



# Overcoming Barriers to Increasing the Use of PCR in the U.S.

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An examination of supply, demand, and financial challenges and the market-driven and policy solutions that can mitigate them

# TABLE OF CONTENTS

<b>Executive Summary</b>	<b>1</b>
<b>Foreword</b>	<b>2</b>
<b>Purpose of Resource</b>	<b>3</b>
<b>Background</b>	<b>5</b>
• Market Conditions – Supply and Demand	6
• Factors Influencing Plastic Prices	7
• Funding the Recycling System	7
<b>Barriers to Increasing the Use of PCR</b>	<b>9</b>
• Insufficient Collection Infrastructure	9
• Other PCR Supply Challenges	12
• PCR Demand	17
• Virgin Resin Supply	20
<b>Conclusion</b>	<b>22</b>
<b>Appendix</b>	<b>23</b>

# EXECUTIVE SUMMARY

Incorporating postconsumer recycled content (PCR) into plastic packaging is essential to closing the circularity loop, reducing virgin plastic use, and keeping materials in circulation. Beyond waste reduction, [using PCR can lower carbon emissions by up to 71% and energy consumption by up to 88% compared to virgin plastic](#), while also decreasing reliance on fossil fuels. PCR is defined, according to ISO 14021, as the proportion, by mass, of postconsumer recycled material in a product or packaging. Postconsumer material is 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.

U.S. Plastics Pact Activators are committed to achieving an average of 30% PCR or responsibly sourced biobased content across all plastic packaging as part of Target 4 in [Roadmap 2.0](#). However, high-quality PCR—especially for applications like direct food contact containers and films—remains scarce and often more expensive than virgin resin, slowing adoption and progress toward circularity. Addressing these challenges requires solutions that stimulate PCR demand and incentivize investment in the collection, cleaning, and processing of postconsumer plastics.

This document examines key cost drivers and market dynamics that impact PCR availability and affordability. It also outlines policy and industry strategies that can accelerate PCR use, helping businesses and policymakers advance circularity in plastic packaging.

## Key Insights

1. **Consistent Demand:** Consistent demand for domestically sourced PCR is necessary to drive investments in U.S. recycling infrastructure and collection systems.
2. **Long-Term Contracts:** Long-term purchase contracts for PCR help stabilize demand, reduce market volatility, and incentivize investments in collection and processing.
3. **Virgin Resin Oversupply:** Oversupply of virgin resin leads to low prices, making it challenging for PCR to compete economically.
4. **Material- and Design-Specific Factors:** Market dynamics, cost drivers, and collection challenges vary by packaging type. Achieving circularity across all formats requires multiple targeted interventions.
5. **Extended Producer Responsibility (EPR):** Comprehensive EPR programs address many challenges, including contamination from poor design, insufficient collection infrastructure, inconsistent demand for PCR, and lack of harmonized recycling technologies. Effective EPR programs include:
  - Ecomodulation fees (with fees for non-compliant packaging exceeding the cost of compliance)
  - Dedicated funding for collection, sortation, and processing infrastructure
  - Dedicated funding for consumer education
  - Incentivization of reuse and composting as possible end of life applications
6. **Deposit Return Systems (DRS):** DRS legislation can improve recycling rates but may adversely impact existing collection infrastructure. Thoughtful legislation can mitigate these impacts.
7. **Cost Disparities:** Recycling keeps valuable material in the economy but is often more expensive than landfilling due to low landfill tipping fees, which do not reflect inflation or negative externalities.



## FOREWORD

Thank you for your interest in exploring the complexities and opportunities involved in increasing the use of postconsumer recycled content (PCR) in plastic packaging—and the steps brands, retailers, and policymakers can take to accelerate progress. Incorporating PCR is crucial to keeping plastic in the economy and out of the environment, diverting [millions of tons of plastic](#) from landfills each year, reducing reliance on fossil fuels, and lowering greenhouse gas emissions. It can also strengthen domestic recycling systems that provide important economic benefits, including job creation and resilient, U.S.-based supply chains.

***Staying the course on sustainability isn't just the right thing to do—it's a strategic advantage in an increasingly competitive and resource-conscious marketplace.***

At the same time, despite growing interest and investment, meaningful use of PCR remains out of reach for many businesses. Financial, supply-side, and demand-related barriers continue to constrain progress, making it difficult to scale PCR adoption to the levels needed for systemic change.

Drawing from the collective insight of more than 100 organizations participating in the U.S. Plastics Pact, this report explores those challenges and presents a path forward. Our aim is to support stakeholders across the value chain with both market-based solutions and policy-driven strategies that can unlock investment, grow supply, drive demand, and accelerate the transition to circularity.

While perspectives on individual points may differ, the shared expertise and deep commitment of U.S. Pact participants provides a powerful foundation for collective action. Staying the course on sustainability isn't just the right thing to do—it's a strategic advantage in an increasingly competitive and resource-conscious marketplace. Circularity offers both environmental and economic returns that no one can afford to ignore.

Meeting this moment requires collaboration and action—from industry leaders, policymakers, and stakeholders at every level. Thank you for your continued engagement in this vital work.

**Jonathan Quinn**

President & CEO, U.S. Plastics Pact



## PURPOSE OF THIS RESOURCE

This resource aims to educate packaging companies, brands, retailers, and policymakers about the supply, demand, and financial barriers to purchasing domestically sourced postconsumer recycled content (PCR), as well as strategies to alleviate or eliminate these barriers through practice and policy. Increasing PCR usage in packaging supports a circular economy for plastics while providing additional environmental benefits, as detailed in subsequent sections.

Economic incentives shaped by market forces and policy are essential for advancing a circular economy. Similar to [how renewable energy has grown over the past 20 years due to mandatory federal and state targets and subsidies](#), plastics recycling requires support through policies and market best practices. A comprehensive set of economic and policy tools is necessary to create a system where existing plastics are used again and again instead of relying on virgin plastic production.

***Increasing PCR usage in packaging supports a circular economy for plastics while providing additional environmental benefits***

Building the infrastructure and markets for a circular economy for plastic packaging is complex, with no single solution. Comprehensive Extended Producer Responsibility (EPR) policy (see [Appendix](#)) offers the most holistic solution and should be prioritized. However, even the best policies benefit from voluntary actions that support supply and demand dynamics. Each section of this document outlines actions for companies and policy solutions. Unless otherwise noted, market-based solutions refer to actions by brands or retailers, while policy solutions apply to state or federal governments.

The table below summarizes the barriers to increasing PCR usage and potential solutions. Use this table to navigate to sections most relevant to the reader:

**Table 1: Summary of Barriers and Solutions**

Category	Barrier	Potential Solutions	Page
<b>Insufficient Collection Infrastructure</b>	Inadequate access to collection	Drop-off sites, reverse vending machines, municipal access requirements	<a href="#">9</a>
	Inadequate sorting capabilities	Federal/state funding, PRO fees, EPR needs assessments	<a href="#">10</a>
	Lack of Tools for Private Investment in Recycling Infrastructure	Investment funds, third-party certified plastics credits	<a href="#">10</a>
	Geographic constraints	EPA Infrastructure Map, hub-and-spoke systems, transfer stations, EPR funding, ecomodulation	<a href="#">11</a>
	Inadequate collection mechanisms for film/small formats	Redesign, research, take-back programs, secondary sortation, EPR needs assessments, EPR fees	<a href="#">11</a>
<b>Other PCR Supply Challenges</b>	Contamination	Redesign, grants/loans, EPR needs assessments, certified claims, audits, ecomodulation, Green Guides	<a href="#">12</a>
	Lower cost of landfilling	Tipping fees, tax credits	<a href="#">14</a>
	Limited supply of high-quality PCR for sensitive applications	AI sortation, EPR needs assessments, infrastructure funding, chemical recycling, LNO process, tax credits	<a href="#">14</a>
	Consumer Engagement	Standardized labeling, labeling certification, consumer research, grants, municipality websites	<a href="#">15</a>
	PCR Certification	Chain of custody following ISO definitions, standard	<a href="#">16</a>
	Policy trade-offs	DRS within EPR, MRF compensation	<a href="#">17</a>
<b>PCR Demand</b>	Prevalence of spot market purchases	Long-term contracts, alternative contracting methods, PCR mandates, government procurement, ecomodulation	<a href="#">17</a>
	Market volatility	Long-term contracts, ecomodulation, EPR reimbursement rates	<a href="#">19</a>
	PCR Pricing Challenges	Brand strategy, harmonized messaging, consumer engagement, PCR mandates, EPR fees	<a href="#">20</a>
<b>Virgin Plastic Supply</b>	Oversupply and subsidies	Reduction/elimination of virgin subsidies, virgin tax, tax credits	<a href="#">20</a>



## BACKGROUND

### Why Using PCR Matters

Incorporating postconsumer recycled content (PCR) into new plastic packaging is essential to building a circular economy. As defined by the [Ellen MacArthur Foundation](#), a circular economy is a system where materials never become waste and nature is regenerated. It is based on three principles, driven by design: eliminating waste and pollution, circulating materials at their highest value, and regenerating nature. A [recent study](#) found that incorporating 40% PCR into all new packaging is one of the four key ways to significantly reduce plastic pollution.

***PCR production requires less energy and water to produce and generates fewer greenhouse gas emissions***

The U.S. Plastics Pact is advancing circularity in plastic packaging through its five Targets outlined in [Roadmap 2.0](#). Target 4 specifically aims to achieve an average of 30% PCR or responsibly sourced biobased content across all plastic packaging.

Using PCR keeps valuable materials in circulation, preventing plastic waste from ending up in landfills or the environment. It reduces the demand for virgin plastics and, in turn, our dependence on fossil fuels. Compared to virgin plastic production, PCR production requires [less energy and water to produce and generates fewer greenhouse gas emissions](#), making PCR an important tool in meeting corporate sustainability and emissions reduction goals.

Expanding plastic packaging recycling in the U.S. will increase the availability of PCR to help companies meet sustainability commitments, minimize reliance on fossil fuel-derived plastics, and retain valuable materials in the economy.

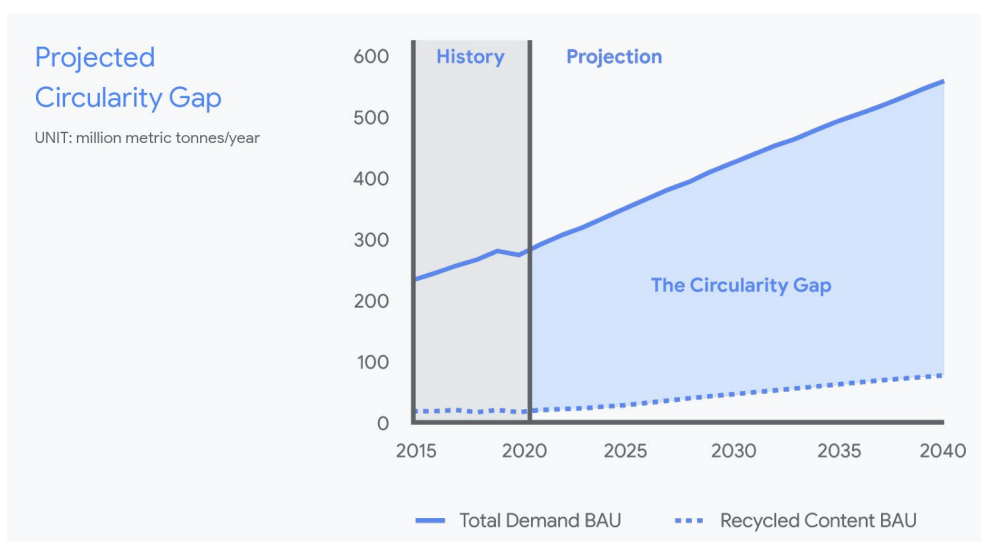
## Market Conditions – Supply and Demand

While many companies have created goals to increase PCR in their plastic packaging, significant challenges in meeting those goals remain. Packaging producers cite limited availability and high costs of high-quality PCR as barriers, while materials recovery facilities (MRFs) and reclaimers struggle with low demand and pricing instability, making it difficult to scale processing. This imbalance slows progress toward a circular economy.

Greater demand for PCR would drive investment in collection, processing, and infrastructure, improving supply and reducing costs. At the same time, policy interventions can enhance both the affordability and quality of PCR, further strengthening demand. Addressing supply and demand in tandem is essential to accelerating circularity in plastic packaging.

A 2021 [AMERIPEN study](#) (analyzing 2018–2020 data) found that high-density polyethylene (HDPE) was the only resin with sufficient U.S. capacity to meet PCR demand. Meanwhile, [Google’s 2021 report](#) projected that closing the global “plastics circularity gap” by 2040 would require \$426–\$544 billion in investment, particularly in infrastructure.

**Figure 1: Projected circularity gap of PCR demand versus supply**



Source: Google, “[Closing the Plastics Circularity Gap](#)” (2021)

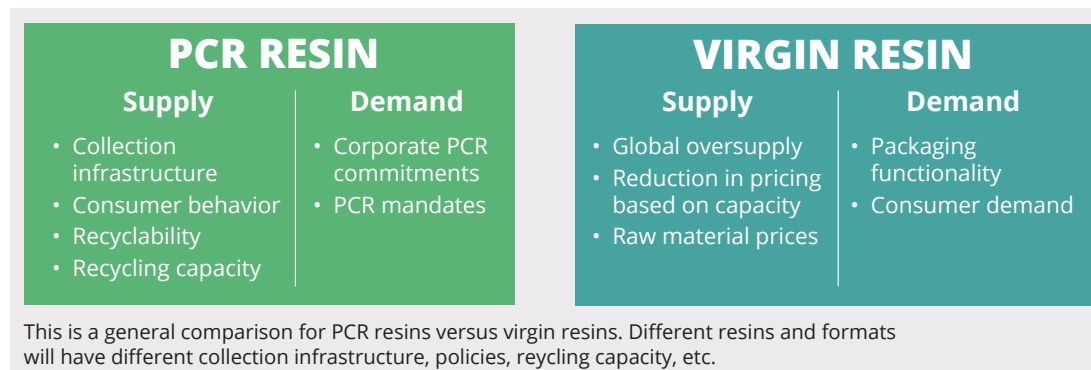
BAU = business as usual

It is important to note that there are multiple types of plastic, adding to the complexity of collection, sortation, and reprocessing. Different plastics have unique performance attributes and cannot be easily interchanged. Recycling rates also vary, creating disparities in material availability. For example, [PET bottles](#)—widely collected through curbside programs and deposit return systems—[have much higher recycling rates](#) than polyethylene film, which is rarely accepted curbside. These differences contribute to inconsistent PCR availability across resin types.

Although postconsumer materials are traded globally, the U.S. Plastics Pact encourages companies selling products in the U.S. to prioritize North American PCR. Building domestic demand strengthens the circular economy by driving investment in local collection and recycling infrastructure, ensuring that more packaging sold in the U.S. is recovered and processed here. Additionally, sourcing PCR closer to production sites reduces transportation emissions and supply chain risks, further supporting sustainability and resilience.

## Factors Influencing Plastic (Resin) Prices

**Figure 2: PCR vs Virgin resin price factor comparison**



This figure provides a systems-level view of the factors influencing the pricing of both virgin and recycled plastic. Historically, [recycled plastic was often purchased as a cost savings](#) to virgin plastic, which led to price ceilings for PCR. However, with the rise in corporate sustainability commitments and regulatory mandates, demand for PCR is now influenced by more than just cost considerations. Seasonal supply and demand factors can also cause pricing fluctuations.

The price of virgin resin is influenced by several macroeconomic factors, including the cost of fossil fuels such as crude oil and natural gas, government subsidies for fossil fuel production, the expansion of domestic and global resin production capacity, and consumer demand for plastic products (including products that require plastic packaging with specific technical attributes). Decades of investment in scaling virgin resin production have led to significant economies of scale, which PCR production has yet to achieve. This discrepancy contributes to the persistent price disparity between PCR and virgin resin.

## Funding the Recycling System

Expanding and improving the recycling system requires significant investment—an essential focus of this paper. Costs in the recycling process impact the municipalities who collect the materials, the Material Recovery Facilities (MRFs) who sort the collected recyclables into bales, and the reclaimers who clean and process the bales into PCR. A well-funded system must cover:

- **Material collection** (curbside, drop-off, and deposit programs)
- **Sorting, cleaning, and processing** into PCR
- **Transportation and logistics** throughout the recycling value chain
- **Infrastructure investments** (e.g., new equipment to improve efficiency, quality, and expand capacity)
- **Operational costs** (e.g., staffing and energy)

The recycling system is currently funded through a variety of public and private mechanisms:

- **Local government taxes:** Municipalities often fund curbside collection services and either own and operate or contract with a MRF to sort the collected recyclables.
- **Fees charged to households and businesses:** Households not residing in an area with community-funded recycling collection, as well as most businesses, must pay a private service to collect their recyclables.
- **Material Recovery Facility (MRF) revenue:** MRFs earn revenue by selling sorted bales of recyclables to reclaimers, sometimes sharing proceeds with municipalities or haulers.
- **Reclaimer sales:** Reclaimers purchase, clean, and process materials into PCR flake or pellets, selling them to packaging manufacturers. Without policy intervention, their compensation is largely dependent on market-driven PCR pricing.
- **Grants:** Public or private funding sources for improved equipment at MRFs or reclaimers.

## Extended Producer Responsibility (EPR) as an Emerging Funding Solution

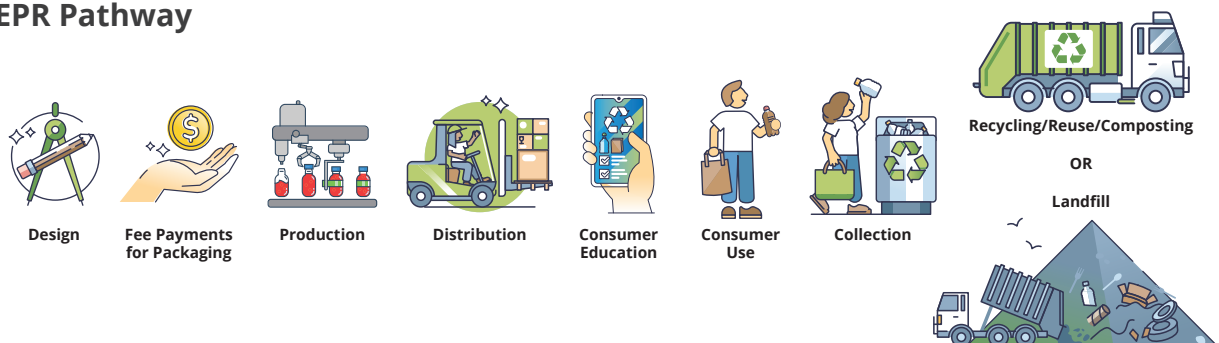
While common in other regions of the world, Extended Producer Responsibility (EPR) laws for packaging have only recently started to emerge in the U.S. As the name suggests, EPR extends the financial responsibility for managing the full lifecycle of a product’s packaging to the producers—typically brand owners—instead of relying on municipalities to cover that cost. EPR for packaging introduces a structured funding mechanism in which producers help finance recycling, composting, or reuse systems. As of April 2025, five U.S. states—California, Colorado, Maine, Minnesota, and Oregon—have enacted EPR laws, each with varying fee structures and regulatory requirements.

Under EPR programs, a Producer Responsibility Organization (PRO) assesses infrastructure needs and determines fees based on the type and volume of packaging sold into the state. These producer fees help fund collection, sorting, and recycling operations, either supplementing or replacing municipal funding.

### Effective EPR programs include:

- Ecomodulation fees (with fees for non-compliant packaging exceeding the cost of compliance)
- Recycling, waste reduction, and reuse/refill targets
- Infrastructure funding
- Consumer education

### EPR Pathway



# BARRIERS TO INCREASING THE USE OF PCR



## Insufficient Collection Infrastructure

Not all Americans have convenient access to recycling. This is often due to a lack of collection infrastructure in a community or region, or limited accessibility to existing infrastructure. Recycling access—the ability to conveniently use a recycling bin sufficient for an individual’s or family’s recyclables—includes curbside collection, public recycling bins, and drop-off sites at depots or stores. Collection infrastructure consists of bins, carts, trucks, transfer stations, and service processes, while processing infrastructure includes MRFs and reclaimers.

### Inadequate Access to Collection (Multifamily Units, Public Spaces, Commercial Venues)

Access to recycling varies greatly across the U.S. [The Recycling Partnership reports](#) that while 73% of Americans have access to recycling, that number decreases to 37% for those living in multifamily housing, such as apartments and condominiums. Access is even lower in public spaces and commercial venues. Expanding collection across curbside, multifamily, commercial, and public settings could increase the U.S. recycling rate from [13% to 26%](#). Each collection setting presents unique challenges and opportunities for expansion.

#### Possible Market-Based Solutions:

- Expand drop-off programs in areas lacking access to curbside collection. Store-based collection programs exist but are often focused only on film and require space and labor. Alternatives include parking lot drop-off sites, such as [community recycling units](#) established by Walmart and D6, which collect multiple types of packaging.
- Utilize [reverse vending machines](#) for PET bottles and other high-value recyclables in high-traffic areas like college campuses and sports arenas. These compact units often offer consumer incentives and can be brand-sponsored.

#### Possible Policy Solutions:

- Require multifamily homes and public businesses (e.g., restaurants, arenas) to offer onsite recycling. Efforts could be supported by tax incentives.
- If local ordinances prohibit municipal collection from multifamily sites as they are considered businesses, adjust ordinances to allow municipalities to provide collection, while requiring adequate reimbursement from the business owner.
- Provide municipal [drop-off depots](#) for residents lacking curbside collection. These facilities could be staffed locations or drop-off bins in public locations, such as a community library parking lot.
- Provide recycling bins, clearly marked with appropriate signage, in public spaces.
- The Recycling Partnership has developed [best practices and toolkits](#) for municipalities for many of these types of programs.

## Inadequate Sorting Capabilities for Plastics Beyond PET and HDPE Bottles

MRFs vary in the types of sorting technology and equipment available at their facilities, and those with only basic equipment often accept only a few formats of plastics, such as PET and HDPE bottles. This limits the recycling of other types of plastic packaging.

### Possible Policy Solutions:

- **Fund MRF upgrades** through EPR legislation to modernize and standardize sorting capabilities statewide, ensuring facilities can effectively process a wider range of recyclable materials, including postconsumer plastics.
- **Require EPR needs assessments** to evaluate critical MRF infrastructure—including sorting technology, bunker space, and storage capacity—to identify gaps and prioritize investments that enhance material recovery.
- **Invest in worker-safety measures** to address the [high occupational fatality](#) rate among recycling facility employees ([BLS, 2023](#)), including improved training programs, better facility design, and protective equipment.
- **Provide tax incentives** for AI-driven optical sorting and robotics to increase efficiency, improve material quality, and reduce yield loss, making it more cost-effective to recover and process postconsumer recycled materials.

## Lack of Tools for Private Investment in Recycling Infrastructure

Voluntary market instruments, such as low-cost private financing or plastic credits, can help fund recycling infrastructure and drive investment in PCR supply. While some grant funding is available through various nonprofit organizations and government programs, much more financing is needed. Investment companies can help bridge this gap by providing loans with favorable financing terms to fund capital projects at MRFs and reclaimers. In some cases, companies investing in the fund have priority in purchasing the PCR collected or processed on the financed equipment.

Plastic credits are another financing mechanism that provide a claimable attribute that can be tied to a brand. According to WWF, [plastic credits](#) are “transferable units representing a specific quantity of plastic that has been collected and possibly recycled from the environment.” Similar mechanisms, like Renewable Energy Credits (RECs) and Sustainable Aviation Fuel credits (SAFc), have successfully supported other industries. However, clear guidelines are essential to prevent greenwashing and ensure plastic credits contribute meaningfully to circularity.

### Possible Market-Based Solutions:

- Consider investment in funds that invest in circular infrastructure. These types of funds may provide a return on investment as well as an opportunity to have priority access to the PCR that is produced.
- Companies can integrate plastic credits into broader circularity strategies but should prioritize direct PCR procurement whenever possible. Plastics credits should be used as a means to fund investment in infrastructure to recycle more plastic, not viewed as a means of offsetting a company’s plastic footprint.
- To ensure credibility and effectiveness of the tool, credits should be third-party certified, geographically relevant, and aligned with the specific resin and packaging format.
- Conduct due diligence when selecting credit programs, ensuring alignment with industry best practices. The U.S. Plastics Pact’s [PCR Certification Principles](#) provide guidance on responsible plastics credit use.

## Geographic Constraints and High Transportation Costs

Recycling collection and transportation costs remain significant barriers, particularly for communities without sufficient material volume to support a local MRF. In these areas, recyclables must be transported long distances just to be sorted—the first step in the recycling process—increasing costs and emissions. Small and remote communities face additional economic challenges, often making recycling financially unviable without external investment or policy support.

### Possible Market-Based Solutions:

- Utilize data-driven siting for new facilities. Tools such as the [EPA Recycling Infrastructure and Market Opportunities Map](#) can help identify optimal locations for new recycling facilities, ensuring they are placed where they can maximize material recovery and minimize transportation costs.
- Implement hub-and-spoke models. This system improves recycling efficiency by using smaller, regional facilities (spokes) to collect and pre-process materials before sending them to a larger, centralized MRF (hub) for full processing. By consolidating materials closer to their source, this model reduces contamination, lowers transportation costs, and makes recycling more viable in rural or underserved areas.
- Establish transfer stations. Strategically placed transfer stations can aggregate recyclables from multiple communities before sending them to a central processing facility, further reducing transportation costs and increasing the financial sustainability of recycling programs.

### Possible Policy Solutions:

- EPR Needs Assessments should consider hub-and-spoke models and transfer stations to ensure access to recycling for rural communities. Comprehensive EPR programs should fund these additional steps to get collected materials to the MRFs, if needed.
- Implement ecomodulation fees to reduce contamination and improve bale quality, so that transported materials are higher in value and trucks are not filled with contamination that must be ultimately landfilled instead of recycled.

## Inadequate Collection Mechanisms for Small Format and Film Packaging

Small-format items (under 2–3 inches in diameter in two dimensions) pose significant challenges in recycling systems, often falling through MRF screens and either ending up in landfills or contaminating glass streams. With [an estimated 10%](#) of plastic packaging classified as small format, this represents a significant amount of plastic that currently can't be effectively collected curbside.

Film and flexible plastic packaging is also difficult to recycle due to design, collection, and end-market challenges. Film is often made of multiple types of materials that can't be easily separated and are incompatible with the recycling process. Collection is also a challenge, as many MRFs do not want to accept film because it gets tangled in their equipment, leading to downtime, and has limited profitable end markets. Currently, most film recycling in the U.S. relies on store drop-off programs, which suffer from low participation rates and inconsistent collection infrastructure. In contrast, European curbside film collection programs—which are often supported by EPR programs and typically require consumers to separate plastics from all other types of recyclables—demonstrate higher consumer engagement and improved material recovery.

The U.S. Plastics Pact will release *Journey to Film & Flex Circularity: Roadmap of Necessary Design, Collection, and End Market Levers* in 2025, outlining collection strategies for film and flex packaging.

### Possible Market-Based Solutions:

- Redesign film and flexible plastic packaging to meet recyclability guidelines and reduce contamination. See the U.S. Plastics Pact [Design for Recycling Playbook](#) for more information.
- [Advance research](#) and innovation in sortation technologies to improve the separation of small-format plastics from glass and other residual materials, preventing contamination and increasing material recovery.
- Expand small-format take-back programs for items like [cosmetics](#), food, and technology packaging, which are often too small for MRF equipment to capture.
- Continue research and pilots to identify the most cost-effective and convenient collection methods for film.
- Implement secondary sortation facilities to recover valuable materials from MRF residue that would otherwise be landfilled, ensuring higher overall recovery rates.

### Possible Policy Solutions:

- Expand depot collection sites for film drop-off, particularly in areas with limited curbside recycling options, to improve accessibility and participation.
- Ensure EPR needs assessments include funding for small-format plastic and film recycling infrastructure, addressing gaps in collection, processing, and end-market development.
- If EPR programs introduce curbside collection for film or small-format plastics, structure fees to account for contamination risks and potential impacts on existing recycling streams, ensuring total-system viability.

## Other PCR Supply Challenges

Beyond inadequate access to recycling due to insufficient collection infrastructure, the recycling industry faces additional supply challenges that create financial barriers. These challenges include contamination, the lower cost of landfilling compared to recycling, obstacles to producing the higher-quality PCR that is needed for packaging, and insufficient consumer participation.



### Contamination

Contamination in the recycling stream reduces yields, increases costs, and brings down the quality of recycled materials. Packaging not designed for recycling can look similar to recyclable packaging and be difficult to sort out at MRFs. In addition to lookalike packaging—where non-recyclable packaging resembles recyclable materials—additional components like colorants, labels, or adhesives can render an otherwise recyclable package unrecyclable.

Other forms of contamination can be even more challenging for MRFs. Consumer confusion may lead to non-recyclable items such as garden hoses, clothing, or toys ending up in the recycling stream. Even worse, hazardous contaminants, such as lithium-ion batteries, pose serious safety risks, potentially causing fires that endanger workers and damage facilities.

If contamination is not effectively removed, it limits end-market options for PCR and increases costs for MRF operators, who must dispose of non-recyclable materials. Larger MRFs with advanced sorting equipment may be better equipped to handle contamination (although no system is fully effective), making this challenge particularly burdensome for smaller facilities with less equipment.

In a circular economy, brand owners must design packaging with recyclability, compostability, or reuse in mind. Packaging that does not comply with these guidelines produces lower-quality PCR—leading to aesthetic and functional issues in new products—or may not be recyclable at all. To ensure a stable supply of high-quality PCR, companies must address contamination challenges and prioritize recyclable packaging design.

### **Possible Market-Based Solutions:**

- Redesign packaging to use widely recyclable resins—PET, polypropylene, and polyethylene. The Association of Plastic Recyclers (APR) provides technical recyclability [design guidelines](#) based on decades of research to help brands make informed decisions. The U.S. Plastics Pact incorporated these guidelines in its [Design for Recycling Playbook](#).
- Fund grants or zero-interest loan programs to help MRFs improve sorting technology.
- Avoid misleading recycling claims such as “Please Recycle” on packaging that is not actually recyclable.

### **Possible Policy Solutions:**

- EPR programs should implement eco-modulation fees that exceed the cost difference between recyclable and non-recyclable packaging. These fees should create strong financial incentives for brands to improve packaging design, making recyclability a cost-effective choice rather than an added expense.
- States should provide dedicated funding for standardized public education to reduce consumer confusion and contamination in the recycling stream. Clear, consistent messaging across municipalities can help consumers correctly identify what is and isn’t recyclable, reducing the volume of lookalike materials that contaminate recycling streams.
- Municipalities could conduct regular audits of curbside bins for contamination, providing residents with direct feedback through bin tags or notices. Persistent violators could face service restrictions to reinforce proper recycling habits. Such programs have been [successfully implemented in some cities](#), leading to measurable reductions in contamination.
- EPR funding should account for both sorting-technology upgrades and labor costs at MRFs to improve bale quality.
- The Federal Trade Commission (FTC) should update its [Green Guides](#) to address misleading recyclability claims and include enforcement measures against deceptive marketing. Stronger regulations would prevent non-recyclable packaging from being labeled as “recyclable” and help consumers make informed choices.
- EPR legislation should include battery disposal programs to reduce fire hazards at MRFs. Lithium-ion batteries—often discarded improperly—pose significant safety risks. Funding for dedicated drop-off programs and consumer education on battery recycling would mitigate these dangers.

## Lower Cost of Landfilling

Landfills, whether publicly or privately owned, charge tipping fees to cover operational and closure costs. While tipping fees have risen since 2016 to an average of [\\$56.80 per ton](#), they have not kept pace [with inflation](#) (ranging from 1.4% to 7% over the past eight years) and often fail to account for environmental externalities such as space utilization and methane emissions. When landfilling remains cheaper than recycling (collection costs can reach [\\$300 per ton](#) [and processing costs \\$100 per ton](#)) there is a financial disincentive for both communities and businesses to prioritize recycling.

### Possible Policy Solutions:

- Increase tipping fees to reflect landfilling's full environmental and operational costs, ensuring that costs are fairly reflected and improving the financial incentives for recycling.
- Provide tax credits to offset the cost difference between landfilling and recycling, encouraging companies to recycle even when disposal is cheaper.

## Limited Supply of High-Quality PCR for Sensitive Applications

Certain applications, such as food, personal care, and over-the-counter medication packaging, require high-quality postconsumer recycled content (PCR) that meets strict safety and performance standards. In these sectors, PCR must not only meet mechanical and structural requirements but also ensure compliance with stringent health and safety regulations. For food-contact applications, most brands require that PCR receive a Letter of No Objection (LNO) from the U.S. Food and Drug Administration (FDA), confirming that the recycling process produces material safe for direct food contact. However, the LNO review process is neither mandated nor funded within a set time frame, often resulting in long approval periods.

### Possible Market-Based Solutions:

- Brands align material choices with actual technical requirements, as not all applications require virgin-like PCR.
- Invest in AI sortation infrastructure to separate materials by initial use, such as household products, chemicals, and food. Matching the source of PCR to its future use improves material compatibility such as color requirements, organoleptic properties, and safety.
- Implement digital identifiers to enhance sorting accuracy, as seen in European markets.

### Possible Policy Solutions:

- When conducting an EPR needs assessment, consider end markets that require high-quality PCR, supporting investments in advanced sorting and washing technologies to meet stringent application requirements.
- Ensure EPR funding supports the necessary infrastructure improvements that enable full circularity, so that, as much as technically feasible, packaging materials can be recycled back into packaging applications rather than downcycled or diverted to lower-value uses.
- Establish clear guidelines for responsible end markets for [chemical recycling](#), which refers to processes that break plastics down into molecular building blocks to produce virgin-quality materials. While chemical recycling has the potential to supplement mechanical recycling for hard-to-recycle plastics, concerns remain about environmental impact, energy use, and material losses. The U.S. Plastics Pact will publish its position on chemical recycling in 2025 to guide responsible implementation.

- Fund the FDA to expedite LNO evaluations, setting a mandatory 180-day review period and increasing staff capacity to process applications efficiently.
- Update FDA guidance on recycled plastics in food packaging more frequently to reflect the latest research on chemicals of concern. While the FDA’s [Use of Recycled Plastics in Food Packaging \(Chemistry Considerations\)](#) was last updated in 2021, research on chemicals of concern such as phthalates, bisphenols, and PFAS is rapidly evolving. Key quality and safety attributes for food-contact PCR should be delineated in regulation, such as the [European Union’s Regulation No. 2022/1616](#) law.
- Provide federal or state tax incentives for upgrading sortation and washing technologies.

## Consumer Engagement and Participation

The FTC’s [Green Guides](#) define pre-consumer and postconsumer recycled content and provide guidance on environmental claims, but they are not directly enforceable. Companies may purchase labels from certification agencies to indicate recyclability, yet some create their own. If a company’s label states that a package is recyclable but the material is not accepted by a local MRF, consumers may unknowingly contaminate the recycling system. Additionally, lookalike packaging further confuses consumers about what goes into the recycling bin versus the trash.

Some consumers throw everything in the trash, while others engage in “wish-cycling,” placing non-recyclable items in the recycling bin in the hope they can be processed. These behaviors contribute to two major recycling challenges: the loss of valuable material to landfills and contamination of the recycling stream. Consumer education and behavior change are critical to addressing these issues. Clearer recycling instructions can improve the quality of postconsumer material and enhance system efficiency.

### Possible Market-Based Solutions:

- Use clear, standardized labeling on packaging indicating the recyclability of the package and appropriate disposal instructions.
- Ensure recycling labels are verified by certification entities to prevent misleading claims.
- Conduct ongoing consumer research to assess recycling behaviors, identify challenges, and evaluate how label updates or other messaging influences recycling habits. Use this research to develop consumer engagement campaigns to drive correct recycling behaviors.

### Possible Policy Solutions:

- Increase municipal grant funding for community education campaigns and improving recycling bin signage.
- Standardize and update public recycling bin labels to indicate accepted materials.
- Update municipal websites and educational materials at least annually to reflect changes in MRF acceptance criteria.



## The Need for PCR Certification

PCR certification is becoming increasingly common as corporate commitments to postconsumer recycled (PCR) content and on-pack labeling claims grow. Many brand owners now require certification on the PCR they purchase to enhance credibility in sustainability claims and mitigate legal risks related to false claims.

Since the PCR supply chain involves multiple ownership points from collection to reprocessing—including haulers, MRFs, reclaimers, converters, and brands—certification ensures that materials are genuinely postconsumer content. This verification is especially critical for internationally sourced PCR as materials often change hands multiple times—including through brokers—increasing the risk of misrepresentation.

While certification improves transparency and accountability, it also adds some costs due to the audit process. As certification is a voluntary effort, this is not a cost borne by all companies making PCR claims. Multiple PCR standards exist, along with various organizations that conduct the audit against the chosen standard and provide certification. The U.S. Plastics Pact's [PCR Certification Principles](#) offer guidance on selecting an appropriate standard. Among its recommendations, the U.S. Pact advises choosing a standard that includes chain-of-custody certification aligned with ISO definitions.

### Possible Market-Based Solutions:

- Certify all PCR used in packaging under a chain of custody standard aligned with ISO definitions.
- Choose only certification standards approved by accredited bodies that provide consistent accounting and traceability methodologies, ideally aligned with the U.S. Plastics Pact's [PCR Certification Principles](#).
- Require documentation regarding the origin of materials to verify they are postconsumer materials. This is particularly important for imported PCR.

### Possible Policy Solutions:

- Mandate third-party accredited PCR certification for regulatory compliance or offer subsidies for voluntary certification.
- Establish standardized accounting methodologies for PCR measurement to ensure consistency in reporting and verification, explicitly excluding waste-to-energy processes from PCR calculations as waste-to-energy does not meet the definition of [material recycling](#).
- Require approved certification standards to verify postconsumer origin of imported PCR, with full traceability back to collection points.
- Prioritize domestic PCR sourcing in PCR mandates to drive investment in U.S. recycling infrastructure.

## Policy Trade-Offs

Deposit Return Systems (DRS), also known as bottle bills, charge consumers a refundable deposit on beverage containers to incentivize returns. These programs typically achieve higher recovery rates and provide high-quality, presorted material suitable for food-contact packaging. A nationwide DRS could increase PET bottle recycling rates [from 24% to 82%](#), with the majority of the material collected going back into new bottles instead of being downcycled.



However, implementing DRS in new states could have a negative financial impact on MRFs. Aluminum cans and plastic bottles are among the most valuable materials processed by MRFs, and their diversion to DRS programs would reduce MRF revenue. In addition to lowering overall revenue for MRFs, reduced volumes of higher-value materials would lead to the reallocation of overhead costs to the lower-value materials still received through curbside collection. Higher costs for these lower-value materials may make it financially unfeasible to continue to collect them.

### Possible Policy Solutions:

- Integrate DRS within EPR frameworks, ensuring EPR fees fully reimburse MRFs for the actual cost of recovering and sorting each material covered under the legislation. This prevents lower-value materials from being subsidized by higher-value materials within the DRS.
- Develop reimbursement mechanisms for MRFs in states implementing DRS legislation independent of more comprehensive EPR policy to offset revenue losses from high-value materials diverted to DRS programs, ensuring MRF financial viability.
- Allow MRF operators to collect deposits on DRS materials recovered in their facilities, enabling them to recapture lost revenue and maintain operational stability.

## PCR Demand

In a market economy, supply and demand dynamics typically determine material prices. Stable or increasing demand drives prices up, incentivizing new investment. However, PCR demand is often unstable and highly price-sensitive, making it challenging to attract investment in the industry. PCR plays a crucial role in closing the loop on circularity, and sustained demand is essential for industry growth.

### Prevalence of Spot Buying and Lack of Long-Term Purchase Agreements

PCR purchases have often been opportunistic, with buyers purchasing more when PCR prices fall below virgin resin. This has resulted in a market dominated by spot purchases or short-term contracts, creating inconsistent demand. Without predictable demand, the recycling industry struggles to expand capacity, improve material quality, and secure financing for new investments. Businesses seeking capital for expansion must demonstrate guaranteed revenue streams, such as long-term purchase agreements. Without these, it becomes difficult to justify or secure investment in new equipment, even for self-funded companies.

Businesses prioritize cost management to satisfy owners, investors, and customers. As a result, they are disincentivized from purchasing higher-cost materials unless there is a compelling long-term business justification. Emerging EPR legislation typically requires that materials included on the covered materials list meet defined criteria proving that responsible end markets exist. To meet these regulatory requirements, companies must develop markets for PCR by integrating it into their purchasing strategies—thereby driving demand for responsible end markets.

## ***Developing responsible end markets for recycled plastic is a business imperative***

As circularity transitions from voluntary commitments to mandated legislation, the business case for PCR is strengthening. Buyers should consider procurement strategies for PCR as they would other constrained or developing markets essential to their business. Just as companies support industry capacity building to ensure long-term availability of critical innovation, they should adopt similar strategies for PCR procurement. This may mean prioritizing stable, long-term contracts over short-term price considerations. Developing responsible end markets for recycled plastic is a business imperative.

### **Possible Market-Based Solutions**

- Execute long-term (multi-year) contracts to guarantee demand, encouraging investment to expand capacity and improve quality.
- Consider alternative pricing models that reduce volatility for the buyer and ensure reclaimers' financial viability:
  - Price floor and ceiling contracts protect reclaimers from operating at a loss during market downturns while shielding buyers from extreme price spikes.
  - Cost-plus contracts pass through raw material costs while negotiating a fixed conversion cost and profit margin. This shifts financial risk and benefits from fluctuating raw material costs from reclaimers to buyers, ensuring predictable revenue streams.

### **Possible Policy Solutions:**

- **PCR Mandates:**
  - Enact legislation requiring PCR inclusion in specific packaging formats, with non-compliance fees set higher than the cost of using PCR to drive adoption.
  - Apply PCR mandates to high-volume items where PCR-inclusion is already successfully happening at scale, such as beverage bottles or shopping bags.
  - PCR mandates may include plastic packaging as well as durable goods.
  - To strengthen market demand and drive material recovery, further expand legislation to include a broader range of packaging formats where PCR inclusion is occurring and incentivize domestically-sourced PCR.
- **Government Procurement Rules:**
  - Periodically review and add additional items that should include PCR in the [Comprehensive Procurement Guidelines](#) which informs the [Federal Acquisition Regulation](#). In addition to plastic products themselves, plastic packaging for any procured goods is another material that may be able to include PCR.
  - State and municipal purchasing departments should require PCR inclusion in products and packaging categories identified in these federal regulations.

• **EPR Programs:**

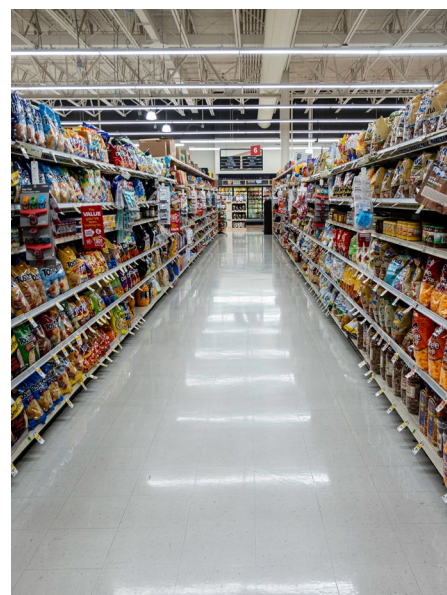
- Include responsible end-market criteria for covered materials to ensure that end-market demand is developed for materials collected.
- Include PCR mandates for products and packaging that are already successfully including PCR at scale as part of EPR legislation. The list of included items should grow as the use of PCR expands.
  - The long-term goal should be to require PCR across most PET, polypropylene, and polyethylene packaging, ensuring sustained demand and incentivizing increased collection and processing of these materials. Policymakers should collaborate with the industry to develop ambitious but achievable PCR mandate percentages.
- Implement ecomodulation fees, offering lower fees for packaging with PCR. If PCR usage is mandated, the fee for noncompliance must outweigh the cost of compliance to effectively increase the use of PCR.
- Prioritize domestically recycled materials in legislation to drive investment in North American recycling infrastructure.

**Challenges Managing Price Volatility**

PCR and virgin resin prices fluctuate due to seasonal supply and demand dynamics, but they do not necessarily move in tandem. For example, in the Northern Hemisphere, PET prices rise in summer due to increased bottled beverage consumption, but rPET supply peaks in fall when reclaimers process used bottles. While virgin resin manufacturers may be able to manage the flow of their raw materials and build a supply position in advance of peak market pricing, the recycling industry does not have that advantage.

Additionally, petroleum market fluctuations impact virgin resin prices, indirectly affecting PCR markets. Virgin resin pricing can serve as a price ceiling to PCR pricing, even though the cost factors are largely different.

Challenges managing price volatility and disconnects between raw material costs and market pricing for finished goods can disincentivize investment as companies need to keep cash on hand to cover operational costs. Smaller reclaimers in particular face challenges in managing volatility due to limited cash reserves.



**Possible Market-Based Solutions:**

- Long-term contracts with cost-plus pricing models or price floors/ceilings can stabilize costs and reduce risk.
- Sustained demand reduces investment risk and attracts financing for recycling infrastructure.

**Possible Policy Solutions:**

- EPR programs with ecomodulated fees or credits for incorporating PCR may encourage brands to secure long-term supply contracts to reduce EPR fees.
- EPR reimbursement rates should consider seasonal or extreme price volatility in rate calculations to ensure reclaimers receive fair compensation.

## PCR Pricing Challenges and Consumer Perception

PCR is often more expensive than virgin resin, yet its value proposition is not always clear to consumers. While concern over plastic waste is high, it is not known exactly how that concern translates to consumer buying decisions—particularly as it relates to products that contain PCR. The majority of consumer behavior research has surveyed consumer buying intentions, which don’t always reflect actual decisions made at the point of sale. Higher-grade PCR, especially for food packaging, often carries significant cost premiums. Companies may be reluctant to absorb costs that their competitors haven’t undertaken, particularly if there is not a clear return on investment.

### Possible Market-Based Solutions:

- Develop a broad PCR adoption strategy across all brands. Incorporating even small percentages of PCR in high-volume, lower-cost product lines can significantly increase overall demand for PCR while being a negligible cost on a per-unit basis.
- Enhance consumer engagement on circularity attributes. Research is needed to determine how sustainability claims affect purchasing behavior and the most effective messaging strategies. Brands regularly research buying habits and needs of their target consumer to develop successful marketing and messaging strategies and can apply these methods to develop messaging on sustainability attributes.

### Possible Policy Solutions:

- PCR mandates with sufficient penalties for non-compliance ensure companies adopting PCR are not at a competitive disadvantage.
- EPR fee structures can incentivize the use of PCR through lower rates for packaging containing PCR, offsetting the higher cost of using it. In turn, a portion of EPR funding could be allocated to consumer education on recycling as well as the sustainability benefits of including PCR in new packaging.

## Virgin Resin Supply and Market Distortions

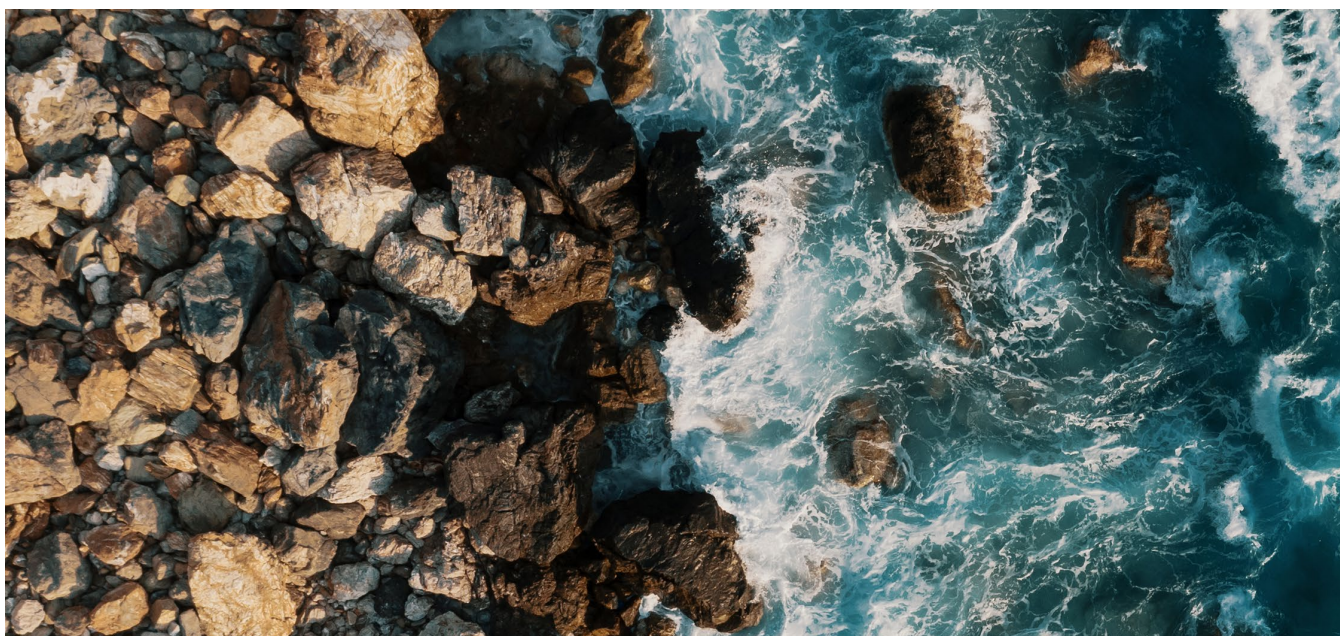


PCR competes directly with virgin resin; and when virgin prices are low, companies often opt for the cheaper alternative. Several factors contribute to artificially low virgin resin prices, including the oversupply of virgin resin due to raw material positions and fossil fuel production subsidies. Virgin resin production is linked to crude oil and natural gas industries, where production is driven by broader energy market dynamics rather than plastic demand. Large-scale resin facilities continue operating even in low-demand periods to avoid shutdown costs, leading to persistent oversupply and downward price pressure. Additionally, these

industries receive state and federal subsidies. According to the International Monetary Fund, the U.S. [provided \\$3 billion](#) in direct fossil fuel subsidies in 2022, along with \$754 billion in unpriced externalities. Globally, oil and gas are [heavily subsidized, as well](#). These subsidies reduce virgin resin costs, putting PCR at a competitive disadvantage.

### **Possible Policy Solutions:**

- Reassess existing subsidies and incentives for fossil fuel-based virgin resin production, or establish equivalent financial support mechanisms for U.S.-based reclaimers. Aligning incentives across the value chain will help reduce cost disparities and promote the growth of a competitive circular economy. Explore tax policy options that reflect the environmental costs of resource extraction and emissions associated with virgin plastic production. Options could also include targeted tax credits for reclaimers to recognize the environmental benefits of PCR and encourage continued investment in domestic recycling infrastructure. Ensure a fair and competitive global marketplace for U.S. reclaimers by reviewing the international trade landscape. As both virgin resin and PCR are globally traded commodities, the federal government should:
  - Assess whether imported virgin resin benefits from subsidies provided by the country of origin. Notably, imported resin is exempted from tariffs imposed (and, as of April 2025, suspended), a policy decision that may warrant reevaluation in light of its impact on domestic reclaimers.
  - Strengthen transparency, traceability, and standardization of imported PCR to ensure compliance with quality standards and help reduce the importation of materials that are falsely claimed as PCR.
  - Consider tariffs, if necessary, to protect the crucial domestic recycling industry.
- Reinvest revenues collected from any new policies—such as fees or trade enforcement actions—into programs that support U.S. recycling and waste reduction goals. These could include infrastructure improvements, environmental monitoring and remediation, pollution prevention, and support for communities disproportionately impacted by plastic production and disposal.



## CONCLUSION

PCR is key to closing the loop on plastic packaging—keeping materials in circulation, cutting carbon emissions, and reducing reliance on fossil fuels. But ambition alone isn’t enough. Persistent supply, demand, and financial barriers are slowing progress toward a truly circular economy.

To overcome these barriers, we need a two-pronged strategy: bold policy and proactive market action.

Comprehensive EPR programs offer one of the clearest paths forward—aligning financial incentives with circular outcomes. By covering the full cost of recycling and rewarding smart packaging design, EPR can unlock system-wide change.

Where full EPR is not yet feasible, targeted tools like Deposit Return Systems (DRS), PCR mandates, and landfill tipping fees can still move the needle—boosting collection, strengthening demand, and catalyzing infrastructure investment.

At the same time, voluntary action remains vital. Long-term PCR commitments from brands and retailers drive market stability. Investments in design for recyclability, consumer education, and robust supply chains help ensure recycled materials don’t just exist—they’re used.

Momentum is growing. Leading brands and retailers in the U.S. Plastics Pact are already proving what’s possible. Governments, reclaimers, and MRFs are working to expand access to recycling. To scale success, we need this collective action—from the plastic packaging value chain, policymakers, and consumers alike.

The path to circularity is clear. It’s time to accelerate.

# APPENDIX

## Recycling-Related Definitions:

**Virgin plastic:** is plastic material in the form of pellets, granules, powder, floc, etc., that has not been subjected to use or processing other than that required for its initial manufacture

**Postconsumer recycled content:** Proportion, by mass, of postconsumer (1) recycled material in a product or packaging. Note 1. ISO14021's usage of the term clarifies postconsumer material as 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. Source: ISO 14021:2016 modified, Environmental labels and declarations — Self-declared environmental claims (Type II environmental labeling), Usage of terms, modified (focus on postconsumer recycled material)

**Material recycling:** Reprocessing, by means of a manufacturing process, of a used packaging material into a product, a component incorporated into a product, or a secondary (recycled) raw material; excluding energy recovery and the use of the product as a fuel. Source: ISO 18604:201

### Policy-Related Definitions:

**Extended Producer Responsibility:** The [OECD defined EPR](#) as an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle.

A comprehensive approach to EPR will include mandatory, fee-based extended producer responsibility programs for packaging and paper products. It will include sufficient funding and operational control to optimize recycling by directing dedicated funding for collection, sortation, processing, infrastructure, promotion, and education. It will also consider reuse and composting as valid end of life applications and incorporate and incentivize these programs.

**Ecomodulation:** Adjustments made to fees in the form of incentives ("bonuses") or disincentives ("maluses") that drive at targeted policy outcomes beyond the factors accounted for in base fees e.g. the use of bio-based materials or recycled content.

**Producer Responsibility Organization:** a producer-led, non-profit organization that provides producers with compliance services to help them meet their obligations.

**Responsible end markets:** A REM is a market for materials that recycles and recovers materials in a way that is safe for the environment, public health and workers.

**Needs assessments:** an in-depth study of a jurisdiction's existing recycling services and infrastructure for managing single-use packaging and paper products.

### Other Resources:

- [U.S. Plastics Pact Supportive Policies document](#)
- [U.S. Plastics Pact Reuse Policy Guidance](#)
- [U.S. Plastics Pact Design for Circularity Playbooks](#)