



10 Materials and waste

This chapter lists the questions about materials and waste that we would like addressed. We present a summary of the analysis of the official data that addresses those questions. We then outline the initiatives that have been identified to address our materials and waste information needs.

Few incentives exist to use resources frugally. Gross national product and similar economic measures do not capture the environmental and social consequences of waste production and disposal costs.

The growth in the volume of waste brings increasing cost implications for its disposal. The economic costs of waste disposal include higher prices paid for landfill use and cleaning unproductive waste storage areas. Some forms of waste produce greenhouse gases while others can have significant health impacts on humans and animals. There are also associated health effects.

The initiatives discussed in this chapter seek to improve information, monitoring, reporting, governance, standards, recognition of indigenous values, levy changes, international comparisons, and the use of current information to inform debate on the issues.

The initiatives focus on a future for all materials – for waste-streams to enter zero-waste flow or produce commercially viable local resources.

Sources of waste

The following are the economic and social activities and processes from which waste originates from.

Exploration, mining, quarrying, physical and chemical treatment of minerals, agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing, wood processing, production of panels and furniture, pulp, paper, and cardboard, leather, fur and textile industries, petroleum refining, natural gas purification, pyrolytic treatment of coal, organic and inorganic chemical processes, manufacture, supply and use of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks, photography, thermal processes, shaping and physical and mechanical surface treatment of metals and plastics, oil wastes, wastes of liquid fuels, organic solvents, refrigerants and propellants, construction and demolition, contaminated soils, human and animal health care, research, waste-water treatment, preparation of drinking and industrial water, and municipal waste including household, commercial, industrial and institutional wastes.

Materials and waste questions

This section presents the enduring questions and the supplementary enduring questions on materials and waste.

Enduring questions

How do production and consumption patterns in New Zealand affect waste generation and minimisation?

Supplementary enduring questions

A. What and where are the effects¹ of production and consumption on New Zealand's environment?

B. To what extent is New Zealand adopting technologies, production methods², and best practices that make more efficient use of natural resources, minimise waste, and reduce the impact on the environment from production and consumption?

C. What and where is the total amount and composition of waste³ generated, recycled, and disposed of in New Zealand?

D. What is the environmental impact of waste in New Zealand?

E. To what extent are Māori values affected by current waste management practices?

F. What environment protection effort⁴ is undertaken to reduce the impact of waste on the environment?

Notes

1. The effects of production and consumption include the physical flow of materials into, through, and out of the economy.

2. Production methods and practices to reduce waste and increase resource use efficiency include waste management, waste minimisation systems, technologies for achieving waste reduction, and improving natural resource use efficiency.

3. Waste includes hazardous waste, solid, liquid, and gaseous waste, and materials disposed of in landfill, and dryfill.

4. Environmental protection effort includes remediating environmental damage, resource management, expenditure, areas protected under regulation and legislation, damage avoidance, research, and minimising natural hazards.

Gap analysis

Table 20 summarises how well official information (including Crown research institute data) informs the supplementary enduring questions on materials and waste. See appendix 3 for details of the analysis process.

Table 20

How well official data informs supplementary enduring questions on materials and waste

Supplementary enduring question (SEQ)	Question topic	Level at which official data informs SEQ
A	Environmental effects from producing and consuming materials and waste	Medium
B	Adoption rate of technologies and best practices	Medium
C	Amount and location of waste	Medium

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Table 20 continued

How well official data informs supplementary enduring questions on materials and waste

Supplementary enduring question (SEQ)	Question topic	Level at which official data informs SEQ
D	Waste impacts on New Zealand's environments	Low
E	Impact on values of Māori	Low
F	Environmental protection efforts	Medium

Five datasets scored highly for informing the supplementary enduring questions:

- WasteTRACK
- Solid waste analysis protocol baseline programme
- Territorial authority stocktake
- Waste minimisation fund projects and accredited product stewardship schemes database
- Incidents database.

Materials and waste initiatives

Twelve initiatives for the materials and waste topic were identified at the workshop. These are listed by priority below.

MW1 Conduct waste-stream data collection

Conduct data collection at the national level to provide uniform and consistent data collection across the whole waste-stream. This work will focus on information collected from:

- levied landfills
- transfer stations
- clean fills
- other types and sources of waste management sites.

The type and source of waste data to be collected is:

- household waste
- industrial waste
- hazardous waste
- bio-solids
- organic and green waste.

The reporting system could:

- be mandatory
- have consistent methodologies

- meet all stakeholders' needs
- provide a complete dataset for the whole waste stream.

Information about materials diverted from the waste-stream, through recycling, reuse, and recovery is sparse and gathered irregularly. Improving diversion information would contribute greatly to recognised needs. Specifically, it would be useful to measure diversion from landfill and provide information that can be used to assess Waste Minimisation Act 2008 achievements.

This initiative could support compulsory data collection to ease concerns on the quality and quantity of data. It also needs to relieve concerns over confidentiality within the waste industry.

Having consistent and standardised methodologies will present information clearly for key users of waste data at all levels (eg. central and local government).

This initiative is linked closely to initiative MW10, establish international best practice in monitoring and reporting waste, and MW4, improve understanding of waste and hazardous sites.

MW2 Assess data needs for a material flow analysis

Assess data needs to enable analysis of material flows, specifically for:

- developing indicators that show material flows life cycles
- monitoring and reporting of resource use and flows through the economy and environment.

Data is required to provide measures of:

- the intensity / efficiency at which resources are being used
- waste generation by industry groupings.

This initiative seeks to ensure data is available on all aspects and stages of materials and waste-stream flows. This data will support robust monitoring and reporting of activity within all sectors where these occur.

Statistics NZ would undertake this initiative by producing (or having a feasibility study on) a System of Environmental and Economic Accounting of material flows. Key data collectors should be consulted to ensure enough information is collected in a sufficient manner.

Generally, material flow accounts measure the flows from the environment to the economy (United Nations, nd, p12).

Information provided for a material flows analysis enables a deep understanding of the relationships between the environment and the economy in New Zealand.

This initiative is linked to initiative MW1, conduct waste-stream data collection.

MW3 Support improved governance over waste to improve coordination of waste information

Support improved waste sector governance and leadership to assist with more coordinated and integrated data collection on waste-flows, sources of waste, and the impacts of waste.

Expanding the governance of waste can enable:

- stronger collaboration and greater consistency in data collection

- increased coordination on the gathering, custodianship, and information sharing of waste data.

The complex character of environmental issues requires stakeholders to adopt clear management. Governance includes business and society stressing a whole-system management approach. Waste governance directly influences public health, the economy, safety, and environmental outcomes.

MW4 Improve understanding of waste and hazardous sites

Better understand the harm from waste and hazardous sites, including contaminated historic sites, and be better positioned to prevent future harm to people and damage to the environment by:

- integrating waste and hazardous sites information
- having a nationally consistent approach to identifying, recording, and remediating hazardous sites.

Many hazardous materials are stored in landfills or other containment areas. If these hazardous waste sites are not properly designed or managed, their contents can be released into the surrounding environment, posing a threat to biodiversity, natural environments, and public health.

This initiative supports having a national register of all waste and hazardous sites in New Zealand and their contents, and mapping materials and waste movements.

MW5 Establish recycling standards

This initiative seeks to develop:

- standards for recycling collection, processing, and reuse
- measures that will assess if recycling is effective at reducing waste entering landfill and maximising resource recovery
- an accurate assessment of what is recycled and to what standard.

In general, most products are not designed with recycling in mind. However, recycling conserves natural resources and reduces the amount of waste that is buried or burnt. Recycling has other benefits, too. Landfills take up space and emit methane while burning can produce noxious emissions.

Remedying this problem may need a rethinking of industrial processes, where recycling becomes part of the design process rather than a process to deal with design flaws. Recycling saves energy and raw materials and reduces pollution. This initiative supports the standards for recycling processes and the implementation of measures that assess how well recycling is effective at reducing waste entering landfill and maximising resource recovery.

MW6 Research how waste may become a resource

This initiative focuses on the future for waste and its potential as an enduring resource. In particular, this initiative pays attention to the catalysts for turning waste into a resource, for example:

- using natural fermentation to turn kitchen waste into usable gas
- extracting hydrogen from food waste using bacteria
- recovering materials from electronic waste for reuse.

This initiative supports research on ways that enable materials and waste to become valued inputs. For example, waste could be used in other ways to deliver good economic,

environmental, social, and health outcomes. Transforming waste into an economic resource reduces it being returned to the environment.

There is current activity into this area. For example, the [Waste Minimisation Fund](#) is funding projects on waste as a resource.

MW7 Integrate Māori values into waste management

Recognise and determine the specific values of Māori on waste and materials, and conduct robust research into developing waste management to reflect these values.

Māori have long adhered to a notion of kaitiakitanga (resource guardianship) to maintain the integrity of environments. In Māori culture, Papatuanuku (the earth) is extremely important and tangata whenua (local people) have a vital role as kaitiaki (guardians) of it. Waste can reduce or destroy the life supporting capacity of soils by damaging the mauri (life essence) of the land and affecting the Taonga (that which is to be prized or treasured) of resources. Therefore, the places where it is disposed of are considered carefully (Barlow, 1991).

Water is a Taonga and is an integral aspect of the environment; its life-supporting capacity can also be reduced by waste.

This initiative supports integrating Māori values into all aspects of the issues surrounding materials and wastes in New Zealand.

MW 8 Maintain a national directory of waste management and diverted materials sites

Maintain a national directory of waste management and diverted materials sites. The directory would list:

- all landfill and transfer station sites
- all non-landfill sites where waste is disposed of to land (eg cleanfills, monofills)
- all sites providing hazardous waste treatment and disposal
- all sites where sorting and / or processing of diverted materials occurs
- all sites that provide opportunities for companies requiring specific treatment and disposal needs, such as medical waste disposal requirements and services
- descriptions of their services.

Note: Some sites will fall into more than one of these categories.

The freshwater topic addresses wastewater sites.

Such a register also provides for a potential hazardous waste mapping system for mapping wastes to particular locations. Before this work can be done, some analysis is needed of the regulatory framework that is needed to achieve this initiative, and who would be involved in this (eg. regional councils, central government).

MW9 Integrate international best practice into New Zealand waste management

This initiative looks to determine international best practice on waste management, including future management technologies and the most effective return for waste management efforts. Best practice for waste management is to be encouraged across the whole waste stream. For example, international best practice could help guide central government legislation, local government waste plans, industry waste plans, and the management of domestic waste.

This includes the best waste management plans that focus on:

- integrating programmes that deal with all types of waste
- covering all facets of the waste management process
- building technical, financial, and administrative capability to sustain them.

MW10 Establish international best practice in monitoring and reporting waste

Find out what international requirements and best practice exist for improving waste monitoring and reporting.

Environmental performance reviews: New Zealand (2007) (Organisation for Economic Co-operation and Development, 2007) and *Targets in the New Zealand waste strategy: 2006 Review of progress* (Ministry for the Environment, 2007a) found that lack of information hampers the ability to set and achieve targets for waste minimisation.

This initiative encourages the adoption of consistent, meaningful methodologies and international best practice that enable informed monitoring and reporting of waste management in New Zealand.

This initiative is linked to MW1, conduct waste-stream mandatory data collection, and MW9, integrate international best practise into New Zealand waste management materials site.

MW11 Conduct research to inform future reviews of the waste levy

The Waste Minimisation Act 2008 provides for a levy (currently \$10 per tonne), payable by disposal facility operators. Half the income is given to territorial local authorities to help them reduce waste in their areas. The remainder is pooled to fund waste minimisation projects throughout New Zealand.

This initiative seeks to better understand costs and benefits of different levy rates to inform future reviews of the waste levy.

MW12 Make better use of current information

Following the stocktake of data available, this initiative seeks to confirm that the information available is used in the best ways. For example, the solid waste analysis protocols could be better used to provide a national estimate. It could also be the best information available on the composition of waste to municipal landfills.

Materials and waste initiatives table

Table 21 lists the materials and waste initiatives by priority, estimates of their complexity, and the supplementary enduring questions they address.

Table 21

Materials and waste initiatives by priority, complexity, and supplementary enduring question (SEQ) addressed

Initiative number	Initiative name	Priority	Complexity	Helps inform which SEQ
MW1	Conduct waste-stream data collection	1	Highly complex	A, B, C, D, E
MW2	Assess data needs for a material flow analysis	2=	Highly complex	A, B, C, D, E
MW3	Support improved governance over waste to improve coordination of waste information	2=	Complex	All
MW4	Improve understanding of waste and hazardous sites	4=	Moderate	All
MW5	Establish recycling standards	4=	Moderate	All
MW6	Research how waste may become a resource	4=	Moderate	A, B
MW7	Integrate Māori values into waste management	7	Moderate	B, E
MW8	Maintain a national directory of waste management and diverted materials sites	8	Highly complex	A, C, D
MW9	Integrate international best practice into New Zealand waste management	9	Highly complex	All

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Table 21 continued

Materials and waste initiatives by priority, complexity, and supplementary enduring question (SEQ) addressed

Initiative number	Initiative name	Priority	Complexity	Helps inform which SEQ
MW10	Establish international best practice in monitoring and reporting waste	10=	Moderate	All
MW11	Conduct research to inform future reviews of the waste levy	10=	Moderate	F
MW12	Make better use of current information	10=	Highly complex	All