

WHY CHEMICAL RECYCLING WON'T SOLVE THE PLASTIC POLLUTION PROBLEM

"Chemical Recycling: A Dangerous Deception. Published by: Beyond Plastics and International Pollutants Elimination Network (IPEN), October 2023. beyondplastics.org/publications/chemical-recycling

February 2024

KEY FINDINGS:

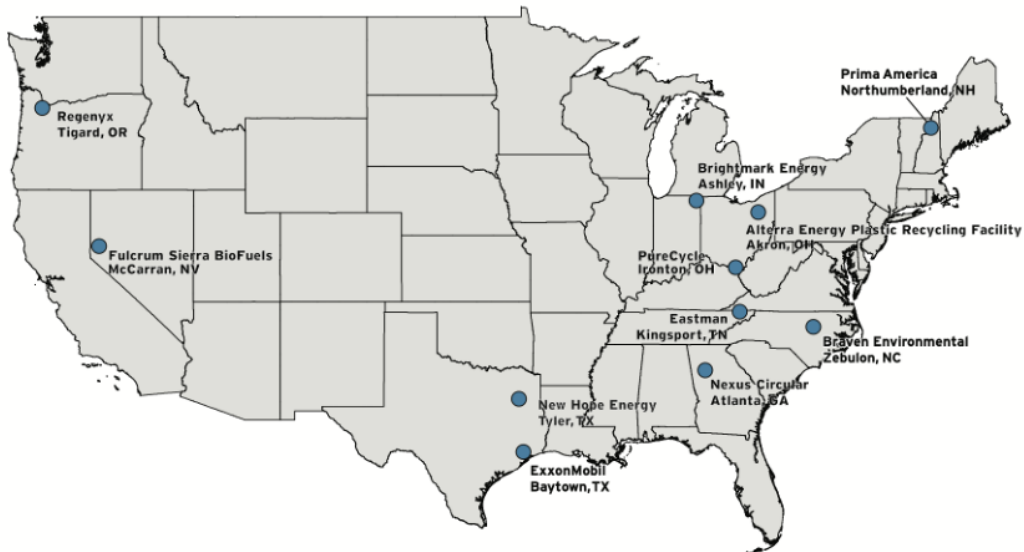
- Of the 11 constructed facilities in the United States, **most are not operating at full capacity**.
- Even at full capacity, the 11 facilities could process **less than 1.3% of all U.S. plastic waste**.
- Expensive construction: up to half a billion dollars per facility, with **significant public subsidies**
- **Minimal production of actual recycled plastic:** Two of the 11 plants have a stated purpose of only making feedstock for plastic production. Three only make fuels, and six make a combination of fuels, chemicals, and plastic feedstocks.
- Eight of the 11 plants are in **environmental justice communities**.
- Some plants have experienced **fires and explosions**.



Braven Environmental facility in Zebulon, N.C.; courtesy of Schuyler Mitchell / The Intercept

"Plastic contains many hazardous additives or polymers, recently estimated at **more than 3,200 hazardous chemicals** (UNEP 2023). In turn, they **contaminate** the plastic waste management processes (Takada and Bell 2021) and **outputs** while possibly exposing waste and recycling **workers**, as well as **nearby communities**."

Constructed U.S. Chemical Recycling Plants, as of September 2023



Chemical recycling processes of the 11 constructed plants we profiled in this report:

- **Eight use pyrolysis** (Agilyx/Regenyx, Alterra Energy, Braven Environmental, Brightmark, Exxon Mobil, New Hope Energy, Nexus Circular, and Prima America).
- **Two use forms of gasification** (Fulcrum and Eastman).
- **One uses solvents** (PureCycle).
- **One uses solvolysis** (Eastman).

(The total adds up to 12 because Eastman has two separate processes.)

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HIGH CONSTRUCTION COSTS

- ★Total project costs: at least **\$1.7 billion**
- ★Total subsidy value: at least **\$184 million**
- ★Private investment: at least **\$1.1 billion**

NOT MEETING RATED PROCESSING CAPACITY

- ★The combined rated annual capacity of the 11 plants is less than half a million tons of plastic waste, or less than **1.3% of the total U.S. plastic waste generated annually** (36 million tons).
- ★Many of these plants are **not operating at their rated capacities**:
 - Two are still in test mode (Brightmark and Eastman).
 - Two are partially operating (New Hope and Nexus).
 - Two appear to be non-operational (Prima and PureCycle).
 - There is little to no publicly available information about the actual operational throughput for five of the facilities (Agilyx, Alterra, Braven, Exxon, and Fulcrum).

HAZARDOUS WASTE GENERATION

- ★Hazardous wastes produced by chemical recycling include polycyclic aromatic hydrocarbons (PAHs), dioxins and furans, persistent organic pollutants (POPs), volatile organic compounds (VOCs), and heavy metals.
- ★Three of the 11 plants are classified by the U.S. Environmental Protection Agency as large-quantity generators of hazardous waste (Agilyx/Regenyx, Alterra, and Braven), while one is classified as a small-quantity generator (PureCycle).

BURDEN TO ENVIRONMENTAL JUSTICE COMMUNITIES

- ★Using the U.S. EPA's Environmental Justice Tool:
 - Eight of the 11 plants are located in areas with **lower-than-average income**.
 - Five of the 11 plants are located in areas with **higher-than-average concentrations of people of color**.



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