NZIER
NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

Waste, resource recovery and contaminated land management

Assessing the economic contributions of the sectors to New Zealand

NZIER report to WasteMINZ

May 2025

About NZIER

New Zealand Institute of Economic Research (NZIER) is an independent, not-for-profit economic consultancy that has been informing and encouraging debate on issues affecting Aotearoa New Zealand, for more than 65 years.

Our core values of independence and promoting better outcomes for all New Zealanders are the driving force behind why we exist and how we work today. We aim to help our clients and members make better business and policy decisions and provide valuable insights and leadership on important public issues affecting our future.

We are unique in that we reinvest our returns into public good research for the betterment of Aotearoa New Zealand.

Our expert team is based in Auckland and Wellington and operates across all sectors of the New Zealand economy. They combine their sector knowledge with the application of robust economic logic, models and data and understanding of the linkages between government and business to help our clients and tackle complex issues.

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Key points

Effective management of waste, resource recovery, and management of contaminated land is crucial for protecting public health and the environment, and growing the economy

Done well, waste management, resource recovery, and contaminated land management protect our environment. These economic activities across the sectors directly and indirectly support businesses and employment. The waste, resource recovery and contaminated land sectors contribute across the entire economy, supplying products, freeing up otherwise limited usable land and containing the effects of waste materials.

Better economic information on the waste, resource recovery and contaminated land management sectors is needed

WasteMINZ has commissioned NZIER to assess the economic contribution of the waste, resource recovery and contaminated land management sectors in Aotearoa New Zealand. Our report aims to fill information gaps in quantifying the sectors' economic impacts to inform policy development and investment.

Other countries have begun developing satellite accounts for the waste sectors, but this is unavailable in New Zealand. Satellite accounts would provide a more comprehensive picture of the various sector interactions and their contributions to the economy. This report provides a starting point for future research to build on to better understand and quantify the impacts, both positive and negative, across sectors.

We use official economic data to define the sectors' industries and products

The sectors are broad in definition and capture various activities that are either not reflected in or separately identifiable within official economic datasets. Therefore, we use established industry definitions to assess the economic contributions of the sectors.

We assess that the core waste collection, treatment and disposal services industry produced $2,415 million of direct output in 2020, which directly supported $998 million of gross value added and 7,200 jobs. Including flow-on indirect and induced effects to other industries and households, the total contribution rises to $6,048 million in output, $2,715 million in gross value added, and 20,150 jobs.

The sectors consist of more than just the core industry and can also include sector-related products supplied by a range of industries. When aggregating the economic activity across the sector-related industries and products, $3,342 million in direct output is generated annually. This directly supports $1,363 million in gross value added and around 10,400 jobs across the economy.

Compared with other countries, New Zealand has a low material productivity. For every tonne of material consumed, only USD1,475 of economic output is produced, whereas the OECD average is USD2,502 per tonne of material consumed. This suggests that more can be done to better utilise the material used in domestic production, which will help to lift productivity and reduce waste.

The sectors also have a wider impact on other parts of the economy

Approximately 1.67 million tonnes of materials were diverted from class 1–4 landfills in 2024, but inefficiencies in waste diversion are costing the economy. An estimated 40 percent of waste sent to class 1 landfills is divertible, which results in estimated avoidable disposal costs of $222.8 million in 2022 alone. This represents a significant opportunity to keep materials circulating in our economy (avoiding the need to buy, extract or grow new materials), and reduce disposal costs and greenhouse gas emissions.

Waste also costs households. Local councils have increased their spending on solid waste management, reaching $629 million in 2023. Approximately 60 percent of domestic kerbside waste collection consists of organic material such as green waste and food scraps. Wasted food alone is estimated to cost the average household between $1,326–1,516 every year.

The sectors generate additional value through environmental management, reduced emissions, and volunteer-driven community initiatives. Addressing illegal dumping, food waste, and air pollution from open burning are critical areas for targeted intervention. Around 3.1 million tonnes of CO_2-equivalent emissions in 2022 came from the disposal and management of waste, with methane accounting for 96 percent of the total. The future cost of abating these emissions is estimated at $481.1 million.

Reducing the volume and types of waste going to landfills is a key priority for the government. Not only does this represent an opportunity for targeted emissions reductions, but it is also a way to reduce costs for businesses and improve productivity through more effective and efficient use of resources.

Key definitions

The definition of the waste, resource recovery and contaminated land management sectors is broad because the sectors include a wide range of activities. Resource recovery can start in homes when people choose to upcycle materials they would otherwise dispose of. Contaminated land can include old timber processing sites, dry cleaning premises, petrol stations, farm dumps or old landfills.

However, broad definitions of the sectors and their activities are unlikely to be fully reflected by official economic datasets. We, therefore, use the Stats NZ system of national accounts and the definitions within these datasets for the assessment. The definitions are as follows:

Table 1 Key terms and definitions

Key term	Definition
The sectors	The waste, resource recovery and contaminated land management sectors. They comprise the industries that primarily provide sector activities, such as waste collection and haulage, waste disposal and treatment facility operations, contaminated site remediation and clean-up, and materials recovery. Other industries may also be included in a broader definition of the sectors, like environmental consultants and sustainability specialists, who are internally employed in non-waste industries, such as construction. Where possible, this is included in our analysis, but this report primarily focuses on the prior definition defined in official statistics.
Core industry	The ANZSIC D29 waste collection, treatment, and disposal services subdivision. This is the industry used to assess the total economic contribution of the sectors. Other industries can be considered to be part of a broader definition of the sectors.
Products	A 'catch-all' term for goods and services supplied or used in market transactions. The core products used in this assessment are: • waste disposal, recycling and environmental protection services, and • wastes and scraps.
Business	Businesses are the geographic units from the Stats NZ data. They comprise each business' individual locations engaged in one, or predominantly one, kind of economic activity at a single physical site or base. These include factories, shops, or offices, to name a few.
Output	The value of goods and services produced in an economy in monetary terms.
Gross value added (GVA)	The net contribution of an industry is defined as output minus input costs used in production. GVA helps to measure the economic contribution of different industries and is a key component of gross domestic product (GDP), but unlike GDP, it does not include taxes or subsidies on products.
Employment	The number of jobs created, sustained, or required to produce a certain level of output in a sector or economy.
Direct, indirect and induced effects	• Direct effects: economic activity (output, gross value added, or employment) generated directly by an industry's production of sector products. • Indirect effects: economic activity in upstream industries associated with supplying inputs to the core industry for its own production. • Induced effects: economic activity resulting from household spending, through income generated by the direct and indirect effects.

Source: NZIER

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1 Introduction

1.1 Background and context

WasteMINZ is the largest representative body of Aotearoa New Zealand's waste, resource recovery and contaminated land management sectors. Its members help to shape the sectors in New Zealand and provide input into relevant legislation and policy from central government.

The sectors find it challenging to influence policy in part because there is limited information and research on the combined impact of the sectors' activities across the economy. This situation has created risks that policymakers will either take too long to take action or set directions that have a net negative impact on the economy and the sectors.

1.2 Research objectives

WasteMINZ commissioned NZIER to help bridge this gap by assessing the value of the sectors in New Zealand. Our research objective is to provide a robust evidence base of the economic contributions and opportunities across the sectors. The purpose of this research is to help:

- influence decision makers and policy settings
- compile existing data on the economic impact of the waste, resource recovery and contaminated land sectors
- encourage appropriate investment in the waste, resource recovery and contaminated land management sectors
- articulate the role of the sectors in delivering on the government's priorities of economic growth, cost-effectiveness, reducing regulation, and reducing emissions
- demonstrate that the sectors are essential and part of critical infrastructure.

Out of scope

The matters that are out of scope for our assessment include:

- non-quantifiable costs or benefits that lack strong evidence
- commentary on waste disposal levy settings
- wastewater infrastructure.

Data and information

We use quantitative and qualitative information to identify, quantify and monetise the various economic values defined in this report. This includes tier-1 datasets published by official government agencies, like Stats NZ, as well as publicly accessible reports and documents. Our research has also been informed through interviews with some of WasteMINZ's key stakeholders. While their involvement in this research remains confidential, we greatly appreciate their insights and eagerness to help us understand the sectors and key issues.

1.3 Structure of this report

In this report, we:

- define the industries and activities that make up the waste, resource recovery and contaminated land management sectors
- review the trends across sector industries and regions
- estimate the economic contribution of the sectors by analysing the inter-industry flows of related goods and services across the economy
- investigate broader concepts of economic value related to the sectors' activities and the impacts of suboptimal waste management practices
- discuss the need for greater focus on the key challenges and opportunities for the sectors.

2 Industry snapshot and trends

The industries and economic activities that make up the waste, resource recovery, and contaminated land management sectors are made up of core:

- industries that supply sector-related and other products to various parts of the economy, and
- products supplied by sector-related industries and other industries outside the core sectors.

In this context, 'core' means the industry and products primarily associated with the sectors that are readily identifiable, quantifiable and monetisable. Product is a 'catch-all' term for goods and services. The core industry is the ANZSIC industry **D29 waste collection, treatment and disposal services**. This is consistent with the industry defined in the Australian Waste Accounts on waste generation, management and economic response by industry (Australian Bureau of Statistics 2020). Therefore, this report covers the direct supply of goods, the physical services of collection and processing materials, and the use of inputs, like knowledge services, such as policy development and consulting for direct supply.

2.1 Core waste, resource recovery and contaminated land management industry snapshot

The core industry consists of several industry classes that perform key sector-related activities. These are:

- waste collection and haulage
- waste disposal and treatment facility operations
- contaminated site remediation and clean-up
- materials recovery.

We focus on this industry because the employment and business datasets are aggregated in this format, and identifying a core industry allows trends in the sectors' employment and business operations to be identified. The industry classes that make up the core industry and their activities are displayed in Table 2. Where possible, and relevant to do so, we disaggregate the data and information for the industry classes.

Table 2 Core industry classes and activities

ANZSIC industry classes for D29 waste collection, treatment, and disposal services subdivision

Class code	Class name	Definition
D291100	**Solid Waste Collection Services**	Units mainly engaged in the collection and haulage (except long distance) of domestic, commercial or industrial solid waste (except through sewerage systems). This class also includes units that provide portable toilets, bins, and other receptacles for hire by clients as part of a waste collection service.
D291900	**Other Waste Collection Services**	Units mainly engaged in the collection and haulage (except long distance) of domestic, commercial or industrial liquid waste and other waste types (except through sewerage systems).
D292100	**Waste Treatment and Disposal Services**	Units mainly engaged in the treatment or disposal of solid, liquid and other waste types (including hazardous), including operating landfills, combustors, incinerators, compost dumps and other treatment facilities (except sewage treatment facilities), including waste transfer stations.
D292200	**Waste Remediation and Materials Recovery Services**	Units mainly engaged in the remediation and clean-up of contaminated buildings and mine sites, mine reclamation activities, hazardous material removal and asbestos, lead paint and other toxic material abatement. This class also includes units mainly engaged in providing materials recovery and sorting services.

Source: Stats NZ

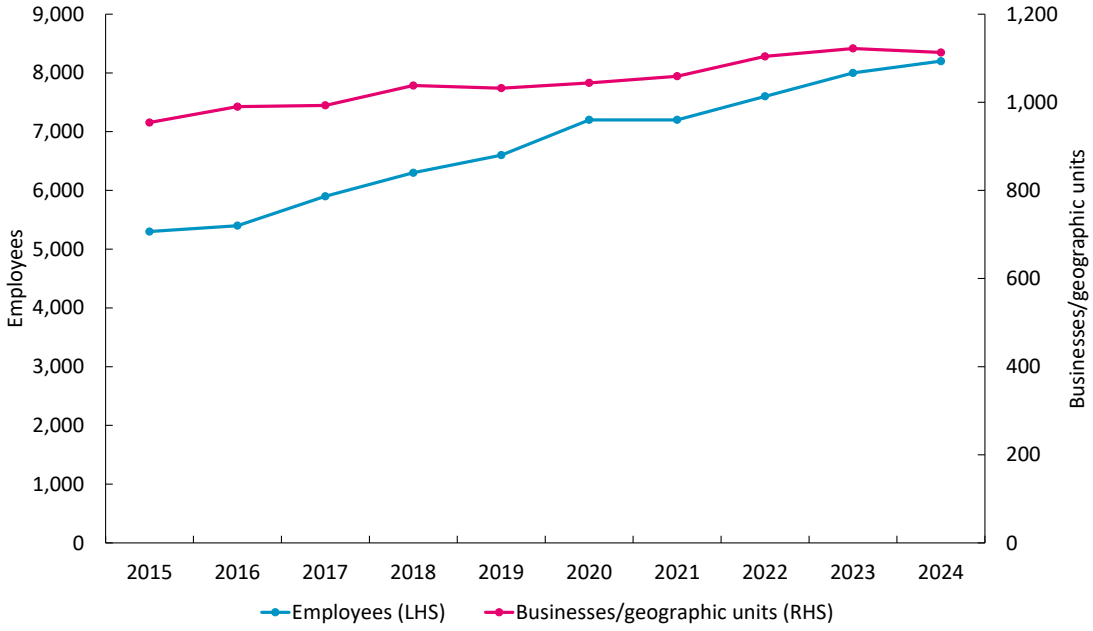
Core industry trends

The core industry has experienced strong employment growth over the 10-year period from 2015–2024. The number of employees in the core industry has grown by an annual average of 5.0 percent compared to an average of 2.2 percent across all industries. Growth in the number of businesses was also positive, although at 1.7 percent, it was slightly lower than the average across all industries, which was 2.0 percent. This suggests that the core industry has experienced growth in its total size, and businesses within it have also grown steadily.

Business and employment growth are underpinned by the industry's net positive rate of job creation. Figure 2 shows the net job creation rate averaged across each quarter for that year. The core industry has experienced higher average job creation relative to job destruction for each year compared to the average across all industries. This rate ranged from 0.5–2.6 percent for the core industry compared to 0.1–1.0 percent for all industries over the 2015–2023 period.

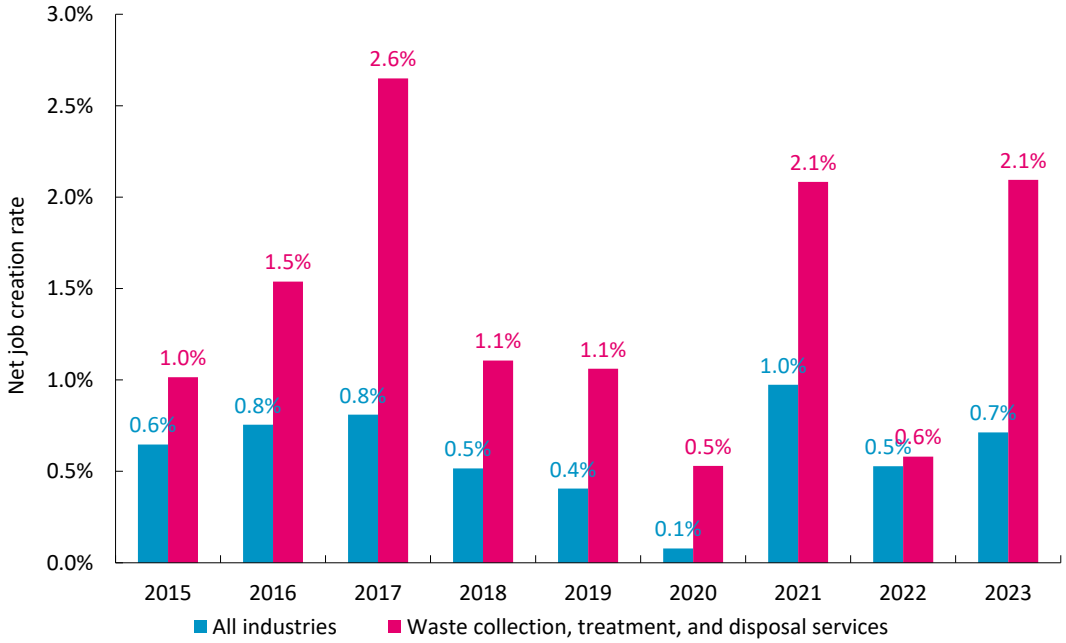
For the purposes of this report, businesses are the 'geographic units' from the Stats NZ data. They comprise each business' individual locations engaged in one, or predominantly one, kind of economic activity at a single physical site or base. These include factories, shops, and offices, to name a few.

Figure 1 D29 waste collection, treatment and disposal services growth in employment and businesses 2014–2024



Source: NZIER from Stats NZ (2024b)

Figure 2 Average annual net job creation rate



Source: NZIER from Stats NZ (2025)

The regional spread of the core industry's employment and businesses largely follows the spread of New Zealand's population across each region. Of the core industry's 8,200 employees and 1,113 businesses, around a third are in Auckland, followed by Canterbury, Wellington and Waikato. These four regions comprise 70 percent of employment and 67 percent of businesses for the core industry.

Table 3 Core industry regional share of employment and businesses

2024 year

Region	Employees	Regional share of employment	Businesses	Regional share of businesses
Auckland	2,950	36%	360	32%
Bay of Plenty	470	6%	72	6%
Canterbury	1,350	16%	153	14%
Gisborne	25	0%	12	1%
Hawke's Bay	410	5%	54	5%
Manawatu-Whanganui	420	5%	54	5%
Marlborough	100	1%	12	1%
Nelson	75	1%	15	1%
Northland	350	4%	27	2%
Otago	390	5%	54	5%
Southland	60	1%	21	2%
Taranaki	130	2%	27	2%
Tasman	75	1%	15	1%
Waikato	740	9%	120	11%
Wellington	670	8%	111	10%
West Coast	45	1%	6	1%
Total New Zealand	**8,200**	**100%**	**1,113**	**100%**

Regional share means each region's percentage of the New Zealand total. Figures may not sum to the total due to rounding.

Source: NZIER from Stats NZ (2024b)

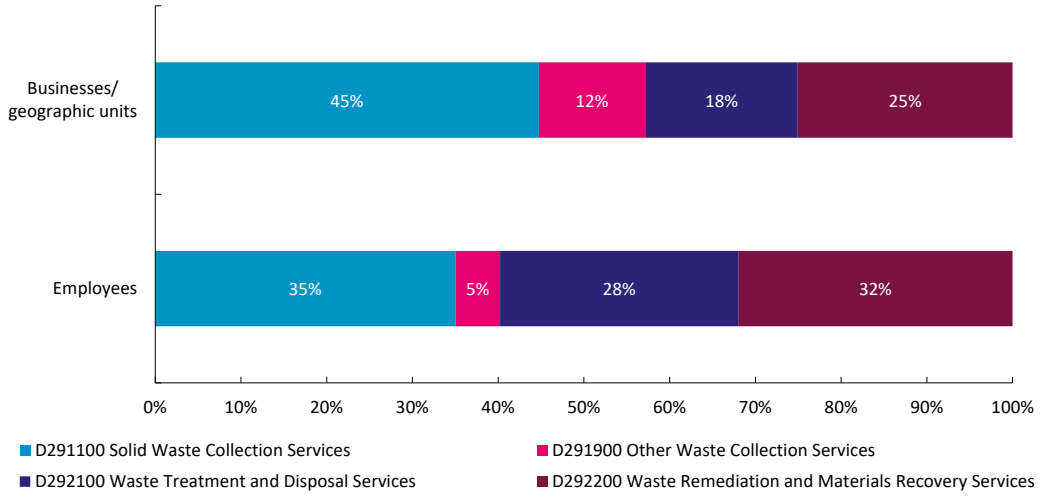
Composition of the core industry by industry class

The breakdown of employment and businesses by core industry class is shown in Figure 3. The solid waste collections services industry class makes up the largest share of the core industry's employment and businesses at 35 percent and 45 percent, respectively.

The waste treatment and disposal services and waste remediation and materials recovery services industry classes make up more equal shares of the total core industry employment than the number of business units. Although other waste collection services have only five percent of core industry employment, they account for 12 percent of core industry businesses.

Figure 3 Percentage share of core industry employment and businesses

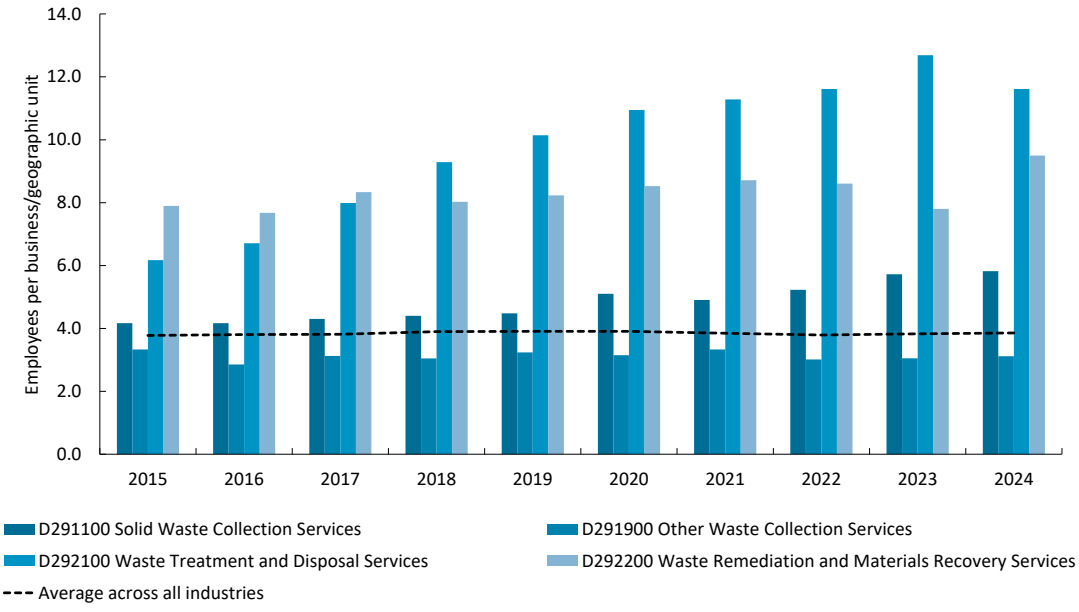
2024 year.



Source: NZIER from Stats NZ (2024b)

Growth in employment across businesses within the core industry has been led by the waste treatment and disposal services industry class, up from 6.2 to 11.6 employees per business between 2015 and 2024. The employment-to-business ratio for the waste remediation and materials recovery services class has remained stable over the period, increasing to 9.5 in 2024. Solid waste collection services have also experienced an increase in the number of employees per business over the period, increasing from 4.2 to 5.8. Other waste collection services have the lowest employment-to-businesses rate of the core industry classes at 3.1, which has stayed more or less the same over the last 10 years.

Figure 4 Number of employees per business



Source: NZIER from Stats NZ (2024b)

2.2 Local authority income and expenditure on solid waste and refuse

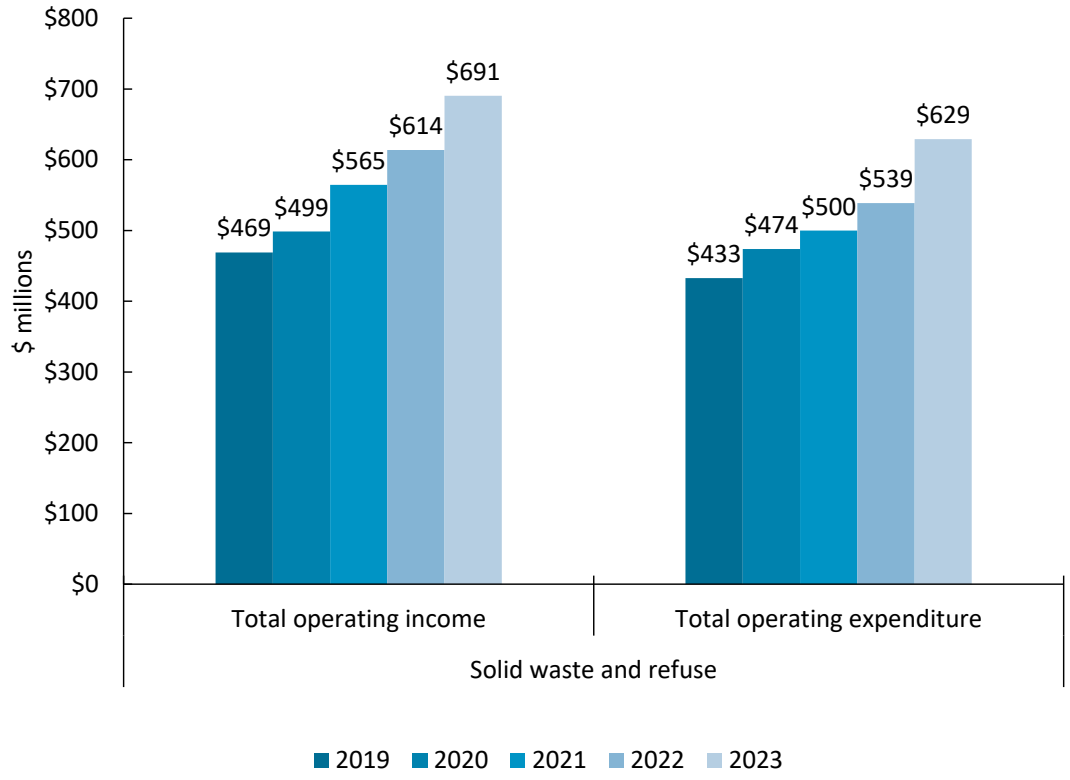
The waste, resource recovery and contaminated land management sectors comprise more than just the core industry and classes listed in the previous section. Other industries and entities also contribute to the sectors' activities. This includes the solid waste and refuse activity of local councils, as well as the associated costs, as shown in Figure 5.

The Stats NZ local authority financial statistics classify various activities, with one being solid waste and refuse activity. This includes:

- collection and disposal – aftercare, landfill operations, street and roadside rubbish bins
- recycling collection and recovery – recycling centres, reusable materials depots, and roadside recycling.

In the last financial year, councils received $691 million and spent $629 million related to their solid waste and refuse activities. Operating income and expenditure for this activity grew 45–47 percent between 2019 and 2023. This is an expenditure increase of $196 million or an average of $49 million per year. The largest of which was in the most recent financial year, where total operating expenditure increased by $90 million.

Figure 5 Local authority solid waste and refuse operating income and expenditure, councils only, 2019–2023



Source: NZIER from Stats NZ (2024a)

The data does not split operating income by source. This means rates revenue, user charges revenue collected by councils, and levy allocations to councils cannot be separately identified within their respective allocations using the Stats NZ data that is readily available. However, regional allocations of the Waste Levy are available in a national dataset kept by the Ministry for the Environment (2025a).

The levy placed on each tonne of waste sent to landfills is collected from landfill operators. Fifty percent of the revenue raised by the levy is distributed to local authorities for waste minimisation activities. The amount distributed to local authorities increased over the last four financial years: $16.77 million in 2021, $25.98 million in 2022, $46.88 million in 2023, and $79.66 million in 2024. This represents growing waste disposal costs, which are then reinvested into reducing waste.

Table 4 lists the total operating income and expenditure across council activities for the 2019 and 2023 years for all councils. Despite the large increases in the last few years, the share of total council operating income derived from solid waste and refuse activities has increased by one percentage point (4.7–5.6 percent), while the share of total council operating expenditure remained about the same at 4.5–4.6 percent. Expenditure on solid waste and refuse has also overtaken the spend on culture as the ninth highest activity spend, up from tenth in 2019.

Table 4 Total operating income and expenditure by council activity, 2019 and 2023

Councils only. $ millions.

Council activity	Total operating income		Total operating expenditure	
	2019	2023	2019	2023
Community development	$220	$284	$243	$378
Culture	$439	$529	$471	$596
Economic development	$290	$283	$264	$280
Emergency management	$53	$115	$38	$92
Environmental protection	$380	$564	$355	$536
Governance	$331	$439	$228	$432
Planning and regulation	$858	$1,224	$782	$1,155
Property	$403	$453	$508	$682
Recreation and sport	$1,185	$1,465	$1,005	$1,177
Roading	$1,294	$1,676	$1,271	$1,887
Solid waste/refuse	**$469**	**$691**	**$433**	**$629**
Transportation	$927	$1,184	$868	$1,150
Wastewater	$980	$1,248	$949	$1,426
Water supply	$609	$796	$578	$876
Other activities	$1,573	$1,455	$1,708	$2,352
Total	**$10,012**	**$12,407**	**$9,701**	**$13,647**

Note: Reporting and definitions for some activities have changed between survey years. This appears to mainly impact council support services and other services activity classes. We have reconciled figures where possible.

Source: NZIER from Stats NZ (2024a)

Table 5 shows the breakdown of operating income and expenditure on solid waste and refuse activities for all councils combined. This is largely funded through rates, which made up 59 percent of council operating income for this activity in 2023. The income received for solid waste and refuse activities from rates has also increased by an annual average of 12 percent since 2019.

Sales and operating income comprise just over two-thirds of solid waste and refuse income for councils, but the proportion of total income from this source has decreased over the last five financial years, from 40 percent to 36 percent. This is because of greater increases in income from rates, grants, subsidies and donations over the period.

Most council expenditure on solid waste and refuse is on purchases and other operating income, at 88 percent of total operating expenditure in 2023. Expenditure on employee costs is the second-highest expenditure area at $36.7 million. However, the full scope of employee costs for this activity may not be included in the data due to how the costs are reported and aggregated by survey participants and Stats NZ. We have not assessed this or its impact on our estimates for this assessment.

Table 5 Total income and expenditure items for solid waste and refuse activities

Councils only. $ millions.

Solid waste and refuse	2019	2020	2021	2022	2023
Rates	$258.2	$292.4	$330.7	$364.5	$405.5
Sales and other operating income	$189.1	$191.1	$215.8	$231.2	$251.6
Current grants, subsidies, and donations income	$15.5	$12.2	$15.6	$15.7	$31.4
Regulatory income and petrol tax	$6.3	$2.9	$2.6	$2.5	$2.1
Total operating income	**$469.1**	**$498.6**	**$564.7**	**$613.9**	**$690.6**
Purchases and other operating expenditure	$374.6	$417.1	$434.8	$476.7	$553.9
Employee costs	$27.5	$28.8	$31.6	$31.2	$36.7
Current grants, subsidies, and donations expenditure	$1.5	$1.9	$1.9	$2.4	$3.1
Interest expenditure	$7.3	$4.7	$7.4	$4.5	$5.7
Depreciation and amortisation	$21.8	$21.4	$24.3	$24.0	$29.5
Total operating expenditure	**$432.6**	**$474.0**	**$500.0**	**$538.8**	**$629.0**

Source: NZIER from Stats NZ (2024a)

The local authority financial statistics show that councils across New Zealand primarily purchase goods and services from the waste, resource recovery and contaminated land management sectors to carry out their activities on behalf of their constituents. In the following sections, we factor this into our analysis, where we describe the economic flows across various parts of the economy, in terms of how industries supply these products as inputs for other industries and to the end consumer.

3 Inter-industry linkages

Inter-industry linkages are the market interactions across the economy. Industries purchase products from other industries and hire employees in order to supply their own products. The income workers receive is then used for their own consumption, resulting in further economic activity in those downstream industries.

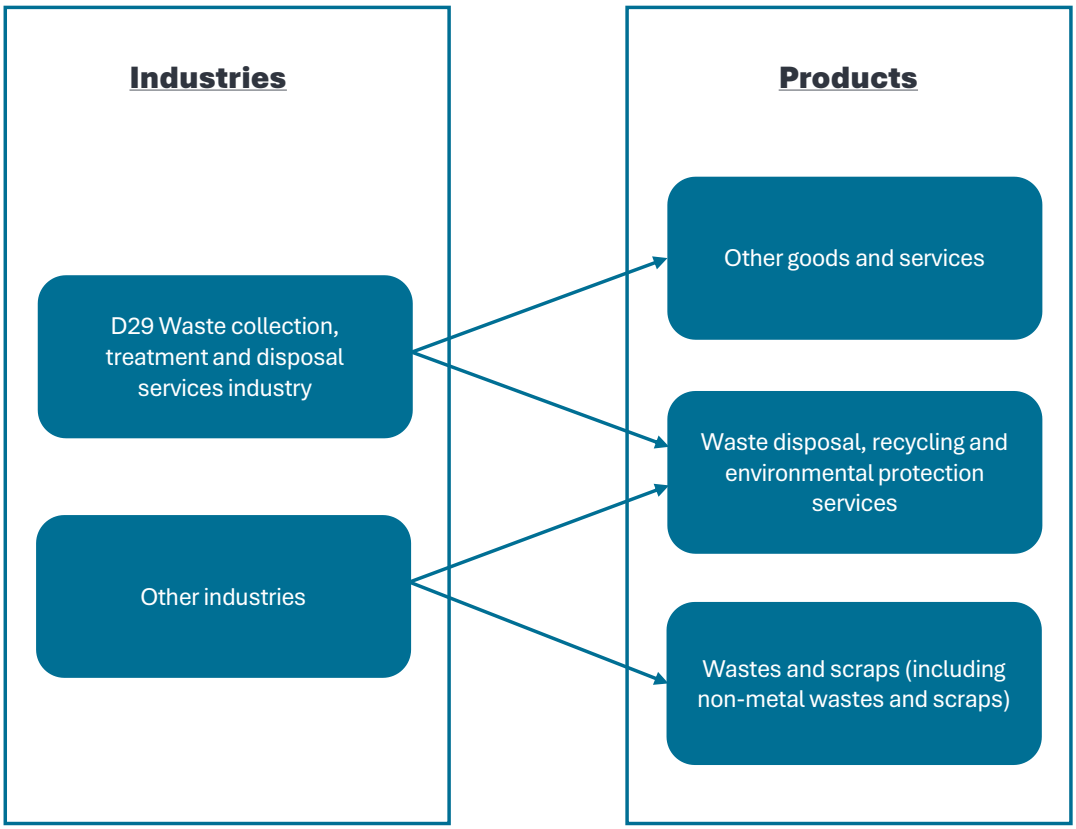
These linkages are important to assessing economic contribution because they show how industries supply and use products across each other. They also show how the associated economic activity flows on to stimulate further economic activity through the supply chain and household consumption.

This section describes the assessment of linkages between industries and products across the sectors. An important consideration for our assessment is that:

- an industry supplies and uses multiple products within the market, and
- multiple industries supply or use the same or similar products.

Our method combines both top-down and bottom-up approaches for a wider assessment. We also assess sector-related products supplied by the core industry and other industries, and waste materials products that are supplied by other industries. Figure 6 illustrates the relationship of the sectors across the economy.

Figure 6 Industry supply of products across the sectors



Source: NZIER

The information used for this part of the assessment is primarily the Stats NZ input-output tables for the year ended March 2020, released in December 2021. Stats NZ releases these tables every few years, with the prior release in April 2016 for the 2012/13 year and the next release expected sometime in 2026.[1]

3.1 Core industry – waste collection, treatment, and disposal services

We examine the products supplied and used by the core industry to better understand the market share of relevant products and the demand in upstream industries. The top five products supplied by the core industry are shown in Table 6. Also shown are the value of total supply of those products across the economy by all industries, and the proportion of total market supply by the core industry. The remaining percentages not shown are the supply values of that product by other industries. A full list of the products supplied and used by the core industry is included in Appendix A.

The core industry primarily supplies waste disposal, recycling and environmental services and is the main source of this product. In 2020, it supplied $2,138 million of the product, which made up 89 percent of the core industry's total supply and represented just over 90 percent of the product's total supply in that year. The core industry also supplies other products valued at $277 million. This includes 4.5 percent of the total supply of cleaning services and 7.6 percent of chemical, fertiliser minerals and salt products. The total output supplied by the industry is valued at $2,415 million in 2020.

Table 6 Top five products by value and other products supplied by the waste collection, treatment, and disposal services industry and total market supply

2020 total supply basic prices. $ millions.

Rank	Product	Core industry	Total all industries	Percentage of total supply by the core industry
1	Waste disposal, recycling, and environmental protection services	$2,138	$2,368	90.3%
2	Cleaning	$107	$2,369	4.5%
3	Electricity	$63	$15,682	0.4%
4	Other chemical products and man-made fibres, non-metal wastes and scraps	$54	$3,058	1.8%
5	Chemical, fertiliser minerals, and salt	$16	$210	7.6%
	Other products	$37	$679,012	0.0%
Total		**$2,415**	**$702,699**	**0.3%**

Source: NZIER from Stats NZ input-output tables

[1] https://www.stats.govt.nz/information-releases/national-accounts-input-output-tables-year-ended-march-2020/

The top five products used by the core industry in 2020 and the total use of these products across all industries are shown in Table 7. This also includes the proportion of the total use, across all parts of the economy, by the core industry. The core industry used $1,392 million worth of products, with the largest share of its use on waste disposal, recycling, and environmental protection services at $712 million. This represents 38 percent of the total use across all industries and 30 percent of the total market use of this product.

Additionally, 1.6 percent of the total market use of transport machinery and equipment maintenance services is by the core industry. The core industry also uses services to carry out its operations, such as maintenance of transport machinery and equipment, road transport freight services and non-residential building construction. For example, five percent of the core industry's total use across all products is spent on management consultancy services.

Table 7 Top five products by value and other products used by the waste collection, disposal and treatment services industry and total market use

2020 total supply basic prices. $ millions.

Rank	Product	Core industry	Total industry	Total market	Percentage of total market use by the core industry
1	Waste disposal, recycling, and environmental protection services	$712	$1,867	$2,368	30.1%
2	Maintenance of transport machinery and equipment	$115	$3,438	$7,052	1.6%
3	Road transport freight services	$68	$8,435	$8,553	0.8%
4	Management consultancy	$68	$10,361	$11,002	0.6%
5	Non-residential building construction	$50	$4,242	$10,720	0.5%
	Other products	$379	$290,431	$663,004	0.1%
Total basic use prices		**$1,392**	**$318,774**	**$702,699**	**0.2%**

Source: NZIER from Stats NZ input-output tables

3.2 Core products – waste disposal, recycling, and environmental protection services, and wastes and scraps

The scope is then expanded beyond just the products supplied and used by the core industry to examine how core sector-related products are used across the economy. This shows the breakdown of the supply and use of the core products across all industries and the market.

Supply of sector products

The core sector-related products included in our assessment are:

- waste disposal, recycling, and environmental protection services
- wastes and scraps.

A breakdown of the components of these products is included in Appendix A. Table 8 shows the top five industries that supply core sector products. As discussed earlier in our assessment, the core industry supplies the majority of waste disposal, recycling and environmental protection services. This product is also supplied by other industries such as road transport, local government and administration services, and scientific, architectural, and engineering services.

The core industry does not supply wastes and scraps products, the other core product included in our assessment. The largest supplier of wastes and scraps is the basic material wholesaling industry, supplying 80 percent of the domestic output in 2020. Domestic industries supplied $665 million of wastes and scraps to the market, with just over a quarter of the total $912 million supplied coming from imports.

Table 8 Supply of core products by top five and all other industries

Total basic supply. 2020 prices.

Rank	Industry	Supply ($ millions)
Waste disposal, recycling, and environmental protection services		
1	Waste collection, treatment, and disposal services	$2,138
2	Road transport	$59
3	Local government administration services	$43
4	Scientific, architectural, and engineering services	$41
5	Metal ore and non-metallic mineral mining and quarrying	$34
	All other industries	$53
Total domestic supply		**$2,368**
	Imports	$–
Total supply		**$2,368**
Wastes and scraps		
1	Basic material wholesaling	$533
2	Meat and meat product manufacturing	$94
3	Primary metal and metal product manufacturing	$17
4	Other manufacturing	$11
5	Machinery manufacturing	$5
	All other industries	$5
Total domestic supply		**$665**
	Imports	$247
Total supply		**$912**

Note: Excluding non-metal wastes and scraps.

Source: NZIER from Stats NZ input-output tables

It is important to note that wastes and scraps in this table do not include 'non-metal wastes and scraps' as Stats NZ has grouped this product with 'other chemical products and man-made fibres' in the 2019/20 input-output tables. Although we cannot fully disaggregate the industry supply and use of non-metal wastes and scraps across industries, we estimate that an additional $31 million of non-metal wastes and scraps is supplied by the basic material wholesaling industry by extrapolating from the 2012/13 input-output tables. This additional supply is then added to the total economic contribution estimates, which we detail in section 4 of this report.

Use of core products

Various parts of the economy use the core products. They are split between industries as inputs for their own production, exports to other countries and other sectors as final consumption.

As shown in Table 9, $2,368 million worth of waste disposal, recycling, and environmental protection services were used in the economy in 2020. Domestic industries used $1,867 million worth of this product, representing just over 79 percent of the total use. Final consumption by households and local government accounted for another 21 percent or $500 million worth. Although this is not the same exact figure as the local council expenditure on solid waste and refuse, it is broadly similar and reflects the composition of final consumption between local councils and households.

The use of wastes and scraps products by the top five industries and other economic sectors is shown in Table 10. Of the $912 million of wastes and scraps products used in 2020, just under half (47 percent) was by domestic industries, with the rest being exported overseas. Seventy percent ($305 million) of the domestic use of wastes and scraps products in 2020 was by the primary metal and metal product manufacturing industry. Basic material wholesaling was the second largest domestic user of wastes and scraps products at $82 million.

Table 9 Use of waste disposal, recycling, and environmental protection services by the top five and all other economic sectors

2020 basic prices

Rank	Sector/industry	Use ($ millions)
1	Waste collection, treatment, and disposal services	$712
2	Non-residential building construction	$160
3	Construction services	$132
4	Medical and other health care services	$121
5	Personal services; domestic household staff	$72
	All other industries	$670
Total industry use		**$1,867**
	Households	$234
	Non-profit institutes serving households	$1
	Central government	$–
	Local government	$266
Total final consumption expenditure		**$501**
	Exports	$–
Total use		**$2,368**

Source: NZIER from Stats NZ input-output tables

Table 10 Use of wastes and scraps by the top five and all other economic sectors

2020 prices. $ millions.

Rank	Sector/industry	Use ($ millions)
1	Primary metal and metal product manufacturing	$305
2	Basic material wholesaling	$82
3	Basic chemical and basic polymer manufacturing	$18
4	Agriculture, forestry, and fishing support services	$12
5 (equal)	Non-metallic mineral product manufacturing	$6
	Poultry, deer, and other livestock farming	$6
	All other industries	$4
Total industry use		**$433**
	Households	$–
	Non-profit institutes serving households	$–
	Central government	$–
	Local government	$–
Total final consumption expenditure		**$–**
	Exports	$480
Total use		**$912**

Note: Wastes and scraps exclude non-metal wastes and scraps.

Source: NZIER from Stats NZ input-output tables

4 The economic contribution of the sectors

This section describes the economic contribution of the sectors based on the breakdown of the core industries and products that make up the sectors in the previous section. To do this, we combine the direct output of the core industry and products to determine the economic contribution of the sectors. These figures represent domestic production or output only, as imports are a leakage out of the New Zealand economy. The indirect and induced effects of direct output are only shown for the core industry. This is to avoid any double-counting issues arising from combining these flow-on effects across multiple industries.

In total, the sectors' direct output in 2020 was $3,342 million. This is comprised of:

- $2,415 million by the waste collection, treatment, and disposal services industry, split across core sector-related and other products
  - $2,138 million of waste disposal, recycling, and environmental protection services
  - $277 million of other products
- an additional $230 million of waste disposal, recycling, and environmental protection services supplied by other industries
- $665 million of wastes and scraps, and $31 million of non-metal wastes and scraps.

4.1 Economic contributions and flow-on effects

Multipliers generated from the Stats NZ input-output tables for the year ended March 2020 were used to determine the direct, indirect and induced contributions of the core industry's output through the economy. The multipliers show the economic activity associated with an industry's output and are defined as:

- **Direct effects:** economic activity (output, gross value added, or employment) generated directly by an industry's production of sector products.
- **Indirect effects:** economic activity in upstream industries associated with supplying inputs to the core industry for its own production.
- **Induced effects:** economic activity resulting from household spending, through income generated by the direct and indirect effects.

The results from our assessment of the core industry's economic contribution are shown in Table 11. The core industry produced $2,415 million of direct output in 2020, which directly supported $998 million in gross value added and 7,190 jobs. This is linked to additional economic output of $2,445 million from indirect industry flows and $1,188 million from induced effects through household spending. The total effects of the core industry's output in 2020 include supporting $6,048 million in economic output, $2,715 million in gross value added, and 20,150 jobs across the New Zealand economy.

Table 11 Direct, indirect and induced effects of the waste collection, treatment, and disposal services industry

2020 prices.

Economic activity	Direct	Direct + indirect	Total (direct + indirect + induced)
Output ($ millions)	$2,415	$4,860	$6,048
Gross value added ($ millions)	$998	$2,085	$2,715
Employment (jobs)	7,190	15,660	20,150

Note: Employment figures differ in the input-output assessment from the business demography datasets due to variances in data classifications and methods.

Source: NZIER

Our assessment shows that $1 of the core industry's direct output supports between $2 and $2.50 of gross economic activity. It is important to note that there is also likely to be additional economic flows between industries and sectors that are relevant to the sectors and are not captured in the figures we provide. For example, the construction sector regularly seeks advice from consultancies and professional services on reducing waste going to landfills and the associated costs.

These transactions fall within the scope of the sectors, but we cannot separate the proportion of this economic activity from the Stats NZ data. Our engagement with consultancies across the sectors suggests that sector-related services could make up 5–10 percent of their total revenue. However, given this industry's vast scope, we couldn't robustly apply this proxy to the estimates.

4.2 The relationship between consumption, waste and productivity

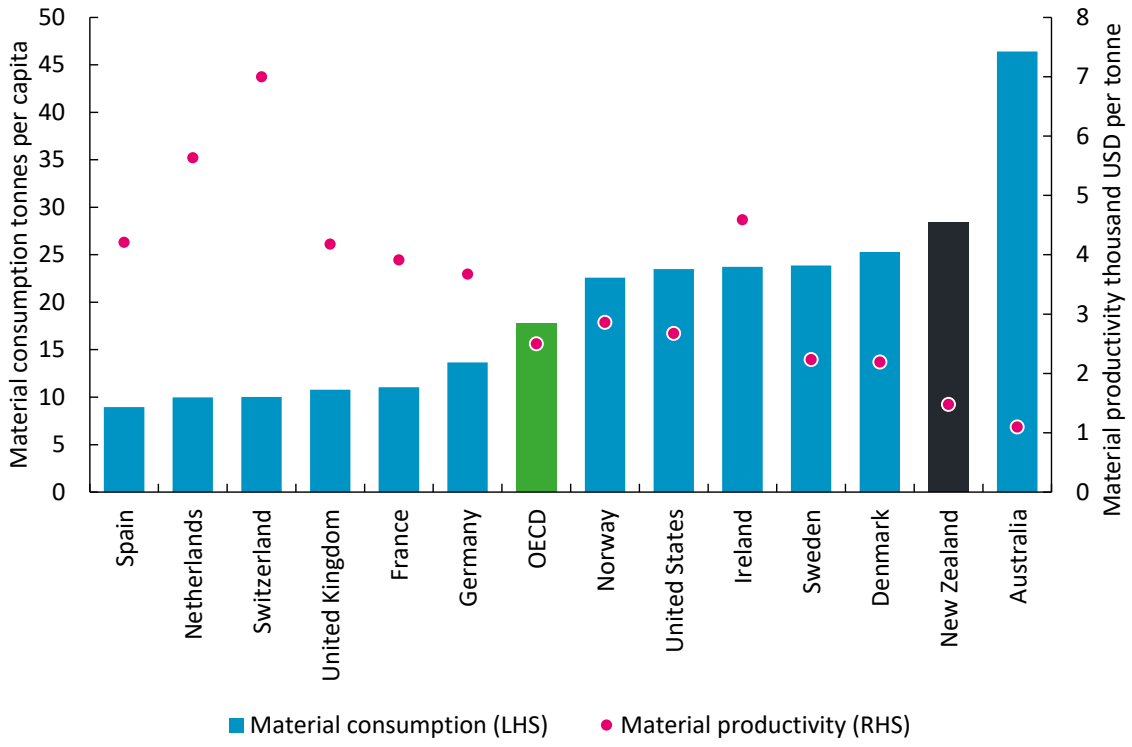
New Zealand ranks among the highest producers of waste and consumers of material per capita in the OECD (n.d.-a). In combination with relatively high amounts of waste being produced, New Zealand has some of the lowest material productivity among OECD countries, which highlights the need to get more out of the resources we use.

On average, New Zealand produced less per unit of input than other countries in 2022, at USD1,475 of economic output per tonne of domestic material consumed, which compares to the OECD average of USD2,502 per tonne.[2] High levels of waste generated are reflected in the above OECD average of domestic material consumption, with New Zealand consuming 28 tonnes of material per capita in 2022. The OECD defines domestic material consumption as the materials extracted or harvested in the country, plus materials and products imported, minus materials and products exported (OECD, n.d.-a).

[2] The OECD defines material productivity as; "*the amount of economic output or value added generated per unit of materials consumed. Economic output is based on GDP and materials consumed is the total amount of material directly used in an economy which is calculated as domestic material consumption.*"

Figure 7 Domestic material consumption and productivity

Calendar year 2022



Source: OECD (n.d.-b)

4.3 Caveats and limitations

There are limitations associated with using economic multipliers to estimate economic contributions. As mentioned earlier in this section, there is potential for double-counting of flow-on economic activities across multiple industries when estimating these effects. As the input-output tables stand, we cannot account for the potential of double-counting in a robust manner. Therefore, we identify the value of the flow-on activities associated with just the core industry.

Input-output multipliers also tend to have general caveats that are additional to how we have applied them in our assessment. These are:

- Linear relationships – industry relationships between industries are assumed to be linear, and firms always require the same quantity and mix of inputs to produce the same level of output.
- Displacement – changes in economic output in one industry potentially displace output in other industries that supply similar or the same products and compete for market share. This is usually unaccounted for in multiplier analysis.
- Price effects – prices are assumed to remain fixed, and the effects of suppliers raising or lowering prices in response to changes in demand are not considered.
- Supply constraints – resources (including labour and capital) are assumed to be available in unlimited quantities, and the resources used by one industry do not affect the resources available to other industries.

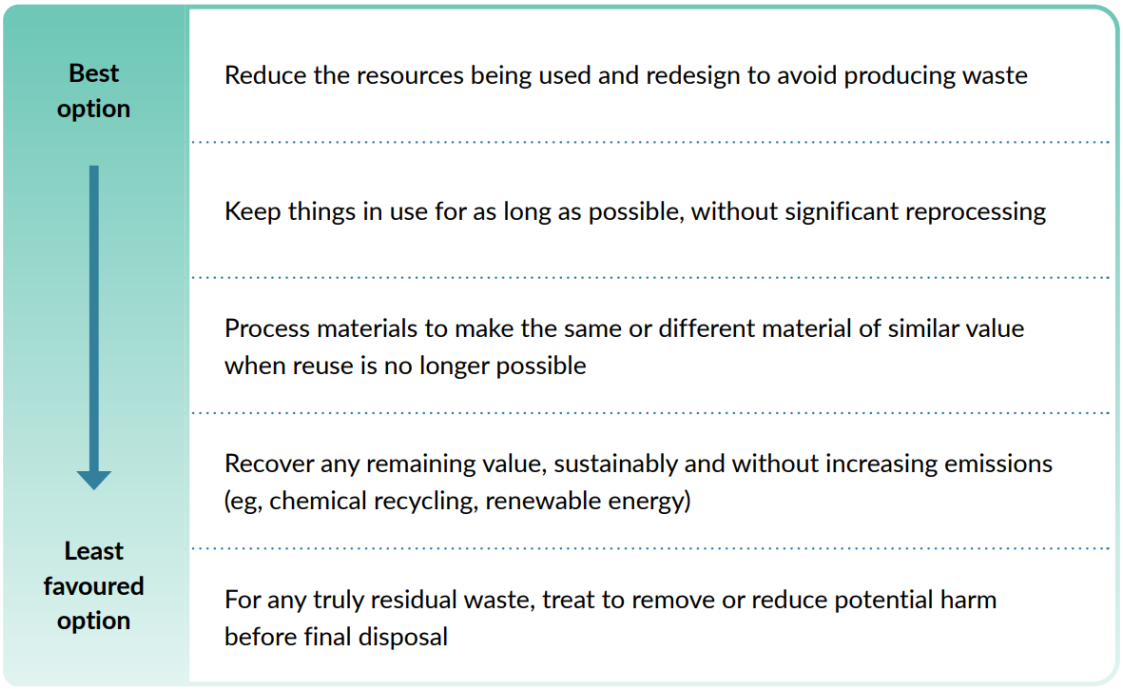
5 Beyond the economic data: broader economic impacts

In this section, we expand on our definition of economic value to also consider the various ways that the sectors underpin the wellbeing of New Zealand, other than just through market transactions. Counterintuitively, the more successful we are in reducing the amount of waste produced in New Zealand, the less transparent the economic value contributed by the sectors considered in this report.

The waste hierarchy framework affirms that the best option is to start by reducing or being more productive with resource inputs, which reduces the volume of waste being produced. Processing and recovering materials come just before disposing of waste, which is the least favoured option (Ministry for the Environment 2023a).

Building out a more comprehensive picture of the different ways that the sectors impact the wellbeing of New Zealand, both positively and negatively, contributes to a better understanding of challenges and opportunities across the sectors and how they operate.

Figure 8 The waste hierarchy



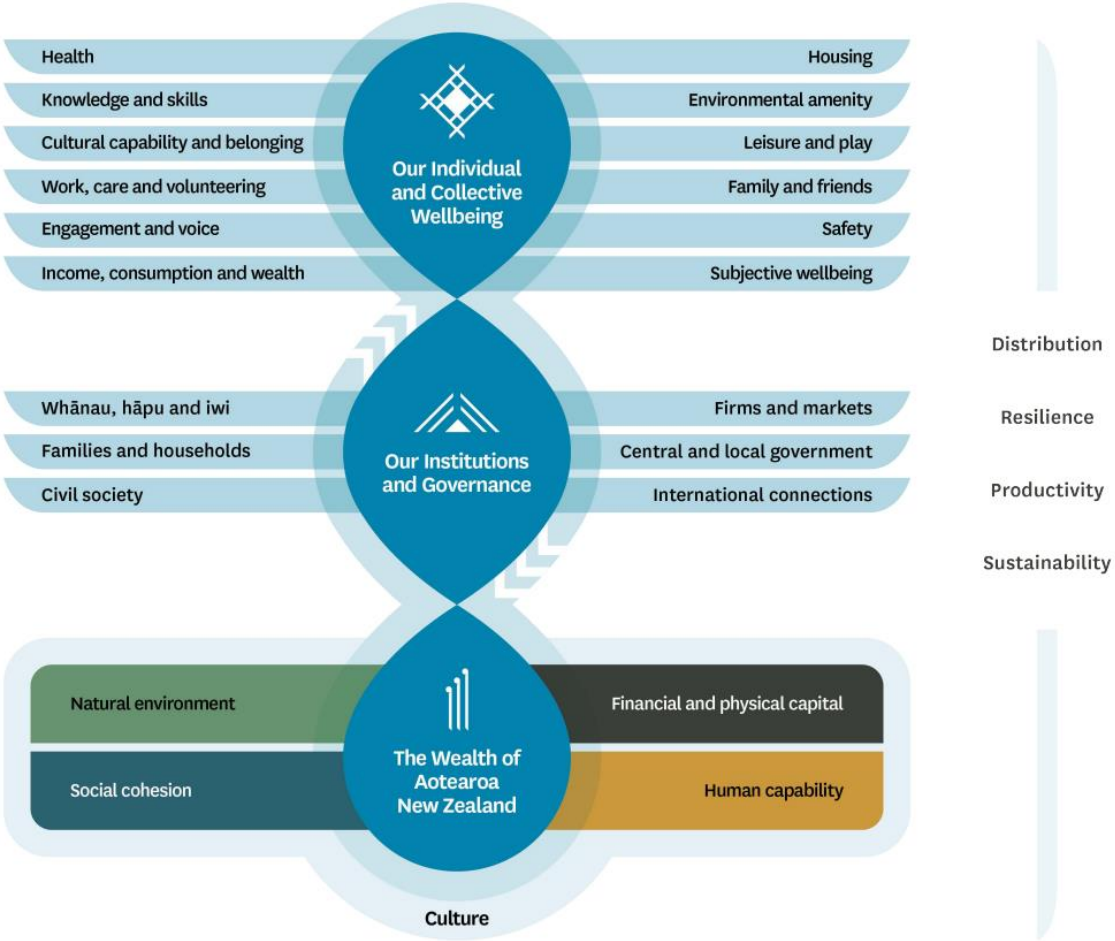
Source: Ministry for the Environment (2025)

5.1 How the sectors impact wellbeing

To capture a complete picture of the economic impact of the waste, resource recovery and contaminated land sectors, we have researched non-market values such as environmental benefits, avoided costs and social outcomes. Due to the scarcity of robust data and reporting in these sectors, we will focus on the impacts that can be confidently identified, quantified or monetised.

The Treasury living standards framework provides the basis for organising and communicating the various impacts across the sectors. The framework consists of a range of wellbeing domains groups across three levels: our individual and collective wellbeing, our institutions and governance, and the wealth of Aotearoa New Zealand. The various impacts can contribute to more than one domain within a level and multiple levels, depending on the issues being investigated (The Treasury 2021).

Figure 9 The living standards framework



Source: The Treasury (2021)

For this report, we focus on the first level – our individual and collective wellbeing. We summarise our findings on how the waste, resource recovery and contaminated land management sectors impact wellbeing across the domains in Table 12. In the section below, we describe the identified impacts in greater detail and discuss the implications that the impacts have on our individual and collective wellbeing.

It is important to note that this is an inexhaustive list developed in collaboration with WasteMINZ based on the scope and timeframes of our assessment. There will, no doubt, be a range of additional factors and impacts across multiple domains that could be added to our list presented in this report. Our assessment, therefore, represents a starting point that future research and analysis can build upon to develop a more complete picture of the size, scale and type of impacts that can be attributed to the sectors.

Table 12 Summary of broader economic impacts by living standards domain

Living standards domain	Impact
Work, care and volunteering	The sectors employ people to supply sector-related goods and services to various parts of the economy.
Engagement and voice	Community-based organisations utilise volunteers across the sectors' activities.
Environmental amenity	Waste sent to landfills produces greenhouse gas emissions, and efforts to reduce or divert waste sent to landfills have decreased the sectors' total emissions in recent years.
	More can be done to reduce waste emissions as around 40 percent of the waste sent to landfills is potentially divertible.
Income, consumption and wealth	New Zealand uses more resources per capita, with lower average productivity gained from materials than other countries.
	Around 60 percent of domestic kerbside waste is avoidable. Wasted food is estimated to cost the average household $1,326–1,516 per year.
	Illegal dumping of waste costs local councils and ratepayers millions of dollars each year to clean up.
Health	Open burning of waste pollutes the air, which negatively impacts people's health and leads to poorer social outcomes.

Source: NZIER

5.2 Assessing the broader economic considerations across the sectors

Private and emissions costs of waste sent to landfill

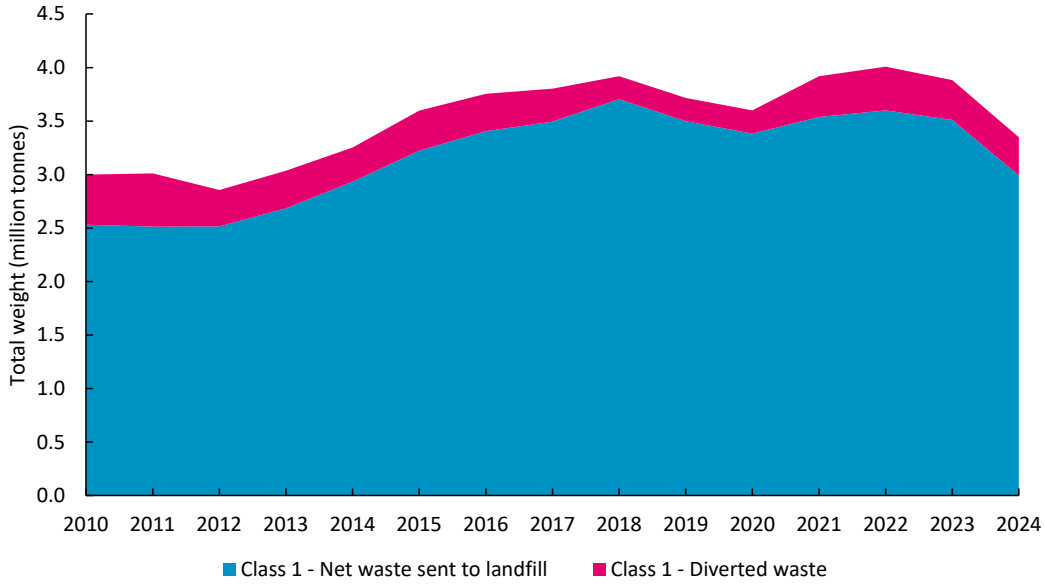
Waste sent to landfills has increased over the years, and so have our diversion efforts

Figure 10 shows the material handled by class 1 landfills in New Zealand from 2010 to 2024. In 2024, class 1 facilities handled a total of 3.35 million tonnes of materials, of which 0.35 million tonnes (11 percent) were diverted from landfills. The growth of volume of material being sent to these facilities has trended upwards over the last 15 years, reaching a peak of 4.0 million tonnes in 2022, and has been declining over the last 2 years. In 2024, this volume was the lowest it has been since 2014.

When looking at class 1–4 landfills, a total of 7.1 million tonnes of material was handled in 2024. Class 1 landfills contributed 47 percent of the total material sent to landfills, with classes 2 and 3–4 handling 9 and 44 percent, respectively. These landfills also had higher diversion rates at 17 percent for class 2 and 39 percent for class 3–4 than class 1 facilities. In total, around 1.7 million tonnes of material were diverted, and the remaining 5.4 million tonnes went to landfill. The proportion of materials being diverted has increased each year since 2018, now at an all-time high of 24 percent of total material handled by waste facilities.

Figure 10 Material handled by class 1 landfills

Million tonnes



Source: Ministry for the Environment (2023b)

This contributes to reducing the volume of emissions generated

Waste facilities have consistently improved their management of emissions from landfill operations. In 2022, approximately 3.1 million tonnes of CO_2 equivalent emissions were emitted across the waste sector, with methane comprising 96 percent of total emissions. As of 2022, this contributed 4.5 percent of New Zealand's total greenhouse gas emissions and 8.5 percent of methane emissions (Ministry for the Environment 2024).

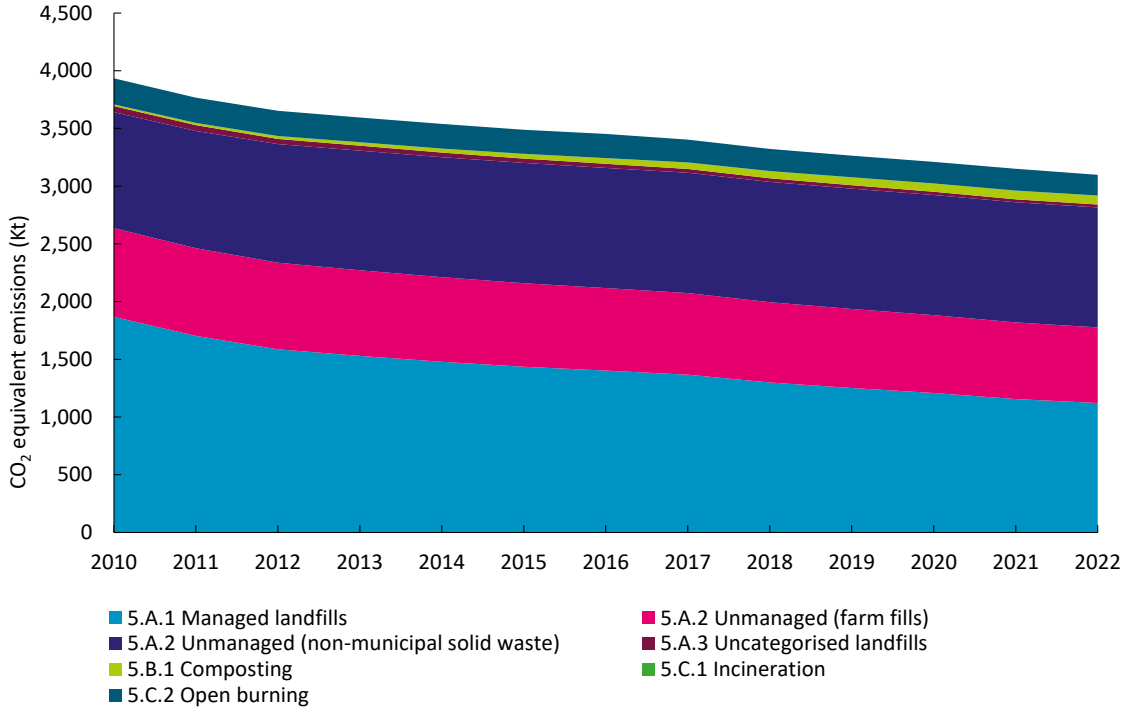
Figure 11 shows the composition of the waste sector emissions by source for the 2010–2022 period. This includes:

- Solid waste disposal defined as managed landfills, unmanaged farm fill and non-municipal solid waste, and other uncategorised landfills
- Biological treatment of solid waste through composting
- Incineration and open burning of waste.

Emissions are shown as CO_2 equivalent figures and comprise the three main greenhouse gas emissions produced by the waste sector from 2010 to 2022 across: methane (CH_4), carbon dioxide (CO_2) and nitrous oxide (N_2O).[3] Emissions from managed landfills decreased over the period by an average of 4.2 percent per year, and in 2022, waste sent to managed landfills produced similar volumes of emissions as unmanaged non-municipal solid waste. Emissions from the incineration of waste also decreased by an annual average of 1.9 percent over the period due to reductions in emissions from the open burning of waste. On the other hand, emissions from waste composting increased by an average of 16.3 percent per year, having grown to 2 percent of total waste sector emissions in 2022.

Figure 11 Waste sector greenhouse gas emissions by source

Calendar years. CO_2 equivalent.



Source: Ministry for the Environment (2023b)

Diverting waste reduces the private and emissions costs from waste disposal

The waste management and resource recovery sector has implemented practices to divert materials away from landfills. This decreases sector emissions and reduces the associated costs. Table 13 outlines the private cost per tonne of waste sent to landfill by material classification. Whereas Table 14 shows the emissions costs related to the waste sector.[4] We source these values from the Treasury CBAx tool (2024b), which provides more detail on the sources of the figures and how they have been generated.

[3] The following estimates do not include emissions from wastewater treatment and discharge, as this is outside the scope of this research.

[4] This is defined by the Treasury as representing *"the 'shadow' price of emissions as the potential incurred (or avoided) marginal abatement cost of reducing or removing (or avoiding the need to reduce or remove) an additional tonne of carbon-equivalent as a result of additional emissions (or reductions or removals) anticipated to occur as a result of an initiative"* (The Treasury 2024a).

In 2024, just under a quarter of the total volume of waste was diverted from landfills. Applying the respective per tonne disposal costs identified suggests that diverting material from landfills avoided $108.1 million in private costs. This figure, however, doesn't account for other costs associated with managing these materials in other ways, like transport, processing or sales costs.

The highest diversion rate was for class 3 and class 4 facilities at 39 percent, compared with the diversion of 11 percent and 17 percent of waste to class 1 and class 2 facilities, respectively. Class 3 and class 4 facilities also contributed the highest avoided costs at $52 million in 2024. On the other hand, class 1 facilities represent over half the net tonnage of waste to landfill (55 percent) and almost 80 percent of the associated total private costs.

Table 13 Avoided and private costs of waste by classification through diversion

Calendar year 2024.

Waste facility classification	Cost per tonne	Net tonnage of waste sent to landfill	Tonnes of waste diverted	Total net disposal costs ($ millions)	Avoided costs ($ millions)
Municipal landfill (class 1)	$139	2,992,887	355,358	$416.0	$49.4
C&D fill (class 2)	$63	500,420	105,982	$31.3	$6.7
Managed fill (class 3 and class 4)	$43	1,906,800	1,210,396	$81.0	$52.0
Total	**–**	**5,400,108**	**1,671,736**	**$528.3**	**$108.1**

Notes:

1 C&D = construction and demolition.

2 Figures may not sum due to rounding.

Source: NZIER from the Ministry for the Environment (2023b) and Treasury (2024a).

Waste sent to landfills produces greenhouse gas emissions, which must be mitigated or offset for New Zealand to reach our climate targets. Across the waste sector, over three million tonnes of CO_2 equivalent emissions were produced. The future abatement cost for these emissions in just one year is estimated to be between $319.7 and $642.6 million, with a central price estimate of $481.1 million.[5]

It should be noted that the emissions costs are based on the government's shadow emissions values, which are different from the costs incurred by businesses under the Emissions Trading Scheme (ETS). ETS costs associated with waste sector emissions are likely to be different based on a range of factors, including the type of waste and geographic location. However, the information required to derive more precise estimates was unavailable at the time of writing this report.

[5] Data on the emissions from the waste sector is not available for the 2023 and 2024 years at the time of writing this report. Therefore, we apply the respective shadow emissions prices to the most recent data for 2022.

Table 14 Emissions costs from the waste sector by shadow value price path

Emissions from calendar year 2022. Not including domestic and industrial wastewater.

Shadow emissions value (present–2030)	Cost per tonne ($)	Waste sector emissions (tonnes CO_2-e)	Total cost ($ millions)
Lower price path	$103	3,097,697	$319.7
Central price path	$155		$481.1
Higher price path	$207		$642.6

Figures may not sum due to rounding.

Source: NZIER from the Ministry for the Environment (2023b) and Treasury (2024a).

The convenience of sending material to landfills for households and businesses shifts the associated costs to other parts of the economy and society

Around 40 percent of the waste sent to class 1 landfills is considered divertible, which would reduce around 50 percent of associated emissions (Eve et al. 2022; The Treasury 2024a; Christchurch City Council 2020). This means that, in 2022, 1.6 million tonnes of waste and 561 kilo-tonnes of CO_2 equivalent emissions could have been avoided with greater efforts to minimise the amount of waste produced.

It should be noted that these figures are based on waste audits that may possibly overstate the true potential for certain waste to be diverted. While sending material to landfill may be the least costly option from the point of view of individual households and businesses, minimising this waste could result in avoided disposal costs of $222.8 million and $83.6 million in future abatement costs to New Zealand, using 2024 prices, indicating that private incentives are not aligned to optimal societal outcomes.

Impacts of suboptimal waste practices

In addition to the direct effects of the sectors' activities and interactions with other parts of the economy, there is a range of costs and externalities associated with suboptimal waste practices that may not be readily visible. This includes avoidable household food waste, illegal dumping, and air pollution from the open burning of waste.

Costs to households

As discussed in section 2 of this report, local council income and expenditure on solid waste and refuse activities have increased at an average annual rate of 10.2 percent and 9.8 percent, respectively, between 2019 and 2023. Rates are the main source of income for this activity, at 59 percent of the total solid waste and refuse income in 2022. Additionally, more of the total rates have been going to this activity. Rates income attributed to solid waste and refuse activity increased from 4.2 percent to 5.1 percent of the total rates income across all activities for the 2019–2023 period. This also coincides with increases in general costs associated with managing waste and the Waste Levy.

Council waste assessments propose that households and individuals could potentially divert up to 57–70 percent of kerbside waste away from landfills (Eunomia Research & Consulting Ltd 2023; Eve et al. 2022). The largest share of household kerbside waste is comprised of organic waste at around 55 percent of the total weight, with half to two-thirds of organic waste comprised of food or kitchen waste (Eunomia Research & Consulting Ltd 2023; Eve et al. 2022; Auckland Council 2023). Wasted food represents a significant cost to households that can be avoided. Recent estimates place the value of wasted food in New Zealand at around $1,326–1,516 per household per year (Kantar 2023; 2024).

Illegal dumping

Managing illegal dumping is another critical role of operators in the waste industry that is often overlooked. Auckland Council picks up, on average, 1,632 tonnes of illegal waste each year, which costs ratepayers $2.6 million annually (Auckland Council 2023). This represents 1.8 percent of the total operating expenditure of Auckland Council's solid waste and refuse operations in 2023. Reports from other regions indicate that the costs for councils to dispose of the illegal waste dumped range between $120,000 and $250,000 per year (Dinsadale 2025). Although other regions spend comparatively less on cleaning up illegal dumping, this still represents a cost burden to councils that could be avoided.

Health impacts from suboptimal waste management practices

Air pollution has been identified to cause a range of adverse social outcomes, including premature mortality, hospitalisations and restricted activity days across New Zealand. Human sources of air pollution include wood and coal fires for home heating, motor vehicles, industrial production, and open burning of waste. Open burning in this context refers to burning combustible material outdoors, such as household rubbish, garden clippings and agricultural waste (EHINZ, n.d.).

Although there is no available comprehensive dataset on the contribution of open burning of waste to air pollution and health impacts, Kuschel et al. (2022) assessed that the open burning of waste contributed up to 12 percent, with a median of seven percent, to total particulate matter exposure from domestic fires, including home heating, across several urban areas.

Intrinsic values associated with waste, resource recovery and contaminated land management

Volunteerism

Volunteering has been assessed to be associated with gains in wellbeing outcomes through increases in life satisfaction (Smith and Davies 2020). Community-based organisations such as the Zero Waste Network provide avenues for volunteerism across the waste sector. In 2024, the Zero Waste Network reported that volunteers made up almost 10 times the number of employees, with 10,400 volunteers across their impact ecosystem (Zero Waste Network New Zealand 2024). The extent of volunteering demonstrates the value that communities place on addressing waste, across all parts, from minimisation to management.

6 Conclusion and recommendations for future research

6.1 Summary of our findings

This report provides a baseline for the waste, resource recovery and contaminated land management sectors

As a country, we generate larger amounts of waste per capita and consume more materials per capita than other countries. This means that New Zealand's use of materials is also less productive than other countries, at around 60 percent of the average productivity achieved across the OECD. The volumes of waste produced from our consumption of material, which is then sent to landfills, result in private costs.

An estimated $3,340 million worth of direct output is produced each year across sector-related industries and products. Almost three-quarters of this comes from the core waste collection, treatment, and disposal services industry, valued at $2,415 million in 2020. Including flow-on economic impacts, such as businesses supplying to the sectors and additional spending by workers and households, the core industry's direct output supports a total of $6,048 million in output and $2,715 million in gross value added and 20,150 jobs.

The full scope of the sectors' economic contribution is broader than what is readily identified and monetised

There are also other ways that individuals benefit from the sectors through initiatives such as volunteering, which is unlikely to be included in core economic datasets. Therefore, it is important to show the broader ways the sectors generate value for the economy beyond just macroeconomic figures.

There are considerable ongoing efforts to reduce waste across the country, as set out by the government's waste and resource efficiency strategy (Ministry for the Environment 2025b). This includes reducing per capita waste disposal rates, increasing material reuse and recycling, minimising emissions from waste, and limiting environmental impacts. These efforts will potentially obscure the value the sectors generate, as reductions in the volume of waste to landfills are likely to result in decreased demand for waste disposal and treatment services.

Dealing with waste comes at a cost to the private sector, local councils and households

Although a quarter of the waste sent to landfills was diverted in 2024, the remaining waste cost an estimated $530 million to dispose of. Dealing with waste also contributed 4.5 percent of New Zealand's greenhouse gas emissions in 2022 (Ministry for the Environment 2024), with an estimated abatement cost of $481 million for New Zealand to reach its emissions targets.

Local council expenditure on waste has increased at an annual average rate of 10 percent from 2019 to 2023, with almost 60 percent of the income for solid waste and refuse activities funded through rates. With around 40 percent of all waste sent to class 1 landfills considered divertible, significant savings can be achieved across all parts of the economy. For households, the proportion of divertible kerbside waste collection is higher at between 57 and 70 percent. Wasted food alone is estimated to cost the average household between $1,326–1,516 every year (Kantar 2023; 2024).

Suboptimal waste practices lead to further negative impacts

Open waste burning pollutes the air, which can result in negative health outcomes. Although it is unclear exactly how much pollution comes from open burning of waste, exposure to pollutants from sources such as open burning has been associated with lung function and cardiac arrest, respiratory symptoms, restricted activity days, hospitalisation and premature mortality (Kuschel et al. 2022). Additionally, local councils spend millions of dollars each year cleaning up waste illegally dumped instead of being disposed of through the right pathways.

6.2 Where to from here?

The key challenge for the sectors is the continued ability to demonstrate the value generated from their efforts across the entire value chain. We expect the make-up of the sectors, as they are currently defined, to shift and change as New Zealand works to increase our productivity from the materials we use and reduce the amount of waste we produce.

There are many potential other facets of the sectors that are not readily apparent by looking at the economic data. For example, the construction industry employing internal resources or hiring consultants to advise them on ways to reduce their waste will not be transparently displayed through the national accounts datasets. One way that these issues have been addressed is through the development of satellite accounts.

Satellite accounts group similar activities across different industries to provide a clearer picture of specific areas of the economy. They offer additional insights into sectors while being consistent with the main national accounts. This approach helps in understanding the economic impact of activities that do not fit neatly into conventional industry categories (Stats NZ 2020). Satellite accounts for the waste sector have already been developed in countries like Australia (Australian Bureau of Statistics 2020).

These satellite accounts provide official measures of the expenditure on waste services, waste generation and waste intensity by industry. Better information enables tackling sector issues across the entire supply and value chain by focusing on key problem areas and allowing the value generated to be captured more broadly. Without concerted efforts from official sources, the sectors may seek to establish these datasets collaboratively by building on the established research currently available.

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Appendix A Supply and use breakdowns

A.1 Supply and use of products by the core industry and all industries

Table 15 Products supplied by the waste collection, treatment, and disposal services industry

2020 total supply in basic prices. $ millions.

Products supplied	Waste collection, treatment, and disposal services
Waste disposal, recycling, and environmental protection services	2,138
Cleaning	107
Electricity	63
Other chemical products and man-made fibres, non-metal wastes and scraps	54
Chemical, fertiliser minerals, and salt	16
Wholesale margin	10
Research and development	8
Equipment hire services	5
Sands, pebbles, gravel, clays, stone, and bitumen	4
General industrial machinery	4
Leased commercial property services	4
Motor vehicles, trailers, and semi-trailers; bodies (coachwork)	3
Superannuation and individual pension services	1

Source: NZIER from Stats NZ input-output tables

Table 16 Products used by the waste collection, treatment, and disposal services industry

2020 total use in basic prices. $ millions.

Products used	Waste collection, treatment, and disposal services
Waste disposal, recycling, and environmental protection services	712
Maintenance of transport machinery and equipment	115
Road transport freight services	68
Management consultancy	68
Non-residential building construction	50
Architectural and engineering services	42
Wholesale margin	31
Equipment hire services	27
Diesel	26

Products used	Waste collection, treatment, and disposal services
Leased commercial property services	25
Structural metal products and other fabricated metal products	22
Other insurance services	20
Paints	14
Advertising and marketing services	12
Other chemical products and man-made fibres, non-metal wastes and scraps	11
Motor vehicles, trailers, and semi-trailers; bodies (coachwork)	10
Telecommunications services	10
Legal services	10
Retail margin	9
Maintenance of other equipment	9
Accounting and taxation services	8
Cleaning	8
Petrol	7
Computers, parts, and office machinery	7
Other petroleum products	6
Basic chemicals; plaster and lime, other paper and paperboard products	6
Packaging products of plastics	6
Postal and courier services	6
Semi-manufactures of plastics	5
Electricity	5
Other support services	5
Publishing, printing, and reproduction services	4
Placement and supply of personnel	4
Investigation and security services	4
Financial intermediation services	3
Newspapers and journals	2
Other plastics products	2
Accommodation	2
Internet telecommunications services and online content	2
Other business services	2
IT technical consulting and support services	2
Rubber tyres and tubes	1
General industrial machinery	1
Games and toys	1
Air passenger transport	1

Products used	Waste collection, treatment, and disposal services
Freight transport agencies and other supporting transport services	1
Taxes on products	25
Compensation of employees	460
Operating surplus	301
Consumption of fixed capital	200
Other taxes on production	48
Subsidies	-11

Source: NZIER from Stats NZ input-output tables

A.2 Core products supply and use by industries

A.2.1 Wastes and scraps

Table 17 Supply of wastes and scraps products by industry

Total supply in basic prices. 2020 prices. $ millions.

Industry	Wastes and scraps
Basic material wholesaling	533
Meat and meat product manufacturing	94
Primary metal and metal product manufacturing	17
Other manufacturing	11
Machinery manufacturing	5
Fruit, oil, cereal, and other food product manufacturing	2
Non-metallic mineral product manufacturing	2
Fabricated metal product manufacturing	1
Repair and maintenance	1
Total industry	665
Imports	247

Source: NZIER from Stats NZ input-output tables

Table 18 Use of wastes and scraps by industry

2020 total use in basic prices. $ millions.

Industry	Wastes and scraps
Primary metal and metal product manufacturing	305
Basic material wholesaling	82
Basic chemical and basic polymer manufacturing	18
Agriculture, forestry, and fishing support services	12
Poultry, deer, and other livestock farming	6
Non-metallic mineral product manufacturing	6
Fabricated metal product manufacturing	2
Meat and meat product manufacturing	1
Other manufacturing	1
Repair and maintenance	1
Total industry	433
Final Consumption Expenditure - households	–
Final Consumption Expenditure - NPISH	–
Final Consumption Expenditure - local government	–
Sub-total final consumption expenditure	–
Exports	480

Source: NZIER from Stats NZ input-output tables

A.2.2 Waste disposal, recycling, and environmental protection services

Table 19 Supply of waste disposal, recycling, and environmental protection services products by industry

Total supply in basic prices. 2020 prices. $ millions

Industry	Waste disposal, recycling, and environmental protection services
Waste collection, treatment, and disposal services	2,138
Road transport	59
Local government administration services	43
Scientific, architectural, and engineering services	41
Metal ore and non-metallic mineral mining and quarrying	34
Sewerage and drainage services	29
Other transport	12
Coal mining	3
Pulp, paper, and converted paper product manufacturing	3
Rental and hiring services (except real estate)	3
Building cleaning, pest control, and other support services	2

Industry	Waste disposal, recycling, and environmental protection services
Advertising, market research, and management services	1
Total industry	2,368
Imports	–

Source: NZIER from Stats NZ input-output tables

Table 20 Use of waste disposal, recycling, and environmental protection services by the top five and all other economic sectors

2020 total use in basic prices. $ millions.

Industry	Waste disposal, recycling, and environmental protection services
Waste collection, treatment, and disposal services	712
Non-residential building construction	160
Construction services	132
Medical and other health care services	121
Personal services; domestic household staff	72
Public order, safety, and regulatory services	58
Residential building construction	50
Road transport	50
Hospitals	48
Petroleum and coal product manufacturing	34
Advertising, market research, and management services	32
Supermarket and grocery stores	31
Building cleaning, pest control, and other support services	30
Sport and recreation services	29
Gas and water supply	27
Wood product manufacturing	25
Banking and financing; financial asset investing	25
Residential care services and social assistance	24
Employment and other administrative services	23
Dairy product manufacturing	21
School education	20
Rental and hiring services (except real estate)	19
Food and beverage services	16
Other transport	13
Scientific, architectural, and engineering services	9
Metal ore and non-metallic mineral mining and quarrying	7
Motor vehicle wholesaling, including parts	7

Industry	Waste disposal, recycling, and environmental protection services
Pulp, paper, and converted paper product manufacturing	6
Veterinary and other professional services	6
Grocery, liquor, and tobacco product wholesaling	5
Tertiary education	5
Fruit, oil, cereal, and other food product manufacturing	4
Accommodation	3
Horticulture and fruit growing	2
Meat and meat product manufacturing	2
Textile and leather manufacturing	2
Pharmaceutical, cleaning, and other chemical manufacturing	2
Polymer product and rubber product manufacturing	2
Primary metal and metal product manufacturing	2
Transport equipment manufacturing	2
Sewerage and drainage services	2
Motor vehicle retailing, including parts	2
Transport support services	2
Preschool education	2
Forestry and logging	1
Fishing and aquaculture	1
Exploration and other mining support services	1
Seafood processing	1
Basic chemical and basic polymer manufacturing	1
Fertiliser and pesticide manufacturing	1
Fabricated metal product manufacturing	1
Electronic and electrical equipment manufacturing	1
Furniture manufacturing	1
Other manufacturing	1
Publishing (except internet and music publishing)	1
Non-residential property operation	1
Legal and accounting services	1
Local government administration services	1
Adult, community, and other education	1
Gambling activities	1
Total industry	1,867
Final Consumption Expenditure - households	234
Final Consumption Expenditure - NPISH	1

Industry	Waste disposal, recycling, and environmental protection services
Final Consumption Expenditure - local government	266
Sub-total final consumption expenditure	501
Exports	–

Source: NZIER from Stats NZ input-output tables

Appendix B Sector product definitions

Table 21 Breakdown of the core products across the sectors

Input-output table products, national accounts products, and central product classification.

Input-output	NA06CC	CPC
Waste disposal, recycling, and environmental protection services	552 Waste collection services	• 94211 Collection services of hazardous medical and other biohazardous waste • 94212 Collection services of industrial hazardous waste (except medical and other biohazardous waste) • 94219 Collection services of other hazardous waste • 94221 Collection services of non-hazardous recyclable materials, residential • 94229 Collection services of non-hazardous recyclable materials, other • 94231 General waste collection services, residential • 94239 General waste collection services, other
	553 Waste treatment and disposal services	• 94311 Hazardous waste preparation, consolidation and storage services • 94312 Ship-breaking and other dismantling of wrecks services • 94313 Non-hazardous recyclable materials preparation, consolidation and storage services • 94319 Other non-hazardous waste preparation, consolidation and storage services • 94321 Hazardous waste treatment services • 94322 Hazardous waste disposal services • 94331 Sanitary landfill services, non-hazardous waste • 94332 Other landfill services, non-hazardous waste • 94333 Incineration of non-hazardous waste • 94339 Other non-hazardous waste treatment and disposal services
	554 Recycling services	• 89410 Metal waste and scrap recovery (recycling) services, on a fee or contract basis • 89420 Non-metal waste and scrap recovery (recycling) services, on a fee or contract basis
	555 Environmental protection services	• 94411 Site remediation and clean-up services, air • 94412 Site remediation and clean-up services, surface water • 94413 Site remediation and clean-up services, soil and groundwater • 94420 Containment, control and monitoring services and other site remediation services nec • 94430 Building remediation services • 94490 Other remediation services nec • 94510 Sweeping and snow removal services • 94590 Other sanitation services • 94900 Other environmental protection services nec

Input-output	NA06CC	CPC
Wastes and scraps	381 Wastes from food and tobacco industry	• 39110 Raw offal, inedible (including pigs' bristles, horse hair, animal guts, bird skins, feathers, bones and ivory) • 39120 Bran and other residues from the working of cereals or legumes; vegetable materials and vegetable waste, vegetable residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding nec • 39130 Residues of starch manufacture and similar residues • 39140 Beet-pulp, bagasse and other waste of sugar manufacture • 39150 Cocoa shells, husks, skins and other cocoa waste; coffee husks and skins • 39160 Brewing or distilling dregs and waste • 39170 Wine lees; argol • 39180 Tobacco refuse
	383 Metal wastes or scraps; other non-ferrous metals; cermets and articles thereof	• 39310 Slag, dross, scalings and other waste from the manufacture of iron or steel • 39320 Ash and residue (except from the manufacture of iron or steel), containing metals or metallic compounds, except precious metals • 39331 Waste and scrap of gold or of metal clad with gold • 39332 Waste and scrap of precious metal (except gold) or of metal clad with precious metal (except gold) • 39333 Ash containing precious metal or precious metal compounds • 39340 Ferrous waste and scrap • 39350 Remelting scrap ingots of iron or steel • 39361 Waste and scrap of copper • 39362 Waste and scrap of nickel • 39363 Waste and scrap of aluminium • 39364 Waste and scrap of lead • 39365 Waste and scrap of zinc • 39366 Waste and scrap of tin • 39367 Waste and scrap of tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, beryllium and thallium • 39368 Waste and scrap of antimony and chromium • 39370 Vessels and other floating structures for breaking up • 39380 Waste and scrap of primary cells, primary batteries and electric accumulators; spent primary cells, primary batteries and electric accumulators • 41601 Tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, beryllium, gallium, hafnium, indium, niobium, rhenium and thallium, germanium and vanadium, unwrought, and powders thereof, except powders of magnesium; (cont) • 41602 Tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, beryllium, gallium, hafnium, indium, niobium, rhenium and thallium, germanium and vanadium, wrought, and articles thereof; powders of magnesium

Input-output	NA06CC	CPC
		• 41603 Bismuth, antimony, manganese, chromium and articles thereof; including waste and scrap of bismuth or manganese • 41604 Cermets and articles thereof
Other chemical products and man-made fibres, non-metal wastes and scraps	382 Non-metal wastes and scraps	• 39211 Silk waste • 39212 Waste of wool or of fine or coarse animal hair • 39213 Garnetted stock of wool or of fine or coarse animal hair • 39214 Cotton waste, except garnetted stock • 39215 Other cotton waste; garnetted stock • 39216 Waste of man-made fibres • 39217 Worn clothing and other worn textile articles • 39218 Rags, scrap twine, cordage, rope and cables and worn out articles of twine, cordage, rope or cables, of textile materials • 39220 Waste of leather, leather dust, powder and flour • 39230 Residual lyes from the manufacture of wood pulp, including lignin sulphonates, but excluding tall oil • 39240 Waste and scrap of paper or paperboard • 39250 Waste, parings and scrap of rubber (except hard rubber) and powders and granules obtained therefrom • 39260 Used pneumatic tyres of rubber • 39270 Waste, parings and scrap of plastics • 39280 Sawdust and wood waste and scrap • 39290 Other non-metal waste or scrap • 39910 Municipal waste • 39920 Sewage sludge • 39931 Pharmaceutical waste • 39939 Other clinical waste • 39940 Waste organic solvents • 39950 Wastes from chemical or allied industries • 39990 Other wastes nec

Source: Stats NZ