

Zero Waste

Cradle-to-Cradle Principles for the 21st Century

Supporting Framework and Background

Current public policy addressing municipal solid waste¹ rests on the assumption that waste is an inevitable consequence of human activity. This has proven to be a self-fulfilling prophesy. Coupled with this assumption about waste is the assumption that local governments bear responsibility for materials and products that residents and businesses no longer want or find useful. Public policies based on these two primary assumptions have fostered the growth of waste, and also its toxicity, resulting in harm not only to our environment but also to our economy and our communities. The harm also extends to the environment, economy and communities in other parts of the world. In this, our public policy has failed in its fundamental function of protecting the commons,

Waste has become institutionalized in our throw-away society. Massive public and private investments have been made in waste management services and infrastructure to provide essentially unlimited waste collection and large-scale facilities for “disposing” of wastes. These publicly sanctioned practices have fostered a societal tolerance of wasting, as evidenced by the growth in production and consumption of “disposable” products and packaging. Product-related wastes we generate as a society have increased 15-fold since municipal waste management programs were introduced in the early 20th Century, tripled since 1960, and increased 20 percent just since 1990.

Not only has our waste increased in volume, it has increased in toxicity and complexity. Common household products embed hazardous substances that, when discarded, routinely make their way into facilities not designed to manage them, posing considerable health and safety risks and liabilities. Presently local governments are responsible for picking up after consumer society, but they lack the information to deal effectively with the incredible array of products used in homes and businesses today. The waste management system is constantly blind-sided by new products with unique waste management challenges. Municipal recycling programs have had limited success in stemming the growth of waste because most products are not designed for recycling, to say nothing of repair or reuse, and policies and programs are designed so that landfills are often the lowest cost option.

Innovation in product design has ignored waste and toxicity, and for a very good reason: producers have nothing to gain from waste avoidance. This is because our waste policies shelter producers from the costs of waste, causing prices to inadequately reflect true costs (a condition referred to by economists as “market failure.”) The costs of managing wasteful and hazardous products are borne largely by taxpayers and ratepayers rather than producers

1 The US Environmental Protection Agency’s definition of *municipal solid waste* includes only the wastes commonly collected from households and local businesses. This leaves out large quantities of construction and demolition (C&D) waste from buildings, auto scrap, treated municipal sewage sludge (biosolids) and other items that often end up in municipal landfills. It also excludes industrial process wastes created in the manufacture of products, which dwarf consumer waste. See US EPA, *Characterization of Municipal Solid Waste, 2005 Update*.

and consumers. These costs are growing and include not only the direct costs of maintaining and operating solid waste management (recycling and disposal) services, but also much greater indirect costs: depletion of resources, loss of habitat and harm to public health and the environment. These effects occur both at home and abroad because of export of wastes and exploitation of poor communities in our globalized economy.

Recycling, while useful, is often in practice more aptly termed “downcycling.” Downcycling is the progressive loss of value and utility of products as they are turned into new products. For example, plastic bottles are made into products other than beverage containers, while new bottles are made almost entirely with new raw materials.

Convenient waste disposal services sustain a market for flimsy products produced by low-waged workers in countries with lax rules for worker safety and environmental protection, putting local manufacturers out of business. These products are received at public ports, shipped on public highways and distributed through Big Box stores that put neighborhood retailers out of business. Our waste policies, supported by our trade policies, harm local communities at home and abroad.

Most worrisome of all, both production and disposal contribute to climate change. By far the greatest environmental impacts of products occur “upstream” of consumers, during resource extraction, manufacturing and transportation. For each ton of municipal solid waste disposed, 71 tons are buried upstream, from mining, manufacturing and distribution of products.² Each of these activities requires energy that becomes “embodied” in the products. Wasting products is a complete loss of this embodied energy. Current disposal practices compound the climate change impacts. Waste-to-energy incinerators convert waste to carbon dioxide (a greenhouse gas) and the energy recovered is far less than the embodied energy in products. Landfills are the largest human-caused source of methane, a greenhouse gas 23 times more potent than carbon dioxide. Paper products are a prime contributor, but food scraps and yard trimmings also decompose in landfills to produce methane, most of which is released to the atmosphere even when gas collection systems are utilized.

The concept of Zero Waste, like Zero Defects, started with corporations, like Xerox, Toshiba, and Fetzer Wineries, which started to think of industrial process waste as a sign of inefficiency and lost profit. Transferred to the municipal sector, the idea focuses attention on the whole life cycle of products. Aiming for Zero Waste is a useful goal, like aiming for the North Star. We will not reach the North Star but it is an essential target during our journey.

To implement the Zero Waste³ approach, the Sierra Club policy proposes specific roles for governments, product makers and the public in ensuring the environmentally sound management of resources in our society.

Sierra Club Zero Waste policy emphasizes the important role of government in protecting “the commons.” Government corrects problems that cause harm to the commons, both by regulating and by providing services that the market cannot or should not provide. Government must establish clear goals, principles and standards for the sound

² United States Office of Technology Assessment, *Managing Industrial Solid Wastes from Manufacturing, Mining, Oil, and Gas Production, and Utility Coal Combustion* (OTA-BP-O-82), February 1992, page 7.

³ Zero Waste policy is an internationally supported approach to waste reduction. See Zero Waste International Alliance, www.zwia.org/standards.html

environmental management of resources. Regulation should emphasize the use of performance-based requirements (outcomes rather than prescriptive rules) allowing private companies to innovate and develop new systems for environmental management that adhere to the goals, principles and standards set by government. Requirements must be backed up with procedures for accountability to ensure that environmental management programs operated by business actually achieve the desired results.

Product makers must be engaged in the environmentally responsible management of their products “from cradle to cradle.” That is, they must adhere to the Zero Waste Hierarchy, designing products that are non-toxic, durable, repairable, reusable or recyclable. This implies that product makers must assume new responsibility for the management of discarded products that currently go into the municipal waste system, providing a recycling alternative for their products. This does not necessarily mean that products will go directly back to their producers; rather it establishes accountability (chain of custody) so that producers are obligated to ensure the environmentally sound management of the resources in their products not only during production but also during use and at the end of the product’s life-cycle. In practice, producers are likely to meet this obligation by contracting with businesses in local communities where products are available for sale. These businesses will provide an appropriate mix of repair, exchange, or recycling services. This repair/ reuse/ recycling industry will become an extension of the producer’s “supply chain,” creating local economic development in communities across the country and possibly even reviving domestic manufacturing. This policy approach is known internationally as Extended Producer Responsibility (or EPR). EPR has already increased recycling where it has been implemented and holds the promise of improving product design as producers try to improve their bottom line by avoiding waste and gain customers by delivering environmental value.

Finally, Sierra Club policy addresses the important role of the public in making sound consumer choices and monitoring the practices of both business and government and calls for the public to have full and timely access to the information needed to fulfill this role.

Sierra Club policy also addresses the need for sound environmental management of non-product organic discards such as food scraps and yard trimmings. *Organics*, for the purposes of this document, is defined as: yard trimmings, food scraps, food processing by-products, non-recyclable but compostable paper, clean scrap wood, and other related compostable, non-liquid materials that are deposited into the municipal solid waste stream and which can be made into organic soil amendments. The term *organics* does not include sewage sludge, which is also known as biosolids. These are materials whose “producer” is difficult to identify, so it is more difficult to establish a chain of custody through EPR. Therefore, Sierra Club policy supports community-based programs overseen by local governments that put the materials to beneficial use right in the community, either through composting or anaerobic digestion. In designing programs for organic materials, local governments should strive to return organic materials to the soil and recover energy through natural biological processes that preserve the ability of the material to be used as soil amendment. Local governments should prioritize organics recovery, either by investing in public infrastructure for this purpose (as a natural extension of public infrastructure providing water and liquid waste management), or by stimulating the development of private sector services, or both. In both cases, a local government Zero Waste policy will be based on clearly stated goals and principles and be implemented through education, incentives and regulations such as disposal and product sale bans, zoning and land-use rules.

Drafted by Sierra Club Zero Waste Committee