



Introduction to End Markets for Hard-to-Recycle Plastics

101
DOC



RECOVERY



GreenBlue is an environmental nonprofit dedicated to the sustainable use of materials in society. We bring together a diversity of stakeholders to encourage innovation and best practices to promote the creation of a more sustainable materials economy.

The Sustainable Packaging Coalition (SPC) is a membership-based collaborative that believes in the power of industry to make packaging more sustainable. We are the leading voice on sustainable packaging and we are passionate about the creation of packaging that is good for people + the environment. Our mission is to bring packaging sustainability stakeholders together to catalyze actionable improvements to packaging systems and lend an authoritative voice on issues related to packaging sustainability. The Sustainable Packaging Coalition is a trademark project of GreenBlue Org.

A Project of

See what else
we're working on

Introduction

The question “Can this _____ be recycled?” often brings to mind the theoretical feasibility of using a material as a feedstock to manufacture a new product. In practice, however, recyclability encompasses several factors, including material selection and design choices, collection, sortation, technical reprocessability and the quality of the reprocessed material, and finally, end markets. Challenges at one or more of these stages contribute to a material being considered “hard-to-recycle.” Lack of robust end markets is a key challenge for recycling certain plastics. Materials that do not have an end market, meaning no one is willing to use the materials to make new items, cannot be considered recyclable.

Hard-to-recycle plastic packaging materials include films and flexible packaging, thermoforms, colored plastics, foams, and small format packaging. Oftentimes these items face challenges at more than one stage of recovery. For instance, black plastics may not be able to sort properly at a materials recovery facility (MRF), hindering their recycling. Black or dark colored plastics that can be recognized by optical sorters still have lower value when it comes to end markets, because these materials can only be made into dark colored recycled products. Likewise, plastic bags and other flexible plastics are typically considered contaminants at MRFs due to their tendency to wrap around and jam equipment. Even when these flexible plastics are successfully sorted out from other materials, low-grade MRF film bales often cannot be sold due to lack of buyers for this material.

Author

Ruth Maust, GreenBlue

EditorsLucy Pierce, GreenBlue
Elizabeth Ritch, GreenBlue

The circularity of hard-to-recycle plastics benefits from design for recyclability, improved infrastructure for collection and sortation, and increased demand pull from end markets. However, some plastics are so unlikely to be recycled that they have been deemed “problematic or unnecessary” materials by the U.S. Plastics Pact. All materials can benefit from efforts to increase circularity; however, problematic or unnecessary materials should be avoided altogether if possible.

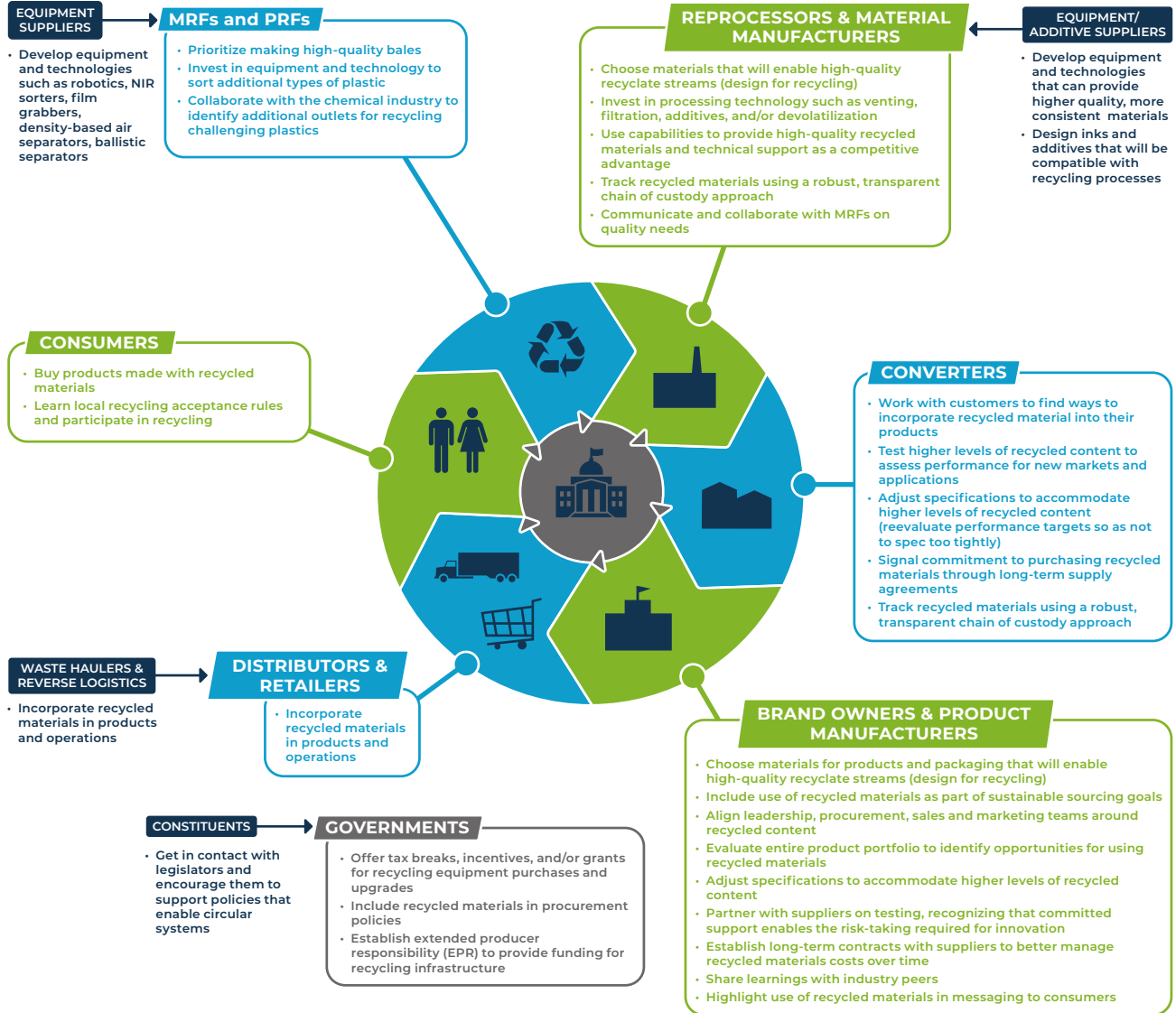
At present, despite growing amounts of plastic being produced, used, and discarded, many companies seeking to incorporate recycled plastic into their products are struggling to meet their recycled content goals. This apparent contradiction can be explained by the market disconnect between supply of and demand for recycled materials. In particular, there are relatively small volumes available of high-quality recycle, such as material suitable for food contact packaging. Non-packaging applications such as building products and other durables are typically more tolerant of lower- or variable-quality recycle. Still, as long as fossil plastic continues to be cheap and readily available, there is little system-wide incentive to dedicate the resources necessary to collect, sort, clean, transport, and adapt manufacturing processes to make use of the plastic already in existence.

So what can be done to bridge the market disconnect? How can stakeholders throughout the plastics value cycle create and expand end markets for plastics that are currently considered hard-to-recycle? The economics of processing and using recycled plastics must be worthwhile, which can be achieved via numerous paths.

- Policy levers to incentivize use of recycled materials include extended producer responsibility (EPR) and recycled content mandates.
- Voluntary measures such as long-term supply contracts can lessen price volatility and provide certainty for both recyclers and buyers of recycled materials.
- Certifications are a valuable tool to support transparency and sustainable sourcing and increase the use of recycled materials. In addition, purchasing recycled material credits or certificates funds investment in reprocessing capacity to increase the future supply of recycled materials.
- Finally, developing and identifying recycled materials suitable for different applications offers opportunities to expand and strengthen end markets for recycled materials with a range of properties and qualities.



HOW THE VALUE CYCLE CAN SUPPORT END MARKETS



RESOURCES & GUIDES



[Stina Recycled Plastic Buyers and Suppliers Directory](#)

[Sustainable Packaging Coalition Design for Recycled Content Guide](#)

[U.S. Plastics Pact PCR Toolkit](#)

[EPA Recycling Infrastructure and Market Opportunities Map](#)

[Stina Buy Recycled Products Directory](#)

[Applying Systems Thinking to Recycling \(ASTRX\) Resources](#)

Notable Projects in Plastic Markets

RECYCLED MATERIALS STANDARD (RMS)

The [Recycled Materials Standard](#), a project of GreenBlue, is a comprehensive standard for third-party certification of recycled materials. The standard is based on a chain of custody model that links claims from the beginning of manufacturing to the final product. The standard currently supports complete accounting of non-virgin plastics for companies in North America.



ASSOCIATION OF PLASTIC RECYCLERS (APR) DEMAND CHAMPIONS

Participants in [APR's Demand Champions](#) program commit to purchase more post-consumer recycled plastic (PCR) than they did in the prior year. By encouraging incorporation of more PCR in plastic products as well as the purchase of products made with PCR, APR aims to establish consistent and reliable market demand for post-consumer recycled plastics.



MATERIALS RECOVERY FOR THE FUTURE (MRFF)

[Materials Recovery for the Future](#) was a series of proof of concept studies conducted at a state-of-the-art materials recovery facility in Pennsylvania. The final phase of the MRFF project evaluated opportunities for using rFlex (primarily PE film) bales in markets such as roof board, concrete additives, pallets, new film, and as a feedstock for pyrolysis.



PLASTICS INDUSTRY ASSOCIATION NEW END MARKET OPPORTUNITIES (NEMO)

The [Plastics Industry Association](#) has worked to identify end markets for hard-to-recycle plastics, namely, plastic film and car bumpers. The car bumper recycling project involved establishing relationships between auto body shops and recyclers. The plastic film project evaluated replacement of polymers used to modify asphalt with recycled polyethylene from plastic film.





A Project of



See what else
we're working on

