

Senate Committee on Environment and Public Works
Hearing Entitled, “Examining the Impact of Plastic Use and Identifying Solutions for
Reducing Plastic Waste”

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Responses to Questions for the Record from Judith Enck, Beyond Plastics
Responses Submitted January 11, 2023

Ex-Officio Chairman Carper:

1. *Technology and science have come a long way in recent decades. It is my understanding that chemical recycling facilities have the capability to produce products from plastic waste, including plastic resin and chemicals, as well as fuel for transportation or other purposes. Some have argued that a process that makes fuel that is burned - and emits greenhouse gasses into our atmosphere – should not be considered, or referred to as, recycling.*

a. Do you agree that converting plastics-to-fuel should not be considered to be recycling?

Yes, I agree that converting plastics-to-fuel should not be considered recycling. Turning waste into fuel and then burning that fuel is similar to burning the waste. Plastics-to-fuel plants inflict harm on the communities where these facilities are located, and using plastics as a fuel emits even more greenhouse gasses and pollution than burning extracted fuel before it’s turned into plastic. Burning is not recycling.

While technology and science have advanced in recent decades, there is nothing particularly new or helpful in what the plastics industry is marketing as “chemical” or “advanced” recycling: pyrolysis and gasification are technologies that have been around – and regulated by the Environmental Protection Agency (EPA) as incinerators under section 129 of the Clean Air Act¹ – for decades.

The only thing new is the industry greenwashing: re-branding pyrolysis and gasification incinerators as “recycling.” The greenwashing has three purposes:

1) **to justify the deregulation of pyrolysis and gasification incinerators** at the state and federal levels including, particularly, escaping existing pollution controls under section 129 of the Clean Air Act;

2) to help the plastics industry build the case for **state and federal taxpayer subsidies** including funding for research, tax breaks, and minimum content procurement requirements for “chemically recycled” plastic waste; and

¹ [“Clean Air Act Guidelines and Standards for Waste Management.”](#) U.S. EPA website, accessed 1/9/23.

3) to give the plastics industry an **argument against reducing plastic production** - which is the most important strategy that policy makers should support.

The plastic waste problem cannot be solved without significantly reducing the quantity of plastic that is manufactured and sold. In particular, we need to ban the use and production of the majority of single-use plastics. So-called “advanced recycling” and “chemical recycling” are just misleading words for technologies that include burning plastics, and far from solving the waste plastics problem, they exacerbate the harms that plastic production already causes. The injuries to public health and environmental justice communities will be especially severe if the deregulation and subsidies are allowed to take effect. The “chemical recycling” greenwashing marketing campaign is also central to the plastic industry’s strategy to support the massive **buildout of plastic production in the U.S.** Because “chemical recycling,” even if it worked perfectly and was only used to actually make plastic (as opposed to fuel, wax, and other industrial products), would only be able to handle a small fraction of plastic waste. It cannot legitimately be considered part of the “solution,” or a “tool in the toolbox.”

b. Are there any risks to public health created from the burning of plastics for fuel or resin that should be considered by the federal government when regulating these facilities?

Yes. Pyrolysis and gasification, like other incinerators regulated under section 129 of the Clean Air Act, generate both hazardous waste and air emissions of a large number of highly toxic chemicals including: styrene, benzene, toluene, mercury, arsenic, dioxins, ethylbenzene, xylenes, naphthalene, acetaldehyde, formaldehyde, hydrochloric acid, methanol and hexane. These toxic substances are associated with a range of adverse health effects including toxicity to the heart, liver, lungs, kidneys, skin, and eyes, as well as neuro developmental and reproductive harm, and cancer.

EPA should absolutely consider the pollution coming from these technologies as it decides whether to eliminate existing federal protections under the Clean Air Act – whether by changing the definition of what is an incinerator or re-defining the idea of “waste” to exclude plastic waste.

2. The Break Free from Plastic Pollution Act of 2021 builds on state laws across the country and outlines plastic reduction strategies in the form of extended producer responsibility actions, the reduction of single-use products, recycled content mandates, and other means.

a. What state and local policies in the United States have successfully reduced plastic waste?

Plastic Bans: The state and local policies which have been the most successful at reducing plastic waste have been outright bans on unnecessary, single-use plastic products. State and local governments have enacted a series of effective bans on items such as polystyrene packaging, bags, straws, cups, plates, utensils, and intentional release of balloons. For example, the states of California, Connecticut, Delaware, Hawaii (de

facto), Maine, New Jersey, New York, Oregon, Vermont, and Washington, and the territories of American Samoa, Guam, Northern Mariana Islands, United States Virgin Islands, and Puerto Rico have all banned single-use plastic bags in some form. Each ban is slightly different from the next, and some are more effective than others, but most of these bans have contributed to a reduction in plastic waste. The United Nations Environment Program (UNEP) estimates that 85% of single-use plastic food containers end up in a landfill or in the environment as mismanaged waste. It's time to enact a nationwide ban on unnecessary single-use plastic items to significantly reduce our nation's contribution to the global plastic pollution crisis.

Reuse + Refill Infrastructure: Another effective state and local policy tool has been investment in infrastructure that reduces our reliance on single-use plastic items. Examples of this type of infrastructure are: water refill stations and drinking fountains on public property; dishwashing equipment and durable serviceware at schools, hospitals, and other institutions; and future financial support for regional bottle washing facilities for shared refill networks and other infrastructure that supports the growth of the reuse + refill economy. If done at the federal level these investments should extend out to federally subsidized programs. They will reduce waste and create local jobs.

Procurement: When governments use their purchasing power to reduce the use of plastics within their own operations, they also help to move markets. This makes procurement a dually effective tool that has been used at the state level and could be used to significantly reduce plastic waste at the federal level. Policies that prohibit the use of tax dollars by government agencies and grantees to purchase single-use plastics, except in special circumstances, have the potential to significantly reduce plastic waste.

Meals on Wheels Programs: Serving more than one million meals each week day to America's elderly and homebound, Meals on Wheels provides an incredible service to our nation. Unfortunately, the majority of Meals on Wheels programs use single-use plastic trays to deliver their meals. Cumulatively this creates at least 45 million pounds of plastic waste each year, filling up more than 1.1 million cubic yards of landfill space. A few dozen programs across the United States have switched to durable, reusable trays with great success. Beyond Plastics studied these programs and wrote a guide for Meals on Wheels programs that are seeking to make the switch, available [HERE](#). We found that the programs save money in the long run and that there was increased satisfaction from both the volunteers and the meal recipients. However, most programs do not have access to dishwashing equipment or the upfront capital that they need to make this cost-effective and waste-reducing shift. Congress should include funding in the federal budget for Meals on Wheels programs to purchase dishwashing equipment and durable, reusable trays and cutlery.

Extended Producer Responsibility: Extended Producer Responsibility (EPR) is a tool for reducing plastic waste, but only if it is well-designed. Dozens of EPR programs for a myriad of products exist at the state level. Common programs cover tires, electronic waste, paint, and carpet. Four states have adopted EPR for packaging laws: Maine, Oregon, California, and Colorado. Of the four laws passed, only California's law has

mandatory plastic reduction targets, but only requires 10% reduction through elimination or a switch to reuse and refill. The law allows for up to 8% of recycled content to count as reduction, which is not real reduction. It is too early to tell how effective the law will be in reducing plastic waste, but Beyond Plastics believes, based on a 2020 study by Pew Charitable Trusts, “Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Pollution,” that the new law did not go far enough and was not commensurate to solving the problem. The Pew report provides analysis showing that it is both necessary and feasible to reduce our use of plastics by 47%.²

b. Are any of those state or local policies feasible to implement at the national level?

Yes, all of the policies listed above can and should be implemented at the national level, plus the following additional policies:

1. Classify plastic as a “toxic substance” as Canada did in 2021, and direct the Environmental Protection Agency to regulate it accordingly
2. Enact a moratorium on new ethane crackers and plastic and petrochemical production facilities and infrastructure
3. Ban plastic waste exports and manage it all domestically
4. Enact a nationwide deposit return system for beverage containers, a.k.a. a “National Bottle Bill” that contains mandatory reuse, refill, and recycling targets. We discuss this in more depth below.
5. Phase out the sale of single-use plastic water bottles at all federal facilities and install water refill stations or water fountains. Exemptions for emergency situations should be included. The National Park Service has announced they will stop selling single-use plastic water bottles, but that will not take effect for ten years. The phase-out should be much sooner.

c. How can organizations like Environmental Health Sciences and Beyond Plastics help find middle ground solutions to our plastic pollution problem, and what is the proper balance between unabated plastic production and an outright ban on plastics production?

Beyond Plastics and many other organizations are committed to ending plastic pollution and will work with members of Congress who are interested in enacting policies that reduce plastic pollution.

If Congress is serious about solving this problem, a 50% reduction in plastics production is a reasonable middle ground and well-supported by the 2020 Pew Charitable Trusts report titled “Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution.” In that report, Pew provides a roadmap for avoiding the devastation to our ocean that is guaranteed if plastic production and mismanagement continues unabated. This roadmap is a thorough analysis of what is

² Figure 5, pg 22, “Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution” by Pew Charitable Trusts, 2020

feasible with the technology currently available today. Pew calls for a 30% elimination of unnecessary plastics that includes switches to refill and reuse systems³ and a 17% elimination of plastic waste by switching to other more recyclable or sustainable materials such as aluminum, glass, and paper.⁴ These policies will not only help prevent turning the ocean into a watery landfill, but they will also create jobs and save tax dollars. There are many small businesses that are providing innovative products and services to reduce single-use plastic. They need more support and expanded markets.

In order to achieve a 50% reduction in plastic production, we will need to 1) end the production and sale onto the market of non-essential single-use plastic, including such product categories as utensils, check-out bags, ring-carriers, straws and stir sticks, all of which were recently banned by Canada; 2) support the development and scaling of reuse and refill models; 3) incentivize the development of non-toxic materials to replace fossil-fuel derived plastics; 4) scale up proven recycling and clean composting solutions.

Another essential element of any policy solution is to not lift or weaken existing pollution controls on plastic disposal (or manufacturing), but rather to increase public health protections from production of plastic through use, recycling, and disposal.

Other important elements of a balanced approach would be to require reporting on production, use, and disposal of plastic products (using TSCA), including polymers and chemical additives; and eliminating the use of the most problematic chemicals in plastics.

d. Please describe the elements that are needed to enact a strong and effective national extended producer responsibility (EPR) program for plastic packaging.

A strong and effective national extended producer responsibility (EPR) program for packaging would include the following elements:

1. Establish Environmental Standards for Packaging

Similar to fuel efficiency standards for cars and appliances, we need environmental standards for packaging: 50% reduction in packaging over ten years—achieved either through elimination or by switching to reuse/refill systems — and the rest must achieve a 70% recycling rate at minimum. Waste reduction comes before recycling in every waste hierarchy and will only be achieved if it is required. Most plastics recycling is a failure, and we cannot rely on recycling to solve our plastics problem.

2. Reduce Toxics in Packaging

³ “Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution” by Pew Charitable Trusts, 2020.

⁴ “Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution” by Pew Charitable Trusts, 2020

Packaging that contains toxic chemicals is harmful to human health and the environment and can make it unsafe to use recycled materials in future products. Known toxic chemicals and substances, such as PFAS, formaldehyde, mercury, and lead should be removed from packaging.

3. No False Recycling

False recycling has no place in any EPR system and should not count towards recycling targets. The following processes should be considered false recycling for the purposes of EPR:

- A. Any process that turns plastic into a fuel or fuel substitute or the general use of plastic in energy production; and/or
- B. The following processes:
 - a. gasification;
 - b. pyrolysis;
 - c. solvolysis;
 - d. hydrolysis;
 - e. methanolysis;
 - f. enzymatic breakdown;
 - g. combustion; or
 - h. any other chemical conversion process used to transform plastic or plastic-derived materials into plastic monomers, chemicals, waxes, lubricants, chemical feedstocks, crude oil, diesel, gasoline, or home heating oil.

The petrochemical industry may claim that some of these facilities will turn plastic waste into feedstocks for making more plastics. However, unlike glass and metal, plastics cannot be recycled indefinitely; there are technical limitations to doing so. Ultimately the majority of plastics produced from the end-products of these “chemical recycling” facilities will be discarded as problematic plastic wastes again.

All of these processes have by-products that are toxic and that end up as air pollution and/or waste ash, and they are almost always placed in low-income communities and communities of color— communities that bear the brunt of toxics releases.

The technologies as a whole are ineffective at managing plastic waste, and building more of these facilities involves substantial public risks. These risks are not limited to greenhouse gas emissions or to local health impacts due to air pollution. From an infrastructural and budgeting perspective, it is risky to direct scarce public resources into ineffective technologies that will inevitably ***reduce the amount of funding available for proven, safe methods of waste reduction***, such as building out a reuse and refill infrastructure. We should be spending

public dollars on solutions that will **reduce plastic waste at the source**, not use multi-million dollar industrial facilities to transform one form of waste into other forms of waste in Cat-in-the-Hat-like fashion.⁵ These technologies should not be considered recycling—the definitions in any EPR policy must make that clear.

4. Include a Modernized Beverage Deposit Law, a.k.a Bottle Bill

Bottle Bills work – deposit return laws are the best example of EPR and the most effective way to handle beverage containers. Most beverage containers should be managed by a modernized deposit law that sets the minimum deposit at ten cents, requires a minimum percentage of refillable containers, has minimum reuse and recycling targets, and makes it easy for people to return their containers at the stores where the consumer paid the deposit. Ten states already have a Bottle Bill. In a later section of this document, we discuss the steps necessary to develop an effective National Bottle Bill.

5. Provide Financial Relief to Taxpayers and Consumers

Packaging companies should pay fees that are used to: reimburse municipalities and consumers for the cost of recycling packaging material, provide new funding for projects that reduce packaging waste and improve recycling, and fund state agencies for managing the program and enforcing the law. Companies should pay no fees for packaging used in reuse and refill systems.

6. Include Both Residential and Commercial Waste

Commercial waste makes up 40% to 60% of the waste stream. The policy should apply to packaging generated in all sectors.

7. Don't Put the Packaging Industry in Charge

We would not expect the tobacco industry to implement effective anti-smoking efforts—do not allow consumer brands to self-regulate through Producer Responsibility Organizations (PROs). There needs to be binding performance targets set in statute, and strong accountability and oversight by state agencies, including the ability to completely disband poor-performing PROs.

8. Ensure Strong Oversight and Accountability

A law is only as strong as its enforcement. Create a new Office of Inspector General specifically to enforce the program, and make sure state agencies receive the funding necessary to implement and enforce the law.

⁵ “The Cat in The Hat.” [Seuss](#), Dr. (Theodor Geisel), 1957.

Beyond Plastics and Just-Zero have drafted a model EPR bill, the “Packaging Reduction and Recycling Act, which is found [here](#). It can be adapted for enactment at the federal level.

e. Please describe key elements that are needed to enact a strong and effective National Bottle Bill.

Steps to establish a robust national beverage container deposit law (“bottle bill”):

Background: A national beverage container deposit law (“bottle bill”) is necessary because more than 180 billion beverage containers were wasted (landfilled, incinerated, or littered) in the United States in 2019. In terms of weight, this is almost 800,000 tons of wasted aluminum, more than 2.5 million tons of wasted plastic, and about 9 million tons of wasted glass, as well as about half a million tons of wasted multi-material packaging.⁶ Those numbers grow each year as Americans’ consumption increases. At the national level, beverage container recycling has stagnated for years. According to the U.S. EPA:⁷

- **fewer than 50% of aluminum cans** have consistently been recycled for five years,
- **peak recycling of plastic PET bottles was 33%** in 1990; it had dropped to 27% by 2018,
- **about a third of glass bottles** are returned for recycling.

When contamination is factored in, actual recycling rates are lower still, such that on average, *two out of every three beverage containers sold in the United States are not being recycled.*

However, beverage container recycling rates are not uniform across the country or even within deposit states themselves. Ten U.S. states have existing bottle bills where a deposit of 5-15¢ is placed on a certain set of beverage containers (beverages covered varies from state to state), and is fully refunded when the containers are turned in for recycling (“redeemed”). Recycling rates for container materials on deposit in those states are much higher than the recycling rates for non-deposit containers. Nationwide in 2019:

- **aluminum cans** with a deposit were recycled at a rate of 77%, vs. 36% for non-deposit cans,
- **Plastic PET bottles** with a deposit were recycled at a rate of 57%, vs. 17% for non-deposit PET, and
- **glass bottles** with a deposit were recycled at a rate of 66%, vs. 22% for non-deposit glass.⁸

⁶ “Tipping Point: Beverage Container Wasting, Plastic Pollution, and the Failed Promise of Curbside Recycling.” Container Recycling Institute, forthcoming in 2023.

⁷ Table 25, “Advancing Sustainable Materials Management: 2018 Tables and Figures. Assessing Trends in Materials Generation and Management in the United States.” U.S. Environmental Protection Agency, November 2020.

⁸ “[U.S. Nominal Recycling Rates by Deposit Status, 2019.](#)” Container Recycling Institute website, accessed 1/6/23.

Containers redeemed through a deposit system are also of a much higher quality and are therefore more valuable as an industrial feedstock than containers collected through curbside recycling programs where contamination is rife. A national bottle bill would enable all container materials to achieve high recycling rates *and* be of a higher quality, thereby eliminating millions of tons of container waste, reducing greenhouse gas emissions from replacing wasted containers, reducing litter, and adding thousands of recycling sector jobs to the U.S. economy. The litter reduction benefits are immense!

Key points for Congress to analyze when considering a national bottle bill would include (but not be limited to):

1. **Incentivizing refillable containers:** The “reduce” and “reuse” parts of the “reduce, reuse, recycle” mantra have largely been paid lip service over the years. Refilling was standard for almost all beverage containers until the late 1950s and early 1960s when this practice was abandoned in favor of the perceived convenience of disposable, one-way containers. Since the refilling infrastructure—which was local and regional in nature—was dismantled, there have been significant logistical, financial, and operational obstacles for local or regional brands wishing to sell their beverages in refillable bottles. A national deposit system is an opportunity to create structures for incentivizing reuse and refill. Options that Beyond Plastics supports includes:
 - a. **Requiring a percentage of all beverage container sales to be made in refillable/reusable containers.** Coca-Cola announced that they will sell 25% of their products in reusable/refillable containers by 2030,⁹ and Pepsi has made a similar announcement.¹⁰ We know that these companies have not achieved the majority of their other recycling and waste reduction pledges;¹¹ it is time to amend federal law to make it mandatory rather than voluntary to increase the use of refillables.
 - b. **Developing a grant program** to spur investment in new refilling infrastructure.
 - c. **Creating one or more standardized bottles** that can be delivered to any number of bottle-washing operations across the country and refilled by various bottlers and distributors. Oregon¹² has done this, as has the Beer Store in Ontario, Canada, with its “industry standard bottle,” or standard brown long neck.¹³
 - d. **Placing a higher deposit on refillables** to encourage return for refill.
2. **Redemption options:** for maximum consumer convenience and participation, there should be multiple redemption channels available to the public, including systems that allow consumers to aggregate their containers (such as Oregon’s Bag Drop or Maine’s CLYNK), independently-owned and/or state-operated redemption centers,

⁹ [“Coca-Cola Commits to Bold Reusable Packaging Goal.”](#) *Plastics Today*, Feb. 11, 2022.

¹⁰ [“PepsiCo aims to double amount of reusable packaging to 20% by 2030.”](#) *Waste Dive*, Dec. 6, 2022.

¹¹ [“Coca-Cola and rivals fail to meet plastic pledges: Beverage company is one of worst offenders among consumer goods groups for missing own targets, report finds.”](#) *Financial Times*, Sept. 6, 2020.

¹² [“Oregon Launches First Statewide Refillable Bottle System In US.”](#) Oregon Public Broadcasting, 8/27/18.

¹³ [“The average beer bottle is refilled 15 times in its environmentally-friendly life cycle.”](#) *Toronto Star*, Jun. 28, 2013.

unmanned reverse vending machines, and return-to-retail. It is also important to ensure that sufficient redemption access is maintained in rural areas and in densely-populated urban areas. Steps should be taken to prevent “redemption deserts” where convenient redemption access is unavailable.

Most importantly, stores that sell beverage containers with deposits must be required to take the empty containers back and refund the deposit to the consumer. Redemption centers and bag drops are *supplements* to returning to retail stores, not a substitute. This is especially important for consumers who do not have cars and for busy people who do not want to make extra stops.

The return process for people who collect large numbers of empty containers, sometimes known as canners or waste pickers, should be substantially improved. They provide an important public service at no cost to taxpayers, and their work should be supported at the local level.

3. **Covered beverages and materials:** rather than be limited to the containers that have traditionally been included in state bottle bills (metal cans, glass bottles, and plastic bottles), a national bottle bill is an opportunity to create markets for harder-to-recycle materials at scale. (We do not advise putting a deposit on containers that have historically been nearly impossible to recycle, such as bag-in-box and foil pouches; these container types should be phased out in favor of more reusable recyclable packaging). A national bottle bill is also an opportunity to place deposits on a full range of beverage types, including carbonated and non-carbonated beverages, wine and spirits, milk, and dairy alternatives, as is done in Canada and other countries. The best way to achieve maximum coverage in the context of an ever-changing beverage market is not to identify all the beverage and material types that are included in the law, but rather to *exclude* a much smaller subset of containers, such as those used for medical purposes.
4. **Enforceable recycling rate targets:** to *meaningfully* reduce environmental impacts from container wasting, a national bottle bill should set strong recycling rate targets in the 85-90% range. These targets should be achieved in an incremental manner over a period of not more than 8 years. These targets should be enforceable: if material types (or brands) fail to hit milestones along the path to achieving their targets, there should be changes. These might include raising the deposit value on the poor-performing containers or requiring producers to switch to another package type that has a higher recycling rate.
5. **Continuity of operations:** should the deposit programs in the 10 existing deposit states (whose laws and operating parameters vary significantly) continue to operate independently as they do now, or should they be folded into a national system? Beyond Plastics does not support pre-empting existing state laws.
6. **Deposit value considerations:**

- a. **Modification:** rather than adopt static deposit value(s), as most U.S. deposit states have done, a national bottle bill should have provisions to tie deposit value(s) to the Consumer Price Index, so that they may increase with time in order to serve as effective financial incentives in the face of inflation.
- b. **Efficacy at reaching targets:** whether a single deposit value or a tiered approach (multiple deposit values based on container size or beverage type) is adopted, the deposit value should be high enough to serve as an *effective financial incentive* for consumers to redeem containers at rates that ultimately reach the targets established. If a material type fails to hit redemption rate milestones according to the schedule established, there should be provisions that require the deposit value to increase automatically, as was done in raising Oregon’s deposit value from a nickel to a dime when the redemption rate fell below 80% for two consecutive years.¹⁴

7. **Reporting requirements:** deposit initiators (original sellers) and redeemers (entities issuing deposit refunds) should be required to report quarterly and annually on sales and returns in *units, by material* (not just overall). Other reporting requirements should include number of points of redemption, average population served by each point of redemption, complaints received and addressed, and weight of containers sold and redeemed by material. This information should be made available to the public.

8. **Auditing & enforcement:** an organization outside of the beverage industry must be established *and adequately funded* to audit distributors, redemption centers, retailers (when applicable), and other relevant entities for compliance with the law and to levy fines or penalties for non-compliance. The penalties must be high enough to not be just the cost of doing business. This organization could be housed in an existing federal agency such as the EPA, or it could be a new office of an inspector general, or a neutral third-party organization hired through a competitive bidding review process.

3. ***Earlier this year, the Recycling and Composting Accountability Act passed the Senate chamber by unanimous consent. This Act would require the U.S. Environmental Protection Agency to collect, and make publicly available, data on recycling and composting rates across the country.***

a. ***What is the importance of data collection in helping to better understand the plastic pollution crisis?***

Good data is at the heart of good public policy. If we have a better handle on what exactly is in our waste stream and what the outcomes are for the materials we place in our recycling bins, we can more easily diagnose where the failures are and identify new policies needed to address the problems. However, we do not need to wait for years of

¹⁴ [“Oregon bottle deposit will go from a nickel to a dime next year.”](#) *Oregon Live*, 8/2/16.

new data to know that waste reduction is the most environmentally effective and cost effective way to address the solid waste problems facing the nation. Waste reduction has been at the top of the solid waste hierarchy for decades but has never been taken seriously. Waste reduction is the most important issue for Congress and the EPA to work on.

4. *Americans want to be good recyclers, but there is a great deal of confusion when it comes to knowing what materials should or should not be placed in the recycling bin. As we all know, not all recycling programs are made equal – a bottle that can be recycled in Delaware may not be recyclable in another state. This creates a great deal of confusion for citizens trying to decide what can be placed in their recycling bin.*

a. *Would you comment on the role of product design and its importance in ensuring products can be widely recycled across the majority of states?*

Design for recyclability plays a key role in reducing confusion and increasing recycling rates. If all products on the market were designed with recyclability in mind, then Americans could recycle many items where facilities exist. Adoption of a strong Extended Producer Responsibility law at the state or federal level would result in fewer non-recyclable products being sold.

b. *What other actions can we take to help educate consumers and reduce confusion when it comes to recycling?*

Consumer confusion is primarily a result of brand owners often presenting false or misleading recycling claims on their products and packaging. Examples include putting the recycling logo on the packaging when they know full-well that the package is not recyclable. These practices mislead Americans into thinking that plastics are recyclable when most of them are not. The Federal Trade Commission's [Green Guides](#) that are currently in effect allow the chasing arrows to be used on a product when a minimum of 60% of communities have recycling programs “**available**” that accept a given material. Availability or access does not equal recycling.

More and more brands are putting recycling labels on packaging that, in most instances, is not recyclable in practice. From plastic bags to granola bars, many packages made from film plastics carry labels that indicate that these products can be recycled at store drop-off bins; or “where locations exist.” Such language is the root of much consumer confusion.

The Attorney General of California is investigating deceptive advertising claims around recyclability. Congress should consider doing the same. Ask brands that have recycling claims on their packaging how much is actually getting recycled and where. Congress should direct the FTC to review and rewrite the Green Guides so that they are both meaningful and enforceable.

5. *Under current law, pyrolysis and gasification are regulated under section 129 of the Clean Air Act as waste incineration units. However, there has been an effort at both the state and federal level to reclassify chemical recycling as a manufacturing process.*

a. *Would reclassifying chemical recycling from a waste incineration process to a manufacturing process change how these facilities are regulated under the Clean Air Act?*

Yes, reclassifying “chemical recycling” from a waste incineration process to a manufacturing process would effectively exempt these facilities from all requirements to control, monitor, or report their toxic emissions. One of the claims that the chemical industry and its allies make is that pyrolysis and gasification incinerators don’t need to be regulated as incinerators under Clean Air Act § 129 because they can be regulated as sources of hazardous air pollutants under § 112. That claim is deeply misleading for three reasons:

1. **There is currently no category of gasification and pyrolysis units under § 112, which regulates major stationary source categories,** and EPA is not required to list them as a new category. Therefore, EPA cannot currently regulate pyrolysis and gasification incinerators as manufacturing facilities.
2. **It is extremely unlikely that a new category of gasification and pyrolysis units would ever be created and regulated, despite a [proposed rulemaking process underway](#)** (“ANPR,” discussed further below). Prior to creating a new major category of gasification and pyrolysis units, EPA would have to make a scientific determination that these facilities present a threat of adverse effects to human health or the environment and then list them as a matter of discretion. Even if such a new category were listed, however, it still would have to be regulated from scratch. Setting the standards would be another resource-intensive, multi-year process. Overall, the chances of ever getting gasification and pyrolysis incinerators controlled under § 112 are extremely small, and if it ever happened, it would take a decade or more. Even then, the new standards wouldn’t actually generate reductions until 3 years after rule promulgation because the incinerators would have been built already and would get a 3-year compliance window.
3. **Any new regulations for gasification and pyrolysis incinerators under § 112 would be unlikely to reduce their toxic emissions meaningfully.** For “area source” manufacturing facilities, such as gasification and pyrolysis incinerators (if EPA were to list them as a manufacturing source category), EPA typically sets “GACT” (*generally* available control technology) standards that require little if

any reduction in toxic emissions, in contrast to the “MACT” standard (*maximum* available control technology) required by § 129, under which these facilities are currently regulated.

It is very important to understand that just because gasification and pyrolysis incinerators are not currently listed as “major sources” of hazardous air pollutants under § 112, that doesn’t mean they aren’t dangerous; it only means that they don’t emit the **high-volume** hazardous air pollutants (HAPS), such as hydrogen chloride, that enable other § 112 facilities to be classified as “major.” But gasification and pyrolysis units **absolutely do emit toxic pollutants**, including dioxins, arsenic, cadmium, benzene, lead, and mercury. These pollutants are dangerous even in minute quantities. ***This is exactly why Congress enacted section 129 in the 1990 amendments to the Clean Air Act: to regulate incinerators with highly toxic emissions that were not captured by section 112.***

To recap: adding gasification and pyrolysis as major source categories under § 112 of the Clean Air Act would entail delays of a decade or more, with no guarantee of meaningful control of very hazardous air pollutants. Instead, it would be much easier, and more effective from a pollution control-standpoint, to just adhere to EPA’s long-standing, **existing classification of gasification and pyrolysis units as waste incinerators:**

- no new listing in § 112 is required
- no new standard setting: all the standards already exist
- no delay in controlling HAP emissions – new gasification and pyrolysis incinerators will be subject to protective MACT standards as soon as they are built.

The plastic industry knows that removing pyrolysis and gasification incinerators from regulation as incinerators under § 129 is a way to deregulate them. It knows that promises of regulation under § 112 would, in fact, effectively mean complete deregulation and a blank check to pollute without ever installing MACT controls, monitoring their emissions, or reporting those emissions to the people in the communities where they operate (which will primarily be in environmental justice communities). That is why the plastic industry is cynically asking that pyrolysis and gasification incinerators be regulated under § 112 instead of § 129.

It is important to note that the chemical industry is lobbying at the state level to have these facilities exempted from various state environmental laws and, in some instances, have them considered manufacturing facilities, which would open the door to taxpayer subsidies.

b. Are area source manufacturing processes subject to the same emissions regulations as waste incinerators?

No, area sources are typically only required to meet Generally Available Control Technology (GACT) standards, which are essentially toothless and ineffective. Waste

incinerators are subject to MACT standards (Maximum Available Control Technology): the standards used in § 129.

c. Is there a category of pyrolysis and gasification manufacturing facilities to regulate under the Clean Air Act?

No, not under Section 112. § 112 regulates source categories, and there is no category of gasification and pyrolysis units to regulate. It is extremely unlikely that a new category of gasification and pyrolysis units would ever be created and regulated, as I described above. If it ever did happen, the process would take more than a decade and be very resource-intensive for EPA.

d. What impact might this reclassification have on communities living near chemical recycling facilities?

The reclassification would have a very negative effect on those communities living near “chemical recycling” facilities, as those facilities would no longer be subject to emissions limits for a range of chemicals that are highly toxic at even small doses, including styrene, benzene, toluene, mercury, arsenic, dioxins, ethylbenzene, xylenes, naphthalene, acetaldehyde, formaldehyde, hydrochloric acid, methanol and hexane. As described above, such facilities would also escape Clean Air Act requirements for monitoring and reporting on emissions. Finally, these facilities would be able to burn other kinds of waste without pollution controls or monitoring and reporting requirements, including PFAS waste, if they were not covered by Clean Air Act protections.

6. In September of 2021, the Environmental Protection Agency issued an Advanced Notice of Proposed Rulemaking (ANPR) requesting comments to assist in the potential development of regulations for pyrolysis and gasification units, such as chemical recycling facilities, that “convert solid or semi-solid waste into products such as energy, fuels, and chemical commodities.” EPA has stated that a primary goal in this process is to address the confusion currently surrounding these facilities and their continued regulation under section 129 of the Clean Air Act.

a. Do you believe that pyrolysis and gasification facilities should be excused from compliance with the Clean Air Act if they are being used to convert waste plastic into useful products?

No. There is no reason to exempt pyrolysis and gasification facilities from compliance with the Clean Air Act just because they may be potentially turning plastic waste into products. The hazardous waste generated and toxic air pollution emitted from pyrolysis and gasification units is no different and no less harmful to the public – particularly those living near these facilities – simply because they are potentially making “useful” products. Congress has never adopted any provision that would provide such an enormous and harmful loophole to the Clean Air Act. To be clear, nothing is currently stopping any company from using pyrolysis or gasification for plastic-to-fuel,

plastic-to-plastic or plastic-to-anything else. The industry is simply seeking to avoid the responsibility of complying with pollution controls so it can further externalize the already enormous cost of plastic production and waste onto taxpayers and those living near pyrolysis and gasification facilities.

b. How should EPA assess comments submitted under this ANPR?

EPA should consider whether it is under any legal obligation, whether from Congress or the courts, to amend its current regulations that treat pyrolysis and gasification as incinerators under Section 129, and that treat discarded plastic as “waste” under the Resource Conservation and Recovery Act (RCRA).

Recognizing that no such obligation exists, EPA should consider the potential harm to public health – particularly for those communities living near existing or projected pyrolysis and gasification facilities – from de-regulating these two technologies by removing them from Section 129 of the Clean Air Act.

Based upon these two factors, and consistent with the Agency’s mission and mandate from Congress under the Clean Air Act, EPA should have no difficulty in concluding that a change to how pyrolysis and gasification are regulated under the Clean Air Act, (including whether plastic waste is treated as such under RCRA) is not only unwarranted but would be dangerous and wrong.

7. Pyrolysis plants are known to emit a number of the most toxic hazardous air pollutants including: Styrene, Benzene, Toluene, Mercury, Arsenic, Dioxins, Ethylbenzene, Xylenes, Naphthalene, Acetaldehyde, Formaldehyde, Hydrochloric Acid, Methanol and Hexane.

c. Will there be any pollution controls on the release of these Hazardous Air Pollutants into surrounding communities if pyrolysis and gasification are removed from Section 129 of the Clean Air Act, or if plastic waste is no longer classified as “waste” under the Resource Conservation and Recovery Act (RCRA)?

No. Industry is pursuing two de-regulatory paths to get out from under the pollution control requirements of Section 129 of the Clean Air Act: 1) change the definition of what is considered an incinerator under Section 129, 2) amend EPA’s regulations under RCRA to exclude plastic waste from being classified as “waste.” Either of these two actions, whether taken by EPA or Congress, would eliminate existing Clean Air Act protections for communities from toxic pollution and hazardous waste coming from “chemical recycling” facilities. This would particularly threaten environmental justice communities.

While the chemical industry says that it can comply with the Clean Air Act if their facilities are covered by Section 112, this is only because the highly-toxic pollutants from pyrolysis and gasification technologies are not emitted in high enough volumes to ever trigger regulation under that section. In addition, as stated earlier, were EPA ever to

embark upon setting pollution limits for pyrolysis and gasification under Section 112, it would take at least a decade to do so, and likely much longer.

To the extent that it is the priority and obligation of EPA and the Congress to protect public health, there is no reason to change the existing scope of what is considered an incinerator or the current inclusion of plastic waste as “waste” under RCRA. Nothing compels EPA to change the status quo in either respect; the Agency would only need to do so if it sought to eliminate existing (and long-standing) pollution controls to favor the interests of the plastics industry over public health and the environment.

8. In your testimony, you said that plastic production is becoming the “new coal” with significant implications for climate change, and the global communities’ efforts to mitigate it.

d. How does plastic production (including manufacturing, use, and disposal, as well as oil and gas extraction and transport) currently contribute to climate change?

Plastic produces greenhouse gas emissions at every stage of its life cycle. As of 2020, the U.S. plastics industry was responsible for at least 232 million tons of CO₂e gas emissions per year, which is equivalent to the average emissions from 116 average-sized (500-megawatt) coal-fired power plants.¹⁵ To provide context, if plastic were a country, it would be the world’s fifth largest greenhouse gas emitter, beating out all but China, the U.S., India and Russia. This analysis was thoroughly documented in a 2021 report by Beyond Plastics, titled, “The New Coal: Plastics & Climate Change.” The report’s conclusions are based on an examination of these ten high-impact stages of plastics production, use, and disposal:

1. Fracking for plastics
2. Transporting and processing fracked gasses
3. Ethane gas crackers
4. Other plastics feedstock manufacturing
5. Polymer and resin manufacturing
6. Exports and Imports
7. Foamed plastic insulation
8. "Chemical Recycling"
9. Municipal Waste Incineration
10. Plastics in water

e. What are the implications of the projected tripling of plastic production over the next 40 years?

Absent legislative or regulatory intervention, plastic production is on track to double by 2040 and triple over the next 40 years. As the plastics industry continues to build

¹⁵ [“The New Coal: Plastics & Climate Change,”](#) Beyond Plastics, 2021.

infrastructure for export and production, its CO₂e contributions will increase as well. Plastic pollution entering the ocean is projected to nearly triple by 2040 to 29 million metric tons per year and will continue to increase exponentially beyond that. The anticipated impacts to the ocean and to human health of this scenario are severe.¹⁶

f. Regarding new plastic production facilities, what is the carbon footprint for the numerous facilities that are currently proposed for the U.S.?

At least 42 plastics facilities have opened since 2019, are under construction, or are in the permitting process. If they become fully operational, these new plastics plants could release an additional 55 million tons of CO₂e gasses – the equivalent of another 27 500-megawatt coal-fired power plants.

g. What percentage of the climate benefits from Inflation Reduction Act investments and reductions will be erased by new plastics manufacturing (including the greenhouse gas emissions from production, use and disposal, as well as oil and gas extraction and transport)?

There are many factors that go into calculating such an estimate, and such a calculation is beyond the scope of this question and answer process. For background, note the following:

Estimates show that the Inflation Reduction Act puts the United States on a path to cut its greenhouse gas emissions by 40% by 2030.¹⁷ As of 2020, the U.S. emits 6 billion metric tons of greenhouse gas each year, therefore in real numbers a 40% reduction is equivalent to a reduction of 2.4 billion tons of greenhouse gas emissions. Given that plastic production is expected to double by 2040, greenhouse gas emissions from plastics production are also likely to double: from 232 million tons to 464 million tons.

¹⁶ [“Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution.”](#) Pew Charitable Trusts, 2020.

¹⁷ “The Inflation Reduction Act Is The Most Important Climate Action In U.S. History.” *Forbes*, August 2, 2022.