Chemical Plastic Recycling and Health

The Issue and Action Steps for Community Members

What is chemical plastic recycling?

Chemical plastic recycling (or advanced recycling) uses high heat and chemicals to break down plastic into liquid or gas, and turn it into either new plastic, or fuel.[1] This process is known as "plastics-to-fuel" or "plastic-to-plastic" technology. The terms "chemical" and "advanced" recycling are industry terms for the same thing. Chemical recycling is expensive and inefficient, and can release harmful chemicals into the environment, including toxic emissions and greenhouse gases. [2] [8]

Not all recycling is chemical recycling. There are different ways to recycle plastic. Mechanical recycling involves sorting, crushing, and melting plastic into pellets that can be used for new products. [8] Other types of recycling involve the process of collecting and processing materials (like paper, aluminum, and plastic) into new products.

How does chemical plastic recycling affect health?

Pollutants from the chemical recycling process affect the health of communities living near processing sites.

- Plastics are processed with harmful toxins to give them specific qualities, like flexibility or clarity. Using high heat and chemicals during recycling releases those toxins into the environment. [1]
- Burning plastic creates air pollution that can contain heavy metals like mercury, and other harmful pollutants like carbon monoxide and black carbon. It also includes many cancer-causing toxins such as dioxins, phthalates, benzene. [2] [3]

These pollutants can create or worsen conditions like asthma, cardiovascular diseases, and cancer. [2]

We would like to acknowledge the Stakeholder Action Board for their contributions and expertise.

Waste burning facilities (incinerators)

An incinerator is a type of chemical recycling facility that burns plastic waste to create fuel or plastic elements.

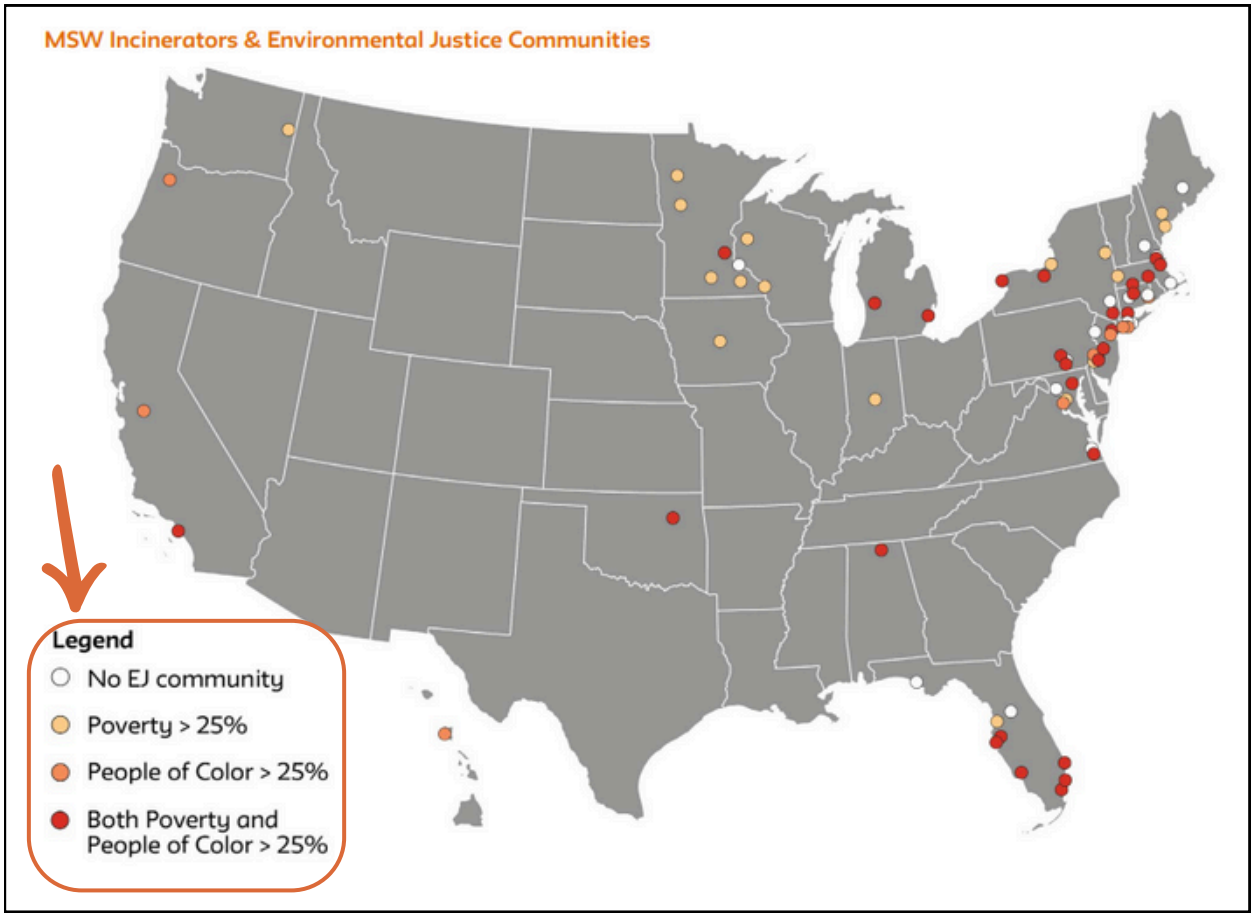
Alterra, a plastic-to-fuel facility located in Ohio.[5]

How are vulnerable communities affected?

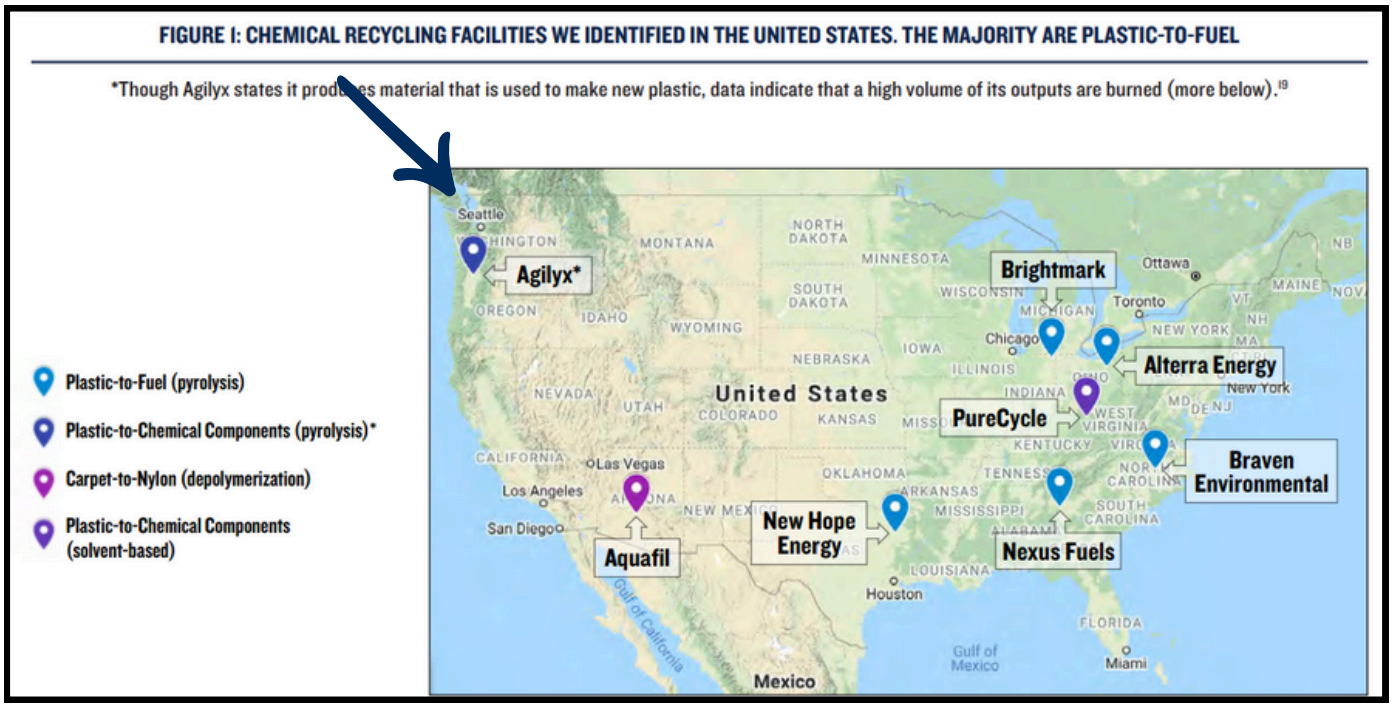
A study found that 80% of waste-burning facilities (called incinerators) in the U.S. are located in communities of color challenges.[6] These communities often have higher exposures to other environmental hazards, such as other air pollutants, and are often low-income communities. [4] The maps and descriptions below show where these facilities are located and how the surrounding communities are impacted.

This map shows the locations of municipal solid waste incinerators across the U.S. in 2019.

- The locations are represented by dots.
- The color of each dot represents the level of poverty or people of color, or both, in that area. The communities that have higher vulnerability are represented by darker dots.



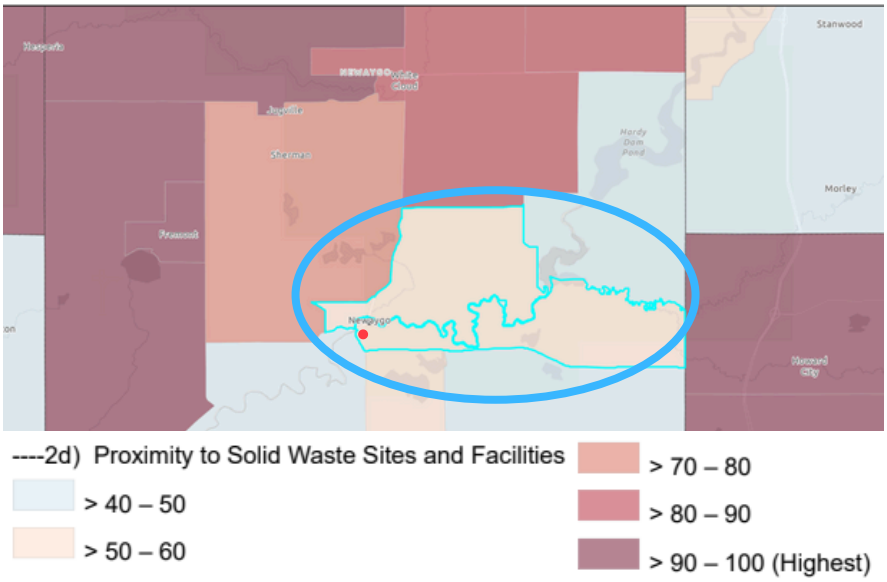
This map shows the locations of chemical recycling facilities across the U.S. A report found that these facilities are often located in communities that are disproportionately low-income, people of color, or both.[4] One facility, Agilyx shut down in 2024 after a report found it produced 211 tons of styrene waste between 2018 and 2022, which was all shipped offsite to be burned. Agilyx created more plastic waste than it could deal with, and was ultimately unprofitable.[7] When facilities close, communities are often left with the environmental cleanup and socioeconomic consequences.



Recycling in Michigan

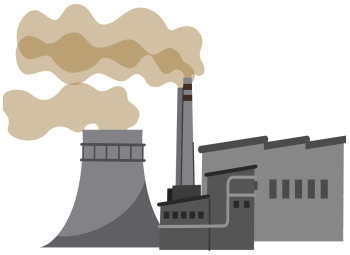
Michigan has 15 plastic recycling plants,[15] and the state's first chemical recycling plant is being planned for the city of Newaygo.[13] The state additionally has many waste disposal sites that expose residents to pollution.

The map to the right shows how close Newaygo and surrounding census tracts are to solid waste sites and facilities. The darker the color, the closer the community is to solid waste sites and facilities. Newago is not as dark as the surrounding communities but the new facility will lead to higher exposures to the harmful emissions that come from chemical recycling.[14]The location of the proposed facility is circled on the map.



Michigan Department of Environment, Great Lakes, and Energy. MI Environmental Justice Screening Tool, Layer 2d: Proximity to Solid Waste Sites and Facilities

How can we protect communities?



Chemical recycling facilities have many drawbacks:

- They pollute communities with toxic chemicals and contribute to global greenhouse gas emissions.[4]
- They are expensive to build and operate.[16]
- Expensive to clean up.
- Plastic manufacturers can use these facilities to claim recyclability, and increase production, but producing more plastic will lead to more plastic waste and harmful exposures for vulnerable communities.[16]

We can protect communities by:

- Preventing new facilities from opening.
- Educating decision makers and residents about the realities of chemical recycling.
- Opposing different forms of chemical and advanced recycling.
- Supporting stricter air quality standards, and the enforcement of new and existing standards created to protect the health of communities from pollution coming from all industrial facilities.

What can Michigan decision makers do?

Research from the Ecology Center highlights essential solutions to plastic pollution:[17]

1. Prohibit new high-heat waste facilities and other solutions that do not truly reduce plastic waste.
2. Reduce single-use and dangerous plastics:
   a. Repeal the preemption law preventing local governments from implementing plastic restrictions.
   b. Phase out all non-essential uses of PVC, polystyrene, and other dangerous plastics.
3. Have polluters fund plastic prevention initiatives
   a. Update Michigan's Bottle Bill.
   b. Shift the responsibility of a product's "end life" to manufacturers through Extended Producer Responsibility Laws.
4. Tackle microplastics in the Great Lakes
   a. Regulate microplastics under the state's surface water laws.

Please see http://mleead.umich.edu/Coec_Fact_Sheets.php for the citations included in this factsheet.

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