

FACT SHEET

“CHEMICAL RECYCLING” IS NOT RECYCLING: The Plastic Industry Is Greenwashing Incineration

Every year, an estimated 242 million metric tons of plastic waste is produced globally, polluting the world’s cities and oceans.¹ The United States is one of the top generators but recycles only about 8.7 percent of its plastic waste; the rest is incinerated or landfilled or ends up in the environment.² As public concern grows about mountains of plastic trash, the plastics industry is promoting technologies known as “chemical recycling” as a solution to the waste crisis—they are not.

An NRDC review of eight “chemical recycling” plants in the U.S. found that these facilities:

- generate little to no recycled plastic;
- produce hazardous waste; and
- exacerbate environmental injustices.³

Quite simply, “chemical recycling” will not solve our plastic problem, no matter how the industry tries to spin it.

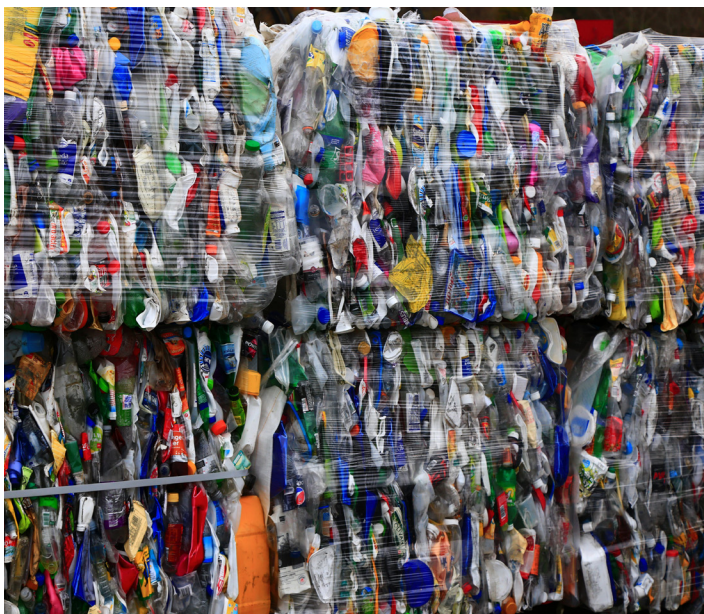
WHAT IS “CHEMICAL RECYCLING?”

The term “chemical recycling” encompasses a variety of processes that convert plastic to fuel or plastic to chemical components. Plastic-to-fuel conversion uses pyrolysis or gasification, both of which apply heat and chemical processes to break down plastic waste into products used for fuel.⁴ The conversion of plastic to chemical components, often referred to as plastic-to-plastic, typically involves the use of heat and solvents to create feedstocks that can further be processed into other chemicals or new plastics.⁵ Technologies called chemical depolymerization and solvent-based purification fall under the plastic to chemical components umbrella.

THE PROBLEMS WITH “CHEMICAL RECYCLING”

Our analysis found that “chemical recycling” technologies are fraught with health and environmental hazards. Among other issues, they:

Create materials that are typically burned—not turned into new plastic. The majority of “chemical recycling” facilities that NRDC studied use energy-intensive processes to turn plastic into fuel that is then burned for energy. This process emits more greenhouse gases than fossil fuel-fired power plants, releases harmful air pollution and toxic chemicals, and offers none of the ecological or economic benefits of true recycling, which returns materials to the production cycle.⁶ Previous analyses indicate that plastic to chemical components “recycling” is barely present on a commercial scale in the U.S.⁷



© Nareeta Martin

Produce toxic air pollutants and large amounts of hazardous waste. By-products generated by “chemical recycling” facilities include benzene, toluene, dioxins, and many other toxics linked to cancer, birth defects, and other serious health problems.⁸ Also of major concern is the volume of hazardous waste these plants can produce. In 2019, one Oregon facility reported disposing of nearly 500,000 pounds of hazardous waste.⁹

Perpetuate issues of environmental injustice. Low-income communities and communities of color already disproportionately bear the burden of health risks from living in proximity to plastics manufacturing facilities, which release highly toxic pollutants.¹⁰ “Chemical recycling” facilities, as well as the incineration sites where their waste products are burned, are similarly situated.¹¹ Of the eight facilities NRDC researched, seven were in communities that are disproportionately Black or brown, low-income, or both.

POLICY RECOMMENDATIONS

“Chemical recycling” will not solve the plastic waste crisis. What is needed instead are policies that reduce plastic production and waste and that promote greater transparency about “chemical recycling.” Such policies should:

Ensure comprehensive regulatory safeguards. Multiple states have reclassified “chemical recycling” plants so that they are no longer considered solid waste facilities, thus

weakening the waste and pollution regulations and reporting requirements these facilities must meet.¹² To ensure transparency and data access, and to protect environmental and human health, “chemical recycling” plants must be classified as solid waste facilities.

Maintain robust definitions of recycling and standards that exclude “chemical recycling.” Converting plastics to fuel creates the mirage of “recycling”—one the plastics industry embraces because it allows for continued high-volume plastic production while assuaging public concerns about plastic use and waste.¹³ Claiming “chemical recycling” is recycling plastic is greenwashing by manufacturers. Turning plastic into fuel cannot be considered recycling, and recycling standards and definitions must continue to exclude such processes.

Invest in solutions that reduce plastic production and waste. Real solutions to reduce plastic harms include the elimination of unnecessary plastics (such as single-use plastics); innovating and scaling up reuse and refill models; creating nontoxic materials to replace fossil fuel-derived plastics; and scaling up proven mechanical recycling and composting solutions.¹⁴

The world is drowning in plastic, and we need to turn off the tap. “Chemical recycling” is a false solution that creates new harms instead of less plastic waste.

ENDNOTES

- 1 National Academies of Sciences, Engineering and Medicine, *Reckoning With the U.S. Role in Global Ocean Plastic Waste*, 2021, <https://www.nap.edu/catalog/26132/reckoning-with-the-us-role-in-global-ocean-plastic-waste>.
- 2 U.S. Environmental Protection Agency (hereinafter EPA), “Plastics: Material-Specific Data,” September 12, 2017, <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/plastics-material-specific-data>. National Academies of Sciences, Engineering and Medicine, *Reckoning with the U.S. Role*.
- 3 Veena Singla and Tessa Wardle, “Recycling Lies: ‘Chemical Recycling’ of Plastic Is Just Greenwashing Incineration,” NRDC, March 2022, <https://www.nrdc.org/resources/recycling-lies-chemical-recycling-plastic-just-greenwashing-incineration>.
- 4 Tariq Maqsood et al., “Pyrolysis of Plastic Species: A Review of Resources and Products,” *Journal of Analytical and Applied Pyrolysis* 159 (October 1, 2021): 105295, <https://doi.org/10.1016/j.jaap.2021.105295>. S. A. Salaudeen, P. Arku, and Animesh Dutta, “Gasification of Plastic Solid Waste and Competitive Technologies,” chapter 10 in *Plastics to Energy*, S. M. Al-Salem, ed. (Norwich, NY: William Andrew Publishing, 2019), <https://doi.org/10.1016/B978-0-12-813140-4.00010-8>.
- 5 Dominik Triebert et al., “Solvent-Based Recycling,” chapter 3 in *Circular Economy of Polymers: Topics in Recycling Technologies*, ACS Symposium Series, vol. 1391, Dimitris Collias, Martin James, and John Layman, eds. (Washington, DC: American Chemical Society, 2021), <https://pubs.acs.org/doi/pdf/10.1021/bk-2021-1391.ch003>. Yu Miao, Annette von Jouanne, and Alexandre Yokochi, “Current Technologies in Depolymerization Process and the Road Ahead,” *Polymers* 13, no. 3 (January 2021): 449, <https://doi.org/10.3390/polym13030449>.
- 6 Global Alliance for Incinerator Alternatives (hereinafter GAIA), “Pollution and Health Impacts of Waste-to-Energy Incineration,” 2019, https://www.no-burn.org/wp-content/uploads/Pollution-Health_final-Nov-14-2019.pdf. GAIA, “Facts About ‘Waste-to-Energy’ Incinerators,” 2018, <https://www.no-burn.org/wp-content/uploads/GAIA-Facts-about-WTE-incinerators-Jan2018-1.pdf>. Brenda Platt, “Stop Trashing the Climate: Full Report,” Institute for Local Self-Reliance, June 2008, https://ilsr.org/wp-content/uploads/2008/06/fullreport_stoptrashingtheclimate.pdf.
- 7 Denise Patel et al., *All Talk and No Recycling: An Investigation of the U.S. ‘Chemical Recycling’ Industry*, GAIA, 2020, https://www.no-burn.org/wp-content/uploads/All-Talk-and-No-Recycling_July-28.pdf.
- 8 Agilyx 2020 Annual Report for the Regenx Tigard Facility, submitted to the Oregon Department of Environmental Quality, February 5, 2021, https://www.deq.state.or.us/AQPermitsOnline/34-9514-SI-01_AR_2020.PDF. Ohio Environmental Protection Agency, “Final Air Pollution Permit-to-Install and Operate—Alterra,” July 5, 2017, <http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=648016>. North Carolina Department of Environmental Quality, “Braven Environmental Air Permit,” September 25, 2020, <https://xapps.ncdenr.org/aq/FDOcsServlet>. Indiana Department of Environmental Management, Permits Branch Office of Air Quality, “Brightmark Permit Renewal,” June 22, 2021, <https://permits.air.idem.in.gov/43439f.pdf>. Georgia Department of Natural Resources, Environmental Protection Division, “Nexus Air Permit,” July 17, 2017, <https://permitsearch.gaepd.org/permit.aspx?id=PDF-ON-24218>. Ohio Environmental Protection Agency, “PureCycle Technologies Final Air Pollution Permit-to-Install and Operate,” September 8, 2018, <http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=900987>. CalSAFER, “Candidate Chemical: Benzene,” <https://calsafer.dtsc.ca.gov/cms/candidatechemical/?rid=22033> (accessed December 4, 2021). California Code of Regulations Division 4.5, Title 22, Chapter 55, 69502.2 § (2013).
- 9 EPA, “BR Facility Summary Report—Agilyx,” 2019, https://enviro.epa.gov/enviro/brs_report_v2.get_data?hand_id=ORQ000029621&rep_year=2019&naic_code=&naic_code_desc=&yvalue=2019&mopt=0&mmopt=0&wst_search=0&keyword1=&keyword2=&keyword3=&rvalue1=&rvalue2=&rvalue3=&cvalue1=&cvalue2=&cvalue3=.
- 10 David Azoulay et al., *Plastic & Health: The Hidden Costs of a Plastic Planet*, Center for International Environmental Law, February 2019, <https://www.ciel.org/wp-content/uploads/2019/02/Plastic-and-Health-The-Hidden-Costs-of-a-Plastic-Planet-February-2019.pdf>. Robert D. Bullard and Beverly Wright, *Race, Place, and Environmental Justice After Hurricane Katrina: Struggles to Reclaim, Rebuild, and Revitalize New Orleans and the Gulf Coast* (New York: Avalon, 2009).
- 11 Ana Isabel Baptista and Adrienne Perovich, *U.S. Municipal Solid Waste Incinerators: An Industry in Decline*, GAIA, May 2019, <https://www.no-burn.org/u-s-municipal-solid-waste-incinerators-an-industry-in-decline/>.
- 12 GAIA, “State Legislation Alert,” December 18, 2019, https://www.no-burn.org/wp-content/uploads/US-ACC-State-Legislation-Alert-2019_Dec-18.pdf. Johnna Crider, “Louisiana Passed Legislation to Allow for Chemical Recycling, AKA ‘Advanced Recycling,’” CleanTechnica, July 6, 2021, <https://cleantechnica.com/2021/07/06/louisiana-passed-legislation-to-allow-for-chemical-recycling-aka-advanced-recycling/>.
- 13 Patel et al., *All Talk and No Recycling*. Stetson Miller, “Maryland Bill Would Ban Chemical Conversion of Plastic Into Fuel,” CBS Baltimore, February 24, 2021, <https://baltimore.cbslocal.com/2021/02/24/maryland-bill-would-ban-chemical-conversion-of-plastic-into-fuel/>.
- 14 Upstream, “Reuse Acceleration Policies,” <https://upstreamolutions.org/reuse-acceleration-policies> (accessed November 16, 2021).