GOVERNMENT OF WESTERN AUSTRALIA

WASTE AUTHORITY
WA...TOO GOOD TO WASTE

WasteSorted
A Waste Authority Program

Position statement on FOGO collection systems

Getting our WasteSorted

August 2020

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This document is available in alternative formats and languages on request to the Waste Authority.

Statutory context
The Waste Authority is charged with promoting better waste management practices in Western Australia under the *Waste Avoidance and Resources Recovery Act 2007*. One of the Authority's functions under the Act is to draft, for the Minister for Environment's approval, a long term waste strategy for the whole of the State for continuous improvement of waste services, waste avoidance and resource recovery, benchmarked against best practice and targets for waste reduction, resource recovery and the diversion of waste from landfill disposal. The *Waste avoidance and resource recovery strategy 2030* was released on 10 February 2019. The Waste Authority publishes position statements from time to time. Position statements formalise the views of the Waste Authority and may be used to inform decisions relevant to the Waste Authority's role in implementing the strategy.

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Overview

Organic waste can refer to the following materials:

- garden organics (also termed 'green waste') from households, parks and gardens
- food waste from industry, institutions, commercial businesses and households
- uncontaminated wood waste, forestry residues, waste paper and cardboard
- other biodegradable organic residues from agricultural and urban activities

In 2016–17, 30 million tonnes of organic waste was generated in Australia, across all waste streams, with around 14 million tonnes arising within the key waste streams of municipal solid waste (MSW), commercial and industrial waste (C&I waste) and construction and demolition waste (C&D waste). The organic waste within these three waste streams amounted to about 581 kilograms per person per year, of which 52 per cent was reported as recycled.[1]

Food waste makes up a substantial proportion of the organics waste stream. In Australia in 2016–17, around 4.3 million tonnes of food waste was reported as being generated. There is a strong push to recover organic materials – including food waste – across all levels of government.

In 2017, the Australian Government released the *National food waste strategy*, which aims to halve Australia's food waste by 2030.

Western Australia's *Waste avoidance and resource recovery strategy 2030* (waste strategy) contains objectives to **avoid** waste, **recover** more value and resources from waste and **protect** the environment, supported by ambitious but achievable targets. Organic material is identified as a focus of actions and measurement under the strategy. The waste strategy includes a headline strategy to introduce a consistent three-bin kerbside collection system, which includes separation of food organics and garden organics from other waste categories, to be provided by all local governments in the Perth and Peel regions by 2025.

1 This excludes organic wastes directly from the agricultural and fisheries sectors, paper and cardboard, and organic wastes that are contaminated with hazardous substances (Pickin et al., 2018).

Organics recycling delivers environmental benefits, including lower greenhouse emissions (when compared to landfill), and can produce valuable outputs such as compost and bioenergy. The recycling of organics represents a significant opportunity to increase overall material recovery rates because of the relatively high volume of organic material available for recovery. Furthermore, organics recycling provides a good example of a closed-loop system because recovered materials can be recycled and re-used locally.

Local governments are increasingly introducing garden organics (GO) or food organics and garden organics (FOGO) kerbside bin collection services. This trend is emerging in Western Australia, but is more established in New South Wales, South Australia and Victoria.

This position statement confirms the Waste Authority's support for FOGO collection systems provided by local governments to households.

Background

The Western Australian *Waste avoidance and resource recovery strategy 2030* aims to move Western Australia towards a sustainable, low-waste circular economy in which human health and the environment are protected from the impacts of waste. The waste strategy contains objectives to **avoid** waste, **recover** more value and resources from waste and **protect** the environment, supported by ambitious but achievable targets.

The waste hierarchy and circular economy are central to the new strategy. The waste hierarchy ranks waste management options in order of their general environmental desirability. A circular economy complements the waste hierarchy – it aims to keep materials and energy circulating in the economy for as long as possible.

Organic waste is identified as a key focus for the strategy. Increasing the recovery of organic materials is consistent with the waste hierarchy and circular economy approaches, and critical to achieving the strategy's targets. A headline strategy is to deliver a harmonised kerbside collection system, which includes FOGO, in the Perth and Peel regions by 2025

Typically, organic material makes up more than half of the waste generated by households. In Western Australia, many local governments provide garden organics collection services; however, few provide dedicated FOGO collection services.

High-performing three-bin services (including food waste) can achieve recovery rates of about 65 per cent. FOGO collection services represent a significant opportunity to support the achievement of the waste strategy material recovery targets.

The Waste Authority is committed to encouraging best-practice three-bin FOGO services to maximise the recovery of valuable materials from the waste stream, deliver economic and environmental benefits, and help support the achievement of waste strategy targets.

This position statement complements the Waste Authority's position statements on the waste hierarchy and source separation, and the Waste Authority's *Better practice FOGO kerbside collection guidelines*.

The Western Australian context

Municipal solid waste generation in Western Australia

In 2016–17, about 4.63 million tonnes of solid waste was generated in Western Australia, of which 1.6 million tonnes was MSW. The reported MSW recovery rate in that year was 31 per cent.

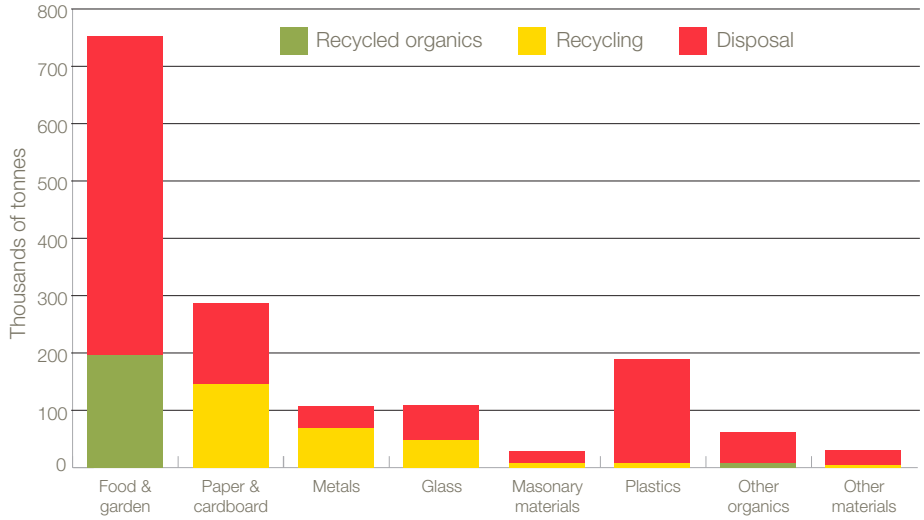


Figure 1: Municipal solid waste recycling and disposal figures for Western Australia, 2016–17 (Pickin et al., 2018)

In 2016–17, about half of the 1.6 million tonnes in the MSW stream was food and garden organics, of which around 200,000 tonnes was estimated as being recycled (Pickin et al., 2018). The recovery of food waste and organic waste is critical to significantly increasing the state's MSW material recovery rates.

FOGO comprises around half of the MSW stream; however, only about a quarter of that material is recovered.

FOGO FACTS

FOGO collection systems present an opportunity to significantly increase material recovery rates.

Legislation and policy

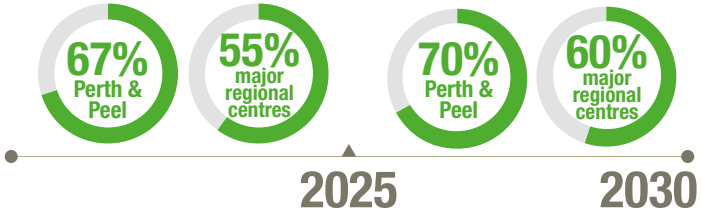
The Government of Western Australia is committed to reducing waste and increasing resource recovery. The *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) and the waste strategy are the key legislative and policy documents that support this commitment.

The WARR Act establishes the Waste Authority and its functions, including a requirement for the Waste Authority to prepare a draft waste strategy for Western Australia.

The waste strategy aims to move Western Australia towards a sustainable, low-waste circular economy in which human health and the environment are protected from the impacts of waste. The waste strategy contains objectives to **avoid** waste, **recover** more value and resources from waste and **protect** the environment. The strategy includes targets for each objective, including 'recover' targets for MSW.

2025 – Increase MSW material recovery to 67 per cent in the Perth and Peel regions; 55 per cent in major regional centres

2030 – Increase MSW material recovery to 70 per cent in the Perth and Peel regions; 60 per cent in major regional centres



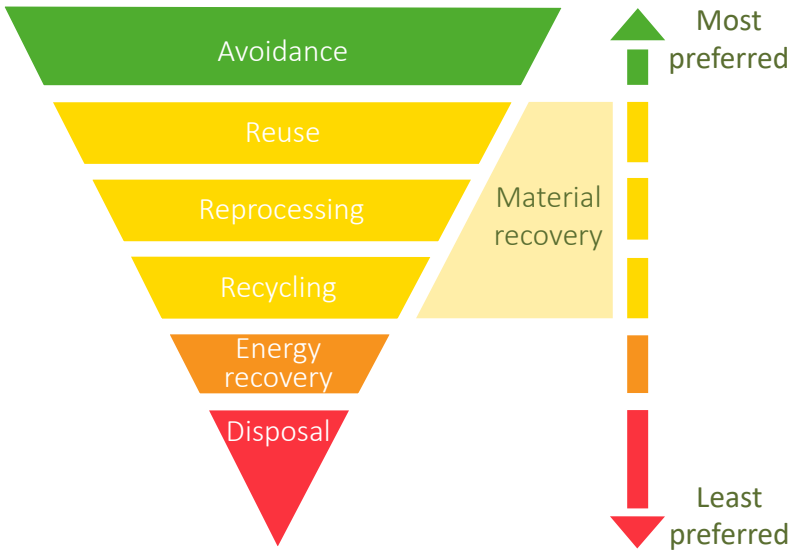
The waste hierarchy and source separation

The waste hierarchy is set out in the WARR Act. The Waste Authority position statement on the waste hierarchy explains how the Waste Authority applies the hierarchy in its decision-making.

The Waste Authority has also released information and guidance on the source separation of waste to explain the benefits of separating waste streams wherever technically, environmentally and economically practicable. Separating waste at the source is consistent with the application of the waste hierarchy.

The Waste Authority uses the waste hierarchy to support its decision-making.

The Waste Authority strongly supports source separation of waste streams wherever reasonably technically, environmentally and economically practicable, to maximise material recovery.



Circular economy and recycled organics

A circular economy builds on long-standing sustainability concepts, including life-cycle thinking and resource efficiency, and it complements the waste hierarchy. A circular economy aims to keep materials and energy circulating in the economy for as long as possible.

A circular economy presents opportunities for increased local recycling activity. Local solutions create local jobs, and minimise the costs and impacts of unnecessary transport.

Recovering organics and using organic-derived products locally is consistent with a circular economy.

National food waste strategy

In 2017, the Australian Government released the *National food waste strategy*, which aims to halve Australia's food waste by 2030.

The strategy needs all Australians to work together and undertake meaningful action to reduce food waste.

Circular economy

FOGO FACTS

Recovering organics through source separated FOGO collection systems supports a more circular economy.

FOGO collection systems support national efforts to improve the management of food waste.

FOGO: materials and processing

Inputs

Wastes that are likely to be suitable for inclusion in FOGO collection systems include food and garden waste and some other organic wastes.

▶ Food organics

Food organics include waste food, inedible food, and parts of food that are not consumed and/or are considered undesirable (such as seeds, bones, coffee grounds, skins and peels).

▶ Garden organics

Garden organics include organic wastes that arise from gardening and maintenance activities, such as lawn clippings, leaves, cuttings and branches.

▶ Other organic wastes

Other organic wastes that may be compatible with FOGO collections can include items such as soiled paper kitchen towels.

Outputs

FOGO can be used to produce products such as compost and biogas.

▶ Compost

Compost is organic matter that has been decomposed and recycled as a fertiliser and soil amendment. The quality of compost produced from the waste stream depends largely on the quality of inputs.

Compost made from source-separated FOGO with low contaminant levels is more likely to produce high-quality compost and meet unrestricted use criteria, such as the *Australian Standard for Composts, Soil Conditioners and Mulches* (AS 4454) (Blue Environment, 2009; Hyder Consulting, 2012).

▶ Biogas

Biogas refers to gases produced by the breakdown of organic matter by microorganisms in the absence of oxygen or air. The methane in the biogas can be used to generate renewable energy.

Processing

Typically, FOGO materials are processed by composting facilities, but other technologies such as anaerobic digestion can also process these materials.

▶ Composting

Composting is a multistage biodegradation process where microorganisms in the presence of adequate oxygen and/or air turn organic materials into a soil amendment (Blue Environment, 2009; Hyder Consulting, 2012).

Composting can be conducted in a number of ways, including composting in open windrows, via in-vessel systems and in aerated static piles (Hyder Consulting, 2012).

▶ Anaerobic digestion

Anaerobic digestion involves organic carbon compounds biodegrading in a controlled process that excludes air and/or oxygen. Anaerobic digestion involves several stages, with the final stage generating biogas, which contains between 50 and 75 per cent methane (CH4), depending on the wastes and the process type used (Hyder Consulting, 2012).

▶ Other technologies

A number of other technologies exist for processing organic wastes, including various thermal treatments and fermentation. Some of these technologies may find applications for processing organic waste from municipal sources in the future, but their use to date has primarily focused on commercial organic waste streams and agricultural residues.

FOGO: benefits

Recovery performance

A significant number of local governments in several Australian states have moved, or have committed to move, towards various types of three-bin services to maximise recovery.

A three-bin service, collecting mixed waste, co-mingled recycling and garden organics, can achieve kerbside recovery rates of about 50 per cent.

As at August 2020, in Western Australia, over 25 local governments provide, or have committed to providing, a three-bin service. Most of these local governments are supported by the Better Bins program.

A three-bin service that includes FOGO can further increase kerbside recovery rates to about 65 per cent, or higher if residual waste undergoes further treatment for recovery.

Figure 2 indicates the recovery rates that can be achieved by different kerbside systems (Sustainability Victoria, 2017).

South Australia is well advanced, with most metropolitan local governments offering FOGO collection services. Some of these services are 'opt-in' services.

A number of local governments in New South Wales and Victoria already provide three-bin FOGO services while others are planning implementation.

As at August 2020, in Western Australia, 10 local governments have introduced a three-bin FOGO service, with several other local governments committed to introducing a service in the short- to medium-term.

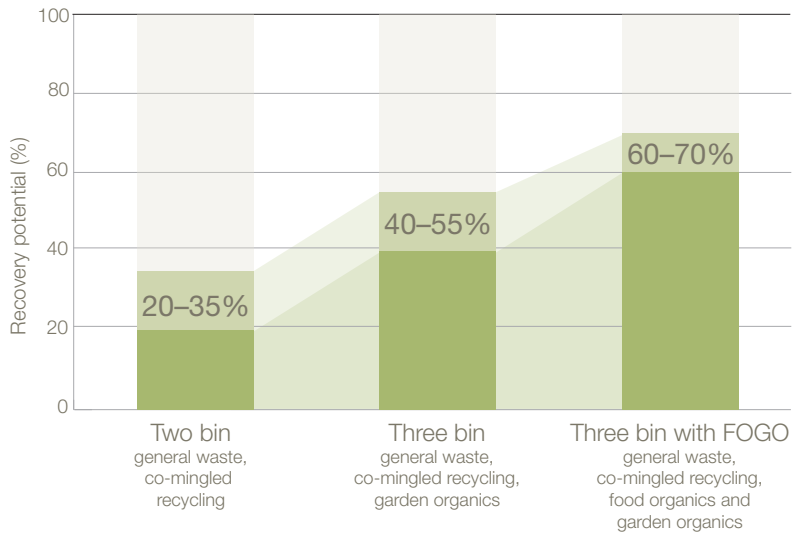


Figure 2: Recovery rates for kerbside bin configurations (Sustainability Victoria, 2017)

The City of Bunbury's FOGO service achieves a kerbside recovery rate of about 65 per cent. Other local governments in the state's South West, including the shires of Augusta-Margaret River, Capel, Collie, Harvey and Donnybrook-Balingup, have successfully introduced a three-bin FOGO service.

The cities of Melville and Fremantle and the Town of East Fremantle have introduced FOGO services following a successful household FOGO trial in the City of Melville, which achieved a recovery rate of 66.5 per cent.

In July 2020, the Town of Bassendean introduced a three-bin service that includes FOGO.

A three-bin service that includes FOGO can achieve recovery rates of around 65 per cent, or higher if residual waste undergoes further treatment for recovery.

High-performing FOGO systems can make the single biggest contribution to achieving the waste strategy material recovery targets for MSW.

Environmental benefits

▶ Greenhouse gas emissions from organics recovery and landfill

Decomposing putrescible waste in landfills produces a mixture of methane and carbon dioxide. Methane is about 25 times stronger than carbon dioxide as a greenhouse gas (DEE, 2017).

High-performing landfills abate much of their potential greenhouse gas emissions by either flaring landfill gas or by capturing and using landfill gas, but leakage into the environment can still occur, even with high performing systems (DEE, 2017). Some landfills have fewer controls and emit significant amounts of greenhouse gases.

Best-practice organics recovery emits less greenhouse gas than putrescible landfills per tonne of FOGO materials managed (MRA Consulting, 2017; Biala, 2011).

The use of compost and other recycled organics as soil amendments can potentially produce further greenhouse gas benefits by offsetting some fertiliser use and/or reducing other greenhouse gas emissions from land management (Biala, 2011).

▶ Local use of recycled product

FOGO can usually be processed close to the source of generation. Products derived from FOGO can also be used locally. Compost produced by FOGO materials can be used by local governments in parks and gardens, or sold back into the local community.

Local processing and use of recycled FOGO products reduces the environmental and economic cost of transporting materials over long distances, supporting a more circular economy.

▶ Other environmental impacts from organics recovery and landfill

Landfilling organic wastes can contribute to a range of other environmental impacts such as odour and the production of landfill leachate.

FOGO recovery reduces the volume of putrescible waste entering landfills and associated environmental impacts.

Economic benefits

▶ Employment

Resource recovery directly creates 9.2 full-time equivalent positions (FTEs) per 10,000 tonnes of waste treated in comparison to 2.8 FTEs per 10,000 tonnes disposed of to landfill (Access Economics, 2009). FOGO collection services make a significant contribution to resource recovery, which can generate local employment opportunities.

▶ Investment

Increased demand for FOGO processing services can drive investment in processing infrastructure.

FOGO FACT

FOGO collection services deliver environmental benefits such as reduced greenhouse gas emissions. FOGO products can also help soil quality and can be used locally, reducing the environmental and economic cost of transporting materials over long distances.

▶ Avoided landfill costs

Sending waste to landfill is becoming more expensive compared to recovery, particularly in areas where the landfill levy is applied. As at 2020, the waste levy at putrescible waste landfills is $70 per tonne for material generated or landfilled in the Perth metropolitan region.

Establishing source-separated FOGO services will have upfront and ongoing costs. However, FOGO services provide an opportunity to significantly reduce the amount of general waste sent to landfill, minimising local governments' exposure to increasing landfill costs over the longer term.

▶ Preparing a FOGO business case

The economic and financial implications of FOGO services in local governments will vary depending on the particular circumstances of each local government, such as its services (including contracts and costs), recovery performance and exposure to the waste levy.

The Waste Authority has developed a FOGO Reference Group to support the rollout of FOGO services until 2025. The Reference Group is working with local governments to support the application of cost benefit analysis relevant to their specific circumstances, including contract arrangements, and collection and processing options.

FOGO FACT

The Better Bins Plus: Go FOGO program, delivered by the Waste Authority, supports local governments with the cost of implementing better practice FOGO kerbside services.

Social benefits

Consumers are increasingly seeking to understand where and how materials are recycled. FOGO collection services provide an opportunity for local governments to demonstrate local recycling and local benefits in the community.

Collection and processing in Western Australia

Recovery

As at August 2020, in Western Australia, 10 local governments have introduced a three-bin FOGO service. The City of Bunbury has been reporting kerbside recovery rates of around 65 per cent. The City of Melville trial reported a recovery rate of 66.5 per cent.

Costs

The costs of delivering a three-bin food FOGO kerbside service depend on a number of factors including contract arrangements and choices around service provision.

The 2016 Southern Metropolitan Regional Council strategic waste management plan estimated bin lift costs for FOGO collections at $1.30 per lift (SMRC, 2016). The plan acknowledges that bin lift costs can differ depending on factors including distance to suitable processing, the number and density of residential dwellings, availability of service providers and any in-house collections conducted by local governments directly.

Publicly available information indicates one-off kitchen caddies may cost between $5 and $10, while rolls of compostable bags, to line the kitchen caddies, may cost up to $10 per year per household.

Some local governments report actual or projected savings as a result of lower disposal costs.

Contamination

High contamination levels can negatively impact the viability and effectiveness of FOGO collections and processing.

Contamination rates from existing regional FOGO collections in Western Australia are typically below five per cent (Dallywater Consulting, 2017; BHRC, 2016b; BHRC, 2015).

Work elsewhere indicates that community education, behaviour change programs, and monitoring and compliance efforts can significantly reduce contamination levels (Hyder Consulting, 2012; Zero Waste SA, 2010).

Processing

The cost of processing source-separated municipal organic waste depends on a number of factors, including the level of process control that processors can apply. Typically windrow composting is cheaper, but is likely to require a suitable site with extensive buffers to limit impact to local communities and other sensitive receptors.

Composters with more process controls, such as enclosed systems with active aeration and/or agitation, usually have higher processing costs (SMRC, 2016; BHRC, 2016c; MRA Consulting, 2014). However, processors with more controls may be able to achieve better economies of scale, have a wider choice of sites that are suitable, and a greater capacity to manage variable inputs, which can affect costs and revenue for processors.

Case studies

Western Australia

City of Bunbury

The City of Bunbury is a major regional centre in Western Australia with a population of about 32,700 (15,400 dwellings).

Bunbury has a weekly FOGO collection that is sent to a local composting facility operated by Bunbury–Harvey Regional Council. The regional processing facility manages around 15,000 tonnes of organics and produces a range of products, including compost products meeting the Australian Standard AS4454.

The city has reported a kerbside recovery rate of around 65 per cent for 2017–18. Reports indicate that around 40 per cent of waste presented by households is placed in the FOGO bin and about 35 per cent of waste is placed in the residual waste bin.

Businesses can access the city's waste services, including the FOGO service, on a fee-for-service basis.

Sources: BHRC, 2016a; BHRC, 2016d; City of Bunbury, 2018; City of Bunbury, 2017; DLGSCI, 2020.

City of Melville

In 2016, the Southern Metropolitan Regional Council (SMRC) released its strategic waste management plan. The plan assessed various options to manage the waste of its member local governments, and included consideration of costs, benefits and recovery performance. The plan ranked a kerbside three-bin option with FOGO collection as first.

During 2017 and 2018, the City of Melville conducted a three-bin FOGO trial across 7,000 households within the suburbs of Bicton, Brentwood, Bull Creek, Mount Pleasant and Willagee.

The trial informed decisions about a possible rollout of a three-bin FOGO collection system by some of SMRC's member local governments.

The trial applied bin auditing and communications with trial households to successfully reduce cross-contamination between the three bins.

The trial achieved a recovery rate of 66.5 per cent and indicated likely lower waste management costs for the City of Melville over time.

Sources: City of Melville 2017; City of Melville, 2018; MRA Consulting, 2018; SMRC, 2016; SMRC, 2017.

Elsewhere in Australia

City of Wodonga

The City of Wodonga began FOGO collection services in 2015, as part of a regional initiative to increase resource recovery.

The city's *Waste management strategy 2019–2023* indicates Wodonga achieves a kerbside recovery rate of over 70 per cent and a FOGO bin contamination rate around 1 per cent.

When the FOGO systems were first introduced, the participating local governments invested in comprehensive marketing and community information to support the service.

The city has received several awards in recognition of its resource recovery achievements.

Sources: Inside Waste, 2017; MRA Consulting, 2015; Sustainability Victoria, 2017; City of Wodonga, 2019

MidWaste Regional Waste Forum

MidWaste Regional Waste Forum (MidWaste) comprises six local governments (Bellingen Shire, Coffs Harbour City, Nambucca Shire, Kempsey Shire, Port Macquarie-Hastings, and Mid-Coast Council) in New South Wales.

Five of the six MidWaste local governments provide FOGO services to their communities, with the weighted average recovery rate for kerbside services across the five local governments being above 60 per cent, and Bellingen having the highest kerbside recovery rate at around 80 per cent.

Sources: Jacobs Group; MidWaste, 2017; MidWaste, 2019; NSWEPA, 2020.

Metropolitan Waste and Resource Recovery Group: FOGO guide

In 2018, the Metropolitan Waste and Resource Recovery Group (MWRRG) released guidance on designing, introducing and maintaining a FOGO service by local governments. The guide set out the following components in relation to FOGO services:

- Case for change – why recover FOGO?
- Service design – service frequency, bin configuration and opt-in versus full rollout.
- Business case development – comparing different modifications to a service.
- Procurement – specifications, pricing and service delivery planning within contracts.
- Service rollout – planning, communications, logistics, monitoring and evaluation.
- Service improvement – monitoring, ongoing communications, service expansion and recycled organics markets.

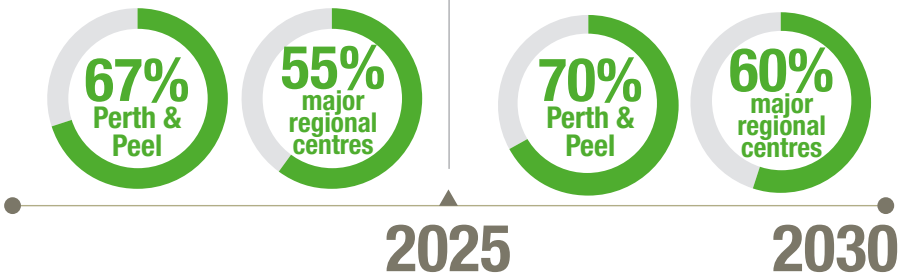
Sources: MWRRG, 2018.

Waste Authority position on FOGO collection systems

Western Australia's *Waste avoidance and resource recovery strategy 2030* contains objectives to **avoid** waste, **recover** more value and resources from waste and **protect** the environment. The strategy includes the following 'recover' targets for MSW.

2025 – Increase MSW material recovery to 67 per cent in the Perth and Peel regions; 55 per cent in major regional centres

2030 – Increase MSW material recovery to 70 per cent in the Perth and Peel regions; 60 per cent in major regional centres



Organic waste is identified as a key focus for the strategy. Organic material, including FOGO, makes up over half of the waste generated by households.

Increasing the recovery of organic materials is consistent with the waste hierarchy and circular economy approaches, and critical to achieving the strategy's targets. Recovering organics provides environmental, economic and social benefits.

To increase the recovery of organic material, it is important to provide better-practice source separated collection services for FOGO. High-performing three-bin services (including food waste) can achieve recovery rates of about 65 per cent.

FOGO collection services represent a significant opportunity to support the achievement of the waste strategy material recovery targets.

The waste strategy commits to a consistent three-bin kerbside collection system, which includes separation of FOGO from other waste categories, to be provided by all local governments in the Perth and Peel regions by 2025 and supported by the Government of Western Australia through the application of financial mechanisms.

The Waste Authority supports FOGO collection services as a demonstrated method of applying better-practice source separation to increase material recovery, support the state's material recovery targets, and give effect to the waste hierarchy and a circular economy.

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