

# Tackling Plastics Pollution: We Can Do Better

By Kenneth J. Warren

An achievement of modern manufacturing is its ability to quickly innovate to meet customer demand. Products that satisfy consumers, advance medicine, or support durable infrastructure are fundamental to economic development and prosperity. The unfortunate downside is that the ecological and human health impacts are often unknown or underestimated, and at times may be concealed as production occurs.

Asbestos is a well-known example. Added to products to provide strength and fire resistance, asbestos was widely used. Years later, after the dangers of exposure to asbestos-containing materials became known to the public, lawsuits and regulatory restrictions drastically curtailed its use. The same cycle has occurred with PCBs and more recently with PFAS.

Plastics are now undergoing similar scrutiny. Plastic products are inexpensive to manufacture and are durable. They can be formulated to perform well in a wide range of products such as pipes, fishing gear, food and beverage containers, packaging and wrapping, household products, clothing containing synthetic fibers, and vehicle tires, among other products. They are ubiquitous.

Over 400 million tons of plastic are produced annually. Consequently, the waste plastic generated is likewise voluminous. The Organization for Economic Cooperation and Development (OECD) estimated that as of 2019, approximately 300 million tons of plastic waste were generated globally each year, much of which consists of single-use items that are disposed in landfills or discarded. According to the U.S. Environmental Protection Agency (EPA), plastic comprises 85% of total marine litter and between 70 and 80% of all land and marine wastes. The United States is the world's largest producer and consumer of plastic.

Although scientific knowledge of the ecological and health impacts of exposure to plastic is developing, adverse effects have been demonstrated. Chemicals may leach out of plastics into soils and water, resulting in adverse health effects to exposed populations. Wildlife and fish may consume pieces of plastic, interfering with their food uptake and growth. Plastic persists in the environment; it does not naturally degrade into its chemical component. Rather it breaks into pieces, eventually becoming microplastics (5 milliliters or less in size) and nanoplastics that enter waterbodies, food chains and ultimately humans and animals, causing bodily injury.

Approaches to manage environmental risks from plastic manufacture and disposal are under review nationally and globally. In April 2023, the EPA released its Draft National Strategy to Prevent Plastic Pollution. Its objectives are to reduce pollution during plastic production, improve post-use materials management, prevent trash and microplastics from entering waterways, and remove escaped trash from the environment. Reuse, collection, recycling and conservation of materials are among the activities the strategy identifies.

The EPA's strategy advocates creation of a "circular economy" that considers the entire life cycle of plastic products from design to waste management. Producer responsibility extends beyond controlling emissions during production. Manufacturers can design plastic products for reuse, utilize chemical compositions that facilitate recycling, finance recycling facilities, collect products at the end of their lifespan, and replace plastics with environmentally friendly materials.

Consumers can be educated to reuse products. The goal is to create a system where plastic is produced, reused, and ultimately recycled. Disposal would be eliminated or drastically reduced. Focusing on all steps in the plastics life cycle recognizes that consumer behavior and technology preclude reliance on recycling as the sole answer to improper waste disposal. Consumers are hesitant to collect plastics; only approximately 9% of plastic waste is recycled. Moreover, the recycling symbol and resin codes marked on plastic containers are confusing and do not reveal whether recycling can be effectively performed. Recycling can also be costly because plastics are ordinarily recycled by resin type. An expensive sorting process is often required to separate types of plastics in preparation for recycling them.

Newer technologies such as pyrolysis and gasification that can break down plastics into their original components are beginning to be deployed as a substitute for existing mechanical and chemical recycling methods. Further technological advances are needed to enhance the viability of recycling.

Addressing plastic waste at all stages of its life cycle confers environmental benefits beyond reducing disposal of plastic waste. Almost all plastics are manufactured from petroleum by a process that emits greenhouse gases and contributes to global warming. Absent government intervention or a change in consumer habits, manufacture of plastics, including plastic packaging, is anticipated to increase over the next 10 years and provide a significant source of revenue for the oil and gas industry. Reducing greenhouse gas emissions by limiting plastics production will require overcoming these economic interests.

Recognizing the global nature of plastics pollution and the interrelationship of plastic production and climate change, in March 2022, the United Nations Environmental Assembly adopted resolution 5/14 titled, "End plastic pollution: Toward an internationally binding instrument." As a result, the parties convened an intergovernmental negotiating committee (INC) to draft a global plastics treaty that will be legally binding on the countries ratifying the treaty. The parties are working toward finalizing an agreement at their November 2024 meeting.

Potentially, the parties will agree upon a life cycle approach encompassing the extraction of fossil fuels, product reuse, and recycling. Whether the treaty will impose mandatory obligations and cap or phase out plastics production is uncertain. Likewise, although the United States is an active participant in the negotiations, whether the final treaty language will be approved by the president and ratified by the Senate is at present unknown.

In the absence of international or U.S. laws and regulations addressing plastics pollution, some states and municipalities have filled the void. Bans on the use of disposable plastic bags are increasingly common. Some states incentivize manufacturers to take back, recycle, or otherwise accept responsibility for their products throughout their life cycle, and certain manufacturers proactively seek to eliminate or reclaim single use plastic products.

As with other contaminants, litigation is a tool to abate plastics pollution. For example, New York state brought suit against PepsiCo. Inc. alleging that PepsiCo.'s single-use plastic packaging such as bottles, bottle caps and food wrappers polluted the Buffalo River and its shoreline, contaminated drinking water, and harmed wildlife. New York alleged that PepsiCo. created a public nuisance, misled the public about its recycling and its efforts to combat pollution, and failed to warn consumers and the public of the risk of harm to human health and the environment. The lawsuit seeks an order requiring PepsiCo. to, among other things, remediate the contamination, reduce the quantity of its packaging entering the river, and place an adequate warning on its packaging.

Environmental organizations have also entered the litigation fray. In *Penn Environment v. BVPV Styrenics*, plaintiffs commenced a citizen suit alleging that BVPV discharged plastic pellets from its polystyrene facility in Monaca, Pennsylvania, without authorization in its permit in the violation of the Clean Water Act. The plaintiff seeks an injunction to stop the discharge of microplastics to Raccoon Creek, remediate the damage, and award civil penalties.

The capability of plastics to meet consumer demands at low cost, and the profits generated by plastics production, render it unlikely that voluntary actions will be sufficiently robust to protect human health and the environment from plastics pollution. Legislation promoting a circular economy will be necessary to compel manufacturers to bear the full costs of the environmental harms. Stringent requirements under the Clean Water Act or Clean Air Act can be employed to reduce discharges of microplastics and emissions of greenhouse gases. Reuse and recycling can be made mandatory. Funding for new recycling facilities can be provided, and new recycling technologies encouraged. Nonessential uses of plastic can be banned. In the past, legislative and regulatory action addressing contaminants has occurred only after substantial injuries to human health and the environment occurred and litigation ensued. Based on lessons learned, we can do better.

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