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Executive Summary

Dunedin is the second largest city in the South Island and the largest in Otago, with around 120,000 permanent residents. Dunedin City Council (the Council) has recently embarked on a 'Waste Futures' project to develop a comprehensive waste management and diverted materials system for Dunedin that aligns with Council's responsibility under the Waste Minimisation Act 2008; to 'promote effective and efficient waste management and minimisation'. The Council has an aspirational vision of being a zero waste city. It also has a target to reduce Dunedin's carbon emissions to net zero by 2050, with solid waste currently accounting for 7.4% of Dunedin's total emissions.

The lack of progress following previous waste investigations means there is now urgency to identify, procure and deliver a preferred waste and diverted material operating model within a reasonable timeframe. Green Island landfill is Dunedin's primary landfill and has consents expiring in five years. Reconsenting the Green Island landfill is likely to be challenging, costly, and may only provide 3-5 years additional capacity. An alternative landfill site is likely to take 7-10 years to plan, consent and implement, potentially leaving a gap between the closure of the Green Island landfill and a new landfill opening. Waste quantities have been steadily increasing, with further increases predicted with the hospital rebuild and university developments. Diversion quantities have been decreasing and China's National Sword policy¹ may result in future constraints on recycling markets.

The Council is following the Business Case Approach to determine the best future waste model. The first stage of this has now been completed which defines the 'strategic case'. This sets out the compelling case for change, including problems, benefits and opportunities, and informs the development of the framework which will be used for assessing the options in the next stage.

As part of this process, representatives from the Council (staff and Councillors), Ministry for the Environment and a resident specialising in waste management participated in a facilitated problem definition workshop and identified the following three problems:

- Problem 1: Council's facilities and services for waste are no longer fit for purpose, resulting in declining Council influence and increased disposal of waste and resources to landfill (40%)
- Problem 2: Consumerism and lack of product stewardship is generating increasing waste resulting in higher costs to provide and maintain waste facilities, and higher carbon emissions (30%)
- Problem 3: Waste and diverted material systems are complex and confusing for some users resulting in contamination and lower recycling participation rates (30%).

The following opportunities and benefits were also identified:

- Opportunities
 - o Work towards zero waste
 - Circular economy
 - o Demonstrate leadership
- Benefits
 - o Minimise waste and carbon emissions
 - o Maximise recovery
 - o Equitable regulation
 - o A system that meets user expectations
 - o Minimise environmental impacts.

Evidence found to support the identified problems identified included:

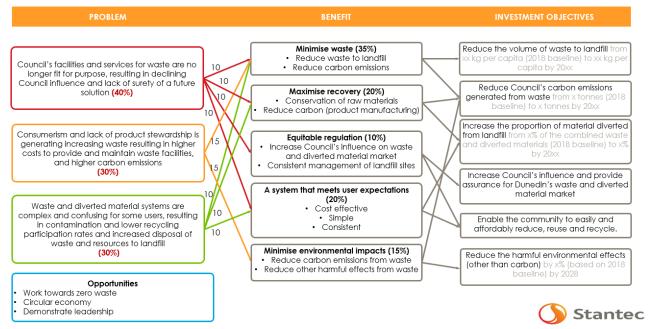
- Green Island landfill, the only landfill in Dunedin that can accept household waste, may reach capacity around the time consents expire in 5 years; however an alternative landfill site is likely to take 7-10 years to plan, consent and implement
- Uneven regulatory playing field results in higher disposal costs for Council compared to unlevied landfills
- Council's influence over waste disposal is declining, with more consumers choosing to use private services
- Council's existing waste and diverted material contracts are inflexible over the contract term
- Increasing volumes of waste are being disposed of to landfill in Dunedin

¹ In June 2017, China adopted the National Sword Policy that halted the entry of 24 materials including paper, plastics and textiles. This was followed by the Blue Sky 2018 initiative in January 2018 that rejected shipments of recycling with contamination rates greater than 0.5%

- Increasing costs to provide and maintain waste facilities, due in part to diminishing revenue and increasing costs to purchase emission trading units
- Likelihood that the cost of waste levy and emissions trading units will increase, increasing landfill costs
- Volume of material diverted from landfill has been decreasing in recent years
- Level of contamination in diverted material collected through kerbside collection has been increasing
- Dunedin's waste and diverted materials streams are complex, resulting in confusion for some users.

There was however no clear link to demonstrate that increased disposal of waste to landfill is a result of Council's facilities and services not being fit for purpose, nor due to a declining Council influence (Problem Statement 1). However the increased disposal of waste is in part occurring due to confusing and complex systems that is resulting in contamination and lower recycling participation (Problem Statement 3). As such, the problem statements have been slightly amended to reflect these changes. These changes are highlighted in the Investment Logic Map shown below.

Delivering a sustainable solid waste system for Dunedin



The evidence supports progressing immediately to Part B of the Programme Business Case (PBC) to identify a preferred medium to long-term waste and diverted material operating model as soon as practical. The development of a Programme Business Case for Dunedin that is consistent with the Council's Waste Management and Minimisation Plan will:

- Review current processes and identify alternative methods to manage waste and diverted material
- Consider diverted material services that meet the expectations and needs of the community as well as the market
- Identify a wide range of potential options that provide medium to long-term assurance for waste disposal for Dunedin residents, and evaluate those options against the problems, benefits and opportunities identified in this Strategic Case
- Enable integrated planning and investment in future waste and diverted materials facilities and services
- Provide certainty and clarity for investors (public and private)
- Ensure services and facilities can meet current and projected future demand, and
- Ensure future solutions reduce impacts on the environment.

Dunedin City Council

Dunedin City Council Waste Futures 2023

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APPENDICES

Appendix A Waste and carbon emission reduction

Appendix B Current Council contracts

GLOSSARY

China Sword refers to the National Sword Policy adopted by China in June 2017, that halted the entry of 24 materials including paper, plastics and textiles.

Blue Sky 2018 is the initiative by China in January 2018 that rejected shipments of recycling with contamination rates greater than 0.5%.

Diverted material refers to material that is no longer required for its original purpose, but rather than being disposed of, is put forward for commercial or other waste minimisation activities instead.

Hazardous waste contains contaminants such as heavy metals and chemicals, at levels high enough to require treatment to render them acceptable for landfill disposal. Hazardous waste includes materials that are; flammable, explosive, oxidising, corrosive, toxic, eco-toxic, radioactive, infectious, mutagenic, carcinogenic, and teratogenic.

Special waste is material that requires special handling at the landfill to ensure it does not pose a risk to the environment or human health during the disposal process.

Waste means:

- a) anything disposed of or discarded; and
- b) includes a type of waste that is defined by its composition or source (for example, organic, electronic, or construction and demolition waste); and
- c) may include a component or element of diverted material, if the component or element is disposed of or discarded.

Part A: The Case for Investment

1. Introduction

1.1 Purpose

The purpose of this report is to present the case for investment in Dunedin's future waste and diverted materials operating models to allow the Dunedin City Council (the Council) to identify and procure the best solid waste solution for Dunedin. This will enable the Council to move towards its goal of a zero-waste future and a more circular economy, and fulfil its commitments under the Waste Minimisation Act 2008.

This Strategic Case tells the story about why investment is needed and documents the case for change by:

- Identifying the scale and scope of the problems by interrogating the evidence
- Articulating the benefits and opportunities that will accrue as a result of addressing the problems
- Understanding how the project aligns with, and can contribute to, overarching national, regional and local objectives
- Engaging with stakeholders to understand their perspective on the matter, and their areas of focus
- Determining the next steps by undertaking critical, evidence-based decision making.

This Strategic Case will allow the stakeholders involved to make an informed decision about the need to invest in changes and improvements to waste and diverted material services and facilities.

The problems, benefits and investment objectives identified in this Strategic Case will be used to develop a framework to evaluate the options, as part of the next stage of the business case process. This method means that options which make the most contribution to addressing the problems, or achieving the benefits and investment objectives, will be clearly identified for further consideration.

1.2 Background

The Council have embarked on delivering three waste management projects, collectively branded as the 'Waste Futures' Project. The Waste Futures Project covers:

- A review of the DCC Waste Minimisation and Management Plan 2013 (WMMP).
- Investigation of options for reducing the amount of Dunedin's organic (food and/or green) waste going to landfill
- Preparing for the closure of the Green Island landfill.

The aim of these projects is to develop a comprehensive waste management and diverted materials system for Dunedin that aligns with the Council's responsibility under the Waste Minimisation Act 2008 to 'promote effective and efficient waste management and minimisation'. The Council has also signalled a commitment to reducing the carbon emissions generated from waste, given that waste is Council's largest source of greenhouse gas emissions.

The Green Island Landfill plays a significant role in Dunedin's waste management system, being the only landfill in Dunedin that can accept household waste. However, based on current rates of waste generation, the landfill may reach capacity around the time resource consents expire in 5 years (i.e. 2023) or possibly earlier. This means that solutions to manage the City's future waste and diverted material demands are urgently needed, given the process of investigation, decision making, and implementation of a future total solution is complex, costly and likely to take some time. To address this, as part of the overall Waste Futures Project, the Council have engaged Stantec to carry out an Options Analysis Business Case Process (i.e., this workstream) and a landfill feasibility analysis (a separate workstream). This workstream primarily aligns with the second and third bullet above.

1.3 Scope

The scope of this project covers all aspects of waste and diverted material management, including production, collection, recovery, recycling, treatment and disposal, services and facilities within Dunedin. The focus of this project is on the aspects Council has influence on, however the review will consider the aspects provided by private suppliers, as these may provide opportunities, as well as impact and influence Dunedin's broader waste and diverted material requirements.

The geographic scope of this project is confined to the boundaries of Dunedin City, however there may be solutions and opportunities that lie outside the City, including collaboration with other Districts. These will be considered as part of the options development phase.

Context

2.1 Waste and diverted material flows

The waste hierarchy establishes priorities for the efficient use of resources that underpins the objectives of Council's Waste Management and Minimisation Plan, with preferred behaviours at the top of the hierarchy (refer to Figure 2-1). The actions and choices that individuals, businesses and governments make influences the volume and type of waste that is generated. As materials flow through the economy they may reach the end of their useful life and become diverted material that is reused or recycled or waste that is



disposed of. However materials have value, and the more these materials are mixed and dispersed, the harder and more expensive it becomes to extract this value. The value of materials can be maximised if materials can be kept clean and consolidated into single material streams.

Figure 2-1: Waste hierarchy

2.2 Waste and resource recovery facilities

When considering the future of Dunedin's waste and resource recovery systems, facilities and services across the wider region need to be considered. Various waste and diverted materials currently enter and exit Dunedin from elsewhere, and there may be further opportunities to share resources to achieve economies of scale and efficiencies. The major landfills, transfer stations and recycling processing centres across the region are shown in Figure 2-2 below. Note that the only major facilities in Dunedin are centred around Green Island.

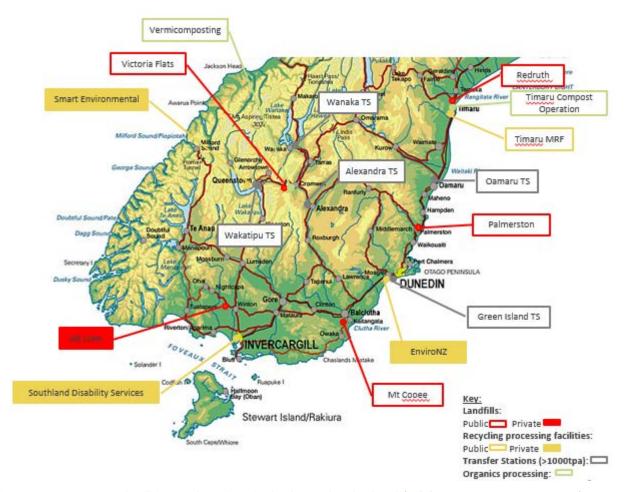


Figure 2-2: Key waste facilities and services in the lower South Island (DCC Waste Assessment 2018)

2.3 Waste and resource recovery services

There are numerous public, commercial and community waste and resource recovery services operating in Dunedin. The main ones are described below.

2.3.1 Council provided services

Refuse Collection

Council provides a user-pays weekly kerbside bag collection service in urban areas of Dunedin, Mosgiel, Waikouaiti and Middlemarch. Residents must purchase DCC black bin bags to use this service. There is ongoing growth of collection areas particularly in the Mosgiel-Taieri area as the urban area and expectation of service grows. The refuse collection service is offered to residential households, commercial premises, industrial premises and institutions such as schools, kindergartens and churches. A private operator contracted to Council currently carries out the kerbside bag collection service. Collected refuse bags are transported to the nearest transfer station or landfill.

The Council also provides public litter bins and additional waste services for major events, such as festivals, concerts and sporting events, and following civil defence emergencies.

Refuse transfer stations

Council transfer stations are currently located at Green Island, Middlemarch and Waikouaiti, with the refuse from the transfer stations transported to the Green Island landfill. Rural skip day services are provided three times a year for communities at Sawyers Bay, Warrington, Long Beach, Aramoana, Outram, Allanton, Portobello, Henley in recognition of the lack of waste facilities nearby.

Landfills

The Green Island landfill is Council's only waste disposal site and the only landfill in Dunedin that can accept household waste. It has resource consents that permit waste disposal until 2023 and at the current

rate of filling may reach capacity around the time consents expire. The landfill only accepts refuse from licensed operators; public access is not permitted.

Recycling and resource recovery activities

Council provides a weekly kerbside recycling collection service for glass (colour sorted by the contractor) and mixed recyclables (including plastic, paper and cardboard) on alternating weeks. Council provides a cardboard collection on two nights a week in the Central Activity Area of Dunedin and has recycling hubs in the City Centre. Resource recovery facilities provided at the Green Island transfer station include places for depositing recyclable items, compostable material, and reusable items. Reusable items are sold through the Rummage Store at Green Island. Council also provides recycling bins in public areas.

2.3.2 Commercial services

The primary commercial waste and diverted material services provided in Dunedin include:

- **Refuse Collection** Private operators provide skip services as well as a regular wheelie bin collection services in Dunedin to domestic and commercial waste generators.
- Refuse Transfer Stations Waste Management owns and operates a transfer station in Dunedin in Wickliffe Street.
- Landfills Envirowaste previously operated a privately consented landfill in Fairfield, which received approximately half of Dunedin's landfilled waste. This landfill closed on 30 June 2017, and some of that waste is now received at Council's landfill at Green Island. Ongoing receipt of this waste will depend upon the relative costs of disposal at Green Island versus other landfills such as Nash and Ross Ltd, which is a new landfill in Dunedin that can receive construction and demolition waste, contaminated soil and other non-putrescible waste but cannot receive household waste.
- **Diverted Material** Envirowaste owns and operates a Materials Recovery Facility near the Green Island landfill that receives diverted material from the Council provided collection service and other sources. There are also a few private green waste reception facilities in Dunedin.

2.3.3 Services provided by community groups

There are a number of community groups and charitable organisations that operate in Dunedin that offer services that divert material from landfill. These include:

- Food recovery services such as Kiwiharvest (formerly Foodshare) that prevent food waste by collecting excess food from commercial businesses and redistributing it;
- Web-based initiatives including Free Resources and Freecycle Dunedin for exchanging resources; and
- Multiple opportunity and second hand stores that take pre-loved items from people and sell them on to others.

2.4 Waste quantities

Understanding the nature of Dunedin's waste and diverted material streams, both quantity and composition, and how it may change is important to be able to manage it in the future. The DCC has access to waste and diverted material data from services or facilities it controls (ie Council's collection service, transfer stations and landfills²). However, it does not have access to data from waste that commercial contractors manage or waste disposed of elsewhere³. This is further complicated by waste that enters and exits Dunedin from other parts of Otago and other regions, which may change over time (eg as other landfills close). Limited data means there is an inherent uncertainty in estimates of waste quantities and type.

Over the last decade, the net tonnage of waste to Green Island landfill has generally increased each year (refer to Figure 2-3), which is consistent with national trends. The sharp increase in waste tonnage in 2017 coincided with the closure of Fairfield landfill and waste being redirected to Green Island landfill. Flood events in 2015 and 2016 contributed to increases in waste disposal in these years.

² Noting that about 80% of the waste received at the Green Island landfill is from non-Council sources

³ Noting that nationally data is only available from levied landfills, which are estimated to only receive about 30% of waste disposed of

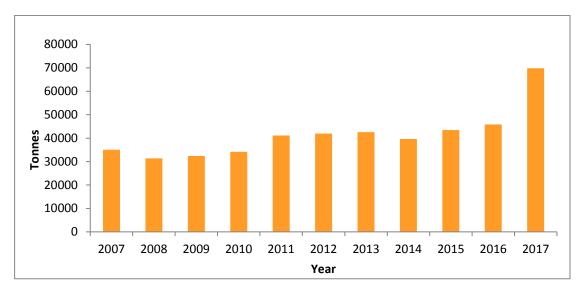


Figure 2-3: Annual tonnage of waste to Green Island Landfill per calendar year, excluding special waste4.

A significant proportion of the waste sent to Green Island is special waste. Special waste is material that requires special handling at the landfill to ensure it does not pose a risk to the environment or human health during the disposal process and includes sludge, animal carcases, asbestos and ashes. The quantity of special waste has been increasing since 2010 (refer to Figure 2-4). In 2017 special waste made up about 13% of waste disposed at Green Island landfill.

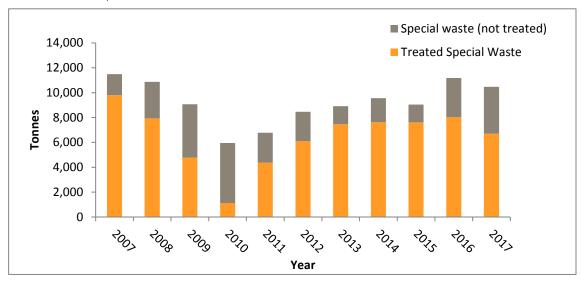


Figure 2-4: Annual tonnages of special waste to Green Island Landfill since 2007⁵

2.5 Waste composition

The estimated composition of waste disposed at Green Island landfill is shown in Figure 2-5. This is based on analysis of waste disposed at the landfill tipping face and hence excludes cover material and special waste (e.g. sludge). Timber and rubble represent the largest proportion of waste going into Green Island Landfill, followed by garden waste and other organics (putrescible material). At the national level, putrescible material, which includes the garden and other organic waste makes up the largest component of the waste stream, followed by plastic and timber⁶.

⁴ Dunedin City Council, 2018, Waste Assessment 2018 (Working Draft).

⁵ Dunedin City Council, 2018, *Waste Assessment 2018 (Working Draft)*. The quantity of special waste accepted by the Green Island Landfill from Landfill 3000. This does not indicate the total special waste produced in Dunedin as some may also be being disposed of at other commercial facilities or fills.

⁶ Ministry for the Environment, 2017, Review of the Effectiveness of the Waste Disposal Levy 2017.

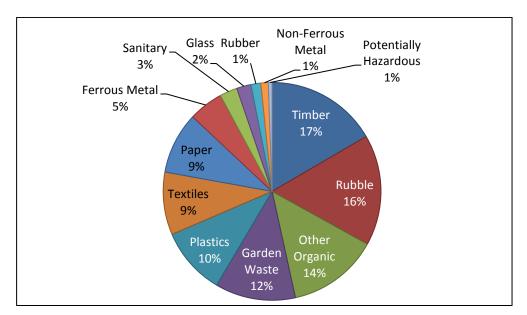


Figure 2-5: Estimated Waste Composition of Green Island Landfill 7.

2.6 Diverted material

The introduction of the new co-mingled recycling service in Dunedin in 2011 resulted in a significant increase in tonnage of diverted material. However over the past five years, the annual tonnage of comingled recyclable quantities has decreased and contamination of kerbside recycling has increased (refer to Figure 2-6). This reduction in recycling quantities aligns with national trends; data from levied waste disposal facilities across New Zealand revealed a 6.3% decrease in the tonnage of diverted materials between the 2014 and 2017 Ministry review periods.

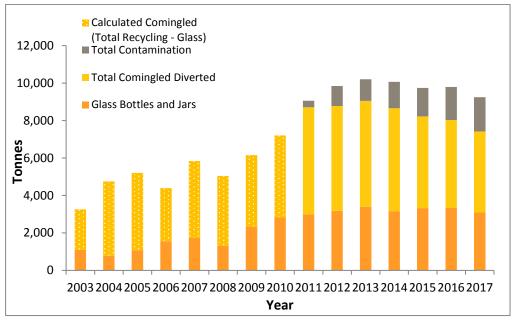


Figure 2-6: Annual tonnes of material diverted from landfill via the DCC kerbside recycling collection service & contamination rates of recycling (Source: DCC)

Residents can also drop off unwanted materials such as such as scrap metal, vegetation, cardboard batteries and gas bottles at the Green Island Resource Recovery Park (RRP) for recycling. Figure 2-7 shows

 $^{^{7}}$ 2012 Solid Waste Analysis Protocol (SWAP) survey results. Preliminary data from the 2018 SWAP survey appears largely consistent to 2012 survey results.

the variety and tonnes of materials diverted from landfill via the RRP; note that kerbside recycling collection service diverts considerably more material than the RRP.

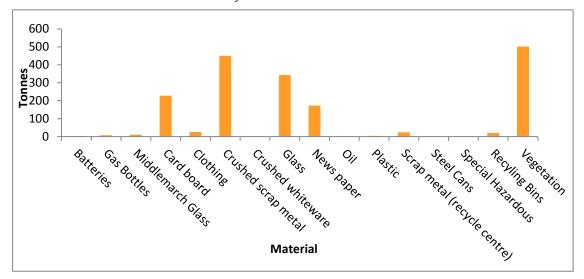


Figure 2-7: Tonnes of material diverted from landfill via the resource recovery area of the transfer station in 2017 (Source: DCC)

2.7 Carbon emissions

In 2015, Council committed to the Compact of Mayors. The aim of the Compact is to reduce Greenhouse Gases (GHGs) and prepare for the impacts of climate change whilst tracking progress on a common platform against other cities worldwide.

An obligation of the Mayors Compact was to undertake an inventory of the sources of estimated gross emissions by the City in 2014/15. Agricultural emissions are Dunedin City's largest source of carbon emissions, followed by transport. While waste represents a small component of the City's overall carbon emissions, the data does not capture the embodied energy of resources lost to landfill (refer to Section 3.3.3). In terms of Council charges under the Emissions Trading Scheme, waste represents the largest source of carbon emissions that the Council may be able to directly influence.

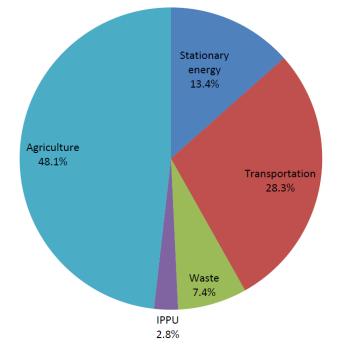


Figure 2-8: Dunedin City carbon emissions by source (Source: DCC)

The greenhouse gas emissions generated from waste in landfills vary depending on the type of material being disposed of. Table 2-1 below identifies the emissions generated by material type, with timber and paper emitting the highest volume of greenhouse gases.

Table 2-1: Greenhouse gas emissions in landfills by material type (Source: Climate Change Amendment Regulations, 2015)

Emitting	NZ Emission Factor	Non Emitting
Timber	3.23	Plastics
Paper	3	Ferrous metal
Textiles	1.8	Non-ferrous metal
Sanitary	1.8	Glass
Garden waste 1.5		Rubble
Other organic 1.13		Rubber
		Potentially hazardous
National Default Factor for emitting and non-emitting	or Landfill Emissions (Calculated using materials)	1.19

When considering the largest components of waste at the Green Island landfill (refer to Figure 2-5), combined with the relative carbon emissions of each material type, timber and paper account for the largest sources of greenhouse gas emissions. Targeting these materials would result in the greatest gains for Dunedin to reduce its greenhouse gas emissions generated from waste. Appendix A provides a perspective on the proportion of the waste and carbon sources at Green Island landfill with the relative ease of diversion of each material type.

Landfill gas from at Green Island landfill is required by legislation to be collected and combusted using a flare to minimise the harmful effects of carbon emissions. This process converts methane to carbon dioxide, which has a significantly lower global warming potential that methane (i.e. 1 verses ~25). Rather than flaring the landfill gas, it can be beneficially used to generate electricity (whilst converting methane). This is currently being done at Green Island landfill to power the Green Island wastewater treatment plant. The impact of reducing methane emissions will reduce the existing power source for the wastewater treatment plant. This impact will need to be considered in the options development and assessment, which is the next stage of the business case process.

2.8 Future demand

2.8.1 Population

Waste production is influenced but is not necessarily directly proportional to the population served. As of the 2013 Census the 'usually resident population' of the Dunedin City area was 120,249 and a number of potential future scenarios are projected by DCC as shown in Figure 2-9. An estimate of Dunedin's population in early 2018 is 129,000 people, which is tracking between the low and medium projections. This demonstrates that currently, population growth is low, and growth may continue to be low in the medium to long term.

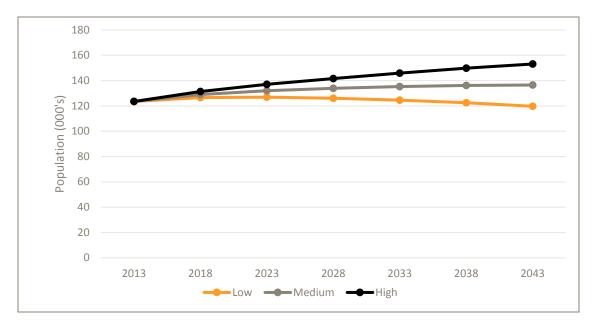


Figure 2-9: Dunedin City area population growth projections⁸

2.8.2 Construction waste

There are a number of significant construction projects planned in Dunedin over the next 10 years. These include the Dunedin Hospital, potential waterfront development and University development projects. These projects will produce a significant amount of construction waste and diverted material, which may be sent to Green Island for processing or disposal, however it may be sent elsewhere depending on cost, unless specific waste reduction criteria are included within the scope of each project. These projects may stimulate population growth.

2.8.3 Civil defence

Civil defence emergencies can produce significant amount of waste, as evident from the Christchurch earthquakes, and the 2015 Dunedin floods. Climate change is predicted to result in an increase in extreme weather events, which for Dunedin is likely to be increased intensity and frequency of flood events. This may therefore lead to a subsequent increase in waste.

2.9 China sword

Historically, China has long been the largest importer for recyclable material, with 50% of the world's market share9. However in June 2017, China adopted the National Sword Policy that halted the entry of 24 materials including paper, plastics and textiles10. This was followed by the Blue Sky 2018 initiative in January 2018 that rejected shipments of recycling with contamination rates greater than 0.5%11.

Since these changes have been implemented, markets for recyclable material have become turbulent, and the monetary value for recycling material has declined. Markets for 3-7 plastics and mixed paper have been particularly affected ⁹ ¹⁰. The lower value for material has led to stockpiling in districts around the country, waiting for material to increase in value to make it viable to sell⁹.

To date, the impact of this policy for Dunedin has been less than for other districts in New Zealand. Recycling material in Dunedin is still being sold due in part to having a separate glass collection leading to a lower glass contamination rate for mixed recycling, and therefore higher monetary value. The material is being sold to markets other than China, however the constraints and downstream effects of the recycling market may impact Dunedin if other countries follow suit with recycling import restrictions.

⁸ Stats NZ. "Subnational Population Projections: 2013(base)-2043 update." Accessed 16/07/2018

⁹ WasteMinz (2018) 'Reboot Recycling, What can Aotearoa Do?' accessed: 23.07.2018.

¹⁰ Rosengren, C. (2018) 'One year Later: How China Has Reshaped US recycling', Waste Dive, accessed 23.07.2018.

¹¹ Waste Management Review (2018) 'China launches Blue Sky 2018 to replace National Sword', accessed 23.07.2018.

2.10 Waste education

Council coordinates and participates in regular waste education activities and initiatives. Some of these activities are listed below:

- Sustainable Living, Food Waste, Zero Waste Parenting, Composting workshops
- EnviroSchools waste minimisation education through the Toimata Foundation, coordinated by the Otago Regional Council
- Tours of landfill
- Events management and minimisation guide
- Kerbside inspection programme
- Orientation Week tent city stall
- Attendance at local events, talks, media, and workshops.

2.11 Closed landfill sites

Council also manages five closed landfill sites. These sites require on-going monitoring and maintenance to mitigate adverse environmental effects. These closed landfill sites are located at Forrester Park, Middlemarch, North Taieri, Sawyers Bay and Waikouaiti.

3. Need for Investment

The development of the Dunedin Waste Futures Strategic Case commenced with a problem definition workshop on 23 July 2018. Participants at the workshop included representatives from Council (staff and Councillors) and the Ministry for the Environment as well as a resident specialising in waste management. Problems, opportunities and benefits of investment were explored during the workshop and evidence to support these are presented below.

3.1 Problems

- 1. Council's facilities and services for waste are no longer fit for purpose, resulting in declining Council influence and increased disposal of waste and resources to landfill.
- 2. Consumerism and lack of product stewardship is generating increasing waste resulting in higher costs to provide and maintain waste facilities, and higher carbon emissions.
- 3. Waste and diverted material systems are complex and confusing for some users resulting in contamination and lower recycling participation rates.

3.2 Problem 1

3.2.1 Council's facilities and services for waste are no longer fit for purpose

Green Island landfill

A crucial issue for Dunedin is Green Island landfill, at current waste filling rates, may reach capacity around the time that resource consents expire in 2023 (i.e. 5 years) and this landfill is currently the only landfill in Dunedin that can accept household waste. While the City has aspirations for Zero Waste, this is unlikely to be achieved in the short term. Dunedin therefore needs a long term solution and assurance for a future waste disposal site to meet the ongoing waste demands of the City.

To plan, consent and build a new landfill is estimated to take seven to ten years and cost around \$30 million. Given the Green Island landfill capacity constraints and that consents expire in five years, an interim solution will be needed. While it may be possible to extend the consent duration beyond 2023 and the consented landfill footprint, this may be challenging and expensive. Preliminary estimates from the landfill workstream suggest the remaining consented capacity at the Green Island landfill will be exhausted by 2023 at the current rate of filling. Some additional capacity may be available if the landfill footprint is extended, however this would require reconsenting and would not provide Dunedin with a viable long term solution. Furthermore, the filling rate may increase; the construction of a new hospital (and demolition of the existing one) and other developments in Dunedin will result in higher volumes of construction waste, increasing the urgency of developing a long term.

Alternatively, Council could send its waste to another landfill, however the household component of the waste needs to be sent to a Class 1 landfill and Green Island landfill is currently the only Class 1 landfill in the City. This may result in loss of control of Dunedin's waste disposal, depending on any contractual arrangement Council secures, and Dunedin may also be more vulnerable and exposed to shocks (similar to that seen as a result of new policies in China) if decisions in relation to acceptance of waste or cost are changed at the receiving landfill(s).

Council have made a public commitment to close the Green Island landfill in the short to medium term. Hence a long term solution is needed to meet the ongoing waste demands of the City. This provides the City with an opportunity to review its waste and diverted material system, and identify new initiatives to enhance waste minimisation practices. While Dunedin is fortunate to have a site at Smooth Hill (near Brighton) that is legally designated under the District Plan for "Proposed Landfilling and Associated Refuse Processing Operations and Activities", further consents would be needed to develop and operate a new landfill which may be challenged by the community.

Market competition

Within Dunedin, there are both private and public (Council) operators that collect and dispose of waste, largely on a user pays basis. Consumers are often price sensitive. However, the application of the waste levy only applies to disposal sites defined in the WMA (which includes Green Island), which are estimated to receive only 30% of New Zealand's total waste disposed to land¹². This makes it difficult for these landfills

¹² http://www.mfe.govt.nz/sites/default/files/media/Waste/Review-of-the-effectiveness-of-the-waste-disposal-levy-2017.pdf

to compete against the private and non-consented landfills that are currently not required to pay the levy. For example, the green waste landfill in Burnside charges \$30/trailer load; by comparison, the cost of disposing of the same waste at Green Island landfill is \$44/trailer load.

Lack of flexibility in system

Council operates its waste and diverted materials services and facilities via six contracts (refer to Appendix B for further details) that range from two to seven years duration. The nature and duration of these relatively inflexible contracts pose the following risks.

- A reduction in waste tonnages at the Green Island landfill will result in reduced revenue for Council. As landfills have relatively fixed operating costs, there will be diminishing returns and potentially additional costs to ratepayers.
- Private contractors have the flexibility to change fees and charges as required. This is not possible for Council facilities, and hence Council may struggle to maintain market share and control over the waste stream. This reduces Council's ability to implement their policy directives.
- Tight procurement timeframes may not allow for innovation, resulting in missed opportunities and reduced procurement competition. Alternatively, existing contacts may be extended/rolled over that have not evolved to encourage either waste or carbon reduction.
- Council staff may not have sufficient time to effectively manage contracts to achieve Council's desired outcomes and objectives.

Lack of investment/ decisions

The need for access to an alternative landfill site to Green Island landfill in the longer term was identified around 30 years ago. A number of studies have been undertaken to investigate development arrangements and governance options for the management of waste and diverted materials over this time. However a lack of progress following these investigations means there is now an urgency to accelerate and prioritise this project. The Council has now invested in the Waste Futures project to take an overarching view of waste management practices in Dunedin. This business case is a key step in enabling informed decision making of the future of Dunedin's waste and diverted material operating models, including any future landfill site.

3.2.2 Declining council influence

With increasing competition and market diversity for the collection and disposal of Dunedin's waste, Council's control of the system is diminishing. Council collects or directly receives just 19% of the waste going to Green Island landfill; the remaining waste is derived from 'other' sources. The main sources are identified in Table 3-1.

Table 3-1: The portion and main sources of waste being sent to Green Island Landfill in 2017 (Source: DCC)¹³

Waste Source	Percentage
DCC	
Transfer Stations (DCC Green Island and rural TS)	3.9%
Sludges from Wastewater Treatment	6.8%
Residential and CBD Black Bags	5.6%
Private	
Construction Demolition	6.4%
General Solid Waste from Residents and Businesses	67.8%
Special waste (asbestos, ashes)	3.7%

Anecdotally, a large portion of the waste to the landfill is from commercial sources. Council could have greater control over this waste and it provides an opportunity for diversion. This should be a focus for programmes.

Changes to Dunedin's weekly residential kerbside collection introduced in 2010 opened up residential waste collection to commercial operators. There are now three suppliers of residential waste collection

¹³ Note that table does not add up to 100%, as there are other minor sources of waste to Green Island landfill.

(including the Council). Council's kerbside waste collection service uses black plastic rubbish bags that can be purchased from the Council's customer service centres or local supermarkets. These cost \$3 for 40 litre bags (\$3.20 for a 60L bag), which includes the cost of collection and disposal. Envirowaste and Waste Management Ltd are private operators that offer a similar service to households using a wheelie bin, with prices starting from \$12.90 per month for an 80L bin.

The introduction of commercial wheelie bin services resulted in a dramatic drop in the sales of black rubbish bags and subsequent shift in control of the domestic waste system (refer to Figure 3-1). Table 3-1 shows that residential and CBD waste collected by Council comprises 5.6% of the waste sent to Green Island landfill. By contrast, waste from residents and business from private contractors made up 67.8% of the waste going to Green Island Landfill in 2017.

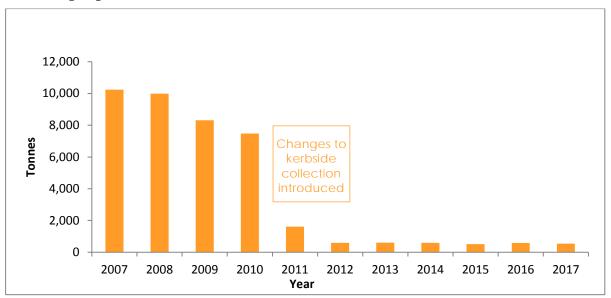


Figure 3-1: Total Tonnes of Waste from DCC Rubbish Bag Collections (Source: DCC)

The declining loss of control of the waste system has numerous consequences for the Council. This includes increasing costs to operate the Council service, as waste operations have fixed costs (such as landfill operational and collection costs) meaning the viability and benefits of investment in Council's services and facilities diminishes. Other potential consequences of Council's declining control over waste collection and disposal include:

- No control on where waste or diverted materials are sent
- Emphasis on commercial activity and profitability of waste management
- Market driven fees and charges¹⁴
- Loss of control of level of service provided in the District
- Loss of control to achieve desired environmental outcomes and potentially negative outcomes for customers
- Potentially less resource recovery
- Loss of access to data and
- Loss of revenue.

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¹⁴ Kate Valley landfill is the main landfill in the upper half of the South Island and landfill gate charges are significantly higher than in the upper half of the North Island where there are several competing landfills.

3.2.3 Increased disposal of waste and resources to landfill

Since the introduction of the \$10/tonne waste levy in 2009, the waste sent to levied landfills in New Zealand has actually increased by 35% (refer to Figure 3-2). It is estimated that New Zealanders produce an average of 734kg of levied waste per person per year 15. Note that the majority (89%) of New Zealand's waste disposal facilities are exempt from the waste levy and no data is available about the waste that is disposed at non-levied facilities, which are estimated to take about 70% of waste. Therefore the actual total waste sent to landfill or otherwise disposed of will be much higher than these estimated figures.

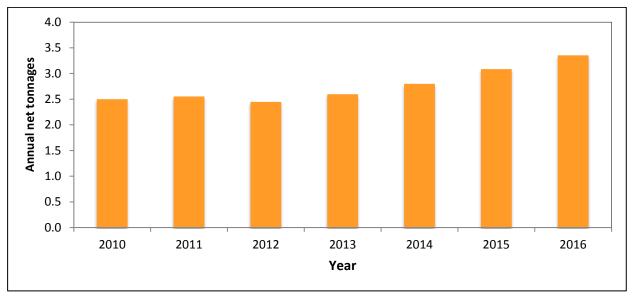


Figure 3-2: Annual net tonnes of waste in New Zealand to levied landfills between 2010 and 2016 (Source: MfE)

Waste produced in Dunedin is on par with national figures; in 2013 it was estimated that Dunedin residents disposed of an average of 716 kg of waste per person per year to landfill¹⁶. Data from Green Island (refer to Figure 2-3 in Context section) demonstrates that the volume of waste disposed of to landfill in Dunedin is generally increasing over time. This trend is likely to continue without key interventions, particularly with the construction of the new hospital in Dunedin (and demolition of the existing site) in the near future. This evidence of increasing waste to landfill in Dunedin provides compelling evidence in support of this problem statement.

3.3 Problem 2

3.3.1 Consumerism and lack of product stewardship generates waste

Consumerism

A key performance indicator for success in capitalist economic systems (such as New Zealand) is measured using the gross national product (GNP); the total of good and services produced by a society in a year. The measure of success for a consumer society is therefore a measure of how much a society consumes. This consumption requires extraction and use of natural resources to produce, process and distribute goods, creating pollution and waste as part of the whole of life cycle of the product 17.

Much of this consumer culture has been driven by business and industry wanting to increase sales and profits, driving a created demand for new products and services¹⁸. However about 93% of the 'raw materials' used are thrown away during the production process, and about 80% of the products

¹⁵ Ministry for the Environment (2017). Review of the Effectiveness of the Waste Disposal Levy 2017. Source: http://www.mfe.govt.nz/publications/waste/review-of-effectiveness-of-waste-disposal-levy-2017 Accessed 16 August 2018

¹⁶ Dunedin City Council (2013). Waste Management and Minimisation Plan 2013.

¹⁷ Robbins, R. (1999). Global Problem and the Culture of Capitalism. Allyn and Bacon, Boston.

¹⁸ http://www.globalissues.org/article/238/effects-of-consumerism

consumers buy are thrown away after a single use¹⁹. The negative environmental, social and economic costs (externalities) generated by the production and disposal of materials are often not costed and are borne by others.

The rise of fast fashion has resulted in enormous amounts of waste, with the clothing and textile industry now considered the second largest polluting industry in the world (after oil). In Australia alone it is estimated that 6000kg of clothing is disposed of to landfill every 10 minutes²⁰. Similarly, a 2013 report²¹ prepared by the Institution of Mechanical Engineers UK estimated that nearly half of the world's food produced is thrown away, either by consumers or due to "strict sell-by dates, consumer demand for cosmetically perfect food, or poor storage facilities".

New Zealand has one of highest volumes of waste per capita in the world (Figure 3-3), and this rate of waste generation has risen substantially since 2012. Note that data is only available from levied waste disposal facilities, which are estimated to receive only about 30% of waste that goes to landfills. This means that the per capita waste production shown in Figure 3-3 is significantly underestimated, and New Zealand may have the highest volume of waste generated per capita in the world.

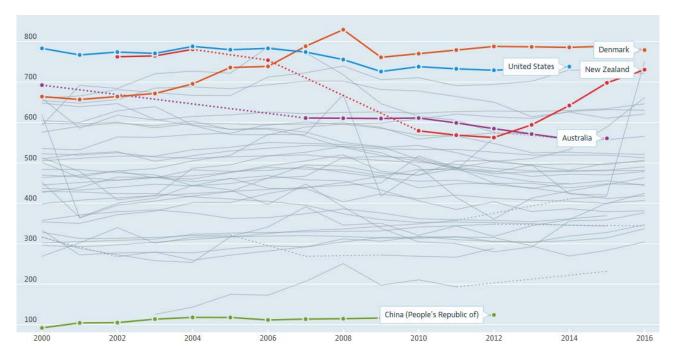


Figure 3-3: Comparison of the municipal waste generated by country (tonnes/capita) between 2002 and 2016 (Source: OECD data²²)

Product Stewardship

Product stewardship is "when a producer, brand owner, importer, retailer or consumer accepts responsibility for reducing a product's environmental impact" (Ministry for the Environment definition²³). This places an obligation on the producers and sellers for dealing with the product at the end of its life to minimise the negative environmental impacts of improper disposal. Currently only voluntary schemes (led by a specific industry or company) operate in New Zealand. An example of voluntary stewardship in New Zealand is the PaintWise initiative introduced by Resene. Resene charges a small levy on the sale of new paint, and allows consumers to bring back unused paint and containers for reuse by community groups,

¹⁹ https://sustainableliving.org.nz/pdf/waste_at_home1.pdf

²⁰ http://www.abc.net.au/news/2017-08-16/fashion-waste-more-research-needed-to-tackle-industry-problem/8807972 Sourced 14 August 2018

²¹ Institute of Mechanical Engineers UK (2014). Global Food: Waste Not Want Not. Source: https://www.imeche.org/docs/default-source/default-document-library/global-food---waste-not-want-not.pdf?sfvrsn=0 Accessed 14 August 2018

²² https://data.oecd.org/waste/municipal-waste.htm

²³ http://www.mfe.govt.nz/waste/product-stewardship/about-product-stewardship

recycling or proper disposal²⁴. This point of difference means that Resene regularly features in the top 10 trusted brands as voted by consumers in New Zealand²⁵. Other examples of product stewardship in New Zealand include the Agrecovery programme, aimed at recovering plastics from the agricultural and forestry sectors; and electrical good recovery services introduced by a number of companies including by Hewlett Packard, IBM, Dell, Fisher & Paykel, Vodafone, and Spark²⁶.

Mandatory product stewardship is allowed for in the Waste Management Act, however regulations to enact this have not been developed as yet. In January 2018, the WasteMINZ Territorial Authority Forum produced the Local Government Waste Management Manifesto²⁷ to highlight the priority actions that the Government needs to implement in order to achieve the Government's goal of minimising waste to landfill. The Manifesto includes actions to implement mandatory product stewardship schemes for a number of industries, particularly tyres, E-waste, and agricultural chemicals and plastics.

Product stewardship laws have been effective in minimising some waste streams in other countries. End-of-life vehicle (ELV) legislation is in operation in parts of Europe and Asia. In the Netherlands a waste disposal levy of €45 is added to the purchase price of new vehicles to pay for the dismantling and recycling of the vehicle at the end of its life. The levy provides a reserve fund to support the industry and it is free to dispose of vehicles for dismantling. As a result, abandoned vehicles are not an issue in the Netherlands, and resources are recovered and diverted from landfills²⁸.

3.3.2 Higher costs to provide and maintain waste facilities

Operational Costs

The estimated operational expenditure and revenue (net) to provide and maintain Council's waste and diverted management systems are provided in Dunedin City's Long Term Plan (2018-2028), and shown in Figure 3-4 below.

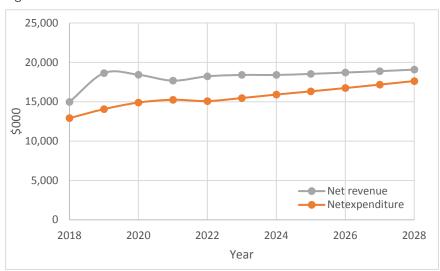


Figure 3-4: Estimated revenue and expenditure statement for the waste management group for 2018 to

While the graph shows a positive net return on expenditure, the returns are diminishing over time. Furthermore, some of the revenue and expenditure streams assume business as usual over the future ten year period. However, there are significant uncertainties in future waste and diverted materials management. There may be substantial increase in costs associated with the waste levy and the Emissions Trading Scheme (discussed below). In addition, no funding has been allocated in the current Long Term Plan to plan for and develop a new landfill site following the expiry of the Green Island landfill consent in 2023 and initial cost estimates for a new landfill are in the vicinity of \$30 million. The Council is undertaking

²⁴ http://www.resene.co.nz/pdf/PaintWise_levy.pdf

²⁵ http://www.trustedbrands.co.nz/default.asp#mostTrusted

 $^{^{26} \, \}underline{\text{http://www.mfe.govt.nz/publications/environmental-reporting/environment-new-zealand-2007-chapter-6-} \\ \underline{\text{waste/current-state-and}}$

²⁷ https://www.wasteminz.org.nz/wp-content/uploads/2018/01/Local-Government-Waste-Manifesto-final-22012018.pdf

²⁸ Cassels, S.M. (2004). Towards Sounds Management of End of Life vehicles in New Zealand. https://mro.massey.ac.nz/bitstream/handle/10179/1614/02 whole.pdf Sourced 14 August 2018

this Business Case process to identify the preferred total solution for the City and will consult with the community on the preferred solution as part of the Annual Plan process in early 2019.

Waste Levy

The introduction of the \$10/tonne national waste disposal levy in 2009 aimed to discourage wasteful behaviour. However the volume of waste has continued to increase since the introduction of the levy (refer to Section 0). The Waste Manifesto includes an action to advocate for an increase in the waste levy to \$140/tonne, and for the levy to be applied to all landfill classes (currently only applies to about 11% of the known waste disposal facilities). Note that during the legislative process to implement the waste levy in 2009, a \$25/tonne levy was proposed, however the lower fee was implemented to reduce the likelihood of illegal dumping²⁹.

The Ministry for the Environment undertook a review of the effectiveness of the Waste Levy in 2017³⁰ and determined that "the levy is not currently achieving its objective". The report recommended that "a staged approach to applying the waste disposal levy across additional classes of landfills and assess the role of a differential rating system" be developed and implemented. This signals that the cost and application of the waste levy will result in higher costs to provide and maintain waste facilities.

Emissions Trading Scheme

In 2008 the Government introduced an Emissions Trading Scheme (ETS) to place a price on greenhouse gas emissions in response to climate change. This requires landfill owners to purchase New Zealand emission trading units (NZU) to cover generated greenhouse gas emissions. These costs are ultimately passed on as user charges for waste collection and disposal services.

A NZU represents one metric tonne of carbon dioxide, with the cost of NZUs determined by the market. When introduced, the price of NZUs was insignificant at less than \$1 per tonne of waste. However the price has increased steadily over the past three years (refer to Figure 3-5); as at 15 August the cost of a NZU is \$24.20/unit (tonne). The implications for Council will be exponential increases in waste disposal costs, as the volume of waste and the cost of NZUs continue to increase. The Council's current estimated liability under the ETS is \$2.2M.

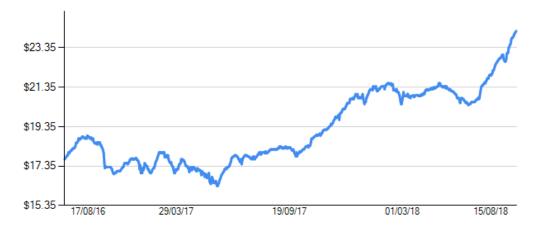


Figure 3-5: Spot price of NZ Trading Units (Source: https://www.commtrade.co.nz/)

3.3.3 Higher carbon emissions from waste

Waste is a significant source of greenhouse gas emissions. In 2014/15 solid waste accounted for 7.4% of total emissions of the City. The quantity of carbon emitted from waste is dependent on the types of materials being disposed. Timber, paper and green waste are the highest emitters, while other materials such as plastics, metal, building rubble and glass are inert and generate no emissions.

Dunedin's waste accounted for 72% of the Council's operational emissions in 2014/15 (refer to Figure 3-6). Of these emissions, almost three quarters were associated with the Green Island landfill, with around a quarter of these emissions coming from other and closed landfills (note that Fairfield landfill was in

²⁹ Ministry for the Environment (2014). Economic Factors of Waste Minimisation in New Zealand. https://www.mfe.govt.nz/.../economic-factors-of-waste-minimisation%20-final.docx Sourced 14 August 2018
³⁰ Ministry for the Environment (2017). Review of the Effectiveness of the Waste Disposal Levy 2017. Source: http://www.mfe.govt.nz/publications/waste/review-of-effectiveness-of-waste-disposal-levy-2017 Accessed 16 August 2018

operation at the time of assessment). Council is liable to purchase carbon credits (NZUs) to offset its landfill emissions as part of the New Zealand Emissions Trading Scheme (ETS) for landfill emissions.

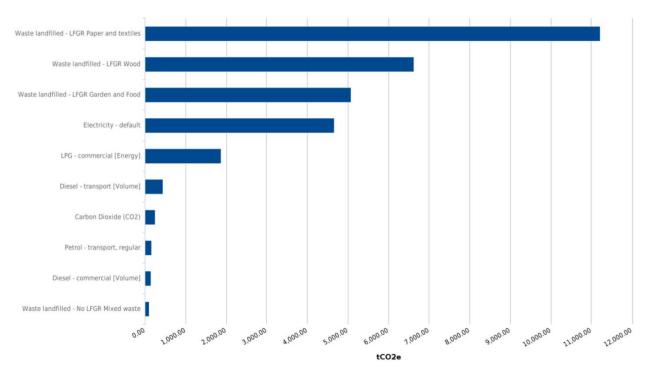


Figure 3-6: Quantity of carbon emitted from different Council activities (Source: DCC Emissions Management and Reduction Plan 2015)

Council has established a target to reduce Dunedin's carbon emissions to net zero by 2050. To achieve this target, greenhouse gas emissions from all sources will need to be minimised, and any remaining emissions offset (e.g. by planting forests). For waste this means minimising waste to landfill as well as operating the landfill to minimise fugitive methane emissions, as while methane and carbon dioxide are both greenhouse gases, methane is over 25 times more detrimental to the atmosphere than carbon dioxide. This includes having an effective landfill gas collection with flaring (and possibly beneficial use).

Embodied energy

In addition to the carbon emitted following the disposal of a product, consideration of the energy required to convert raw materials into a product, known as embodied energy, also needs to be considered. Energy is needed at all stages of product development and manufacturing, from design, production, distribution, use, as well as disposal.

Eunomia Consulting in 2015³¹ found that the actual climate change impacts on a per tonne basis from disposal appear quite small compared to the positive impacts from recycling (which avoids energy used in extracting raw materials and their processing) and, most notably, waste prevention (which avoids energy use throughout whole chain). This is shown in Figure 3-7.

Focussing efforts on waste prevention followed by recycling, particularly of dry materials (notably aluminium and textiles), will provide Council with the greatest benefits in relation to reducing total carbon emissions.

³¹ Eunomia Consulting (2015). The Potential Contribution of Waste Management to a Low Carbon Economy. http://www.eunomia.co.uk/reports-tools/the-potential-contribution-of-waste-management-to-a-low-carbon-economy/ Sourced 14 August 2018

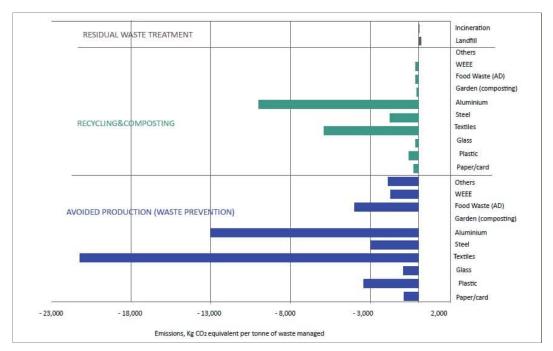


Figure 3-7: Indicative climate change impacts of key waste management activities (excluding biogenic sources)³²

3.4 Problem 3

3.4.1 Waste and diverted material systems are complex

The waste and resource recovery services and facilities in Dunedin are complex and diverse. Dunedin has public and privately operated collection services and landfills; rural and urban facilities that offer inconsistent services; varying management of household, construction and demolition waste, and special waste (such as sludges, hazardous waste, medical waste, asbestos); and specific resource recovery streams for numerous products such as e-waste, recyclables and glass. Figure 3-8 below aims to depict the complexity of the numerous waste and diverted material streams available in Dunedin.

³² Eunomia Consulting (2015). The Potential Contribution of Waste Management to a Low Carbon Economy. http://www.eunomia.co.uk/reports-tools/the-potential-contribution-of-waste-management-to-a-low-carbon-economy/ Sourced 14 August 2018

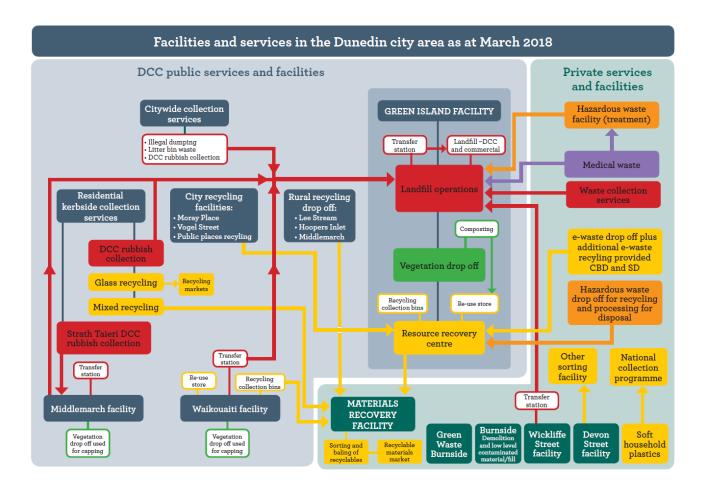


Figure 3-8: Dunedin waste and diverted material flow chart (DCC Waste Assessment 2018)

3.4.2 Contamination of systems

The complexity and inconsistency of the waste and diverted materials system means that residents and businesses may not be aware or familiar with the various schemes in place. While residents are not permitted to dispose of paint, batteries and gas bottles in waste bags and bins, many residents find it difficult, inconvenient or expensive to properly dispose of this waste as it involves travelling to a landfill or transfer station and often paying for disposal.

Recycling services vary across New Zealand, and some residents may be unfamiliar with what can and can't be recycled in Dunedin. Many well-intentioned residents undertake wish-cycling, where questionable items are put in the recycling bin hoping they can somehow be recycled. This often includes products that consist of mixed materials, such milk and juice cartons and coffee cups, as well as soiled paper and cardboard (e.g. pizza boxes). Another common form of contamination is plastic bags.

In Dunedin, the rate of contamination of recycling bins has been increasing (refer to Figure 2-6). Contaminated recycling reduces the value of the diverted materials, and in some cases may result in the materials being sent to landfill. In 2017, 1830 tonnes of recycling was contaminated, representing nearly 20% of all recycling. By comparison, only 347 tonnes of recycling was contaminated in 2011(3.8% of recyclable material collected). This low rate is potentially due to Council's corresponding education efforts to support the introduction of the new recycling service in 2011.

Nationally, the average contamination rate of recycling is around 9%. To combat Dunedin's high contamination rate, Council introduced kerbside inspection audits in 2017. The Council audited 3000 bins and following the checks, the contamination rate of assessed bins dropped from 11% to 7.1%³³.

³³ Dunedin City Council website. Source http://www.dunedin.govt.nz/services/rubbish-and-recycling/recycling-inspections Accessed 17 August 2018

3.4.3 Lower recycling participation rate

Dunedin's kerbside recycling scheme was introduced in 2003. Changes to the recycling service were implemented in 2010, with the introduction of a comingled bin service and separate glass collection. This initiative resulted in a substantial increase in recycling participation (refer to Figure 2-6), with 8,700 tonnes of recyclable material diverted from landfill in 2011. This value has gradually decreased over the last 5 years, and by 2017, only 7,400 tonnes was diverted from landfill. This is consistent with decrease in diversion seen nationally. In Dunedin, the decrease is due to a reduction in the quantity of comingled recyclables (ie cardboard, tins, plastics) as the quantity of recycled glass and bottles has remained constant.

While there may have been some gains in changing consumer behaviour towards the upper tiers of the waste minimisation hierarchy that may have resulted in a decrease in recycling (e.g. reduce, reuse), overall the national and local data (refer Figure 3-2 and Figure 2-3) demonstrates that waste generation is increasing. This suggests that the recycling participation rate is likely to be decreasing.

An audit undertaken in 2017 found that 11% of the contents in Council's rubbish bags was recyclable (e.g. glass, paper, rigid plastic, aluminium and steel). An assessment of the composition of the Green Island landfill in 2012 found that nearly 30% of what was being sent to the landfill could have been recycled (refer to Figure 2-5 in Context section). This situation is unlikely to be unique to Dunedin as the composition of waste disposed of to landfill in Dunedin is generally similar to national data.

There are clearly opportunities to increase the rate of recycling in Dunedin. However the complexity of Dunedin's waste and diverted materials systems, the lack of education and the lack of incentives to encourage recycling are likely to have resulted in reducing recycling participation rates in Dunedin. Some communities in other regions have achieved impressive diversion rates, however these are driven by community groups strongly reliant on volunteers rather than through Council services delivered in larger centres.

3.5 Opportunities

3.5.1 Work towards zero waste

One of the guiding principles of Dunedin's Waste Management and Minimisation Plan is to work towards zero waste. It is a visionary goal that aims to guide people towards a more sustainable lifestyle and practices, where discarded materials are conserved and repurposed.

3.5.2 Circular economy

A circular economy is a system that aims to "keep resources in use for as long as possible, extracting the maximum value from them whilst in use, then recovering and regenerating products and materials at the end of each service life³⁴". A circular economy (also colloquially known as 'closing the loop') is an alternative to that traditional linear economy where natural resources are taken, made into a product and then disposed of. The linear approach gives little consideration for the resources consumed, and what happens to the product at the end of its life, generating waste and carbon emissions. Figure 3-9 illustrates the comparison of the linear and circular economies.

As part of Council's waste minimisation efforts, Council can seek opportunities to 'close the loop'. As one of the largest cities in the South Island, there may be wider regional benefits and economies of scale to develop recovering and regeneration industries that can provide employment opportunities and economic growth benefits.

³⁴ https://www.mfe.govt.nz/waste/circular-economy



Figure 3-9: Comparison of a linear and circular economy (Source: Ministry for the Environment³⁵)

3.5.3 Demonstrate leadership

Council is committed to modelling zero waste practices within its organisational culture, and minimising waste generation as part of delivery of core services. The Council can also demonstrate leadership across the region and New Zealand through the implementation of innovative waste minimisation and resource recovery practices and initiatives. As the largest City in Otago/Southland, Dunedin has the opportunity to develop coordinated solutions for the region with enhanced efficiencies, opportunities for employment, and economic development for region. Note that the Otago Regional Solid Waste Section 17a review³⁶ completed in 2017 recommended a single sub-regional landfill for Dunedin City, Clutha District and Waitaki District Councils.

3.6 Benefits of investment

3.6.1 Minimise waste

Investing in solutions that contribute towards minimising waste increases the lifespan of a landfill and may result in lower carbon emissions generated from waste decomposition. These benefits will reduce overhead costs, achieve Council's high level strategic goals in relation to waste and carbon as well as Council's requirements under the WMA, and align with community expectations.

3.6.2 Maximise recovery

Maximising recovery will reduce the volume of diverted materials ending up in landfill. This will ultimately minimise waste, and achieve the benefits described above, including increasing landfill lifespan and contributing to policy goals and outcomes. Increasing the volume of products that can be reused and recycled may enhance the viability of local recycling markets, conserve raw materials, and reduce energy requirements and carbon emissions associated with extraction and product manufacturing.

3.6.3 Equitable regulation

Improvements to regulation of landfills, and consistent application of the waste levy to cover all types of landfill is likely to increase Council's influence on the waste and diverted material market. In addition to extending the waste levy to apply to all classes of landfill, a number of Councils are advocating to substantial increases to the waste levy charge. The Local Government Waste Manifesto considers the waste levy is the single most powerful tool available to the Government to reduce waste and improve resource efficiency and recovery.

³⁵ http://www.mfe.govt.nz/waste/product-stewardship/about-product-stewardship

³⁶ Section 17a under the Local Government Act was introduced in 2014 requiring local authorities to review the costeffectiveness of current arrangements and consider options for the governance, funding and delivery of infrastructure, local public services and local regulation.

3.6.4 A system that meets user expectations

The evidence highlighted in this business case demonstrates that current waste and diverted material systems and complex, which is impacting on consumer's ability to access services, resulting in increasing costs and harmful environmental effects. Investing in a system that is convenient, cost effective, and applied consistently across the City will enable people to dispose of their waste and diverted materials in an environmentally sustainable manner. A user-friendly system will succeed in meeting community expectations and contribute towards Council's Waste Minimisation and Management goals.

3.6.5 Minimise environmental impacts

The Council is undertaking a review of existing systems through its Waste Assessment. This will inform the business case process in identifying the optimum future operating model for Dunedin's waste and diverted material to enable Council to move towards its goal of a zero waste future. This will contribute to reductions in greenhouse gas emissions generated from waste, as well as reducing other harmful effects from waste including leachate, noise, litter, odour and vermin.

3.7 Summary

An assessment of the evidence generally supports the problems statements that were developed following the stakeholder workshop in July 2018. However there is not a clear link to demonstrate that increased disposal of waste to landfill is a result of Council's facilities and services not being fit for purpose, nor due to a declining Council influence (Problem Statement 1). Rather, the increased disposal of waste is in part occurring due to confusing and complex systems that is resulting in contamination and lower recycling participation (Problem Statement 3). As such, the problem statements have been slightly amended to reflect these changes. These changes are highlighted in the Investment Logic Map shown in Figure 3-10 below, along with the investment objectives that will be used to assess potential programmes of work. Baseline and target measures (KPIs) will be further developed in the next stage of work (Part B of the Programme Business Case).

Delivering a sustainable solid waste system for Dunedin

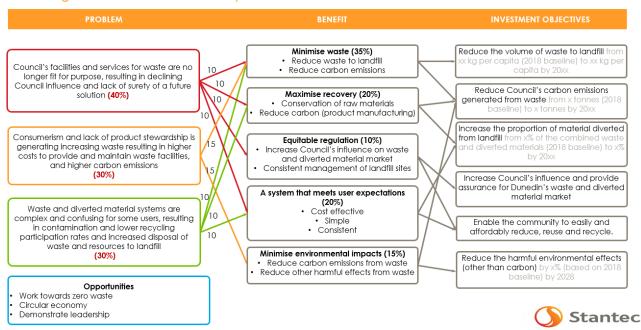


Figure 3-10: DCC Waste Futures Investment Logic Map

4. Partners and Key Stakeholders

There are a number of partners and key stakeholders with interest in this business case. Consultation with the Stakeholder Engagement Groups will be undertaken through the groups developed for the Waste Minimisation and Management Plan (WWMP). The responsibilities and focus of each stakeholder in relation to this business case are also summarised in the table.

Table 4-1: Partners and Key Stakeholders

Stakeholder	Responsibilities and Focus
Dunedin City Council (DCC)	Dunedin City Council provides and manages development, infrastructure and community services across the largest geographic area in New Zealand. DCC has a statutory responsibility to promote effective and efficient waste management and minimisation within its district and currently provides waste and diverted material services and facilities in both urban and rural areas. DCC is also responsible for managing Dunedin's land resource and the building consent process.
Otago Regional Council (ORC)	Otago Regional Council (ORC) is responsible for managing Otago's land, air and water resources on behalf of the community. ORC regulates the environmental effects of waste disposal facilities by granting and monitoring resource consents and can also play a role in facilitating a collaborative approach to waste management and minimisation amongst territorial authorities.
Ministry for the Environment	Ministry for the Environment (MfE) is the part of central government responsible for caring for, managing and investing in the natural resources of New Zealand. MfE is responsible for implementing and administering the legislative framework for managing and minimising waste as well as the harmful effects associated with waste.
iwi	Representatives from Ngai Tahu and local runanga have been invited to participate in the process to provide a perspective on matters of importance to local iwi. Of relevance to this business case is the Maori concept of kaitiakitanga, which expresses an integrated view of the environment and recognises the relationship of all things. Kaitiakitanga represents the obligation of current generations to maintain the life sustaining capacity of the environment for present and future generations.
Stakeholder Engagement Groups	DCC set up working parties comprising local residents, local business owners and other interested parties to participate in the development of the latest Waste Management and Minimisation Plan (WMMP). Four WMMP working parties have been established; organics, rural areas, tertiary precinct and construction and demolition (C&D). Issues and options raised by the working parties will feed into the business case development, with further feedback sought as the business case develops.
Saddle Hill Community Board	Saddle Hill Community board provides advice to the DCC on matters affecting their community and advocates for the interests of their community. Particularly of relevance to this business case is that both the existing Green Island landfill and the designated Smooth Hill landfill site are within the Saddle Hill community area.
Otago Chamber of Commerce	Otago Chamber of Commerce provide businesses with a range of services and advocate with a view of promoting and encouraging business growth and opportunity through the Otago region. There are potential waste and diverted material-related business opportunities in Dunedin and Otago, including job creation.
Neighbouring Councils	Taking a collaborative approach to waste management and minimisation across territorial authorities may provide opportunities that may not otherwise be achievable by DCC alone.

5. Strategic Context

5.1 National

5.1.1 Resource Management Act 1991

The Resource Management Act 1991 (RMA) is New Zealand's main piece of legislation that sets out how the environment should be managed. The purpose of the RMA is to promote the sustainable management of natural and physical resources.

In the RMA sustainable management means managing the use, development, and protection of natural and physical resources in a way which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:

- sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations
- safeguarding the life-supporting capacity of air, water, soil, and ecosystems
- avoiding, remedying, or mitigating any adverse effects of activities on the environment.

5.1.2 Local Government Act 2002

The Local Government Act empowers councils to promote the well-being of communities.

The purpose of local government as given in Clause 10 is to:

- a) to enable democratic local decision-making and action by, and on behalf of, communities; and
- to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.

Solid waste collection and disposal is identified as a core service to be considered by a local authority as required to promote public health. The landfill is also one of Council's strategic assets.

5.1.3 New Zealand Waste Strategy 2010

The New Zealand Waste Strategy 2010 (NZWS) has two high level strategic goals:

- reduce the harmful effects of waste
- improve the efficiency of resource use.

The NZWS recognises that in order to reach these goals, the responsibility is shared among all New Zealanders, central Government, local government (regional councils and territorial authorities), the waste industry, businesses and communities. The NZWS provides the high level strategic direction for waste management and minimisation activities nationally, which underpins a suite of legislation, regulatory tools and best practice guidelines.

5.1.4 Waste Minimisation Act 2008

The Waste Minimisation Act 2008 (WMA) encourages a reduction in the amount of waste generated and disposed of in New Zealand and aims to lessen the environmental harm of that waste. The WMA also aims to benefit the economy by encouraging better use of materials throughout the product lifecycle, promoting domestic reprocessing of recovered materials and providing more employment.

The WMA seeks to achieve its aims by:

- Imposing a levy on all waste disposed of in landfills
- Providing government accreditation of product stewardship schemes which recognises businesses and organisations that take responsibility for managing the environmental impacts of their products
- Requiring product stewardship schemes for 'priority products' where there is a high risk of environmental harm from the waste or significant benefits from recovering the product
- Allowing for regulations to be made to control the disposal of products, materials or waste, require take-back services, deposit fees or labelling of products
- Allowing for regulations to be made that make it mandatory for certain groups (e.g., landfill facility operators) to report on waste to improve information on waste minimisation
- Clarifying the roles and responsibilities of territorial authorities with respect to waste minimisation.

Local authorities have responsibilities that they must adhere to as part of the Waste Minimisation Act 2008, including a commitment to 'promote effective and efficient waste management and minimisation'.

5.1.5 Climate Change Response Act 2002

The Climate Change Response Act 2002 puts in place a legal framework to enable New Zealand to meet its international obligations under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. The Act enables the New Zealand Emissions Trading Scheme (ETS) and establishes a national inventory agency to record and report greenhouse gas emissions information. There are seven regulations and four orders under this Act covering a broad scope of activities including waste, forestry and fossil fuels as well as general exemptions and unique emissions factors. Operators of disposal facilities have specific obligations under the NZ ETS. These Regulations are frequently updated to update technical factors, confirm assumptions and improve the accuracy of reporting.

5.1.6 Hazardous Substances and New Organisms Act 1996

The Hazardous Substances and New Organisms Act 1996 (HSNO) and its regulations control the import, manufacture, use and disposal of manufactured chemicals that have hazardous properties.

The HSNO Act prohibits the import or manufacture of a hazardous substance unless it is done under an approval. An approval sets controls (rules) for the substance throughout its lifecycle such as requirements for storage, identification, emergency management and disposal. The approval covers the lifecycle of the substance until it is disposed of according to the controls on the approval (e.g, treating it so that it is no longer a hazardous substance or exporting it from New Zealand as a waste).

5.1.7 Litter Act 1979

The Litter Act was established to make better provision for the abatement and control of litter. The Act is a basic mechanism for local government to prevent littering.

The functions of the Act include:

- establishing enforcement officers and litter wardens who may issue fines and abatement notices for litter offences
- allowing territorial authorities to force the removal of litter
- allowing public authorities to make by-laws pursuant to the provisions of the Act.

5.2 Regional

5.2.1 Regional Policy Statement

The proposed Regional Policy Statement (RPS) was notified in 2015 and decisions released in 2016 were the subject of appeals. The proposed RPS is still in the Environment Court appeal stage but hearings have occurred and most of the proposed RPS has been settled via mediation. This means that the proposed RPS should be operative within the next six months or so. The provisions of the proposed RPS do not appear to be directive regarding landfills, but do require minimisation of effects on the environment.

As outlined below the various regional plans are due for review and are expected to have regard to any proposed RPS (s 66[2][a]) and to be consistent with any operative regional policy statement (s66[2][d]). It is possible that with the impending Operative RPS, and Otago Regional Council's (ORC) requirement to ensure a regional plan gives effect to any regional policy statement (section 67[3][c] of the RMA) will result in either changes to or a full review of the plans listed below.

5.2.2 Regional Plan: Waste for Otago (1997)

The purpose of the Regional Plan: Waste for Otago (the Waste Plan) is to provide an integrated approach to waste issues with the aim of reducing the adverse effects associated with Otago's waste stream. To achieve this, the Waste Plan has policies and methods (that include rules) to address the waste issues facing Otago. The Waste Plan was made operative in April 1997 and was due for review in 2007.

The Green Island landfill will require new consents regardless if it is operated beyond 2023 as consents are required for a closed landfill site. New landfills with discharges onto land, air and water have discretionary activity status under Rule 7.6.1, while the discharge of hazardous waste also has discretionary activity status under Rule 5.6.1.

5.2.3 Regional Plan: Air for Otago (2003)

The purpose of the Regional Plan: Air for Otago (the Air Plan) is to promote the sustainable management of Otago's air resource. To achieve this, the Air Plan has policies and methods (that include rules) to address the air quality issues facing Otago. The Air Plan was made operative in January 2003 and was due for review in 2013.

If a discharge to air is not offensive or objectionable at the site boundary and is 20m from a formed road and 150m from a public amenity it is a permitted activity under Rule 16.3.7.1. Other discharges to air have a discretionary activity status under Rule 16.3.7.3.

5.2.4 Regional Plan: Water for Otago (2004)

The purpose of the Regional Plan: Water for Otago (the Water Plan) is to promote the sustainable management of Otago's water resources. To achieve this, the plan has policies and methods (that include rules) to address issues of use, development and protection of Otago's freshwater resources, including the beds and margins of water bodies. The Water Plan was made operative in January 2004 and was due for review in 2014.

The Water Plan covers a number of activities that may require consent depending on the landfill site location (proximity to a significant wetland or aquifer), construction and engineering. Relevant rules include:

- Taking of surface water (discretionary activity) under Rule 12.1.5
- Taking of surface water for land drainage under Rule 12.1.2.6 (permitted activity if there are no adverse effects)
- Taking of groundwater and diversion for land drainage under Rule 12.2.2.2 (permitted activity if there
 are no adverse effects)
- Discharge of stormwater and contaminants into land where it may enter water (restricted discretionary activity) under Rules 12.B.3 and 12.C.2
- Discharge of water from an industrial or trade premise (discretionary activity) under Rule 12.B.4; and
- Drilling (restricted discretionary) under Rule 14.2.3.

5.3 Local

5.3.1 Waste Management and Minimisation Plan 2013

Under the Waste Minimisation Act 2008, Council has an obligation to 'promote effective and efficient waste management and minimisation' and, for this purpose, to 'adopt a waste management and minimisation plan'. Dunedin's Waste Management and Minimisation Plan establishes Council's high level strategic vision and guiding principles, outlines how the Plan will be funded, sets measurable performance indicators and provides a summary of Council's Waste Assessment. The waste assessment describes the existing provision of waste and diverted materials facilities and services in Dunedin. The Plan covers collection, recovery, recycling, treatment and disposal, services and facilities in Dunedin, including waste minimisation promotion and education, whether provided by the DCC or others.

The vision for the DCC Waste Management and Minimisation Plan 2013 (WMMP) is that "Dunedin is a zero waste city where resources are valued by the community, enhancing the health of our environment, economy and people."

The current Waste Management and Minimisation Plan was developed and adopted by the Council in September 2013 through a public consultation process. A new plan is currently being developed in tandem with this business case process, and consultation on Dunedin's 'Waste Future' will be undertaken through the 2019 Annual Plan process.

5.3.2 Environment Strategy: Te Ao Tūroa – The Natural World 2016–2026

The purpose of Te Ao Tūroa is to identify actions and initiatives that safeguard the natural environment, and strives to improve the health of areas that have become degraded. While everyone in the community has a responsibility of environmental guardianship, the DCC recognises its role to promote positive environmental outcomes in its roles as provider, funder, facilitator and advocate. The strategy builds on existing work, and aims to guide the Council's efforts to look after, respect and enjoy the natural environment now and into the future.

The core aims of Te Ao Tūroa are to:

- set the direction for a future safe from climate change impacts
- improve and maintain the health of Dunedin's natural environment
- give Dunedin people every opportunity to feel connected to and look after the environment.

One of the three high level goals of the Environment Strategy is 'Dunedin is resilient and carbon zero'. The Strategy identifies how the DCC aim to achieve this goal, which include the following initiatives in relation to waste:

- reduce greenhouse gas emissions
- minimise waste
- deliver a low carbon transport system
- make sure our infrastructure supports positive environmental outcomes
- develop resilient and sustainable supply chains
- use natural resources with future generations in mind.

5.3.3 Dunedin's Long Term Plan 2018-28

Dunedin's Long Term Plan 2018-28 outlines the services and activities the DCC plan to provide over the following decade, however it is reviewed every three years. The current Long Term Plan was adopted in June 2018, and also sets key performance measures for core services. For waste management these are:

- Overall satisfaction with rubbish disposal services
- The quantity and quality of diverted material collected via DCC's collection service for diverted material.

Note that funding and revenue for the waste management group contained within the Long Term Plan is based on business as usual; the Plan does not recognise the issues in relation to the expiration of the Green Island landfill resource consent. No funds have been allocated to develop a new landfill site, nor any investment to improve Dunedin's waste and resource recovery services.

However, the Council is carrying out this Business Case process to identify the preferred total solution for the City and will consult with the community on the preferred solution as part of the Annual Plan process in early 2019. This will enable additional funding to be allocated for these initiatives through the Annual Plan process, as it will be a variation to the investment strategy/budget as established in the 2018-28 LTP.

Conclusions

A summary of the key findings and conclusion for each of the problem statements and opportunities is provided in Table 6-1 below.

Table 6-1: Summary of Key Findings and Conclusions

Problem/ Opportunity Councils facilities and At the current rate of waste There is a pressing need for long services for waste are generation, Green Island landfill is term assurance for waste disposal no longer fit for expected to reach capacity around given the consent for Dunedin's purpose, resulting in the time resource consents expire in only landfill that can accept declining Council five years and there is no other household waste may reach influence and lack of landfill in Dunedin that can accept capacity around time consents surety of a future household waste. A solution for expire in 2023. Investigation of a solution. waste disposal for Dunedin City is future site and potential methods urgently needed. Extending the of waste disposal needs is a priority consent duration and consented and should be progressed urgently. landfill footprint may be possible, but The evidence highlights that will only provide a stop gap Council's existing waste and measure, as there is limited available diverted materials systems are not capacity at the site. meeting customers' needs. There is strong evidence to Therefore exploration of options to demonstrate Council's influence on improve collection and recovery of the waste stream is declining. diverted materials, and identify Producers of waste are choosing to options and markets for new materials should be investigated to use waste services offered by private contractors as these are provide a service that meets community expectations and perceived as more cost effective and/or convenient. needs. Commercial sources of waste are a significant portion of the waste stream. It provides scope to sustainably divert material from the landfill and should be a focus of programmes considered. Consumerism and lack New Zealand's consumer culture is Dunedin needs to make significant of product leading to high volumes of waste. improvements to reduce waste to landfill in order for the Council to stewardship is Evidence demonstrates that New generating increasing Zealand has some of the highest achieve its waste and carbon waste resulting in volumes of waste generated in the reduction goals. higher costs to provide world. The evidence shows that the Council should continue to and maintain waste volume of waste being generated in advocate at the national level for facilities, and higher Dunedin is also increasing over time. the implementation of levers and carbon emissions Costs to provide and maintain waste equitable regulation that can facilities are increasing due to a influence waste and diverted number of factors including material streams. increasing operational costs, diminishing revenue and increasing Council should also consider costs to purchase emissions trading options to expand waste units to offset carbon emissions from education efforts, promote waste. Substantial increases to the initiatives that align with the upper waste levy are possible, which will tiers of the waste hierarchy (avoid, incur significant additional costs to reduce, reuse) and introduce waste disposal. initiatives (and support communityled initiatives) that discourage resource consumption and waste. These options will be considered in the next stage?

Problem/ Opportunity	Key Findings	Conclusion
Waste and diverted material systems are complex and confusing for some users resulting in contamination and lower recycling participation rates and increased disposal of waste and resources to landfill	Dunedin's has numerous streams to manage waste and diverted materials, and these systems are varied, complex, and inconsistent. This is confusing for customers, and evidence demonstrates a significant proportion of recycling contamination in Dunedin. Furthermore, the volume of material diverted from landfill has been decreasing in recent years, while waste volumes to landfill are increasing.	A widespread review of the current waste and diverted materials systems is needed to identify the key gaps and flaws, as well as new and emerging opportunities. The implementation of an integrated system is needed that is affordable, user friendly and support behaviours towards the upper tiers of the waste hierarchy.
Work towards zero waste	This aligns with the vision of Council's WMMP.	The project provides Council with an opportunity to review current processes and invest in a system that will enable Council to work towards its goal of zero waste.
Circular economy	Reusing resources or 'closing the loop' aligns with Council's and goals of the WMMP.	Investing in a system that values and repurposes resources will enable the Council to move closer towards its goal of working towards zero waste, and minimise the environmental impacts of waste.
Demonstrate leadership	As one of the largest cities in the region, Dunedin has the opportunity to coordinate waste minimisation and resource recovery efforts that can support smaller Councils in the region and beyond.	Options that enable collaboration across the region and beyond should be explored that may have the added benefit of supporting economic development and employment opportunities.

7. Next Steps

After reviewing the evidence it is recommended that Part B of the Programme Business Case (PBC) is commenced without delay to develop a long term solution to manage Dunedin's waste given that the Green Island landfill resource consent expires in 2023. Part B of the PBC presents the Council with the opportunity to identify a preferred medium to long-term waste and diverted material operating model. The results from the Council's recent review of Dunedin's waste and diverted material streams (carried out as part of the Council's Waste Assessment) can be used to inform and develop options and identify innovative initiatives to manage existing and potentially new waste and diverted material streams. These options will ultimately be packaged into a programme of works that will enable Council to work towards their zero waste vision and achieve the desired benefits of investment.

The development of a Programme Business Case for Dunedin that is consistent with the Council's Waste Management and Minimisation Plan will:

- Review current processes and identify alternative methods to manage waste and diverted material
- Consider diverted material services that meet the expectations and needs of the community as well as the market
- Identify options that provide medium to long-term assurance for waste disposal for Dunedin residents and evaluate those options using a method which reflects the problems, benefits and opportunities identified in this Strategic Case.
- Enable integrated planning and investment in future waste and diverted materials services and facilities
- Provide certainty and clarity for investors (public and private)
- Ensure services and facilities can meet current and projected future demand, and
- Ensure future solutions reduce impacts on the environment.
- Diversion of material from the commercial sector should be a focus because it provides good opportunity to develop sustainable diversion routes.

Part B: Developing the Programme

TBC

Part C: Implementing the Programme

TBC

Appendix A Waste and carbon emission reduction

A list of the most common materials found in the waste stream is show below, along with the proportion of these materials disposed of to the Green Island landfill and the associated proportion of carbon emissions based on the 2012 SWAP survey. The relative ease of diversion is also shown in the table (red = most challenging, yellow = some challenges and green = well established).

Table A-1: Waste and Carbon Emission Reduction

Waste Stream	% Waste	% Carbon	Comment	Ease of Diversion
	17%	40%	NZ emission factor: 3.23; 40% of GHG emissions at Green Island landfill.	
Timber			Treated timber is difficult to divert. Untreated timber could be diverted for reuse or though composting (e.g. MDF)	
			Non-emitting	
Rubble	15%	0%	Rubble used for engineering work for the Green Island Landfill is still classified as waste.	
			Rubble could be separated and disposed of at C&D landfill	
Paper	9%	20%	NZ emission factor: 3; 20% of GHG emissions at Green Island landfill.	
		2070	Paper recycling is well established	
Other		0%	Non-emitting	
recyclables (Plastic, Glass, Metals)	18%		Outlets for these materials already existing. May in part be from Central Business District where kerbside recycling is not available.	
	12%	13%	NZ emission factor: 1.5; 13% of GHG emissions at Green Island landfill.	
Garden waste			Garden waste can be processed into compost at household level or at a community level and on sold (if there are reliable markets).	
Other			NZ emission factor: 1.13; 13% of GHG emissions at Green Island landfill.	
organic waste	14%	11%	Kitchen waste can be processed at household level (compost, worm-farm) or composted at a community level and on sold (if there are reliable markets).	
Textiles	9%	12%	NZ emission factor: 1.8; 12% of GHG emissions at Green Island landfill.	
			Some local textile recycling.	
6		Note 1	Note 1: not included in SWAP survey	
Special waste -	Note 1		NZ emission factor: 1.13	
sludge			Wastewater treatment plant residuals can be processed for beneficial use, if there are reliable markets	

Appendix B Current Council contracts

Council provides a number of key waste and diverted materials services via the contracts identified in Table B-1 below.

Table B-1: Council Waste Contracts

Contract	Annual Value	Existing Contract Term	Estimated costs for services provided (per annum)
C7642 – Rural Skip Days and Rural Transfer station operation Waste Management	\$180,000	1 Oct 2017 - 30 June 2019	Transportation and disposal of waste from 2 TS sites (MM and W). 30k Staffing for the TS. 50k Staffing for Rural Skip Days. 25k Overheads, H and S etc. Dayworks and provisional sums. 40k Information about services on DCC website
C3345 - Kerbside Refuse and Recyclables Collection and Processing Envirowaste	\$3,600,000	30 June 2011 - 30 June 2018, 1-year extension to 30 June 2019	Based on approx. 50,000 rated households. The collection of colour sorted glass and mixed recycling. 2.8m The collection and disposal of bags (covered by bag sales). 700k Additional services. University area, Rural recycling collection points. 60k
C3448 - Central Activity Area Litter Bins and Recycling Stations Servicing McCallums	\$530,000	1 Oct 2013 - 30 June 2018, 1- year extension to 30 June 2019	Litter bins and Public Places Recycling bins that WES service (some are serviced by Parks contractors). And Nightly collection of bags 360K Illegal dumping (other departments also involved) 42k Maintenance and installation etc of bins 15k Cardboard collection 2 nights per week 72k Services of the 2 city recycling hubs 30k
C3629 - Official Rubbish Bag Manufacture and Distribution	\$100,000	1 July 2013 - 30 June 2018, 4 month extension to 31 October 2018	Production, distribution and management of the DCC official rubbish bags. 100k
C6863 – Landfill Environmental Monitoring and Reporting	Not applicable	1 July 2018 – 30 June 2021 + 3 years	The scope of work includes; Environmental sampling and reporting of the 4 closed landfill sites and GILF. Some auditing of sites and additional work. Resource Consents outline the extent of the work.
C6865 – Green Island Landfill and Transfer Station Management	\$3,000,000	1 July 2018 – 30 June 2025	Overheads 300k, Landfill operations 450k, rummage 530k and weighbridge operations 130k, variable portion based on tonnage of waste in the gate 1.4 m. Dayworks 200k.

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