

March 21, 2025

RE: Support for House Bill 2960 – Certain Facilities that Convert Plastic Waste

Dear Committee Members,

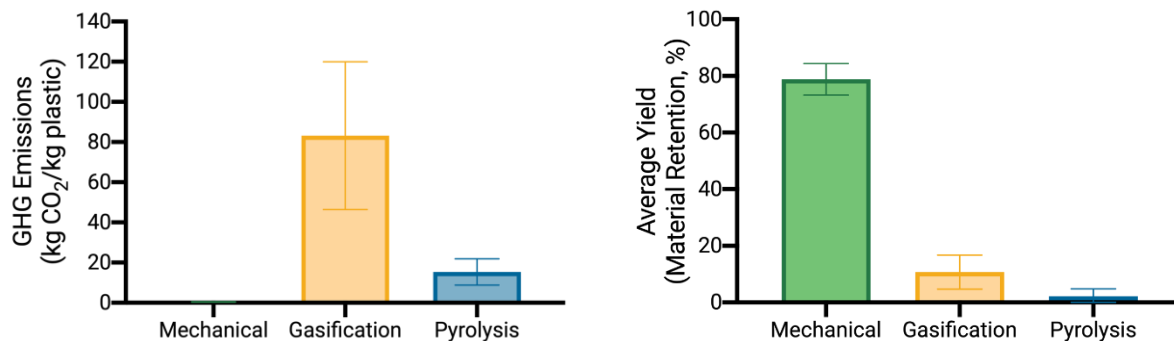
I earned my PhD from Stanford University in environmental engineering specifically studying a type of plastic chemical recycling. As a scientist and an engineer, I recognize the role that technology will play in tackling the plastic pollution crisis and the objective of this bill is not to stifle innovation.

I'd like to explain the two separate buckets of technologies under consideration by HB 2960: the first are conversion chemical recycling technologies that would be prohibited under this bill. These conversion technologies use high heat and pressure to convert plastics into small hydrocarbons (pyrolysis oil and syn gas), largely for use for energy and fuels. These facilities are currently regulated as incinerators under the Clean Air Act. Moreover, because these technologies do not recover plastic materials, they perpetuate the need for new virgin plastic.

The second type of technologies are innovative technologies like depolymerization and purification, which are not prohibited under this bill under - 1 amendment. These technologies like depolymerization and purification use chemicals and/or enzymes to either recover plastic polymers (purification) or monomers (depolymerization), the building block of new plastics. These types of recycling are precisely the innovative technology we should prioritize here in Oregon, not conversion technologies.

Conversion technologies are expensive, inefficient, and hazardous. According to peer reviewed research by a national lab (BOTTLE, a consortium within the Department of Energy), depending on the polymer type gasification yield varies from 1.7 - 13.7% usable material and pyrolysis yield 0.1 - 5.7% (Uekert, T., 2023, [ACS Sustainable Chemistry & Engineering](#)). According to the same research, mechanical recycling yields range from 75 - 83%. The same research found that conversion technologies are 5-6 times more expensive than mechanical recycling. Because of these economics, numerous facilities have closed over or filed for bankruptcy the last few years (closure in [Oregon](#), closure in [Nevada](#), bankruptcy in [Indiana](#)).

Conversion chemical recycling is energy-intensive, releases harmful emissions and fails to address the root cause of plastic pollution: overproduction of single-use plastics. Furthermore, since these technologies turn plastics into fuels and energy instead of turning them back into new plastic products, this perpetuates our need to continue to use fossil fuels to produce new plastic products, putting our environment and communities at risk. Another concern with the widespread deployment of these technologies is the "lock-in" effect, where given the significant financial investments in these systems, industry will be incentivized to continue producing single-use plastics to ensure there is a constant stream of waste.



These technologies are known to release [harmful emissions](#) including [polycyclic aromatic hydrocarbons](#) (PAHs), volatile organic compounds (VOCs), carbon monoxide (CO), and nitrous oxides (Nox) in addition to harmful greenhouse gas emissions. [Harmful chemical additives](#) from plastics have been found in the products (e.g., oil), byproducts (e.g., char), and air emissions from chemical recycling like pyrolysis. Conversion technologies release [30-200 times](#) more greenhouse gas emissions than mechanical recycling.

Around the country, industry is pushing for these conversion technologies to avoid the upstream changes necessary to end plastic pollution like reduction and redesign to make their packaging mechanically recyclable. We need plastics recycling to work if we want to fix the ocean plastics crisis. But *how* we recycle matters, and we should be supporting improvements to mechanical recycling, not investing in harmful conversion technologies. This is also why the Association of Oregon Recyclers (AOR) and the Alliance of Mission Based Recyclers (AMBR) support this bill.

From my research on chemical recycling technologies, I can tell you conversion technologies are anything but advanced. Thank you.

Sincerely,

Anja Brandon, PhD
Director, Plastics Policy
Portland, OR

Appendix: Additional Information

- The United States ranks as high as third when it comes to contributors to ocean plastic pollution. (Law, K.L., et al., 2020, [Science Advances](#))
 - From the same peer-reviewed study, the U.S. is the number one generator of plastic waste, both in total and per capita.
- An estimated 33 billion pounds enter the marine environment each year from land based sources. (Lau, W.W.Y., et al., 2020, [Science](#))
- Since Ocean Conservancy's International Coastal Cleanup began in Oregon, more than 115,000 volunteers have participated in shoreline and waterway cleanups, removing 1.4 million pounds of debris (as of 2022). (Ocean Conservancy. "Trash Information and Data for Education and Solutions (TIDES) dataset." Retrieved from: <https://www.coastalcleanupdata.org/>).
- We mentioned the low yield of conversion chemical recycling technologies (gasification and pyrolysis) relative to mechanical recycling.
 - According to peer reviewed research by a national lab (BOTTLE, a consortium within the Department of Energy), depending on the polymer type gasification yield varies from 1.7 - 13.7% usable material and pyrolysis yield 0.1 - 5.7%. (Uekert, T., 2023, [ACS Sustainable](#)

[Chemistry & Engineering](#)). According to the same research, mechanical recycling yields range from 75 - 83%.

- We mentioned [Oceana's national polling](#) on the issue of chemical recycling. The poll, conducted by the nonpartisan polling company Ipsos, surveyed 1,000 American adults from across the U.S. between December 12 and 19, 2022. Polling questions and results are available [here](#).
 - 70% of American voters are concerned about the negative impacts of “chemical recycling.” Also included among the findings: 79% of voters are concerned about the serious health risks associated with toxic chemical emissions from “chemical recycling” plants.
- Agricultural plastic wastes are poor candidates for pyrolysis processing due to their contamination from pesticides, fertilizers, and animals waste, which can contaminate operations and pose additional technology challenges. (Kusenber, M. et al., 2022, [Waste Management](#))
- In the European Union, pyrolysis only accounts for 1.1% of recycling despite decades of investments. ([PlasticsEurope](#), 2023)