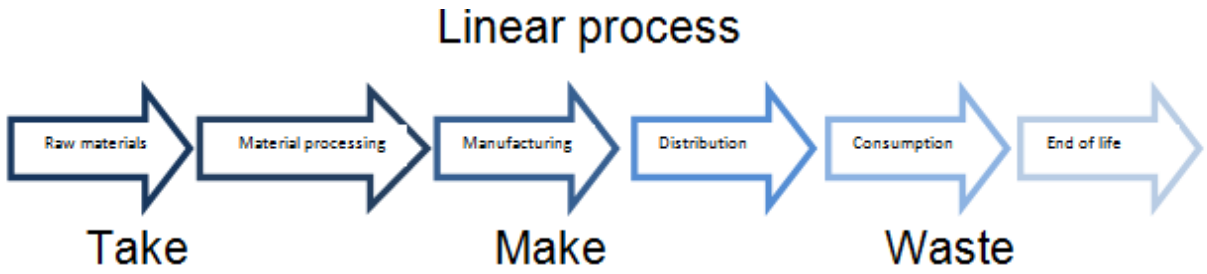
Towards Zero Waste

Zero waste

Zero waste is a way of thinking about waste that profoundly changes our current approach to resources and production. Zero waste involves copying what happens in natural eco-systems where there is no waste. Waste is an issue created by humans not nature. In nature, everything is returned to use through a continual natural cycle of life and death. It is a closed loop system, where the end of one life is the start of a new life.

Until recently, waste management has focused on creating safe disposal of waste, rather than looking at ways to minimise waste and conserve valuable resources. Production has involved a linear 'cradle to grave' process where raw materials are taken, processed, used and then dumped in this old approach. At the end of its life, a product is seen as having no further use.



1 Graphic showing the linear process of waste.

The linear 'Take Make Waste' approach (shown above) involves materials being taken from the environment, processed, turned into products, transported to users and, finally at end of life, discarded. It extremely inefficient and wasteful. It is not just the end product that ends up as waste, but all the resources consumed along the way. For example, the fuel needed for transportation, and the water and energy required for processing. A study by the US National Academy of Engineering in 2010 found that 93% of resources are consumed before becoming saleable products and of those 7% of resources that do become a product, 80% are used only once before becoming waste.

Zero waste is about restructuring production and distribution systems to prevent waste from being produced in the first place, and recycling and recovering materials after use so that resources are not lost to landfill. This cradle-to-cradle model is a closed-loop system that ensures that resources already available are used to their maximum potential. It provides economic and environmental efficiencies throughout the chain of production and avoids exploiting untapped resources.

In the cradle-to-cradle cyclic model of zero waste, raw materials are processed, manufactured into products, distributed, consumed, and then reused or recycled instead of going to waste. Product stewardship also helps to recycle products back into the manufacturing process and ensures more sustainable production. Essentially, this loop sees raw materials being reused and recycled into new products continually, rather than waste in landfill.

Product stewardship

Product stewardship is an extremely powerful way to shift the thinking and processes that leads to waste.

The simple premise behind product stewardship is that manufacturers, importers and retailers also share responsibility for dealing with any waste their products create. This differs from the common thinking that it is solely up to residents and councils to deal with it.

Companies which consider product stewardship in their practices and design products and packaging in a way that prevents unnecessary or unrecyclable waste in the first instance. They may also start industry networks which work together to find new ways to reuse the waste created from their products. You may have noticed product stewardship programs in place to help deal with the waste caused by tyres, mobile phones and electronic waste. A Container Refund Scheme to keep beverage bottles and cans is another type of product stewardship scheme.

Cleaner production

At the core of cleaner production is the manufacturing process. The aim is always to reduce material waste, reduce emission toxicity, and conserve resources such as raw materials, energy and water. At the end of a product's use, resources are recovered through recycling, composting, reuse and collection of gas.

Alternative waste treatment

As Australia's population continues to rise, there is growing pressure to consider a range of alternative waste treatment technologies (AWT) to manage waste in the future. Increasing environmental awareness and landfill costs have led to interest in the using of AWT technologies, which increase the recovery of resources from the landfill stream and minimise impact on the environment. The three main types of AWT include:

- Changes to the usual landfill techniques
- Thermal (treatment using heat to decompose waste)
- Biological (treatment using organisms to process waste such as bacteria or worms).

Brisbane City Council currently employs a number of technologies for recovering resources from waste such as:

- commercial composting of green waste
- recovery of gas to generate electricity from the landfill site and
- the VISY Material Recovery Facility at Gibson Island which sorts different recyclable materials ready for reprocessing into new products.

Future technologies under consideration may include large scale thermal or biological processes such as:

- anaerobic digestion plants for green and organic waste to produce energy and compost
- Mechanical Biological Treatment for mixed waste that produces an inert product that could be burnt to harness energy, or used in other composting processes.
- thermal processes such as gasification or pyrolysis that generate electricity and create products such as oil, gases and biochar.

Sustainable waste behaviour

Working towards zero waste is not just about changing approaches to resources and production. It also depends on a behavioural shift within the community. Waste is a social and ethical issue as much as it is an economic and environmental issue.

Our current ‘disposable’ mindset is not sustainable. To achieve sustainable waste behaviour, we need to change our consumption and purchasing behaviour and make a personal commitment to waste minimisation, beneficial reuse, and resource recovery. In other words, we need to move from being a ‘consumer society’ to becoming a ‘conserver society’.