

Item 3.

Planning For a Food Organics Recycling Service to All Households

File No: X021464.009

Summary

This report describes the planning process required to roll out a food organics (FO) or combined food and garden organics (FOGO) service to City households by 2030, provides the results of the service types that have been evaluated, and recommends the most suitable service type for Council endorsement (either a food organics service or a combined food organics and garden organics service).

A decision on the type of service (i.e. FO or FOGO) the City will provide is required to be made now as the service type will influence how we continue to plan for the service rollout and will inform the remaining key service decisions including how we collect and process the waste and service levels.

The City of Sydney is required to provide FOGO collection services (either combined or in separate bins) to all households by 1 July 2030 as per the state government mandate arising from the *NSW Waste and Sustainable Materials Strategy 2041*.

The City has made good progress towards implementation of the FOGO mandate through the successful delivery of the food scraps collection and recycling trial from 2019 to 2021. This service is still operating and is currently available to more than 22,500 households across the City.

Since the conclusion of the trial, project staff have been investigating the different service types for a full-service rollout against an established evaluation criteria. The criteria used to assess the service options were: environmental impact, resident satisfaction, suitability, consistency, achievability and flexibility. The criteria were presented at a Councillor Briefing on 20 March 2023, following which Councillors were invited to provide feedback. No feedback was received.

Results of the analysis indicated that a food organics (FO) service is the service option that best suits the City's requirements and service objectives. This is because this option would deliver the best environmental outcomes, suits the waste profile of City households, is already proven in more than 22,000 households through the trial, uses smaller bins making the service more achievable in our space constrained households and has more processing options making it flexible to pivot to new processing technologies as they emerge. The City's existing separate garden organics service would continue for those households that need it.

A FOGO service is well suited to regional and suburban areas that have a high use of garden organics (GO) bins. However, results from the City's own food scraps recycling trial, waste audits, bin fullness studies and kerbside collection service statistics show that City residents, who predominantly live in apartments, generate extremely low volumes of garden organic material but comparatively high amounts of food waste. There is also a risk of reducing the value of garden organic material when it is combined with food organics. Currently the City's garden organics service is used by a small number of households, the stream has low contamination and high recovery rates.

A separate food organics (FO) bin can be processed via a number of different methods including composting, anaerobic digestion and bioconversion (e.g. insect farming, worms etc.), making it a desirable stream to collect separately in terms of its high environmental benefit compared to a combined FOGO stream which is typically processed into compost only. In addition, a FO service uses smaller bins which suit limited bin storage space within the City's high-density housing. Also, acceptance and participation by residents in a FO service in the City has already been well proven through our existing food scraps recycling service.

This report recommends that the City implement a food organics (FO) recycling service to sit alongside the City's existing garden organics (GO) recycling service to meet the requirements of the NSW FOGO mandate.

Recommendation

It is resolved that Council:

- (A) note that a food organics (FO) service has been determined as the optimal service type for recycling of food scraps in City of Sydney households;
- (B) endorse implementation of a FO service to all City households and continue providing a separate garden organics service in line with the NSW Government mandate for councils to provide food and garden organics (FOGO) services to all households by 2030;
- (C) endorse progression to the next stage of service rollout planning; and
- (D) note that suitable service collection and processing methods and service levels will be reported back to Council for consideration.

Attachments

Nil.

Background

1. The City of Sydney is required to provide food and garden organics (FOGO) collection services (either combined or in separate bins) to all residential properties by 1 July 2030 as per the state government mandate arising from the *NSW Waste and Sustainable Materials Strategy 2041: Stage 1 - 2021-2027*.
2. The legislation for the mandate is set out in the *Protection of the Environment Legislation Amendment (FOGO Recycling) Bill 2024* (the Bill) which was introduced to the NSW Legislative Council in November 2024 and was passed through state parliament into law this year.

Planning for a FO or FOGO service rollout

3. Good progress has already been made towards implementation of the mandate through the City's successful delivery of the food scraps collection and recycling trial from 2019 to 2021. This service is still operating and is currently available to more than 22,500 households across the City in over 300 apartment buildings and 1,000 houses (~17% of total City households). To date, the food scraps recycling service has collected and recovered more than 2,440 tonnes of food scraps.
4. Since the conclusion of the service trial, project staff have been testing different communication and education methods to increase the use of food scrap bins in apartment buildings, as well as investigating different service model options for a full rollout. Work completed has included a draft options paper, multi-criteria analysis, initial briefing to council, greenhouse gas modelling, processing market insights study, preliminary cost modelling (based on assumptions) and investigation into and implementation of the insect farming food scraps processing trial.
5. On 20 March 2023 City staff briefed Council on the options under investigation for full rollout of a food organics (FO) or a combined food organics and garden organics (FOGO) service. This briefing included information on:
 - Key drivers for the service rollout.
 - The 3 key decisions to be made for the service rollout and the options under investigation:
 - (i) Service type: FO or FOGO.
 - (ii) Processing options: Anaerobic digestion, Composting or Insect farming.
 - (iii) Collection options: The City runs the service in-house or tenders for a contractor to deliver the service.
 - Criteria for evaluation of the options.
6. Councillors were given the opportunity to provide feedback on the criteria following the Briefing. No feedback was received at the time.

7. Six project stages have been identified for full rollout of a FO or FOGO service to residents in the City of Sydney local area. These stages, their associated tasks and status are shown against dates in the below table:

Year	Project stage	Tasks	Status
2019-2021	1. Identify need	• Trial conducted • NSW mandate - FO or FOGO service by 2030	Complete
2022-2024	2. Investigate options	• Trial evaluation report • Options paper • Criteria for assessment • Councillor Briefing 1 • Market insights • Insect farming trial in progress	Complete and in progress
Decision 1 - Criteria to evaluate options			
2025	3. Endorse approach	• Council briefings • CEO updates • Council approval	Council approval required
Decision 2 - Service type (FO or FOGO)			
2025-2027	4. Build the plan	• Evaluate insect farming trial • Sourcing plan and property study for collection • Service operations plan • Processing tender • Draft communication and education plan • Procure caddies and liners	Pending service type approval
Decision 3 - Processing type			
Decision 4 - Collection type			

Year	Project stage	Tasks	Status
2027-2030	5.Implement	• Communication and education campaign • Bin roll-out • Collection transition • Processing contract commencement • Service commencement	Not started
2031+	6. Manage performance	• Communication and education campaign • Bin roll-out • Collection transition • Processing contract commencement • Service commencement	Not started

Table 1: Project stages for FO / FOGO rollout

8. As indicated in Table 1, the tasks in stages one and two are now complete. This report is the final part of stage 3. Council endorsement of the recommended service type is required before staff can move to the next stage (stage 4, 'Build the plan'). This is because there are different factors to consider if we are planning for a FO service compared to planning for a FOGO service as each service type has different implications for processing and collection.
9. There are 4 major decisions that Council must make for the rollout of FO or FOGO services as follows:
 - (i) What criteria the City will use to evaluate the service options (this decision is complete).
 - (ii) What service type the City will implement (the current decision required).
 - (iii) What processing technology the City will prioritise for recovery of food organics (the next decision).
 - (iv) What collection model the City will employ (the final decision).
10. These 4 decisions and the proposed timing for them are shown in Table 1.

Service options

Service Types

11. There are 2 service types that the City is considering for rollout:

- (i) *FOGO* (Food and Garden Organics): This is the collection of food and garden organics together in the one green lid bin. A FOGO stream is typically processed into compost. Bin size for a FOGO service is larger than a FO service to accommodate bulkier garden organics.
- (ii) *FO* (Food Organics): This is the separate collection of food only in a small maroon lid bin. A FO stream can deliver superior environmental benefits if it is processed by anaerobic digestion or insect farming technologies.

Processing Options

12. There are 3 processing technologies that the City is investigating for FO or FOGO:

- (i) *Anaerobic digestion (AD)*: This technology uses microbes to break down food organics in large tanks without oxygen. The outputs of the process are biogas and an organic sludge. The gas can be converted to electricity or fuel and the sludge is dried off and converted to fertiliser. The process is typically suited to a FO stream and has high greenhouse gas benefits. There are currently no commercial AD facilities operating in NSW. However, the EarthPower facility in Western Sydney is set to re-open soon but capacity will be under high demand from commercial food waste generators.
- (ii) *Composting*: Composting is the natural breakdown of food and garden organics to form compost. It is a simple and reliable processing technique. There are many different types of commercial composting including open windrow, enclosed tunnels, vermi-composting (using worms), and more. Composting is suitable for both FO and FOGO streams. The composting process does produce a negligible amount of GHG emissions. There are 5 composting facilities currently servicing the Sydney market but these have no additional capacity. There is a further five known planned facilities in NSW due to come online by 2030.
- (iii) *Insect farming*: This technology uses black soldier fly larvae to process food waste. Outputs of the process are insect protein (dried larvae) and frass (larvae droppings). The insect protein is used as animal feed for poultry and aquaculture and the frass is used as a fertiliser. This new technology is a modular system with a low footprint and high greenhouse gas benefits. It is a circular process where food waste is used to produce more food. The City is currently testing the feasibility of this processing technique through the insect farming processing trial. Unlike other organics processing technologies, insect farming is relatively new to Australia, has limited market players, and has been proven on commercial food waste but not with local municipal feedstock.

Evaluation of the options

13. The service types (FO or FOGO) have been evaluated against six criteria:

- (a) environmental impact

- (b) resident satisfaction
- (c) suitability
- (d) consistency
- (e) achievability
- (f) flexibility

14. The greenhouse gas emissions impact of different processing options has also been modelled. Results of the modelling for the emissions impact of processing one tonne of FO or FOGO by different processing techniques are shown in Figure 1 below. As indicated, a FO service processed via insect farming or anaerobic digestion can deliver significant greenhouse gas savings.

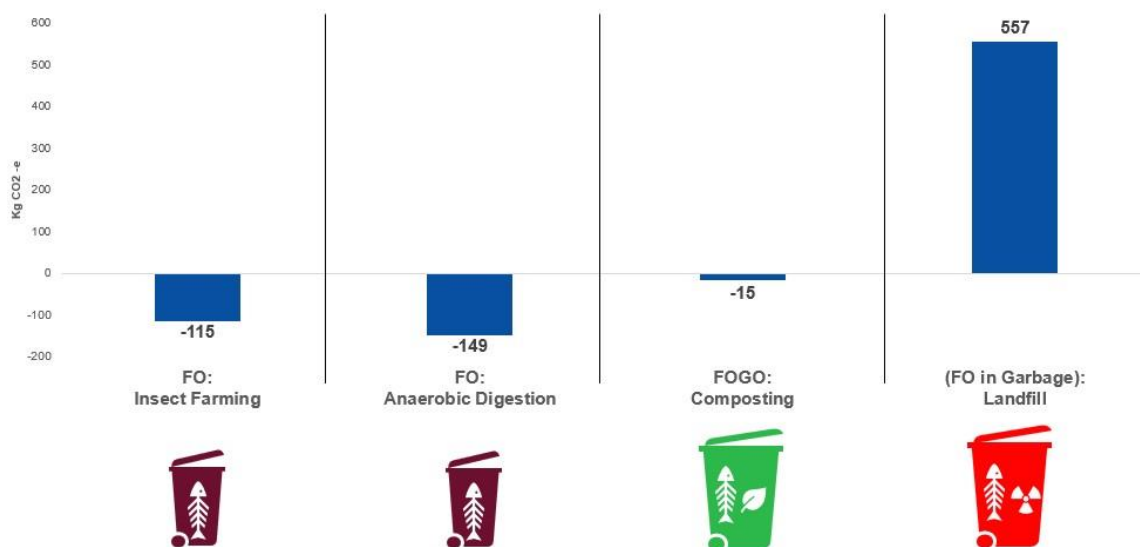


Figure 1: Greenhouse gas emissions impacts from processing 1 tonne of FO or FOGO

15. The results of the evaluation indicate that the optimal service option for the City of Sydney is a FO service with a separate GO service because:

(a) *Environmental Impact*

- FO can deliver superior environmental benefits with the right processing technology (e.g. insect farming or anaerobic digestion)
- The City's garden organics (GO) collection is a clean stream with very low contamination and therefore the outputs are high quality and high value. The addition of food organics (FO) to our GO stream under a FOGO service would present a high risk of contamination and would likely de-value the compost outputs.

(b) *Resident Satisfaction*

- Acceptance and participation in a FO service in the City has been well proven in both apartments and houses through our food scraps recycling service.

(c) *Suitability*

- FO suits waste profile of City households as approximately 80% of residents live in apartments and minimal garden organic waste is generated by our residents however all residents generate food waste.
- Last year we collected only 1,911 tonnes of GO through the opt-in kerbside GO collection service. For comparison 41,204 tonnes of red bin waste was collected last year containing approximately 40% of food waste (or approximately 16,481 tonnes). The GO service is available to all residential properties in the City but only around 47% of properties have opted for a GO bin. These factors suggest that a FO service is better suited to the majority of our households.

(d) *Consistency*

- A FO service is well understood by City residents as a result of the food scraps recycling trial and is already available to 22,673 households.
- Keeping our GO service separate will continue to provide high recovery and low contamination.

(e) *Achievability*

- A FO service uses smaller bins which suit limited bin storage space within the City's high-density housing. Introducing a FOGO bin would add many larger bins to households and increase the risk of more bins stored on the street.

(f) *Flexibility*

- A FO service has more processing options where as FOGO typically can only be processed by one main method which is composting. FO can be processed through a number of different methods including composting, anaerobic digestion and bioconversion (e.g. insect farming, worms, etc.).
- A FO service would allow for a move to a FOGO service with the addition of garden organics in future if required.

FO and FOGO service rollout - comparison of Sydney councils

16. The table below shows the metropolitan Sydney councils that have or will be implementing a FOGO service, and the councils that are known to be proposing to implement a FO service.

Council	Service type	Service scope	Service start date	Property types
City of Sydney	FO (w/ separate GO)	Partial	2019	Houses & apartments
Lane Cove	FO (w/ separate GO)	Proposed	TBC	TBC
Hornsby Shire	FO (w/ separate GO)	Proposed Full	~2027-28	Houses & apartments
North Sydney	FO (w/ separate GO)	TBC	TBC	TBC
Northern Beaches	FO & FOGO	Trial	TBC	Houses & apartments
Penrith City	FOGO	Full	2009	Houses & apartments
Woollahra	FOGO	Full	2020	Houses & apartments
Randwick City	FOGO	Full	2021	Houses & apartments
Inner West	FOGO	Full	2023	Houses & apartments
Fairfield City	FOGO	Full	Jun-2024	Houses
City of Parramatta	FOGO	Full	Nov-2024	Houses & apartments (<30 units)
Blacktown City	FOGO	Full	Jun-2025	Houses
Liverpool City	FOGO	Full	Jul-2025	Houses
City of Canada Bay	FOGO	Trial	2022	Apartments
Cumberland City	FOGO	Trial	2023	Houses
Waverley	FOGO	Trial	Oct -2024	Houses & apartments

Table 3: FO and FOGO service rollout - Comparison of Sydney Councils

Why service type needs to be decided now

17. The type of service (i.e. FO or FOGO) the City endorses for implementation will influence how we continue to plan for the service rollout and the remaining key service decisions. It will:
 - Affect how the City will collect the waste. It will affect bin type, bin size, truck type, truck size and job tasks.
 - Affect how the City will process the waste. There are more processing options for a FO service.
 - Enable us to plan and research all available processing options with confidence.
 - Signal to the markets where we are heading so that contractors can factor our service needs into their business planning.
 - Give us the opportunity to apply for EPA grant funding and influence statewide communications to the public on the introduction of FO/GO services which, according to the NSW EPA, are scheduled to start as early as this year.
18. Without a decision on service type the City cannot progress with detailed and targeted further service rollout planning.

Next project stage: build the plan

19. Once Council endorses the preferred service type, the next project stage is to build the plan for the service rollout. This stage will be completed from 2025 to 2027 and will involve the following tasks:
 - Evaluation of the insect farming processing trial.

- Implementation and evaluation of food scraps recycling service pilot testing projects including the Food scraps service as a standard service in apartment buildings pilot and the Small food scraps bins in houses pilot.
- Comprehensive analysis of collection service options including:
 - Depot properties study to determine needs and capacity to accommodate in-house service.
 - EOI to waste collection contractors to get indicative contractor pricing.
 - Sourcing plan.
 - Modelling of collection operating costs.
- Council decision regarding the preferred collection method (i.e., in-house or contractor).
- Service operations plan.
- Tender for processing services.
- Draft communications and engagement plan.
- Procurement of kitchen benchtop caddies and compostable caddy liner bags.

Key Implications

Strategic Alignment - Sustainable Sydney 2030-2050 Continuing the Vision

20. Sustainable Sydney 2030-2050 Continuing the Vision renews the communities' vision for the sustainable development of the city to 2050. It includes 10 strategic directions to guide the future of the city, as well as 10 targets against which to measure progress. This program is aligned with the following strategic directions and objectives:
- (a) Direction 2 - A leading environmental performer - a FO service will directly contribute to achieving the following City environmental targets:
 - (i) 90% diversion from landfill for residential waste by 2030.
 - (i) Minimum of 35% source-separated recycling for residential waste by 2030.
 - (ii) By 2035 we will achieve net zero emissions in the City of Sydney local area.

Organisational Impact

21. Delivering a FO service to all residents will require additional staff, plant and equipment, and budget within City Cleansing and Resource Recovery to manage and deliver the service. However, the service is 100% cost recoverable through the City's domestic waste management charges.

Risks

22. The key risks are:

- (a) Storage and access limitations in existing apartment buildings - Space for bin storage and service access limitations will limit service feasibility in some buildings (e.g. buildings with rubbish and recycling chutes or bin rooms with no additional storage space). The City will develop a strategy to overcome these barriers and work with buildings individually on their service feasibility issues. Options include providing small bins, signage, and bin stickers for food waste for the chute rooms and training for building staff. The City will also promote the financial incentives for participation in the food scraps service as it could lead to buildings requiring less residual (red lid) rubbish bins which can be costly. Work is also currently being done with relevant City planning policies to ensure new buildings are designed to have space for food scrap recycling.
- (b) Low participation rates - Low participation is a risk if residents are unaware of the service, not using the service, resist behaviour change, or are dissatisfied with the service due to bin odour, vermin, or other service issues. This risk will be mitigated by preparing a detailed communications and engagement plan for the service using insights from the trial, implementing a comprehensive ongoing engagement and education program to encourage participation, and issuing kitchen caddy packs (including a caddy and supply of caddy liners) to all participating households to ensure ease of use (including minimising odour and pests). As well, customer service and operations staff will be trained to handle complaints and enquiries.
- (c) High contamination - There is a risk that residents will not use the FO bins correctly and will place incorrect items in bins resulting in high contamination, rejection of contaminated loads by the processor, and penalties and increased costs to Council. This risk will be managed by building awareness in residents of the difference between acceptable items and contamination through the service communications and education program. The City will also prepare a contamination management plan that will include a contamination monitoring program to be conducted by collection staff and/or a dedicated contamination management team. Consideration may also be given to the use of artificial intelligence (AI) to detect, record, and manage contamination. A policy will also be put in place to remove properties from the service that present persistent contamination.

23. The recommendation is within the City's risk appetite and tolerance because:

- We embrace innovative solutions and emerging technologies that enable us to minimise environmental risks and enhance sustainability. We actively explore and invest in sustainable alternatives, renewable energy sources and efficient resource utilisation.
- We are open to exploring new opportunities and changing service levels to the community, taking into account community expectations, needs and our financial sustainability.
- We encourage business activities and decisions that are undertaken in alignment with the 'City's Environmental Strategy 2021 – 2025' and 'Sustainable Sydney 2030 – 2050 Continuing the Vision'

- We encourage exceptional community and user service, maintenance of service availability, reliability and performance, continuous improvement in service quality and efficiency.

Social / Cultural / Community

24. The rollout of a FO service will make food waste recycling available to all residential properties across the City of Sydney, not just those properties that have been participating in our existing food scraps recycling trial (there is currently a waiting list of over 600 houses that would like to participate in the trial). It will also improve the City's waste and recycling service offering by providing an opportunity for residents to easily reduce the waste in their red lid rubbish bin and their domestic waste charge payments by diverting food waste into a dedicated FO recycling bin.

Environmental

25. The recommended service will deliver multiple sustainability benefits including increased resource recovery rate, diversion of waste from landfill, landfill space savings, reduced greenhouse gas emissions, and generation of beneficial outputs such as compost, fertiliser, insect protein (for animal feed), or green energy.

Economic

26. A FO service will provide processing cost savings as the processing costs for a dedicated food scraps recycling service are lower than landfill costs (the current landfill gate fee is \$383/tonne and food scraps processing gate fees range from approximately \$190 /tonne to \$290/tonne). This differential is likely to increase with time as the NSW landfill levy increases to drive more recycling.

Financial Implications

27. There is no substantial difference in the cost per tonne to process FO compared to the cost to process FOGO. However the processing costs for FO and FOGO are both considerably lower than the cost to process red bin waste
28. The service costs including collection will be modelled in detail and presented to Council during the next project stage in order for Council to make the decision on the preferred collection method.
29. Similar to all other residential waste and recycling services, the cost of the FO service will be fully recovered through the City's domestic waste management charges that are levied on all residential rated properties in the LGA.

Relevant Legislation

30. Protection of the Environment Legislation Amendment (FOGO Recycling) Bill 2024
31. Waste Avoidance and Resource Recovery Act 2001 No. 58
32. Local Government Act 1993

Critical Dates / Time Frames

33. The critical milestones and dates for rollout of the FO service are as follows:

Milestone	Date
Council approve tender recommendation for processing services	2026
Council review and endorse recommended collection method	2026
Procurement of kitchen caddies and compostable liner bags	2026
Commencement of collection service and processing contract	2027 to 2030
NSW residential FOGO mandate deadline	1 July 2030

Options

34. The City is required to provide organics collection services to all residential properties by 2030 as per the state government FOGO mandate for all councils in NSW to provide these services to resident by 1 July 2030. As a result, the decision-making process for implementation of a food organics collection service to all residents has moved from 'will we to 'when will we' provide this service.
35. If the City does not implement a food organics collection service, the City's waste targets will not be achieved, community expectations would not be met, and it would prolong the provision of the food scraps recycling service in its current trial format which is not cost efficient over the long term due to the small scale of the project.
36. In addition, if the City does not meet the requirements of the state FOGO mandate by the 2030 deadline, Council will be subject to a fine of \$500,000, and a further \$50,000 for each day the service is not implemented.

Public Consultation

37. Residents have been consulted about the FO service throughout the food scraps recycling trial and ongoing service via direct engagement, newsletters, and multiple surveys targeting all service stakeholders including trial participants, building managers, strata managers, and owners corporation members.
38. The City has also consulted and collaborated with external stakeholders including the NSW EPA, waste industry organisations, other councils, and regional organisations of councils since the food scraps recycling trial commenced in 2019, and the feedback, learnings, and advice received has been incorporated into service option investigations and planning.

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