



February 24, 2025

Honorable Marc Korman  
Chair, House Committee on Environment and Transportation  
6 Bladen Street  
Annapolis, MD 21401

**MEMORANDUM OF SUPPORT**

Bill: **House Bill 1092, Recycling—Prohibition on the Chemical Conversion of Plastic**

Dear Chair Korman and Honorable Members of the Committee,

Thank you for the opportunity to submit this memorandum today. Beyond Plastics<sup>1</sup> **supports** the passage of House Bill 1092, which would amend the definition of recycling in state law to expressly exclude chemical recycling as well as prohibit the construction of chemical recycling facilities in the state of Maryland. We thank Delegate Terrasa and the bill cosponsors for their leadership on this timely issue and urge passage by the Committee.

Chemical recycling is an industry marketing term for a set of polluting technologies that mostly turn petrochemical-based plastic waste into fuels. It is not a novel or advanced approach as it is based primarily on technologies such as pyrolysis and gasification which have struggled technically and commercially to process plastic waste for decades. It is a dangerous deception pushed by the petrochemical industry that seeks to distract from the need to reduce plastic production.

Beyond Plastics and the International Pollutants Elimination Network (IPEN) published a report<sup>2</sup> on October 31, 2023 documenting the dangers of chemical recycling, how a buildout threatens environmental justice communities, and how the constraint failures and technical limits of this industry will prevent it from ever living up to the promises made by the petrochemical industry. (I have included the Key Findings and Executive Summary from the report with this memorandum).

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<sup>1</sup> Beyond Plastics is a national education and advocacy organization that works to end plastic pollution through policy change. Using deep policy and advocacy expertise, Beyond Plastics pursues the institutional, economic, and societal changes needed to save our planet and ourselves from plastic's harmful impacts on health, climate, and the environment. There are four Beyond Plastics grassroots local groups and affiliates (LGAs) in Maryland: Less Plastic Please, Plastic Free Queen Anne's County, Safe Healthy Playing Fields MD, and Beyond Plastics MoCo Maryland.

<sup>2</sup> [https://www.beyondplastics.org/s/10-30-23\\_Chemical-Recycling-Report\\_web.pdf](https://www.beyondplastics.org/s/10-30-23_Chemical-Recycling-Report_web.pdf)

For decades, plastics lobbyists have held up recycling—first mechanical recycling, and now chemical recycling—as the definitive solution for plastic pollution. Over the past fifty years, local, county, and state governments have invested massively into building out the infrastructure to collect, transport, and process recyclable plastics in addition to launching massive public outreach and education campaigns. The result: a plastics recycling rate of 5-6% in the United States as of 2021.<sup>3</sup> Now, the plastics industry is pushing chemical recycling as their preferred solution. The reality is that chemical recycling has failed for decades and it continues to fail. At the time of the publication of the Beyond Plastics/IPEN report in 2023, 11 chemical recycling facilities existed in the United States. In the ensuing 16 months, two facilities have completely shut down due to a combination of capacity, safety, and economic issues. The six that remain operational are running far below designed capacity. Together, they process 0.43% of plastic waste in the U.S.<sup>4</sup>

Plastics recycling has never lived up to the promises made by the plastics industry and there is no evidence to show that it ever will. In fact, the inviability of recycling—including chemical recycling—as a solution for plastic pollution was laid bare in California Attorney General Rob Bonta’s 2024 lawsuit against ExxonMobil<sup>5</sup>. Specifically, the lawsuit found that plastic manufacturers never intended for most single-use plastics to ever be recycled—its support for recycling programs is instead a public relations effort waged to allow for the unchecked production of plastics, and single-use disposable products and packaging in particular.

The true solution to the plastic pollution crisis is not chemical recycling. The evidence on this is clear—it is very much a false solution. There are, however, policies that states can enact that have been proven to reduce plastic pollution. Strong packaging reduction and recycling laws (also known as *extended producer responsibility*, or EPR) give producers a financial stake in the end-of-management of their products. Strong packaging reduction and recycling programs encourage innovation in packaging design and product delivery, improve recycling programs, protect public health by prohibiting the use of toxic chemicals and heavy metals, and reduce the fiscal burdens of waste collection and management for local governments and taxpayers. Another proven solution is beverage container deposit programs, commonly known as bottle bills, which significantly improve the recovery of plastics that actually have valuable end-markets such as PET and HDPE; decades of evidence have proven that strong bottle bill programs have high recovery rates and can be successful in reducing plastic pollution in communities, the environment, and waterways. Finally, local, county, and state governments can invest in building and scaling up reuse and refill systems to replace single-use disposable products and packaging as well as their regrettable substitutions like bioplastics.

A huge—and critical—step towards tackling plastic pollution, though, is the one proposed in this legislation. By excluding chemical recycling from the legal definition of recycling and prohibiting the construction of chemical recycling facilities, Maryland is sending a clear signal to the plastics industry that it rejects their false-promise of chemical recycling’s technical and economic viability. Chemical

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<sup>3</sup> [https://www.beyondplastics.org/s/The-Real-Truth-about-the-US-Plastic-Recycling-Rate-2021-Facts-and-Figures-\\_5-4-22.pdf](https://www.beyondplastics.org/s/The-Real-Truth-about-the-US-Plastic-Recycling-Rate-2021-Facts-and-Figures-_5-4-22.pdf)

<sup>4</sup> <https://www.lastbeachcleanup.org/globalchemicalrecyclingplantcounter>

<sup>5</sup> <https://oag.ca.gov/news/press-releases/attorney-general-bonta-sues-exxonmobil-deceiving-public-recyclability-plastic>

recycling is a dirty, risky, and economically unsustainable technology that only exacerbates the underlying issue of plastic overproduction.

Beyond Plastics commends the bill sponsors for their leadership on this issue and **strongly supports House Bill 1092**. We urge the honorable members of this committee to do the same.

Best regards,

A handwritten signature in black ink, appearing to read 'J. Berard', with a stylized flourish at the end.

Johnathan Berard  
Policy Director, Beyond Plastics



# CHEMICAL RECYCLING: A DANGEROUS DECEPTION

WHY CHEMICAL RECYCLING WON'T SOLVE  
THE PLASTIC POLLUTION PROBLEM

October 2023

## KEY FINDINGS

**Chemical recycling is a false solution to plastic pollution.** Chemical recycling has failed for decades, continues to fail, and there is no evidence that it will contribute to resolving the plastics pollution crisis.

**Plastics are inherently risky to recycle.** Plastics are made with toxic chemicals and when recycled, these chemicals go into the recycled plastic or product. Toxic chemicals can also be created in recycled plastics from cross contamination and heating, resulting in ongoing and often increased chemical threats to our health and the environment.

**Chemical recycling is inefficient, energy-intensive, and contributes to climate change.** According to U.S. government researchers, the energy needs (derived from plastic waste itself or additional fossil fuels) of chemical recycling can create as much as 100 times more damaging environmental and climate impacts than virgin plastic production.

**Chemical recycling creates large amounts of toxic waste.** Regardless of what products facilities are attempting to create, chemical recycling — at best — produces small amounts of usable products from large amounts of plastic waste. Typically, most of the plastics going into chemical recycling facilities will become waste (often hazardous waste), be burned as fuel, or be landfilled.

**Chemical recycling is dangerous and dirty.** Chemical recycling facilities release toxic emissions, create hazardous waste, and are prone to fires and explosions.

**Chemical recycling will not supplement conventional (mechanical) recycling.** Proponents say chemical recycling is needed for mixed plastics that are difficult to recycle mechanically, but there is no evidence that chemical recycling can economically or effectively recycle mixed plastic waste. To the extent it works at all, chemical recycling uses the same kinds of plastics as conventional recycling. Thus, chemical recycling will likely compete with, not supplement, conventional recycling.

**Burning plastic as fuel is dirty and unsustainable from start to finish.** These operations can create unacceptable risks to nearby communities, posing threats to environmental justice. Weak regulations will increase these health and environmental risks. Using chemical recycling to turn plastic waste into fuel creates a toxic, dirty fuel that is harmful to human health and disastrous for the climate.

**Making plastic into fuel to burn is not recycling.** According to internationally accepted definitions, plastic to fuel is not recycling. It is a dirty and dangerous disposal method.

**Eliminating or relaxing regulations puts our health at risk.** Chemical recycling facilities emit cancer-causing chemicals and substances that have been banned globally because they are among the most toxic chemicals known. Yet in the United States, many states eliminate or relax environmental and health rules to incentivize new plants, and the industry often evades federal clean air rules. Environmental justice communities that already face unequal health risks from toxic pollution will face the highest health risks from expansion of chemical recycling.

**Public funds should support sustainable solutions, not chemical recycling.** Government subsidies for chemical recycling are risky investments in a dirty, unproven technology. We need to support innovation for safe, clean materials to create sustainable alternatives that can replace plastics.



## KEY FINDINGS FROM OUR CASE STUDIES

As of September 2023, 11 chemical recycling facilities have been constructed in the United States. Chapter 2 of this report provides a summary of findings, and a detailed case study of each facility can be found in Appendix 1. Just a few of the key facts include:

- In 2021, a [Reuters special report](#) profiled the demise of the Renewlogy chemical recycling project, a collaboration between Dow and Reynolds Consumer Products (the maker of Hefty plastic bags). The 2018 program instructed residents of Boise, Idaho, to place their hard-to-recycle plastics in “Hefty EnergyBags,” which were then trucked 340 miles away to the Renewlogy pyrolysis plant in Salt Lake City, Utah. The program — which benefited from state and city loans totaling more than half a million dollars — failed in part because the plastic waste collected contained “10 times” the amount of contaminated garbage than was expected. Since March 2020, plastics collected in Boise’s recycling program have been sent to a Utah cement plant to be burned.<sup>4</sup>
- In 2012, two companies, Agilyx and Americas Styrenics, opened a chemical recycling plant in Tigard, Oregon. After 12 years, the plant has yet to prove commercially viable and despite its low output, regulators say the operation is a “large quantity generator” of hazardous waste. In 2013, another Oregon chemical recycling plant owned by Agilyx opened to convert plastic to oil, after receiving a \$577,255 tax credit from the state. The plant closed in 16 months.
- An Alterra company plant broke ground in 2014 in Akron, Ohio, but has only run as a “demonstration” plant. Despite its low output, regulators say it is a “large quantity generator” of hazardous waste.
- After 10 years of testing, a Braven chemical recycling facility in Zebulon, North Carolina, received a state air permit in 2020, though it remains unclear whether the plant is producing commercially viable amounts of outputs. Regulators say it is a “large quantity generator” of hazardous waste, and on at least two occasions state regulators cited the plant with a notice of violation for its mismanagement of hazardous waste.
- In June 2020, Brightmark Energy facility in Ashley, Indiana claimed its chemical recycling plant in Ashley, Indiana, would reach a yearly plastic waste recycling capacity of 100,000 tons by early 2021. But to date the plant remains at the “test” phase, has processed just 2,000 tons of plastic waste, and has been affected by fires, oil spills, and worker health and safety complaints. Brightmark has received \$4 million in federal subsidies for the project. A Brightmark plan to build the nation’s largest chemical recycling plant in Georgia was contingent on the company proving its Indiana plant could produce useful output, but in December 2021, Brightmark admitted it was unable to deliver recycled end-product, and the Georgia project was abandoned. There was strong opposition to the facility.



Brightmark Energy facility in Ashley, Indiana. Source: The Last Beach Cleanup

- A 2020 statement by New Hope Energy company claimed its chemical recycling plant would process 50,000 tons of plastic waste annually, but in June 2022, a company official optimistically noted the plant was “on track” to process about one-third of this amount by the year’s end. No company data was found to confirm whether the plant reached even this low goal.
- A Nexus Circular company recycling plant in Atlanta, Georgia, has been operating since 2011 at “pilot” capacity, with latest figures showing the plant operating at between 6% and 13% of capacity. The plant sells oil from plastics certified as “sustainable” by ISCC. In 2020, Shell agreed to purchase **66,000 tons** of Nexus’ plastic waste oil over four years, but as of January 2023, the plant had processed just 4,000 tons of plastic waste.
- In 2010, a Prima America chemical recycling plant applied for a permit to make diesel fuel from plastic waste in Northumberland, New Hampshire. In March 2023, a plant manager admitted the facility was still in its “test” phase and noted its diesel fuel was too expensive to be sold economically. The plant shut down for about a year in 2019/2020 due to multiple issues with state environmental rules.
- In March 2023, PureCycle defaulted on its agreement with the Southern Ohio Port Authority and UMB Bank by failing to complete construction of its chemical recycling project before December 1, 2022, as called for in its financing agreement. UMB Bank and Southern Ohio Port Authority waived the default in exchange for a number of financial and performance-based conditions. In September 2023, the Iron-ton facility experienced a mechanical failure and its operations were halted. In filings to its bondholders and the Securities and Exchange Commission Purecycle claims that the mechanical failures were due to a power outage on August 7, 2023, caused by inclement weather affecting a third-party power supplier. After repairs and replacement of a faulty seal, restart procedures were initiated at the facility on September 11, 2023, but PureCycle could not guarantee that the restart would be successful or whether further mechanical failures would occur as the result of the August 7, 2023, power outage. Recognizing that the facility would not meet a key milestone as required in its default waiver, PureCycle filed a Notice of Force Majeure to release itself and its bondholders from their contractual obligations.

## 10 RECOMMENDATIONS

1. **Declare** a national moratorium on new chemical recycling plants.
2. **Require** extensive analyses and testing of existing chemical recycling plants’ toxic emissions, releases, waste residues, wastewater, output contamination levels, and fire and explosion risks.
3. **Deny** approval or permitting of chemical recycling plants if risks from their emissions or products (for example, fuels) exceed a one in 1 million excess public cancer risk.
4. **Mandate** testing of oils and other outputs from chemical recycling before they can be used as fuel or plastic feedstock to prevent widespread contamination of products and human exposure to unacceptable toxic risks.
5. **End** all federal, state, and local incentives for establishing chemical recycling plants, including public funds, subsidies, tax breaks, investment bonds, carbon credits, landfill diversion credits, and other schemes.
6. **End** siting of chemical recycling plants in environmental justice communities.
7. **Prohibit** plastic-to-fuel projects, which recreate (rather than displace) fossil fuels that pose dangers to the climate and the environment.
8. **Implement** the “polluter pays” principle and ensure that the petrochemical industry bears all financial risks of chemical recycling and the manufacture, use, and disposal of plastics.
9. **Prohibit** chemical recycling of any form to count toward recycling targets or recycled content goals in any public policy or program, including but not limited to extended producer responsibility (EPR) programs.
10. **Prohibit** use of free-allocation mass balance accounting in determining recycled content of products that incorporate chemical recycling outputs.

## EXECUTIVE SUMMARY

This report has been prepared to address the plastic industry's claims that chemical recycling, also known as “advanced recycling,” can play a significant role in reducing global plastic pollution. The science and data currently available do not support this claim and actually point to the conclusion that chemical recycling would support expansion of plastic production, while potentially causing unacceptable levels of environmental and social harm — as well as impacts on human health — through emissions, waste generation, energy consumption, and contaminated outputs.

Highly informed and experienced delegates at the 2023 Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal (hereafter the Basel Convention) did not agree to include chemical recycling in the global technical guidance on the management of plastic waste. The delegates overwhelmingly rejected its inclusion because it could not be demonstrated that chemical recycling met the threshold of environmentally sound management (ESM). This report identifies many of the technical and economic reasons why chemical recycling is not considered environmentally sound, will not effectively address plastic pollution in any meaningful way, and should not be supported with public funds, subsidies, tax breaks, or similar instruments. Chemical recycling is not anticipated to be commercially viable, and any economic risks associated with its investment should be borne by those responsible for plastic production, not the public.

Chemical recycling is not new or advanced, as it is based primarily on technologies such as pyrolysis and gasification that have struggled technically and commercially to process such wastes for decades. The majority of the output is not feedstock for new “circular” or “green” plastic but petrochemical fuels that will be burned, creating toxic emissions and emitting greenhouse gases. Every step of these technologies is expensive, polluting, and energy-intensive, from pretreatment and thermal processes to output cleanup.

Many chemical recycling companies use fossil fuel energy to turn petrochemical-based plastics back into fossil-derived fuels to burn, creating a polluting, carbon-intensive merry-go-round. U.S. government researchers have concluded that the economic and environmental impacts of pyrolysis and gasification are likely to be 10 to 100 times higher than those of virgin polymer production, casting serious doubt on the environmental credentials of the sector (see Appendix 1: U.S. Case Studies on page 80).





Chapter 1 briefly summarizes the state of the global plastic pollution crisis and how that pollution has exceeded the Earth's limits for its ecosystems to function in a stable manner. Then it explores the reasons why conventional, mechanical recycling has failed to process more than 9% of all plastic ever produced. It includes the technical, economic, and policy limitations that prevent effective recycling and explains the plastic industry's awareness of this as it launched its recycling campaigns to head off plastic product bans in the 1980s.

Chapter 2 summarizes the 11 chemical recycling plants that were constructed, operating, or partially operating in the U.S. as of September 2023. It is supplemented by "Appendix 1: U.S. Case Studies," which details these plants' financing, investment and public subsidy status, outputs, if any, and whether they are situated in environmental justice communities. Environmental justice communities are communities where a high percentage of residents are low income or people of color. These communities often bear a disproportionate impact from heavy industries and are further burdened by the establishment of polluting chemical recycling plants.

Chapter 3 explores current attempts spearheaded by chemical industry lobbyists to deregulate the chemical recycling sector in the U.S. and reclassify its operations as manufacturing facilities, not solid-waste operations, in an attempt to reduce emissions monitoring and regulatory controls needed to protect workers and communities. Technical data on chemical recycling emissions, yield, and waste streams is generally not made public. That which is available, combined with research data, suggests that chemical recycling represents a significant threat to nearby communities and must be regulated at least as strictly as other incineration facilities. The issue of toxic plastic feedstock and its relation to toxic outputs and emissions from chemical recycling is also discussed.

Chapter 4 describes the international linkages to chemical recycling technology and policy, how it is regarded outside the U.S., and rejection of these technologies as environmentally sound management of plastic waste by the leading global hazardous waste decision-making body, the Basel Convention. It also examines the relevance of the Stockholm Convention on Persistent Organic Pollutants to chemical recycling in relation to toxic compounds contaminating feedstock, formed in the process, released in emissions, and contaminating outputs.

Chapter 5 establishes conclusions that can be drawn from the report research and recommendations with respect to chemical recycling and plastic pollution.

The Technical Addendum Part 1 details the myriad terms, definitions, and technologies that currently fall under the umbrella of chemical, or advanced, recycling. Many of these terms also have marketing synonyms that bear little resemblance to technical processes being proposed or used. The addendum also addresses the technical processes, principles underlying the processes, and feedstock types. Part 2 elaborates on the long history of chemical recycling and why its application to post-consumer waste has not been successful or viable, especially in relation to plastic waste. It addresses the problems encountered in the scaling-up processes from lab or pilot stage to commercial operations. It also explains that for regulatory purposes, pyrolysis and gasification are regarded as incineration technologies, requiring strict monitoring for and regulation of toxic emissions and releases. Finally, it refutes the claims that chemical recycling is suitable for mixed plastic waste recycling and that the process does not compete with conventional mechanical recycling for clean feedstock.

Ultimately, policymakers worldwide must decide whether they will engage in years of further delay, distracted by the promise of a technology "solution" that has failed before and will fail again, while the global plastic pollution crisis spirals out of control. Planetary toxic plastic waste pollution requires immediate action. The answer lies in producing a lot less plastic, making it significantly less toxic, and substituting other reusable or more sustainable materials for plastics wherever possible.

The cost of inaction, distraction, and delay will be terrible, and it will be paid by us all: by future generations, the environment, and especially by environmental justice communities. The myth of chemical recycling as a solution to plastic waste should be seen for what it is: a public relations distraction to prevent plastic regulation and prop up the profits of the petrochemical/plastics industry. We have lost nearly 40 years waiting for conventional plastic recycling to "work." We have waited decades for chemical recycling to work. We can no longer afford to waste more time waiting for mythical solutions. Plastic recycling simply does not work.