

Advanced recycling strategies needed to clean up plastic pollution problem, says expert

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Sustainability across the entire value chain—rather than advances in technology alone—is required to solve the United States' plastic waste problems, according to a new brief from Rice's Baker Institute for

Public Policy.

The report by Rachel Meidl, fellow in energy and environment at the Baker Institute, argues that the U.S., which is one of the largest contributors to global pollution and has among the lowest [recycling](#) rates, needs to improve the quality of its plastics and the economics of collection, sorting and [waste management](#).

"It is imperative to understand that the vision of a circular economy can only be realized by deeming used plastic a resource and not a [waste](#), and through employing advanced recycling technologies that 'keep the molecule in play' and maintain materials at an economic value," she wrote.

Plastic recycling in the U.S. has been at 9% since 2012, while the current global rate is between 14% and 18%, according to the report. Current conventional recycling technology in the U.S. is strained by the "steadily increasing volume of plastics, which cannot be managed using only traditional mechanical recycling," Meidl wrote.

"With [global demand](#) for plastics projected to triple by 2050, the overall contribution of plastic waste to the supply chain must change dramatically," she continued. "The recycling and petrochemical industries can play an important role in the transition to a circular economy by converting polymeric waste into virgin-grade feedstock, which can then be used to produce new materials and chemicals of virgin-grade quality."

The U.S. ranks as high as third among countries contributing to coastal plastic pollution, according to new figures that account for U.S. plastic exports and illegal dumping and littering domestically.

"More than half of all plastics collected for recycling in the United

States were exported, and, of this, 88% of exports were routed to countries with insufficient solid waste infrastructure, unable to effectively manage, recycle or dispose of plastics," Meidl wrote. "Accounting for these updated contributions, the amount of plastic waste generated in the United States and estimated to enter the coastal environment is five times larger than previously estimated, rendering the U.S. contribution among the highest in the world."

Advanced recycling, also called chemical recycling, has the potential to help the nation achieve global sustainability goals and a climate-neutral, circular economy, according to Meidl. It increases the capacity to process and recover unrecyclable plastics waste and ensures that more polymers are reprocessed into higher-value products.

Yet, sustainability will require informed and balanced policies that keep pace with technologies across their whole life cycle and account for impacts along the global supply chain, Meidl argues.

"The United States cannot progress to circularity without an advanced recycling agenda that recognizes the value in plastic waste," she wrote. "Chemical recycling is only one key component in an overall integrated waste management system that will complement existing mechanical methods that are successfully and profitably managing a subset of polymers."

Meidl argues the Biden administration should commission a sustainability study on the social, environmental and economic impacts of chemical recycling technologies to identify where federal investment in research and development is needed.

"Without a transformational shift in our approach, the mismanagement of plastics waste will continue, resulting in the loss of valuable materials and squandered opportunities to recover and harvest the value of these

resources," she wrote. "If sustainability is a global and national priority, it is imperative to understand that the vision of a circular economy can only be realized by deeming used [plastic](#) a resource and not a waste."

The brief is part of a series of policy recommendations for the Biden administration on pressing issues facing the country. View the entire series at www.bakerinstitute.org/recommendations-2021.

Provided by Rice University

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