



# Minimizing Waste Materials Using Zero Waste Management Technique

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## DESCRIPTION

Zero waste is the conservation of resources from their production, consumption, and reuse, recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that harms the surroundings.

At its core, zero waste takes aim at our “take, make, and waste” approach to production and consumption, encouraging more indirect approach to the way to use resources. At its utmost basic level, this states that the goal of zero waste is to push economies towards the aim of transferring no waste to landfill, incinerators, and the sea.

Still, while recycling process and conscientious waste management remains core to achieving that desire, zero waste extends much longer than simply deals with “end-of-life” waste. In fact, it inspects the entire lifecycle of a product, emphasizing inefficiencies and unsustainable production and consumption practices. Zero waste refers not only to keeping waste out of landfill, but also bringing our economy to be less wasteful in production and consumption.

### Zero waste principles

Each principle signifies a specific stage of the waste stream. Producers are at the front end, and they should take responsibility for product design and manufacturing. The Community is at the back end, holding responsibility for consumption and disposal. Intermediary, political responsibility must fill the gap between community and producer, promoting both environmental and human health while enforcing new laws planned to promote the zero waste principles.

The principles are as follows, still, they are constantly expanding to meet new challenges that arise:

- Design closed loop systems;
- Ensure processes happen close to the source;
- Conservation of energy;
- Harmful waste is not exported;
- Promote change by engaging with community.

### Zero waste hierarchy and cradle-to-cradle thinking

An important distinction between zero waste and conventional waste management and recycling is the prevention of wasteful practices at the initial stage of the chain. There are two types of methods use to manage the waste products are as follows:

**Cradle to grave:** A linear model that starts with resource extraction, moves through manufacturing, and sees products end up in landfill. Considered an “open loop” system that is inherently wasteful.

**Cradle to cradle:** A circular model that minimizes waste and keeps resources in use for as long as possible. Considered a “closed loop” that promotes sustainability and strives for zero waste through reduction, reuse, and recycling.

Organic farming and composting are an example of cradle to cradle thinking is found within the sustainable natural cycles, and this efficient process serves as the perfect archetype for the broader concept. Food is grown by natural methods without using toxic chemical pesticides or fertilizers is distributed and consumed.

However, while this elegant example of the cradle to cradle concept works good with organic farming, when it comes to more complex products there is a need to re-evaluate. The zero waste hierarchy comes to light, basically expanding the three R’s (reduce, reuse, recycle) to encourage policy making, activity, and investment in operations that promote the cradle to cradle concept.

### Zero waste hierarchy principles

Using of reused, recycled, or sustainably gathered non-toxic materials. Incentivize cyclical materials and extended producer responsibility for the entire lifetime of a product.

**Reduce:** Sustainable purchasing that supports social and environmental concerns and local markets, or to take back programs to avoid disposal of products. Reduce the quantity and toxicity of materials while planning for consumption habits to reduce waste.

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**Reuse:** Optimize the reuse of materials and products through repair, refurbishment, modular technologies, and repurposing in alternative ways.

**Recycle/compost:** Support and expand existing systems that allow for high-quality recyclables and materials. Build local markets for collection and processing of recyclables. Promote decentralized composting at home.

**Material recovery:** Enhance material recovery and using only energy recovery systems that operate at biological temperatures and pressures.

**Residual management:** Reduce polluting gasses and toxic residuals from materials. Vitalize the preservation of resources and minimize destructive disposal methods.

**Unacceptable:** Disincentivize and remove support for the incineration of waste and waste to energy systems. Remove all

toxic residuals from consumer products and in building materials.

### Zero waste

According to the EPA, only around 30% of the US waste stream is recycled and around 140 million tons of waste is disposed in landfill every year. And only 9% of single use plastics are being recycled.

Landfills should not continue to hold the waste, they are not only harmful to the environment, but they also release toxic gasses like CO<sub>2</sub>, methane, hydrogen sulfide. Additionally, leachate from landfills enters into groundwater and pollutes farmland and drinking water.