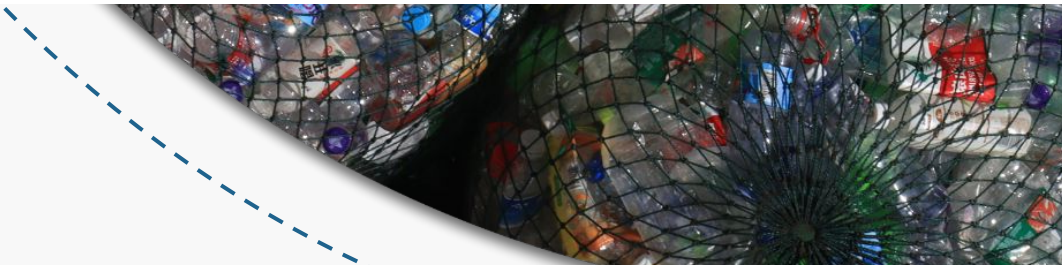
The Circulate Initiative

Breaking the Bottleneck

How Advance Market Commitments Can Bridge the Supply-Demand Gap in Recycled Materials



September 2026

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Executive Summary

According to a 2025 report from Pew Charitable Trusts, roughly 130 million tonnes of plastic pollute the environment each year, and this will reach 280 million tonnes by 2040 without ambitious action. Solving this challenge will require significant investment in a range of solutions, including recycling.

In recent years, an increasing number of multinational companies have committed to using more post-consumer recycled (PCR) plastic resin in their products and packaging. This, along with countries enacting policies such as extended producer responsibility (EPR), provides reason for optimism. However, a greater supply of recycled material has not yet materialized, as recyclers are hesitant to build new capacity based on company commitments alone – they want to see firm purchase orders from customers. Similarly, investors in solutions to plastic waste need to see robust end markets to ensure their investments will achieve acceptable returns.

In this context, over the last year, The Circulate Initiative conducted research and engaged experts to evaluate the potential for advance market commitments (AMCs) to help address this supply-and-demand imbalance. In brief, an AMC is a binding financial agreement that incentivizes the development of new products and services in areas where no market exists or where entering the market is risky for private companies. AMCs have been used in several other areas, for example carbon dioxide removal and vaccine development, that share similar characteristics, including high research and development and capital costs, a need for collective purchasing to accelerate technological development, and a need to align on technical specifications.

Based on our work, we believe that AMCs have the potential to address the supply-and-demand gap for recycled and alternative materials when applied to specific resin types and packaging formats. AMCs are most applicable to materials and formats for which recycling is less mature and additional research and development is needed, such as flexible packaging, film, and textiles. AMCs are less applicable to more commercially available and mature resins and formats, such as rigid PET and HDPE.

Relative to other procurement approaches, AMCs offer several advantages, including the ability to:

- Spread procurement risk and due diligence efforts across multiple buyers.
- Allow suppliers (e.g., recyclers) to gain a fuller picture of market demand.
- Harmonize product specifications and requirements.
- Serve as a price discovery mechanism when a wide range of prices exist.

Developing and implementing AMCs for plastics face several hurdles that will need to be overcome, including:

- An AMC model is very different from current practices, where brands procure material individually via index-linked contracts, offtake agreements, or on a spot basis.
- Bringing together multiple companies to coordinate and align on product specifications and requirements will be a challenge, given competitive dynamics and different end applications for materials.
- Even with multiple buyers making binding purchase commitments, the price gap between virgin and recycled or alternative materials may not fully close, or it may take more time to do so.

We have identified three scenarios in which AMCs hold promise: mixed plastic waste, textile waste, and paper-based alternatives for flexible packaging. In this report, we provide details on each of these scenarios and outline plans to further develop each one.

Introduction

Overview

In recent years, a growing number of multinational companies have made commitments to increase their use of post-consumer recycled (PCR) plastic in their packaging and products. They are doing so for a variety of reasons, including to reduce their environmental impacts, comply with current and future regulations, and mitigate the risk of volatile virgin input costs. Companies have made such pledges individually and through collaborative platforms such as the Plastics Pact Network, the Association of Plastic Recyclers (APR) Recycling Demand Champions Program, and Textile Exchange's 2025 Recycled Polyester Challenge. By pooling individual company targets, these platforms aim to demonstrate broader demand for recycled content, thus sending a market signal to suppliers.

While it is encouraging to see increasing demand for recycled content, there is not enough supply of high-quality, cost-competitive PCR to meet this demand. By one estimate, we would have had to build at least 1,800 new recycling plants globally with an average output of 25,000 tonnes per year to achieve the 2025 recycled PET targets set by companies.[1] Adding another layer of complexity, collection of plastic waste differs across geographies: in developed nations, collection tends to be formalized, whereas in many developing nations, the vast majority of plastic is collected by informal waste sector workers. For a number of reasons, including regulatory compliance and brand protection, companies sourcing recycled plastic in developing markets seek "responsibly sourced" PCR to ensure better working conditions for the informal sector.

Yet, commitments to source PCR are not actual purchases. Plastic recyclers are hesitant to build new capacity or make operational improvements based on pledges alone – they need to see firm financial commitments from customers. Likewise, investors in the recycling ecosystem need to see firm financial agreements in place to ensure that their investments will achieve acceptable returns.

We thus face a chicken-and-egg dilemma: brands and packaging manufacturers want a robust supply of PCR and plastic alternatives to meet their commitments and regulatory requirements, while recyclers want firm demand from their customers to enable them to invest in increasing capacity and improving quality. Solving this dilemma was the impetus for The Circulate Initiative to investigate the potential role of advance market commitments (AMCs).

In brief, an AMC is a binding financial arrangement that incentivizes the development of new products and services in domains where the market does not yet exist or where entering the market is risky for private companies. "Buyers" commit a defined amount of money to purchase a product or service if specific criteria are met. For example, through Frontier, companies such as Stripe, Google, and H&M have made upfront, guaranteed financial commitments to support startups working to remove carbon dioxide from the atmosphere. When these innovators deliver removals that meet criteria agreed by platform participants, the aforementioned companies purchase high-quality carbon dioxide removals that contribute to their greenhouse gas (GHG) reduction goals.

Through our research and analysis, we have examined the potential for AMCs to bridge the supply-and-demand gap for PCR and alternatives to virgin plastic. We have also identified and evaluated other demand-side mechanisms that could be deployed for this purpose.

[1] As we discuss below, company commitments to PCR have shifted since this estimate was made in 2022, in part due to insufficient supply of PCR at the required quality and price.

Research objectives and approach

The objective of our research was to evaluate the potential for AMCs to help address this supply-and-demand imbalance and increase demand for and supply of responsibly sourced PCR and alternative materials. Ultimately, we want to reduce the amount of plastic waste entering the environment, including oceans and other bodies of water.

In addition to AMCs, we also looked at other collective approaches to pool demand for other commodity types to understand their potential applicability and identify lessons for plastic. Our scope did not include developing an AMC platform, as this would require more focused conversations around specific materials and packaging formats. However, we have illustrated several scenarios in which we believe AMCs could be applicable.

As part of our research, we conducted desk research into existing AMCs for other commodities, including Frontier and the Gavi Pneumococcal and COVAX AMCs, to understand their mechanics and relevance for plastic. We also examined other approaches to pooling demand in different sectors, including buyers' clubs, cooperative models,[2] and more. We provide details on AMCs and other mechanisms in Section 5 below.

We also conducted interviews with over 40 stakeholders from across the plastic ecosystem, including recyclers, brands, civil society organizations, investors, and others. We provide a synthesis of these conversations below.

Addressing the PCR supply-and-demand gap is a complex challenge, and we view this research as our contribution to identifying solutions. We will use our work as a foundation for follow-up conversations about possible paths forward and for continuing to learn from others.

[2] A business model characterized by shared ownership and management, for example multiple buyers pooling their purchasing power.

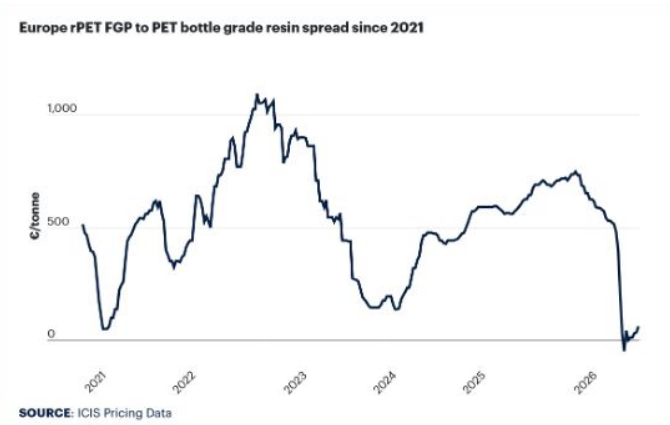
Macroeconomic context for plastics recycling

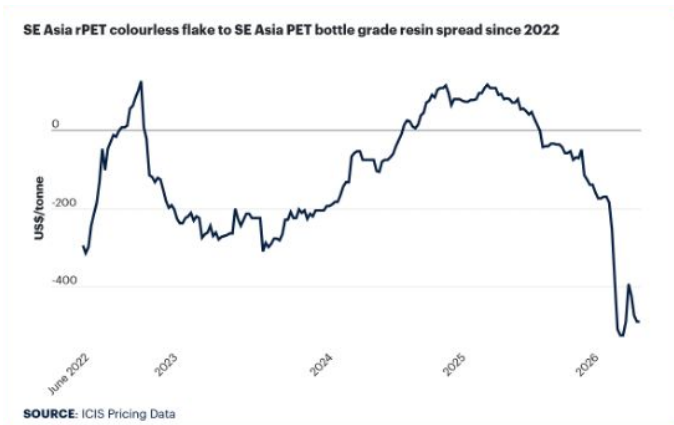
Virgin and recycled plastic resin are commodity materials, and their prices are shaped by a number of factors, including feedstock costs (i.e., oil and gas), energy costs, production capacity, demand, and regulatory requirements. Prices for virgin and recycled plastic resin move in cycles and can be volatile, particularly in times of macroeconomic shocks, such as the war in Iran that began in February 2026.

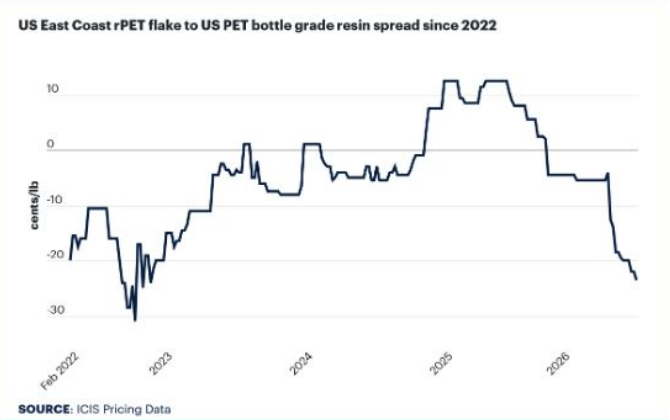
Prior to this event, the plastics recycling industry was on shaky ground in the United States and Europe. According to The Recycling Partnership, in the preceding 12 to 18 months, roughly 25% of PET recycling capacity shut down in the United States, driven by cheap virgin feedstock (i.e., oil and gas) and low-cost imports of recycled PET (rPET). Europe was facing a similar crisis, with a 50% increase in recycling facility closures in 2025. High energy costs in Europe have exacerbated the problem.

The crisis in the United States and Europe is being driven by cheaper alternatives to domestic recycled content, namely virgin resin and imported rPET. That said, the price gap between virgin and recycled resin varies around the world, with multiple factors at play, including regulation and buyer commitments.

To illustrate, based on data shared by ICIS, rPET food-grade pellets have consistently traded at a premium to virgin resin in Europe over the last five years. In contrast, the price gap between rPET flake and virgin bottle resin in Europe, the United States, and Asia has fluctuated, with a recent dip due to the war, as virgin prices have risen.

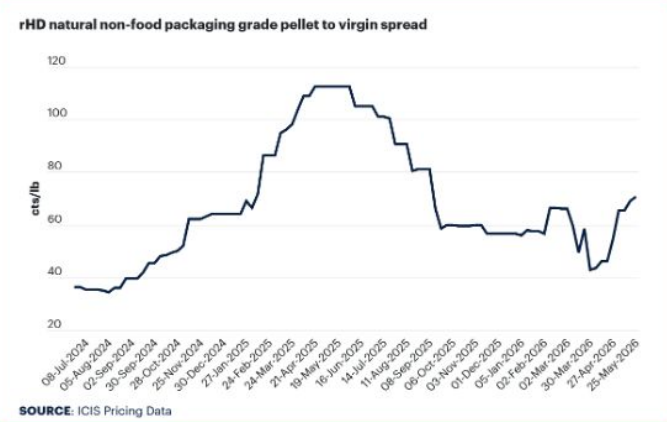




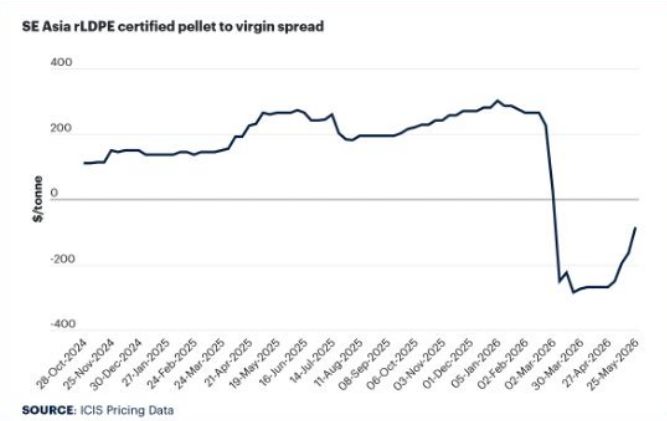


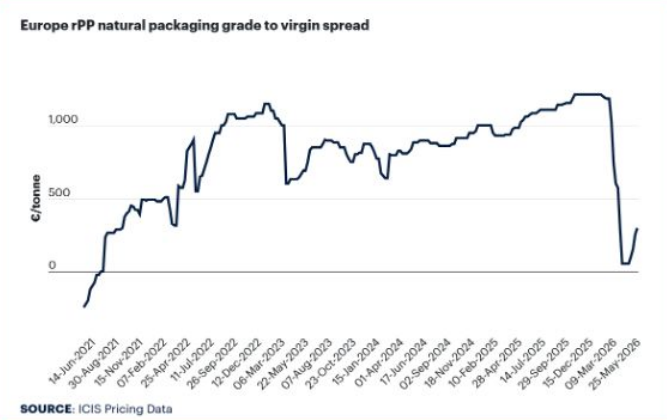
Macroeconomic context for plastics recycling (cont'd)

For HDPE, recycled resin for packaging grades has traded at a notable premium to virgin resin in Europe and the United States over the last several years, driven by regulation and brand commitments.



For LDPE, recycled resin for packaging grades has generally traded at a premium to virgin resin in Europe and Asia, also driven by regulation and brand commitments. Recycled polypropylene exhibits the same dynamic.





Select policy efforts on recycled content

In recent years, countries around the world have enacted extended producer responsibility (EPR) laws that charge fees to consumer packaged goods and packaging companies to fund the collection of plastic and other materials for recycling. EPR has been enacted in regions and countries such as the European Union, the United States (at the state level), India, the Philippines, and Viet Nam. This is a welcome development, yet we also need demand-side interventions such as recycled content mandates (RCMs) and tax incentives to drive greater demand.

Below is a selection of regions and countries with RCMs:

European Union

From January 1, 2025, all PET beverage bottles must contain at least 25% recycled content. This target increases to 30% from 2030.

India

From April 1, 2026, rigid packaging must include at least 40% recycled content, increasing to 60% from April 1, 2028.

California

From January 1, 2022, plastic beverage bottles must contain 15% recycled content, increasing to 50% from 2030.

Brazil

From January 2026, large companies must include a minimum of 22% recycled content in plastic packaging. This increases to 30% from 2030 and 40% from 2040.

United Kingdom

From April 1, 2022, plastic packaging manufactured in or imported into the United Kingdom (minimum of 10 tonnes) must contain at least 30% recycled plastic, or the producer must pay a tax.

South Korea

From January 1, 2026, manufacturers and importers of bottled water and non-alcoholic beverages that use at least 5,000 tons of colorless PET bottles annually must ensure that at least 10% of their PET are made of recycled resin. In 2028, the mandate expands to manufacturers using at least 1,000 tons of PET annually, and in 2030, the recycled content threshold increases to 30%.

In theory, robust and well-enforced RCMs would likely lessen the need for voluntary, collective purchasing mechanisms such as AMCs. However, AMCs would help recyclers begin investing in the necessary infrastructure and operational improvements to prepare for future demand.

Plastic procurement: Current state

When considering collective approaches to sourcing PCR resin, it is important to first describe the value chains of virgin and PCR resin, as well as how these materials are currently procured.

Virgin plastic value chain

The primary raw materials for plastics are oil and gas, which are refined into different fractions: ethane for natural gas and naphtha for oil. This feedstock varies globally depending on resource availability. For example, plastic production in the United States and the Middle East generally utilizes ethane (natural gas), whereas Europe relies on naphtha (oil). The ethane and naphtha are then processed in a steam cracker into monomers such as ethylene and propylene, which are in turn converted into polymers such as polyethylene and polypropylene. The resulting output – pellets – is melted and mixed with additives (i.e., compounding) and converted into semi-final or final forms (e.g., extrusion, injection molding) for use in packaging and products.

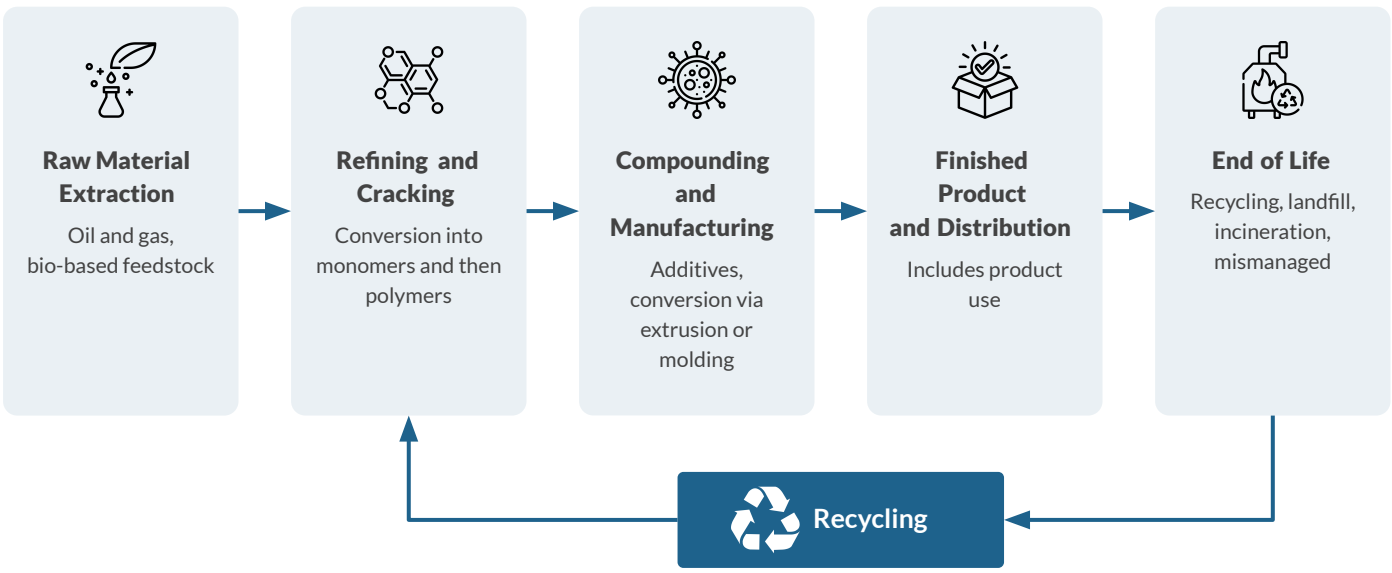
For bio-based feedstocks such as corn and sugarcane, there is no cracking phase; rather, polymers are created through biological (e.g., fermentation) and chemical processes.

Recycled plastic value chain

With mechanically recycled plastic, the extraction phase starts with recycled plastic (e.g., PET bottles), which is collected and sorted, then processed into flakes and/or pellets that go through compounding and converting, as with virgin feedstock.

With advanced or chemical recycling for polymer applications, plastic waste is generally processed to the monomer level, which is then delivered to a steam cracker ahead of downstream polymerization.

FIGURE 1 - PLASTIC VALUE CHAIN



Procurement approaches

The approaches taken to procuring both virgin and PCR resin differ across companies of various sizes and buying power. For example, larger brands and packaging companies may deploy several strategies, including:[3]

- **Index-linked contracts:** A brand agrees to buy a fixed amount of resin at the market rate, plus or minus a pre-negotiated margin. The market rate is derived from pricing reporting agents such as ICIS and Platts.
- **Offtake agreements:** A brand agrees to purchase a fixed percentage of a supplier's output – typically larger volumes than with index-linked contracts and over longer time frames. Offtake agreements are often used to support the development of new supply (e.g., a brand might commit to buying 50% of the output of a rPET manufacturer).
- **Spot market:** Purchases on the open market for immediate delivery.

Small- to mid-sized companies do not have the same buying power as larger ones and thus rely more heavily on the spot market. They also utilize price-cap contracts that set a ceiling price for a window of time (e.g., three to six months). There are some efforts to bundle demand from small- to mid-sized companies, for example QCS Purchasing Cooperative.

Examples of offtake agreements

As noted above, offtake agreements are used to lock in larger purchases over a longer period of time than the spot market and index-linked contracts. Offtake agreements are used in various sectors, including packaging and textiles, for example:

- In 2024, H&M signed a contract with textile recycler Syre to purchase US$ 600 million of textile-recycled polyester over seven years.
- In 2022, PepsiCo and Eastman entered into a multi-year offtake agreement for recycled PET from hard-to-recycle materials. In April 2026, PepsiCo shared that it was rolling out Gatorade bottles made with Eastman's recycled materials.
- Indorama has entered into a variety of offtake agreements, both for its feedstock and for material it supplies to its customers. For example, in 2022, Indorama opened a food-grade, bottle-to-bottle recycling plant in the Philippines in partnership with Coca-Cola Beverages Philippines, Inc. (CCBPI, now CCEAP), for which CCEAP is a primary offtaker.
- In 2025, American retailer REI Co-op entered into a three-year offtake agreement to purchase textile-recycled polyester from Ambercycle.

Importantly, offtake agreements can vary in their level of commitment; for example, they may be non-binding letters of intent rather than legal obligations to purchase material. It is generally not possible to determine the degree of commitment based on public information.

Offtake agreements tend to be bilateral in nature, whereas, for the purposes of this research, we have explored the potential for multiple buyers to pool their demand.

[3] Note that there are many variations of these examples.

Human rights in the plastics recycling supply chain

In many emerging markets, informal waste sector workers are the foundation of plastic recycling – indeed, roughly 40 million informal workers account for 60% of all plastic collected globally. These individuals face persistent marginalization, including a lack of social safety nets, gender inequality, child labor, and insufficient incomes. Increasing recycling rates and combating plastic pollution depend on improving the livelihoods of these people.

While some brands and recyclers – including those engaged in the Responsible Sourcing Initiative – are starting to address human rights conditions in plastics recycling, such issues are insufficiently incorporated into procurement decisions. As we explore the potential for AMCs and other collaborative purchasing mechanisms, responsible sourcing must be an integral component.

40 million

Informal workers in plastic collection

60%

of all plastic collected globally comes from them

Insights from expert interviews

In evaluating the possibility of an AMC for plastics, we interviewed roughly 40 stakeholders between November 2025 and March 2026 to understand the potential for applying an AMC construct to the recycled plastic market. These experts span the recycling and circular economy ecosystem, including brands, recyclers, chemical companies, industry associations, civil society organizations, and others. We also spoke with representatives from existing AMCs and other collective mechanisms. Interviewees represented a range of geographies, including North America, Europe, India, Southeast Asia, Africa, and Latin America.

Across the interviews, a number of themes emerged:

1. Volatile market conditions impacting recyclers globally

Interviewees cited the challenging market conditions for PCR in key regions over the last year or so, particularly the United States and Europe, where recycled resin costs more to produce than virgin resin. In these markets, the expectation is that this situation will continue, given the oversupply of petrochemicals (in large part due to significant capacity expansion in China).[4] While prices fluctuate over time, this downturn in the cycle is making recycling uncompetitive in Europe and the United States. These conditions are also starting to result in trade policies to support domestic recyclers. For example, in the European Union, only recycled plastic sourced and processed within the EU and European Economic Area counts toward meeting the EU's mandatory recycled content targets (this is in place through mid-November 2027).

2. Say/do gap with respect to purchasing recycled resin

Given these market conditions, interviewees – particularly recyclers and plastic producers – shared that buyers are unwilling to pay a premium for PCR over time, regardless of any public commitments they have made to using such content. Interviewees cited the conflict between company sustainability and procurement teams, with the latter seeking to procure goods and services at market prices.

3. Key differences between recycled resin and other environmental attributes

In considering the applicability of AMCs, interviewees noted the different nature of PCR relative to other goods and services, such as renewable energy and GHG reductions. With PCR, brands and packaging producers need physical recycled resin, which in turn entails logistics such as shipping and storage. Buyers of recycled resin also seek specific performance attributes and must test the quality of the material. Buyers of products such as renewable energy certificates or carbon removals do not need to take ownership of and test physical products, and a unit of renewable energy from one wind turbine essentially has the same characteristics as a unit from another farm.

4. AMCs better suited to more complex recycling and material scenarios

AMCs may be best suited for materials and formats for which recycling is not yet commercial or mature and that require more research and development, for example, flexible packaging (e.g., film, multilayer packaging) and textiles. For such materials and formats, an AMC could support advances in recycling as well as alternatives such as paper and other bio-based materials. AMCs may also be useful for more mature materials such as HDPE in specific countries and contexts, for example, food-grade HDPE in India.

[4] Note that we conducted most of these interviews before the war in Iran started in late February 2026.

5. AMCs are likely less suitable for more mature materials

For recycled materials such as PET and HDPE, an AMC is likely not applicable given the commercial availability of these materials. Innovation is not needed; rather, this is a market pricing and quality issue. If the price difference between PCR and virgin is too wide or the quality is too low, brands and packaging manufacturers will buy less PCR.

6. Government policy is essential

Interviewees stressed the importance of government policy to increase demand for PCR, for example, through recycled content mandates. Such demand-side policy interventions should be coupled with policies that address supply, such as EPR. The combination of demand- and supply-side policies, if enforced, will accelerate the development of recycling markets.

7. Aligning on specifications is challenging but critical

In considering AMCs and other joint purchasing arrangements, interviewees noted that alignment on specifications will be essential. While there are industry specifications for recycled material (e.g., ISRI specifications for baled plastic), recyclers and brands may have their own specifications. There have been efforts to align specifications, such as the Alliance to End Plastic Waste's effort in 2023, though more work is needed.

Innovative approaches to addressing the virgin/recycled resin price gap

AMCs and other collective demand mechanisms are essentially trying to address the price differential between conventional and environmentally preferable materials. In our research, we learned of other means of addressing this gap. For example:

California's Plastic Market Development Payment Program uses state funding to pay reclaimers and plastic product manufacturers that use recycled content from the state's deposit return system. Payments vary. For example, reclaimers that process high-quality PET bales can receive US$ 75 per tonne, while product manufacturers that use more PCR than the state requires can receive US$ 150 per tonne.

Fashion for Good has developed the Price Parity Toolkit, which aims to bridge the price gap between so-called next-generation and conventional materials. In brief, the Toolkit aims to decouple the price premium for next-generation materials early in the supply chain so that markups are not carried through at each subsequent phase, thus making the final material less expensive for brands.

Collective demand mechanisms for procuring plastic and other materials

While the focus of our research was on exploring the potential for AMCs as a solution to bridge the supply-demand gap for PCR and alternative materials, we also examined other collective demand mechanisms that are currently used for other goods and services, including energy, cement, and low-carbon aviation fuel.

We assessed each mechanism based on the following criteria to help evaluate its potential applicability to the procurement of PCR resin.

TABLE 1 - EVALUATION CRITERIA

Criteria	Description
Nature of commitment	Binding (i.e., contractual) or non-binding
Maturity of procured good or service	Market maturity or availability of the material in focus, for example, non-food-grade rPET is widely available, whereas textile-to-textile recycled polyester is not
Nature of financial commitment	Characteristics of the buyer's financial commitment, e.g., a specific monetary pledge over multiple years, paying a premium for sustainable attributes on a spot basis, etc.
Physical good/service	Does the buyer take delivery of a physical good with sustainability attributes or claims on the attributes (e.g., rPET pellets vs. credits)?
Compliance requirements	Does the transaction allow the buyer to comply with regulatory requirements (e.g., recycled content mandates)?

Public commitment platforms

Public commitment platforms are organized platforms through which multiple companies band together to publicly commit to using recycled resin or other sustainable materials. While these commitments are generally non-binding, they are intended to send a demand signal for the material in focus. Making the commitments public allows stakeholders to hold the companies accountable for their progress. That said, voluntary commitments can be rescinded or delayed, especially when the price gap between virgin and recycled resin widens or if the financial health of a company deteriorates.

Examples of public commitment platforms include:

The Plastics Pact Network: Convened by the Ellen MacArthur Foundation and WRAP, regional and national networks facilitate knowledge sharing and solutions to plastic waste, and include commitments for members. For example, members of the U.S. Plastics Pact commit to using an average of 30% PCR or responsibly sourced bio-based content across all plastic packaging by 2025.

APR Recycling Demand Champions Program: A collaboration between the Association of Plastic Recyclers (APR) and The Recycling Partnership that aims to increase the use of North American PCR resin by recognizing companies that publicly commit to long-term sourcing of this material.

Textile Exchange 2025 Recycled Polyester Challenge: Concluded in 2025, the challenge called on apparel and textile companies to commit to sourcing 45% to 100% of their polyester from recycled sources by 2025. Over 100 brands and textile suppliers were signatories to the challenge.

RE100: Convened by Climate Group, over 400 companies have committed to using 100% renewable electricity for their operations. Climate Group also manages SteelZero, through which members commit to sourcing 100% net-zero steel by 2050.

First Movers Coalition: Convened by the World Economic Forum, the First Movers Coalition comprises companies that commit to leveraging their purchasing power to decarbonize heavy-emitting industrial sectors such as aluminum, cement, and aviation. For example, for aluminum, members commit to sourcing a minimum of 10% of their primary aluminum volumes from low-carbon sources by 2030.[5]

[5] Based on publicly available information, it appears that book-and-claim approaches are not allowed for aluminum, but the position is unclear for other focus areas, such as aviation.

TABLE 2 - EVALUATION CRITERIA: PUBLIC COMMITMENT PLATFORMS

Criteria	Description
Nature of commitment	Not legally binding; the public nature of the commitment allows for public scrutiny
Maturity of procured good or service	Can vary; for example, recycled polyester (textiles) and PET (packaging) are mature and generally available
Nature of financial commitment	Signatories/members buy PCR (and other sustainable goods and services) on the open market, so the financial outlay is the premium paid for those materials
Physical good/service	For the plastic-related platforms noted above, including textiles, buyers are sourcing physical content (i.e., PCR) and not claims on the recycled attribute. Buyers of other commodities, such as renewable energy, may be sourcing claims, for example, renewable energy certificates (RECs)
Compliance requirements	If a company sources PCR to meet the commitments of such platforms, this could contribute to meeting recycled content mandates

Buyers' clubs

Buyers' clubs entail multiple companies pooling their purchasing power to buy products or services, with the goal of achieving economies of scale and better pricing. Similar to cooperative models, there are many examples of buyers' clubs for commodities such as plastic, energy, consumer goods, and more. Examples include:

QCS Purchasing Cooperative: A buying cooperative representing over 700 food and beverage production companies with over US$ 900 million in collective purchasing power, which aims to secure competitive advantages and pricing. Packaging, including plastic, is one area of focus.

Fiber Club: An initiative by Fashion for Good that aims to accelerate the development and adoption of next-generation sustainable materials through innovator-specific consortia (e.g., Circ Fiber Club). It does so by pooling demand, aligning on material specifications, and securing long-term discounted pricing for participants.

Nylon Materials Collective: A collaboration between Samsara Eco and the European Outdoor Group that aims to increase adoption of textile-recycled nylon through demand pooling, collaboration on material specifications, and connections to a network of supply chain partners.

Sustainable Concrete Buyers Alliance (SCoBA): Convened by Rocky Mountain Institute (RMI) and the Center for Green Market Activation, SCoBA is a platform that aggregates demand from end-use customers to channel investment into low-carbon cement and concrete via a book-and-claim approach.[6]

Zero Emission Maritime Buyers Alliance (ZEMBA): Aims to accelerate the commercial deployment of clean energy-powered shipping by aggregating demand from freight buyers such as Amazon, Nike, and Philips for emissions reductions (environmental attributes) from lower-carbon shipping. Buyers can claim the environmental benefits through a book-and-claim approach.

Sustainable Aviation Buyers Alliance (SABA): Strives to increase investment in and development of sustainable aviation fuel (SAF). SABA-approved SAF guarantees credible emissions reductions and allows members to invest in SAF and claim emissions reductions via a book-and-claim approach.

From our research, we did not come across any buyers' clubs or joint purchasing arrangements among larger buyers for packaging, only cooperatives such as QCS that serve smaller buyers. It may be that collective purchasing platforms work better for small- to mid-sized companies that do not face the same competitive dynamics as larger buyers.

[6] The Center for Green Market Activation has initiatives for other commodities, including ZEMBA and SABA.

TABLE 3: EVALUATION CRITERIA: BUYERS' CLUBS

Criteria	Description
Nature of commitment	In general, legally binding (i.e., participants have contracts with the organizers of buyers' clubs)
Maturity of procured good or service	Other than the QCS example above, the other clubs cited relate to goods and services that need research and development to develop and scale
Nature of financial commitment	For the clubs other than QCS, buyers generally pay a premium for the sustainable attributes. In some instances, they might also provide upfront financial support for technical development
Physical good/service	The plastics-related clubs (including synthetic textiles) entail the procurement of physical products (e.g., recycled nylon). Clubs such as ZEMBA, SABA, and others under the Center for Green Market Activation involve the purchase of claims on environmental attributes.
Compliance requirements	Procurement of physical material can allow a company to comply with regulations, whereas book-and-claim generally does not (see box below)

A note on book-and-claim approaches

Several of the examples shared in the buyers' club section above are book-and-claim approaches, which allow buyers to purchase the environmental benefits of a good or service without taking physical possession of that good or service. One example is renewable energy certificates, whereby a buyer pays to secure the rights to the environmental benefits of renewable energy, supporting the installation of such energy, but does not actually access the renewable electrons. Rather, the green power is added to the grid. In the plastics sector, plastic credits take a similar approach – a company can buy the recycled attribute for plastic, but it does not take physical delivery of that recycled content.

While plastic credits can be used in some countries, such as the Philippines, to meet waste collection targets, they generally cannot be used to meet recycled content mandates. Buyers need physical PCR to meet these mandates.

Collective capacity building and funding

Across sectors, there are collaborative initiatives that combine technical support and capacity building with financial resources to drive specific environmental outcomes. Such initiatives vary widely and may share traits with other mechanisms, for example, pooled demand for carbon credits. Examples include:

Rimba Collective: A long-term forest conservation and restoration financing mechanism co-designed by Nestlé, PepsiCo, Procter & Gamble, Unilever, and Lestari Capital. Each company contributes funds based on its procurement volumes of palm oil, which are then invested in projects vetted by conservation experts. The companies are thus able to claim ecosystem outcomes, contributing to their sustainable development objectives. This collective does not entail the purchase of sustainable palm oil.

Film and Flexibles Recycling Coalition: A coalition led by The Recycling Partnership that aims to improve the recyclability of film and flexible packaging in the United States. It does so through grants to expand curbside access to recycling, improve sorting tools and technologies, and foster innovation in end markets.

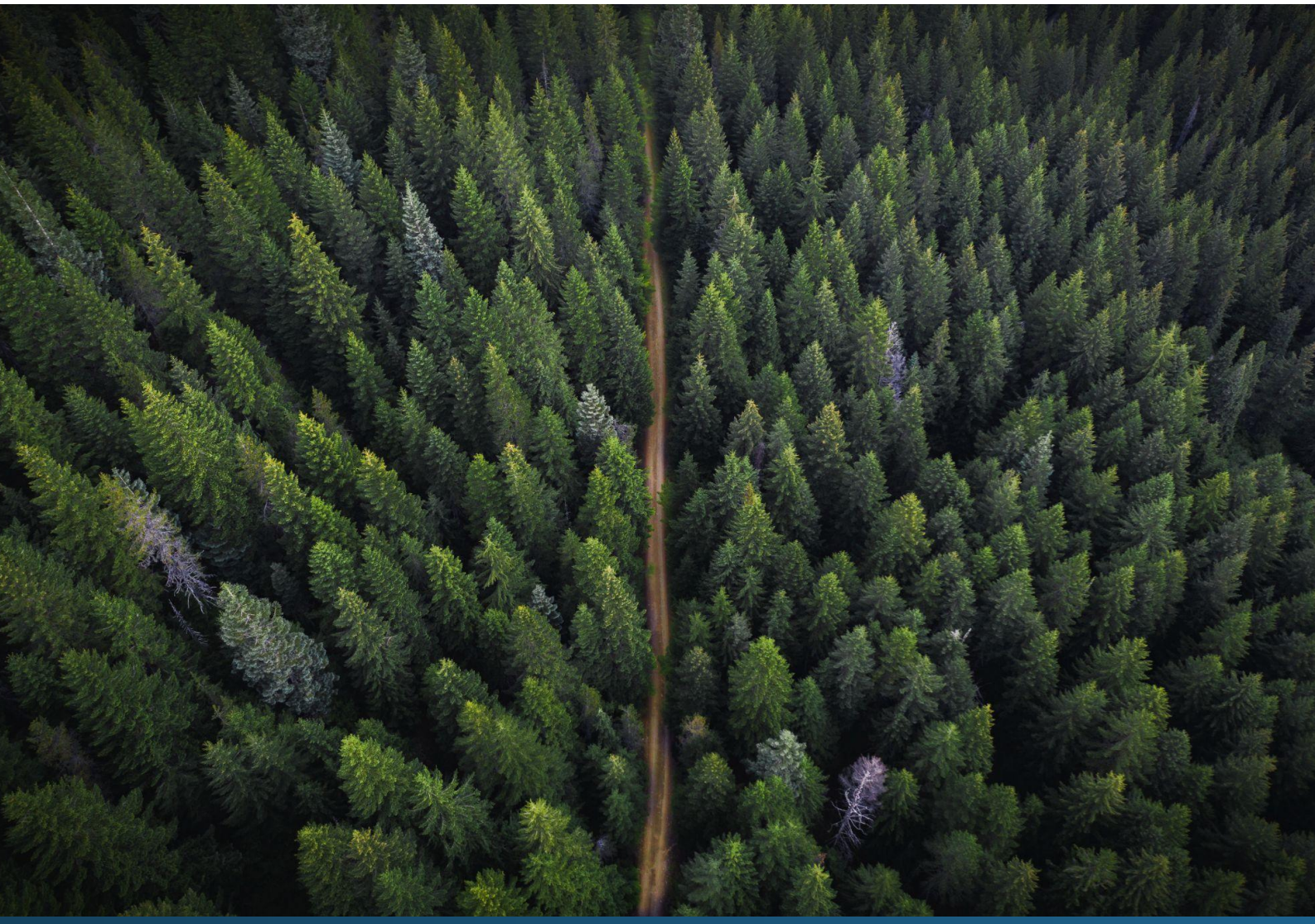
Future Supplier Initiative: Convened by Apparel Impact Institute, the Fashion Pact, and Guidehouse, the initiative is a collective financing model to support decarbonization in the apparel sector. It combines technical and financial support for apparel manufacturers.

Fashion Climate Fund: Led by Apparel Impact Institute with investments from brands including lululemon, H&M, and PVH, the fund aims to mobilize US$ 250 million to identify, fund, and scale proven solutions that reduce GHG emissions across the apparel and footwear supply chain. The goal is to reduce 100 million tonnes of GHG emissions by 2030.

LEAF Coalition: The Lowering Emissions by Accelerating Forest Finance (LEAF) Coalition is a public-private partnership that aims to halt deforestation by financing large-scale tropical forest protection through the purchase of high-quality carbon credits. Through their participation and funding, companies such as Amazon, Inditex, and Unilever gain access to these carbon credits.

TABLE 4: EVALUATION CRITERIA: COLLECTIVE CAPACITY BUILDING AND FUNDING

Criteria	Description
Nature of commitment	Companies enter into contracts with convening organizations regarding the objectives and outcomes for their financial contributions. Companies are not committing to specific environmental targets via these mechanisms, but rather supporting broader goals (e.g., supply chain decarbonization)
Maturity of procured good or service	Generally less mature, which is why collective financing is being deployed
Nature of financial commitment	Varies – under Rimba and LEAF, companies make financial contributions to achieve specific environmental outcomes. For the apparel-related mechanisms, companies contribute funds to a pool that is deployed across a portfolio of solutions
Physical good/service	Generally no
Compliance requirements	Varies; for example, successful efforts on film and flexibles could help companies comply with regulations in California



Matchmaking platforms

Matchmaking platforms are technology platforms that aim to bring transparency and efficiency to matching buyers and sellers of recycled plastic and other materials. While these platforms allow buyers to access a range of potential suppliers (and vice versa), companies act independently to buy and sell materials. Examples include:

Resycure: A platform that allows recyclers to leverage the combined PCR demand of multiple buyers to increase volumes and establish long-term contracts.

Circular: A platform that connects buyers and sellers of sustainable materials, including PCR resin. Buyers can use the platform to evaluate the specifications of supplier material, manage compliance, and ultimately source materials.

Matium: A marketplace for buying and selling plastics that aims to secure better pricing for both sellers and buyers through competitive and reverse auctions.[7]

TABLE 5: EVALUATION CRITERIA: MATCHMAKING PLATFORMS

Criteria	Description
Nature of commitment	No future commitment – companies transact based on prices and volumes on the platform
Maturity of procured good or service	Underlying materials are generally mature
Nature of financial commitment	Buyers pay for PCR
Physical good/service	Yes
Compliance requirements	Yes

[7] An auction in which a buyer posts a request for a good or service, and multiple sellers submit competing bids until a seller's offer is accepted.

Advance market commitment (AMC)

An AMC is a binding financial contract used to incentivize the development of new products or services. Buyers pledge investment upfront, which is deployed if service providers can deliver on agreed criteria. Examples include:

Frontier: Aims to accelerate the development of carbon removal technologies by guaranteeing future demand for them. Frontier Climate has an initial goal of purchasing over US$ 1 billion in carbon removals. As of April 2026, nearly US$ 700 million had been contracted.

Symbiosis: A 20-million+ tonne AMC to help develop the next generation of nature-based carbon removal projects. Members sign long-term offtake agreements for a specific volume of credits by 2030.

NextGen CDR Facility (NextGen): NextGen convenes buyers from Asia, Europe, and North America to promote high-quality, certified carbon dioxide removals (CDRs) from technological projects. Designed for companies committed to net-zero targets, NextGen aims to make high-quality CDRs accessible at a target price of US$ 200 per tonne.

Gavi Pneumococcal and COVAX AMCs: Gavi, a global vaccine alliance, created AMCs to accelerate the development of vaccines for pneumococcal disease and COVID-19 and increase their availability to low-income countries.

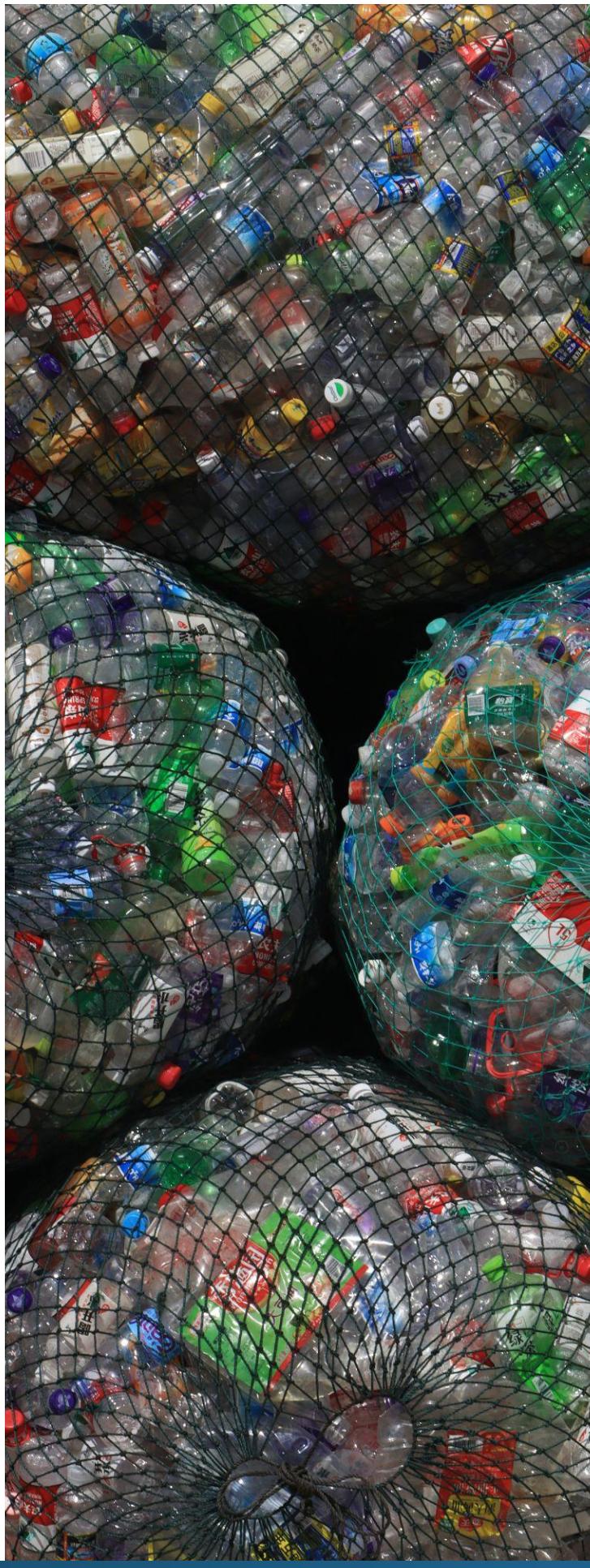
Innovate UK Low Carbon Concrete: A program from the United Kingdom government through which buyers such as Heathrow Airport and Scottish Water commit to purchasing low-carbon concrete if suppliers meet technical and commercial specifications. The initial target is to secure commitments for up to 500,000 cubic meters of low-carbon concrete.

TABLE 6: EVALUATION CRITERIA: AMCs

Criteria	Description
Nature of commitment	Legally binding – if suppliers meet specifications, a transaction occurs
Maturity of procured good or service	Less mature
Nature of financial commitment	Can be significant relative to business as usual, for example, committing millions to an AMC versus paying the premium for sustainable goods on a spot basis
Physical good/service	Yes
Compliance requirements	Yes

Ensuring compliance with antitrust and competition laws

In considering collective demand-side approaches to recycled content and alternative materials, it is essential to ensure that the mechanisms and participating companies comply with antitrust and competition laws. This has come into sharp focus in the United States, where a number of state attorneys general have issued letters of notice to roughly 80 companies involved with the U.S. Plastics Pact, the Consumer Goods Forum, and the Sustainable Packaging Coalition concerning practices that could potentially violate antitrust and consumer protection laws.



The case for AMCs and illustrative scenarios

From our research and stakeholder interviews, we believe that AMCs hold great promise for addressing the supply-and-demand imbalance for recycled plastic and alternative materials in specific resin types and material and packaging formats. We see AMCs as most relevant when the following factors are in play:

High research and development and capital expenditures

Suppliers of recycled and alternative materials must make significant upfront investments to go from lab to commercial scale and to build out infrastructure. Examples: flexible packaging and textile recycling

Multiple vs. single buyers

The solution is needed by multiple buyers, and this collective demand is needed to send a signal to suppliers to invest

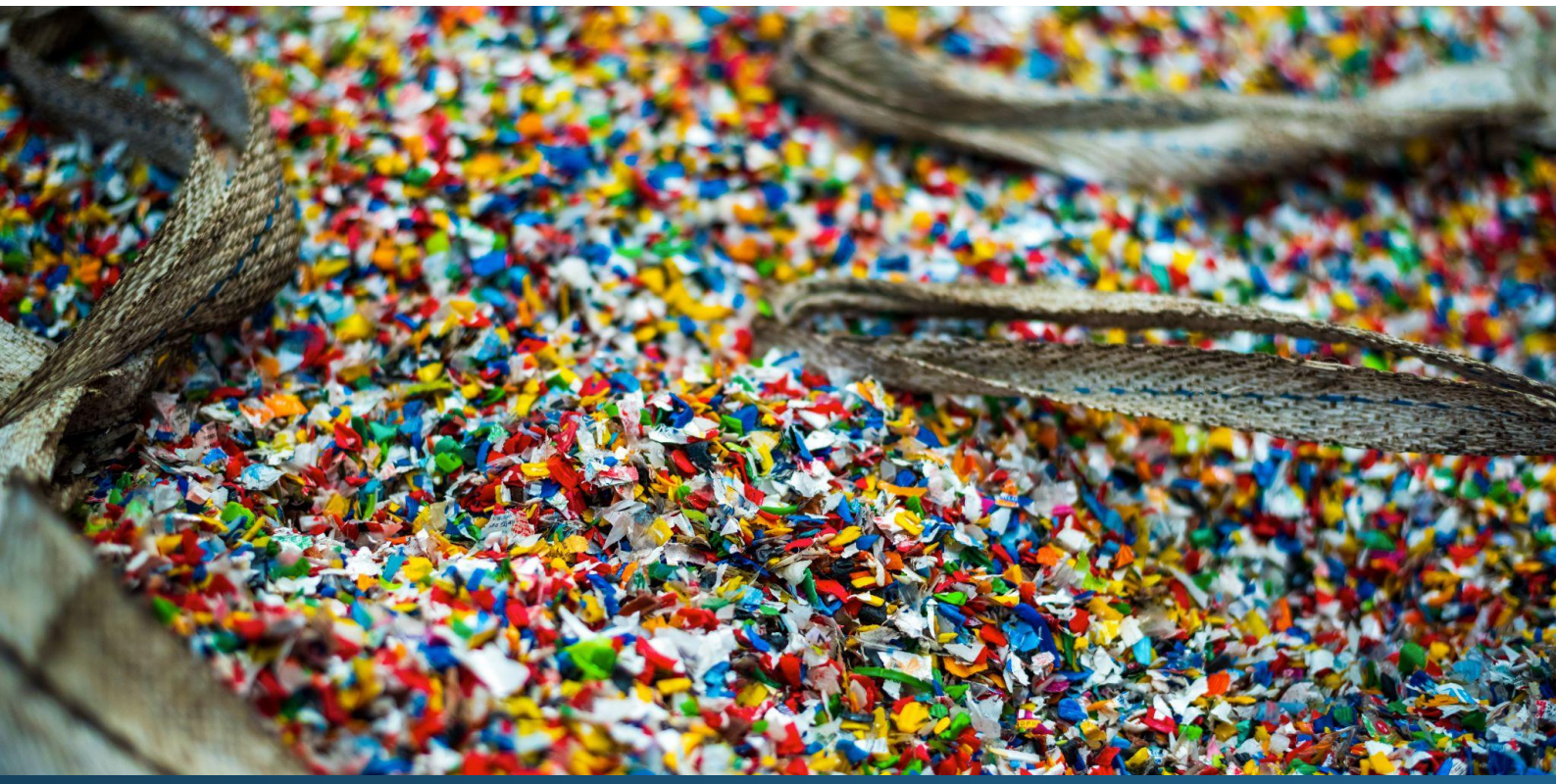
Clear and aligned specifications

Resin quality specifications such as melt index, density, and contamination allowance can vary by brand and converter.[8] Thus, an AMC would need to align on these technical specifications for the good or service in focus

Diverse supply base

An AMC would open up competition for suppliers, ideally building a robust and diverse supply base

[8] For a list of common specifications for recyclate, see Table 2, "Recyclate Characteristics," in Eunomia (2023).



As noted above, we see AMCs as most applicable for materials and formats for which recycling is less mature and additional research and development is needed, for example, flexible packaging, film, and textiles. AMCs are likely less applicable for more commercially available and mature resins and formats, for example, rigid PET and HDPE.

Compared with other procurement approaches, AMCs have several advantages:

- Spread procurement risk and due diligence effort across multiple buyers.
- Allow innovators (suppliers) to see a fuller picture of market demand for their products.
- Harmonize specifications and requirements across buyers.
- Serve as a price discovery mechanism where a wide range of prices are offered by innovators.
- Buyers pay only if a supplier meets the agreed specifications and price range – they do not pay to help innovators reach the transaction point.

There are a number of hurdles that will need to be overcome to implement AMCs:

- Committing to an AMC to procure materials would be a very different approach from current practices, for example, in which brands procure material on an individual basis via index-linked contracts, offtake agreements, or on a spot basis. With an AMC, a buyer would effectively put funds into an escrow account[9] that would be drawn upon at an undetermined future date, if specifications are met. Presumably, this would require the involvement of company functions that are not typically engaged in procurement, for example, treasury.
- As noted above, getting multiple companies to coordinate and align on the specifications and requirements of the AMC will be a challenge given competitive dynamics and different end applications for materials. Below, we discuss how this hurdle can be mitigated in three scenarios.
- Even with multiple buyers making binding purchase commitments, the price gap between virgin and recycled or alternative material may not fully close, or it may take more time to do so. In this instance, there may need to be some form of subsidy, such as California's Plastic Market Development Payment Program, to narrow the price gap.

Critically, for AMCs to be effective in bridging the supply-and-demand gap, they must be based on binding, "bankable" offtake agreements between buyers and sellers. That is, recyclers and suppliers of alternative materials must be able to use these contracts to secure bank financing to expand their operations.

Below, we have outlined three scenarios in which we believe an AMC could be useful to address the supply-and-demand gap for recycled plastic and alternative materials. Each of these scenarios addresses a complex challenge that requires additional research and development, as opposed to more mature markets such as the mechanical recycling of PET bottles. In presenting these scenarios, we intend to solicit feedback on our assumptions and how these scenarios might work in practice.

[9] An account where a third party holds funds for two other parties until specific conditions of a transaction are met.

Scenario 1: Advanced recycling of mixed plastic waste

Mixed plastic waste, including multilayer and flexible formats made from polyolefins, represents a growing portion of plastic waste that leaks into the environment. According to Pew Charitable Trusts, of the 150 million tonnes of plastic used for packaging in 2025, 66.1 million tonnes (44%) were flexible or multilayer, and very little of this material is recycled due to its nature, for example, multiple plastic layers and metallized films. Rigid packaging represents 96% of all packaging waste sent for recycling in formal systems. Mixed plastic waste presents a particular challenge in emerging economies, where sachets are widely used to serve lower-income consumers. Aseptic packaging (with mixed layers) is also widely used in countries such as India for milk and other beverages to enable longer-term storage without refrigeration.[10]

Mechanical recycling can be used to recycle mixed plastic waste. For example, Deluxe Recycling (India) converts multilayer packaging and film into boards that can be used in construction and other applications, as does ReCB LLC (United States). Yet these technologies translate the feedstock into "downcycled" applications and generally do not allow it to be used in new packaging. Given the size of the mixed plastic waste stream and its contribution to leakage into the environment, there is a need for additional solutions – this is where advanced recycling is promising.

The potential solution: advanced recycling

In brief, advanced recycling (also referred to as molecular or chemical recycling) includes a number of technologies that use solvents, heat, pressure, and/or enzymes to break down plastic waste to the molecular level. The outputs can be fed back into the plastic value chain as a replacement for fossil-fuel-based feedstock without the loss of quality that comes with mechanical recycling. According to Closed Loop Partners, there are three categories of molecular recycling:

1. Purification

Uses solvents to dissolve plastic, allowing for the separation and removal of additives, dyes, and contaminants from the polymer. It does not break the molecular bonds of the plastic, but rather returns the plastic to a "purified" state.

2. Depolymerization

Uses thermal, chemical, or biological means to break the polymer chains back down into their original building blocks. These monomers can be repolymerized to create new plastic that is indistinguishable from virgin material.

3. Conversion

Uses high heat to break the molecular bonds of plastic waste into liquid or gaseous hydrocarbons. The output liquid and gas hydrocarbons can be used as feedstock in steam crackers to make new chemicals and plastics.

[10] Beyond packaging, there are other common plastics applications without commercial recycling solutions, for example, polyester textiles, electronics, and durable goods.

Key considerations for advanced recycling

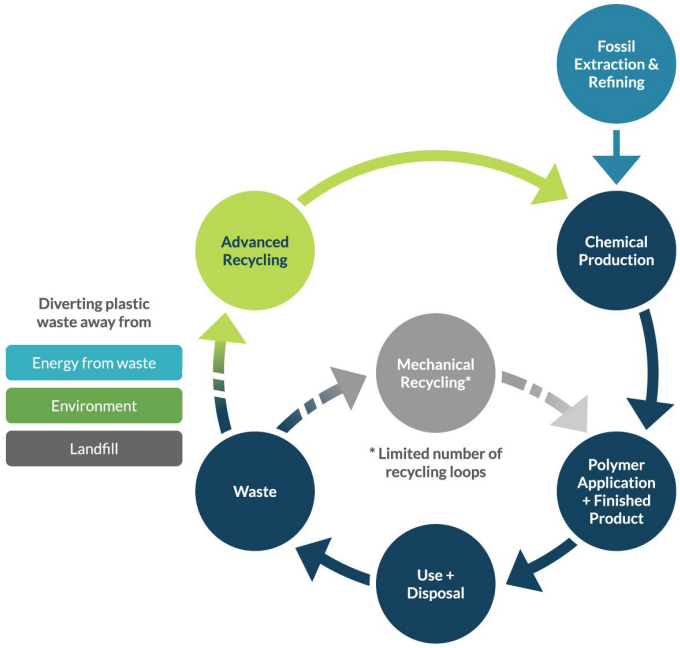
We recognize the perspective of some stakeholders that advanced recycling can perpetuate plastic production and that some advanced recycling approaches may have worse environmental impacts relative to virgin and mechanically recycled resin.

The Circulate Initiative believes source reduction should be the top priority, with reuse and refill models as key strategies, followed by mechanical recycling for resins such as PET and HDPE. We see advanced recycling as a part of the solution to plastic waste, expanding the range of plastic resins and formats that can be recycled, for example, flexible packaging and textiles. Advanced recycling can be particularly valuable in emerging markets where formats such as sachets are widely used.

As noted above, advanced recycling includes a number of categories and technologies, and it is important to evaluate the impacts of each technology and not make generalizations. The Closed Loop Partners report cited above has data on the carbon, water, and natural resource impacts of advanced recycling, for example, indicating that purification has the highest environmental benefits compared with virgin resin.

Given the variety of advanced recycling approaches and technologies, we use one company – Mura Technology – to illustrate how an AMC might apply to the recycling of mixed plastic waste. In brief, Mura uses supercritical water[11] to break down plastics to their basic molecular structures. Supercritical water acts as a solvent and stable heat transfer medium, enabling precise control of reaction kinetics and overcoming many of the scale-up challenges associated with conventional thermal processes. The resulting product stream is typically separated via flash distillation into steam-cracker-ready liquid hydrocarbons, which can be tailored to customer specifications. This process displaces virgin feedstock (i.e., oil and gas) with mixed plastic waste to produce new plastic products.

FIGURE 2: ILLUSTRATION OF MURA'S PROCESS FLOW



Mura works with waste aggregators to source mixed plastic waste as feedstock, striving for an average content of 90% polyolefins. Mura targets all types of HDPE, LLDPE, LDPE, and PP, with a focus on lower-value plastic waste given the limitations of mechanical recycling for these materials. Mura's process can tolerate other thermoplastics, including up to 5% of PET and roughly 7% of other polymers, including those in multilayer structures.

Mura has three facilities in advanced commissioning – in the United Kingdom, Japan, and South Korea – each with an output capacity of 20,000 tonnes per year. Mura has partnered with offtakers including Neste and Dow Chemical. Its next generation of Hydro-PRT® facilities have a higher output capacity of 50,000 tonnes per module, which can be deployed in multiples on a single site. Mura is evaluating projects in Europe, the Middle East, and Asia, with the potential to scale to 100,000 tonnes per site.

[11] Water under elevated temperature and pressure.

How an AMC might work

The virgin polymer production ecosystem has been operational for decades and thus has achieved substantial economies of scale. While there are a number of promising innovators in the molecular recycling sector, including Mura, these companies need time and investment to build high-volume recycling facilities and secure feedstock. Scale such as that which Mura is aiming to build is critical to meeting high-volume demand, and sufficient, binding commitments from buyers through an AMC would give advanced recyclers the certainty they need to invest.

Offtake agreements from individual brands, such as those between PepsiCo and Eastman and H&M and Syre, certainly send a strong demand signal and serve as an anchor commitment that suppliers can build upon. Yet, an AMC with multiple buyers and substantive financial commitments would send a stronger signal, allowing buyers to spread the risk and enabling multiple suppliers to compete for the purchases. The AMC platform would set the target price relative to virgin material and any necessary specifications. Rather than entering into 1:1 agreements with recyclers and making investments to advance their technologies, buyers would only purchase the outputs of the "winning" recyclers if the criteria are met.

With an increasing number of recycled content mandates for packaging in regions such as Europe, India, and California, packaging producers and brands will need solutions for all plastic resins and packaging formats that meet quality and food safety requirements. AMCs can send the necessary market signal to project developers and investors that new, large-scale facilities can deliver this recycled content and generate the necessary returns.

Scenario 2: Advanced recycling of textile waste

According to one estimate, roughly 120 million tonnes of apparel were discarded in 2024, the vast majority of which went to landfills and incineration. Currently, very little textile waste is recycled back into fibers for use in new products – according to Textile Exchange, virtually all (98%) of the recycled polyester used in fabric comes from PET bottles.

With the growth in so-called ultra-fast fashion in recent years, the apparel industry's consumption of fiber – specifically synthetic fibers such as polyester – has skyrocketed. Global fiber consumption in 2024 was 132 million tonnes, which is more than double that of 2000. Polyester's share of all fiber was 59% in 2024, compared with roughly 32% in 2000. The apparel sector is an overlooked source of plastic pollution – by one estimate, the apparel industry results in 8.3 million tonnes of plastic waste, or 14% of all plastic waste globally.

There is a global market for textile reuse and mechanical recycling. For example, a portion of discarded textiles is downcycled into wipers (rags) and used as filler for various applications (e.g., upholstery). That said, there is growing backlash to the export of used textiles from developed to developing markets. Also, mechanical recycling is limited in terms of the end outputs; for example, it generally cannot convert used garments back into fiber to be used in new apparel products.[12] Molecular recycling is a promising solution to this challenge.

The potential solution: advanced recycling

As described in the scenario for mixed plastic waste, advanced recycling comprises a variety of technologies that use solvents, heat, and enzymes to break down plastic waste, including textiles with synthetic content such as polyester, to the molecular level. The outputs can be used to produce new fiber of the same quality as virgin synthetics for apparel products.

There are a growing number of advanced recyclers focused on textiles – Ambercycle, Circ, Reju, and Syre, to name a few.

This trend has been driven by a number of factors, including brand interest in "next-generation" sustainable materials, reducing GHG emissions, and fiber security and diversification (i.e., from PET bottles). On the latter point, as more governments around the world mandate recycled content in consumer packaging, the textile sector will face more competition for PET bottles.

While there are examples of bilateral agreements between textile recyclers and brands, and emerging collaborative platforms such as Fiber Club and the Nylon Materials Collective, we have yet to see collective procurement at significant scale.

Select partnerships and offtake agreements for recycled textiles

H&M contract with Syre to purchase US$ 600 million of textile-recycled polyester over seven years

Nike multi-year agreement to incorporate recycled polyester from Syre in products

REI Co-op three-year offtake agreement to purchase textile-recycled polyester from Ambercycle

Arvind Limited partnership to incorporate recycled textile material from Circ

[12] While some mechanically recycled fiber can be incorporated into new fiber, the recycling process damages the fiber, and thus it must be blended with virgin material to be used.

How an AMC might work

Similar to the case with plastic packaging recycling, the textile recycling sector is competing against an incumbent system that has developed economies of scale and thus cost advantages over decades. Not only do textile recyclers need to solve the technical challenge of recycling apparel – a sizable portion of which is made from mixed materials – but they also need to figure out how to integrate their technologies into a value chain that spans the globe. For example, hotspots of post-consumer textile waste such as the United States and Europe are far from where materials and finished products are made (e.g., Asia).

Over the last decade or so, apparel brands have provided funding to textile recyclers, some of which have faced financial challenges and others have failed to deliver on their ambitions. In bringing together multiple buyers to support textile recycling, an AMC could accelerate the development of textile recycling technology and allow buyers to spread the risk of bringing new innovations to market. Through an AMC, buyers would make firm financial commitments, but payments would be made to innovators only if they met the specifications defined by the AMC platform. Such a model would go against conventional procurement practices in which brands purchase materials a few seasons in advance at a market price. With an AMC, brands would essentially be putting funds into an escrow account to purchase material years into the future, with the funds drawn only if a supplier meets the agreed specifications and price.

Scenario 3: Paper-based alternatives to flexible plastic packaging

As noted in the mixed plastic waste scenario, multilayer and flexible packaging formats represent a growing portion of plastic waste that leaks into the environment, particularly in emerging economies where sachets are widely used to deliver products to lower-income consumers. In addition to the challenges posed by the material composition of flexible packaging, collection and sorting in material recovery facilities are also difficult given the small size of many formats (e.g., candy wrappers, crisp bags).

Given these challenges, we should ultimately look for opportunities to reduce the use of small-format packaging, for example, through reuse and refill and larger formats made with resins that are more widely recyclable. In the interim, paper-based alternatives could reduce the environmental impacts of flexible packaging, and there is growing interest in this material type.

The potential solution: paper-based flexible packaging

In March 2026, the Ellen MacArthur Foundation published a paper on the potential for paper to play a role in addressing plastic flexible packaging waste, particularly in countries with high rates of leakage into the environment. Such paper versions would include a cellulosic substrate combined with performance elements such as barrier coatings. The Foundation described the above-mentioned challenges with the collection and sorting of small-format packaging, as well as the trade-offs between paper and plastic. For example, there are deforestation, water, and biodiversity impacts to consider with paper. Yet, the Foundation cited several advantages of paper, including its greater likelihood of biodegradability when leakage occurs and its higher potential for recycling if collection and sorting can be addressed. It also presented design criteria to ensure that paper-based flexible packaging is responsibly designed and sourced and to avoid unintended environmental and social consequences.

How an AMC might work

As with other sustainable materials that compete with incumbent versions, scaling paper-based flexible packaging will require significant investment in research and development to ensure that the paper performs on an equivalent basis to conventional flexible packaging across different products and environments (e.g., paper can be challenged in hot and humid climates). Investment is also needed for equipment as well as for operational processes such as applying coatings.

An AMC is very well suited to this scenario given these investment needs and the seemingly increasing interest among brands and packaging companies in paper alternatives (see, for example, the dozen-plus companies that endorsed the Foundation's report). This interest is in part due to looming regulatory requirements that threaten the existence of current plastic-based flexible packaging, for example, in California.

An AMC for paper solutions to flexibles would work in a similar fashion to the other scenarios. Buyers would commit set amounts of funding to purchase paper-based solutions if agreed-upon specifications are met. Individual brand commitments would be combined so that innovators see the full market demand, allowing them to compete for the purchase. If the specifications are met, then the funds would be transferred to the "winning" supplier, and brands would receive the material. As noted earlier in this report, given that physical material is being transferred (as opposed to carbon removals with Frontier Climate), the AMC would need to work with participants to design the logistics.

Conclusion and next steps

Based on our research, AMCs have the potential to address the supply / demand gap for recycled and alternative materials, if applied to specific resin types and packaging formats. We identified three such scenarios: mixed plastic waste, textile waste, and paper-based alternatives for flexible packaging. Each of these meets the factors that we believe are needed for AMCs:

- ✔ High research and development and capital expenditures required to scale supply
- ✔ A need for multiple vs. single (or few) buyers
- ✔ Alignment on technical specifications
- ✔ A need for a robust and diverse supply base

In speaking with a range of stakeholders on these scenarios, there is enthusiasm about AMCs. However, we would need to see buyers that are willing to match their enthusiasm with firm financial commitments, and a willingness to change how their organizations typically procure goods. Without binding and bankable commitments from buyers, suppliers will not have the needed certainty to raise capital and invest.

Over the next year, with this report as a foundation, we will go deeper into each scenario and convene the key actors who would need to be involved in each, for example buyers (e.g., brands), packaging converters, innovators, representatives from the waste collection sector, and more. While our partners will influence the geographic focus of these deep dives, our intent is to identify opportunities in emerging markets, given the prevalence of plastic waste in these regions and The Circulate Initiative's own footprint.

Our aim is to define the structure and key elements of each AMC, for example:

- Governance and management of the AMC platform
- Partners and collaborators
- Criteria and specifications for the solution in focus
- Minimum buyer monetary commitments
- Duration of AMC platform (i.e., how long do suppliers have to deliver?)
- Process for evaluating innovator offerings
- Transaction mechanics and logistics (e.g., how physical material is exchanged)
- Impact measurement and reporting
- Legal implications (e.g., antitrust)

We look forward to this next step to translate our research into actual AMC platforms.

The Circulate Initiative

Breaking the Bottleneck: How Advance Market Commitments Can Bridge the Supply-Demand Gap in Recycled Materials

This research report is supported by Builders Vision Philanthropy

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