

Plastic Recycling

Understanding Today's Recycling System and Opportunities for Improvement

What is Plastic Recycling?

Plastic recycling refers to the collection, sorting, processing, and remanufacturing of plastic materials into new products. Recycling can help conserve resources, reduce greenhouse gas emissions, decrease reliance on virgin plastic production, and divert waste from landfills and the environment.

Despite decades of investment and technological improvements, plastic recycling remains one of the most challenging components of modern waste management systems. Differences in plastic resin types, consumer behavior, collection systems, market demand, contamination, and processing infrastructure all impact recycling outcomes.

While recycling plays an important role in a circular economy, it is only one tool among many including source reduction, reuse, redesign, composting, and recovery technologies that are needed to manage plastic waste effectively.

The Current State of Plastic Recycling

Plastic plays an essential role across the U.S. economy, but much of its value is lost when materials are not recovered at the end of their useful life. According to the Circular Economy for Plastics in the Bi-National Great Lakes Region Gap analysis prepared for Circular Great Lakes by Resource Recycling Systems (RRS), approximately 18% of plastic containers and packaging are recovered for recycling in North America, with the Great Lakes region reportedly recovering similar amounts, highlighting significant opportunities to improve collection, processing, and end-market development.

The report uses the U.S. EPA's National Recycling Goal of achieving a 50% recycling rate for municipal solid waste by 2030 as a benchmark for measuring recovery potential. RRS estimates that meeting this goal in the Great Lakes region would require recovering an additional 20.99 million tons of recyclable materials annually, including approximately 3.04 million additional tons of plastics. Achieving this will require continued investment in collection systems, sorting and recycling infrastructure, product design, and strong end markets for recycled materials.

Plastic Recycling: Progress Over the Past 20 Years

Over the past two decades, plastic recycling systems across North America have made significant progress. Investments in collection programs, advanced sorting technologies, recycling infrastructure, and policy initiatives have increased the amount of plastic diverted from landfill and improved the quality of recovered materials.

At the same time, growing plastic consumption, changing packaging formats, and market disruptions have created new challenges for recycling systems. Today, recycling infrastructure is more sophisticated and resilient than it was 20 years ago, but continued investment, innovation, and policy support will be needed to keep pace with increasing material generation and growing demand for circular solutions.



Year/Period	Event	Impact on Recycling
2008–2009	Global Financial Crisis	Reduced demand for recycled commodities and created significant market volatility.
2013–2018	China's Green Fence & National Sword Policies	Tightened contamination standards and restricted recyclable imports, exposing weaknesses in North American recycling systems and accelerating investment in domestic infrastructure.
2018–Present	Growth of E-Commerce	Increased packaging generation, particularly cardboard, films, and flexible plastics, creating new collection and recycling challenges.
2020–2022	COVID-19 Pandemic	Caused labor shortages, market disruptions, and increased the need and use of single-use packaging due to sanitary concerns while highlighting supply chain vulnerabilities.
2020–Present	Corporate Recycled Content Commitments	Major brands established recycled content goals, increasing demand for post-consumer recycled (PCR) materials and investment in recycling infrastructure.
2021–Present	Expansion of Extended Producer Responsibility (EPR)	New packaging EPR programs shifted responsibility to producers and created new funding mechanisms for recycling systems.
2022–Present	Inflation & Rising Energy Costs	Increased operational costs for collection, sorting, and recycling facilities while affecting the competitiveness of recycled materials.
2024–Present	Global Plastics Treaty Negotiations	Increased international focus on plastic pollution, circular economy strategies, recycling, and waste reduction policies.

Single-Stream vs. Multi-Stream Recycling

Collection systems play a major role in recycling performance.

Single-Stream Recycling

Single-stream systems allow residents to place all recyclables into one collection container.

Advantages

- Convenient for households
- Higher participation rates
- Lower collection costs

Challenges

- Increased contamination
- Higher sorting requirements
- Lower material quality

Multi-Stream Recycling

Multi-stream systems require materials to be separated by type before collection.

Advantages

- Higher quality materials
- Reduced contamination
- Improved marketability

Challenges

- Lower participation in some areas
- More complex collection systems
- Higher collection costs

Many jurisdictions continue to evaluate tradeoffs between convenience and material quality when designing recycling programs.

Plastic Diversion in the Great Lakes Region

State/ Province	Plastic Packaging Recycling Rate (Includes Flexible Packaging)
Minnesota	14%
New York	12%
Michigan	12%
Wisconsin	12%
Pennsylvania	11%
Illinois	11%
Indiana	9%
Ohio	8%

Source: Ball Corporation & Eunomia, 50 States of Recycling 2.0 (2023).

Provincial recycling figures are not reported consistently across Canada and should not be considered directly comparable. RECYC-QUÉBEC reports that 20% of plastics generated through Quebec's municipal selective-collection system were sent for recycling in 2023. A comparable official, province-wide recycling rate specifically for plastic packaging could not be identified for Ontario; available provincial reporting uses different material categories and performance measures. Nationally, the Canada Plastics Pact estimates that 16% of plastic packaging generated in Canada was recycled in 2022.

Challenges Facing Plastic Recycling

Technical Challenges- Different resin types (PET, HDPE, LDPE, PP, PS, and others) may require separate processing streams which can be solved by optical sortation. Mixed materials, labels, adhesives, colors, and additives can complicate recycling.

Varied Infrastructure- According to Resource Recycling Systems (RRS), 53% of U.S. households have automatic curbside recycling. In contrast, Ontario and Quebec each provide curbside recycling access to more than 90% of households. Across the region, what's accepted at the curb varies depending on available infrastructure. Sparsely populated rural areas pose additional challenges for collection infrastructure.

Consumer Participation- Recycling systems depend on public participation and proper sorting behavior. Contamination remains one of the largest barriers to efficient recycling.

End Market Development- Recovered materials must have viable buyers. Without stable demand for recycled content, collection and processing systems become economically challenging. Low prices of using virgin materials disincentivizes the purchase of post consumer material.



Building an Effective Recycling System

According to The Recycling Partnership, five conditions are necessary for a successful recycling system:

Recyclable Packaging- Products should be designed for recyclability whenever possible.

Universal Access- All households should have convenient recycling opportunities.

Consumer Participation- Residents need clear guidance and education to recycle properly.

Efficient Processing- Facilities should maximize material recovery while minimizing contamination.

Strong End Markets- Recovered materials need consistent demand from manufacturers and brand owners.

Key Takeaways for Policymakers

Systems Approach – Recycling is an important component of a circular economy and delivers the greatest benefits when combined with waste prevention, reuse, product redesign, and other complementary strategies.

Access & Infrastructure – Convenient collection systems, modern sorting and recycling infrastructure, and investment across the value chain can improve material recovery, increase participation, and strengthen system performance.

Product Design & Policy – Designing products and packaging for circularity, together with policies such as Extended Producer Responsibility (EPR) and other market-based approaches, can help improve material recovery, support innovation, and strengthen recycling systems. Different jurisdictions may implement these policies in different ways to meet local needs.

Markets & Material Quality – Strong demand for recycled materials, low contamination, and reliable end markets are essential for maintaining economically viable recycling systems.

Data & Continuous Improvement – Reliable data on material generation, recovery, contamination, and end markets supports informed decision-making and helps identify opportunities to improve recycling performance.

Collaboration & Investment – Advancing plastic recycling requires ongoing collaboration among governments, industry, communities, and consumers, along with continued investment in infrastructure, technology, education, and market development.