multiple product units for sale to speed restocking from storeroom to shelf.

Simulated MRF tests

A system for testing the effective capture rate of individual packaging types through a defined and witnessed test protocol using real-world MRF technology of different configurations.

Strong and widespread (market)

Material readily marketable to outlets covering most regions of North America.

Tertiary packaging

Outer packaging, including pallets, slip sheets, stretch wrap, strapping, and any plastic labels, used for the shipment and distribution of goods. This packaging is also referred to as transport or transit packaging and is rarely seen by the final consumer (e.g., household or individual).

Value added

The process by which former waste materials increase in value through collection, processing, and use in new products, thereby being transformed into salable products.

Resources

American Chemistry Council (ACC) Post-Consumer Non-Bottle Rigid Plastic Recycling Report

ACC United States National Post-Consumer Plastic Bottle Recycling Report

Aluminum Association's Container Design Guide

Aluminum Association's 2021 KPI Report

American Forest & Paper Association (AF&PA) Design Guide

American Forest & Paper Association's (AF&PA) 2021 Access to Recycling Study

AF&PA's 2020 Paper and Cardboard Recycling Rates

Can Manufacturers Institute (CMI) Homepage

Can Manufacturers Institute Food Can Facts

Carton Council of North America Homepage

Closed Loop Partners Cleaning the rPET Stream: How we scale post-consumer recycled PET in the US

Fibre Box Association (FBA) and the American Forest & Paper Association (AF&PA)'s Voluntary Standard for Recyclable Wax Alternatives

Federal Trade Commission Green Guides

Glass Packaging Institute's Glass Recycling Facts

Glass Recycling Coalition (GRC)'s Map of Glass End Markets

Institute of Scrap Recycling Industries (ISRI) Specifications

ISRI's U.S. Scrap Exports by Commodity

More Recycling's Buy Recycled Products Directory

NAPCOR 2020 PET Recycling Report

Ocean Conservancy's Recycled Content Report

Plastic IQ Solutions Database

The Association of Plastic Recyclers (APR) Design® Guide

The Association of Plastics Recyclers HDPE Design Guidance

The Association of Plastic Recyclers Recycling Categories (including Preferred and Detrimental to Recycling)

Resources

The Association of Plastic Recyclers Demand Champions Program

The Association of Plastic Recyclers Post-Consumer Resin (PCR) product vendors list

The Association of Plastic Recyclers Model Bale Specifications

The Pathway to Circularity Industry Council (The Circularity Council)

The Recycling Partnership's Film & Flexibles Coalition

The Recycling Partnership's National Recycling Database

The Recycling Partnership's Paying It Forward Report

The Recycling Partnership's Polypropylene Coalition

The Recycling Partnership's Polypropylene Coalition Awarded $4.2M in Grants

The Sustainability Consortium (TSC)'s Small Format Packaging Coalition

Sustainable Packaging Coalition's (SPC) 2020-21 Centralized Study on Availability of Recycling

Sustainable Packaging Coalition's Design for Recycled Content Guide

Sustainable Packaging Coalition's How2Recycle Label Program

Recyclingmarkets.net

Resource Recycling Magazine (or e-newsletter)

U.S. Environmental Protection Agency's Comprehensive Procurement Guideline (CPG) Program

U.S. Plastics Pact Roadmap to 2025

Notes

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Acknowledgements: The development of the Pathway has been supported with funding from Colgate-Palmolive, Johnson & Johnson, Walmart, Target, and members of The Recycling Partnership. The Recycling Partnership also thanks the 35 Circularity Council members, who provided essential input and expertise to set thresholds, definitions and protocols that address industry challenges.

References

i. https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf (see 260.12 (b)).

ii. Note that the inclusion of examples does not imply or confer a specific status for an innovation. Examples may only indicate alignment with a single Pathway requirement.

iii. https://usplasticspact.org/roadmap-reader/ (see page 4).

iv. https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf (see 260.12 (b)).

v. The Recycling Partnership recently launched a National Recycling Database that can provide up-to-date information about the availability of recycling at the local community level. Future iterations of this Framework will draw upon this data.

vi. https://sustainablepackaging.org/wp-content/uploads/2021/09/2020-21-Centralized-Study-on-Availability-of-Recycling-SPC-7-2021-1.pdf (see page 6).

vii. The Members of End Market subcommittee include representatives from the Circularity Council from all sectors of the industry including paper, glass, metal, plastic, brand, retailer, industry organizations, public, and MRFs.

viii. Note that the inclusion of examples does not imply or confer a specific status for an innovation. Examples may only indicate alignment with a single Pathway requirement.

ix. The Pathway to Circularity Coalition Formation Criteria are as follows:

- There is a path to scalable, circular solutions that can be achieved through actionable steps.
- The format/material is expected to have a significant presence in a circular system of the future.
- There are no viable alternative formats or materials that could serve the same purpose with increased recyclability/circularity.
- Multiple companies across the value chain (such as producers, converters, brands, and retailers) are ready to join the initiative with multi-year commitments to contribute to make meaningful progress toward a solution.
- It is aligned with The Recycling Partnership's mission, leverages the core competencies of The Partnership, and does not duplicate efforts.