

# ZERO WASTE PRINCIPLES

Zero waste means a 100% resource-efficient economy where, as in nature, material flows are cyclical and everything is reused or recycled harmlessly back into society or nature.

'Waste' as we think of it today will cease to exist because everything will be viewed as a resource.



*"The principle of zero waste is akin to such principles as 'zero accidents' or 'zero defects' – which are now well established in manufacturing. By setting an extreme target for waste reduction, new levels of innovation and efficiency are unleashed.*

*The concept of zero waste and the thinking behind it challenge traditional approaches to waste management. Although zero waste exists in nature, the theory and language is relatively new, and the breadth and depth of the ideas and practice surrounding it are still evolving.*

*The key principle of zero waste is that it defines 'waste' as something that is simply not acceptable. This sidesteps debate about what a 'reasonable' level of waste is, and instead puts the focus on steadily working towards a world without waste.*

*The current business model is based on the industrial revolution assumption that the Earth provides an infinite source of raw materials, and an unlimited capacity to absorb our waste products. This assumption is clearly out dated and businesses now need to concentrate on creating goods and services, while reducing waste and resource consumption.*

*Zero waste is based on the understanding that all of the materials we utilise are resources, and only become waste through poor design and end of life management. In practice, this means minimising waste during production as well as designing products that can be reused or recycled at the end of their lives". From the Industry Guide to Zero Waste – Towards Zero Waste and a sustainable New Zealand by NZBCSD*

## WHAT IS THE ISSUE?

Zero waste starts and ends with nature itself and the world we live in. Over time nature has devised a system where waste from one organism becomes resources for others, creating cyclical material flows in a state of constant equilibrium and balance.

It has taken nature hundreds of millions of years to perfect zero waste and it is a fundamental principle of the natural world.

However, mankind is in the process of rapidly destroying the very system that sustains us. Our global production processes, transportation systems and manufacturing models have created a one-way, linear model. These material flows are depleting finite resources and treating nature as an enormous disposal point for our increasing volumes of waste.

Our industrial system is predicated on the extraction of 'cheap' resources to make products that are largely designed to last a short period of time and end up in landfills. We have invested so heavily in waste disposal and the supply chain system that feeds it, that attempts to change it over the past 30 years have made little impact.



Zero waste is both a domestic and international movement. Zero waste has always been described as a journey and an aspirational goal.

As new technologies and strategies emerge for eliminating waste at source and recovering more resources at the end of the pipeline, it is becoming clear that what once seemed impractical has become increasingly more achievable.

As part of a New Zealand zero waste campaign, the following key strategies were proposed to drive progress. Many of these concepts have since been implemented into the mainstream.

Many of the strategies involve changing the rules to make wasting more costly and difficult - and waste minimisation, reuse, repair, recycling and composting more attractive. There are key strategies that could be implemented under the Waste Minimisation Act 2008.

### PROPOSED STRATEGIES FOR ACHIEVING ZERO WASTE IN NZ

- Increase landfill fees by increasing the landfill levy from \$10 per tonne (2015). In comparison, in New South Wales Australia the levy is \$120 per tonne (2015/2016).
- Implement landfill bans on materials that can be recycled or composted. Begin with banning all organic material from landfills
- Use regulation and declare priority products under the Waste Minimisation Act and put advanced recycling fees on scrap tyres and electronic waste.
- Pay as you throw means householders are motivated to reduce the amount of waste placed at the kerbside, rather than filling their bin or bag each week.
- Deposit refund schemes for beverage containers see recycling rates of around 85% to 90% rather than less than 50% where schemes do not exist.
- Extended producer responsibility and mandatory product stewardship schemes increase recycling rates.
- Government funded zero waste agency like Zero Waste South Australia, Zero Waste Scotland and others around the world
- Set targets and dates for achieving zero waste.

# KEY PRINCIPLES OF ZERO WASTE THEORY

## PRODUCT STEWARDSHIP

To achieve Zero Waste products need to be redesigned so they can be easily recovered and recycled. Product Stewardship has been included as a key component of the 2008 Waste Minimisation Act and will be an important tool for achieving Zero Waste. Product Stewardship initiatives include levies put on tyres to fund their recovery and refundable deposits on beverage containers.

Product stewardship is a way of managing the health, safety and environmental impacts of products, and in particular the impacts of disposal. Responsibility for reducing the environmental impacts of manufactured good is shared amongst all those involved in the product life cycle - producers, brand owners, importers, retailers and consumers. This is what makes it such a crucial concept for today's community recyclers, who are concerned with end-of-life products and the education of communities around these issues.

Product stewardship can take a number of forms, and can be applied to all kinds of products. Probably the most familiar example is Container Deposit Legislation. On looking closely at the label of most beverage containers in NZ you will see the phrase "10c Refund at Collection Depots when sold in S.A.". This is product stewardship at work. South Australia is one of many international examples where a small fee is included

in the price of the item and if the container is returned, the fee is used to fund the reuse, recycling or (less commonly) disposal of the item.

'Extended Producer Responsibility' is a closely related concept, often used interchangeably with 'Product Stewardship'. It focuses on the part the manufacturer plays. A financial incentive encourages environmentally friendly design by making the manufacturer responsible for the product at the end of its life. It means the costs for recovering and recycling the product is incorporated into the purchase price by the manufacturer.

## LANDFILLS AND INCINERATION

The Zero Waste philosophy recognises the need for landfills, but only as an interim measure until waste has been dramatically reduced. However, it is opposed to incineration because of negative environmental, social and economic impacts. Amongst the arguments against incineration are:

- Reuse and recycling initiatives create many more jobs than incineration
- Once an incinerator is built it requires a constant, regular flow of waste
- Incinerators release toxic dioxins
- Burning waste releases greenhouse gases.



## LOCAL ECONOMIC DEVELOPMENT

Zero Waste focuses on finding local solutions to waste issues. The waste stream is a community asset and can generate local jobs and business opportunities. Studies from around the world show that recycling and resource recovery create more jobs per tonne of material, than landfilling or incineration. In fact it could be said that when waste materials are buried or burnt, jobs are destroyed. It is estimated that recycling can create ten times as many jobs through just sorting recyclables, and twenty five times as many jobs through re-manufacturing from recycled materials

A study on the recycling potential in London stated that, "Recycling is an engine of urban job creation" and calculated that for every 10,000 tonnes of material recycled, 21-39 jobs could be created, without including any remanufacturing and related employment. The recycling/resource recovery industry is a 'value-adding' industry creating more jobs and more wealth from the small percentage of the waste stream the sector is able to access, than the waste industry that has control of the lion's share.

## ENVIRONMENTAL JUSTICE

The effects of over-consumption and unsustainable waste management practices are felt most by the poor. It is the poor who live near landfills and incinerators and have to deal with contaminated air and water. It is the poor whose countries have become the dumping grounds for affluent societies' electronic and other wastes. By advocating for an end to landfills and incinerators, and for a dramatic increase in local resource recovery, Zero Waste aims to eliminate the social injustices brought about by our desire to put waste 'out of sight and out of mind'. Poor countries are also likely to be the first to suffer as sea levels rise with climate change. Increasing calls to implement zero waste to help halt climate change are being heard around the world (eg GAIA's campaign [www.zerowarming.org](http://www.zerowarming.org))



## A CHANGE IN PARADIGM

There are two common approaches to thinking about product lifecycles and the frameworks by which our modern systems of consumption are based: the existing 'cradle to grave' framework, ending in disposal, and the 'cradle to cradle' model that begins with design that takes into account the entire lifecycle of the product.

### CRADLE TO CRADLE

A phrase invented by Walter R. Stahel in the 1970s and popularized by William McDonough and Michael Braungart in their 2002 book of the same name. This framework seeks to create production techniques that are not just efficient but are essentially waste free. In cradle to cradle production all material inputs and outputs are seen either as technical or biological nutrients. Technical nutrients can be recycled or reused with no loss of quality and biological nutrients composted or consumed. By contrast cradle to grave refers to a company taking responsibility for the disposal of goods it has produced, but not necessarily putting products' constituent components back into service.

<http://www.sustainabilitydictionary.com/cradle-to-cradle/>

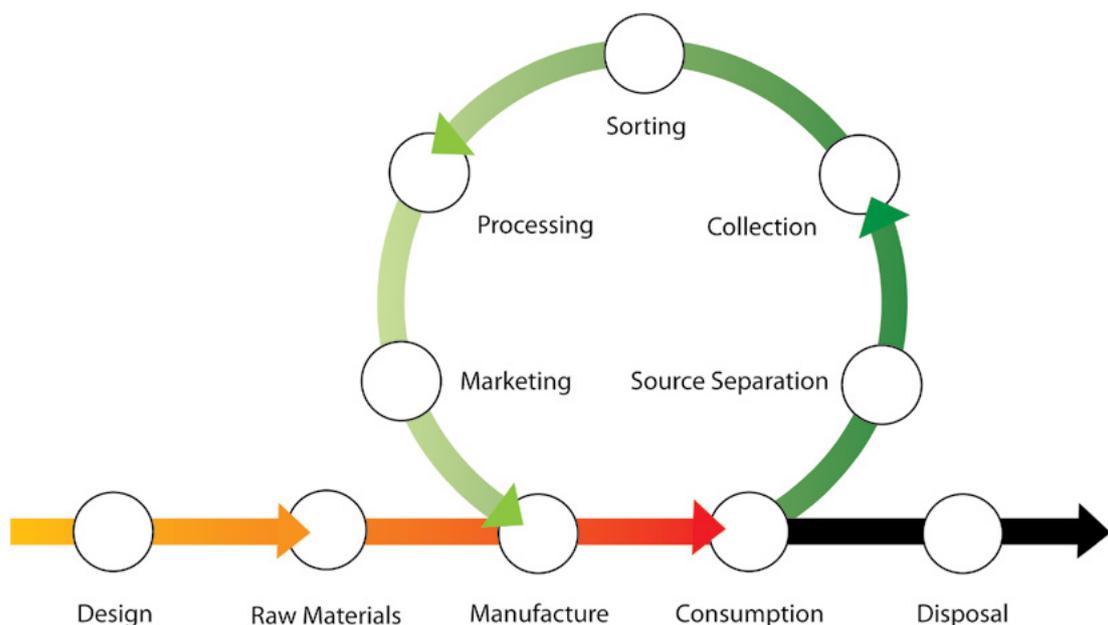
A related concept is that of the Circular Economy which is now commonly linked to the zero waste concept. It is a generic term for an industrial economy that is, by design, restorative and in which material flows are designed to re-enter the biosphere safely.

In a circular economy, the biological and technical components of a product are designed to fit within a materials cycle and designed for disassembly and re-purposing.

### CRADLE TO GRAVE

Braungart and McDonough base their theory on an analysis of the current system - commonly referred to as 'cradle to grave'. In this paradigm raw materials are extracted then made into something using manufacturing processes that often generate waste, the product is used and its life generally comes to an end by sending it 'away' to landfill.

For many modern consumers 'away' represents where products come from and where they go - items are conveniently obtained from shop shelves, without much sense of where or how they got there. Once used, the items are generally disposed of and not given another thought. With our resource consumption at the highest levels in history, 'away' is both emptying out and piling up, leaving us with ecological and resources crises looming.



**CRADLE TO CRADLE (CIRCULAR) VERSUS CRADLE TO GRAVE (LINEAR): TWO APPROACHES TO THINKING ABOUT PRODUCT LIFECYCLES**