



CHEMICAL RECYCLING

A TOXIC TECHNOLOGY

Chemical recycling, also marketed as ‘advanced recycling,’ ‘molecular recycling,’ ‘plastic circularity,’¹ and ‘solvolysis,’² is the plastics industry’s latest branding of a set of industrial processes that use heat, chemicals, or solvents to convert plastic waste into chemical products.³

Industry trade groups such as the American Chemistry Council (ACC) promote these technologies as innovative solutions to the plastics waste crisis.⁴ In reality, these technologies remain inefficient, prohibitively expensive, and harmful to human health and the environment, according to analyses by Beyond Plastics, the International Pollutants Elimination Network, and the National Resources Defense Council.⁵

Dozens of chemical recycling facilities are now proposed across the US,⁶ despite their significant barriers to commercialization — including immature technology,⁷ high energy demands,⁸ uncertain supply chains,⁹ inconsistent feedstock,¹⁰ low yield rates,¹¹ competitive end markets,¹² and legal risk.¹³ The chemical recycling industry also has a history of facility failures and closures, financial instability, and staunch community opposition.¹⁴

“Everyone is investing in advanced recycling, everyone is counting on that to maintain acceptance of plastics, to maintain the social license to operate.”

- Clay Boswell, S&PGlobal Chemical Week Podcast¹⁵

A TROUBLED SECTOR

Company	Facility	Status	Background
Agilyx/AmSty	Regenyx Pyrolysis Facility	Closed	Facility shuttered in 2024 after reporting \$4.5 million in losses over three years of operation. ¹⁶
Alterra	Sugarloaf Chemical Recycling Plant	Cancelled	Cancelled following staunch opposition from area residents. ¹⁷
Braven Environmental	Zebulon Chemical Recycling Plant	Operating	Received repeated citations from state regulators; labeled a 'significant noncomplier' by North Carolina Dept. of Environmental Quality. ¹⁸
Brightmark	Macon-Bibb Plastic Renewal Facility	Cancelled	Contract terminated after Brightmark failed to deliver end product; ¹⁹ Brightmark entered Chapter 11 bankruptcy proceedings in 2024. ²⁰
Blue Cycle	Heerenveen Pilot Project	Closed	The Netherlands' first plastic-to-oil firm declared bankruptcy in late 2024. ²¹
Clean-Seas, Inc	Templeton Recycling Facility	On Hold	Local officials in Templeton adopted a chemical recycling moratorium in 2024; ²² SEC filings question Clean-Seas' ability to operate as a going concern. ²³

“We have concluded that the scale of our ambition to use 1 million tonnes of plastic waste a year in our global chemical plants by 2025 is unfeasible due to lack of available plastic waste feedstock, slow technology development and regulatory uncertainty.” - Shell Sustainability Report (2023)³²

Company	Facility	Status	Background
Encina	Encina Chemical Recycling Facility	Cancelled	The project was cancelled in 2024 following staunch community opposition. ^{24 25}
Fulcrum	Fulcrum Sierra Bio-Fuels Plant	Closed	Gasification plant closed in 2023 after defaulting on \$289 million bond; ²⁶ company entered Chapter 11 bankruptcy proceedings in 2024. ²⁷
Neste/Ravago	Chemical Recycling Facility	Cancelled	Project scrapped in 2025 after failing to meet final investment decision readiness. ²⁸
PureCycle	Ironton Purification Facility	Operating	In 2024, PureCycle settled a \$12 million lawsuit with its investors after they alleged the company repeatedly shared misleading information about facility operations. ²⁹
SOBE Thermal Energy Systems	Sobe Tire Pyrolysis Facility	On Hold	Project delayed after the local City Council voted to adopt a moratorium on chemical recycling in 2023. The moratorium was extended in 2024. ³⁰
Renewlogy	Renewlogy Chemical Recycling Facility	Closed	Closed in 2019 after a year of operations. The company cited difficulties processing locally sourced waste streams. ³¹

FINANCIAL BACKERS

This report examines the banks and investors financing three representative chemical recycling companies: Freepoint Eco-Systems, Alterra, and Nexus Circular. As privately held firms, information on these companies was limited.

We identified investor data for all three companies, but bank financing was available for only one, suggesting that chemical recycling companies rely more on equity investments than debt financing to fund new facilities. Where bank loans are available, backing from a larger, established parent company appears to play a role in securing funding.

Beyond private equity firms, investors frequently include companies operating in adjacent petrochemical, oil and gas, and packaging sectors. In one case, corporate investors committed to purchasing feedstock from the very facility financed by their investments. While some investors frame this involvement as contributing to sustainability goals, the extent to which these claims reflect genuine environmental benefits, rather than greenwashing, remains highly questionable.

TOP BANKS FINANCING FREEPOINT ECO-SYSTEMS (JANUARY 2019 - JUNE 2025)

	BANK	COUNTRY	LOANS
1	Groupe BPCE	France	\$2,669 M
2	Mitsubishi UFJ Financial	Japan	\$2,628 M
3	BNP Paribas	France	\$1,688 M
4	ING Group	Netherlands	\$1,440 M
5	Société Générale	France	\$1,390 M
6	Rabobank	Netherlands	\$1,390 M
7	Wells Fargo	United States	\$971 M
8	UBS	Switzerland	\$719 M
9	Standard Chartered	United Kingdom	\$592 M
10	ABN Amro	Netherlands	\$592 M

FREEPOINT ECO-SYSTEMS

Investors: Freepoint Eco-Systems is a subsidiary of Freepoint Commodities, a global commodities trader and financier located in Stamford, Connecticut.³³ In turn, Freepoint Commodities is owned by **Stone Point Capital**, a private equity firm that invests in the financial services industry.³⁴

Banks: Freepoint received a total of \$15.7 billion in loans from seventeen banks between January 2019 and June 2025. We estimate that \$1.1 billion was allocated for the expansion and operation of pyrolysis and chemical recycling.

Freepoint received 63% of its financing from just five banks: **Groupe BPCE, Mitsubishi UFJ Financial, BNP Paribas, ING Group, and Société Générale**. The vast majority of funding came from banks located in France (38%), the Netherlands (22%), and Japan (20%). Freepoint Eco-Systems received \$50 million from **ING Group** in project financing for its plastics pyrolysis facility in Hebron, Ohio, in March 2025.³⁵

ALTERRA

Investors: In October 2024, Alterra closed an investment round led by **Infinity Recycling** and joined by LyondellBasell, Chevron Phillips Chemical, Neste, and **Potenza Capital**.³⁶ Neste, a sustainable aviation fuel company, had already acquired a minority stake in Alterra in 2021,³⁷ and **Potenza Capital** is referred to as a 'long-term investor.'³⁸ Alterra has also agreed to license its process to Neste and Freepoint Eco-Systems to develop plants in Europe and the US.³⁹

Banks: No bank financing was identified between January 2019 and June 2025.

NEXUS CIRCULAR

Investors: In January 2023, Cox Enterprises became the majority owner of Nexus Circular after leading a \$150 million funding round.⁴⁰ Cox Enterprises is the parent company of Autotrader, Kelley Blue Book, and the Cox cable company. Other investors include Braskem, Chevron Phillips Chemical, and Printpack.⁴¹ Braskem and CPChem are both petrochemical companies that signed offtake agreements with Nexus Circular for the output from its new facility.⁴² Printpack is a packaging company serving 150 consumer brands, including Hershey's, Doritos, Tostitos, Cheetos, Lays, Goldfish, Skittles, Purina, and Kleenex.⁴³

Banks: No bank financing was identified between January 2019 and June 2025.

ENDNOTES

- 1 "Plastic Circularity," Shell, accessed January 31, 2026, <https://www.shell.com/business-customers/catalysts-technologies/decarbonisation-solutions-portfolio/plastic-circularity.html>.
- 2 "Solutions Explained: Chemical Recycling," Cefic, accessed January 31, 2026, <https://cefic.org/solutions-explained/chemical-recycling-making-plastics-circular/>.
- 3 "Solutions Explained: Chemical Recycling."
- 4 "Advanced Recycling," American Chemistry Council, accessed January 31, 2026, <https://www.americanchemistry.com/better-policy-regulation/plastics/advanced-recycling>.
- 5 Beyond Plastics and International Pollutants Elimination Network (IPEN), *Chemical Recycling: A Dangerous Deception* (Beyond Plastics and IPEN, 2023), https://static1.squarespace.com/static/5eda91260bbb7e7a4bf528d8/t/674f56482360216cb1c253c0/1733252686279/10-30-23_Chemical-Recycling-Report_web.pdf; Renee Sharp et al, *More Recycling Lies: What the Plastics Industry Isn't Telling You About "Chemical Recycling"* (Natural Resources Defense Council, 2024), https://www.nrdc.org/sites/default/files/2025-03/More_Recycling_Lies_IB_25-02-A_07_locked.pdf.
- 6 "Search the Oil & Gas Watch Database," Oil and Gas Watch, accessed February 1, 2026, <https://oilandgaswatch.org/search?projectType=Chemical+Recycling+Plant&operatingStatus=Proposed>. Environmental Integrity Project's Oil and Gas Watch Database shows twenty-nine proposed chemical recycling projects as of February 1, 2026.
- 7 Zero Waste Europe, *Fifty Years: Chemical Recycling's Fading Promise* (Zero Waste Europe, 2024), https://zerowasteurope.eu/wp-content/uploads/2024/11/ZWE_Nov24_FiftyYearsChemicalRecycling_FullOverview.pdf.
- 8 Iker Ayuso-Díaz et al., "Progress on Waste Plastics Gasification Process: A Review of Operating Conditions, Reactors and Catalysts for Clean Syngas Production and Tar Abatement," *International Journal of Hydrogen Energy* 148 (2025), <https://doi.org/10.1016/j.ijhydene.2025.06.190>.
- 9 Peter Quicker, *Status, Potentials and Risks of Chemical Recycling of Waste Plastics: Study on the Evaluation of Approaches for the Feedstock Recycling of Plastic Waste* (Swiss Federal Office for the Environment, 2023), <https://www.aramis.admin.ch/Default?DocumentID=71779>.
- 10 Christoph Stallkamp et al., "Pyrolysis of Mixed Engineering Plastics: Economic Challenges for Automotive Plastic Waste," *Waste Management* 176 (2024), 105-116, <https://doi.org/10.1016/j.wasman.2024.01.035>.
- 11 Taylor Uekert et al., "Technical, Economic, and Environmental Comparison of Closed-Loop Recycling Technologies for Common Plastics," *ACS Sustainable Chemistry & Engineering* 11, no. 3 (2023): 965-978, <https://pubs.acs.org/doi/10.1021/acssuschemeng.2c05497>.
- 12 "Chemical Market Overcapacity and Weakening Demand: A Perfect Storm (2024 Update)," ICIS, accessed February 1, 2026, <https://www.icis.com/explore/resources/chemical-market-overcapacity>; Mohi Narayan and Joyce Lee, "Global Petrochemical Firms Shape Up in Oversupply Crisis," Reuters, August 8, 2024, <https://www.reuters.com/markets/commodities/global-petrochemical-firms-shape-up-oversupply-crisis-2024-08-09>.

13 See, e.g., *California v. Exxon Mobil*, 77.

14 Ben Seal, "Latest Chemical Recycling Plant Closing Spurs Concern Over The Industry's Viability," *Environmental Health News*, Apr 08, 2024, <https://www.ehn.org/chemical-recycling-plant-closing>; Valerie Volcovici, "Brightmark, Georgia County Cancel \$680 mln Plastic-to-Fuel Project," Reuters, April 12, 2022, <https://www.reuters.com/world/us/brightmark-georgia-county-cancel-680-mln-plastic-to-fuel-project-2022-04-11/>; Stephen Landry, "Measure Passed By Templeton Residents Opposes Proposed Plastics Recycling Facility," *The Gardner News* (Gardner, MA), Dec 6, 2024, <https://www.thegardnernews.com/story/news/local/2024/12/06/templeton-ma-town-meeting-plastics-recycling-landfill-toxic-waste/76822259007>.

15 Chemical Week, "WPC Preview: How Will the Petrochemical Industry Navigate the Downturn and Geopolitical Tension?" S&P Global Commodity Insights, Mar 13, 2025, <https://open.spotify.com/episode/7gju0GMSJMIvaDdIWjMdfN?si=ebaeb89d11be4f2f>.

16 Beatriz Santos, "Agilyx, AmSty Lost \$4.5 Million in Polystyrene Chemical Recycling JV Since 2021," *Sustainable Plastics*, Mar 7, 2024, <https://www.plasticsnews.com/news/agilyx-amsty-lost-45-million-polystyrene-chemical-recycling-jv-2021/>.

17 Alexander Tullo, "Alterra Pulls Pennsylvania Plastics Pyrolysis Plan," *Chemical & Engineering News*, Aug 22, 2025, <https://cen.acs.org/environment/recycling/Alterra-pulls-Pennsylvania-plastics-pyrolysis/103/web/2025/08>.

18 Schuyler Mitchel, "Garbage In, Toxics Out: They Promised 'Advanced Recycling' for Plastics and Delivered Toxic Waste," *Carolina Public Press*, Sept 28, 2023. <https://carolinapublicpress.org/61724/garbage-in-toxics-out-they-promised-advanced-recycling-for-plastics-and-delivered-toxic-waste/>.

19 Valerie Volcovici, "Brightmark, Georgia County Cancel \$680 Mln Plastic-to-Fuel Project," Apr 12, 2025, <https://www.reuters.com/world/us/brightmark-georgia-county-cancel-680-mln-plastic-to-fuel-project-2022-04-11/>.

20 Bondoro, "Case Summary: Brightmark Chapter 11," March 18, 2025, <https://bondoro.com/brightmark/>.

21 Patrick Knight, "Blue Cycle, Netherlands' First Plastic-to-Oil Recycling Company, Declares Bankruptcy," *Chem Analyst News*, Jan 3, 2025, <https://www.chemanalyst.com/NewsAndDeals/NewsDetails/blue-cycle-netherlands-first-plastic-to-oil-recycling-company-declares-bankruptcy-32582>.

22 Stephen Landry, "Measure Passed by Templeton Residents Opposes Proposed Plastics Recycling Facility," *The Gardner News*, Dec 6, 2024, <https://www.thegardnernews.com/story/news/local/2024/12/06/templeton-ma-town-meeting-plastics-recycling-landfill-toxic-waste/76822259007/>.

23 Clean Vision Corporation, Form-10K, *US Securities and Exchange Commission*, 2024, 18-19, https://www.sec.gov/Archives/edgar/data/1391426/000190359625000196/clnv_10k.htm.

24 Kristina Marusic, "Pennsylvania's First Proposed Chemical Recycling Plant Cancelled," *Environmental Health News (EHN)*, Apr 22 2024, <https://www.ehn.org/encina-chemical-recycling>.

8 Chemical Recycling

- 25** James Bruggers, "A Giant Plastics Chemical Recycling Plant Planned for Pennsylvania Died After Two Years. What Happened?" *Inside Climate News*, Apr 26, 2024, <https://insideclimatenews.org/news/26042024/encina-pennsylvania-chemical-recycling-plant-canceled/>.
- 26** Jacob Wallace, "Fulcrum BioEnergy Misses Payments on Nevada Bonds; Indiana Project May Be On Hold," *WasteDive*, Nov 7 2023, <https://www.wastedive.com/news/fulcrum-bioenergy-sierra-biofuels-forbearance-reno-nevada-gary-indiana/698991/>.
- 27** Erin Voegele, "Fulcrum BioEnergy Files for Bankruptcy," *Ethanol Producer Magazine*, Sept 16 2024, <https://ethanolproducer.com/articles/fulcrum-bioenergy-files-for-bankruptcy>.
- 28** Beatriz Santos, "Neste, Ravago Abandon Chemical Recycling Project in the Netherlands," *Sustainable Plastics*, Aug 1 2025, <https://www.sustainableplastics.com/news/neste-ravago-abandon-chemical-recycling-project-netherlands>.
- 29** Pomerantz LLC, "12 Million Settlement for PureCycle Investors," 2024, <https://pomlaw.com/monitor-issues/12-million-settlement-for-purecycle-investors>.
- 30** 21 WFMJ, "Youngstown Council Extends Moratorium on Plants to Turn Tire Chips Into Synthetic Gas," Nov 21, 2024, <https://www.wfmj.com/story/51834355/youngstown-council-extends-moratorium-on-plans-to-turn-tire-chips-into-synthetic-gas>.
- 31** Joe Brock, et al, "The Recycling Myth: Big Oil's Solution for Plastic Waste Littered With Failure," *Reuters*, July 29, 2021, <https://www.reuters.com/investigates/special-report/environment-plastic-oil-recycling/>.
- 32** Shell plc, "Sustainability Report 2023," 2023, https://www.shell.com/sustainability/reporting-centre/reporting-centre-archive/_jcr_content/root/main/section_2106585602/tabs/tab/text_copy/links/item0.stream/1742906426699/4ef5cfa607e5e308ad8a68fc3ddffbe6342f8fa8/shell-sustainability-report-2023.pdf.
- 33** "Merchant Finance," Freepoint Commodities, accessed February 1, 2026, <https://www.freepoint.com/what-we-do/merchant-finance/>.
- 34** "Freepoint Commodities," Stone Point Capital, accessed February 1, 2026, <https://www.stonepoint.com/company/freepoint-commodities/>; Freepoint Ecosystems, "Unsolicited Proposal for MSW Processing Services Prince William County, Virginia," 5, May 6, 2022, https://www.pwcva.gov/assets/2022-08/Prince%20William%20Unsolicited%20Proposal%20Final%2005062022_Redacted.pdf.
- 35** Chris Voloschuk, "Freepoint Eco-Systems Receives \$50m Loan for Plastics Recycling Facility," *Recycling Today*, March 18, 2025, <https://www.recyclingtoday.com/news/freepoint-eco-systems-receives-50-million-dollar-loan-for-plastics-recycling-facility/>.
- 36** LyondellBasell, "Infinity Recycling, Lyondellbasell and CPChem Invest In Alterra to Accelerate the Commercial Development of Advanced Recycling," press release, October 24, 2024, <https://investors.lyondellbasell.com/news/news-details/2024/Infinity-Recycling-Lyondell-Basell-and-CPChem-invest-in-Alterra-to-accelerate-the-commercial-development-of-advanced-recycling/default.aspx>.
- 37** Deanne Toto, "Neste Acquires Minority Stake in Alterra Energy," *Recycling Today*, January 4, 2021, <https://www.recyclingtoday.com/news/neste-acquires-stake-ohio-plastics-chemical-recycler/>.

38 LyondellBasell, "Invest in Alterra."

39 Alexander Tullo, "Petchem Firms Invest in Recycler Alterra," *Chemical and Engineering News*, October 27, 2024, <https://cen.acs.org/environment/recycling/Petchem-firms-invest-recycler-Alterra/102/i34>.

40 Nexus Circular, "Nexus Circular Secures \$150 Million to Accelerate Momentum of Advanced Recycling Solution for Plastics," press release, January 3, 2023, <https://nexuscircular.com/nexus-circular-secures-150-million-to-accelerate-momentum-of-advanced-recycling-solution-for-plastics/>.

41 Braskem, "Braskem Invests in Nexus Circular to Accelerate Advanced Recycling of Plastics," press release, February 1, 2022, <https://www.braskem.com.br/usa/news-detail/braskem-invests-in-nexus-circular-to-accelerate-advanced-recycling-of-plastics>.

42 Chevron Phillips Chemical, "Chevron Phillips Chemical Deepens Collaboration with Nexus Circular, Securing Contracted Long-Term Supply of Advanced Recycled Plastic Feedstocks from New Facility," news release, February 7, 2023, <https://www.cpchem.com/media-events/news/news-release/chevron-phillips-chemical-deepens-collaboration-with-nexus-circular>; Nexus Circular, "Braskem and Nexus Circular Strengthen Relationship Through a Long-Term Contract for Circular Plastic Feedstocks From New Advanced Recycling Facility," press release, January 23, 2023, <https://nexuscircular.com/braskem-and-nexus-circular-strengthen-relationship-through-a-long-term-contract-for-circular-plastic-feedstocks-from-new-advanced-recycling-facility/>.

43 "About Us," Printpack, accessed February 1, 2026, <https://www.printpack.com/about-printpack/>; *Printpack Leads the 2025 Flexible Packaging Achievement Awards with Six Wins*, Printpack, March 11, 2025, <https://www.printpack.com/printpack-leads-the-2025-flexible-packaging-achievement-awards-with-six-wins/>; *Printpack Mexico Earns Three Awards For The Liquid Soap Stand-up Pouch During the Envase Estelar 2023 Competition*, Printpack, July 5, 2023, <https://www.printpack.com/printpack-mexico-earns-three-awards-for-the-liquid-soap-stand-up-pouch-during-the-envase-estelar-2023-competition/>; Keren Sookne, "2022 FPA Awards Highlight User Experience, Shelf Impact," *Packaging World*, May 24, 2022, <https://www.packworld.com/flexibles/article/22131851/innovations-in-flexible-packaging-from-popcornopolis-tyson-brand-nestl-hershey-fritolay>; *Behind the Bag: How Printpack Helped Bring Sustainable Packaging to the Super Bowl*, Printpack, May 14, 2025, <https://www.printpack.com/compostable-package-fpa-winner/>.

PHOTO CREDITS

Page 1: © Ted Auch, FrackTracker Alliance, 2023.

Page 2, 3, 4, 5: © Wikicommons, US federal government. Notes: Photo was edited from and in no way endorsed by original source.

Money Textures: © Texturelabs.com.