



Increase resource
recovery



Flatline waste to
landfill



New recovery
infrastructure



No new landfills
scheduled

Recycling and Waste Management Strategy

2018 - 2027

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Executive Summary

Purpose and Alignment

The Bayside City Council's strategy to reducing the impact of waste generated by the Bayside community that is disposed to landfill is a commitment to meeting community expectations that are addressed by Goal 5 - Environment of the Council Plan 2017-2021:

Council and the Bayside community will be environmental stewards, taking action to protect and enhance the natural environment, while balancing appreciation and use with the need to protect natural assets for future generations.

The Council Plan also specifies the action to develop a new Recycling and Waste Management Strategy focusing on community education and behaviour change in preparation for the introduction of food waste to the green organics kerbside collection and to address the increasing costs of landfill and haulage of waste.

Reducing waste to landfill by increasing the recovery of resources is a demonstration of the Bayside Better Place Approach, whereby Council's dedicated professional staff, with an ongoing focus on efficiency, provide core services to improve liveability for the Bayside community.

The Bayside Environmental Sustainability Framework (ESF), which was adopted by Council in 2016, also identifies *Waste Management* as a strategic objective to influence Council's operations, and scheduled the development and implementation of a Recycling and Waste Strategy as a high priority deliverable to achieve this objective.

The Problem

Growing volumes of waste and the practice of landfilling is a critical global issue that requires urgent action at domestic, municipal and regional levels. The disposal of waste to landfill (landfilling) is problematic for the following reasons:

- *Increasing cost of landfilling:* the Victorian State government's approach of increasing regulations for new landfills and charging a levy to all disposed material has increased the cost of landfilling, a cost which is borne directly by the community through the municipal waste charge;
- *Inefficient use of resources:* waste materials that could be recovered for re-use, recycling or conversion to energy; and
- *Potential environmental impacts:* the decomposition of organic matter under anaerobic conditions in landfills produces methane, a potent greenhouse gas. Landfills have also been known to contaminate land, groundwater and freshwater streams when liners and caps fail. Ongoing monitoring and management of landfills is required to address these risks.

Furthermore, consumerism and the proliferation of product packaging generates large quantities of recyclable material from households that is dependent on demand from manufacturing industries in overseas countries (predominately China) for the local recycling industry to be viable. Demand from China for recyclables has waned over recent years due to an increase in affluence of the middle class and a cultural shift to consumerism occurring in China over the past 10 years, resulting in a large volume of recyclable material being available locally within China and other Asian countries. Also, persistently low global commodity prices make virgin manufacturing materials more competitive than recyclables that need to be collected, sorted, processed and transported long distances. Both of these factors have influenced the cost of Council's kerbside recycling service.

Vision

In this context, the following vision has been set for this strategy:

The Bayside community prioritises the avoidance of waste in the first instance, then re-uses and recycles to recover resources when waste is generated and Council utilises technology, such as waste to energy, to divert as much residual waste from landfill as possible.

Goals and Strategic Objectives

This vision is described further by five guiding themes that are supported by strategic objectives (listed as dot points under each theme) that have been used to guide the development and implementation of the Recycling and Waste Management Strategy:

1. Waste reduction, avoidance and re-use

- Increase waste avoidance and recycling
- Integrate waste reduction and avoidance in Council's procurement process
- Promote re-use

2. Resource recovery and recycling

- Improve source separation
- Rationalise the management and use of existing waste facilities
- Increase diversion of food and garden organics
- Source alternate waste treatment opportunities
- Review efficiency improvements to Council recycling and waste arrangement services
- Influence waste behaviour of commercial enterprises

3. Governance and policy

- Promote user pays principle
- Data collection and evidence
- Monitoring and evaluation of services and strategy
- Integrate waste management into planning

4. Environment and public amenity

- Achieve carbon neutrality
- Reduce litter
- Reduce illegal dumping
- Reduce marine impacts
- Maintain social licence
- Support sustainable practices within local businesses

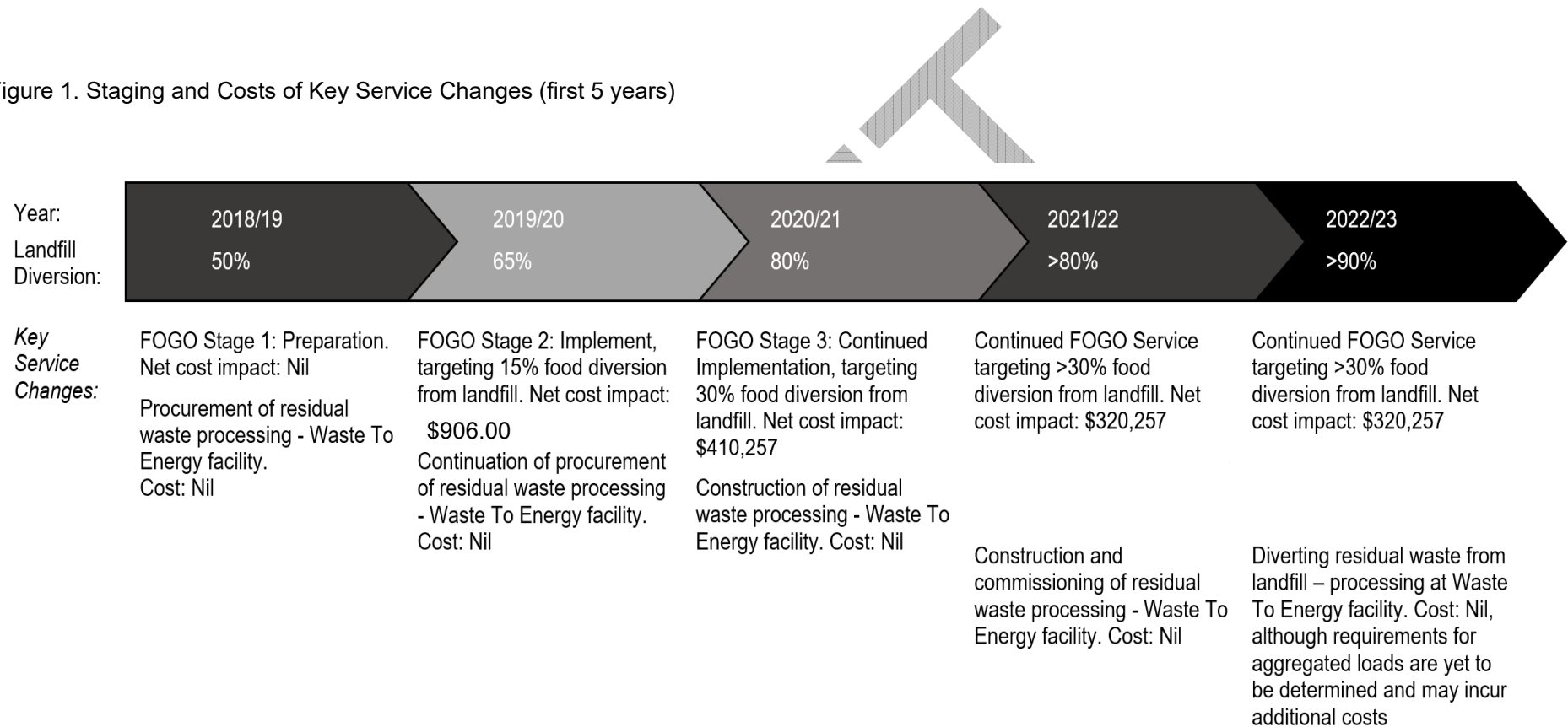
5. Engagement

- Measure and improve the community's satisfaction
- Measure and influence community recycling attitudes and behaviours
- Maintain transparency and confidence in the recycling system
- Engage and participate in regional and state waste management forums

Key Service Changes and Costs of Strategy

Key service changes involved in the strategy actions involve the introduction of household food waste recycling via the green organics kerbside bin collection service (FOGO) and the procurement of advance waste processing facilities to divert residual waste from landfill. An action to investigate the suitability of a user-pays hard rubbish collection may reduce service costs in the future (if implemented), however this has not been included as a financial consideration of this Strategy. The timing and costs associated with these changes are depicted below in Figure 1.

Figure 1. Staging and Costs of Key Service Changes (first 5 years)



The net cost of the actions listed in this Strategy over the next 10 years is \$6.5 million. The timing of the implementation of the actions has been determined to ensure the municipal waste charge to residents is not increased (beyond cpi) over this period.

The staging and associated cost impacts of the key service changes associated with this Strategy are based on certain assumptions that will require ongoing monitoring and management to ensure these changes are implemented successfully. Examples of these assumptions are summarised as:

- The staged implementation of FOGO considers the constraint of the expiry dates for the existing garbage and green organics collection contracts and that household behaviour change on source separating food waste will be modest at first (7%) and increase gradually over the following two years supported by sustained community engagement, education and promotion by Council over this period. The costs of implementing FOGO includes the provision of caddies or compostable bags to only a portion of Bayside households for temporary storage of food prior to transfer to the kerbside organics bin given storage solutions need to be flexible and tailored to the varying sizes and layouts of resident's kitchens. Again, the importance of household source separation of food organics to the success of the FOGO service needs to be a focus of Council's ongoing community engagement activities.
- The procurement of advanced waste resource recovery (AWRRT) facilities to process residual waste (garbage) to further divert this material from landfill is considered to have a negligible net cost impact to current service costs in this Strategy on the basis that the AWRRT services will only be established in the marketplace by being cost competitive with current landfill disposal fees.

1. Action Plan

The strategic objectives were used to develop a set of actions that Council will implement over the next ten years to achieve the objectives of this strategy. These actions are presented in the following tables.

Each action has been annotated with an indicator of whether it is currently accommodated within the Long Term Financial Plan (LTFP), an indicative preliminary cost and the timeframe for completion.

Funding of Actions

A number of options exist to source funding for the proposed actions contained within the Recycling and Waste Management Strategy:

Deliver as part of future operational budget

A number of the actions identified within the Strategy are already foreshadowed in Council's operational budget or LTFP. Other actions requiring a funding allocation from Council's annual operating budget will be considered as part Council's annual budget planning process.

Deliver as part of future capital works programs

A number of the actions identified within the Strategy are already foreshadowed in Council's four-year capital works program or LTFP. Other actions requiring a funding allocation from Council's annual capital works program will be considered as part Council's annual budget planning process.

Federal and State government grants

There will be opportunities to apply for funding from the Federal and State governments for the implementation of some actions contained within the Strategy. For example, the delivery of the Household Detox service provided at the Transfer Station was funded from the funding from Sustainability Victoria.

Deliver within other proposed infrastructure projects

Maximise opportunities to implement new facilities when other projects are being delivered to reduce costs and increase the reach of each annual budget.

New Initiatives

New initiatives are identified programs that are not incurred on an annual basis. Actions seeking new initiative funding are considered on an annual basis as part of Council's budget planning process.

Council operates with a municipal charge for waste and recycling services. The costs associated with this service provision are required from service area via the municipal charge.

Theme	1. Waste reduction, avoidance and re-use				
Objectives	#	Actions	LTFP?	Budget	Year/s
Increase waste avoidance and recycling	1.1	<p>To assist the community, develop and implement annual community engagement and education campaigns that leverage regional and State government messaging for community behaviour change, involving:</p> <ul style="list-style-type: none"> • Design a range of promotion and education campaigns and shift attitudes to raise awareness of the need to reduce consumption and increase recycling within the broader community. • Expand education and behavioural change programs to encourage correct source separation of household waste and recyclables. • Review promotional messaging on kerbside collection trucks to communicate Council's commitment to recycling and identify loads to landfill. • Continue to promote the benefits of home composting and provide guidance to the community. • Develop a plan to promote all waste services provided by Council, to increase community awareness and understanding of the services available. 	✓	\$40,000	Ongoing (annual)
	1.2	<p>To support commercial traders,</p> <ul style="list-style-type: none"> • Design a range of activities promoting recycling within local businesses, sporting clubs, schools and the general community. • Engage with commercial enterprise to determine the best resource recovery options as a pre-cursor to behaviour change and develop behaviour change plans to influence waste operations of commercial enterprises in retail and industrial hubs and promote/educate. • Engage with all commercial food premises to encourage them to arrange for private collections of food scraps and/or promote installation of the on-site digester units. 	✓	\$20,000	Ongoing (annual)
	1.3	<p>To assist Council staff,</p> <ul style="list-style-type: none"> • Develop staff education and behaviour change programs to increase waste avoidance and reduce contamination of waste from the Corporate Centre and other satellite sites. • Promote the use of reusable cups as an alternative to disposable takeaway coffee cups 	✓	\$1,000	Ongoing (annual)

Integrate waste reduction and avoidance in procurement process	1.4	<p>Integrate sustainable procurement within Council's Procurement Policy and procurement decisions to ensure the following criteria are routinely implemented:</p> <ul style="list-style-type: none"> • Source and use recycled, organic and environmentally friendly products and materials for Council needs and operations according to Circular Economy principles. • Consider economic, social and environmental impacts in purchasing decisions, valuing a non-linear supply chain approach. 	✓	\$22,000	2018/19
	1.5	Require active participation by contractors and recyclers in and contributing to community education activities when assessing quotation/tender submissions.	✓	-	Ongoing as tender opportunities arise
	1.6	Participate in Municipal Association of Victoria's LEAP Procurement Program to identify and prioritise sustainable procurement opportunities and improvements according to the recycling and waste hierarchy	✓	-	2018/19
	1.7	Review community facility leases to ensure waste management and recycling provisions, controls and reporting are included.	✓	-	Ongoing as lease opportunities arise
Promote re-use	1.8	Assist the operator to develop the 'Tip Shop' at the Transfer Station to promote waste re-use and resource recovery.	✓	\$20,000	2018/19

Theme		2. Resource recovery and recycling			
Objectives	#	Actions	LTFP?	Budget	Year/s
Improve source separation	2.1	Expand education and behavioural change programs to encourage correct source separation of household waste and recyclables (within Action 1.1).	✓	-	Ongoing
	2.2	Increase the frequency of soft plastics collection services at the Community Recycling Stations.	✓	\$10,000	2018/19
	2.3	Expand the Community Recycling Station service to other Council owned facilities and buildings.	✓	\$50,000	Ongoing (annual)
	2.4	Provide larger paper recycling bins next to shredder bins around the Corporate Centre.	✓	-	2018/19
Rationalise the management and use of existing waste facilities	2.6	Investigate and evaluate new waste handling techniques (e.g. Dirty Material Recovery Facilities (DMRF), Pre-Sort Facilities, Waste to Energy (W2E), etc.) working with Metropolitan Waste resource Recovery Group (MWRRG), contractors and Sustainability Victoria.	✓	\$5,000	Ongoing (annual)
Increase diversion of food and garden organics	2.7	<p>Introduce FOGO collection in stages:</p> <ul style="list-style-type: none"> • Roll out compulsory green waste bin service to all households. • Introduce food organics to existing green waste service. • Create, execute and manage a comprehensive, evidence based waste education and communications plan to prepare and manage implementation of FOGO program. • Evaluate the benefits of kitchen caddies. • Following an implementation transition, reduce the frequency of service for residential general waste in 2021/22. • Evaluate if the bins sizes and colours need to conform to industry standard. It may be less of a disruption to residents to keep the bins the same size. 	✗	\$4.3M	2018/19 – 2027/28
Source waste to energy (W2E)	2.8	Evaluate and adopt alternate waste treatment technologies to divert residual domestic garbage from landfill on the basis that this treatment is cost competitive with current landfilling costs. This will be conducted as per a regional approach with the Metropolitan Waste and Resource Recovery Group (MWRRG).	✓	-	2018/19 – 2022/23

Theme	2. Resource recovery and recycling				
Objectives	#	Actions	LTFP?	Budget	Year/s
Review efficiency improvements to Council waste services and contracts	2.9	Promote additional hard waste collection services and the Transfer Station on Council website. Additional utilisation of the transfer station by residents would reduce the cost of the hard waste collection service.	✓	\$10,000	2018/19

Theme	3. Governance and policy				
Objectives	#	Actions	LTFP?	Budget	Year
Promote user pays principle	3.1	Promote additional hard waste collection services (user-pays) and the Transfer Station on Council website.	✓	-	Ongoing (annual)
	3.2	Investigate the suitability and community appetite for a shift to a user-pays hard rubbish collection as a means of: <ul style="list-style-type: none"> providing a price signal to residents encouraging waste avoidance, re-use and recycling rather than seeking to dispose of material through the kerbside hard rubbish collection; and providing a more equitable service offering by removing a cross-subsidy to the hard waste service that is utilised by a fraction of households despite the costs of the service being supported by all residential waste charges. 			
Data collection and evidence	3.3	Commission regular bin audits for kerbside and public place services to establish evidence base for proposed actions and monitor outcomes.	✓	\$20,000	Ongoing (annual)
	3.4	Gather and maintain data for Multi-Unit Developments (MUDs) general waste and recycling collections by working with private commercial service providers.	✗	\$20,000	2019/20
Monitoring and evaluation of services and strategy	3.5	Monitor, evaluate and report strategy performance according to strategy metrics.	✓	\$15,000	Ongoing (annual)
	3.6	Address the quantity and resource recovery rates of waste generated by MUDs not included in Council's reporting framework to drive awareness and improvement in this area. (as part of Action 1.1)	✓	-	2019/20
Integrate waste management into planning	3.7	Develop and enforce planning policy for waste management infrastructure requirements for MUDs.	✓	-	2019/20
	3.8	Consider sustainable design principles for design, construction, operation and fit outs at the planning stage for new developments.	✓	-	2019/20
	3.9	Explore the feasibility of marking bin collection areas and target area parking restrictions, to manage congestion and access to laneways.	✓	-	2019/20

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Theme		4. Environment and public amenity			
Objectives	#	Actions	LTFP?	Budget	Year/s
Reduce litter	4.1	Upgrade ageing bin infrastructure in public areas with innovative waste solutions.	✓	\$20,000	Ongoing
	4.2	Address the changed smoking laws by installing additional Cigarette Butt Bins, freestanding and attached to the existing litter stations.	✓	\$15,000	Ongoing
	4.3	Assess the frequency of public bin collection during peak and seasonal times.	✓	\$20,000	2018/19
Reduce illegal dumping	4.4	Collaborate with other councils on pooling resources to target illegal dumping.	✓	-	Ongoing
Reduce marine impacts	4.5	Continue advocacy for a ban on plastic bags	✓	-	Ongoing
	4.6	Evaluate effectiveness of existing gross pollutant traps (GPTs) and install further GPTS in all flow-in pollution risk areas.	✓	\$300,000	2020/21
Maintain social licence	4.7	Manage Council's facilities to reduce impact on environment and neighbours.	✓	-	Ongoing
Support sustainable practices within local businesses	4.8	Develop initiatives in sustainable business practices to support local businesses to operate more sustainably.	✗	\$15,000	2019/20
	4.9	Adopt a methodology for sustainable business certification.	✓	\$5,000	2019/20

Theme 5. Engagement					
Objectives	#	Actions	LTFP?	Budget	Year/s
Measure and improve the community's satisfaction	5.1	Collect feedback on the community need for and service satisfaction with the Transfer Station.	✓	\$5,000	2018/19
Maintain transparency and confidence in the recycling system	5.2	Implement a reporting regime with the Transfer Station operators to monitor and improve recycling and landfill diversion rates.	✓	\$10,000	2019/20
Engage and participate in regional and state waste management forums	5.3	Understand and support new developments and legislative initiatives, such as new policies, product stewardship, waste bans, and other activities.	✓	-	Ongoing (annual)
	5.4	Attend and contribute to all relevant forums, meetings and policy planning with National, State and local authorities, industry organisations and interest groups, advocating for measures to increase landfill diversion.	✓	-	Ongoing (annual)
	5.5	Partner with authorities and interest groups to explore new technological, infrastructure and service methodology opportunities.	✓	-	Ongoing (annual)
	5.6	Collaborate with MWRRG and neighbouring Councils to adopt alternate waste treatment	✓	-	Ongoing (annual)

2. Glossary

Abbreviation	Definition
APC	Australian Packaging Covenant
APCO	Australian Packaging Covenant Organization
AS	Australian Standard
ATRA	Australian Tyre Recycling Association
AWT	Advanced Waste Treatment
BCC / Council	Bayside City Council
BR&WTS	Bayside Recycling & Waste Transfer Station
C&I	Construction and Industrial Waste
CAG	Community Advisory Group
CCT	Compulsory Competitive Tendering
CDS	Container Deposit Scheme
COAG	Council of Australian Government
CO ₂	Carbon dioxide
CO ₂ -e	Carbon dioxide equivalent
DHHS	Department of Housing and Human Services
DMRF	Dirty Materials Recovery Facility
EIP	Environmental Improvement Plan
EPA	Environmental Protection Authority
ESD	Environmentally Sustainable Design
ESF	Environmental Sustainability Framework
FET	FOGO Engagement Team
FFC	Full Fuel Cycle
FOGO	Food Organics, Garden Organics
GHG	Greenhouse gas, also referred to as CO ₂ -e
hh/y	Household per year
ISO	International Organization for Standardization
KT	1,000 tonnes
LCA	Life Cycle Analysis
LEAP	Leading Efficiency and Analytics Program
LG	Local Government
LGA	Local Government Association
LGP	Local Government Procurement
LGPRF	Local Government Performance Reporting Framework
LTB	Let's Talk Bayside publication
MAV	Municipal Association of Victoria
MBT	Mechanical and Biological Treatment
MGB	Mobile Garbage Bin
MRA	MRA Consulting Group
MRL	Melbourne Regional Landfill
MSW	Municipal Solid Waste
MUDs	Multi-Unit Dwellings
MWRRG	Metropolitan Waste and Resource Recovery Group
NGER	National Greenhouse and Energy Reporting
SE	South East
SEMTS	South East Melbourne Transfer Station

Abbreviation	Definition
SEOP	South East Organics Processing
SFLC	Sandringham Family and Leisure Centre
SV	Sustainability Victoria
SWIRP	State-wide Waste and Resource Recovery Infrastructure Plan
TBL	Triple Bottom Line
TDF	Tyre Derived Fuels
W2E	Waste to Energy
RWMS	Recycling and Waste Management Strategy
VLAA	Victorian Litter Action Alliance

Waste Terms

Contamination refers to any material placed in a recycling bin (comingled recycling or organics) that is not specified as accepted for recycling by the waste processing facility.

Kerbside Collection is the collection of waste materials from the front boundary of a dwelling/ business, alongside the kerb of a street.

Leakage of recyclables refers to recyclable material that is disposed of in residual waste bin, instead of a recycling bin, resulting in loss of resources.

Recyclable refers to solid waste materials that are able to be recovered, processed and used as a raw material for the manufacture of useful new products.

Residual Waste refers to all waste materials that have not been separated out for recycling and are destined for landfill disposal.

Contamination Rate is a measure of the proportion of incorrectly disposed of, or non-recyclable material in a recyclable materials stream.

$$\text{Contamination Rate} = \frac{\text{Total weight of all non recyclable material}}{\text{Total weight of recyclable material stream}} \times 100$$

Recycling rate is a measure of the proportion of the total waste stream that is collected for recycling. The recyclable material streams include both the comingled recycling and organics material streams.

$$\text{Recycling Rate} = \frac{\text{Total weight of recyclable material stream}}{\text{Total weight of garbage and recyclable material streams}} \times 100$$

Resource recovery rate is a measure of the proportion of a material that is recovered compared to the overall amount of that material in all bin systems. This rate excludes material sent to landfill by recycling facilities in the total weight of recovered materials.

$$\begin{aligned} \text{Resource Recovery Rate} \\ = \frac{\text{Total weight of recovered material}}{\text{Total weight of material across all waste collection streams}} \times 100 \end{aligned}$$

3. Purpose

Goal 5 of the Council Plan 2017 – 2021 which relates to the Environment includes the Strategic Objective of reducing the Bayside community's volume and percentage of waste that goes to landfill. The Council Plan also lists the action to develop a new Recycling and Waste Management Strategy focusing on community education and behaviour change in preparation for the introduction of food waste and the increasing costs of landfill and haulage.

The Bayside community of 102,800 residents produce 45,050 tonnes of waste every year, of which over 23,600 tonnes end up at the landfill. At current rates and allowing for population growth, Bayside residents will be contributing almost 30,000 tonnes of waste to landfill by 2036.

The disposal of waste to landfill (landfilling) is problematic for the following reasons:

- Increasing cost of landfilling: the Victorian State government's approach of approving less airspace for new landfills and charging a levy to all disposed material has increased the cost of landfilling, which is borne directly by the community through the municipal waste charge;
- Inefficient use of resources: waste materials that could be recovered for re-use, recycling or conversion to energy; and
- Environmental impacts: the decomposition of organic matter under anaerobic conditions in landfills produces methane, a potent greenhouse gas. Landfills have also been known to contaminate land, groundwater and freshwater streams when liners and caps fail. Ongoing monitoring and management of landfills is required to address these risks.

The proportion of Bayside's residential waste material diverted from landfill has remained at 50% over the past three years, despite ongoing efforts to increase community recycling and resource recovery behaviour through promotion, engagement and education the total amount of waste and recycling has increased.

The purpose of the Recycling and Waste Management Strategy 2018 is to guide the planning and delivery of Council's recycling and waste management services over the next ten years with the aim of meeting the goals set in the Council Plan 2017-21 and Environmental Sustainability Framework 2016 of increasing diversion of waste from landfill by 60% in 2020 and 75% in 2025.

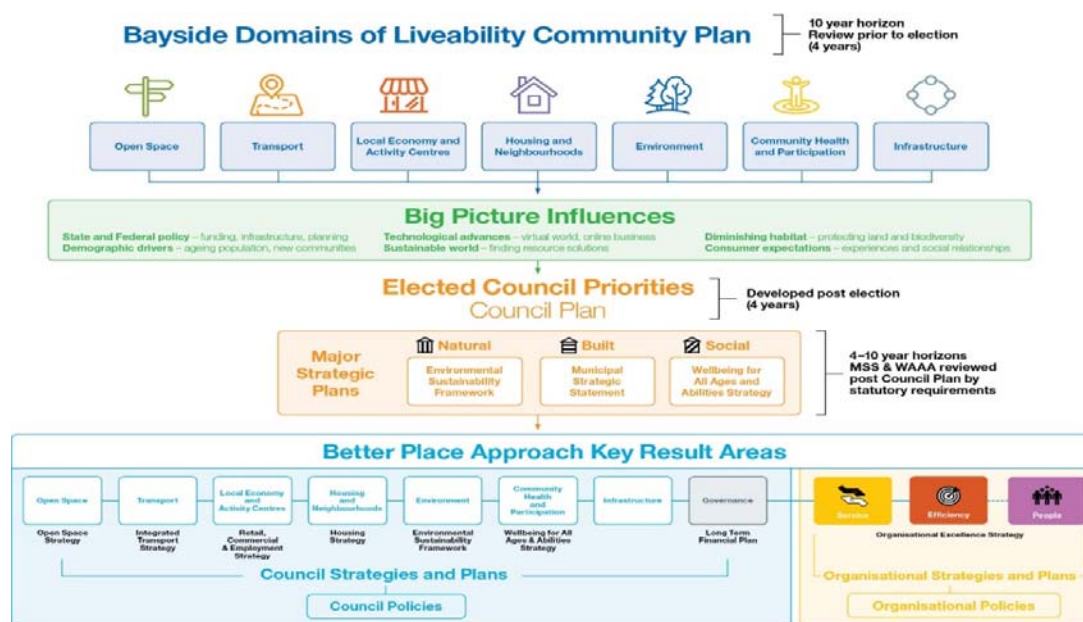
To achieve an increase in diversion of waste from landfill of 10% in next 3 years followed by another 15% in 5 years, Council and the community need to work together to adopt a new approach to waste – reduce waste generation by addressing consumption, introduce effective waste separation at source, especially organics, and continue to improve the current recycling practices.

4. Council's Better Place Strategic Planning Framework

The Recycling and Waste Management Strategy (the Strategy) is an integral part of Council's Better Place Strategic Planning Framework and is aligned with both the Community Plan 2025 (which identifies the environment as one of seven domains of liveability), the Council Plan 2017 – 2021 and the Environmental Sustainability Framework 2016 – 2025.

The relationship between Council's Better Place Strategic Planning Framework and the Strategy is illustrated in Figure 1 below.

Figure 2. Bayside City Council Better Place Strategic Planning Framework



Built on community aspirations expressed through the Bayside Community Plan 2025, the Council Plan 2017-2021 aims to ensure that Bayside continues to enjoy its status as one of the most livable places in the world's most livable city.

Figure 3. Making Bayside a Better Place



Transforming Bayside into a better place, one that is sustainable and liveable, is a journey toward a different future. This pathway forward requires a connected community with a shared sense of belonging, ownership and accountability. These elements are imperative if we want to create a resilient community and a thriving, natural environment, as we tackle challenges

such as resource depletion, species loss, technological change and complex health and economic drivers. Climate change amplifies each of these challenges.

There is an ongoing need to realise improvements through planned initiatives and programs to ensure Council's substantial investment in infrastructure and service provision are utilised to achieve best outcomes. Further, there are opportunities for Council to adopt a more sustainable approach to improve waste management operations.

Promotion of Council's recycling and waste management operations as an essential service would also improve community awareness and understanding of the environmental, economic, and social challenges faced by this service.

Bayside's Recycling and Waste Management Strategy supports making Bayside a better place through the vision presented below in Section 7.

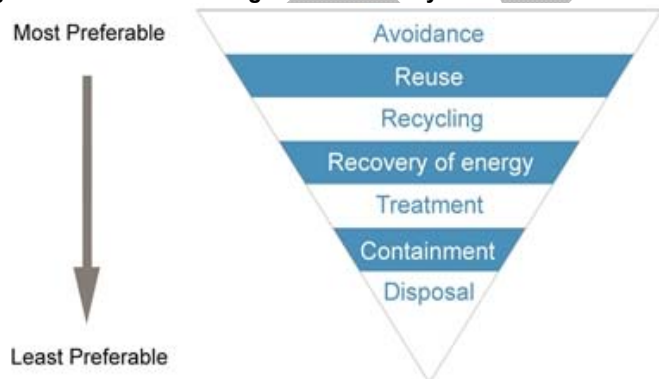
5. Scope

This Strategy involves the following aspects of Council's recycling and waste management services involving:

- Advocacy to State government agencies responsible for the recycling and waste management sector in Victoria;
- Engagement and education to support behaviour change within the community;
- Provision of recycling and waste collection, processing and disposal services;
- Customer service;
- Delivery of infrastructure assets, including ongoing operations and maintenance.

These services apply individually or in combination to each aspect of the waste management hierarchy, as defined in the Environmental Protection Act 1970 and depicted in Figure 3 below.

Figure 4. The Waste Management Hierarchy



A central concept to waste management in Victoria is that of efficient resource management. As per the hierarchy, where the generation of waste cannot be avoided, waste needs to be available for reuse or recycling options. A wide number of products and materials, especially packaging can be efficiently recycled and used to produce new products again – cardboard, glass, some plastics, metals, etc.

Waste that cannot be recycled that contains some calorific value can be used for energy generation. A number of new technologies that have proven track records in Europe and Asia are emerging for use in greater Melbourne.

Following the waste to energy process, relatively low quantities of residue remain that are required to be landfilled, unless identified for re-use or recycling potential.

Although landfill disposal remains the least preferred option in the waste management hierarchy, 50% of domestic garbage (much of which having value to higher levels in the hierarchy) currently end up in landfill.

The timeframe for the implementation of this strategy is ten years (2018 to 2027). It is anticipated that the success of the implementation of this Strategy will be reviewed by the midpoint of this timeframe.

6. Key principles

Bayside City Council is a provider of kerbside recycling, green waste and garbage collection, processing and disposal services to the community. Council is also a regulator of local laws related to illegal dumping and is an active member of the waste industry advocacy and interest groups.

Bayside's Recycling and Waste Management Service aims to deliver public value by *improving liveability by keeping Bayside clean, tidy and safe*. This service achieves this through:

- Delivering an effective, efficient and environmentally sustainable recycling and waste service;
- Educating the community to avoid, reduce, reuse, recycle and recover waste to reduce the rate of waste to landfill; and
- Effective leadership and advocacy to influence strategic direction at a state and federal level.

The concept of circular economy (refer to Appendix 5) underpins this Strategy. Circular Economy (as opposed to Linear Economy) promotes the higher order outcomes of the waste hierarchy. The concept re-thinks traditional product life trajectories, the "extraction-production-use-disposal model", and promotes the recirculation of products and materials after the end of each use phase.

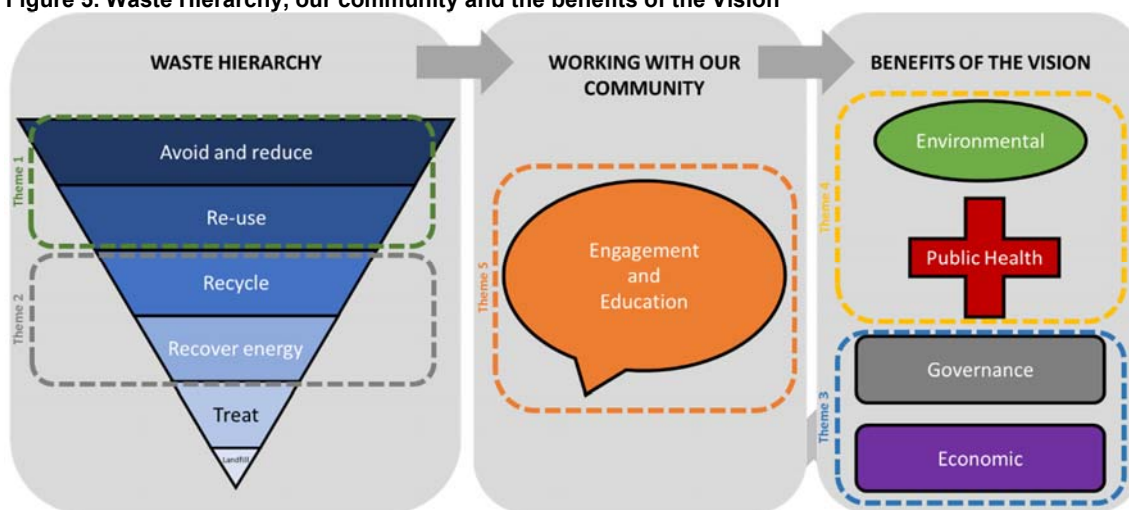
Circular economy is supported by waste management systems through an emphasis on:

- Services and opportunities for re-use and resource recovery;
- Sustainable procurement; and
- Environmentally conscious behaviour.

A shift in community attitudes towards prioritising the upper levels of the Waste Hierarchy shown in Figure 3 is required for higher rates of diversion of waste from landfill and to recover more resources from the domestic waste stream for re-use, recycling, composting, or conversion to energy. Bayside City Council will lead this change through promotion, education, and engagement programs and implementing innovative and sustainable waste management practices in line with industry and legislative responsibilities.

Figure below depicts the concepts discussed above illustrating the linkage of the strategy theme areas to the waste hierarchy, our community and the benefits delivered by the vision of the strategy which is discussed in the next section.

Figure 5. Waste Hierarchy, our community and the benefits of the Vision

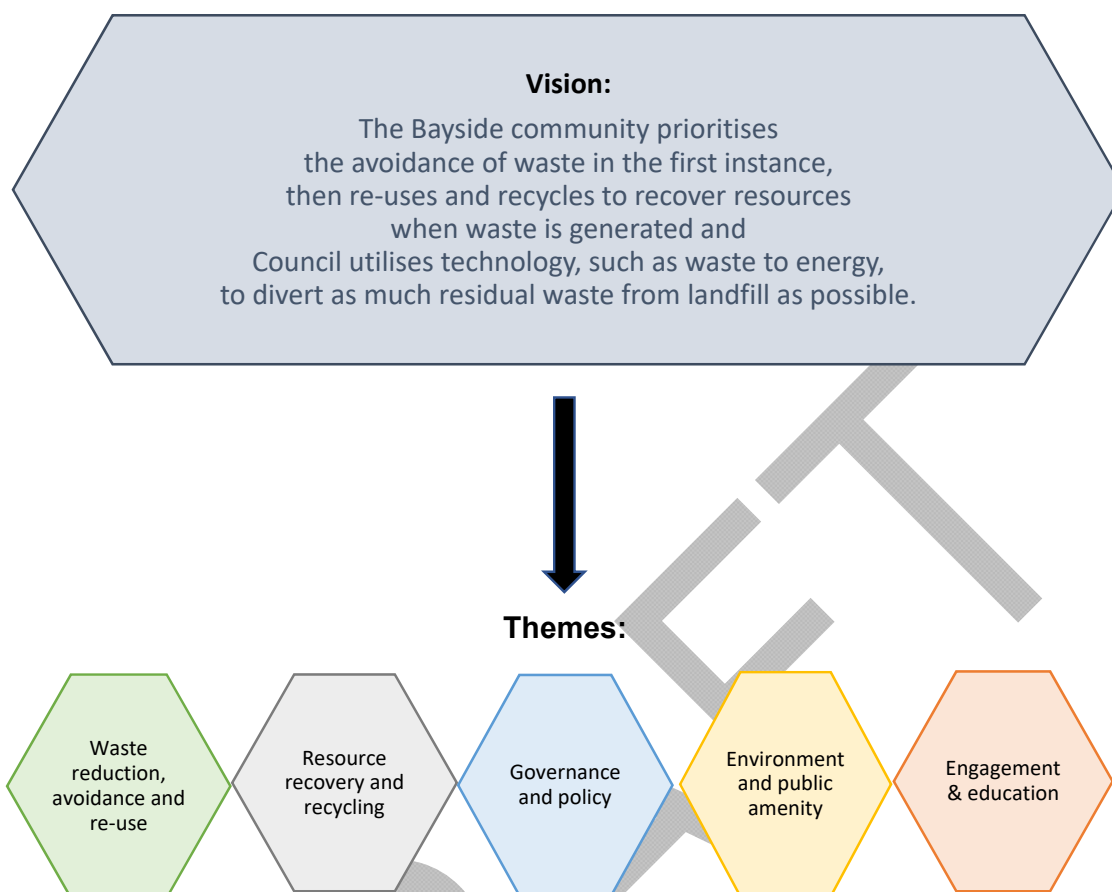


7. Vision statement

To reduce the generation of waste by the Bayside community and drive diversion of waste generated from landfill, Council has established a vision to guide waste avoidance, re-use and recycling and waste to energy conversion planning, policy and action over the lifetime (10 years) of the Strategy. This vision is supported by the five complementary guiding themes, each of which addresses a different aspect of waste management in Bayside and is depicted below in Figure 5.

Each guiding theme is supported by relevant strategic objectives and actions that will deliver the community benefits associated with a more efficient and environmentally sound waste management system, outlined below in the below tables.

Figure 6. Bayside's Recycling and Waste Management vision and themes



The tables below present a list of strategic objectives developed in accordance with each of the five strategy themes.

Table 1 Strategic objectives – Theme 1

Theme	1. Waste reduction, avoidance and re-use
Objectives:	
Increase waste avoidance and recycling	
Integrate waste reduction and avoidance in Council's procurement process	
Promote re-use	

Table 2 Strategic objectives – Theme 2

Theme	2. Resource recovery and recycling
Objectives:	
Improve source separation	
Rationalise the management and use of existing waste facilities	

Theme	2. Resource recovery and recycling
Objectives:	
Increase diversion of food and garden organics	
Source alternate waste treatment opportunities	
Review efficiency improvements to Council recycling and waste arrangement services and contracts	
Review the needs of business operators in Bayside	

Table 3 Strategic objectives – Theme 3

Theme	3. Governance and policy
Objectives:	
Promote user pays principle	
Data collection and evidence	
Monitoring and evaluation of services and strategy	
Integrate waste management into planning	

Table 4 Strategic objectives – Theme 4

Theme	4. Environment and public amenity
Objectives:	
Achieve carbon neutrality	
Reduce litter	
Reduce illegal dumping	
Reduce marine impacts	
Maintain social licence	
Support sustainable practices within local businesses	

Table 5 Strategic objectives – Theme 5

Theme	5. Engagement
Objectives:	
Measure and improve the community's satisfaction	
Measure and influence community recycling attitudes and behaviours	
Maintain transparency and confidence in the recycling system	
Engage and participate in regional and state waste management forums	

8. Key issues and findings

Government, Councils and industry groups are paving the way to some great initiatives – plastic bags ban, packaging covenants, etc., aimed at reducing the amount of packaging used, product stewardships activities leading to reuse and recycling of specific products by original manufacturers, waste to energy research funding and heavily promoting organics recycling and eliminating the compostable food waste from domestic garbage bins.

Bayside's recycling and waste management strategy (RWMS) is informed by an assessment of key issues faced by Council, in terms of waste management initiatives, services and infrastructure, as described further in the RWMS document.

The strategy is also framed around addressing the following challenges:

- Increased transport cost and time/ distance travelled for disposal of wastes due to lack of local landfills;
- Increasing population, traffic and area development;
- Increasing landfill disposal costs and EPA levy; and
- Increasing densification due to the Multi Unit Developments and challenges of waste management systems within these developments.
- Changes in the comingled recycling sector

There are a number of high-level drivers and issues considered important to waste management issues in the development of this Strategy. The key drivers include:

1. Over Consumption
2. Vulnerability of Recycling Markets
3. The Landfill Problem
4. Council's Role and Service Provision
5. Wasted Food
6. Advanced Waste and Resource Recovery
7. Transfer Station

1. Over Consumption

• **The Continuing Growth of Waste**

Bayside's population is expected to increase to around 120,000 by 2036. Victoria's annual waste generation has increased from roughly 8 million tons in 2000, to 11.9 million tons in 2011 and is projected to continue to rise by about 4% annually.

In Bayside, the volume of waste to landfill has also increased over the same period, despite the introduction of a green waste collection service and an increased variety of household items now accepted for recycling.

In 2014, 65% of the material going to landfill (13,130 tons) from waste kerbside bins could have been recycled or composted. Approximately 40% of Bayside's landfill waste is food, and 15% is recyclable materials.

• **Product Packaging**

The growing trend for consumer products involves an ever increasing dependence on packaging. Much unnecessary packaging of products serves merely marketing purposes

rather than to prevent spoilage, utility, protection and transport purposes. The demand for packaging is increasing as global population grows and society is faced with a need to deal effectively with growing plastic waste.

Research indicates 35% of recyclable packaging is not recycled, ending up in landfill or as litter in the environment¹. This has significant consequences for environmental health. Looking at a more circular economy for recyclables rather than a one use model by prioritising recycled material products.

- **Consumerism and Over-Consumption**

The high rate of waste and the resulting impacts to the environment is a detrimental consequence of consumerism and over-consumption, which not just a Bayside characteristic but a global phenomenon.

A complex set of social and cultural factors shape community attitudes to the environment, lifestyles and choices on taking action. These factors include self-interest, individual community member's sense of personal responsibility for and control of environmental impact, the level of environmental knowledge and understanding, and concern and differences in values.

An urgent challenge is to shift community attitudes and behaviour towards sustainable living practices that addresses over-consumption and waste generation and the environmental degradation it causes. Such a shift will come from increased awareness and education within the community.

2. Vulnerability of Recycling Markets

The domestic recycling industry is dependent on the demand for recyclable materials (plastic, glass, paper) an inputs to manufacturing and is therefore tied to the global price of commodities. As global commodity prices have fallen over recent years and the use of recycled material is considered less competitive than the use of virgin materials, demand for recyclables falls.

China has historically been the world's largest importer of mixed recyclables driving global demand for this material. With an increase in consumerism in China over the past decade leading to increased waste and potential for domestic recycling, China has banned the import of mixed recyclables, requiring a higher level of sorting and processing by local recyclers to participate in this marketplace. The ban on mixed recyclables into China took effect on 1 January 2018 and has already had a significant effect on recycling processors within Victoria. Victoria has three main recycling processors (Polytrade, Visy and SKM) and all are facing similar pressures in moving the recyclables that they receive.

Although the local recycling industry is considering investments in new technology and equipment to achieve a higher level of processing quality, it has been slow to act and financial pressures caused by the waning demand has led to unsustainable stockpiling practices by Material Recovery Facilities and some contracts for processing of materials for Victorian municipal kerbside collections have been terminated.

¹ Australian Packaging Covenant Organisation

3. The Landfill Problem

- **Why Is Landfilling a Problem?**

The disposal of waste to landfill (landfilling) is problematic for the following reasons:

- Increasing cost of landfilling: the Victorian State government's approach of approving less airspace for new landfills and charging a levy to all disposed material has increased the cost of landfilling, which is borne directly by the community through the municipal waste charge;
- Inefficient use of resources: waste materials that could be recovered for re-use, recycling or conversion to energy; and
- Environmental impacts: the decomposition of organic matter under anaerobic conditions in landfills produces methane, a potent greenhouse gas. Landfills have also been known to contaminate land, groundwater and freshwater streams when liners and caps fail. Ongoing monitoring and management of landfills is required to address these risks.

- **Landfill Locations and Capacity**

Bayside City Council's previous landfill disposal site at Fraser Road Clayton closed in 2017 due to reaching its capacity and alternate landfill sites in the outer western suburbs of Melbourne were identified for the disposal of Bayside's residential garbage, increasing transport costs due to longer haulage routes.

One of the identified sites operated by Wyndham City Council is not currently able to accept Bayside's garbage due to a lack of available space resulting from delays in the development of a new landfill cell. It is anticipated that these will be rectified late in 2018.

- **A Looming Reduction in Landfill Competition**

A potential future cost impact to Council may result from the reduced competition in the landfill disposal market when the current MWRRG disposal contracts expire in 2021. In the absence of a new market entrant, price increase in garbage disposal prices could occur in 2021.

- **Slow Implementation of Alternative Landfill Technologies**

The strategic direction of the Metropolitan Waste Resource Recovery Group is reliant on market forces to encourage private investment in the implementation of alternate waste and resource recovery technologies to reduce reliance on landfill disposal in Victoria. However, there is a short term gap between such needs and diminishing opportunities to cost-effectively dispose of waste in south-east metropolitan Melbourne.

As new technologies (such as waste to energy) are yet to appear for waste management in Melbourne, Council will need to continue to dispose waste in regional landfills in western Melbourne until new innovative technologies become available for processing Bayside's residual residential garbage. Council is working with the MWRRG and Council's in the south east region to establish an alternative waste facility.

- **Transport and Traffic Impacts of Direct Haulage**

Bayside's collection trucks currently transport garbage a round trip of 90kms across the Westgate Bridge to the Melbourne Regional Landfill (MRL) in Ravenhall. This is currently a cost effective arrangement due to the competitive gate fee to dispose at MRL and the relatively low cost of fuel. However, as traffic congestion increases in Metropolitan Melbourne, the

carbon emissions associated with direct haul and with the potential for increases in fuel costs, this is not a sustainable practice.

The option to secure nearby processing and disposal facilities in the future requires careful consideration prior to the expiry of current collection contracts.

- **Climate Change Implications and Zero Carbon**

In 2012, Bayside adopted a Climate Change Strategy that focuses on responding to the detrimental impacts of climate change through initiatives to both reduce greenhouse gas emissions (Carbon Neutrality) and adapt to the impacts of a changing climate.

In 2018, a Carbon Neutrality Action Plan was adopted by Council which determines the approach to achieving carbon neutrality based on the adoption of the energy hierarchy of energy avoidance, increasing energy efficiency, consumption of renewable energy and offsetting (i.e. purchasing approved carbon offsets). An extract from the Carbon Neutrality Action Plan is provided in Appendix 1.

The practice of direct haulage of waste to landfill in distant suburbs to the west of Melbourne described below in the Transport section of this Strategy contributes to a substantial amount of Council's carbon pollution. Securing nearby processing facilities will align with the second tier of the energy hierarchy and reduce greenhouse gas emissions associated with the Council's recycling and waste management service.

4. Council's Role and Service Provision

- **Community Aspirations**

The feedback received from community engagement activities to support the development of the Community Plan 2025 highlighted a disconnect between community expectations that all levels of government take action on environmental matters, such as landfilling, and without the realisation that individual actions also have an impact. Bayside produces more household waste per capita (comparatively) to many other municipalities, uses more water and electricity per capita, and has higher levels of car ownership and usage.

There is no doubt from this feedback that the Bayside community has high expectations for both a high quality of life and a well-protected environment.

The leadership expectations identified during the engagement with the community is best demonstrated by Council:

- reducing its own environmental footprint and improving its capacity to lead by example;
- engaging and empowering the Bayside's community to take action;
- encouraging and participating in collective and collaborative action; and
- advocating beyond its direct responsibility, in particular for development/ planning.

- **Illegal Dumping and Litter Prevention**

Illegal dumping of rubbish is not only unsightly, but results in the contamination of land and receiving waters when washed into the drainage system. Dumped rubbish is found in front of residential properties, building sites, public spaces, reserves and foreshore carparks. The collection of illegal dumping costs Council \$65,000 annually.

The development of a targeted communications and education plan to deter illegal dumping and promote Council's various recycling and waste services including hard waste and bundled branches, community recycling stations and kerbside collection services will increase utilisation and reduce illegal dumping.

Further assistance on illegal waste dumping issues from Sustainability Victoria via DumpInData program outlined below. DumpInData was created by Sustainability Victoria and the Victorian Litter Action Alliance (VLAA) to support land managers to collect, manage and share illegal dumping data – *it is not a public reporting tool*.

It provides assistance with:

- Access to consolidated data to inform management of illegal dumping
- Visualisation of data to view hotspots and their movement over time
- A resource to evaluate illegal dumping programs and interventions
- Information to assist in preparation of business cases to bid for funding / resources, or to conduct cost benefit analyses.

VLAA is the peak body for litter management and prevention in Victoria and aims to provide a coordinated approach to preventing litter across state and local government, industry and community sectors. Each of the Alliance members plays its part in the fight against litter.

Illegal Dumping Prevention Kit can be accessed via the link below:

<http://www.litter.vic.gov.au/Planning-a-program/Litter-prevention-kits/Illegal-dumping>

A coordinated approach is required to address the impact of illegal dumping and littering within Bayside. To confront the challenge of illegal dumping and litter, Bayside needs to address:

- Community behaviour change
- Improved bin infrastructure
- Enforcement
- Community action, through community volunteer groups

• **Waste from Residential Development at Higher Densities**

Although Council currently monitors and reports on the volumes of waste that recycling diverts waste from landfill from single and dual occupancy residencies and some smaller unit developments in Bayside, Council holds no such data on the waste behaviors of residents in high density multi-unit apartment developments.

Council currently uses its planning powers to require new developments to implement Environmentally Sustainable Design (ESD) elements into all new buildings, including recycling facilities. However, an understanding of the effectiveness of these facilities and the contribution residents of MUDs make to the total volume of waste to landfill is not well understood due to a lack of data.

• **Role of Sustainable Procurement**

The implementation of a Sustainable Procurement approach within Council will support the objectives of this strategy in the following:

- Purchase of materials manufactured from a high percentage of recyclables, addressing the low demand problem discussed above under 'Vulnerability of Recycling Markets'
- Support the practice of Product Stewardship whereby manufacturers of goods are committed to accepting and processing their products at the end of their useful lifecycles, typically including the cost of this step into the purchase price which is borne by the customer.
- Awarding of quotations and tender submissions for works contracts that involve recycling of demolition materials and other wastes resulting from the works

Council's participation in the MAV Procurement LEAP program which assists municipalities to identify and implement sustainable procurement improvement opportunities, will address this aspect of the Strategy.

5. Wasted Food

Food waste is estimated to cost the Australian economy \$20 billion each year, having significant impacts on the environment through the wasted use of resources such as land, water, energy and fuel to produce and distribute food. When disposed of in landfill, the anaerobic breakdown of food in landfill generates methane, a potent greenhouse gas.

Food waste includes fruit and vegetables, meat, poultry, bones, dairy products, seafood, rice, pasta, bread, coffee, tea, other organic material and paper used to wrap food waste.

A recent audit of a random selection of Bayside's kerbside garbage bins showed that approximately 40% of the waste currently sent to landfill comprises discarded food, which equates to 8,000 tonnes annually.

The problem of food waste can be addressed in three complimentary ways:

1. Waste avoidance:
2. Composting in the home:
3. Recycling using FOGO:

Waste Avoidance

Employing the first tier of the waste management hierarchy, the generation of food waste is best avoided in the first instance. Community behaviour involving the purchasing of more food than is needed is driven by several factors:

- Growing affluence within the community;
- Better value in when in buying bulk; and
- Food marketing and promotions by retailers.

Communities can avoid wasting food by planning meals based on ingredients that have already been bought and shopping only for new ingredients required by planned meals. A key to supporting behaviour change on avoiding food waste is raising awareness within the community through targeted, appropriately designed promotional and educational campaigns. Such campaigns can also be effective in placing pressure on supermarkets and retailers to discourage marketing that results in bulk buying of perishable foods.

In-home Composting

A variety of in-home devices are available from hardware stores for turning food scraps into compost (an excellent source of free garden food and soil improver), as well as reducing the amount of waste disposed of. There are a variety of sizes or composting systems depending on how much organic material (food waste) is available, even composting options for people who live in apartments or have limited outdoor space.

Targeted promotional and educational campaigns to support the adoption of in-home composting practices within the community are crucial in achieving meaningful behaviour change.

Food Organics – Green Organics (FOGO)

For remaining quantities of food waste, a Council provided Food Organics – Green Organics (FOGO) kerbside collection² is effective in diverting this waste from landfill. Current contracts

² The 2017 Recycling and Waste Management Service Review recommendation: *Council considers supporting the introduction of Food Organics Green Organics Collection (FOGO) by 2020 and commences an assessment of the implementation and benefits of such an approach in the Recycling and Waste Strategy. All recommendations from the Service Review are presented in Appendix 3*

are in place for green organics processing that can accommodate food waste and produce high quality soil amendments that are in demand by the agricultural industry.

Households are required to separate food waste from other recyclables and garbage at the source, typically by using a dedicated 7 to 8 litres caddy or compostable (corn starch) bags/liners and to transfer the food waste to the organics bin every 2 to 3 days. The provision of suitable in-kitchen food waste storage options (kitchen caddy) will be the focus of Council's FOGO education and promotion campaign, with the option of having a Council supplied standard caddy. Following the expiry of current green organics and garbage collection contracts, the FOGO collection service frequency can be increased to weekly and the frequency of the garbage collection can be reduced to fortnightly to reflect the changed compositions and volumes of the respective waste streams.

Figure 7. FOGO household model



In metropolitan Melbourne, four of the thirty-one Councils have commenced a FOGO service. Of these four, only one has changed the frequency of the general waste to fortnightly and provided a weekly schedule for the FOGO. The remainder have maintained a weekly general waste service and a fortnightly FOGO service. A further eight Councils are in various stages of preparing to implement a FOGO service.

As the processing costs associated with FOGO and similar to disposal to landfill at current volumes, effective behaviour change campaigns that achieve a degree of waste avoidance and at-home composting are required prior to implementation to ensure reduced volumes of food waste are dealt with by the FOGO service. To ensure the community behaviour change is reinforced following the implementation of FOGO, ongoing bin audits and corresponding targeted educational and promotional campaigns will be required.

Currently, two-third of Bayside residents opt-in for a green organics service. The implementation of FOGO will require the mandatory rollout of the respective bins at an additional cost to residencies that currently do not use the green organics service.

6. Advanced Waste and Recovered Resource Treatment

Although, the practice of landfilling waste is considered the least desirable outcome on the waste hierarchy, it is the most common way in which Australian's treat their waste. Bayside City Council residents disposed of over 20,000 tonnes in the 2017 calendar year. To increase diversion of waste from landfill, Bayside needs to explore alternative waste and resource recovery treatment facilities. There are a number of different technologies that have been proven successful for processing waste into energy overseas and locally at smaller scales over many years. Some of the technologies available include:

- *Gasification* – thermal decomposition of a substance in the presence of a gasification agent (i.e. steam) to produce syngas. In this process, carbon from the waste is reacted

with oxygen in a controlled manner to produce heat (exothermic reaction). The heat drives the endothermic reaction which produces syngas, which is captured. The syngas produced is predominantly CO, H₂ and CH₄. Ash and/or slag and metals are left behind after the process, and the syngas requires 'cleaning'.

- *Incineration* – burning waste using an excess of oxygen to generate heat energy, which can be used to produce high pressure steam for energy production. Heat from the hot exhaust gases is also captured and used for energy production. The process creates ash, which must go to landfill. Emissions must be controlled through gas cleanup technology which will represent approximately 50% of the total capital cost.
- *Pyrolysis* – thermal decomposition of a substance in an oxygen-free atmosphere to produce synthesis gas (syngas). No burning takes place as part of this process, and the reaction is endothermic, meaning heat must constantly be applied by an external source. The synthesis gas, which is predominantly CO and H₂, must be 'cleaned' to remove particulate matter, sulfur, chlorine / acid gases and trace metals. Other waste products produced include bottom ash, carbon char and metals. Of these end products, the latter two currently have industrial uses and are recycled. The synthesis gas can be used to generate energy.

It is important to understand the feedstocks required to support the technology and work with other Council's and the MWRRG to ensure that AWT's can support municipal waste requirements and not be cost prohibitive. The benefits of AWT is that it reduces the communities' reliance on landfill and the waste is converted into energy making it a more sustainable outcome. The aim of AMT is to achieve more socially, commercially and environmentally sustainable options for treating municipal waste.

7. Transfer Station Deficiencies

The Bayside Recycling and Waste Transfer Station (the Transfer Station) in Talinga Road, Cheltenham accepts only residential and commercial quantities of non-putrescible wastes for either recycling or disposal to landfill.

The design of the Transfer Station involves an open-sided tipping area that is unable to prevent dust and litter from escaping the site on windy days. The commercial operator of the Transfer Station employs operational measures to minimise dust and litter nuisance, however high winds (in excess of 35km/h) result in this aspect being uncontrollable with the current open design.

Due to the age and design of the facility, the Transfer Station is deficient in the following aspects:

- Unable to accept putrescible waste (municipal solid waste) as part of normal operations (the benefits of this are explained in detail below under Transport);
- Prone to causing dust and litter nuisance to neighbouring industrial/commercial properties on windy days; and
- Causes service disruption and inconvenience to customers when operational measures cannot address dust and litter impacts and closure of the facility is required on windy days.
- Closure of the facility impacts the viability of the business operation, reducing income and affecting staffing operations on days of closure. Further impacts of closure involve staff seeing the facility as an unreliable source of employment and customers seeing the facility as an unreliable service.

A project to enclose the existing tipping area to control dust and litter issues is underway with an allocation foreshadowed for the 2018/19 financial year for the construction phase of the project.

9. Methodology

Council has developed this Strategy in a way that incorporates and analyses relevant policies, strategies and data as well as community and stakeholder input to present a coherent view of recycling and waste management in Bayside. Key inputs considered as part of the development of the Strategy are outlined below.

Service Review Recommendations

A Service Review was undertaken in 2017 to assess how the role and function of Council's Recycling and Waste Management services are aligned to community needs, are operating efficiently and are delivering public value.

The Service Review has involved targeted benchmarking and research, analysis of performance and financial data and stakeholder interviews. An assessment of options and recommendations for eight aspects of Council's Recycling and Waste Management services were considered, as well as further operational improvement opportunities. Recommendations from this Service Review have been incorporated in the development of this Strategy.

Community Feedback

In December 2017 Council contracted Metropolis Research to conduct four annual community satisfaction surveys, over the lifetime of the 2017-2021 Council Plan. This survey program provides detailed data on the drivers of community satisfaction, our residents' views on Council as an organisation and the areas for improvement. Residents were also surveyed about their current and potential future participation in a range of sustainable environmental initiatives, as well as an exploration of the issues that respondents identify as barriers to their participation in these initiatives.

Over March-April 2018 Metropolis Research conducted 700 personal interviews with Bayside householders, in accordance with age group and gender quotas that match the local demographic profile. The five Council services with the highest levels of community satisfaction were:

1. the weekly garbage collection service
2. the local library
3. the green waste collection service
4. the regular recycling service
5. services for people with a disability

Community Engagement Findings

In August 2018, Council conducted a community engagement program using both online and face to face information gathering. This engagement was widely advertised in both online and print media. The engagement activities generated significant interest, with 1681 responses being received from members of the Bayside community. The engagement was centred around the views of the community on the introduction of a food organics green organics (FOGO) collection service as a means of diverting food waste from landfill.

As depicted in Figure 8 below, a significant majority (74%) of responders indicated that they would be happy to put most or all food waste in a green waste bin, even if it was only collected at the current fortnightly schedule. Although the size of the household size did not have a significant impact on the likelihood of adopting the use of the green organics bin for food waste, as depicted in Figure 10, sole person households were found to be less likely to do this and larger households (of five or more people) were more likely to do so.

Figure 8. Community Preferences Regarding Food Waste in the Green Organics Collection

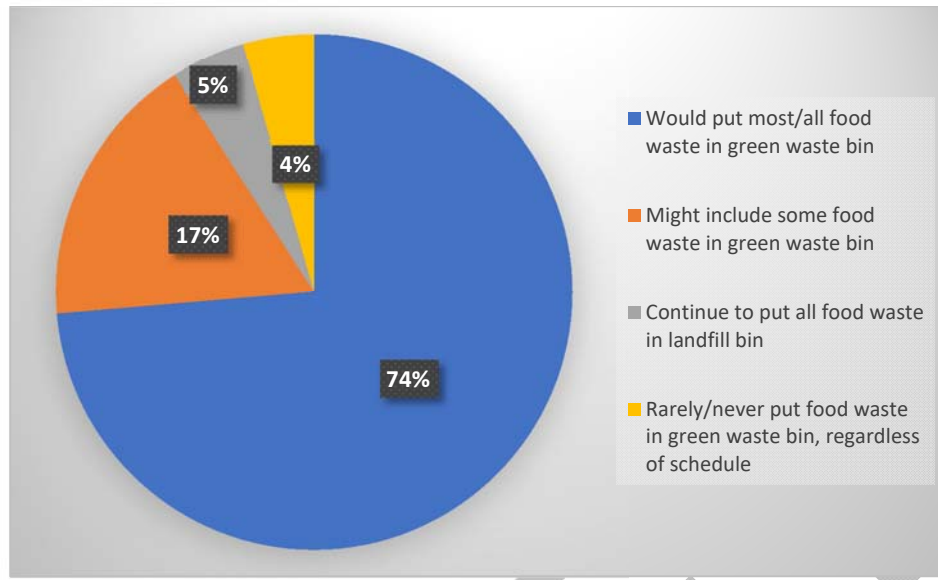
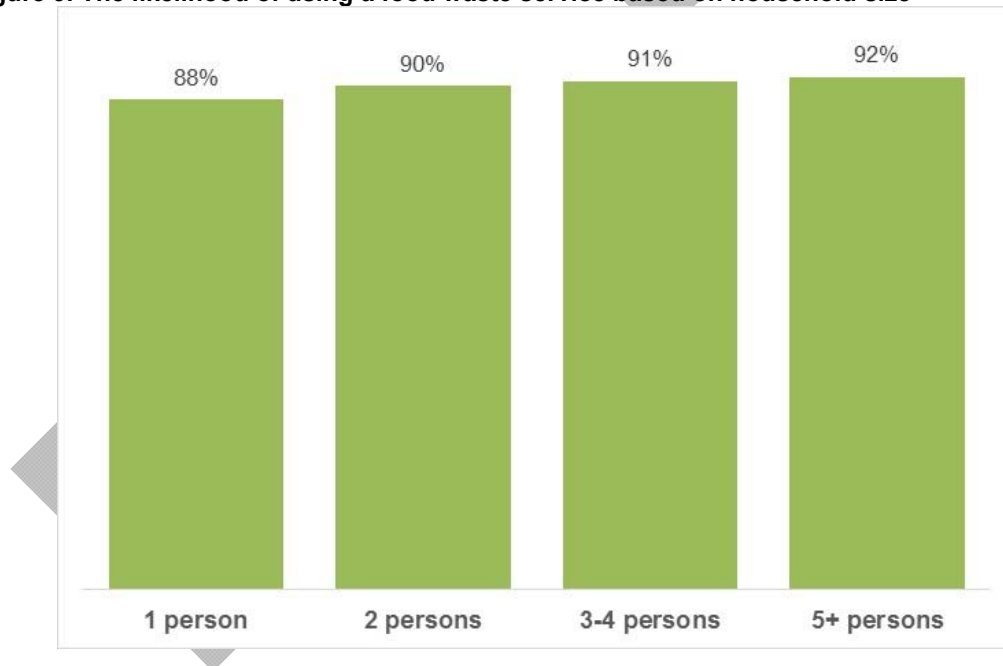


Figure 9. The likelihood of using a food waste service based on household size



As an indication of a community support for a future garbage collection service frequency change, Figure 10 below depicts a significant majority (68%) of responders indicated that they would support a change to fortnightly collection frequency for the garbage bin given food waste would no longer be contained in this bin. Again, the size of the household size did not have a significant impact on the level of support for a change in collection frequency for the garbage bin following the implementation of a FOGO service (Figure 11).

Figure 10. Community Preferences Regarding a Fortnightly Garbage Collection Service

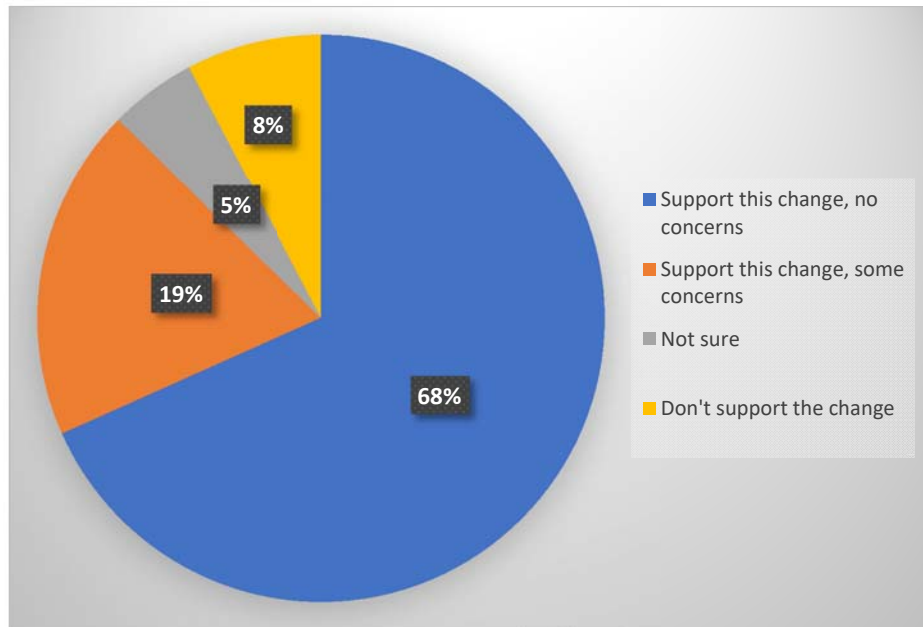
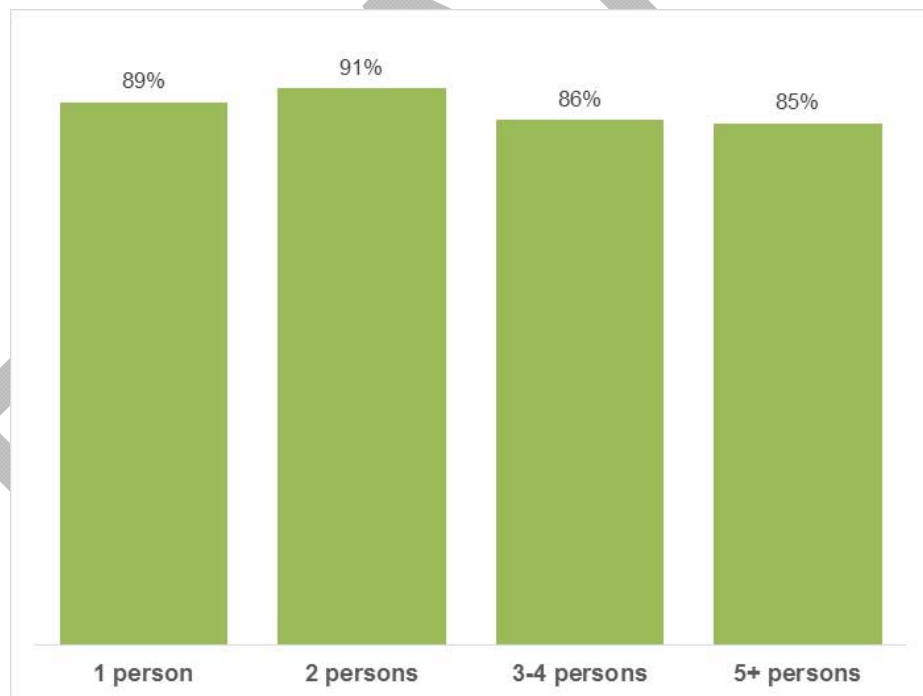


Figure 11. The likelihood of supporting a Fortnightly Garbage Collection Service



These results demonstrate that respondents indicating their support for using their green organics collection service for food waste were also more likely to support the fortnightly garbage collection schedule, and vice versa. This is detailed further in the following Figure 12.

Figure 12. Community Preferences for Switching Garbage/FOGO Collection Schedules



447 respondents (27%) either did not support the collection frequency change, or had some concerns. Comments received from this cohort are listed in the Figure13 below. As the issue of collection frequency and bin size is closely linked, many comments raised both these points. Also it should be noted that some respondents weren't clear about which bin they were referring to: the landfill bin or the green waste bin.

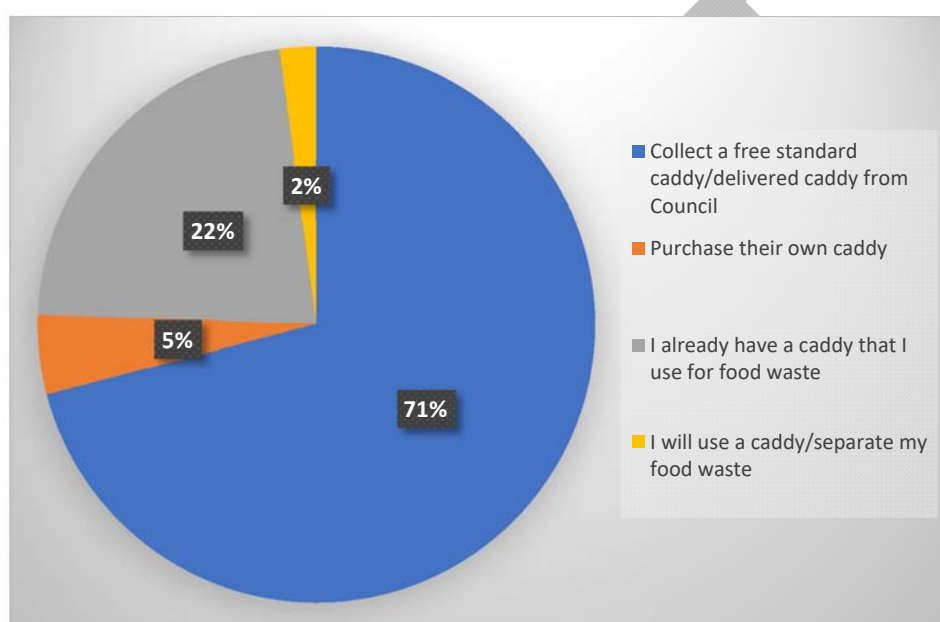
Figure 13. Why didn't respondents support change or their concerns.

Feedback Theme	Detailed Comment
Smelly bins, smell on street / dirty bins	Particularly linked to fortnightly collection but still a concern if weekly collection. Bags would assist however concerns about rotting food/meat/fish, dog poo, nappies, feminine hygiene waste. Bigger problem in summer (100)
Want to retain larger landfill bin	Need the larger bin due to household size or babies/young children, too much waste due to disposal practices, regret downsizing to smaller bin now, concerns if small bin full/overflowing (96)
Frequency of collection for landfill or green waste bins	Concern about inability to assess or test before implementation, don't want the switch to frequencies, want weekly collection for both bins, linked to concern about smelly bins, having downsized need to retain weekly landfill collection (89)
Bin size and collection frequency	Make clear link between the two/trade-off, can't make one change without the other (45)
Suggestion for change process or Council implementation	Trial process over time, lots of education re what goes in what bin, encouraging composting/worm farms first, addressing peak waste periods eg Christmas, Council providing all resources (43)
Minimal concerns as already have compost bin, worm farm	Won't fill the green waste bin due to compost or worm farm, don't need the FOGO service (27)
Critical of Council – various issues	Don't like Council involvement in issue, don't agree with policy stance, don't trust recycling practices, dislike waste charge and cross-subsidy (24)

Additional Council activities – service to dispose of soft plastics, advocacy re soft plastics and packaging	Soft plastics/packaging fill up landfill bin, need a solution, advocacy to reduce packaging production (23)
Food waste bin will attract vermin	Rats, possums, crows, ants, flies, foxes (19)

As depicted in the following Figure 14, a significant majority (71%) of responders indicated a preference for Council to provide a kitchen caddy to enable food waste to be separated from other household waste in the kitchen and then emptied in the green organics collection bin. Furthermore, 25% responded that they did not want a Council provided caddy because they already had one and the remainder indicating that they would purchase their own caddy.

Figure 14. Community Preferences Regarding Using a Caddy to Separate Food Waste.



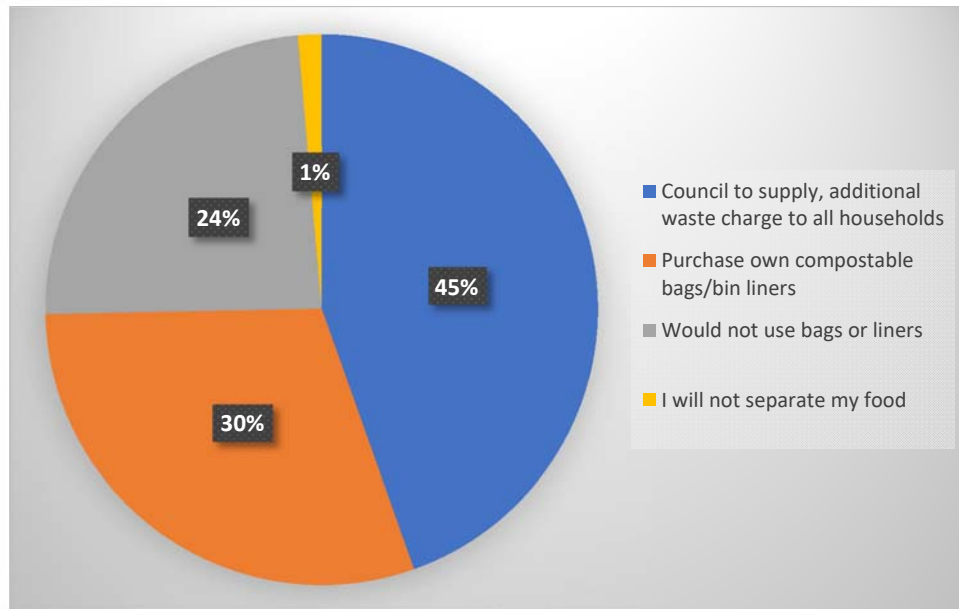
Note: 4 comments written in the 'Other' option have been added to this table.

Other relevant comments made by respondents were:

- they use a 'insinkerator' instead (3)
- they would prefer bags instead of a caddy (3)
- don't mind either option of purchase/provided (3)
- they prefer to put food straight into their compost (2)
- they would need more than one caddy (2)
- no room for a caddy (2).

The issue of whether a compostable bag or liner to place food waste in a green organics bin was preferred to be used was also explored. As depicted in the following Figure 15, a significant majority (75%) of responders indicated a preference to use compostable bags or liners, with 45% preferring Council to provide these and 30% indicating they would purchase their own.

Figure 15. Community Preferences Regarding Use Of Compostable Bags/Liners.



As depicted in the following Figure 16, a significant majority (72%) of responders indicated a preference for Council to change

Review of Relevant Documentation

A suite of relevant internal and external documents such as legislation, policy and strategy and plans have been reviewed in the development of formulating the Bayside Waste Management Strategy.

Relevant External documents:

- EPA Act 1970;
- Metropolitan Waste and Resource Recovery Implementation Plan 2016;
- Metropolitan Waste and Resource Recovery Strategic Plan;
- Optimising Kerbside Collection Systems (SV 2017);
- State-wide Waste and Resource Recovery Infrastructure Plan;
- The Victorian Litter Report;
- Victorian Organics Recover Strategy 2016; and
- Sustainability Victoria Strategic Plan 2020.

Relevant Internal documents:

- Community Plan 2020;
- Council Plan 2017;
- Strategic Resource Plan 2018;
- Recycling and Waste Management Service Review 2017;
- Environmental Sustainability Framework 2016-2025
- Coastal management Plan 2014-2024;
- Active by the Bay Strategy 2013-2022;
- Property Strategy 2014-2018;
- Bayside City Council 2018 Community Satisfaction Survey (May 2018);
- Long Term Financial Plan;

- Recreation and Open Space Asset Management Plans; and
- Education Plan - Waste Management.

10. Background

History

The community expectations documented in the Community Plan 2025 led to a commitment that is addressed by Goal 5 - Environment of the Council Plan 2017-2021:

Council and the Bayside community will be environmental stewards, taking action to protect and enhance the natural environment, while balancing appreciation and use with the need to protect natural assets for future generations.

The Council Plan also specifies the action to develop a new Recycling and Waste Management Strategy focusing on community education and behaviour change in preparation for the introduction of food waste and the increasing costs of landfill and haulage.

Reducing waste to landfill by increasing the recovery of resources is also a demonstration of the Bayside Better Place Approach, whereby our dedicated professional people, with an ongoing focus on efficiency, provide core services that improve liveability for the Bayside community.

The Bayside Environmental Sustainability Framework (ESF), which was adopted by Council in 2016, also identifies *Waste Management* as a strategic objective to influence Council's operations, and scheduled the development and implementation of a Recycling and Waste Plan as a high priority deliverable to achieve this objective.

Key stakeholders

Key stakeholders will be consulted prior to and during the introduction of key initiatives from the Action Plan.

Communication of this strategy, its implementation and the resulting actions will be guided by the Bayside City Council Communications Team to ensure presentation format and message are consistent and aligned with Council objectives.

Table 6. Internal stakeholders

Internal Teams	Role/ Influence
Executive Team/ CEO	Strategic direction
Communications and Community Engagement	Promotion and support with community engagement and consultations approach
Leasing and Procurement	Advice regarding the lease of Bayside Recycling and Waste Transfer Station and procurement of Council managed services
Finance	Advice regarding budget estimations
Asset Planning and Building Maintenance	Advice regarding infrastructure renewal planning, operations and maintenance
Urban Design	Design process and placement schedules of street litter bins and recycling stations

Planning and Investigations	Advice on planning scheme amendments and planning permit conditions/ enforcement
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Table 7. External stakeholders

Stakeholder	Role/ Influence
Residents and community interests groups	Customers of Council services, advocates for improved environmental outcomes
Service providers (contractors)	Providers of Council managed services including kerbside garbage, recycling, green waste, litter bins, hard waste and bundled branches collections, processing and disposal
Copper Rock Investments	Lessee and operators of the Bayside Recycling & Waste Transfer Station in Cheltenham
Sustainability Victoria	Victorian State government agency involved in strategy and grant funding for local government and the waste industry
Department of Environment, Land, Water and Planning	Victorian State government agency responsible for legislation
Metropolitan Waste Resource Recovery Group	Victorian State government agency responsible for local government representation and group contracts negotiations

Demographics

Current Demographic Profile of Bayside

Renowned for its quality of life, Bayside is characterised by attractive residential areas, popular business precincts, and a coastal environment. The City of Bayside is located in Melbourne's middle southern suburbs, between 8 and 20 kilometres south of the Melbourne CBD. The Bayside municipality occupies 37 square kilometres along the 17 km stretch of foreshore. The municipality encompasses all (or part) of the suburbs of Beaumaris, Black Rock, Brighton, Brighton East, Cheltenham, Hampton, Hampton East, Highett and Sandringham, and is adjoined to the cities of Port Phillip, Glen Eira and Kingston.

Bayside's estimated population for 2017 was 104,030 residents – an increase of 1,293 people (1.3 per cent) from 2016. Compared to the Greater Melbourne area, Bayside has a smaller percentage of adults aged 20 to 39 years. Over 19 per cent of Bayside residents were aged 65 years and over, compared to 14 per cent for Greater Melbourne. The 2016 Census found that the median age of Bayside residents increased from 42 years in 2011 to 44 years in 2016, due to the large increase in the number of residents aged 45 to 54 years and 65 to 74 years.

Families make up 70 per cent of all Bayside households comprising couples with children (37 per cent), couples without children (24 per cent) and one parent families (9 per cent). The majority of couples without children were older couples aged 65 years and over, or middle aged couples. Lone person households made up 23 per cent of Bayside households, a slightly higher percentage than in Greater Melbourne.

Housing density has increased over the past five years, resulting in 38 per cent of dwellings categorised as apartments or townhouses (from one to four storeys), while 62 per cent are separate houses – a drop from 68 per cent separate dwellings in 2011. Nearly half of all apartments were occupied by lone residents, with approximately one in five occupied by

couples. Multi-storey townhouses were mostly occupied by families with children, while semi-detached single storey houses were predominantly occupied by sole residents.

As at June 2017, Bayside had 44,553 rateable properties³ and 1,044 non-rateable properties (such as parks, churches and schools). Of the rateable properties, 40,438 use the recycling and waste service (90.7 percent usage rate). The remaining 3,370 rateable properties that do not use the Council service consist of multi-unit developments (3,159) and exempt properties (211) such as electrical substations, billboards and bathing boxes.

There are over 13,200 businesses and 3,375 business premises registered in the municipality including 765 food preparation and serving restaurants, bars and cafes.

Future Demographic Trends Impacting the Recycling and Waste Service

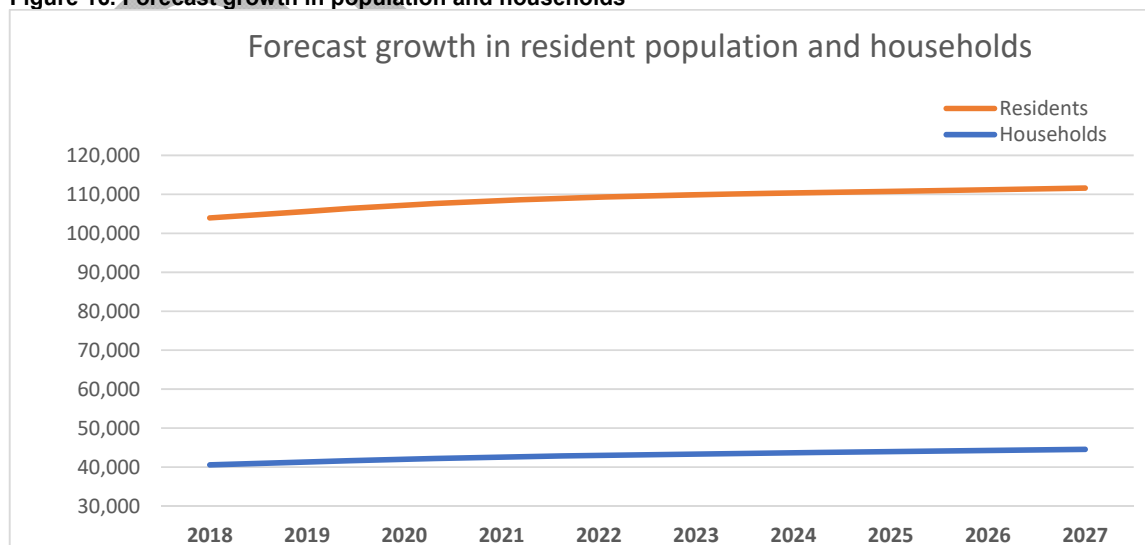
A number of demographic trends in Bayside will have an impact on the recycling and waste service, throughout the lifetime of this Strategy:

- a steady growth in the number of households (1.1% per annum) and residents living in private dwellings (0.8% per annum)
- continued population ageing as the youngest members of the 'baby boomer' generation reach retirement age
- decreasing household size related to the growth in the number of lone person and couple only households
- increasing numbers of high and medium density dwellings, and aged care facilities in Bayside.

Whilst there will be steady growth in the number of households, many of those households will have only one or two occupants. The expected rise in the numbers of apartments and aged care facilities, both likely to have a private waste collection service, will moderate the increase in the number of private dwellings.

By 2027, there will be an additional 4000 households in Bayside (slow growth of 1.1 per cent per annum) and an additional 7,650 residents living in private dwellings.

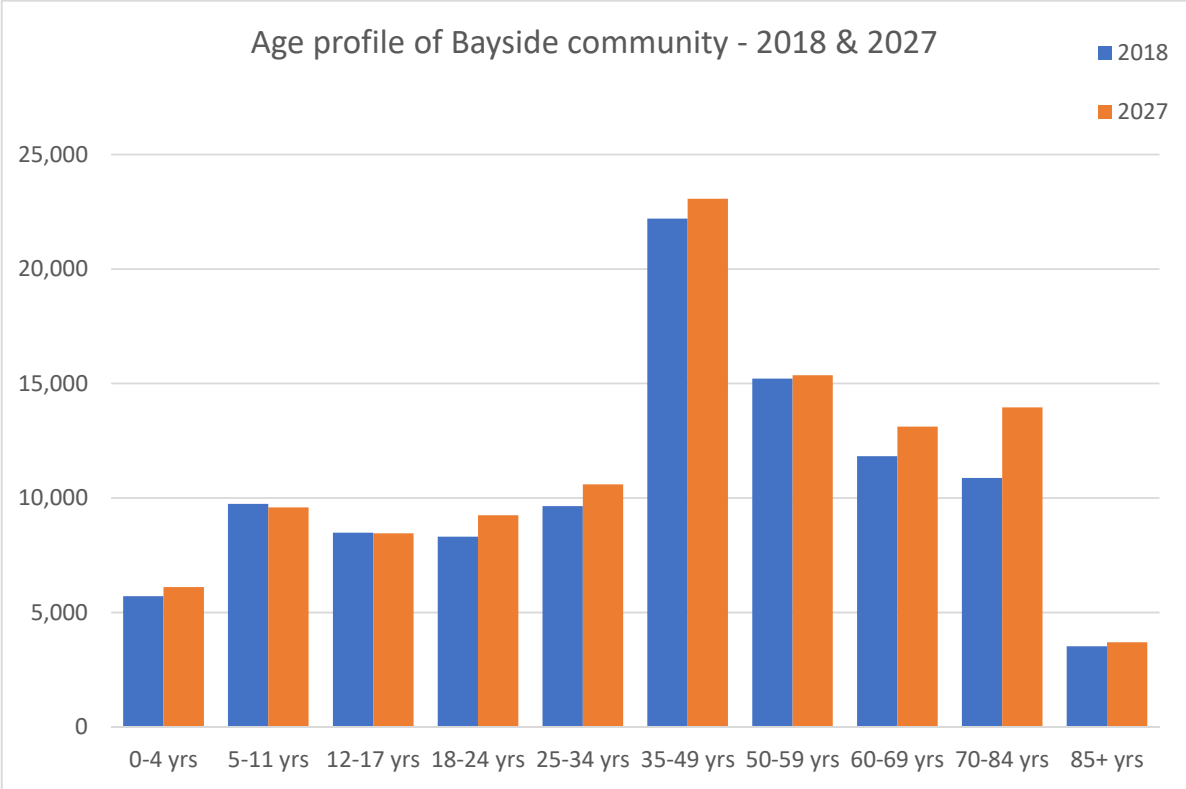
Figure 16. Forecast growth in population and households



NB: Households refers to occupied private dwellings and residents are those living in private dwellings
Source: forecast.id

The major demographic change forecast for Bayside is the increasing numbers of seniors aged 70-84 years, the baby boomer generation. By 2027 there will be 3000 additional seniors and 1300 additional older adults aged in their sixties. Bayside will also see some growth in the number of adults aged in their twenties and early thirties, on the assumption they will be moving into the apartment and townhouse developments.

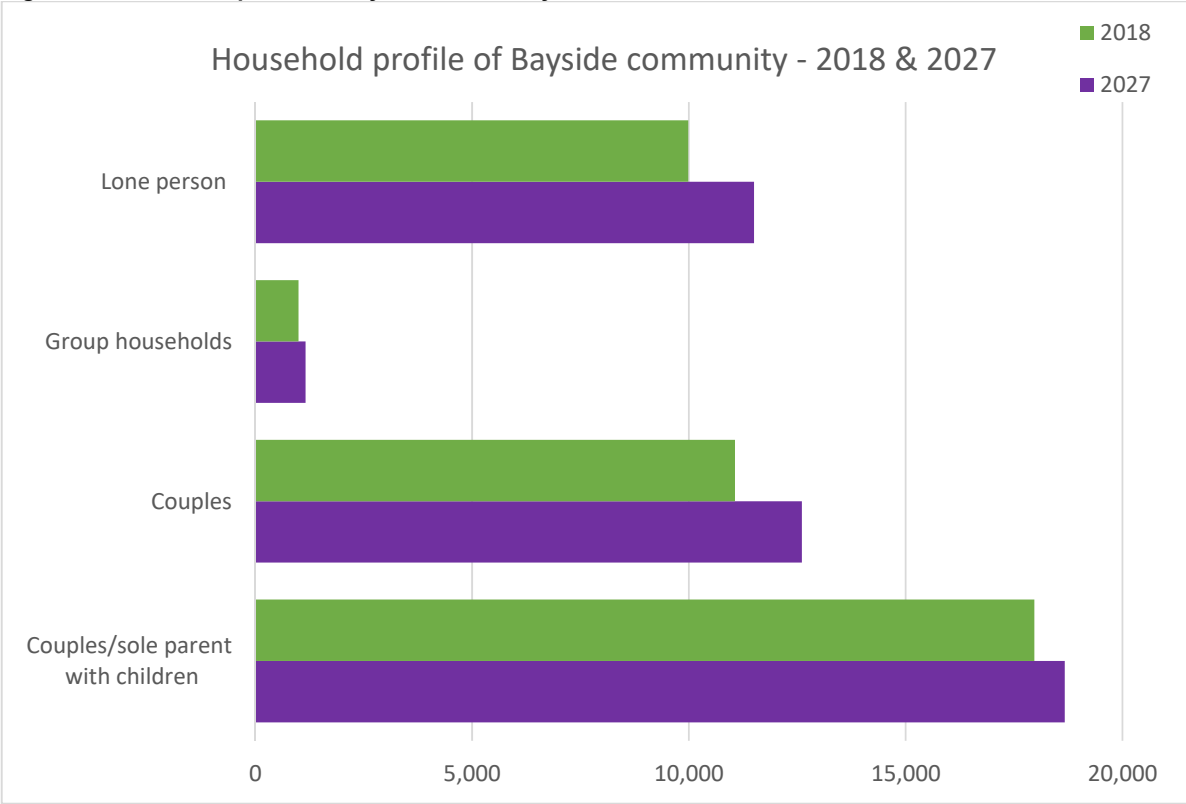
Figure 17. Age profile of Bayside Community – 2018 & 2027



Source: forecast.id

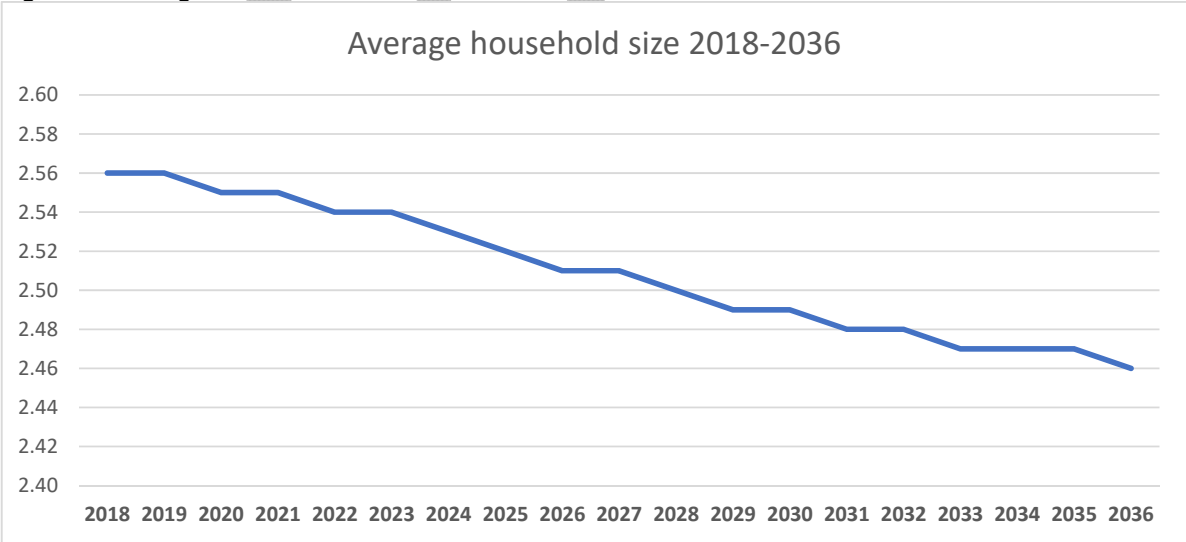
The ageing of the Bayside population is forecast to impact upon household size due to the higher mortality rates, residents transitioning to non-private dwellings (hospitals, nursing homes) or residents' relocation to "retirement" communities outside Bayside. Other national social trends are forecast to contribute to decreasing household size in Bayside (persons living alone by choice, partnering and family building later in life), as well as changes to the housing market with more apartment and townhouses being offered.

Figure 18. Household profile of Bayside community



Source: forecast.id

Figure 19. Average household size 2018-2036



Source: forecast.id

11. Legislative and policy and context

Federal

The Australian Government is responsible for national legislation, strategies and policy frameworks for waste, including measures that give effect and controls to obligations under international agreements.

The National Waste Policy is a strategic national framework for waste management and resource recovery in Australia to 2020, providing the basis for collaboration among stakeholders to:

- deliver effective approaches to national waste issues,
- avoid the generation of waste,
- reduce the amount of waste for disposal, and
- manage waste as a resource to deliver economic, environmental and social benefits.

Implementation of the policy requires all wastes, including hazardous wastes, to be managed in a way that is consistent with Australia's international obligations and for the protection of human health and the environment.

The National Waste Policy sets six key directions:

- Taking responsibility;
- Improving the market;
- Pursuing sustainability;
- Reducing hazard and risk;
- Tailoring solutions; and
- Providing the evidence.

Recycling and waste management initiatives relevant at the national level include:

- Australian Packaging Covenant
- Product Stewardship
- Paintback
- Container Deposit Schemes (NSW, SA, NT, Qld and ACT)

State

In Victoria, the State government sets the direction and priorities for waste. The Environment Protection Authority is the regulator that controls and monitors waste to ensure that it is managed correctly and safely as set out in the Environmental Protection Act 1970. Other government agencies such as Sustainability Victoria, Department of Environment, Land, Water and Planning and Metropolitan and Regional Waste and Resource Recovery Groups work toward achieving the priorities set out by the State government.

The primary legislation for waste management in Victoria is the *Environment Protection Act 1970* (EP Act). A central concept to waste management in Victoria is that of resource efficiency. Principle 1 of the EP Act establishes a “wastes hierarchy” for Victoria with waste to be managed in order of preference for management option.

The Waste Management Policy provided that “*waste should be deposited to landfill if there is no other practicable waste management option higher up the wastes hierarchy that does not lead to inferior outcomes in terms of the protection of people and the environment*”.

In August 2014, the EP Act was amended to establish the Victorian Waste and Resource Recovery Infrastructure Planning Framework. The Framework facilitates strategic planning for waste and resource recovery that integrates planning at the state level with planning for local and regional communities. Under the EP Act:

- Sustainability Victoria must prepare a *State-wide Waste and Resource Recovery Infrastructure Plan* to provide “strategic direction for the management of waste and resource recovery infrastructure in Victoria for a period of 30 years”; and
- Statutory Waste and Resource Recovery Groups must prepare Regional Waste and Resource Recovery Implementation Plans for waste and resource recovery in a region.

The Metropolitan Waste and Resource Recovery Group (MWRRG) established under the EP Act supports Melbourne’s 31 metropolitan councils working with their communities to minimise waste and maximise resource recovery across metropolitan Melbourne. The MWRRG has prepared a *Metropolitan Waste and Resource Recovery Implementation Plan 2016* (Metro Implementation Plan) that focuses on identifying Melbourne’s waste infrastructure needs and how these will be met over the next 10 years. The Metro Implementation Plan’s objectives are to:

- Reduce waste sent to landfill;
- Increase organic waste recovered;
- Deliver community, environmental and economic benefits; and
- Plan for Melbourne’s growing population.

Key actions in the Metro Implementation Plan relevant to Bayside City Council are:³

- Support local government to progressively increase recovery of materials from municipal waste streams;
- Build the metropolitan organic recovery and processing network and maximise the network’s productivity; and
- Encourage best practice operations for the resource recovery and waste network.

Section 50BH of the EP Act requires that “A council must perform its waste management functions consistently with the *Regional Waste and Resource Recovery Implementation Plan* applying to the council’s municipal district”.

The key recycling and waste management plans and initiatives relevant at the state level include:

- State-wide Waste and Resource Recovery Infrastructure Plan (SWRRIP)
- SV2020 Strategic Plan
- Ban on free, single-use Plastic Bags
- Ban on disposal of e-waste to landfill (Policy)
- Tyres Stewardship
- Victorian Litter Plan
- Waste to Energy Infrastructure Fund

Local

Under the *Local Government Act 1989* (LG Act), a Council must ensure the most efficient and effective use of resources, and ensure that it provides services in accordance with best value principles. A council may undertake a range of recycling and waste management roles, including;⁴

- Providing and procuring waste and recycling collections, transport, reprocessing and/or disposal to landfill services for the local communities either directly or through contractors;

³ *Metropolitan Waste and Resource Recovery Infrastructure Plan 2016*, p.16.

⁴ Roles as listed in the *State-wide Waste and Resource Recovery Infrastructure Plan 2015-44*.

- Undertaking strategic land use planning and assess development applications, including applications for waste and resource recovery facilities, high-rise and multi-use developments and the associated waste infrastructure under a Planning Scheme;
- Delivering a range of waste and resource recovery related projects on behalf of government;
- Educating local communities on waste and resource recovery and litter; and
- Purchasing goods made from recovered material streams.

Under the LG Act, a Council can also pass local laws that reinforce land use planning and municipal waste and resource recovery strategies. Clauses 29 and 59 of Bayside City Council's *Local Law No.2: Neighbourhood Amenity* sets out the rights and obligations of residents, businesses and community and Council for waste management.

The development of the Recycling and Waste Management Strategy (RWMS) considered the following goals and targets:

- **Council Plan Goal 4 Open Space - Increase community satisfaction with the appearance of public areas.**
 - To actively participate in all relevant waste and litter related state government supported education and behaviour change programs.
 - Progressively upgrade all waste only public place bins to dual waste and recycling units along the foreshore, parks and other open spaces in line with best practice.
 - Increase resource recovery and reduce contamination from public place recycling from 15% to 5% by 2025 through community education programs.
 - Design a range of programs promoting involvement and understanding activities within local businesses, sporting clubs, schools and the general community to reduce waste generation, improve public places recycling rates and reduce recyclables contamination rates in public bins by 2020.
- **Council Plan Goal 5 Environment – Maintain community satisfaction with Council's advocacy**
 - Contribute to the development of any future state and federal waste policy, legislation, regulations and other relevant opportunities, which effect of the management of waste on an ongoing basis.
 - Play an advocacy role by lobbying state and federal government bodies to take action to reduce levels of resource use, consumption and waste production, product stewardships and other waste reduction and environmental initiatives.
 - Design a range of campaigns to raise awareness of the need to reduce consumption levels and waste generation within the broader community (households, local businesses, sporting clubs and schools) by 2020.
- **Council Plan Goal 5 Environment – Increase community satisfaction with waste and recycling services**
 - Address the Waste Service Review's 11 operational improvements and 15 recommendations regarding the services provided.
 - Analyse new technologies and improvement options for waste management collections, pre-treatment and disposal.

- Investigate and recommend potential efficiencies and improvements of the hard waste collection services.
- **Council Plan Goal 5 Environment – Diversion of waste from landfill**
 - Develop a waste action strategy to inform how the framework outcomes and targets are achieved.
 - Achieve a 60% diversion of waste material from landfill by 2020.
 - Reduce food waste disposed in waste bins from 46% to below 30% by 2020.
- **ESF Goal 1 – Reduce percentage of waste to landfill from Council operations**
 - Develop staff education and behaviour change programs to reduce contamination of recyclables and compostable materials to below 20% by 2020 from the Corporate Centre operations.
- **ESF Goal 1 – Increase percentage of recyclables (comingle and green waste) recovered from kerbside collections**
 - Facilitate and evaluate opportunities, and develop recommendations for systems and infrastructure to keep food organics out of landfill.
 - Design a range of campaigns to raise awareness of the need to reduce consumption levels and increase recycling within the broader community (households, local businesses, sporting clubs and schools) by 2020.
 - Investigate and recommend potential efficiencies in the hard waste collection service to maximise resource recovery by 2025
- **ESF Goal 2 – Increase diversion of waste from landfill to 60% by 2020 and to 75% by 2025 compared to FY 14/15 baseline**
 - Review and provide recommendations and strategy to implement FOGO (food organics, green organics) system within the Bayside municipality.

12. Financial analysis

The net cost of this Strategy over a period of 10 years is \$6.5million. The timing of the implementation of the actions has been determined to ensure the municipal waste charge to residents is not increased (beyond cpi) over this period.

The key service changes that have involve financial implications are:

- Implementation of a FOGO service to divert food waste from landfill; and
- Processing residual waste at and AWRRT facility, such as Waste To Energy facility;

Furthermore, the recent difficulties experienced by the recycling industry are identified below as a further cost implication.

FOGO

The change costs associated with the introduction of the FOGO service are depicted in Table 9. Note: Negative amounts represent savings that contribute to net totals for each financial year

Table 8 – FOGO Change Costs

Activity	2018/19	2019/20	2020/21	2021/22
Develop and implement engagement and education plan. Commence full-time fixed term Band 5 FOGO Support Officer position in April 2019.	105,000	170,000	170,000	
Provision of kitchen caddies to residents that request them.		400,000		
Reduced landfill disposal costs.		-240,247	-559,027	-559,027
Additional 12,948 bins to be collected fortnightly (not currently using the green waste service)		262,080	262,080	262,080
Increased organics processing costs under MWRRG FOGO contract (\$95/T).		313,898	617,204	617,204
TOTALs	105,000	906,000	490,257	320,257

Residual Waste Processing – Alternate Waste Treatment

The diversion of residual waste (garbage) from landfill by processing at Advanced Waste Resource Recovery Treatment facilities is mainstream practice in Asia and Europe at costs approximating current gate fees for disposal at Victorian landfills. As such, no costs above current landfilling budgets are anticipated as part of this strategy. However, requirements for transport are yet to be determined as a location for such a facility is not known.

Changes to Recycling Costs

A further financial consideration is the changing landscape within the recycling sector. With the current uncertainty surrounding recycling processors following a ban of foreign waste by China, there is the likelihood that a fee will be introduced for recyclables. What once provided an income to Council will inevitably attract a fee for processing. This would be at a

considerable cost to Council as in the 2017 calendar year over 11,000 tonnes of recyclables were processed from Bayside residents. The below table highlights the current recycling situation and some potential future implications within the changing recycling sector.

Table 9 – Recycling Cost implications to 2017-18 Budget

Potential Recycling Implications			
	Tonnes	Rebate/Charge	Charge/Rebate P.A.
Current \$50 per tonne rebate (income)	11,000	\$50	\$550,000
No rebate	11,000	\$0	\$0
\$150 per tonne disposal (expenditure)	11,000	- \$150	-\$1,600,000

*Tonnages based on 2017 Calendar year

As the above table highlights if a charge is placed on the receiving and processing of recyclables of \$150 per tonne, this would represent a \$2,200,000 unfavourable change to Bayside City Council. The current experience with recycling has highlighted that a more sustainable contract model could be to link contract rates with commodity prices so that Council and its recycling processors share the risk of commodity price fluctuations.

Funding Options

A number of options exist to source funding for the proposed actions contained within the Recycling and Waste Management Strategy:

Deliver as part of future operational budget

A number of the actions identified within the Strategy are already foreshadowed in Council's operational budget or LTFP. Other actions requiring a funding allocation from Council's annual operating budget will be considered as part Council's annual budget planning process.

Deliver as part of future capital works programs

A number of the actions identified within the Strategy are already foreshadowed in Council's four-year capital works program or Long Term Financial Plan. Other actions requiring a funding allocation from Council's annual capital works program will be considered as part Council's annual budget planning process.

Federal and State government grants

There will be an opportunities to apply for funding from the Federal and State governments for the implementation of some actions contained within the Strategy. For example, the delivery of the Household Detox service provided at the Transfer Station was funded from the funding from Sustainability Victoria.

Deliver within other proposed infrastructure projects

Maximise opportunities to implement new facilities when other projects are being delivered to reduce costs and increase the reach of each annual budget.

New Initiatives

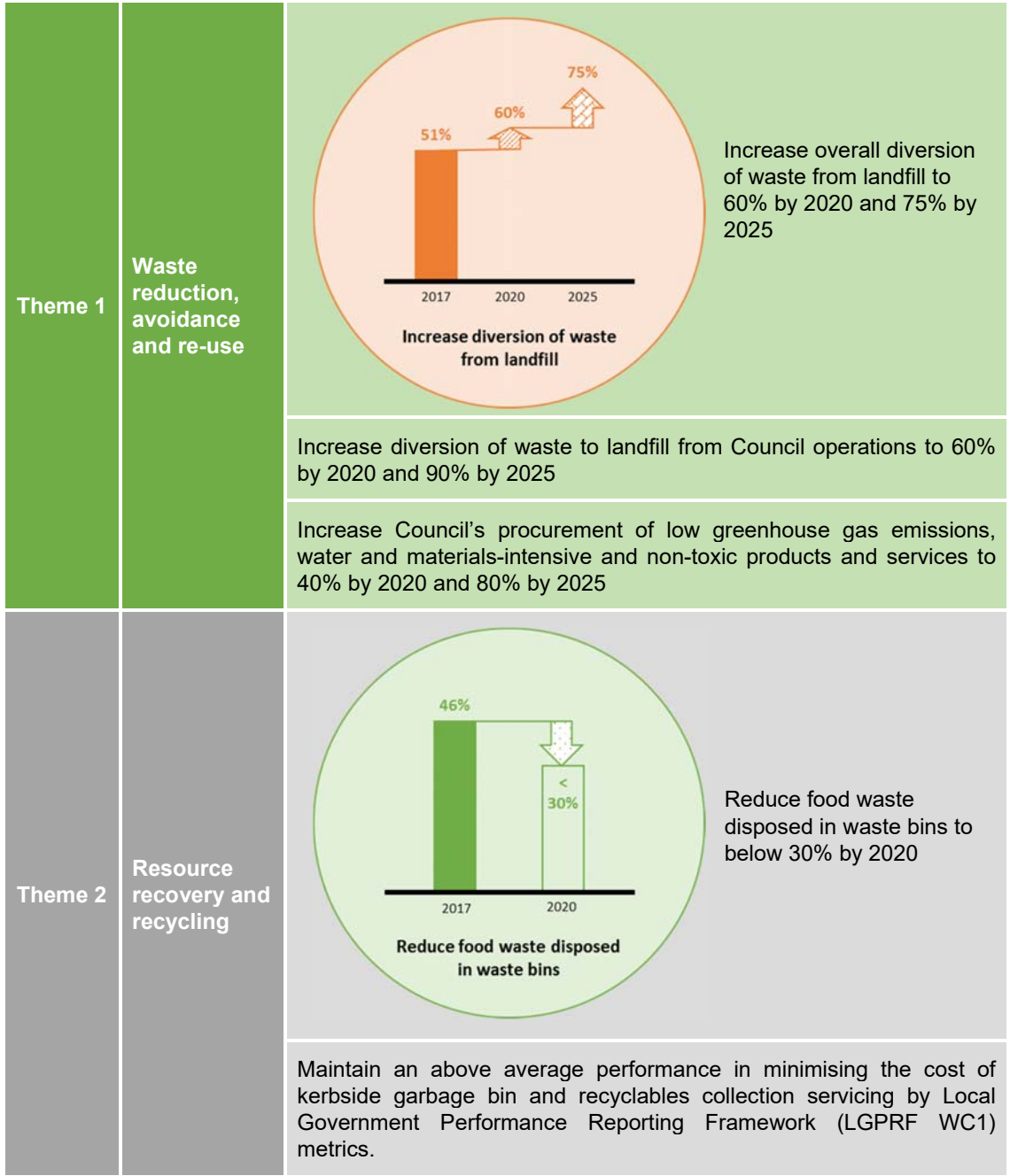
New initiatives are identified programs that are not incurred on an annual basis. Actions seeking new initiative funding are considered on an annual basis as part of Council's budget planning process.

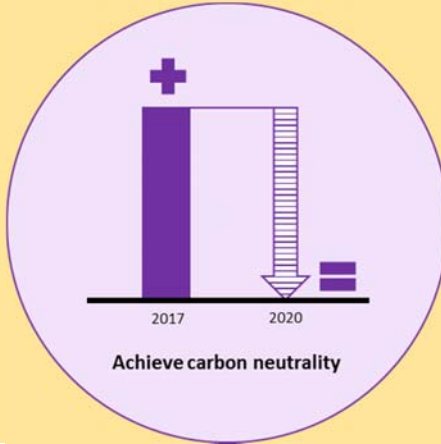
Council operates with a municipal charge for waste and recycling services. All waste associated with this service provisions are recouped from service users via the municipal charge.

13. Implementation and reporting

Strategy metrics and targets will be used to monitor and evaluate progress toward achieving the strategy vision and themes in an efficient and comprehensive manner. Figure presents the strategy metrics for each theme.

Figure 20. Strategy Performance Metrics



Theme 3	Governance and policy	Increase the number of completed capital works projects and new developments that consider Environmental Sustainability in their design and planning documentation to 90% by 2020
		Achieve no net increase in operational costs, beyond CPI, for Council's kerbside garbage collection
Theme 4	Environment and public amenity	Achieve a Local Government Community Satisfaction Survey index score of more than 74 for the appearance of public areas
		Reduce Scope 1 and Scope 2 greenhouse gas emissions from the use of Council buildings by 30% by 2020
		Increase the proportion of renewable energy used in Council's operations by 30% by 2020
		 <p>Reduce Council's total GHG emissions by 5% per year to achieve carbon neutrality by 2020</p>
		Identify and monitor seasonal litter hot spots and reduce litter by 15%
		Reduce the number of instances of illegal dumping by 10% from 2017 levels
Theme 5	Engagement	Reduce the number of kerbside bin requests and kerbside collection bin missed compared to 2016/17 figures, as reported in the LGPRF WC2
		<p>Reducing contamination to below:</p> <ul style="list-style-type: none"> • 3% for organic bins; • 10% for recycling bins; • 20% for Corporate Centre operations; and • 5% for public place recycling by 2025

14. Appendices

Appendix 1 Carbon Neutrality Action Plan Extract

The greenhouse gases that are reported under the NGER Scheme include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur hexafluoride (SF₆) and specified kinds of hydro fluorocarbons and perfluorocarbons.

Greenhouse gas emissions are measured as kilotons of carbon dioxide equivalence (CO₂-e). This means that the amount of a greenhouse gas that a business emits is measured as an equivalent amount of carbon dioxide which has a global warming potential of one. For example, in 2015–16, one tonne of methane released into the atmosphere will cause the same amount of global warming as 25 tonnes of carbon dioxide. So, the one tonne of methane is expressed as 25 tonnes of carbon dioxide equivalence, or 25 t CO₂-e.

Scope 1 emissions are specified under the NGER legislation and must be reported.

Scope 1 greenhouse gas emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level.

Scope 1 emissions are sometimes referred to as direct emissions. Examples are:

- Emissions produced from manufacturing processes, such as from the manufacture of cement
- Emissions from the burning of diesel fuel in trucks
- Fugitive emissions, such as methane emissions from coal mines, or
- Production of electricity by burning coal.

Scope 1 emissions are specified under the NGER legislation and must be reported.

Scope 2 greenhouse gas emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity. For example, 'indirect emissions' come from the use of electricity produced by the burning of coal in another facility.

Scope 2 emissions from one facility are part of the scope 1 emissions from another facility.

For example, a power station burns coal to power its generators and in turn creates electricity. Burning the coal causes greenhouse emissions to be emitted. These gases are attributed to the power station as scope 1 emissions. If the electricity is then transmitted to a car factory and used there to power its machinery and lighting, the gases emitted as a result of generating the electricity are then attributed to the factory as scope 2 emissions.

Scope 3 greenhouse gas emissions are not reported under the NGER Scheme.

Scope 3 emissions are indirect greenhouse gas emissions other than scope 2 emissions that are generated in the wider economy.

They occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business. Some examples are extraction and production of purchased materials, transportation of purchased fuels, use of sold products and services, and flying on a commercial airline by a person from another business.

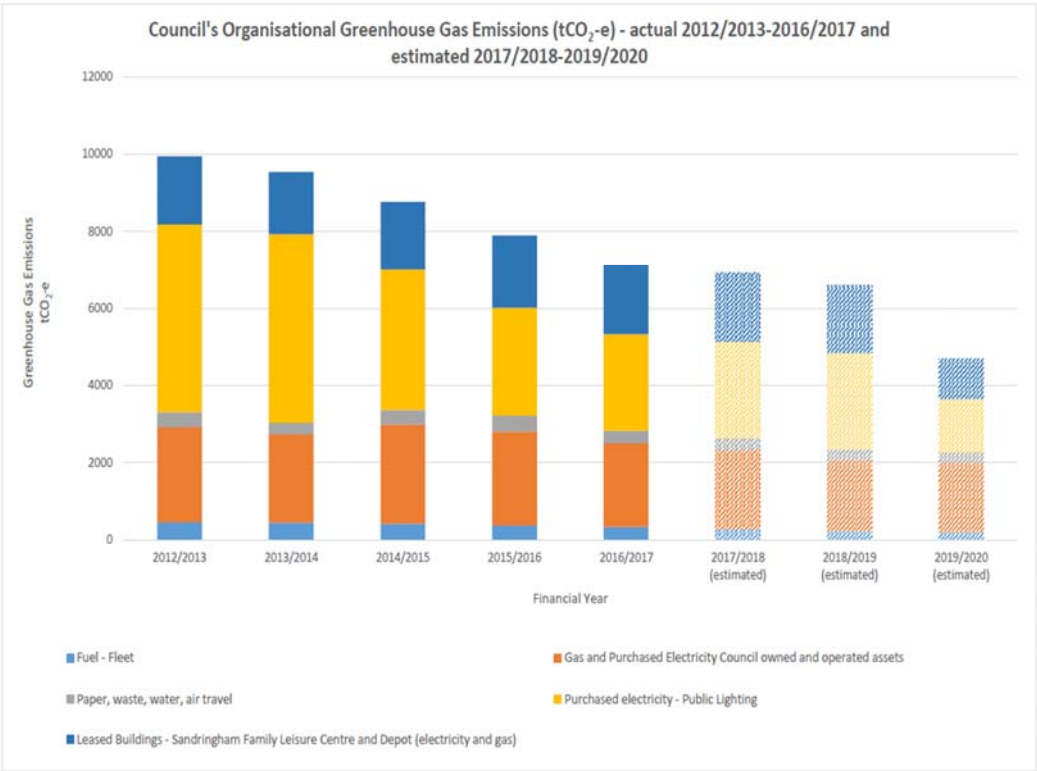
Table 10. Bayside CO2 emissions results 2016-2017

2016 - 2017 Emissions Inventory Data	Emissions (tCO₂-e)
Scope 1	
Fleet Fuel	328
Gas - council owned and operated	137
Scope 2	
Electricity Council owned and operated	1965
Scope 3	
Gas - Council leased FFC SFLC	498
Electricity - Council SFLC and Depot	1289
Electricity - Street light	2498
Water	302
Waste	14
Air Travel	9
Paper	0
Total Scope 1	465
Total Scope 2	1965
Total Scope 3	4610
Total Scope 1+2+3	7040

A carbon neutrality review completed in 2016 has resulted in the following:

- Council's greenhouse gas emissions for 2009/10 baseline year totaled 11,107 tons of carbon dioxide equivalent;
- Council's emissions for 2016/17 are expected to reduce by 25 per cent compared to 2009/10 (see figures below – data not verified);
- Three additional emission sources: consultant and contractor services, reticulated water supply, and employee commuting are now included within Council's carbon neutral accounting; and
- Council's carbon emissions will be minimized first and offset as a last resort.

Table 11. Bayside CO2 emissions graph (historical and predicted)



The above graph shows the actual greenhouse gas emissions and predicted emissions to 2020 from implementation of the Carbon Neutrality Action Plan.

DRY

Appendix 2 - FOGO Implementation Action Plan

Following the recommendation of the Recycling and Waste Management Service Review:

Council considers supporting the introduction of Food Organics Green Organics Collection (FOGO) by 2020 and commences an assessment of the implementation and benefits of such an approach in the Recycling and Waste Strategy.

FOGO deployment steps

The following steps outline a typical process flow for successful deployment of FOGO services:

1. Garden Organics services to all households are established and operating at low contamination.
2. Conduct bin assessments (Garbage, Recyclables and Garden Organics) to establish base contamination levels.
3. Design bin system alternatives to deploy, which in Bayside City Council case would require staggered bin infrastructure changes to comply with AS.
4. Design and provide education resources to residents.
5. Provide caddies and compostable liners on an ongoing basis.
6. Stage the deployment of new bin frequencies - if planning to deploy weekly FOGO and fortnightly Residual, it is recommended to transition households and start with an initial roll out of Garbage weekly, FOGO weekly and Recyclables fortnightly.
7. Conduct regular bin audits following roll out to monitor the implementation success and contamination of waste streams.
8. Identify issues and resolve using the "FOGO Engagement Team" (FET).
9. Allow at least 3 months to settle - only when the new FOGO service settles down should the Garbage bin be dropped to a fortnightly service with ample notice provided to residents

Change Management Model

The following change management model needs to be adopted:

1. Establish a community advisory group (CAG) and engagement plan:
 - a. Diverse group to provide community perspective and advice;
 - b. Representatives of MUDs, SUDs, community groups; and
 - c. Utilise the CAG to inform and develop a community engagement and communication plan.
2. Begin community education and discussion 1-2 yrs. prior to FOGO deployment:
 - a. Provide reasons why the change is necessary;
 - b. Provide the benefits;
 - c. Consider TV, cinema, print and social media;
 - d. Information sheets and brochures; and
 - e. 'Brand' the change.
3. Increased communication 6 months before deployment and during deployment:
 - a. Establish a "FOGO Engagement Team" (FET) – a positive in house (or subcontract) helpful team that assists the community do the right thing;

- b. Develop key messages-what to do, what is expected and reasons why minimal contamination is important;
- c. Undertake high profile shopping centre displays and demonstrations;
- d. Deliver schools education materials and demonstrations;
- e. Train staff to manage enquiries – provide sufficient enquiry platforms; and
- f. Develop templates for media responses and management.

4. During deployment

- a. Provide household instruction brochures delivered with kitchen caddies;
- b. Ensure usage information stickers are placed on bins and/or caddies;
- c. Key messages reinforced by advertisements -include TV, cinema, print and social media;
- d. The FET is used to discourage contamination – random bin inspections+ helpful advice; and
- e. Develop a rewards program to reinforce and promote positive behaviours.

5. Post Deployment:

- a. FET maintains a presence, auditing bins, advising residents;
- b. Maintain media presence;
- c. Deliver targeted resources for new resident's via real-estate agents and rates notices;
- d. Provide early bin calendar and bin liners delivery; and
- e. Deliver a 'Thanks Campaign' -showing achievements and savings etc.

FOGO contamination management

The following elements of a contamination management strategy are suggested for the successful deployment of FOGO services:

1. The "FOGO Engagement Team" (FET) conducts conduct random bin audits/ bin inspection program and communicate directly with households to provide advice and sticker bins if contamination remains high following intervention;
2. Collection drivers monitor bin contamination via on-board camera and record contaminated bins;
3. Engagement with Community Advisory Group (CAG) to develop alternatives and approaches;
4. Provide alternative bin options for households with specific needs/issues;
5. Introduce a 3-strike system for unwilling residents then shift to a 'contamination service' – higher cost residual bin and no FOGO bin; and
6. Report contamination levels to the community.

FOGO Indicative costs

The following factors will affect the overall cost of a collection scheme and need to be considered during planning and budgeting phases. The list below includes both initial investment costs, which have to be funded when establishing a new collection scheme, and on-going operating costs.

- Number of additional staff (management, operational and administration);
- Infrastructure changes and adjustment to service systems;
- Contractor collection rates increases – new frequency, disposal route, etc.;

- Type and size of collection bins and kitchen containers provided to residents;
- Type and number of liners for kitchen containers, if provided to residents;
- Intensity and duration of public education and motivation campaign; and
- Performance monitoring, including audits and contamination management.

The Recycling and Waste Management Service Review recommended the following:

Address waste stream contamination and avoidance of resource loss by considering changing the bin lid colours to meet Australian Standards as part of the Recycling and Waste Strategy.

It is recommended that Bayside City Council introduce of a uniform colour scheme for waste bins that accords with that prescribed by the *Australian Standard AS 4123.7 – 2006 “Mobile Waste Containers – Colours, marking and designation requirements”*. The colours of the Bayside's bin lids do not currently correspond with the Australian Standard and this has the potential to increase contamination and hamper efforts to increase diversion from landfill.

DRAFT

Appendix 3 - Recommendations of the Recycling and Waste Management Service Review

Kerbside collections:

#	Recommendations
3.1.1	Council considers supporting the introduction of Food Organics Green Organics Collection (FOGO) by 2020 and commences an assessment of the implementation and benefits of such an approach in the Recycling and Waste Strategy.
3.1.2*	Encourage a reduction of waste to landfill at the source by considering reducing the size of the standard bin offering or altering the frequency of service for residential general waste as part of the Recycling and Waste Strategy.
3.1.3*	Address waste stream contamination and avoidance of resource loss by considering changing the bin lid colours to meet Australian Standards as part of the Recycling and Waste Strategy.
3.1.4	Engage with businesses and traders who have multiple Council bins to determine the best options to suit their waste needs.
3.1.5	Engage with all commercial food premises to encourage them to arrange for private collections of food scraps.

Bayside Recycling and Waste Transfer Station:

#	Recommendations
4.2.1	Council awaits the outcomes of the planning and design of the Transfer Station upgrade to be completed by June 2018 to further explore future options regarding the Transfer Station.
4.2.2	Collect feedback to ascertain the community need for and service satisfaction with the Transfer Station from the community as part of the Recycling and Waste Strategy.

Street, park and foreshore recycling and waste collection:

#	Recommendations
4.3.1	Investigate opportunities to increase frequency of public bin collection during peak and seasonal times and in the major activity centres.
4.3.2	Upgrade the ageing bin infrastructure within shopping centres, parks and foreshore with innovative public waste solutions, and include in the Recycling and Waste Strategy.

Booked green and hard waste collection:

#	Recommendation
4.4.1	Maintain the current booked hard waste and bundled branches service and promote its benefits.

Corporate Centre and Council-owned facilities waste and recycling collection:

#	Recommendation
4.5.1	Review community facility leases to ensure appropriate waste management and recycling provisions are included.

Community recycling stations:

#	Recommendation
4.6.1	Expand the Community Recycling Station service to other Council owned facilities and refer to 2018/19 budget.
4.6.2	Increase the frequency of the soft plastics collection service at the Community Recycling Stations to cater for demand.

Composting products sale:

#	Recommendation
4.7.1	Withdraw from selling composting products by December 2017, however continue to promote the benefits of composting.

Service improvement opportunities:

#	Recommendation
5.1.1	Develop a comprehensive communications and marketing plan to promote all recycling and waste services provided by Council including hard waste and bundled branches, community recycling stations and kerbside collection services to increase utilisation and reduce contamination rates. This includes providing additional information on the website – both transactional and educational – to increase community awareness and understanding.
5.1.2	Review signage on kerbside collection trucks to promote Council's commitment to recycling and waste management.
5.1.3	Improve implementation and enforcement of the Bayside Planning Scheme in relation to recycling and waste requirements for multi-unit developments.
5.1.4	Work with Council staff and contractors to reduce contamination and volumes of waste generated in the Corporate Centre and other satellite sites such as libraries and Maternal and Child Health Centres. This includes providing larger paper recycling bins next to shredder bins and soft plastics bins around the Corporate Centre to improve recycling rates.

5.1.5	Review of waste and recycling generated by Council operations, including Council-run events and determine improvement opportunities in the Recycling and Waste Strategy;
5.1.6	Explore the feasibility of marking bin collection areas, including parking restrictions on collection days in major activity centres and identified 'hot spots' to manage congestion and access to laneways.
5.1.7	Improve the level of service between cleaning and waste collection contractors at the Corporate Centre to ensure the handling of waste stored in the bin corral area on the south side of the corporate centre does not become a source of windblown litter to the car park and surrounding parkland.
5.1.8	Address the quantity of waste generated by MUDs not included in Council's reporting framework to drive awareness and improvement in this area.

People improvement opportunities:

#	Recommendation
5.2.1	Consider the resources required to create, execute and manage a comprehensive, evidence based waste education and communications plan to prepare and manage implementation of FOGO program.
5.2.2	Develop a clear succession plan for the Recycling and Waste Management Unit to ensure effective service delivery and business continuity.

Waste contractors improvement opportunities:

#	Recommendation
5.3.1	Embed process improvements for key recycling and waste management activities to support efficient service delivery.
5.3.2	Where appropriate, bundle contracts together to reduce administration costs.

Appendix 4 Circular Economy principles

The term Circular Economy has been proposed to describe an economy that is designed to be restorative and regenerative; one that aims to keep products, components, and materials at their highest utility and value at all times.

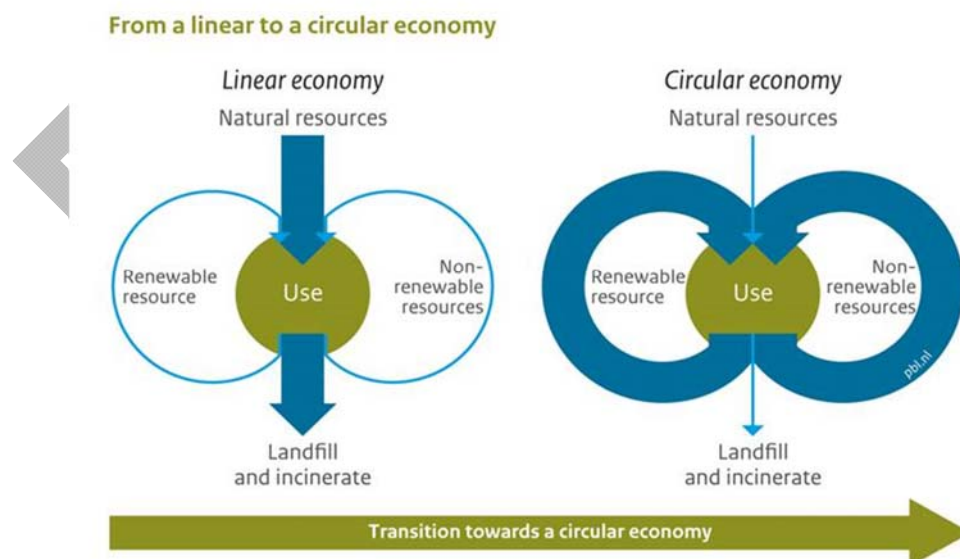
When it comes to food production, there is a growing buzz around the Circular Economy concept, and for good reason. At the same time, there is a risk that the term gets hijacked, diluted, and employed as a form of “green washing.” To avoid this, there is a need to develop clear design principles that address the deep-seated problems of how we grow, produce, and consume food.

A key limitation of industrialized food production stems from a tendency towards linear design. This means that industrialized food systems are typically organized around the idea of a production line where resources (i.e., materials) are extracted, made into products (e.g., food, feed, or fibre), consumed or discarded, and finally disposed of by way of incineration or landfill.

Linear designs are supported by a set of technological and institutional assumptions, principles, and practices that result in the standardization of processes. While standardization has traditionally been championed for offering economies of scale, it has also reduced the diversity of our food sources.

Furthermore, because of this linear design, industrial food production systems tend to disconnect places of production from places of consumption, reinforcing disconnect between where food is produced and where it is consumed. It's why we get to enjoy daily cups of coffee, but also why many children struggle to identify common fruits and vegetables.

Figure 23. Linear vs Circular Economies

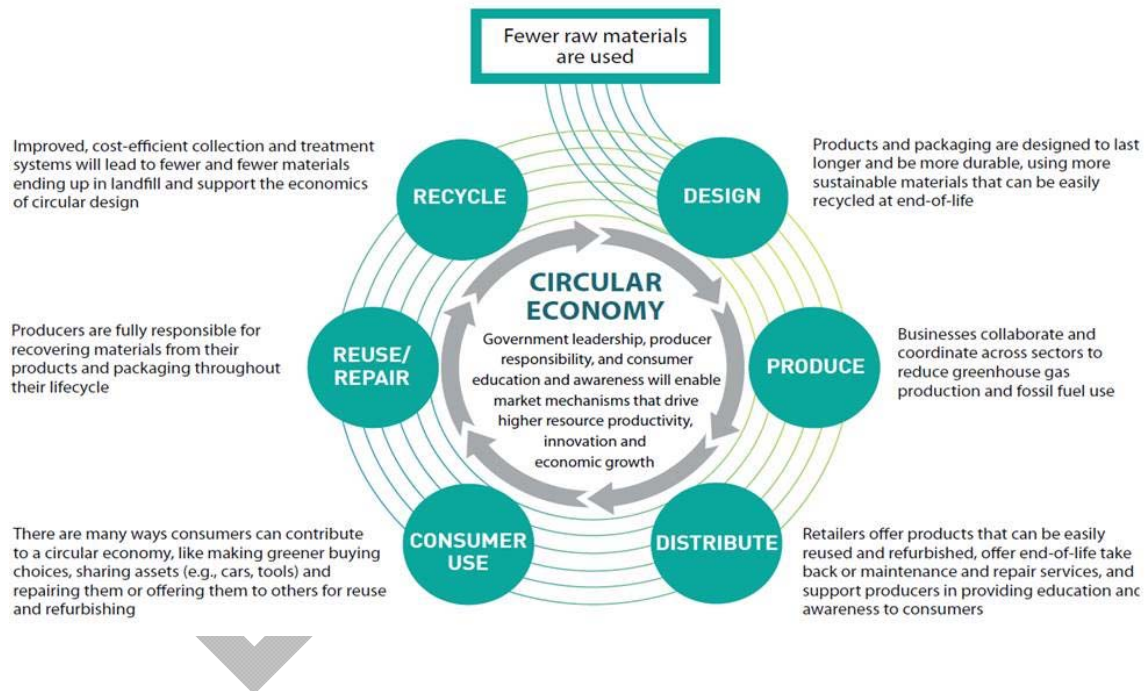


The concept of a circular economy, introduced by the late David Pearce in 1990, addresses the interlinkages of the four economic functions of the environment. The environment not only provides amenity values, in addition to being a resource base and a sink for economic activities, it is also a fundamental life-support system. Environmental economists have suggested that, taking these four functions as an analytical starting point, un-priced or under-priced services should be internalised in the economy.

In Europe significant advances have been achieved in the pricing of externalities by means of truly interdisciplinary analysis which accounts in detail for the environmental consequences. The monetary estimates reached as a result of such interdisciplinary research are gradually being applied to the economic analysis of environmental policy priorities.

Although such figures provide only a partial and incomplete picture of the environmental costs at stake, they support and inform the analysis of the virtues of a circular economy for individual resources as well as for sustainability as a future trajectory.

Figure 24. Circular Economy



There are emerging examples of production systems that have embraced the Circular Economy approach although implementing a circular design takes time and careful consideration. Below are examples of Circular Economy principles applied to various waste streams.

Figure 25. Circular Economy Metals and Aluminium

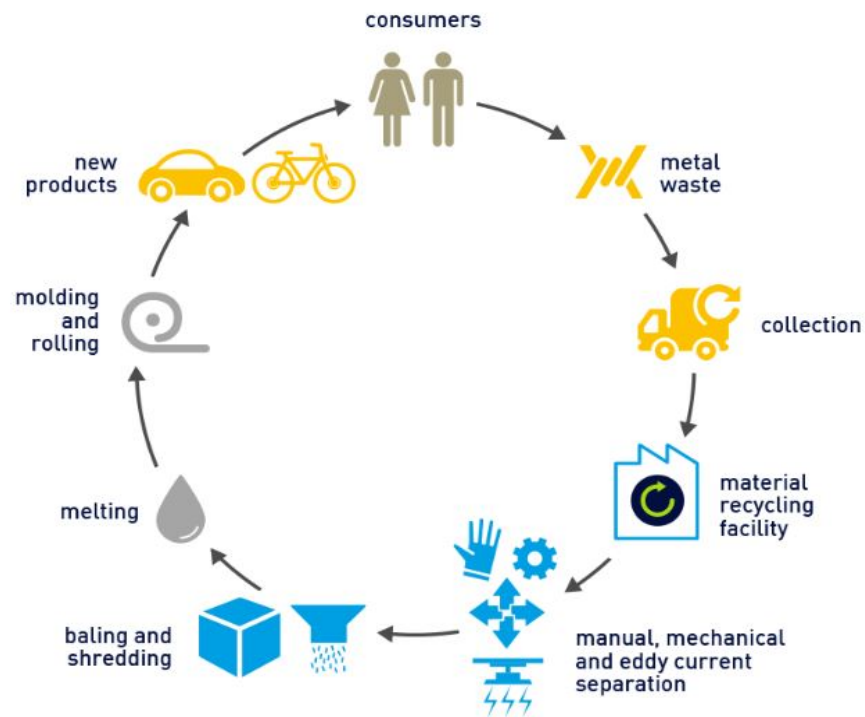


Figure 26. Circular Economy Organics



Figure 27. Circular Economy Glass

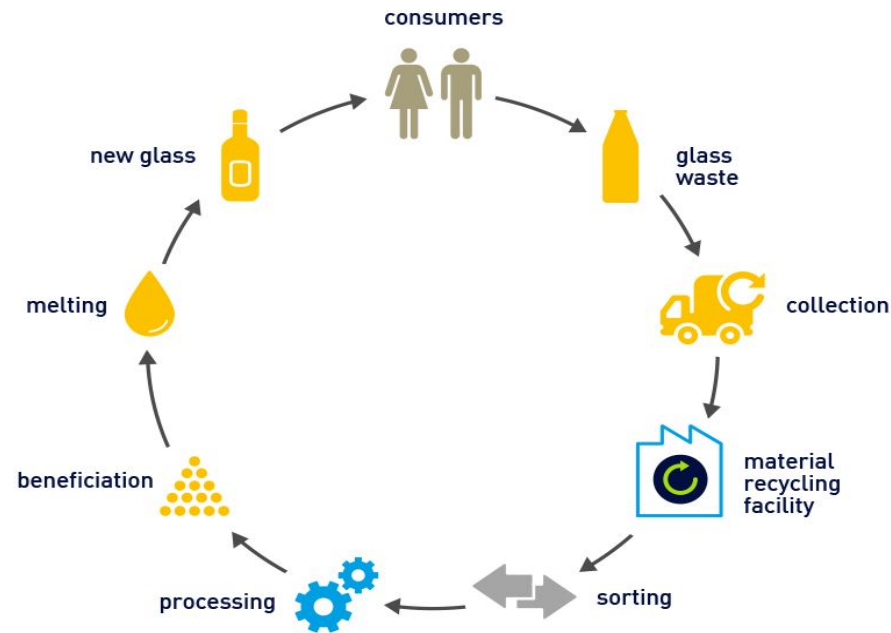


Figure 28. Circular Economy Comingled Recyclables

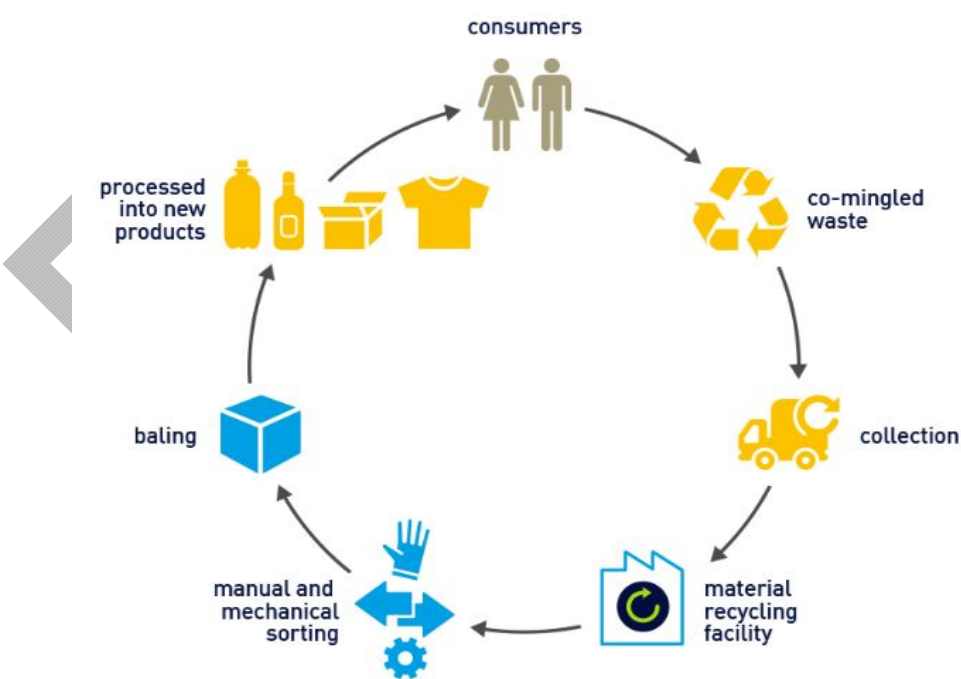
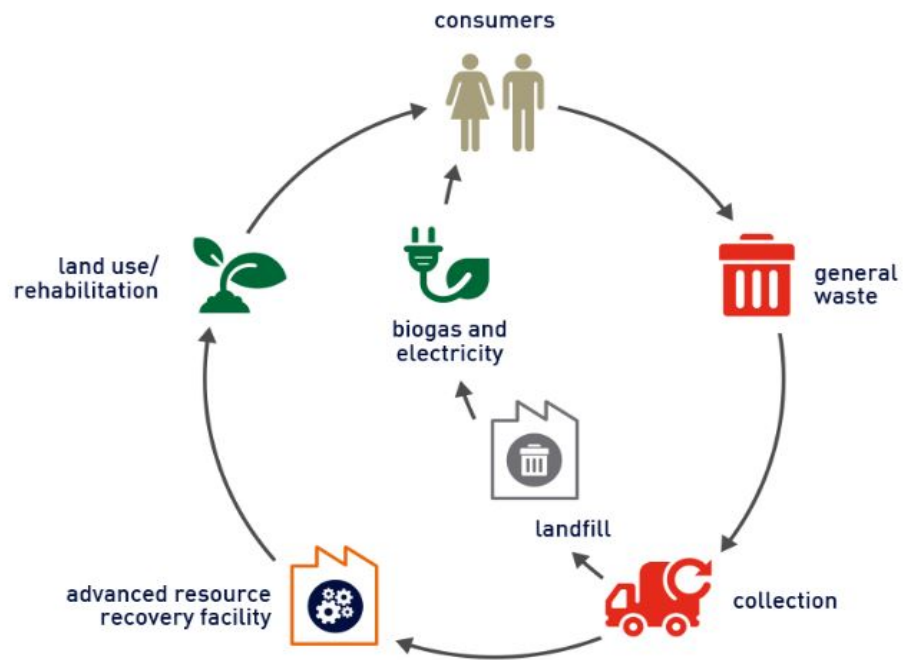


Figure 29. Circular Economy General Waste



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We acknowledge the Boonwurrung people of the Kulin Nation as the traditional owners of this land and we pay respect to their Elders past and present.

We acknowledge that together we share a