

Sustainable Living programme

2008 Edition

Waste Making – an introduction



What a waste!

About 93% of the 'raw materials' we use were thrown away during the production process, and about 80% of the stuff we buy is thrown away after one use: a sobering thought! New Zealanders throw away more rubbish per person than people in most developed countries. The wealthier we have got the more we have wasted.

The 'solid waste' deposited in NZ landfills, from industrial and domestic sources combined, is 3.4 million tons a year. Landfill is the principal means of disposal of rubbish in New Zealand. Many older and smaller landfill sites have poor environmental standards and are being closed.

A fast-growing problem

Auckland Region's annual weight of domestic waste per person by 2000 was up with the throw-away levels of the five international 'worst offenders', including the USA. The annual total weight of waste reaching landfills in Auckland region alone more than doubled between 1985 and 2004, to reach a volume that would cover a rugby football field to the depth of a 10-storey building, *every month*.

North Shore City has set a zero-waste target, long term, but in 2001-2002 the average household's rubbish sent to landfill was 7kg per week *plus* 4.4kg/week of materials in the kerbside recycling crate.

In **Hamilton** the total weight of solid waste reaching Horotiu landfill also doubled in the decade 1990 to 2000.

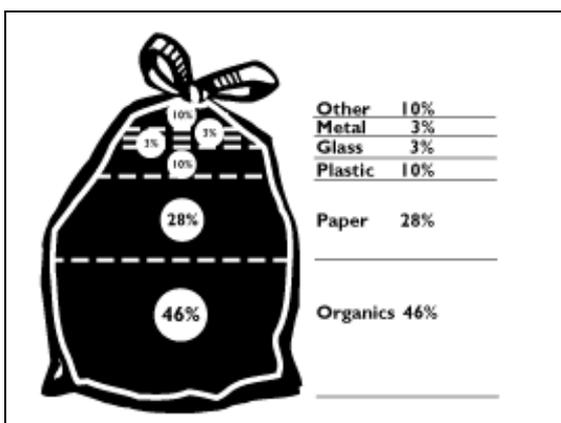
In **Christchurch** the city-based Burwood tip has closed, replaced by a \$50M regional landfill at Kate Valley, north of the city. Wastes are being trucked there: 300,000 tonnes per year, estimated to increase to 360,000 tonnes in 2007 despite a corresponding increase in kerbside recycling – up 21,100 tonnes to 32,096 in the 06/07 year.

Marlborough, with a smaller population, still sends enough rubbish to landfill annually for the equivalent volume of more than one rugby pitch area to a 10-storey depth.

How much rubbish do you throw away from home?

The average NZ polythene sack or 'wheelie bin' of mixed domestic rubbish, collected from the kerbside by a local authority, has, by weight:

- between 42% and 47% garden clippings and kitchen scraps (often more when in bins, less in sacks)
- 26% to 34% paper, cardboard, newspapers, advertising flyers and mixed-material packaging.
- 8 to 11% plastics
- 3 to 6% glass
- 3 to 6% metals and
- 2 to 4% other (including potentially hazardous items such as solvents, cleaning and garden chemicals, batteries, paints, medicines)



Typical domestic rubbish composition in Christchurch 2002. 'Organics' used here means kitchen scraps and garden clippings. Christchurch City also has a kerbside recycling collection. (Picture from CCC)

Why are landfills a problem?

The problem with putting materials into earth-sealed landfill is that the land is permanently lost from agricultural, housing or business use – landfills in the past have been unstable, emitted flammable methane gas, unpleasant smells and have soil contamination.

It is an expensive process, not least to buy land and provide engineering safeguards such as clay layers, collection pipes and pumps that prevent a toxic leachate from reaching groundwater or streams.

It is a waste of nutrients, from the garden clippings and food scraps, which could otherwise be returned usefully to soil, through natural cycles of decay. And it is a waste of many other materials, which if separated at the source, instead of being mixed, could be recovered affordably.

For a summary of Government policy of moving towards zero waste see 'The New Zealand Waste Strategy at a Glance' available free from Ministry for the Environment: 04 917 7400 www.mfe.govt.nz

The Strategy's aim is to: minimise and manage hazardous waste; upgrade landfill disposal facilities so that older and dirtier sites can be closed;

upgrade waste water treatment plants (which will help clean up the beaches), promote composting and recycling of garden and kitchen wastes; and encourage re-use/recycling of building site and demolition materials. Waste generators are to be charged the environmental cost of treatment and disposal: this is the principle of *the polluter pays*.

Challenging three myths of rubbish

Surveys of households have shown some commonly-held false ideas:

1. "The Council gets rid of it" – they do transport it but it does not disappear, and most of it goes into managed landfills.
2. "Rubbish breaks down in the ground" – it actually persists for many years in an airtight landfill, so that a newspaper or book would still be readable after 40 years!
3. "The Council sorts out the useful stuff". -They don't. But the householder or business can, before it goes to the kerbside.



What's in your rubbish sacks or bins?
Make a target of reducing rubbish.
(Photo: Matthew Smith, Papanui HS).

Influences upon our growing wastefulness (To waste is a verb!)

Here's a range of examples for group discussion – you could add to this list.

We live busy lives and seek convenience and speed, which sometimes comes in the form of pre-cooked or processed foods, which have to be kept fresh and safe by their packaging. We do not see the waste that's involved in their manufacture.

By comparison, home-made food from fresh ingredients involves less packaging. Food scraps such as veg peelings can be composted or fed to worms or fermented in a bucket under the workbench using EM Bokashi.



Steel cans preserve food for extended periods, handy for emergency supplies, but we buy them for immediate convenience. We don't see the waste involved in making them, and then many people don't rinse them and save the steel for recycling either! (photo: Matthew Smith)

We eat canned and bottled food even when the shops are full of fresh 'seasonal' food. In a year, the typical New Zealander eats the equivalent of a domestic bath-volume of tinned food – and each week throws away 10 steel food cans plus a similar number of glass food jars and frozen food plastic or card packs. The cans and glass have to be collected and transported a distance for recycling, sometimes overseas, or they otherwise get buried in landfill.

Composite or mixed materials are becoming more common in packaging. These include wax on cardboard cartons, and plastic film and foil bonded onto paper, making a packaging that's strong and lightweight to transport, but hard to recycle. Some labels on plastic containers are a different plastic from the container. Other examples of mixed packaging materials are 'blister packs' of clear plastic glued to bar-code printed card, on items that traditionally were sold loose. Supermarkets drove this trend.



Many glass containers could be cleaned and re-used but without container deposit legislation there is little economic incentive to do this.

'No deposit – no return'. Very few products in NZ have a container deposit charged which is refundable on return of the container, and even the returnable thicker-glass milk bottle (capable of up to 50 return trips) and returnable brown beer bottle are becoming rare. In other countries, where legislation requires certain containers to be returnable, and of standard shapes/sizes, recovery rates can rise above 70% and street litter is also reduced.

A campaign for container deposit legislation can be found here <http://www.bottledrive.org.nz/index.htm>

Some items are intentionally 'throw-away'. Proportionately fewer goods on

sale these days are designed for repair or renewal by the user, and more are designed for short-term 'fashionable' use followed by disposal (and, the manufacturer and retailers hope, by prompt replacement with new items). Examples range from disposable plastic pens and razors to babies' nappies, toys and those electronic goods labelled 'sealed - unserviceable'.

Daily newspapers accumulate fast. Every tonne recycled saves 17 trees and 26,000 litres of water in the papermaking process.

Typically, 45% of domestic rubbish is **garden and kitchen material** (known as green waste or organic waste) that natural systems could break down into useful nutrients for the soil, in suitably damp and aerated conditions, such as when compost-making. Nutrients can also be reclaimed in your kitchen using sealed bucket fermentation with EM Bokashi (The effective micro-organisms mixture of Naturally-occurring yeasts, lactic acid bacteria and actinomycetes). For further information look up EM at www.ccc.govt.nz/waste or visit the EM shop <http://www.emshop.co.nz/howto-make-em-bokashi.html>

In contrast, when sealed from air inside a landfill site, green waste decomposes without oxygen to make a toxic liquid (leachate) that may later threaten groundwater quality, and this sealed decomposition also makes methane gas. It eventually escapes to the atmosphere, where methane contributes to global warming, so it has to be collected and stored or used on site as a substitute for other fuels.

We need to avoid putting organic material into landfills, to reduce methane and leachate pollution, to save on expensive managed disposal space and also to return nutrients to the soil. Composting on a local-neighbourhood or civic commercial scale is possible, as well as composting in your garden, but it

involves transport of the materials, kept separate from other 'rubbish'. NZ Government has a target of 60% green wastes diverted from landfill.



Compost ingredients: a 2 to 1 mix by volume of browns (e.g. autumn leaves, straw) and greens (e.g. vegetable peelings, grass), plus air, a little water, helpful insects, fungi and bacteria, for a natural decay process, aided by occasional turning. It produces safe, useful garden fertiliser/soil conditioner. Our detailed notes on compost explain how.

Waste output from our homes includes liquids as well as solids.

Sadly, some of the used motor engine oil, brush-cleaning solvents and paint residues plus detergents from car washing, are tipped directly into (or get hosed into) the storm water drains on roadsides. This pollutes the natural waterways that they lead into, killing fish and insect life. *Remember that the road drains are only for rain.*

If liquid wastes (such as unused medicines, bleach cleaners, paints) are put into toilets instead, it may reduce the efficiency of town sewage treatment works, or poison the useful micro-organisms working in domestic septic tanks, so that's also very undesirable. Instead, liquid wastes should be stored in sealed labelled containers and disposed of safely at Council Transfer Stations or contact your Regional Council for local disposal options.

Motor oil, for example, can be cleaned of its sooty carbon, lead, and dioxins, to allow re-use. Take your used oil in a labelled screw-top container to a responsible petrol station or motor

workshop or Council Transfer Station or Resource Recovery Park.
N.B. Supported by a Government programme, used oil is collected from around NZ and transported to Westport to fire the kilns at the Holcim Cement Factory.

How does NZ compare on resource recovery?

Nationally we recover lower proportions of useful materials from our waste than, say, Japan, or the Netherlands. By the late 1990s New Zealand was reclaiming 46% of aluminium, 30% of steel and 40% of glass (for bottle re-use as well as glass making), plus 33% of steel. The *NZ Packaging Accord* aims to improve on this with targets set for 2008 of 65% aluminium, 70% paper and 43% steel cans. If voluntary action does not achieve this legislation is likely to follow (as in South Australia, and Europe). See detail at www.packaging.org.nz

Meanwhile, communities such as Ashburton (Wastebusters Trust Canterbury), Kaikoura (Innovative Waste), Alexandra (Central Otago Wastebusters), Waimate (Whitehorse Recycling Trust) Wanaka Wastebusters, Hurunui District, Kaitaia (Community Business Environment Centre), Raglan (Xtreme Waste) have shown great initiative in 'resource recovery projects' setting up community business models. The CRN (Community Recycling Network) is now set up with support from Ministry for the Environment to assist other communities take control of their local waste stream. A reduction of more than 50% in waste carted from the town to landfill has resulted from this action. District Councils including Mackenzie, Opotiki and Selwyn have also invested in comprehensive collection and processing to work towards zero waste. See www.wastebusters.net.nz
www.qldc.govt.nz
www.xtremewaste.org.nz

Waste Material Exchanges, which link waste producers and re-users, operate in the Waikato/Bay of Plenty (No Throw), in Timaru, Ashburton (Wastebusters), Mackenzie District, West Coast, Christchurch (Terranova), Wellington (Enviromart) and Auckland (Renew) and are supported by Regional Councils: Look in your local telephone book for similar listings or visit www.wasteminz.org.nz/wasteexchange/ for an area near you..

A directory published by the Recycling Operators of New Zealand lists recycling business contacts all over the country: Phone 09 488 9449 www.ronz.org.nz

The first year of Christchurch kerbside recycling green bins, organised by the City Council and Terranova (formally the Recovered Materials Foundation), rescued 12,650 tonnes of materials that previously went into landfill. These included: 7 million glass bottles and jars; 5 million aluminium drink cans; 3 million steel cans; 7.5 million soft drink bottles (code1, PET plastic) and 4.5 million plastic milk bottles (code 2, HDPE plastic). Even when compressed, the volume diverted from landfill was over 28,000 cubic metres, equivalent to filling the city's Olympic-size Queen Elizabeth Swimming Pool 40 times!

Christchurch, Auckland, Wellington and other cities charge for rubbish disposal 'per bag' as an incentive to reduce what reaches landfill. Now that kerbside crates collect recyclables, Christchurch households get only 26 bags a year 'free' on the rates, instead of 52. What is your council doing to discourage waste to landfill?

How do we cut down on the rubbish bags & fill wheelie-bins less often?

Think of the five R's!

1. By shopping for things using different criteria, so that we think before purchasing about how we will deal with the materials involved, especially packaging. This can **REDUCE** the amount of stuff we have to dispose of later.

(Another topic in this *Households* series looks at your shopping choices in detail.)

2. By **RE-USING** what we have now, which diverts it from the waste stream, either permanently or temporarily. This includes refilling containers, repairs and maintenance (of houses, vehicles, equipment and clothes); and the salvage of useful working parts.
3. By **RECYCLING** – using kerbside recycling programs and recycling drop off centres, where household items such as glass bottles, jars, steel tins and aluminium, paper and cardboard and plastics # 1 & 2 are collected for reuse or recovery. Escalating oil prices are resulting in increasing markets for other plastics 3-7 being collected or accepted at drop off. Call your local District Council for information on plastics recycling in your area. Glass recycling is undergoing problems in NZ due to increasing one-use containers and limited recycling options and very little reuse of bottles. Contact your District Council for local recycling information.

4. **RECOVERY of materials** often involves collecting sufficient quantity in one place to make re-processing financially viable, so it suits business and the local authority rather than the domestic scale. Recovery is carried out by community enterprises, waste collection companies or by local authorities. Households are dependent on business or local authority initiative to handle metals, plastics, oil, batteries, etc. Vehicle tyres are recovered in the Motor Trade's Tyre Track scheme. (www.tyretrack.co.nz)

There are industrial processes that recover useful materials at lower energy or chemicals cost than manufacturing from the original raw materials, and it is this cost

difference plus savings on landfill charges that finances the recovery.

Each aluminium can that's recycled saves enough electricity to run a TV for 3 hours! For aluminium, the energy saving is 93% compared to smelting bauxite ore, and for PET plastic 76%. For glass-making the energy saving is lower, at 57%, but still useful



Every tonne of paper recycled saves trees for other use, and saves energy.

Of course, **you are not fully recycling unless you buy recycled products too**. Website users, see the *Buy it Back Guide* at <http://www.zerowaste.co.nz> for a NZ guide to recycled goods, aimed mostly at business buyers. It can be searched by category.



5. Only after the first four: Reduce, Re-use, Recover and Recycle, have been considered, should the fifth 'R' for **RESIDUAL DISPOSAL** apply. Residual material gets land-filled. Burning it is air-polluting, so that's not currently an alternative. Live clean!