

National Caucus of Environmental Legislators

# Zero Waste Policy Roadmap For a Plastic-Free Future



# Zero Waste Policy Roadmap

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# Zero Waste Policy Roadmap Acknowledgments

## Roadmap Partners

This Roadmap was created in collaboration with various partner organizations who provided expertise on specific areas. The organizations listed below were all contributors to various components, but have not necessarily endorsed all of the content included within the final product.

NCEL is grateful for the support and expert knowledge of the following organizations throughout the creation of this document: GAIA (Global Alliance for Incinerator Alternatives), Safer States, and Upstream.



# Zero Waste Policy Roadmap Executive Summary

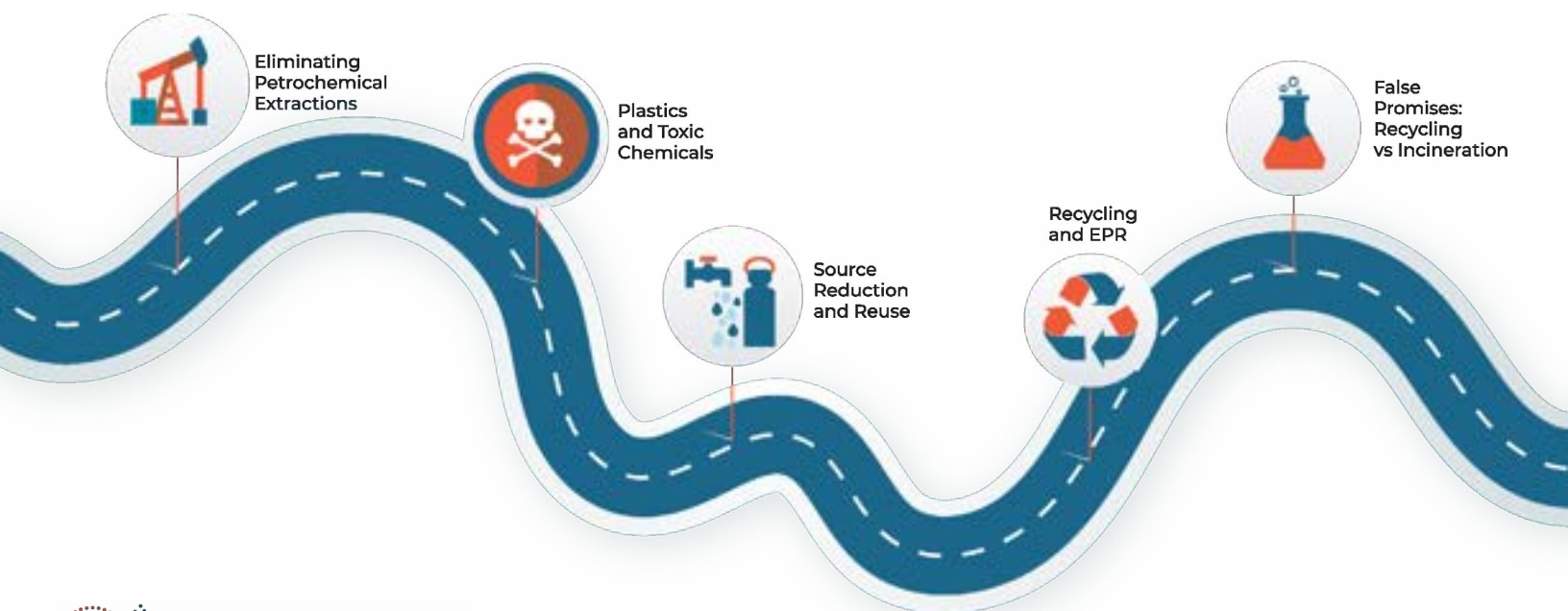


## Our Plastic Problem

Plastic pollution is a global crisis causing extensive public health and ecological adversities. Single-use plastics are the most pervasive plastic pollutants that contain hazardous substances and that slowly break down into smaller particles that stay in the environment. Plastic is largely made from fossil fuels, and production is expected to increase by more than **30%** over the next decade. At a current national recycling rate of **5%**, recycling won't ever be able to keep pace with the production or generation of single-use plastics. Many policies currently focus on how to manage waste once generated. But to address the full extent of the plastic pollution crisis, comprehensive policy strategies are needed that account for the full life cycle of plastics and remediate the problem upstream where it's created.

## Solutions Within the Roadmap to Zero Waste

**This roadmap is intended to strengthen the analysis of policy solutions so that decision-makers can transform our waste system into a just, toxic-free, circular economy.** To do this, the roadmap connects policy solutions to environmental justice and climate goals. Each of the five sections within the roadmap (shown below) contains equity and justice considerations and key policy options. The policies highlighted have been identified using criteria that: (1) centers justice and equity, (2) prevents further petrochemical buildout, (3) protects public health, (4) avoids regrettable substitutions, and (5) drives momentum away from resource extraction.







# Zero Waste Policy Roadmap

## Eliminating Petrochemical Extractions

### Overview

Over [99% of plastics](#) are made from petrochemicals i.e. fossil fuels (oil, gas, and coal). Oil and gas are obtained from both conventional and unconventional drilling techniques such as horizontal drilling and hydraulic fracturing (i.e. “fracking”), used in the U.S. to extract shale gas. As our society transitions to renewable energy and the demand for oil and gas for energy generation begins to decrease, extraction is becoming [less profitable](#) unless there is a new market for these fuels. As a result, the petrochemical industry is massively investing in the U.S. in turning natural gas into [ethylene and propylene](#) used to make significantly cheaper plastic.

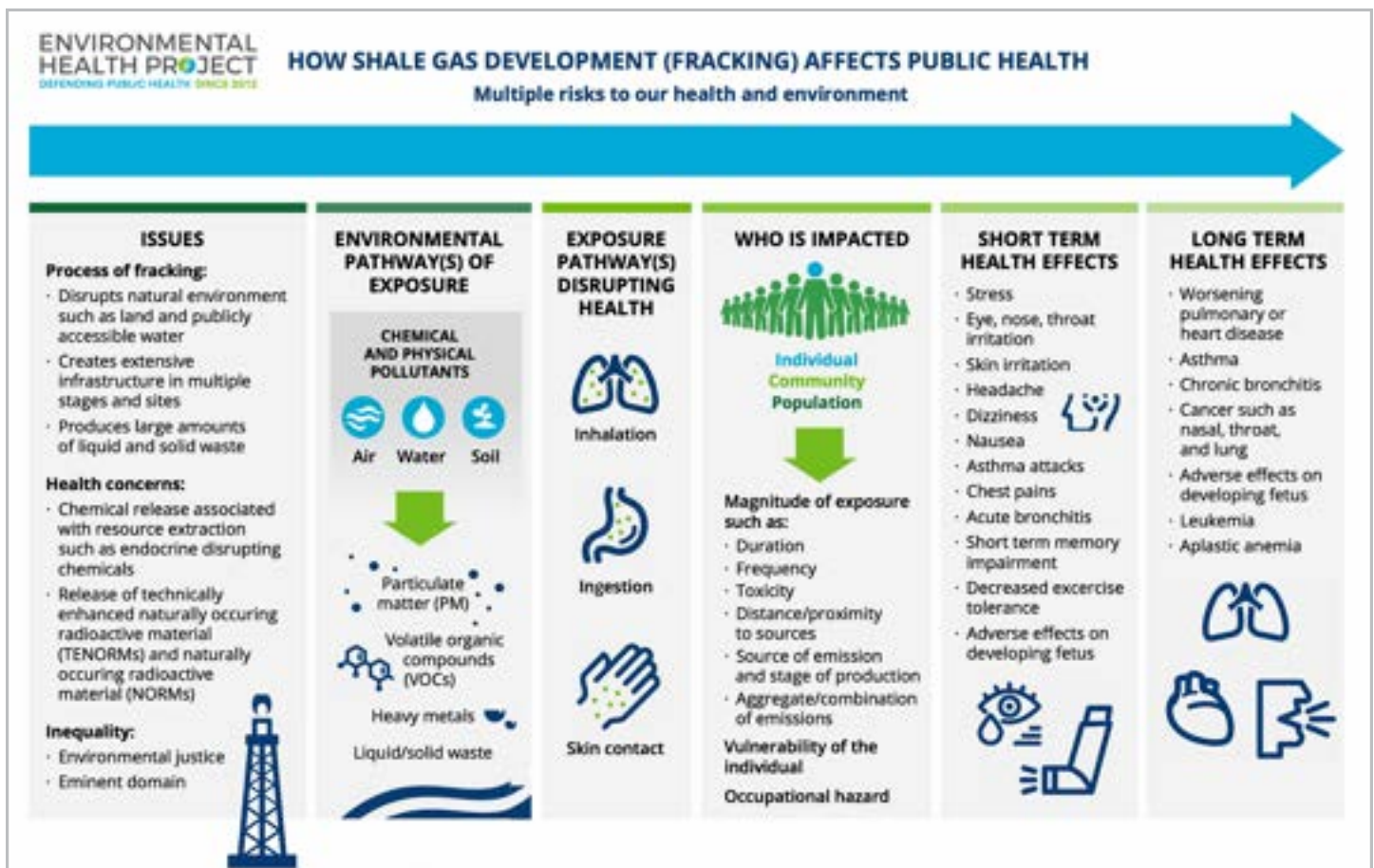


Figure 1: Infographic covering the impacts of hydraulic fracturing on public health. Source: [Environmental Health Project](#)



While petrochemical companies promise economic benefits to the localities where oil and natural gas is extracted and refined, the truth is that they often bring in their own workers rather than hire locally for jobs in petrochemical and plastic facilities. Moreover, the facilities - predominantly located in low-income areas and communities of color - pose [major health and environmental risks](#) and can also force schools, churches, and homes to relocate, leaving communities with the choice of staying and risking their health or negotiating a buyout and abandoning their homes.

## Equity and Justice Considerations

**Public Access to Information:** Current federal procedures fail communities due to their lack of accessibility and transparency to the public. States should ensure that the public is aware of any hazards that arise from manufacturers, waste, spills, and fires, as well as those from lawful operations of petrochemical infrastructure. People should be advised about the toxins in their communities, how the infrastructure operates, and informed before new infrastructure is built. Federal procedures also fail to account for the number of people who are considered [Limited English Proficient](#). Local outreach programs to educate the public of potential hazards to their public health due to manufacturing practices from Risk Management Plan (RMP) facilities is paramount to achieving environmental justice.

**Public Input in Permitting of Facilities:** Public participation is critical to the permitting process in order to empower communities and build public trust in state and local governments. Standardized public input and robust cumulative impact assessments should be conducted prior to issuing permits. The agency and the public should work together to consider the environmental and cumulative considerations of a community before a facility is issued a permit.

## Key Policy Options

**Environmental Justice Screenings** [Environmental justice screening](#) and mapping offer tools for states to consider environmental, socioeconomic, and demographic information when identifying [environmental justice communities](#). These screenings will allow state and local governments to better recognize overburdened communities and to prevent further harm.

- **[Maryland H.B.1200 \(Enacted 2022\)](#):** Requires that certain permit applications to the Department of the Environment include the Maryland EJ tool score for the relevant census tract. The department is required to review the EJ score to verify the applicant's information.
- **[New York S.8830 \(Enacted 2022\)](#):** Defines disadvantaged communities and establishes a host of provisions regulating the equitable siting of environmental facilities across the state. Also requires environmental impact statements to state whether the siting of the facility will pose a disproportionate burden on disadvantaged communities.

**Ban Fracking** Currently, oil and gas fracking wells are active in at least 30 states. Fracking injects millions of gallons of fluid -- a mixture of water, sand and more than 550 undisclosed chemicals -- into a deep well to fracture the rock and release gas or oil. In some cases, the fluid returns to the surface with new, dangerous chemicals such as arsenic, a known carcinogen. These toxic chemicals have direct and documented impacts on skin, eyes, and other sensory organs, the respiratory, nervous, endocrine, reproductive, and gastrointestinal systems, liver, and brain. Banning fracking is an important step to prevent further harm and pollution.



- **Maryland H.B.1325 (Enacted 2017):** Prohibits a person from engaging in the hydraulic fracturing of a well for the exploration or production of oil or natural gas in the State.
- **New York S.B.883 (Enacted 2015):** Prohibits the issuance of any permit for drilling or operating any well using hydraulic fracturing or hydraulic fracturing fluids.

**Wastewater Testing and Treatment** [Fracking wastewater](#) is the byproduct of the fracking and drilling process, which contains chemicals such as benzene and naturally occurring radioactive materials. The wastewater is then disposed of, with little testing or treatment, in unsuspecting communities. To begin to address the impacts of fracking, wastewater must be considered hazardous waste and be thoroughly tested and treated before disposal.

- **Pennsylvania H.B.1302 (Introduced 2021):** Would have closed a loophole regarding state laws governing the disposal of toxic drilling waste. Oil and gas companies would no longer be exempt from thoroughly testing or treating waste prior to disposal.

**Preventing Further Petrochemical Infrastructure** Limiting fossil fuel extraction and build out of new petrochemical facilities is a crucial step to stopping plastic pollution. One way to achieve this is to deny permits. The petrochemical industry is spending over [\\$200 billion on more than 300 different plastics projects](#) across the United States. States can take action by denying permits for the construction of these facilities.

- **Virginia H.B.2292 (Introduced 2021):** Proposed moratorium on fossil fuel projects.

**Fossil Fuel Divestment** Fossil fuel divestment is a growing tactic to stop fossil fuel extraction and plastic manufacture. The fossil fuel industry is dependent on investments and subsidies to operate. Divesting from these companies limits their production ability and effectiveness. Together with reinvesting in renewable energy and a just transition, this tactic can limit fossil fuel and plastic (99% of which is derived from fossil fuels) production and start building safer alternatives.

- **Maryland S.B.0566 (Enacted 2022):** Requires the State Retirement and Pension System to perform a climate risk assessment to determine the risk of assets and investments in state pensions.

**Protective Buffers** Industrial and chemical infrastructure associated with petrochemicals have a history of polluting air, water, and soil. This is especially true for communities in Pennsylvania, Texas, and Louisiana where extractive petrochemical activities are concentrated. [Protective buffers](#) offer communities security by ensuring these projects are a minimum distance away from people's homes, schools and other community sites.

- **California S.B.1137 (Enacted 2022):** Establishes a health and safety setback of 3,200 ft between oil and gas sites and homes, schools, childcare facilities, healthcare facilities, and other sensitive locations. The law also applies to rework permits, effectively ending existing extraction and prohibiting oil and gas operators from deepening or reworking wells in the short-term.

**Full Chemical Disclosure** A federal law from 2005 bans the federal government from requiring companies to report the chemicals used in oil and gas drilling and fracking activities. However, states can require full chemical disclosure from companies, which can help inform communities about the chemicals they may be exposed to from petrochemical extraction.

- **Montana H.B.243 (Introduced 2015):** Would have required companies to disclose the composition of fracking fluid, which would then be posted on a public website. This bill would have also required 45 days notice to property owners with a water supply 3,000 feet from the fracking site.



## Zero Waste Policy Roadmap

# Plastics and Toxic Chemicals

### Overview

Plastic creates serious toxic impacts across its entire life cycle, with low-income and communities of color most impacted. From the extraction and refining of fossil fuels, through manufacturing and use of plastic products, to waste management and disposal at the end of product life, communities are impacted by air and water pollution stemming from these activities. We are all exposed to the chemicals contained in everyday plastics, from the food we eat that is wrapped in plastic to the vinyl flooring in our homes.

Toxic plastic additives can leach from food packaging into our food, escape into our water and indoor air, and are found in microplastics. The chemicals used to make plastic are associated with [health effects](#) ranging from cancer and neurological harm to birth defects, immune system suppression, reproductive harm, hormone disruption, and asthma. Many of the endocrine-disrupting chemicals that scientists have linked to a [sharp drop in sperm count](#) are common in plastic.

### Equity and Justice Considerations

Industry is more likely to build oil refineries, chemical production facilities, plastic manufacturing plants, landfills, and incinerators that are a part of the plastics life cycle in or near low-income and communities of color. Therefore, these communities bear the brunt of the air, water, and other pollution that is associated with these activities, including both chronic and acute exposures that result from both regular operations as well as spills and other releases beyond regular business operation. Indigenous communities in the Arctic are also at higher risk because air and ocean currents tend to concentrate chemical and plastic pollution in these regions, polluting their food sources, mostly fish and marine mammals.

### Key Policy Options

**Implement Non-Toxic Government Procurement Standards** States can be leaders in promoting public and environmental health by implementing strong procurement policies that advance non-toxic alternatives to plastic products and other environmental objectives. In particular, states can implement policies that avoid purchasing single-use plastic in favor of reusables certified to be non-toxic and move to reusables that are [certified](#) to be non-toxic.





- **[New York Executive Order 4 \(Enacted 2008\)](#)**: Establishes a [State Green Procurement and Agency Sustainability Program](#) that develops procurement lists and specifications of product criteria that reduce the use and release of toxic substances, prevent pollution, promote sustainable resource management, and reduce greenhouse gas emission, and provide other environmental and health benefits.
- **[Washington Executive Order 18-01 \(Enacted 2018\)](#)**: Directors shall ensure that their agencies are complying with state rules and guidance on environmentally preferable purchasing. Directors of the Department of Enterprise Services (DES) and the Department of Ecology (ECY) shall ensure that their agencies are collaborating to produce guidance that is simple, clear, and targeted on the most important opportunities for toxics reduction.

**Remove Harmful Chemicals From All Packaging, Including Plastic Packaging** There are many toxic chemicals found in packaging, including ortho-phthalates, bisphenols, per- and polyfluoroalkyl substances (PFAS), formaldehyde, styrene, lead, and mercury, just to name a few. These compounds may be intentionally added to products, used during the manufacturing process, or may be contaminants from a variety of sources that end up in products. Harmful chemicals found in packaging have been linked to a wide range of adverse health effects including cancer, infertility, low sperm count, birth defects, early puberty, immune system suppression, and obesity. One recent scientific study even linked phthalate exposure to [100,000 premature deaths](#) each year.

- **[Maine H.P.1043 \(Enacted 2019\)](#)**: Bans lead, mercury, cadmium, hexavalent chromium, PFAS and phthalates in food packaging.
- **[Vermont S.20 \(Enacted 2021\)](#)**: Bans PFAS, phthalates, and bisphenols in food packaging.
- **[Washington RCW 70A.350 \(Enacted 2019\)](#)**: Creates the Safer Products for Washington program, directing the state to identify and take action on the products that are significant sources of high-priority chemicals.
- **[New York S.4246 \(Introduced 2023\)](#)**: This bill, which aims to reduce packaging waste and improve recycling and reuse infrastructure, includes key provisions which would ban 12 high-priority toxic chemicals and chemical classes in packaging.
- The model [Extended Producer Responsibility \(EPR\)](#) policy presented in another section of this roadmap includes key provisions which would ban 12 high-priority toxic chemicals and chemical classes in packaging, which could also be adapted into a stand-alone policy.

**Ban Polystyrene and PVC Packaging and Incentivize Safer Packaging Materials** Polystyrene and polyvinyl chloride (PVC) are two of the most toxic and problematic forms of plastic and have both been named to the [“Problematic and Unnecessary Materials List”](#) list of the U.S. Plastic Pact – a voluntary industry-driven initiative to address the plastic waste crisis. While all plastics have a toxic life-cycle, these two plastics clearly stand out as some of the worst.

**Polystyrene** causes litter in communities, harms wildlife, and has a highly toxic life cycle. It is made from the carcinogens styrene and benzene, and contains harmful polycyclic aromatic hydrocarbons, some of which can also cause cancer. Polystyrene is often used for packaging, such as loose-fill packaging “peanuts” or polystyrene blocks, and foodware. For more information on the health and environmental issues associated with polystyrene, see this factsheet on the [Problems with Polystyrene Foam Products and Foodware](#). The use of polystyrene packaging should be replaced with non-toxic alternatives (where product redesign cannot eliminate the need for packaging altogether).

- **[Washington S.B.5022 \(Enacted 2021\)](#)**: Bans the use of polystyrene foam in food service containers, packaging peanuts, and coolers.



- **Maine H.P.1055 (Introduced 2023):** Would prohibit the sale of plastic packaging containing certain problematic materials and additives, including all packaging made from polystyrene and PVC.

**PVC** is made from the carcinogenic compound vinyl chloride as well as other toxic additives and stabilizers. Its manufacturing involves the carcinogen asbestos and/or the toxic and persistent “forever chemicals” known as PFAS. PVC is difficult to recycle, is a potent and expensive contaminant in recycling streams, can leak harmful compounds into the ground after landfilling, and when incinerated releases toxic dioxins, furans, and heavy metals. For more information on the health and environmental issues associated with PVC, see this report on [Why PVC Remains a Problematic Material](#). PVC packaging should be replaced with non-toxic alternatives (where product redesign cannot eliminate the need for packaging altogether). While the US has been slow to phase out PVC packaging, [South Korea](#) has banned almost all PVC-based packaging, while [Taiwan](#) and [New Zealand](#) have banned its use in food packaging. Policies should also ensure that the packaging used in place of polystyrene and PVC don't include toxic chemicals, potentially by requiring that they meet third-party certification requirements such as [GreenScreen Certified](#).

- **Maine H.P.1055 (Introduced 2023):** Would prohibit the sale of plastic packaging containing certain problematic materials and additives, including all packaging made from polystyrene and PVC.

### **Take Action to Address Microplastics**

Instead of breaking down in the environment, plastic breaks up into tiny plastic particles called microplastics which are now an emerging health threat. Found in food, water, air, and in the human body, microplastics can both contain toxic chemicals and absorb others in the environment. A [2023 University of California report](#) commissioned by the California State Legislature concluded that exposure to microplastics is a likely reproductive and digestive hazard to humans, and may lead to cancer. Therefore, states can be proactive in addressing this growing problem. Initial steps could be to initiate drinking water or sludge testing or develop a statewide strategy.

- **California S.B.1263 (Enacted 2018):** Requires the state to adopt and implement a Statewide Microplastics Strategy, including investigating the health and environmental impacts of microplastics and identifying key policy changes to reduce harm.
- **California S.B.1422 (Enacted 2018):** Requires the state to conduct four years of microplastic testing in drinking water.



# Zero Waste Policy Roadmap

## Source Reduction and Reuse

### Overview

State waste legislation and regulations generally emphasize diverting waste from landfills through waste reduction, reuse, recycling, composting, and other forms of disposal, like incineration and energy recovery. While most states prioritize “source reduction” - i.e. reduce and reuse, the Rs at the top of the [waste management hierarchy](#) - few have had any measured success with reduction strategies. Most focus on best practices for managing waste once it’s created. By reducing as many single-use products as possible and transitioning to non-toxic reusable products and packaging, states can dramatically decrease waste management costs for residents and businesses and provide significant environmental benefits. **Therefore, the number one zero waste priority should be adopting policies and practices that prioritize reduce and reuse as the first choice over recycling, waste treatment, and disposal.**

### Equity and Justice Considerations

Historically, waste and waste prevention policies in the U.S. have failed to adequately embed equity and justice values in the development process. This has led to the exclusion of the communities most affected by climate change and plastic pollution. The following principles allow for policy-makers and advocates to find more ways to develop equitable policies in the future:

1. Develop meaningful relationships with diverse groups and communities.
2. Prioritize grassroots organizing.
3. Incorporate diverse voices in policy development.
4. Acknowledge and adequately credit for positive outcomes.
5. Provide resources to enable community partners to participate.
6. Create reuse policies that are developed inclusively and ensure continued meaningful community engagement and equitable access.
7. Create reuse policies that support a just transition.

### Key Policy Options

#### Reduce the Use of Disposable Products and Packaging

**Packaging Reduction Targets** Consider creating reduction targets for the four business sectors that contribute the majority of single-use plastics to the waste system:

1. **Food and beverage service** (on-site dining, take-out, delivery, and events)



2. **Beverage industry** (alcoholic and nonalcoholic beverages, such as water, soft drinks, milk, and milk alternatives)
3. **E-commerce/transport packaging** (both business-to-business and business-to-customer)
4. **Consumer goods** (household cleaning/ maintenance, personal care)

Creating a series of benchmarks can help to achieve substantial progress. For example, starting with 10% reduction within two years of policy enactment and reaching 50% within 10 years. This reduction can be accomplished either by eliminating unnecessary packaging or by transitioning to reusable packaging, or a combination of both.

## Phase Out Single-Use Items

Phasing out toxic and otherwise problematic plastics is an essential part of addressing the plastic life cycle. This industry list of “[problematic and unnecessary materials](#)” is a good starting point for bans and other policies. Policies should be designed to avoid regrettable substitutions of plastics with other single-use products and packaging.

**Bans On Single-Use or Disposable Packaging Products** There are a wide array of policies that ban disposable products, including bans on disposable hotel toiletry containers in various states.

- **California A.B.1162 (Enacted 2019):** Prohibits disposable foodware for onsite dining in a number of California cities.

**Plastic Bag Bans or Fees** Six states have banned plastic bags. Bag bans should include definitions of single-use to avoid regrettable substitutions with thicker single-use plastics, and should be accompanied with bans or fees on paper bags.

- **Oregon H.B.2509 (Enacted 2019)** and **Maine L.D.1532 (Enacted 2019):** Ban single-use plastic bags and place a fee on single-use recycled paper bags and plastic reusable bags.

**Polystyrene Bans** As mentioned in the Plastics and Toxic Chemicals section, polystyrene is one of the most toxic and problematic forms of plastic.

- **Maryland S.B.285 (Enacted 2019):** Prohibits polystyrene.
- **Maine L.D.289 (Enacted 2019):** Prohibits polystyrene and bans single-use stirrers.

**Comprehensive Single-Use Plastic Bans** Some states are considering bans on all single-use, non-recyclable products.

- **Vermont S.113 (Enacted 2019):** Prohibits the distribution of single-use plastic carryout bags, polystyrene products, and plastic straws to customers.

**Accessories “On Request” Legislation** Too often with delivery and take-out food service, customers receive straws, utensils, napkins, condiment packets, and other accessory items they don’t want or need. To date, over 30 local jurisdictions (including Los Angeles, Denver, and Washington, D.C.), and two states (California and Washington) have enacted [policies](#) that require food businesses to ask first before providing customers with foodware accessories.

- **California A.B.1276 (Enacted 2021):** Prohibits food facilities from providing single-use foodware and condiments without first being requested by a consumer.
- **Illinois H.B.3379 (Introduced 2019):** Would have required straws to only be provided upon request.





# Transition the Rest to Non-toxic Reusable and Refillable

**Ensure That Reusables and Refillables are Non-Toxic** A glass cup has a **much less toxic life cycle**, for example, than a reusable cup made from melamine – a type of plastic made with the carcinogen formaldehyde. Any reuse mandates should include provisions requiring that the materials used be made from non-toxic materials and additives since some reusable materials are still problematic such as polycarbonate which contains additives that are known to be endocrine disruptors, or melamine which is made from formaldehyde, a known carcinogen. Any reusable material derived from fossil fuel plastic will also have life-cycle impacts so it is best to transition to non-toxic materials.

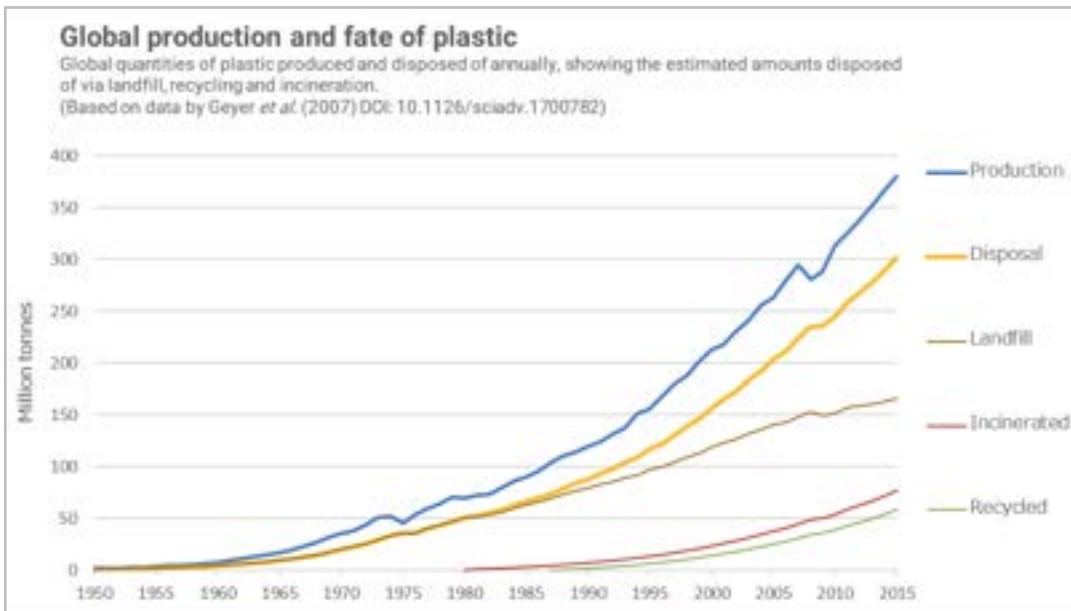


## Zero Waste Policy Roadmap

# Recycling and Extended Producer Responsibility

### Overview

Recycling is a key element of [successful local zero waste programs](#), however, recycling attracts a disproportionate amount of attention compared to its place on the waste hierarchy: remember that **recycling is lower on the waste hierarchy than reduction and reuse**. Recycling policies should be accompanied by ambitious reduction and reuse policies that include targets, funding, and enforcement. To optimize recycling, state policy should drive the marketplace toward feasibly recyclable materials, away from non-reusable, non-recyclable materials. A just transition for zero waste will prioritize labor and community benefits, and eliminate toxic additives from products so they don't harm workers or communities or contaminate recycling streams.



**Figure 2:** Graph showing trends in global plastic production and disposal. Data Source: [Science Advances](#)

## Recycling is Not Feasible for Most Single-Use Plastics

While a few plastics have strong domestic recycling markets, most are not feasibly recyclable because they aren't technically or economically recyclable, or lack domestic markets. In recent years, the plastic recycling system conditions in the U.S. have eroded significantly. Misleading labels contribute to the problem: [64% of plastics](#) collected for recycling in five major US cities cannot actually be recycled, despite many containing the "recyclable" label or "chasing arrows" symbol. Nationally, only [5% of plastics](#) are estimated to be recycled. The remaining [95% of plastics](#) are landfilled and incinerated, causing further health and environmental harm.



## Equity and Justice Considerations

Creating a just transition for the waste and recycling sector is an important and achievable goal. A zero waste scenario through reuse, recycling, and composting would create [1.5 million new jobs nationally](#), including domestic manufacturing using recycled content. Sorting recycling creates 20 times more jobs than wasting the same materials. Policy action is needed to make these jobs safe. Currently, recycling sorting and waste hauling are [dangerous jobs](#), and hiring temporary labor is a common practice at recycling sorting facilities. Deposit return systems (DRS) rely on informal labor and new legislation should include protections for this under-recognized sector, including the decriminalization of collecting recyclable containers.

## Strengthen Recycling for Metals, Paper, Glass, PET Plastics

While many types of plastic cannot feasibly be recycled, **aluminum, paper, and PET plastic** have strong recycling markets, and glass is highly recyclable. Mechanical recycling of these materials creates jobs, emissions, and conserves natural resources. With the majority of cardboard boxes and aluminum cans still ending up in the trash, states should work to scale up collection and recycling of these valuable resources. With effective policies like bottle bills and mandatory recycling, recycling of these materials will be far more successful.

## Key Policy Options

**Deposit Return System (DRS)** Deposit return systems (DRS), also known as [Bottle Bills](#), are producer-financed systems that place a refundable deposit on beverage containers made from common materials like plastic, glass, and metal. Consumers pay a small fee upon purchasing the beverage containers and receive a full refund once the emptied container is returned to an accessible collection point. These straightforward policies are popular with the public and effective: states with DRS have much higher container recycling rates than other states.

- **Important Considerations for Deposit Return Systems:**

1. Funds generated from DRS should be allocated back to program management for program improvements and innovation on source reduction and reuse (rather than funds being allocated general funds).
2. New DRS systems should include support and transition for existing recycling programs to offset the loss of high-value materials for recycling operations. Systems should also consider and protect informal labor (including the decriminalization of collection of deposit containers).
3. DRS systems should connect to recycled content use demands to ensure an equivalent increase in demand for the increased supply of materials. Without plans to balance supply and demand, the oversupply of containers in the market could crash prices and jeopardize existing recycling infrastructure and programs.

- **Bottle Bill | Oregon** achieves a 90% redemption rate with clear goals and accessible redemption centers. The Oregon bottle bill includes a refillable and reusable program that is less carbon-intensive than recycling. The program is incredibly popular with a 97% public approval rate.
- **Container Law Expansion | California S.B.1013 (Enacted 2022):** Places a California Redemption Value (CRV) on the 1.3 billion wine and liquor containers sold in the state each year, which will dramatically [increase the quantity and quality](#) of glass recycling.



**Extended Producer Responsibility (EPR) for Packaging** Plastic packaging waste accounts for about 16% of the waste stream in the U.S. Such packaging is largely unrecyclable and pollutes our waterways, streets, and burdens the public with the costs of disposal and health impacts. In addition, plastic often contains [harmful additives](#) and other chemicals that make recycling both difficult and dangerous. [Extended Producer Responsibility \(EPR\)](#) with strong safeguards, regulatory oversight, and manufacturer accountability can be a strong solution to packaging waste and plastic pollution.

- **Key Components of EPR Policy:**

1. Reduce single-use packaging: Companies are required to reduce their packaging, transition to reuse, and ensure their remaining packaging is easily recyclable - this does not mean reducing plastic content alone.
2. Eliminate toxic chemicals from packaging: Companies are required to remove toxics from their packaging and use safer alternatives. The implementing agency must have the authority to declare packaging as unrecyclable based on the toxic materials used in the packaging.
3. Provide strong independent oversight and accountability: State agencies set rules and fees and oversee the program. Companies do not control the program.
4. Ensure taxpayer relief: Companies pay fees based on how difficult it is to recycle their packaging and whether it contains recycled content. Fees compensate taxpayers for recycling costs and fund reuse and recycling infrastructure.
5. Build on existing infrastructure and providers.
6. Contain no manufacturer-driven recycling plans, or manufacturer control over funds raised through the program.
7. No false solutions: Prohibit all types of plastic burning and toxic technologies including what is often termed “chemical recycling,” “advanced recycling,” “waste to energy,” gasification, pyrolysis and similar technologies.

- [Model EPR legislation](#)

**Truth in Labeling** For decades, manufacturers have made misleading environmental marketing claims about plastic and recycling. The chasing arrows symbol has been unregulated and permitted to be displayed on products despite many being unrecyclable. Unfortunately, these plastic products subsequently end up in incinerators and landfills.

- **Key Components of Truth in Labeling Policy:**

1. Contain a clear definition of “recyclable,” such that only products and materials that are widely recyclable in a state can be marketed as “recyclable.”
2. Ensure consumers receive accurate information on how to properly dispose of products and packaging.
3. Promote transparency in environmental marketing claims.
4. Prohibit the marketing of products as recyclable if they contain high priority toxic chemicals such as PFAS or for other reasons not widely recyclable.
5. Contain meaningful penalties and enforcement.

- **Embed Clear Definitions of What is Recyclable | [California S.B.343 \(Enacted 2022\)](#):** Defines what can be called “recyclable” to include only those products and materials that are widely recyclable, and limits some high-priority toxics in products considered “recyclable.”

- **Limit Container Recycling Symbol | [Maryland H.B.0700 \(Introduced 2022\)](#):** Would have prohibited a container from displaying a recycling sign if the container or packaging is not considered recyclable in at least 60% of the state’s recycling programs.





**Improving Recycling Systems on the Path to Zero Waste** Targets, enforcement mechanisms, standards, education, community engagement, and funding are all essential for zero waste to thrive in cities and states.

- **Ambitious Statewide Targets and Mandatory Programs | [California A.B.341 \(Enacted 2011\)](#):** Landmark recycling legislation that sets a 75% recycling goal for California by 2020 — the most ambitious in the nation. Additionally, the measure required every commercial business, institution, and apartment building to implement recycling programs by July 2012. **State waste audits, reporting requirements, and transparent data** are essential to ensure targets are met and identify needed improvements.
- **Disposal Bans of Recyclable and Hazardous Materials | [Massachusetts](#)** bans a wide variety of materials from landfills and incinerators to reduce disposal and reduce pollution, including [construction and demolition materials \(see page 19\)](#) which is a large and highly reusable and recyclable waste stream.
- **Economic & Market Development | [California Recycling Market Development Zone \(RMDZ\) program](#)** combines recycling with economic development to fuel new businesses, expand existing ones, create jobs, and divert waste from landfills.
- **Zero Waste Grant Programs | [Minnesota H.F.2661 \(Introduced 2022\)](#):** Would establish a zero waste grant program.
- **Mixed Plastic Waste Exports Don't Count as Recycling | [California A.B.881 \(Enacted 2021\)](#):** Closes an existing loophole in California law that allows mixed plastic exports to be counted as recycling regardless of their ultimate destination, often overseas landfills, incinerators or waterways. This policy ensures that only materials that are truly being recycled get counted towards state and local recycling goals.

## Key Components for All Recycling Policy

- All recycling policies should include **targets for reuse and refill**.
- **Policies that promote recycled content should include or be paired with policies that eliminate toxic chemicals in products** to reduce the issues associated with harmful chemicals being recycled into new products. Using recycled plastic for food packaging raises special concerns and should be approached with caution.
- **Embed clear definitions of what is recyclable**, for example, [California S.B.343](#) (enacted 2022) defines what can be called “recyclable” to include only those products and materials that are widely recyclable in the state, and limited some high-priority toxics in products considered “recyclable.”
- Definition of recycling should **exclude** gasification, pyrolysis, “conversion technology” - including solvolysis, plastic to any fuel, plastic or other waste to hydrogen, incineration, waste to energy, waste combustion, cement kilns, co-incineration in boilers, any high heat treatment, and similar technologies.



# Zero Waste Policy Roadmap

## False Promises: Recycling vs. Waste Incineration and Toxic Technologies

### Overview

For decades industries (plastic, fossil fuel, heavy manufacture, incineration, and waste) have located infrastructure in low-income and communities of color. These communities have been dealing with the negative health effects of these cumulative impacts for decades. This policy roadmap aims to outline these threats and promote viable legislative and regulatory solutions to protect environmental justice and other communities, and to move towards a just, toxic-free, circular economy.

As public and policy pressure builds against plastic pollution, the petrochemical and plastics industries are increasingly promoting the burning of plastic, waste incineration, and other toxic technologies. These [false solutions](#) -- from so-called “advanced recycling,” “chemical recycling,” or “molecular recycling,” to burning in cement kilns and municipal waste incinerators -- use heat, pressure, and/or other toxic chemicals to convert plastic waste into a new commodity. Such industry-driven technological fixes will create enormous amounts of toxic pollution, compound environmental injustices, incentivize the creation of more plastic and plastic waste, and exacerbate the climate crisis.

A recent [NRDC investigation](#) of operating or proposed U.S. facilities found that: (1) “the majority of facilities are not recycling any plastic, (2) the facilities generate large quantities of hazardous waste, (3) they release hazardous air pollutants, and (4) they are often in communities that are disproportionately low-income, people of color, or both.”



**Figure 3:** Map showing the states that currently include incineration in the definition of “Renewable Energy” in their Renewable Portfolio Standards (RPS). Source: [GAIA](#)

### “Chemical Recycling” Explained

So-called “chemical recycling” or “advanced recycling” are industry terms for processes that break down post-consumer plastic with some combination of heat, pressure, catalysts, and/or solvents to turn it into either fuel or new plastic products. In practice, the technologies primarily used are [gasification and pyrolysis incineration](#). New technologies are being developed and marketed that may not require high heat, but that are still problematic.



## Equity and Justice Considerations

Waste facilities and environmental racism go hand in hand. The “[Toxic Wastes and Race at Twenty](#)” report found that **race is “more important than socioeconomic status in predicting the location of the nation’s commercial hazardous waste facilities.”** Nearly [80% of municipal waste incinerators](#) are located in environmental justice communities, populations that are already overburdened by pollution from other industrial sources, contributing to cumulative impacts that are often disregarded by regulators setting emissions regulations. The 2021 report “[Vestiges of Environmental Racism](#)” specifically spotlights the last two active incinerators in California. Both are cited in communities of color, and the latest research on chemical recycling operations shows incinerators are often in communities that are disproportionately low income, people of color, or both.

## Key Policy Options

### “Chemical Recycling”

The plastics and chemical industry has led an effort to deregulate gasification and pyrolysis incineration of plastic -- as well as other toxic technologies the industry calls “chemical recycling”-- in states across the country. To date, 24 states have passed bills that deregulate these technologies by removing them from waste facility policies and reclassifying them as recycling.

- **Key Components of “Chemical Recycling” Prevention Policy:**

1. Solid waste management definitions should clearly include gasification incineration, pyrolysis incineration, as well as plastic to fuel in the definitions of waste combustion/incineration and solid waste management operations.
2. Recycling definitions should clearly exclude any combustion and high-heat processes: gasification and pyrolysis incineration, fuel and energy production, co-incineration in cement kilns, and incineration. Recycling definitions should also exclude other toxic technologies, such as solvolysis, that apply heat, pressure and/or chemicals to depolymerize or otherwise convert plastic waste.
3. In states with existing facilities, policies should require facilities to provide public information about impacted communities, emissions, mass balance, energy balance, and destination of outputs (wastes, fuels, etc).
4. Policies should not classify “advanced recycling,” “chemical recycling,” “molecular recycling”, plastic to fuel, or other high-heat or related toxic processes as manufacturing, recycling, or renewable energy, or provide any incentives for such operations.

**Ban Chemical Recycling Oregon H.B.2811 (Introduced 2021):** Would have banned chemical recycling: *“A public body as defined in ORS 174.109 may not issue a permit or other authorization for the construction, expansion or modification of any chemical recycling facility.”*

**Exclude All Incineration as a Form of Recycling Minnesota H.F.2661 (Introduced 2022):** Zero waste grant program bill would have accurately ruled out all forms of incineration as recycling: *“‘Recycling’ means the mechanical processing of materials that has reached the end of its [sic] current use into materials to be used in the production of new products. It does not include incineration or any energy recovery process or depolymerization or a similar process.”*



**Exclude Plastic to Fuel as a Form of Recycling** [California S.B.343 \(Enacted 2022\)](#): Note that California law refers to incineration as “transformation”: “...for purposes of this section, ‘recycling,’ ‘recyclable,’ and ‘recyclability’ do not include transformation, as defined in Section 40201, EMSW conversion, or production of fuels.”

## Incineration

State policies should ban incineration and remove any existing incentives in order to ensure just and toxic-free communities. Incinerators rely on plastic, made of fossil fuel, and other easily combustible wastes like paper and cardboard to operate. It is important to include all forms of incineration in legislation to prevent loopholes. Removing any existing subsidies or incentives that boost incinerators in the state will require a careful review of existing waste, climate, and renewable energy legislation and regulation for policies that enable waste to energy, incineration, gasification, pyrolysis, other toxic “chemical recycling” technologies, cement kilns, and waste combustion.

- **Key Component of Incineration Prevention Policies:** Close loopholes that allow the burning of plastic and other wastes in, or to power, cement kilns, industrial boilers, gasification incineration, pyrolysis incineration, other toxic “chemical recycling” technologies, plastic to fuel, or other combustion operations.

**Suite of Policies Against Incineration** [Rhode Island. RI Gen. Laws § 23-19-3](#) (14) and (16) incorporate a “declaration of policy” against incineration, describes the toxic threats as “unacceptable,” the financial costs of incineration would place unreasonable burdens on state and municipal budgets. [RI Gen. Laws § 23-19-11](#)(7) prohibits the agency that develops and implements the state solid waste management plan from including incineration in the waste disposal plan.

**Prohibit Incineration in Proximity to Sensitive and Overburdened Populations and Environments** [Rhode Island H.B.5923 \(Enacted 2021\)](#): Defines incineration, gasification, and pyrolysis as high-heat medical waste processing, and prohibits permits for high heat medical waste processing facilities within 2,000 feet of any water, open space, floodplains; within one mile of any school and area zoned for residential use; or located in an environmental justice municipality.

**Prohibit Solid Waste Management Facilities Near Schools** [New York S.B.S4101 \(Introduced 2021\)](#): Would have mandated that new facilities cannot be sited within one mile of a school, and that existing facilities may not expand if located within one mile of a school.

**Prohibit Incineration of PFAS Chemicals** [Maryland S.B.0273 \(Enacted 2022\)](#): Prevents incineration of PFAS fire fighting foam “using incineration, including by burning, combustion, pyrolysis, gasification, thermal oxidation, acid recovery furnace or oxidizer, ore roaster, cement kiln, lightweight aggregate kiln, industrial furnace boiler, and process heater.”

**Exclude Waste Incineration From State Renewable Portfolio Standard (RPS)** [Illinois RPS under Public Act 102-0662 \(the “Climate and Equitable Jobs Act”\)](#) states: “Renewable energy resources’ does not include the incineration or burning of tires, garbage, general household, institutional, and commercial waste, industrial lunchroom or office waste, landscape waste, railroad crossties, utility poles, or construction or demolition debris, other than untreated and unadulterated waste wood.”





# Zero Waste Policy Roadmap Conclusion

## Roadmap Recap

As this Roadmap has shown, plastic pollution does not begin and end with the disposal of single-use plastic products. Rather, achieving a just, toxic-free, circular economy is a holistic process that addresses plastic pollution at each stage in its life cycle. By eliminating petrochemical extractions, moving to non-toxic reuse/refill models, reducing single-use plastics at the source, improving recycling systems, and avoiding the false promises of “chemical recycling,” U.S. states can meaningfully address the health and environmental impacts of plastic.

## Learn More

For more information on plastic pollution, zero waste solutions for your state, or the contents of this resource, please visit NCEL’s [Plastic Pollution webpage](#) or contact [Mara Herman](#), NCEL’s Environmental Health Program Manager.

# **Zero Waste Policy Roadmap For a Plastic-Free Future**

202.744.1006 • [www.nceleenviro.org](http://www.nceleenviro.org) • 1100 H St NW, Suite 600 • Washington, DC 20005