

Advanced Recycling: Reducing Plastic Waste, Cutting Emissions, Growing Economies

Plastics are highly valuable materials that play an important role in the modern economy. Plastics increased sustainability benefits compared to alternative materials and will continue to play an important role in helping society mitigate greenhouse gas emissions.

As we move toward a circular economy, there is greater demand to increase plastic recycling as well as recycled content in products. **Advanced recycling is a necessary and essential complement** to mechanical recycling to ensure that plastics stay **out of the environment**, while also creating **new products** and **economic growth opportunities** that benefit society.

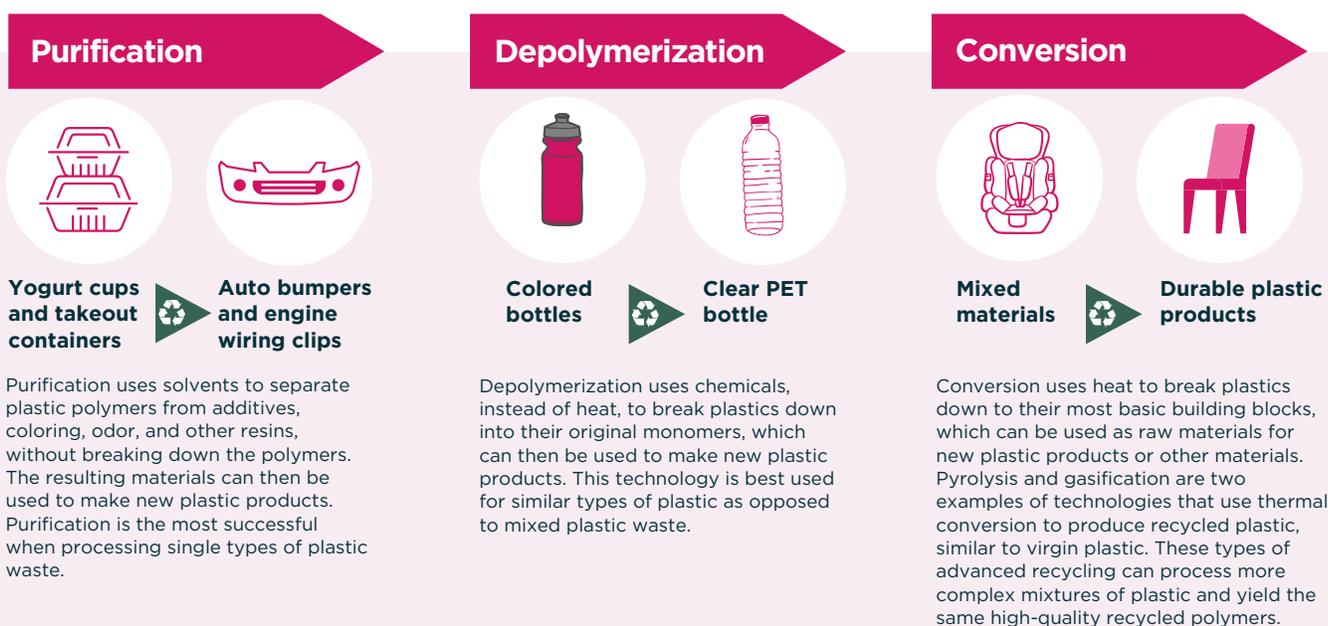
What is Advanced Recycling?

Advanced recycling, also known as chemical, molecular, tertiary or feedstock recycling, encompasses any technology that converts plastics into a purified form or a feedstock that can be used in the production of new polymers, monomers, intermediates, or other materials.

How does Advanced Recycling work?

While mechanical recycling uses physical processes such as grinding, washing, separating, and compounding in which polymers remain intact, advanced recycling typically alters the chemical structure of plastics, by methods such as dissolving with chemicals or using heat to break them down into original components. Advanced recycling produces materials that are indistinguishable from virgin plastic so they can be used to make a wide range of new products.

Advanced recycling is typically grouped into three categories: purification, depolymerization, and conversion.



More than one million Americans work in jobs directly or indirectly connected to the plastics industry, spanning a wide range of sectors. From the engineers who design the machinery that manufactures essential plastic products, to the material suppliers distributing raw plastics, to the processors shaping materials into goods, and the recyclers giving used plastic a second life, the plastics supply chain is a vital aspect within both the U.S. and global economy.

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Environmental Benefits

In addition to diverting plastics from landfills and ensuring that plastics stay out of the environment, advanced technologies are more environmentally beneficial than the production of virgin plastic from fossil fuels from an emissions standpoint. According to a 2021 report from investment firm, [Closed Loop Partners](#), purification, depolymerization (decomposition), and conversion technologies require less energy, less water and emit fewer greenhouse gases compared to the production of virgin plastics. These technologies can also help mitigate climate change by displacing the use of virgin plastics and keep valuable materials in circularity.

Economic Opportunity

In a 2021 report, [Closed Loop Partners](#) found that advanced recycling could yield up to **\$970 million** in potential revenue based on demand for advanced recycling products and double the amount of plastic packaging recycled in 2019. The development of advanced plastic recycling and recovery facilities also have the potential to support nearly **40,000** new jobs in the United States alone. Major brands already buying or committed to using products from advanced recycling include Gatorade, H&M, L'Oréal, Procter & Gamble, PepsiCo, and Unilever. Just in the last few years, several industry members have also announced new investments in [advanced recycling facilities](#), like Exxon's expanded capacity in Texas, to ensure that all plastic can and is recycled.