[CONFIDENTIALITY STATEMENT IF REQUIRED]

Waste levy review

An assessment of outcomes and recent performance of investment of the waste levy

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Glossary

Abbreviation	Stands for
BCR	Benefit Cost Ratio
CBA	Cost-benefit analysis
CAPEX	Capital expenditure
MfE	Ministry for the Environment
OPEX	Operational expenditure
PIF	Plastics Innovation Fund
PV	Present value
RfP	Request for proposals
TA	Territorial authority
VfM	Value for money
WMF	Waste Minimisation Fund

Executive summary

The purpose of this work is to provide expert advice to support the invitation for the Minister for the Environment to report back to Cabinet on the performance of central government spending of the waste levy. The research contained in this report is guided by three key objectives, which are:

- providing independent advice on how well the central government is performing in terms of outcomes, considering:
    - value for money (VfM) from use and investment of the central government portion of the levy through the waste funds, i.e. the Waste Minimisation Fund and the Plastics Innovation Fund
    - outputs and outcomes being achieved through the above—both qualitative and quantitative benefits
    - potential for outcomes to be achieved in the near future arising from recent investment decisions.
- examining whether there are situations in which investment of the levy may have the effect of crowding out or have a negative impact on private capital investment
- providing any practicable recommendations on how the performance of government investment of the levy could be improved.

Key findings

Our central estimate indicates society is worse off by $9.6M due to investments made via the waste levy fund from 2021

The table below shows the present value of benefits is around 7 per cent less than the present value of costs in funding and operating projects.

Table 1: Summary of central CBA estimates (PV, $M)

Effect	Value
Total benefits	$122.6
Total costs	$132.1
Net benefits	-$9.6
Benefit-cost ratio	0.93

However, we qualify this estimate with a few considerations:

- This is a rapid or lite CBA, which focuses only on the most significant and measurable costs and benefits
- Analysis was hampered by data quality and availability issues

- This part of the analysis only considered 50 per cent of total levy funding
- Simplifying assumptions were needed to estimate the operational expenditure (OPEX) required to operate funded projects (as such data are not routinely collected by the Ministry).

The caveats above mean we present a range of estimated impacts. While we are confident that the central estimate is sound (given available data) we have modelled two alternative scenarios based on the upper and lower bounds of our sensitivity testing.

Our upper estimate indicates society would be better off by $116M due to investments made via the waste levy fund from 2021

The table below shows the present value of benefits is around 94 per cent greater than the present value of costs.

Table 2: Summary of upper-bound CBA estimates (PV, $M)

Effect	Value
Total benefits	$239.2
Total costs	$123.1
Net benefits	$116.2
Benefit-cost ratio	1.94

Our lower estimate would see society worse off by $69.6M due to investments made via the waste levy fund from 2021

Table 3: Summary of lower-bound CBA estimates (PV, $M)

Effect	Value
Total benefits	$71.4
Total costs	$140.9
Net benefits	-$69.6
Benefit-cost ratio	0.51

The fund has delivered a series of benefits not included in our CBA model

Not all benefits are amenable to monetisation or inclusion in a CBA model. Waste levy funding has provided the following benefits not included in our CBA model:

Table 4: Benefits excluded from the CBA

Benefit	Description	Reason for exclusion

Gained knowledge from feasibility studies	Increased knowledge and understanding about waste management technologies and techniques	Benefits become tangible when knowledge and understanding is translated into projects that divert or prevent waste
Increased awareness	Increased public awareness of waste minimisation and disposal techniques	Limited impact on analysis. Only one education/awareness project was included in our tranche of projects
Warm glow effects	Emotional satisfaction from engaging in environmentally responsible behaviours	These effects are highly subjective and difficult to quantify
Social cohesion and community engagement	Positive social impacts that waste minimisation programmes can have by bringing communities together	Difficulty expressing this impact in monetary terms
Employment opportunities	FTE created by successful projects	Frequently a redistributive effect, which involves moving labour from one job to another

Ensuring the fund delivers value for money is manged in several ways

- Fund applicants providing a forecast of benefits arising from their projects.
- A focus on the cost per tonne of waste diverted.
- Successful applicants providing actual results against previous targets.
- Applications requesting more than $1M in funding required to provide a business case.

A strict value for money approach understates the importance of waste prevention technologies and innovations

A dollar per tonne of waste approach to VfM favours investment in infrastructure projects that divert various waste types from landfill. While infrastructure plays an important role in managing New Zealand's waste, it is generally not a solution for minimising waste production. Innovation and other projects which are comparably risky, but may prevent waste production, are often overlooked when considered through a VfM lens.

Crowding out has not been a widespread issue, but it could become one

Industry stakeholders are broadly of the view that crowding out due to waste levy funding has not been a widespread issue to date. However, some expressed concern as waste levy revenue grows, crowding out could become an issue. Our examination of project case files and funding data supports the view that crowding out has not been a widespread issue:

- $101.7M of the $141.3M invested by the fund has gone to commercial applicants.

- There is some overlap in the types of projects funded between commercial and council applicants, namely infrastructure and services.
- However, there are differences in the types of waste managed by council and commercial applicants.
- Community enterprises have received $18.9M of contestable levy funding for projects in areas where council and commercial applicants appear to have limited involvement.

Recommended actions

Based on the findings and conclusions we have reached throughout this report, we have developed a brief series of recommendations aimed at improving the overall performance of the levy.

- Value for money analysis on the territorial authority allocation
- Cost-benefit analysis of project applications seeking $1M or more
- Extended ex-post monitoring period for projects
- Consideration to alternative funding models, including loans and equity arrangements
- Increased focus on applicants' ability to deliver a projected result
- Increased appetite for innovation projects aimed at preventing waste from entering the system
- Long-term planning around New Zealand's waste management needs
- A shift away from project-by-project allocation of contestable funding

We also present an option for significant change

In addition to our other recommendations, which could be implemented within the current waste levy framework, we outline an option for large-scale change to how funding is distributed and where it is directed. The option includes:

- moving away from the project-by-project assessment approach towards a more direct and purposeful investment strategy
- focusing exclusively on waste prevention and infrastructure investments, thereby addressing two priority areas; (1) New Zealand's waste infrastructure deficit, and (2) preventing the creation of waste
- the use of lending and equity as alternative models to create a self-sustaining funding model, incentivise efficiency, reduce the risk of crowding out, and improve the value for money proposition for the public
- maintaining a TA allocation, while moving to a strategic and collaborative partnership between MfE and TAs to encourage TA spending of the allocation in a way that complements national priorities.

1. Purpose and approach

The Waste Minimisation Fund (WMF) is the primary fund for investing the government proportion of the waste disposal levy, along with the Plastics Innovation Fund (PIF). Monies for both funds have come from the same government appropriation. PIF is currently closed, and there is no expectation that it will reopen in the future. Instead, the Ministry for the Environment (MfE) intends to condense into a single fund, with multiple signals under the WMF.

Considering the levy expansion and significantly more levy money for investment before the WMF reopened in 2022, significant changes were made to fund management processes including the fund being open year-round with a focus on initiatives that make the greatest impact (reflected in an increase in the minimum grant size). Given the quantum of levy expected to be generated and managed, sizeable investments were also made in the levy expansion period by MfE in funds management processes, including a funds management system.

Investment in waste materials collection, sorting, and processing has increased through these funds. Waste disposal levy monies were also supplemented in recent years by investment in resource recovery infrastructure and enabling assets using monies from the COVID-19 Response and Recovery Fund (CRRF) and Climate Emergency Response Fund.

The Coalition Government has been establishing its priorities for the waste work programme and for waste levy investment alongside Budget 24 savings exercises. In doing so, Cabinet agreed to a substantial amendment to the Waste Management Act (2008) (WMA) to allow for broader use of levy funds for a wider range of environmental outcomes. The amendment, which came into effect on 1 July 2024, will also include further step increases to the levy over a three-year period, which will provide additional revenue for central and local government investment while also allowing for fiscal savings.

The purpose of this work is to provide expert advice to support the invitation for the Minister for the Environment to report back to Cabinet on the performance of central Government spending of the waste levy.

1.1 This report has three main objectives

Our report is guided by three key objectives, which are:

- providing independent advice on how well the central government is performing in terms of outcomes, considering:
    - value for money (VfM) from use and investment of the central government portion of the levy through the waste funds, i.e. the Waste Minimisation Fund and the Plastics Innovation Fund
    - outputs and outcomes being achieved through the above—both qualitative and quantitative benefits
    - potential for outcomes to be achieved in the near future arising from recent investment decisions.

- examining whether there are situations in which investment of the levy may have the effect of crowding out or have a negative impact on private capital investment
- providing any practicable recommendations on how the performance of government investment of the levy could be improved.

1.2 Our approach

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2. The structure and dynamics of the waste management sector

Here, we discuss the structure and dynamics of the waste management sector. This section has been informed by a combination of relevant literature and discussions with key industry stakeholders, including private sector representatives, TA representatives, and central government stakeholders.

2.1 Separate and distinct markets are a feature of the waste sector

While waste services can often be seen as homogenous in nature, in reality and more formally, distinct markets within the sector have been defined. Market definition is a key part of competition analysis and specifically, used as an initial step in Commerce Commission determinations on mergers and acquisitions. Market definition is helpful, as it is intended to reveal the effective constraints upon a firm's business behaviour.

In considering a proposed acquisition of waste assets and businesses in the South Island and Manawatu, the Commerce Commission determined that the relevant markets were:

- *local authority collection contract market* – local/regional markets for the provision of local authorities' contracts for public kerbside collection of solid non-hazardous waste
- *wheelie bin collection market* – local/regional markets for the provision of privately contracted collection of solid non-hazardous waste in wheelie bins
- *front-end loader collection market* – local/regional markets for the provision of privately contracted collection of solid non-hazardous waste in front-end-loaded bins from commercial customers
- *gantry collection market* – local/regional markets for the provision of privately contracted collection of solid non-hazardous waste by gantry and huka bins
- *refuse transfer station markets* – local markets for refuse transfer stations
- *landfill market* – regional markets for disposal of solid non-hazardous waste at landfills
- *national multi-regional customers waste management market* – the national market for the provision of waste management services to multiregional customers.

While the market definitions outlined above relate specifically to the circumstances of the application under consideration, they illustrate the importance of geography/location, the nature of the service provided, who provides the service, and waste type to the sector. In addition, there are other functional aspects that inform market structure and dynamics, such as treatment and processing, recycling, disposal, and a range of other specialist activities and services.

The factors above highlight that the waste sector is a highly complicated industry with many relevant dimensions. Nevertheless, some insights are possible, drawing on previous work.

2.2 Business numbers are falling; the sector appears relatively highly concentrated, but dispersed geographically

There are 120 waste treatment and disposal services businesses in New Zealand as of 2024. This compares to an estimated 180 such businesses in 2008. On average the number of businesses in the sector has declined by almost 2 per cent annually in the period 2019-2024. It is difficult to be precise about the prospects of further reduction in business numbers in the future, but we see no obvious reason why the recent downward trend would be reversed.

Two foreign-owned entities dominate the private companies in New Zealand's waste sector: Waste Management, which is owned by Igneo Infrastructure Partners (part of First Sentier Investors Holdings, headquartered in Sydney, Australia) and Enviro NZ (owned by CK Infrastructure Holdings Limited, a Chinese firm). A glance at the history of control of some waste entities indicates that there is a relatively high rate of ownership turnover, which suggests a dynamic environment, with profit potential (i.e. there does not appear to be instances of distressed companies needing to exit the market).

Publicly available data on market shares is limited, but using forecast 2025 revenue as a proxy, we estimate that those two firms could be responsible for around 53 per cent of the market. The next largest company appears to be Smart Environmental, a New Zealand-owned firm, that could be responsible for as much as 12 per cent of projected 2025 industry revenue.

Thus, notwithstanding the range of distinct definable markets outlined above, the sector is reasonably highly concentrated. A three-firm concentration ratio (CR3—which combines the market shares of the three biggest firms operating in the market—of 65 per cent is relatively high (i.e. the market is quite highly concentrated). On its own, such a concentration ratio would not give rise to competition concerns. Factors such as barriers to entry (e.g. economies of scale and scope), brand loyalty, product differentiation and geographical considerations can influence the degree of market concentration.

In assessing applications for mergers and acquisitions, the Commerce Commission uses a CR3 of 70 per cent as a first step in assessing the degree of competitiveness in a market, but considers other relevant market share metrics combined with the CR3 to determine if the merger or acquisition would give rise to competition concerns.

While overall the sector is quite highly concentrated, the nature of waste means that regional differences are highly likely. In bigger metropolitan areas such as Auckland, Wellington and Christchurch, there is likely to be far more competition than in more rural and less-populated areas. Of the 120 relevant businesses in the sector, Auckland (25), Canterbury (15) and Waikato (12) account for just over 43 per cent of businesses.[1] Having said that, the bigger firms do seem to operate quite widely. In the case of Enviro NZ, they have a dispersed network of locations, with 27 sites serving over 20 local councils and 500,000 customers.

[1] https://www.ibisworld.com/nz/number-of-businesses/waste-treatment-disposal-services/5024/

2.3 Contract structures influence competition and overall waste outcomes

The manner by which waste contracts are organised is thought to have a large effect on market structure and competition. Further, contracts focussed at a municipal level impact the ability to coordinate waste management across territorial boundaries and across different sources of waste.[2] This type of contract structure has advantages and disadvantages, summarised as follows:[3]

> If a single operator is responsible for all elements of the recycling service, they can make decisions on where resources are best directed to maximise recovery rates and value. This could include how materials are collected at kerbside, compaction rates, and contamination management, etc. Where specialist operators [to provide one or more services] are used, this can have advantages in terms of their expertise and focus on optimising their part of the service.
>
> However there need to be clear, enforceable, contractual standards relating to input contamination, compaction ratios, and operating procedures for the transfer of material between the collector and the Material Recovery Facility. The level of service integration also impacts where risk is allocated in the contracts.

We understand that longer-term contracts (i.e. 10 years or more) are a prominent feature of the market. In terms of waste processing, the length of contracts and the mixed nature of contracting (i.e. a mix of private and public sources of financial capital) could be seen as a barrier to entry for market participants and hinders cross-regional solutions, ergo making optimal outcomes from a national perspective difficult to achieve.[4]

[2] https://media.umbraco.io/te-waihanga-30-year-strategy/4zih23ph/sector-state-of-play-resource-recovery-and-waste.pdf

[3] Ministry for the Environment (2018) *National Resource Recovery Project - Situational Analysis Report*, p21.

[4] https://media.umbraco.io/te-waihanga-30-year-strategy/4zih23ph/sector-state-of-play-resource-recovery-and-waste.pdf

3. An overview of the Waste Minimisation Fund

In this section we provide a brief overview of the Waste Minimisation Fund (WMF) and highlight some of the significant changes the fund has undergone in recent years. This section is the result of our analysis of documentation provided for review by MfE.

3.1 WMF to boost New Zealand's performance in waste minimisation

The purpose of the WMF, as gazetted, is to boost New Zealand's performance in waste minimisation. There is considerable scope to reduce waste and increase the recovery of useful resources from waste.

> Lifting our performance in recovering economic value from waste also provides environmental, social and cultural benefits and reduces the risks of harm from waste. Achieving these objectives will require investment in infrastructure and systems for waste minimisation and developing educational and promotional capacity. The purpose of the fund is to provide *some* of the funding to ensure that this occurs.

The fund is targeted towards projects and initiatives that reduce or minimise waste, particularly around construction and demolition, organic waste, plastics, kerbside recyclables, and special products targeted in product stewardship schemes such as tires, e-waste and refrigerants.

3.1.1 The waste disposal levy

The waste disposal levy was initially charged at municipal landfills (Waste funds annual report, 2021), but has since been expanded and progressively increased to construction and demolition fills and managed or controlled fill facility fills. A breakdown of landfill classes and their relevant levies is outlined in The Waste Investment Strategy in 2023 and shown below:

Table 6: Waste disposal levy charges

Landfill class	1 July 2021	1 July 2022	1 July 2023	1 July 2024
Municipal landfill (class 1)	$20	$30	$50	$60
Construction and demolition fill (class 2)		$20	$20	$30
Managed or controlled fill facility (class 3 and 4)			$10	$10

Source: Ministry for the Environment

The government has also agreed to changes to allow further progressive increases to the levy until 2027 (Schedule 2 of the Waste Minimisation Regulations 2009), which will see levy rates increase to $75 (class 1), $45 (class 2), and $20 (classes 3 and 4).

Planned increases to the levy are projects to increase levy revenue from $109M in 2022/23 to around $250M in 2028/29.

Table 7: Projected levy revenue

2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29
$109m	$222m	$257m	$255m	$240m to $255m	$233m to $253m	$224m to $251m

Source: Ministry for the Environment

Under present settings, half of the funds received from the levy must be distributed to territorial authorities relative to their proportion, with the other half being available for government investments in funds such as the WMF, PIF and the CRRF, after covering the waste work programme budget, provision for emergency waste management and compliance and administration costs (BRF-4090). It is our understanding that the PIF is permanently closed with applications to reduce plastic waste being redirected through the WMF, while the CRRF budget closed in 2022.

3.2 Recent changes to the waste levy

3.2.1 Waste levy transformation project

The waste levy transformation project was conducted in anticipation of increased levy revenue. The key drivers of this project were the need to make a systemic and sustainable impact, a "lack of scalability" in the previous model, the desire to lift stakeholder experience, bringing in organisations who can contribute impact and scale, and the underrepresentation of Māori organisations.

An initial brief in 2022 suggested a transition from small projects towards large-scale projects due to the low impact and high proportion of administrative resources associated with small projects. The proposed investment model would move away from ad-hoc projects towards strategic programmes, to further focus on high impact projects and align the fund with key outcomes.

There remain a number of challenges associated with investment activity from the waste levy:

- It remains cheaper to dispose of some materials as waste to landfill, rather than recycle or process it, especially in areas where landfill costs are low, and where an alternative solution creates substantial transport costs.
- Council waste collection and disposal contracts are long-term, inhibiting new investment and the entry of new players and recovery opportunities.
- There is inadequate data to inform decision-making by central government, local government, and industry to measure the impact of investments.

3.2.2 An updated funding criteria

Restructuring of the fund saw changes in the eligibility criteria of projects that could receive funding, and a re-prioritisation of project types and waste streams. While the purpose of the fund remains the same, the new eligibility criteria aims to prioritise projects that have higher returns on investment with minimal risk. The criteria that form the fundamental purpose of the fund remains the same, in that:

- projects must promote or achieve waste minimisation
- the promotion or achievement of waste minimisation must be through a new initiative or a significant expansion in the scope of existing activities
- investments must not be for the ongoing support of existing activities or running costs of existing activities of any organisation
- projects must have a discrete timeframe, after which the project objectives will have been achieved, and if applicable to the project, self-funding
- funding can be for either operational and/or capital expenditure required to undertake a project.

Changes in the fund largely centre around the scale of the project, with greater emphasis on larger projects that are likelier to have a better 'bang-for-buck.' The differences in funding criteria before and after the 2022 changes are highlighted below:

Table 8: Key differences in funding criteria pre and post 2022

	Pre-2022	Post-2022
Minimum grants	$10,000 for feasibility or scoping studies $50,000 for all other projects	$50,000 for research and development, business cases or innovation projects $150,000 for all other project types
Maximum grants	$500,000, with potential for exceptions	None, more focus on larger projects
Applier contribution to project	40% for large-scale organisations 5-20% for small organisations	Commercial projects may receive up to 50 per cent from the fund. Flexibility on a case-by-case basis. There is an expectation for contribution by the applier.

Source: Ministry for the Environment

3.2.3 Changes in project and waste stream priorities

BRF-4090 highlights the six key types of project categories MfE wishes to target, as these will address the waste issue at different levels on the waste hierarchy. They also outline the overall appetite for investing in these specific project categories, details of which are highlighted in Table 9.

Table 9: Funding priority

Project category	Scope	Funding prioritisation
Infrastructure	New or expanded resource recovery and processing facilities including materials recovery facilities (MRFs), transfer stations, onshore recycling/processing facilities	70 – 80%
Contaminated and valuable land	Sustainable management and remediation of contaminated land and sites vulnerable to the impacts of climate change	15 – 25%
Innovation	Developing new or expanding on existing technologies and approaches (for example, new options for treated timber or hard to recycle plastics)	5 – 10%
Community solutions	Community, charitable or sector initiatives that bring a collaborative approach to a key problem	5 – 10%
Education and behavioural change	Nationally driven and centrally supported programmes and delivered by regional or sector partners, e.g. better recycling or litter prevention programmes	5 – 10%
System design	Supporting the design of product stewardship or container return schemes	2 – 5%

Source: Ministry for the Environment

The fund also prioritises five key waste streams where there are supposedly higher returns on investment for diversion from landfill, environmental and health and wellbeing, public concern, and where is there is a strong case for "achievability" (BRF-4090):

- **Construction and demolition**: MfE have identified investment opportunity in sorting and processing facilities for materials recovery and consolidation. Some investment and expansion in construction and demolition resource recovery facilities has taken place in the past three years.
- **Organic waste**: a few partner organisations have been funded to deliver national-scale food waste reduction programmes across three categories: household, business and Māori. There has been recent investment in new innovative technologies, such as anaerobic digestion, with a number of medium to large scale opportunities currently under assessment.
- **Plastics from commercial sources and packaging**: MfE have identified high public interest and opportunities for better recycling and product design. Infrastructure and innovation are key investment categories to prevent, reduce or design out plastic waste.
- **Kerbside recyclables:** containers and packaging such as bottle glass, aluminium, plastics and fibre packaging. There are investment opportunities with onshore markets and processing options to increase circularity.
- **Special products:** product stewardship opportunities for products such as tyres, agrichemicals, and refrigerants. There is high public concern and potential for harm from these products.

The prioritisation strategy does not exclude funding opportunities for initiatives that address waste materials outside these groups such as textiles, or other waste issues like litter prevention, although significant value for money would have to be demonstrated.

4. Assessing value for money

In this section, we discuss our assessment of VfM from the central government portion of waste levy funding. The 50 per cent allocation to TAs is not in scope for this part of our research. This section contains a summary of results from, and approach to, the CBA. We also discuss more qualitative aspects of how value for money is assessed and managed.

4.1 Cost-benefit analysis

Here, we delineate our approach to conducting a CBA of the levy fund. It is important to note that for reasons of available data, resources, and time, this is a lite or rapid CBA. Our CBA monetises costs and benefits based on primacy and significance. Simply put, our CBA sheds a spotlight, and not a floodlight, on the question of value for money.

4.1.1 Our analysis period begins in 2021 and ends in 2032

We have elected to begin our analysis period for the CBA in 2021. This decision is based on the following:

- **Data limitations:** collected data on projects prior to 2021 is weak and has comparatively more gaps than those from 2021 onwards.
- **Changes to the levy:** the levy has undergone substantial change with the most significant occurring in 2021/22. Prior to 2021, the volume of funding available was far lower than post-2021. For example, maximum grants were previously to the value of $500,000,[5] which now have no set limit. Similarly, the minimum funding threshold increased over the same period from $50,000 to $150,000.[6]
- **Changes to funding prioritisation:** funding priorities have shifted. The levy is now targeted mainly at infrastructure projects (70 to 80 per cent of funding), moving the focus away from projects centred on innovation, community solutions, and education.

Our scoping of the analysis period means there are projects not included in the CBA. We examine those projects separately and comment on their costs and benefits in a qualitative way through a value for money lens.

4.1.2 Our analysis covers a concise tranche of funded projects

In concordance with our analysis period, we examine costs and benefits of successfully funded projects from the PIF 2021, PIF 2022, and WMF 2021 onwards. Seventy-one applications were successfully funded during this period. Project types include infrastructure (n=25), feasibility studies (n=17), services (n=12), innovation (n=8), community (n=4), data collection and analysis (n=2),

[5] With some exceptions for higher levels of funding.
[6] Feasibility studies excepted.

research and development (n=2), and education[7] (n=1). Benefits from feasibility studies, data collection, and research and development projects are realised when study findings are translated into projects that divert or prevent waste. As such, we do not attach any monetisable benefits to these projects.

4.1.3 The territorial authority portion of funding is not in scope

Half of the levy money goes to city and district councils (territorial authorities). The funds are used to spend on achieving their respective goals set out in their waste minimisation plans. As such, territorial authorities invest in similar waste reducing projects as those funded by MfE directly via the contestable fund. In this analysis, we do not have oversight of the projects funded by territorial authorities. We do not have access, or the resources to access, the spending of the waste levy by territorial authorities. Consequently, waste levy spending by territorial authorities is considered out-of-scope.

We acknowledge merit in further work that examines how and where territorial authorities spend their waste levy funds. Such work would enable a further analysis of crowding out at a local level, accounting for any market dynamics relevant to different jurisdictions. Our approach to that piece of work would broadly reflect this research at a territorial authority level, but with greater consideration for the nuanced landscape of waste markets across New Zealand.

4.1.4 We have estimated the OPEX for running funded projects due to a lack of available data

We note that waste levy funds are not intended to fund operational expenditure (OPEX) or the continued operation of existing projects. OPEX data, being the operational expenditure to run funded projects, is not collected by MfE. Nevertheless, these are costs to society and are relevant to our cost-benefit analysis. We have addressed the lack of OPEX data in the following ways:

- **Examining case studies:** MfE provided a sample of case studies where fund applicants delineated their forecast OPEX, should their project be funded. We use these cases to identify a range of CAPEX:OPEX ratios that we could broadly apply to our cost-benefit analysis.
- **Engagement with experts:** we discussed typical CAPEX:OPEX ratios, particularly for large waste infrastructure projects with a manager of a similar fund in South Australia. Through this discussion we obtained a conservative, mid-point, and upper estimate, of CAPEX: OPEX which we triangulated with our case study findings.

[7] The education project in our tranche aimed to conduct 45 wānanga over a three-year period to raise awareness about the disposal of nappies and other sanitary items. We recognise these wānanga may have led to increased recycling activities. However, we assess the scale of change to be minimal and, as such, have not included it in our analysis.

4.1.5 Taxonomy of costs and benefits

As this is a rapid or lite CBA, we focus exclusively on the costs and benefits we identify as being the most significant and monetisable. Not all benefits attributable to the fund are amenable to monetisation and inclusion in the CBA model. We describe these benefits in a qualitative way.

Table 10: Taxonomy of costs and benefits

Benefits	Key aspects	Accuracy	Assumptions
Waste diverted from landfill	Waste diverted away from landfill to other processing and recycling facilities Reducing the cost of landfilling	Current waste diversion volumes may not accurately reflect future trends	Waste diversion volumes remain the same once projects reach operating capacity
Avoided emissions	Avoided emissions resulting from the diversion of waste away from landfills	Current waste diversion volumes may not accurately reflect future trends Emissions factors may be revised in the future	Diverted waste would otherwise end up in landfills with Landfill Gas Recovery (LFGR).
Costs	**Key aspects**	**Accuracy**	**Assumptions**
Capital (CAPEX)	Investment from the WMF into funded projects	High: investment data provided by MfE	None
Operating (OPEX)	The costs of operating successfully funded projects	Low: data on these costs is not collected	Assumed annual OPEX as a proportion of CAPEX
Operating (OPEX)	Administration costs of assessing, funding, and maintaining projects	High: admin costs provided by MfE	None

Source: Sapere analysis

4.1.5.1 We assess cost and benefits relative to a counterfactual scenario where there is no WMF or comparable alternative

We acknowledge this counterfactual is not entirely realistic. We would anticipate that in lieu of investments from the waste levy fund, other entities such as charities and private businesses would continue to make funding available for waste management investments.

This counterfactual scenario has been utilised in our analysis for two main reasons: (1) tractability and (2) available time and resources. It is not feasible within the parameters of this lite CBA to model scenarios in which alternative funding for waste management projects becomes available from alternative sources. Such an approach would require a thorough project-by-project examination of

investments and discussions with project managers and co-funders to make determinations on the extent to which WMF investments would be supplanted by funding from alternate sources, and what those sources might be.

4.1.5.2 We factor optimism bias into our assessment of benefits

To avoid overstating benefits, we cut these forecast outcomes by 20 per cent. There are no established guidelines on how best to account for optimism bias. However, a rule-of-thumb is optimism bias generally results in overestimations ranging from 10 per cent to 30 per cent. Our sensitivity analysis captures the upper and lower estimates of this range. We do not factor optimism bias into our costs as our OPEX does not come from fund applicants.

4.1.6 Estimated costs and benefits

In this section, we outline how relevant costs and benefits have been estimated. Both costs and benefits are expressed in present value terms.

4.1.6.1 Actual costs total around $132M, most of which is operating cost

In total, the costs across the study period are estimated to be $132M. Most of this is operating cost associated with running successfully funded projects. Capital expenditure is the next highest cost category.

OPEX for running successful projects ($81M)

OPEX for running successful projects is not currently collected by MfE. We recommend they begin collecting this data going forward. The analytical implication of this absent data is that we have developed a series of assumptions to estimate annual OPEX for different projects based on invested capital. These assumptions were informed by (1) discussions with managers of similar funds overseas, and (2) an examination of project application documents which contained OPEX estimates provided by MfE.

Table 11: OPEX estimates as a proportion of CAPEX

Annual OPEX as a % of CAPEX for **Infrastructure projects**	55
Annual OPEX as a % of CAPEX for **Service projects**	50
Annual OPEX as a % of CAPEX for **Community projects**	40
Annual OPEX as a % of CAPEX for **Innovation projects**	50

Source: Sapere analysis and expert insights

We assume there is no additional OPEX required for running feasibility studies, education and awareness projects, data collection and analysis projects, and research and development projects.

We assess OPEX for running successful projects to begin in 2024, two years following the first capital investments. This assumption reflects our view that OPEX is only incurred once a project has been successfully implemented and is capable of diverting waste. We acknowledge this is a somewhat

crude approach to the inclusion of OPEX in a CBA, but we deem this to be the most suitable approach given data limitations as well as time and resource constraints on this analysis.

OPEX for administration and assessing applications ($16.8M)

OPEX for administration and assessing applications totals around $16.8M. This is based on actual direct expenditure and shared services costs provided by MfE. We are only interested in these costs for the years 2022, 2023, and 2024. Costs incurred during this period are associated with the assessment and administration of applications in our study period. Any prior or subsequent OPEX of this kind would not be relevant to the tranche of projects we are assessing.

CAPEX funding to successful projects ($34.3M)

Capital costs, the sum of investment for successful projects in the study period, total $34.3M. These costs are based on the sum of actual and scheduled payments to successful project applicants, as per the dataset provided by MfE. We have not included scheduled payments to projects which have since been terminated or withdrawn.

4.1.6.2 Actual benefits total around $122.6M, which comes mostly from avoided landfill costs

In total, the nominal benefits across the study period are estimated to be $122.6M. Most of this comes from avoided landfill cost and the rest comes from avoided emissions.

Avoided landfill costs are almost $73M

Landfill management costs are avoided by diverting waste. We estimate landfill cost savings to be around $73M over the study period. This is based on an estimate of diverted waste tonnage of nearly 2.5 million tonnes during the same period. Our waste diversion estimates are based on targets and results provided by fund applicants trimmed for optimism bias. We estimate landfill management costs at the beginning of the study period to be $52.24 per tonne of waste. This is drawn from previous estimates of landfill costs in our CBA of community recycling centres[8] and adjusted for inflation.

Avoided emissions costs are $49.6M

We assume all diverted waste in the study period would have otherwise ended up in landfill with gas recovery systems, if it were not for the waste diversion projects funded during the study period.

Cost savings are based on a social cost of emissions of $74.46/tonne CO2e. This is based on an estimate used in our CBA of community recycling centres, which was $63/tonne CO2e[9] in 2017. We have adjusted for inflation to update the estimate for the beginning of our study period.

[8] Estimated to be around $45 per tonne in 2018, based on an assumption of 20 per cent mark-up for landfill operators, accounting for the waste levy portion, environmental costs, labour, and transport.

[9] The original estimate was made based on insights from experts at Auckland Council, Ministry for the Environment, and Ministry for Business Innovation and Employment.

To estimate offset emissions, we multiply our estimates of waste diverted, by type, with the relevant emissions factor. Emissions factors are drawn from MfE's emissions factors summary.[10] Waste volumes by type, emissions factors, and offset emissions are shown in Table 12.

Table 12: Waste volumes, emissions factors, and offset emissions

Waste type	Waste volume (tonnes whole study period)	Relevant emissions factor	Tonne CO2e
Green	354,501	0.552	195,684.55
Food	824,944	0.674	556,012.26
Timber	1,053,735	0.38	400,419.30
Organic	23,494	0.613[11]	14,401.82
Tyres	54,000	0.02[12]	1,080.00
Plastic	139,333	0.02[13]	2,786.66
Totals	2,450,007	-	1,170,384.59

By multiplying offset emissions (CO2e) by our social cost of emissions estimate we arrive at a cost savings of around $69.7M, or $49.6M in present value terms.

4.1.6.3 Qualitative benefits include the gains in knowledge, waste minimisation awareness, and other impacts

We acknowledge the following benefits arising from funded projects which were not included in the analysis.

Table 13: Qualitative benefits

Benefit	Description	Reason for exclusion
Gained knowledge from feasibility studies	Increased knowledge and understanding about waste management technologies and techniques	Benefits become tangible when knowledge and understanding is

[10] https://environment.govt.nz/publications/measuring-emissions-a-guide-for-organisations-2023-emission-factors-summary/

[11] This is an average of food and green waste. A specific emissions factor for organics is not outlined in the emissions factor summary

[12] https://www.climatiq.io/data/emission-factor/565d9c6b-3086-4799-9923-9e68e915abcc

[13] Specific emissions factors for plastics are not included in the emissions factor summary. Literature is divided on the issue. Many non-biodegradable plastics are estimated to have no emissions factors, while others attribute an emissions factor of 0.01 or 0.02. We have attributed an emissions factor of 0.02. We note that either emissions factor does not have a material impact on the outcome of this CBA.

		translated into projects that divert or prevent waste
Increased awareness	Increased public awareness of waste minimisation and disposal techniques	Limited impact on analysis. Only one education/awareness project was included in our tranche of projects
Warm glow effects	Emotional satisfaction from engaging in environmentally responsible behaviours	These effects are highly subjective and difficult to quantify
Social cohesion and community engagement	Positive social impacts that waste minimisation programmes can have by bringing communities together	Difficulty expressing this impact in monetary terms
Employment opportunities	FTE created by successful projects	Frequently a redistributive effect, which involves moving labour from one job to another

Source: Sapere analysis

4.1.7 Net effects

This section compares the estimated costs and benefits across the study period to determine the extent to which the fund is delivering a net benefit to society. Estimates in this section are presented in present value terms using a discount rate of 5 per cent. Table 14 summarises the net effects.

Table 14: Net effects (PV, $M)

Effect	Value
Total benefits	$122.6
Total costs	$132.1
Net benefits	-$9.6
Benefit-cost ratio	0.93

4.1.8 Sensitivity analysis

The core model is examined for sensitivity to changes in assumptions of the discount rate, costs, cost savings, and optimism bias.

4.1.8.1 Discount rate

Discounting is one of the more controversial aspects of a CBA and often has a significant impact on the outcomes.

Table 15: Sensitivity analysis - discount rate (PV, $M)

Effect category	2%	5%	8%
NPV benefits	$149.9	$122.6	$101.4

NPV costs	$138.3	$132.1	$126.6
Net benefits	$11.6	-$9.6	-$25.2
Benefit-cost ratio	1.08	0.93	0.80

4.1.8.2 Landfill costs

Our estimated landfill costs come from a prior CBA of community recycling centres, adjusted for inflation. We analyse how increasing and decreasing this estimate impacts on the CBA outcomes.

Table 16: Sensitivity analysis - landfill costs (PV, $M)

Effect category	$42	$52	$62
NPV benefits	$108.3	$122.6	$136.2
NPV costs	$132.2	$132.1	$132.2
Net benefits	-$23.9	-$9.6	$4.1
Benefit-cost ratio	0.82	0.93	1.03

4.1.8.3 Optimism bias

Accounting for optimism bias is not an exact science. Here, we provide upper and lower estimates from our central estimation of 20 per cent.

Table 17: Sensitivity analysis - optimism bias (PV, $M)

Effect category	10%	20%	30%
NPV benefits	$137.9	$122.6	$107.3
NPV costs	$132.2	$132.1	$132.2
Net benefits	$5.8	-$9.6	-$24.9
Benefit-cost ratio	1.04	0.93	0.81

4.1.8.4 Social cost of carbon

As above, our estimated social cost of carbon come from a prior CBA of community recycling centres, adjusted for inflation. We analyse how increasing and decreasing this estimate impacts on the CBA outcomes.

Table 18: Sensitivity analysis - social cost of carbon (PV, $M)

Effect category	$60	$74	$89
NPV benefits	$112.9	$122.6	$132.3
NPV costs	$132.2	$132.1	$132.2
Net benefits	-$19.2	-$9.6	$0.1334
Benefit-cost ratio	0.85	0.93	1.00

4.1.8.5 Estimated OPEX for running successfully funded projects

Our estimated OPEX for running successfully funded projects comes from analysing a sample of project documents and discussions with stakeholders operating a similar fund overseas. These estimates represent the most uncertain part of our analysis.

Table 19: Sensitivity – OPEX (PV, $M)

Infrastructure	**45%**	**55%**	**65%**
NPV benefits	$122.6	$122.6	$122.6
NPV costs	$121.4	$132.1	$142.9
Net benefits	$41.0	-$9.6	$20.3
Benefit-cost ratio	1.01	0.93	0.86
Services	**40%**	**50%**	**60%**
NPV benefits	$122.6	$122.6	$122.6
NPV costs	$128.1	$132.1	$136.2
Net benefits	-$5.5	-$9.6	-$13.6
Benefit-cost ratio	0.96	0.93	0.9

4.2 An overview of funded projects prior to the CBA study period

Here we provide a brief overview of observations we have made examining funded projects that were not in scope of the CBA study period. Namely, these are projects funded prior to 2021 and projects without a clear application date.

- It is important to note that we are reluctant to express the headline impacts of these projects as we do not have confidence in the data. As such, we treat these findings with some caution.
    - The dataset captures targets and results for projects in the same fields, risking double counting and thus overstating.
    - We found multiple entries for the same project, again suggesting a potential for double counting.
    - We found several instances where comments provided by applicants contradicted the raw estimates of benefits they have provided.
    - Assessing and filtering this data for accuracy requires a line-by-line analysis. This was also the case for projects included in the CBA. However, the CBA was considerably more concise and manageable.
- We estimate around $123M was allocated to projects prior to 2021.

- Almost half of this funding was spent on infrastructure projects, less than the current prioritisation to allocate 70 to 80 per cent to infrastructure.
- Projects we deemed to have no measurable, immediate benefits for the CBA such as feasibility studies ($10M), education programmes ($13.5M), and data collection projects ($4M) received a large share of funding compared to the post-2021 period.
- Innovation projects were allocated around $0.5M during this period, which could reflect a low appetite for risk.
- On benefits, we noticed there seemed to be a greater focus on benefits other than waste diversion, such as job creation, unlocked co-funding, and number of wānanga held, when compared with the sample of projects used for the CBA.

With the comparatively higher spend on projects with few measurable, immediate, benefits, and lower spend on waste diverting infrastructure, we expect a CBA of projects prior to 2021 would yield a lower value for money estimate than those post-2021. That is not to suggest there is no value in these benefits, only that they are not amenable to our CBA modelling.

4.3 How is value for money assessed and managed?

To get a sense of how value for money is assessed and managed, we draw on insights from conversations with key stakeholders and a review of levy applications.

- **Fund applicants must provide a forecast of benefits arising from their projects.** Common examples of benefits include tonnes of waste diverted, FTE created, and education programmes delivered. Anticipated benefits provide an indication of value for money but are independently insufficient for determining VfM.
- **A focus on the cost per tonne of waste diverted.** A key VfM metric used to assess applications is the cost per tonne of diverted waste. However, the cost per tonne diverted ratio is based on waste minimisation targets generated by the applicant. They do not appear to account for optimism bias,[14] which may distort value for money estimates.
- **Successful applicants provide actual results against previous targets.** Once a project is operational, applicants provide results which can be compared against previous targets. These results give a more realistic indicator of VfM. However, these results are self-reported and could be subject to reporting bias.[15]
- **Applications requesting more than $1M in funding are required to provide a business case.** A detailed business case assists with a more rigorous VfM assessment, although it is not a full VfM assessment.

A CBA of high investment projects would provide considerable rigour to the assessment of VfM. Moreover, much of the data required to conduct a CBA is contained within the business cases which

[14] The general tendency to overestimate positive outcomes and underestimate potential risks or challenges in future events.
[15] A tendency to overstate outcomes or present them in a more favourable light.

are already required from these projects exceeding $1M. We acknowledge additional resourcing would be required to conduct CBAs of high investment projects, but this would enhance decision-making by ensuring levy finding is channelled to projects with the greatest value for money potential.

4.4 Project delivery appears to be less of a priority on the WMF scoring system

Examining the scoring guide for WMF applications, we find a series of criteria with maximum possible scores of 100 or 50. Examples of criterion with a maximum score of 100 include, but are not limited to the following:

- Does the proposed solution provide a low-emission, circular-economy solution to the identified problem or opportunity?
- Does the proposal offer a deliverable solution for a high-priority waste stream or investment signal?
- Does the project consider the tonnage, scale of the project, the quantity of waste involved and the subsequent impact on a regional or nationwide basis?
- What is the project's potential to reduce greenhouse gas (methane) emissions?
- What is the project's level of genuine engagement with Māori (i.e. is the project co-designed or led by a Māori organisation or iwi and of benefit to Māori communities)?

Example of criterion with a maximum possible score of 50 include, but are not limited to the following:

- Are the project objectives realistic and achievable and therefore likely to achieve the proposed impact?
- How does the proposal demonstrate the organisation's experience and its ability to successfully deliver the project's objectives?
- Is the proposed level of governance commensurate with the scale or complexity of the project?
- Will the identified outputs of the project continue after the funding ends?
- Does the budget comprehensively demonstrate reasonable and realistic costs, beyond business as usual, value for money, alignment with the objectives, and alignment of expenditure to successfully deliver project objectives?

The lower maximum score attributed to criterion concerned with the realistic nature of project objectives, as well as the applying organisation's relevant experience, project governance, ongoing outputs, and realistic budgets, suggests the scoring process is weighted to the applicant's ability to craft an optimistic application over practical considerations like feasibility, experience, and cost realism. From a value for money perspective, this approach risks inefficient use of funds where ambitious projects fail to meet stated expectations or fail entirely.

4.5 A strict value for money approach understates the importance of waste prevention technologies and innovations

A dollar per tonne of waste approach to VfM favours investment in infrastructure projects that divert various waste types from landfill. While infrastructure plays an important role in managing New Zealand's waste, it is generally not a solution for minimising waste production.

Innovation, in the form of new technologies and approaches to waste management, may offer solutions for stemming the flow of waste into the system. Reductions of waste inflows subsequently reduces the need for waste management infrastructure. Innovation projects are, however, inherently risky, and comparatively prone to failure. Failed innovation projects have little to no observable benefits and, therefore, do not offer value for money. However, trial and error are crucial elements of the innovation process. In other words, the cost of failed innovation projects is often a requisite to landing successful innovations—which are positively associated with a faster and more dynamic pace of development (Nawrocki & Jonek-Kowalska, 2022).

5. Assessing potential crowding out of private investment

In this section, we present our assessment of crowding out. We begin with a definition of crowding out and explain why crowding out is a problem. We then move to discuss our approach to assessing crowding out. We then present our findings, which includes an explanation of how crowding out is assessed and managed by administrators of the contestable fund and the TA allocation of the fund.

5.1 Crowding out is where government investment curtails opportunities for private sector investment in a sector

Crowding out refers to a phenomenon where the government invests in the provision of a good or services that might otherwise be provided by private sector businesses.

- Seminal research into crowding out in the USA and Canada (Voss, 2002) argues that public investment in a sector does tend to crowd out private investment, and there is no evidence to suggest that public investment encourages or complements private investment.
- Research examining crowding out effects across 145 countries (Furceri & Sousa, 2011) finds government spending produces crowding out effects, by negatively impacting consumption and investment from the private sector.
- Keynesian economics argues public investment can increase private sector consumption and investment.
- The effects of public sector investment on crowding in and crowding out are nuanced. Generally, during times of high economic growth and employment, public sector investment has more acute crowding out impacts.
- During periods of economic downturn public sector investments can yield a crowding in effect.
- Public sector investment impacts on crowding in or out also vary by sector. Consequently, assessing crowding out effects, especially from a bottom-up perspective can be challenging.

5.1.1 Crowding out could be a problem because...

The crowding out of private investment in the waste sector could lead to a series of issues, including:

- **Reduced competition and innovation.** Innovation is often driven by private organisations operating in competitive environments. Reduced investment incentives, due to the prominence of public investment, could lead to sub-optimal levels of innovation and operational efficiency.
- **Dependency on the WMF.** Prominent public sector investment can foster an environment where the private sector becomes reliant on funding available from the WMF. This can reduce the incentives for efficiency.
- **Risk of anti-competitive environments**. Investment from the fund could lead to market monopolisation, particularly in smaller regionalised markets. Market monopolisation may lead to reductions in consumer choice and in incentives for efficiency.

5.2 Our approach to assessing crowding out in the waste management sector

Our assessment of crowding out investment in the waste management sector should be considered a silver buckshot, not a silver bullet. Our analysis seeks to assess the likelihood of crowding out occurring by interrogating available data and stakeholder insights. It is not the final word on crowding out in the waste management sector.

Our approach to assessing crowding out relies on three sources of information:

- **Data on projects funded by the WMF.** Using this dataset, we identify recipients of funding as belonging to the public or private sectors. Once this disaggregation is made, we examine the differences in funding between public and private organisations. We focus on funding volumes and types of projects funded to determine the public-private funding share across different domains of the waste management sector.
- **Case studies.** We have been provided a sample of 14 applications to the WMF. These are a mix of successful and unsuccessful applications seeking funding for different types of projects. We use these cases to identify instances where the private sector may have been crowded out or where opportunities for the private sector have been created via the WMF.
- **Stakeholder perspectives.** We interviewed a sample of 10 industry stakeholders. Stakeholders were asked to describe the dynamics and structure of the waste management sector and comment on instances of, and the potential for, crowding out. We note that stakeholders had strong and often polarising feelings about crowding out based on which part of the waste management sector they worked in. We treat these insights as indicative only and do not give them the same weighting as the data or case studies.
- **A brief review of other jurisdictions.** To assess if the issue of crowding out has been raised elsewhere in relation to waste levy fund equivalents.

5.3 Most contestable funding has gone to commercial entities

A total of 353 projects contained in the dataset provided by MfE received payments. Our analysis of these projects serves as an indicator of the potential for crowding out arising due to investments made via the contestable aspect of waste levy funding.

- A total of $141.3M has been paid out to these projects since 2010.
- $101.7M of this has been paid out to commercial applicants.
- $17.8M has been paid out to Territorial Authorities, and almost $18.9M has been paid to community enterprises[16].

[16] We have used this as a catch-all identifier for community led projects, trusts, and charities.

- Other funding recipients include state-owned enterprises, Crown Research Institutes, District Health Boards, central government (defence), and tertiary education. Combined, the funds paid to these applicants totals just under $3M.

The predominance of commercial recipients suggests strong access to contestable levy funding, securing a significant share of available resources.

5.3.1 There is some overlap in the types of projects funded across commercial and non-commercial applicants

Looking at the types of projects funded, we see some convergence in the significant areas of funding between commercial and council applicants.

- Commercial applicants received $56.8M for infrastructure projects.
- Council applicants received $8.9M for infrastructure projects.
- Commercial applicants received $29Mfor service projects.
- Council applicants received $6.6M for service projects.
- Both council and commercial applicants received funding for feasibility studies or investigative projects, $1.7M and $6.5M respectively.

Council and commercial applicants attracting funding for similar activities could signal a potential for crowding out. However, we note commercial applicants have received considerably more funding across these domains than Territorial Authorities, suggesting crowding out has not occurred due to investments from contestable waste levy funding.

5.3.2 Council and commercial applications for infrastructure and services projects are delineated by waste stream

Overlaps between commercial and council applications for waste levy funding can be further disaggregated by the type of waste managed by the project. Here, we find some delineation between council and commercial applicants. Project applications dealing with plastics, primary sector organics and hazardous waste, refrigerants, timber, tyres, and commercial food waste were received solely from commercial applicants. Council projects did not address these waste streams. Applications for projects managing household organics came solely from council applicants only. MfEs Emissions Reduction Plan indicates an obligation on the part of councils to offer organics kerbside collection for food scraps. This creates a requirement for increased organics processing capacity.

Significant areas of overlap in waste stream addressed include bio-solids, packaging, and household green waste. However, in the case of both packaging and household green waste, commercial applicants have received considerably more than councils.

- In the management of household green waste commercial applicants have received $3.5M, while councils have received $1.2M.
- In the management of packaging waste commercial applicants have received $7.6M, while councils have received around $400K.

We note, councils have received considerably more funding in the management of biosolids than commercial applicants; $2.3M and $370K respectively. However, biosolid management is an intrinsic component of wastewater treatment, typically undertaken by councils, explaining the comparatively low levels of application funding.

5.3.3 Community enterprises appear to have a well-defined role in the waste management sector

Of the $18.9M in contestable levy funding received by community enterprises most has been invested in education and awareness ($8.8M), data collection and analysis ($3.7M), and community projects ($1.2M). Commercial and council applicants have received comparatively lower volumes of funding for these activities. For example, commercial and council applicants received around $700K for community projects and just over $200K for data collection and analysis projects.

Interestingly, commercial applicants have received around $4.7M for educational and awareness projects, suggesting something of an overlap between the activities of community enterprises and commercial entities.

Community enterprises have also received funding for infrastructure projects ($1.8M) and service projects ($2.5M). Much of this funding has been directed at the management of plastic (type 1), e-waste, and biosolid waste.

Altogether, the activities of community enterprises, proxied by funding applications, indicate they have a reasonably defined role in the waste sector which involves research, analysis, awareness raising, community projects, and some direct waste management activities.

We assess the activities of community enterprises to be largely irrelevant in the question of crowding out. Although the imperatives of community enterprises go beyond the commercial, they are no less private from the perspective of applying for waste levy funding. A delineation based on organisation imperatives i.e., profit generation vs community impact appears spurious.

5.4 Case studies contain little evidence of crowding out, but some evidence of crowding in

We examined the documentation of five projects to identify instances if crowding out may have, or could occur, due to WMF investments. These five cases were selected from a sample of 15 provided by MfE. Importantly, we are not assessing the respective merits of each case. We are focusing solely on the potential for crowding out.

5.4.1 Matamata Piako District Council: kerbside organics collection

The Matamata Piako District Council (MPDC) kerbside organics project sought investment to facilitate the purchase of new refuse bins and food scraps bins for households in the region. New bins were delivered to households over July and August 2023. Bins were acquired via an RfP process with the Council. The bins were supplied by SULO NZ under contract to WM New Zealand Ltd.

The collection of food scraps commenced during September 2023. Messaging was delivered to residents highlighting what items should and should not be placed into the new bins.

Between June 2023 and June 2024, 359.69 tonnes of food waste were collected in the new bins. Food scraps were diverted and weighed at the Living Earth composting facility in Tirohia. We note that the Living Earth facility is owned by WM New Zealand Ltd.

In this case, we note two commercial opportunities have been created due to the investment into MPDCs organic kerbside collection project: (1) the purchase of bins and (2) the diversion of food waste to a privately owned site. We do not identify any evidence of crowding out in this case. Instead, this case speaks to the commercial opportunities created due to public investment, otherwise known as crowding in.

5.4.2 Wellington Councils: kerbside organics collection

Hutt City Council, Wellington City Council, and Porirua City Council applied to the WMF for funding to support organic kerbside collection. 9(2)(b)(ii) The rollout of the bins in the region were expected to divert around 26,000 tonnes of organic waste away from landfill, towards other processing options, per annum.

The project business case outlines several options for processing diverted organic waste, including, but not limited to, food rescue, stock feed, composting, and anaerobic digestion. At the time of project approval, and as far as we are presently aware, an option for managing diverted organic waste has yet to be determined. However, in the approval brief for this project, it was noted that there are currently "no facilities in the region that could easily process the additional organic waste material from the kerbside rollout."

As part of the approval process, the three councils agreed to undertake a formal procurement process by going out to tender for the best solution for processing organics in the region.

Similar to the MPDC case, we note commercial opportunities have been created via the WMF investment (1) in the procurement of 9(2)(b)(ii) bins and (2) in the eventual processing of diverted organic materials. We also note the diversion of household organic waste appears to have created a commercial rationale for establishing an organics processing facility in the Wellington region capable of handling the forecast volumes of organic waste diversion. We do not identify any evidence of crowding out in this case. Again, this points to instances of commercial opportunity being created via investments to local authorities.

5.4.3 Christchurch City Council: organics processing facility

Christchurch City Council applied to the WMF seeking around $18M (approved funding was $15M) to co-fund the development of a new organics processing facility. The council's existing processing facility lacks sufficient capacity to accept higher volumes of organics, nor can it process the range of commercial organic feedstock produced in the city. Christchurch City Council noted the existing facility could not be upgraded due to its location and impacts on neighbouring households.

The chosen solution for the new organics processing facility is an anaerobic digestion plant paired with a biomass fuel processing line. Christchurch City Council awarded the long-term contract for the

new facility to Ecogas Limited Partnership (Ecogas). Ecogas were the preferred suppliers identified via a competitive RfP process with six shortlisted suppliers. The processing plant will be designed, constructed, and owned by Ecogas under a Build Own Operate agreement. Once the plant is in operation (expected late 2026), Ecogas will process kerbside organics under a services agreement where the council pays an agreed gate fee from the volume of organics processed.

The issue of crowding out in this case can be assessed by asking the question: would commercial interests have established an alternative processing facility without co-investment from Christchurch City Council and the WMF? A definitive answer is wanting. However, we note the existing organics processing facility has been considered unfit for purpose for an extended period. Residents living close by have complained about odour from the cite for around ten years. In 2021, Environment Canterbury issued the council with an abatement notice for the site and has issued several infringement notices since. Despite the unsuitability of the existing site, a commercial opportunity to establish a new alternative site did exist but did not appear to be pursued.

In this case, we note Christchurch City Council ran a competitive tender process for the new site. Through this process, a significant commercial opportunity was presented to the market and ultimately won by the commercial entity Ecogas. Crowding out could have occurred if businesses in the waste sector had recognised, and were working towards, an alternative privately-owned site or other market solutions to the ongoing issues with the existing council organics processing facility. However, evidence of such moves in the market remains to be seen, at the time of authoring this report.

5.4.4 The Warkworth transfer station

The Warkworth transfer station was an example of crowding out frequently cited by sector stakeholders. In the case, Auckland Council owned a transfer station in Warkworth following the amalgamation with Rodney District Council in 2010. The transfer station was described to us as an "old landfill site". Auckland Council had been operating the site via a private contractor, who had held the contract for a considerable period.

The site was deemed contaminated, and the Council was required to close it for remediation. Consequently, the private contractor had to cease using the site. In the meantime, the private contractors parent company have purchased a new piece of land and developed a new site nearby.

The Council later received an Infrastructure Reference Group (IRG) grant via the Provincial Growth Fund to improve and redevelop the existing site. The Council then ran a tender through their council procurement process. The tender was won by *Localised* a commercial arm of the Zero Waste Network and run by a local trust. In the arrangement, the Council pay a base fee to run the site and are of the view that the benefits of waste diversion from landfill justify this operational fee. In the Council's view, the landfill is a community site and there are no commercial aspirations for the site.

The parent company of the former landfill contractor is concerned that their new site will divert substantial tonnage from their new site, affecting its viability.

In this case, there is the potential for crowding out to occur. The proximity of the sites in the Warkworth area could divert waste from the privately established new site in favour of the council site. Our view, however, is there is limited evidence to indicate this instance of potential crowding out

occurred as a direct consequence of waste levy investments. It is unclear to what the Council or the parent company knew of their respective plans for the area. It is also unclear if the parent company had been aware of the Council's plans to retender and reopen the site, they may not have proceeded with the decision to establish an entirely new site in the Warkworth area. We note that these events occurred across periods of COVID-19 lockdown in New Zealand and the Auckland region, which may have stemmed the flow of information. Irrespective the former landfill contractor made a commercial decision to establish a facility with the associated risks and rewards.

5.4.5 Upgrading Auckland transfer stations to facilitate increased construction and demolition waste recovery

Waste Management NZ applied, in the first instance, for $3.35M (approved funding was $1.899M) to upgrade two transfer station sites in Auckland to facilitate increased resource recovery of construction and demolition (C&D) waste.

At the time of application most C&D sorting and processing facilities were in South Auckland. With four facilities located across North Auckland and West Auckland, C&D waste recovery is underserved in Auckland. C&D waste tends to go to landfill or transported to a South Auckland site.

The project proposed upgrading two sites, one on the North Shore[17] and the other in West Auckland[18]. These locations were cited as areas of high growth, with high levels of construction and, therefore, construction waste. The upgrades were expected to enable the diversion of 3,000 tonnes of timber and 2,000 tonnes of green waste per annum.

Waste Management NZ is the largest collector of waste across the country and is also the largest collector and processor of recoverable materials. This investment increases commercial opportunity in the waste sector for Waste Management NZ. We, therefore, do not consider this an instance of crowding out in the strictest sense. However, the expansion of Waste Management NZ in the C&D waste domain could limit competition in the sector and could, therefore, lead to a crowding out scenario, particularly if this provides a less than equal playing field for competitors who are unable to offer the same facility to their customer base while remaining price competitive.

5.5 We find no evidence of the crowding out question being asked in other jurisdictions

A comprehensive review of similar waste schemes in other jurisdictions was not in scope for this work. However, we conducted a scan of waste programmes in other jurisdictions to find if the crowding out question had been addressed elsewhere.

Looking at the National Circular Economy Scheme (Germany), Waste Reduction and Recycling Support (Canada), and the Landfill and Communities Fund (UK), we can find no evidence of consideration being given to the question of public investment crowding out opportunities for the private sector.

[17] Rosedale Road, Rosedale
[18] Selwood Road, Henderson

We are, therefore, unable to draw on lessons from these jurisdictions on managing crowding out nor balancing commercial and public imperatives. However, we also note these schemes are not like-for-like with the WMF and tend to be underscored by objectives broader than waste minimisation. For example, the UK Landfill and Communities Fund uses the Landfill Tax to fund the rejuvenation of public spaces and amenities, nature and biodiversity projects, and heritage projects.

More direct comparisons can be made between the WMF, and waste levy schemes operated across Australia. The Green Industries Fund (South Australia) bears a close resemblance to the WMF. Since 2017, Green industries SA has funded around $75 million (AUD) into building and improving waste management infrastructure. We interviewed a former manager of Green industries SA and asked if crowding out was ever considered as a potential issue arising from the fund. He noted the question of crowding out had not been asked:

> "Most of the money we invested went to the private sector, so the question of crowding out feels a bit redundant."

A cursory examination of projects funded by the Green Industries Fund[19] indicates most funding has gone to private companies and applicants. A relevant consideration when drawing comparisons with Australia is that in most jurisdictions the entire collected waste levy is not reinvested into the waste management sector. For example, 50 per cent is reinvested in South Australia, 66 per cent in Victoria, 70 per cent in Queensland, and 25 per cent in Western Australia[20]. The potential for crowding out could be comparatively weaker in these Australian jurisdictions than in New Zealand where 100 per cent of the levy is reinvested in waste management. However, we note that 100 per cent of the waste levy in Tasmania is reinvested back into the waste management sector. Again, we find no evidence of the issue of crowding out being raised as per of their investment strategy.

The Tasmanian Waste and Resource Recovery Strategy (2023-2026)[21] outlines its objectives around engaging with the private sector and providing investment to private enterprises, indicating its use of the private sector as a vehicle for waste management in the state. Altogether, the strategy indicates commercial opportunities are being created by public investments in waste management.

5.6 Sector stakeholders agree that crowding out has not been a widespread issue to date

Our discussions with waste management sector stakeholders indicated there is little evidence to suggest crowding out has occurred due to investments made via the levy fund.

- Most stakeholders were of the view the contestable nature of the fund meant investment opportunities are equally available to private and public sector applicants.

[19] https://www.greenindustries.sa.gov.au/projects-funded
[20] https://www.hunterjo.com.au/wp-content/uploads/2024/07/20240725-Review-of-Waste-Levy-Issues-Paper_Hunter-JO-Submission_FINAL.pdf
[21] https://wrr.tas.gov.au/Documents/Tasmanian%20Waste%20and%20Resource%20Recovery%20Strategy%202023-2026.pdf

- Stakeholders who viewed the fund through a critical lens were of the view that crowding out "probably" hasn't happened, but as the fund grows the potential for crowding out becomes more pronounced. Specific concern was raised that as more funds become available for investment, the scope of investment will grow, minimising opportunities for the private sector.
- Concern was also raised about the volume of funding distributed to territorial authorities and a perceived lack of transparency regarding territorial spending of the fund.
- Representatives from each New Zealand's largest TAs advised they configure their funding in a contestable way, keeping opportunities available for the private sector.
- TA representatives advised most of their allocation goes to private organisations, so they do not recognise crowding out as an issue at a local level.

5.7 However, there is a feeling crowding out could become an issue

Progressive increases in the levy from 2021 will see projected revenue increase from $109M 2022/23 to around almost $260M in 2024/25, settling at around $255M each year thereafter until 2028/29.

- Some stakeholders expressed concern about the sector's ability to sustain increased levels of investment into the future without crowding out occurring.
- Increased available funding represents a significant opportunity for the sector to deliver waste infrastructure.
- Opportunity needs to be balanced with ongoing assessments of national and regional infrastructure requirements to avoid overinvestment, crowding out, or underperforming investments.

Ongoing assessments may involve a rethink of the current investment prioritisation framework, giving infrastructure less of a priority in favour of other project types. We are aware that among the more recent suite of waste levy changes, the scope of projects invested in has broadened to include other project types. This broadening of scope could limit the potential for crowding out in parts of the waste sector. However, we also note some stakeholders are concerned a broadened scope could pull levy funding too far away from areas of greatest investment need.

5.8 Crowding out has been managed by…

At present, crowding out is managed through a qualitative assessment of how market structure and dynamics will be impacted by an investment. For the contestable portion of the fund, the assessment panel advised:

- Consideration is given to regional and national market dynamics as part of the assessment process. Local need, competition, and suppliers all inform the assessment of crowding out.
- The contestable fund is open to private sector applicants, exposing it to free market dynamics.

Speaking to representatives from each of New Zealand's largest TAs[22], we were advised:

[22] Auckland, Wellington, Christchurch

- Most of their non-contestable funding allocation was ultimately diverted to commercial interests[23], usually through competitive tenders.
- Commercial opportunities are generally created when TAs apply for contestable funding[24].

One TA representative advised the extent of private sector opportunity created by their spending of waste levy funding generally hinged on whether inclusion of the private sector was conducive to the goal of 'looking after the public purse'. In other words, opportunities for the private sector are created by TA spending where there is a value for money case to be made for their involvement.

It is also worth noting public and private drivers and incentives are different. The public sector is generally focused on the delivery of their Waste Management and Minimisation Plan, while the private tends to focus on commercial sustainability. In other words, the private sector will take on investments and services that are profitable and walk away from those that are not. TAs have must be successful in the delivery of their Waste Management and Minimisation Plan, regardless of commercial imperatives.

[23] We did not observe any TA expenditure as part of this work

[24] In our examination of funded projects with TA applicants, we found all had created commercial opportunities for the private sector.

6. Recommendations for improving the levy

Based on the findings and conclusions we have reached throughout this report, we have developed a brief series of recommendations aimed at improving the overall performance of the levy. This section is not intended to serve as a comprehensive policy review or formulation process. The purpose of this section is to highlight possible solutions for addressing some of the issues we identified throughout the course of this work, which can be carried forward by policy experts at MfE and other government agencies where appropriate.

6.1.1 We echo calls for long-term national planning

We echo calls, primarily from the Waste Management Industry Forum[25], for long-term national planning around New Zealand's future waste management objectives.

We are not suggesting the lack of a long-term national plan has necessarily led to sub-optimal outcomes from investments via the levy. However, we are of the view a long-term plan would help to ensure levy funds are strategically targeted to meet New Zealand's waste management needs into the future. An established long-term plan would also provide the private sector a degree of confidence to invest in the sector.

We are aware the Aotearoa New Zealand Waste Strategy[26] signals next steps for the Government to work with TAs and others to develop a waste action and investment plan that focuses on:

- priorities for the next five years in different parts of the country
- the mix of regulatory, investment, infrastructure, systems and behavioural change and other actions planned to address priorities
- sequencing and how actions fit together

Although this is an important step in planning for New Zealand's infrastructure needs, longer term planning, beyond 5 years, could limit uncertainties and make the sector more attractive to private sector investment.

6.1.2 Value for money and crowding out analyses on the TA allocation and spending of the levy

The scope of this work has focused on the contestable portion of waste levy funding. Our analysis, therefore, accounts only for 50 per cent of levy funding which is administered by MfE. Although we have held conversations with stakeholders from TAs, we did not provide detailed analysis on the value for money or potential for crowding out from TA usage of levy funding.

[25] https://www.wrif.org.nz/wp-content/uploads/2023/09/Investing-for-the-circular-economy-FINAL.pdf

[26] https://environment.govt.nz/what-government-is-doing/areas-of-work/waste/aotearoa-new-zealand-waste-strategy/

We suggest similar analyses are conducted at TA level. Examining funding at the TA level is important not only because of the volume of levy funding received (50 per cent), but also because of the potential for variable waste management needs and market dynamics across different regions of the country.

We acknowledge co-ordinating an analysis across all TA levy funding recipients would be a significant undertaking. As such, we suggest an initial analysis which focuses on those TAs which receive the most funding i.e., Auckland, Wellington, and Christchurch as well as a sample of smaller TAs.

6.1.3 A cost-benefit analysis of projects exceeding $1M investment value

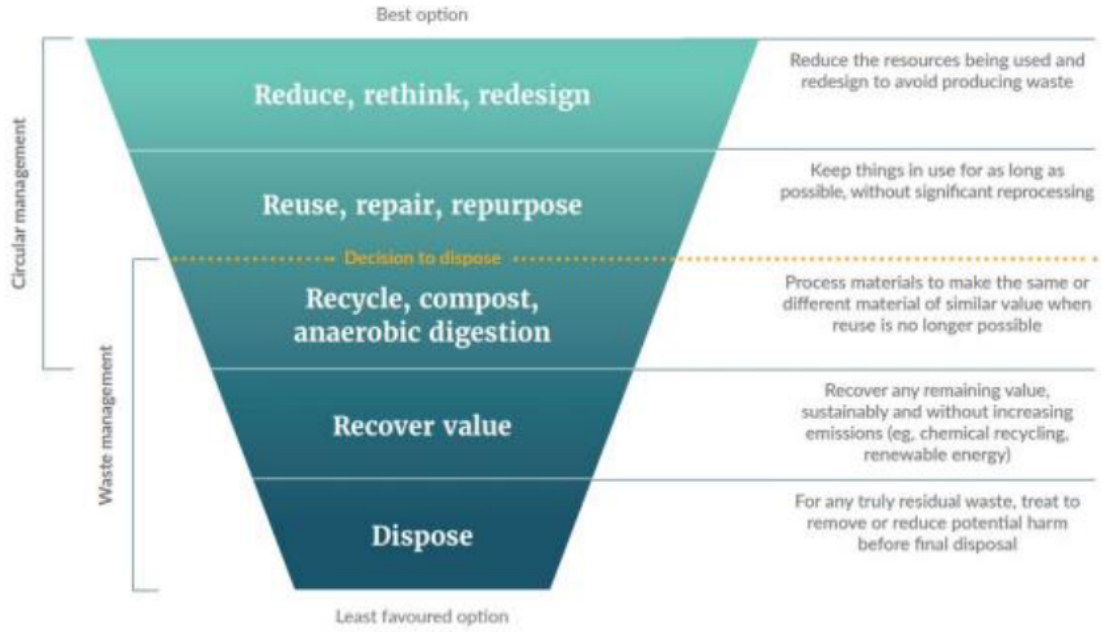
Projects applications seeking funding of $1M undergo a more rigorous application process which involves the submission of a Business Case and, in some cases, approval from the Minister. However, these projects are not subject to a comprehensive value for money analysis. We recommend these projects are subject to a CBA as part of the approval process. We acknowledge this would require an increase in resourcing at the assessment phase by MfE. However, we also note that much of the data required to conduct a CBA of projects would be contained in the Business Cases submitted as part of the current assessment process.

Contending with the resourcing issue, CBAs could be conducted using a two-stage process: (1) a lite or rapid CBA and (2) a comprehensive CBA, with the comprehensive CBA being reserved for projects over a certain value threshold or with particularly sensitive benefit-cost ratios. Rapid or lite CBAs are often imperfect models, but we echo Treasury and argue a lite or rapid CBA is better than no CBA.

6.1.4 Increased appetite for innovation projects and routine assessment of funding priorities

The current funding prioritisation framework gives 70 to 80 percent funding priority to infrastructure projects. This reflects New Zealand's unmet demand for waste infrastructure and level of administration required by MfE to assess applications. However, we note a central focus on infrastructure is counter to the waste hierarchy, which places waste prevention at the highest priority.

Figure 1: Waste hierarchy



Source: Ministry for the Environment (https://environment.govt.nz/assets/publications/Te-rautaki-para-Waste-strategy.pdf)

We suggest MfE increases its appetite for projects which are targeted at waste prevention. We estimate these projects would fall into the categories of education and behavioural change and innovation. The risk-prone nature of innovation means MfE would also have to increase its willingness to fund risky projects. Increased risk heightens the likelihood of failed applications, which is not conducive to VfM measures. However, failures are inherent in the innovation process and often required to land paradigm shifting change, such as waste prevention.

For clarity, we are not suggesting MfE completely depart from infrastructure investments, only to reconsider their appetite for projects focused on waste prevention. Although, we mirror concern expressed by some stakeholders that by focusing too intensely on waste management infrastructure, MfE risks supporting the development of a sector that depends on consistently high flows of waste as feed stock to be commercially viable.

6.1.5 Increase focus on criterion that signal an applicant's ability to deliver a project

Our review of criteria used to assess funding applications noted there is a greater focus on what the project may deliver rather than the likelihood of the project being successfully delivered. For example, applications can score a maximum of 100 points for the outcomes the project is forecast to deliver, while the project can only score a maximum of 50 points for having a realistic budget. The scoring process is weighted to the applicant's ability to craft an optimistic application over practical considerations like feasibility, experience, and cost realism. We suggest MfE revisits the assessment criteria to give equal or greater weighting to criteria which assess the applicant's ability to successfully deliver the project.

6.1.6 Improved monitoring of projects ex-post and improved data collection

Comprehensive data collection was not a priority during the early years of the waste levy. In addition, several changes to the configuration of the levy during the past 10 years has impacted data collection and management techniques at MfE. Consequently, accessing sufficient data to conduct a comprehensive VfM analysis has been a challenge of this work.

We recommend MfE continues its journey of improved data collection and management, focusing on the cost and benefits (forecast and realised) of projects. We suggest MfE collect the operational expenditure of projects. Although the waste levy is not presently used to fund ongoing operations, the collection of operation expenditure is important for two main reasons (1) OPEX represents a cost of delivering a projects benefit – and is, therefore, required in a VfM analysis, and (2) providing an OPEX estimate for a project reinforces confidence in an applicant's ability to successfully deliver a project. We note projects seeking $1M or more provide a Business Case under the current settings, which generally contain estimates of OPEX. We suggest rolling out the requirement to provide an estimate of OPEX to projects of a lower investment ask.

Adjacent to data collection and management limitations, we found limitations in ongoing monitoring and evaluation of projects. Specifically, under current settings, projects impact, or benefits, are estimated for the three years after investment. We deem this period to be insufficient, especially for infrastructure projects which may take several years to operate at full capacity. We suggest MfE extends this period to around 10 years for new infrastructure projects and at least five years for other projects, unless it is known the project will be completed earlier.

6.1.7 Consideration of alternative funding models

Crowding in is as much as a risk as crowding out with a grant system. That is, grants to private business could entrench local monopolies, limit competition, and create an uneven playing field. Moreover, a grant system actively discourages private businesses from using other available sources of capital. Moving to alternative funding models, namely lending or equity ownership arrangements would help maintain a level playing field in the waste management sector. It would also promote better value for money outcomes capital investments are secured via lending capital or infrastructure assets.

7. An option for significant change

Recommendations in the previous section have been made within the parameters of the existing waste levy framework. Here, we present an option for large-scale change that shifts how funding is distributed and the areas to which funding is directed.

- **Recognise the limitations in the current approach.** The project-by-project approach by which MfE receives, assesses, and makes funding decisions on applications is sub-optimal. It does not take a targeted, proactive, approach to the issue of waste management. Nor does the current prioritisation framework reflect the primacies of the waste hierarchy.

- **Recognise the risk in prioritising waste management infrastructure.** The commercial viability of waste management infrastructure relies on continual inflows of waste as feedstock. By continuing to focus on funding infrastructure projects, there is a risk of creating a waste diversion industry which becomes dependant on generating and maintaining a steady stream of waste, potentially discouraging efforts aimed at reducing or preventing waste at the source.

- **Abandon the project-by-project approach.** Applications for levy funding would no longer be accepted. Direct investments by MfE, or other relevant government entity such as MBIE, should be made in partnership with the private sector to avoid crowding out.

- **Focus exclusively on waste prevention and waste infrastructure investments.** MfE would invest exclusively in waste prevention schemes, such as product stewardship, and technologies, as well as waste management infrastructure. This change addresses two priority areas (1) New Zealand's waste infrastructure deficit, and (2) preventing the creation of waste.

- **Use lending and equity instead of grants for infrastructure projects.** Equity and lending can create a self-sustaining model and incentivise efficiency. They are also a far more compelling value for money proposition for the public. Alternative funding models help to reduce the risk of crowding in by helping to balance the playing field between businesses that receive funding and those that do not.

- **Maintain a TA allocation.** TAs have a legislated responsibility for waste management and minimisation. An allocation of funding should be maintained. However, planning with TAs should move towards a strategic and collaborative approach to encourages distribution of the TA allocation in a way that complements national priorities.

These changes would lead to a more strategic and proactive funding model aimed at waste management and waste management while addressing the limitations of the reactive project-by-project approach. This approach would encourage more efficient use of levy funds through lending and equity mechanisms. It also channels funding towards national priorities, while maintaining a central role for TAs.

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