



SECTION ONE

The waste problem



HOW AND WHY WAS THE STRATEGY DEVELOPED?

This strategy is the result of a partnership formed in May 2000 between government and Local Government New Zealand to look for ways to minimise this country's waste and improve its management.

Reducing our waste and managing it better is vital to New Zealand's long-term environmental, social and economic wellbeing. It is a cornerstone of government's commitment to sustainable development,¹ while local government plays a crucial part in planning for and achieving the reduction.

A Working Group on Waste Minimisation and Management was set up to advise on the strategy's content and direction, and its advice² released for public submission. Fifteen public meetings were held around the country for discussion of its recommendations, and the group's report prompted 252 submissions.

Both the Working Group and public submissions called for clear national leadership and recognition of the crucial role regional and local government must play in addressing our growing waste problem. There was also widespread agreement that all New Zealanders must take responsibility for waste.

This strategy is a response to that consensus. Its vision, goals and targets all express national and local government commitment to minimise waste and manage it better. The measures the strategy sets out are based on central and local government's assessment of what is important, practical and achievable.

Many of its proposals need further consideration and consultation before specific policies are adopted. Others build on work already being done by government, individuals and organisations throughout the country. While the strategy sets out central and local government's expectations for future waste minimisation and management, it allows policy detail to be settled during the course of implementation.

A monitoring and evaluation system will be in place by February 2003, and the Ministry for the Environment and local government will undertake a first review of progress towards strategy targets in 2003.

WHY DOES WASTE MATTER?

What is waste?

Almost every activity using materials and energy generates waste — from mining to manufacturing to cooking dinner. Waste is not a uniform substance; it is created in many ways and can be difficult to define. Waste takes all forms:

- **Solid wastes** are those generated as solids or converted to a solid form for disposal. They include common household wastes such as paper, plastic, glass, metals, appliances, and kitchen and garden wastes, as well as a range of industrial and commercial wastes, such as construction and demolition wastes, organic wastes from agriculture and food processing, and mine and quarrying tailings. Most solid wastes are disposed of in landfills or cleanfills. Some solid wastes, such as medical wastes generated by hospitals, are hazardous or potentially hazardous, and require controlled disposal, often through high temperature incineration.
- **Liquid wastes** are those generated as liquids or disposed of into a liquid waste stream as suspended solids. Wastewater (or sewage) is collected by the sewerage system and piped to public wastewater treatment facilities before being discharged into rivers or coastal waters. This includes domestic food wastes, washing water and toilet wastes, as well as chemical and process wastes from industry. Not all wastewater is collected by the sewerage system. Some domestic wastes go into septic tanks, and some industrial plants have their own treatment facilities. Non-point source discharges include livestock excrement and agrichemicals that are washed from the land by rainwater, and urban stormwater, which collects wastes as it channels rainwater into waterways, and out to sea.
- **Gaseous wastes** consist of gases and small particles emitted from open fires, incinerators, agricultural and industrial processes, and vehicles. Once gaseous wastes have been released into the environment their effects are very hard to control. If gases are contained through pollution control devices before they enter the atmosphere, they can be controlled more easily.

¹ In May 2000, Cabinet agreed that sustainable development meant "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs".

² Ministry for the Environment, December 2000, "Towards a National Waste Minimisation Strategy".

Defining waste

This strategy defines waste as:

any material, solid, liquid or gas, that is unwanted and/or unvalued, and discarded or discharged by its owner.

This definition recognises that what one person or organisation regards as a waste can be a useful resource when used again for a beneficial purpose. For more information and guidance on identifying waste see the New Zealand Waste List, accessed at: www.environment.govt.nz/NZWLOnline

What wastes does this strategy cover?

The strategy covers waste in all its forms — solid, liquid and gas. This comprehensive approach to minimisation and management helps avoid policies that might encourage transfer of waste from one disposal medium to another, rather than reducing or removing the waste problem itself.

The strategy does not cover all environmental impacts of waste, however. Wastes that deplete the ozone layer, and increases in greenhouse gases caused by gaseous wastes are subject to existing programmes and lie outside this strategy. Other important non-point source wastes such as animal wastes and vehicle emissions are addressed by separate work programmes. Stormwater, which receives a range of wastes, is an increasingly important issue for many communities, but is not specifically dealt with here.

Strategy implementation will be coordinated with work programmes already underway.

Why waste matters

Waste management is crucial to our ability to live sustainably. Waste can be bad for the environment, bad for our health and bad for our economy. Numerous adverse environmental and human health effects can be attributed to waste.

Decomposing organic waste in landfills generates methane, a harmful greenhouse gas. Landfills also produce leachate when percolating water and other liquids pick up heavy metals and decomposing organic wastes. Uncollected leachate can escape into the environment, contaminating our water and soil.

Project Reclaim

Every day, Watercare Services Ltd's Mangere treatment plant discharges 290,000 cubic metres of highly treated effluent into the Manukau Harbour. Although unsuitable for drinking, the effluent is safe for use by industry as a low-cost source of water for cooling, washdown and similar purposes.

Project Reclaim is the company's investigation into the industrial re-use of effluent. The concept, which has proven successful overseas, is being discussed with industry in the Onehunga area. Initial studies at the treatment plant indicate that, once treated, the effluent could be dosed with chlorine and piped to local industries. Once the new treatment process is on-line, pilot trials complete, and the commercial viability of effluent reuse is confirmed, Watercare aims to have a recycled effluent scheme in place by early 2004.



Water passing through the final stage of treatment (ultra violet light disinfection) at the wastewater treatment plant.

MIPS and the *ecological rucksack*

Friedrich Schmidt-Bleek has developed a measure of materials efficiency called MIPS — materials intensity per service. Each material used in producing goods and services emerges sooner or later as waste, emission or discharge. MIPS measures each *unit of service* to the consumer from a product or service. A car, for example, delivers transport services, a book delivers information and entertainment services, and a glass of water serves to quench thirst. Producing all these services requires many materials, and the MIPS model measures how many are used in the production of a range of products and services.

The concept of the *ecological rucksack* is used to assess the environmental impacts of various products and services. A kilogram of metal obtained from mining, for example, usually requires the processing of tonnes of ore. When you use a product made from that metal it carries its own *ecological rucksack*. So using the MIPS measure, a ten gram gold ring carries an *ecological rucksack* of three tonnes! The concept can measure all the ecological effects of producing goods.

The longer you use a product, the greater the service it returns. If you recycle a product you've finished with, the materials will be used again, reducing the MIPS or *ecological rucksack*, of the new product. More gains can be made by reducing the amount of material needed to deliver the service to the consumer.

The MIPS model calls for economic, social and technical innovation to satisfy people's needs, along with far less reliance on natural resources to generate the same — or better — value of output.³

Burning wastes releases hazardous and toxic substances into the air and leaves a concentrated ashy residue that requires further treatment and disposal.

Domestic wastewater and tradewaste can contain pathogens, heavy metals and hazardous wastes, which can pollute our land and waters. Hazardous wastes can persist in the environment and enter the food chain, harming future generations.

Waste weakens our sense of connection to the environment. If we think of the environment as a dumping ground, it is harder to value its other qualities. For some, this directly affects cultural and spiritual values, and our role as *kaitiaki*, or stewards, of natural resources.

Waste incurs substantial economic costs. Producing unnecessary waste means we are not using resources sustainably. Studies show we use most resources very inefficiently and generate far more waste than durable, useful products. Approximately 93 percent of the materials we use never end up in saleable products at all but are discarded during the production process; approximately 80 percent of what we produce is discarded after a single use.⁴

Inefficient resource use stems from a failure to count environmental and social costs in resource use, waste production and disposal.

One of the best ways to reduce such costs is to reduce resource inputs by being smarter in our use of raw materials. The environmental benefits of greater efficiencies can be significant. One American study found a \$US170 environmental benefit for each ton of solid waste eliminated from the production system, plus avoided disposal costs of \$US100 per ton.⁵

The waste problem *can* be tackled effectively and this strategy sets in place a plan for doing this.

3 From Von Weizsacker, E, Lovins, A B, and Lovins HL, 1997, *Factor 4: Doubling Wealth — Halving Resource Use*, Allen & Unwin, chapter 9.

4 Von Weizsacker, E, Lovins, A B, and Lovins HL, 1997, *Factor 4: Doubling Wealth — Halving Resource Use*, pxx, Allen & Unwin.

5 Yale Study of Waste Reduction in New York, Tellus Institute and John Schall (Yale University), 1992. The scale of environmental benefits from source reduction probably apply to New Zealand given the sophistication of our economy and current emphasis on 'end of pipe' technology.

How big is New Zealand’s waste problem?

The amount of waste we produce is directly linked to how many goods and services we consume — the greater our wealth, the more we waste. This link between material wellbeing and waste generation is recognised internationally. The Organisation for Economic Cooperation and Development (OECD), of which New Zealand is a member, recently commented:

Despite nearly 30 years of environmental and waste policy efforts in OECD countries, the OECD-wide increase in waste generation is in direct proportion to economic growth. A 40 percent increase in OECD GDP since 1980 has been accompanied by a 40 percent increase in municipal⁶ waste during the same period.⁷

New Zealand is no different to other OECD countries. In spite of some progress, our waste problem continues to grow. The 1997 *State of the Environment Report* found that:

While waste management responses increasingly include recycling, cleaner production systems and higher landfill fees, total waste has increased, our landfill management practices are generally poor, as are our practices and attitudes towards managing hazardous waste.⁸

New Zealand’s waste problem is large, and growing. Just how fast it is growing is difficult to judge precisely. Data on the size of the problem is inconsistent, difficult to compare, and in many cases, doesn’t exist. Data from the Auckland region, where total landfill waste has been monitored since 1983, shows an increase in waste disposed to landfill per person of 73 percent.⁹

Nationally we dispose of over 3.4 million tonnes of waste into our landfills every year. Similar amounts of waste from building and demolition activities are disposed of into cleanfill sites.

Staff at the Kaitaia Community Business and Environment Centre demonstrate the value of recovered materials! CBEC has received funding from the Zero Waste Trust to establish resource centres and education programmes.

Zero Waste New Zealand Trust

The Zero Waste New Zealand Trust is a funding, advocacy, support and information group fostering community development projects for minimising waste. In the past four years it has granted \$2 million for waste reduction initiatives, and helped 34 of New Zealand’s 74 territorial authorities commit to a target of zero waste to landfill.

Dunedin City council signed up to zero waste, with the trust helping develop the Dunedin Zero Waste Strategy. This looks at ways the council can reduce the quantity of waste sent to landfill, and prioritises them according to environmental, social and economic outcomes. It is guiding Dunedin’s Zero Waste by 2015 policy.

Zero Waste funding, advocacy and technical support has helped about 40 community organisations and some small businesses develop resource recovery and waste minimisation projects. These are reducing waste flows and simultaneously creating job and business opportunities. The trust also fosters partnerships between community groups and their local councils, who can often provide the ongoing support required to maintain projects.



6 There is no internationally agreed definition of municipal waste, but it generally refers to household wastes, and similar wastes collected from commercial and industrial sectors.
7 Environment at the OECD, www.oecd.org/env/efficiency/wastemini.htm

8 Ministry for the Environment and GP Publications, 1997, Chapter 10 page 16.
9 While this growth rate is very high, in per capita tonnage terms we still produce less waste than most OECD countries.

Past waste policies

Several attempts have been made at a national level to tackle waste. In 1990, government policy targeted a reduction of the country's solid waste to 20 percent below 1988 levels by 1993. This spurred local authorities and industries to develop recycling programmes, and the development of national guidelines for monitoring and managing landfill waste. Guidelines for hazardous wastes, contaminated sites and cleaner production have since been developed.

In 1992, the government dropped its waste reduction target and emphasised instead the importance of waste management programmes, generator-pays policies and implementation of the 5R hierarchy of reduction, reuse, recycling, recovery and residual management. The Ministry for the Environment was directed to negotiate waste reduction targets with business sectors and encourage voluntary initiatives.

Legislation has also played a part. The Resource Management Act 1991 regulates the effects of discharges into the environment. While seen as a poor instrument for promoting waste minimisation, it plays a key role in waste management through the administration of the resource consent process. This Act also provides national instruments (National Policy Statements and National Environmental Standards), which could impact on waste management.

The Local Government Amendment Act 1996 brought the 5R hierarchy of reduction, reuse, recycling, recovery and residual disposal into law and required territorial local authorities to prepare waste management plans. More recently, the Hazardous Substances and New Organisms Act was introduced, but it is still unclear how the Act will apply to hazardous wastes.

Territorial authorities hold principal responsibility for implementing waste policies in their local communities. They have undertaken a range of activities including waste management plans, cleaner production and education programmes, kerbside recycling systems, polluter-pays charging policies, identification of contaminated sites and improved landfill standards.

Around 500 billion litres of sewage flow annually into approximately 250 public wastewater treatment plants. Treatment of this wastewater generates between 700,000 and 1,000,000 tonnes of sewage sludge each year.

Approximately 282,000¹⁰ tonnes of hazardous waste is landfilled each year, and a further 70,000 tonnes accepted at treatment facilities. New Zealand has approximately 20 waste incinerators that burn 13,000 tonnes of general medical waste, along with pathological and quarantine waste.

Some wastes are not so easy to measure. We don't know how much waste is illegally dumped every year. It is also difficult to measure non-point source waste discharges such as agricultural runoff and stormwater. Much more work is needed on all aspects of our waste streams to reveal the true size and nature of New Zealand's problem.

We do know that past waste practices have left a legacy of contaminated sites. A 1992 desktop study found 7,200 potentially contaminated sites (excluding timber treatment sites). Of those, 716 are landfill sites. Approximately 1,580 sites are potentially a high risk to human health and/or the environment.¹¹ Studies by regional councils suggest many more sites than the 1992 estimate. Councils have been systematically investigating these sites, and by 2000 had confirmed that 1,134 were contaminated. Forty-two percent of these have been cleaned up or are being managed. Although some sites resulted from poor practices or unlawful disposal methods, many stemmed from previously acceptable practices now regarded as inappropriate.

What progress have we made?

Waste minimisation and management policies at both central and local government level have changed practices over the last decade. Individuals, groups, businesses, non-governmental organisations, and central and local government agencies have launched many initiatives in a bid to address aspects of the waste problem. These have not by any means solved the waste problem, but they are steps in the right direction.

Landfill standards have markedly improved, and many substandard landfills are being closed in favour of modern, well-engineered landfills. Kerbside recycling schemes have helped raise awareness of the waste

¹⁰ This figure is based on data from various sources that may define hazardous wastes differently. It includes, for example, 176,000 tonnes of *Special Wastes* from Auckland. This requires special handling before being landfilled in a suitable site and is likely to range from sewage sludge and animal carcasses to asbestos.

¹¹ Potentially Contaminated sites in New Zealand: A broad scale assessment. November 1992, Worley Consultants Ltd.

problem, and many communities are spearheading the drive for alternatives to waste disposal. Hazardous waste management is also being improved.

In other areas, results are mixed. Some councils have introduced cleaner production programmes for business, but are finding them difficult to promote because waste disposal is still easier, and in some cases cheaper, than recycling or waste prevention.

Waste management plans prepared by local authorities under the Local Government Amendment Act 1996 have resulted in good waste management progress in some areas. But the Act sets no timeline for completion of plans, and a few councils have not produced plans at all. Lack of central government guidance also means the quality of some plans is poor.

Voluntary agreements with industry have also brought mixed results. The 1996 Packaging Accord sought to minimise the environmental effects of packaging waste, and has improved rates of packaging recycling. Innovations such as lightweighting have slowed the growth in this waste. As in other countries, however, the total quantity of packaging waste has increased.

Under the Used Oil Recovery Programme, the major oil companies have made efforts to recover used oil and re-use it appropriately. Unfortunately, problems beyond the companies' control have dogged the programme, and legislation may be needed to ensure a workable New Zealand recovery network.

Higher environmental standards have sometimes led, paradoxically, to more waste. Higher wastewater treatment levels, for example, have increased the amount of sewage sludge requiring disposal. New policies to improve separation of hazardous wastes from the general waste stream will result in more waste requiring treatment before disposal.

Some waste streams are growing very quickly. As our forest plantations mature, for instance, harvesting and processing millions of logs will generate a lot of wood-processing waste. Although these wastes are potentially recoverable as fertilisers or fuel, as with all wastes they must be carefully managed to ensure they don't adversely effect the environment.

CBEC: community waste minimisation and management

The Community Business and Environment Centre (CBEC) in Kaitaia was formed in 1998. CBEC has piloted a broad range of services since then as a means of reducing waste to landfill and providing local employment. A large proportion of this development has come from running a comprehensive recycling programme under contract to the Far North District Council. The community company runs Kaitaia's kerbside recycling services, the Kaitaia recycling and transfer station, and the wider council network of transfer stations. It has operated the council's largest landfill, Ahipara, for four years, and run "Slash Trash", a schools and business education campaign on waste reduction.

CBEC have found they can handle the Far North District waste stream at about two thirds of the conventional waste handling cost, with a 65 percent recovery rate. Of the 40,000 cubic metres of refuse entering the Kaitaia recycling and transfer station annually, approximately 26,000 cubic metres is recovered through recycling and reuse.

Experience has led CBEC to believe the key to achieving high levels of waste reduction lies with councils running separate contracts for recycling and the operation of transfer stations, the transport of residual waste to landfill, and the disposal of residual waste at landfill. This allows councils to purchase, and measure, the appropriate services for each different function of waste handling. It would also provide an incentive for the recycling operator to improve recovery rates.



A CBEC staff member unloads kraft collected from Kaitaia retail stores. Over half of the recyclables that go through the Kaitaia Recycle Station come from the commercial sector.

Fisher & Paykel

Fisher & Paykel has been operating a whiteware take-back scheme since 1993, giving dealerships and service centres an alternative to landfilling. The company has agreements with most of its North Island dealerships and service centres to take back old appliances for dismantling and recycling. Fisher & Paykel's own appliances are partially stripped down and materials separated for recycling. Other brands' appliances may be stripped down but less is salvaged because of the difficulty in identifying materials.

Fisher & Paykel can re-use or recycle around 75 percent of appliances by weight. The company processes around 25,000 used appliances annually. It recovers 1,600 tonnes of materials, including aluminium, stainless steel, copper, steel, plastics, packaging, electric cable, compressors, glass and circuit boards. Refrigerants are safely removed from freezers and refrigerators.

Packaging is the biggest source of recovered material — 75,000 pieces per year — and the single highest revenue earner for the take-back centre. Some packaging can be used up to four times, so ensuring packaging is undamaged when appliances are delivered is crucial to the operation's success.

With sales of recyclable materials, and internal savings from the re-use of packaging material, the take-back centre is making a small profit, with revenue in 2000 topping \$500,000.



Fisher & Paykel staff holding materials that tell a great recycling story. The polystyrene packaging on the left is collected, shredded and compressed into the heavy piece of material at centre, which is then used again in other plastic products such as the building component on the right.

WHAT'S BLOCKING THE PATH TO ZERO WASTE?

Past waste policies tended to focus on *end of pipe* solutions — those dealing with disposal rather than prevention. This strategy adopts a more comprehensive approach, recognising that we cannot minimise waste without a system that deals with it from generation through to final disposal. Crucially, the strategy recognises the need to promote materials and resource efficiency at every stage of production and consumption.

The strategy also recognises that the best environmental, social and economic solutions will vary for different wastes and different areas. While particular outcomes should be achieved throughout the country, a degree of flexibility is required in the means of achieving them.

In some areas, change can be immediate, but a number of factors stand in the way of easy, orderly progress. These must be addressed alongside change, or sometimes before change can be attempted.

Lack of information

Limited information on the size and nature of our waste problems hinders good policy-making and target-setting. We know more about waste disposal than we do about waste generation, but we need standardised measuring systems to establish baseline data and trends. We must also get a better understanding of production and consumption trends, which are closely correlated to how much waste we generate.

Variable community commitment

Many people enthusiastically promote and practice waste minimisation, but others know little about the problem. We need to raise awareness so we can build on and support community responses to local waste issues.

New Zealand's special character

Our towns and cities are widely dispersed, and transporting wastes and recyclables long distances is expensive. We are isolated from the rest of the world and all our imports and exports must be shipped or air-freighted. We import a large proportion of our consumer products so encouraging manufacturers to reduce waste or take back end-of-life products presents particular problems.

Inaccurate pricing and charging

Generating waste and disposing of it has social, environmental and economic costs, but these are not all covered by the *price* of waste treatment or disposal. Some councils still meet some or all of the costs of waste collection and disposal through a uniform annual charge levied on ratepayers. This gives waste generators little incentive to reduce the waste they dispose of, and is unfair to those who generate little, or recycle and compost their wastes.

Unreliable markets

There are healthy markets for some recyclable materials, but many markets are global, and susceptible to fluctuating prices. We must find reliable markets for more of our recyclables and ways to better manage fluctuations in prices. Part of the solution lies in overcoming prejudices about the quality of recovered materials. Many recyclers produce high-quality materials and products but are hampered by perceptions that virgin materials are better.

Hard choices

We need to minimise waste *and* improve waste management. Many contaminated sites need better management and remediation; wastewater treatment plants need upgrading; hazardous waste-handling and treatment processes must be improved; substandard landfills must be upgraded or closed down. Making this happen takes time and money. Many communities will have to make hard choices about prioritising resources.

Waste minimisation funding problems

We spend millions on waste disposal but it's often difficult to get ongoing funding for waste reduction research, education and implementation programmes. Quantifying the financial gains of waste minimisation is complicated and benefits may not be apparent for some time, so decision-makers and waste generators are often reluctant to allocate funds for this purpose. Some councils find the initial funding of two systems, waste disposal and resource recovery, a financial burden as they try to make the transition to a resource recovery system.

Lack of incentive in existing contracts

Some local authorities have sunk significant capital in landfills, so diverting waste to other uses can add to their total costs. Some local authorities and businesses have long-term fixed waste contracts with private firms, which lock them into paying for the disposal of a set amount of waste, whether they generate it or not. This provides no incentive to reduce waste.

