



APRIL 2025

Food and garden organics material flows and markets analysis

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Executive summary

South Australia is a leader in organic waste diversion, with widespread Food Organics and Garden Organics (FOGO) kerbside collection, experienced composters, and established markets for Recycled Organic (RO) products. The South Australian Environment Protection Authority (EPA) and Green Industries SA (GISA) play a key role in tracking and assessing resource management performance, aiming to support a sustainable circular organic sector. Their focus extends beyond FOGO collection to ensuring high-quality compost products and fostering viable end-use markets.

This study was commissioned to examine the role of FOGO within metropolitan Adelaide and the Fleurieu Peninsula’s organic sector, mapping material flows from collection to end use, assessing the quality of RO products, and identifying challenges within the supply chain.

Key results of the RO sector in FY 2023/4 are presented below.

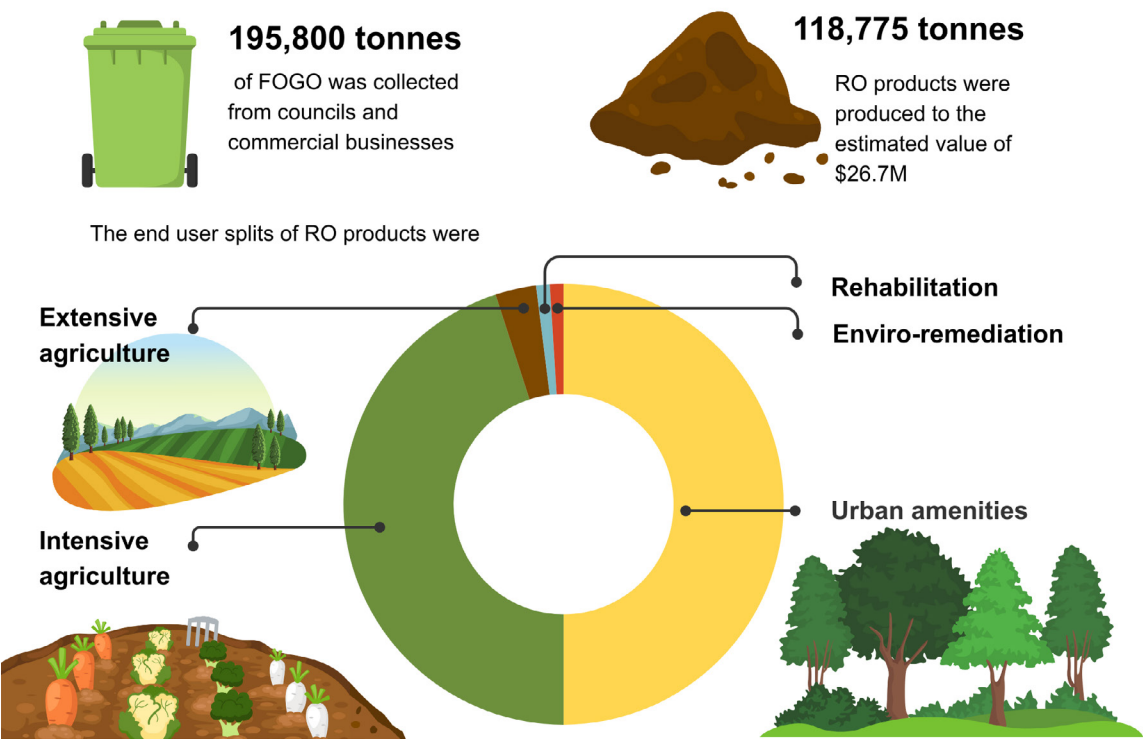


Figure 1: Key data findings (FY 2023/24)

Key challenges

Contamination was identified as the primary risk to maintaining product quality, with physical contaminants such as plastic, glass, and asbestos being a potential risk at all stages of the supply chain. Managing contamination at the source—through improved collection systems, education, and targeted screening technologies—is the most effective mitigation strategy. The composting industry also faces financial pressures from low gate fees, high processing costs, and limited willingness to pay from end users, particularly in agriculture.

Emerging concerns, such as per- and polyfluoroalkyl substances (PFAS), add complexity to regulatory and market dynamics. While PFAS contamination originates from everyday consumer products rather than the composting process itself, its presence in FOGO-derived compost poses potential risks to market stability, especially if stricter regulatory controls or public scrutiny increase costs or deter end users.

Key opportunities

To strengthen the sector, the report highlights several key opportunities, tabulated below.

Table 1: Key opportunities

#	KEY OPPORTUNITIES
1	Encourage the adherence to the Sustainable Kerbside Services and update the guide to address contamination management at source and for composters
2	Update the Guide to Kerbside Performance Reporting to include FOGO specific information, including the management of contamination by councils
3	Review requirements and guidance to strengthen composter feedstock contamination and end product quality assurance, including the update of the 2013 EPA Composting Guidelines
4	Investigate levers to source control biodegradable, but not certified compostable, products entering the market
5	Incentivise the use of RO products through financial incentives such as rebate schemes or grants to agriculture and urban end users

Introduction

BACKGROUND TO THIS PROJECT

The South Australian government, through the Environment Protection Authority (EPA) and Green Industries SA (GISA), collects and reports data to monitor resource management performance. The EPA tracks annual organic waste flows at registered sites, while GISA assesses household waste generation and broader resource recovery trends. A 2021 sector analysis highlighted gaps in understanding material flows and barriers to food organics and garden organics (FOGO) derived Recycled Organics (RO) products—a crucial component of the organic sector. Despite the role of FOGO collections in landfill diversion and circular economy regeneration, the composting industry faces market vulnerabilities, particularly due to contamination issues outside its control. Addressing these challenges is essential for ensuring the long-term viability of organic waste recovery.

ABOUT THIS REPORT

The aim of this project is to assess the current FOGO supply chain to identify challenges, barriers and opportunities to achieving quality RO product and high-value use to be considered for future policy, regulation and strategic development.

The geographical scope included the 19 metropolitan Adelaide councils and the Fleurieu Regional Waste Authority. Three major composters process FOGO waste in this area: Peats Soil, Jeffries and IWS.

This report serves to understand the impact and specific role of FOGO material and its products in the region by examining:

- The material flow of FOGO material, as a portion of the organic flows, from the kerb to end user
- The specific characteristic of RO products produced by FOGO feedstock and the key challenges of meeting the expectation of the market end users
- Council, waste authorities, composters and end user stakeholder views on the challenges and opportunities to increase FOGO to compost and compost higher value use
- Suggestions for pathways to address opportunities and challenges.

HOW WAS THE INFORMATION COLLECTED?

The project was delivered using mixed methods including data analysis, desktop research and stakeholder engagement.

The main output is a model that follows the material flow from Council FOGO collections to composters to RO products to end users. There were three key input data sources provided by GISA and EPA. In addition, RMCg conducted market research into:

- RO product retail value ranges (\$/tonne/product) to enable a high-level analysis of the value of FOGO derived RO products
- Gate fees of composters from SA, QLD, NSW, VIC and Tas.

The analysis methodology that produced the model and outputs is summarised below.

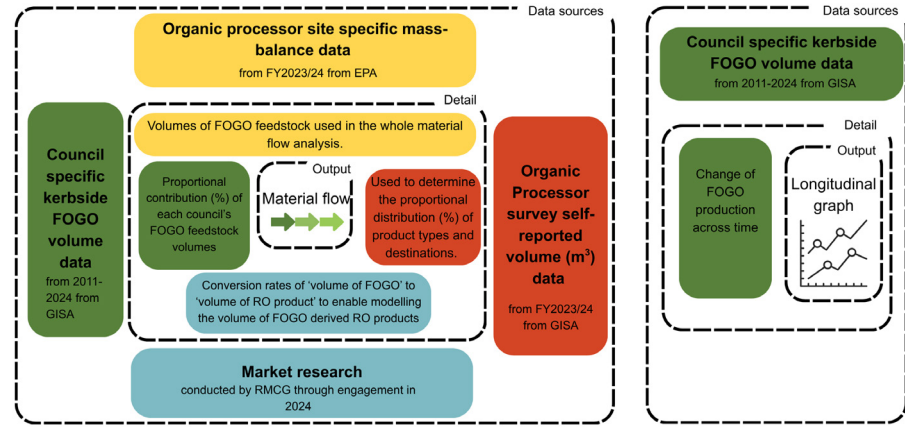


Figure 2: Project data modelling method summary

ENGAGEMENT AND GROUND TRUTHING

The project involved direct engagement with 48 stakeholders, including local councils, waste authorities, composters, peak industry organisations, farmers, and landscaping businesses.

The engagement approach included a survey sent to 22 councils and 3 waste authorities, along with direct interviews conducted via phone calls with all other stakeholders.

Data overview:

Material flow results

In financial year 2023/24 a total of 195,800 tonnes of FOGO was collected, producing a total of 118,775 tonnes of RO products. The flows of organic material from FOGO in councils to RO products and end use destination sectors is summarised in Figure 3. The width of bands is proportional to volume of organic material.

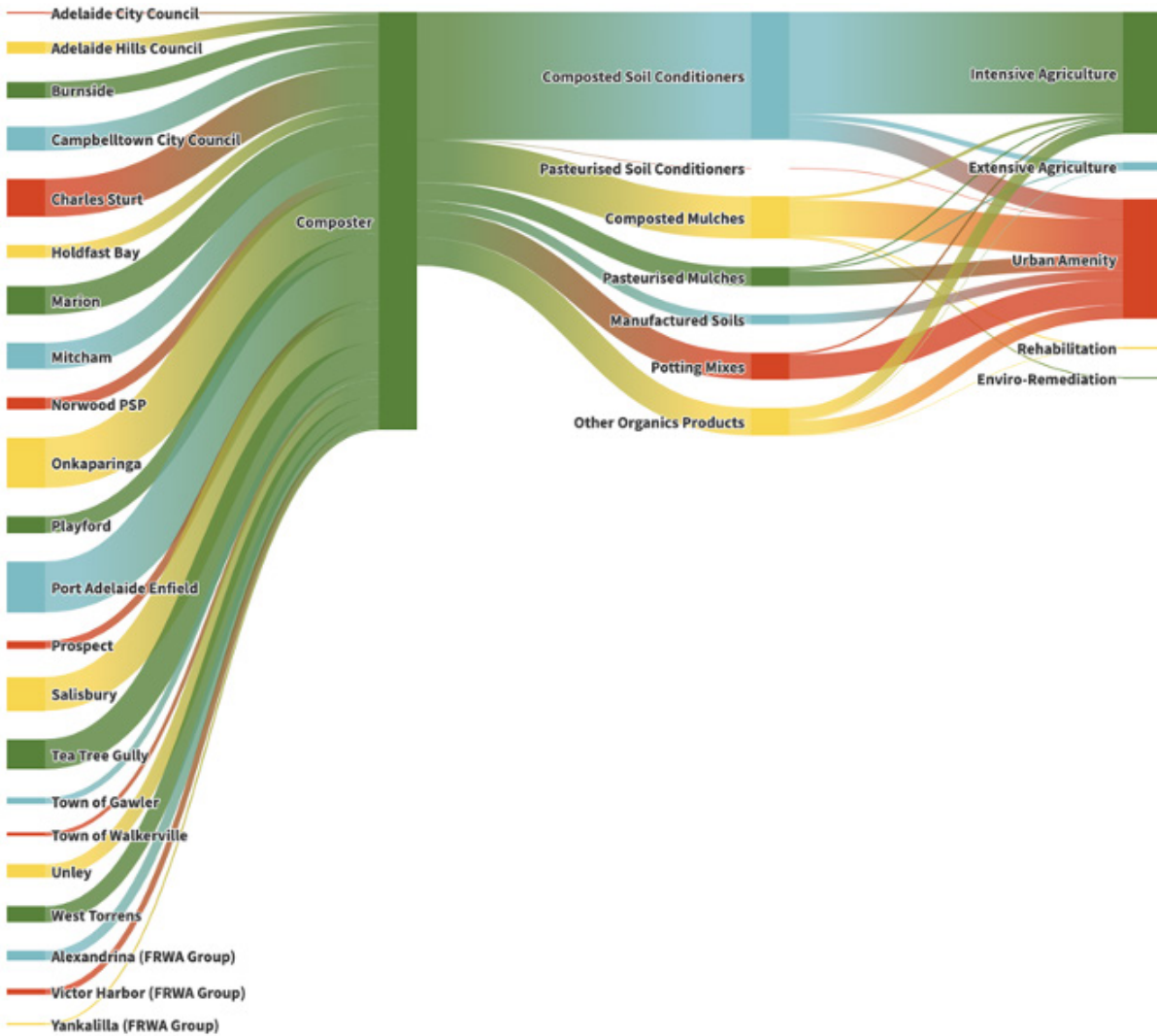


Figure 3: Sankey diagram of FOGO waste generated by councils and received by composters and the RO products produced and end use destinations (FY 2023/24)

FOGO to RO products

COUNCIL FOGO COLLECTIONS

All 19 metropolitan councils and three councils in the Fleurieu Regional Waste Authority (FRWA) offering a FOGO kerbside collection were investigated.

In FY 2023/24 all councils combined collected a total of 186,876 tonnes of FOGO¹. This presents a 49.5% increase from the annual tonnage received in 2011 and represents an approximate increase of 4.1% year on year. The increase in council kerbside FOGO and the population of South Australia from 2011 to 2024 is depicted in Figure 4.

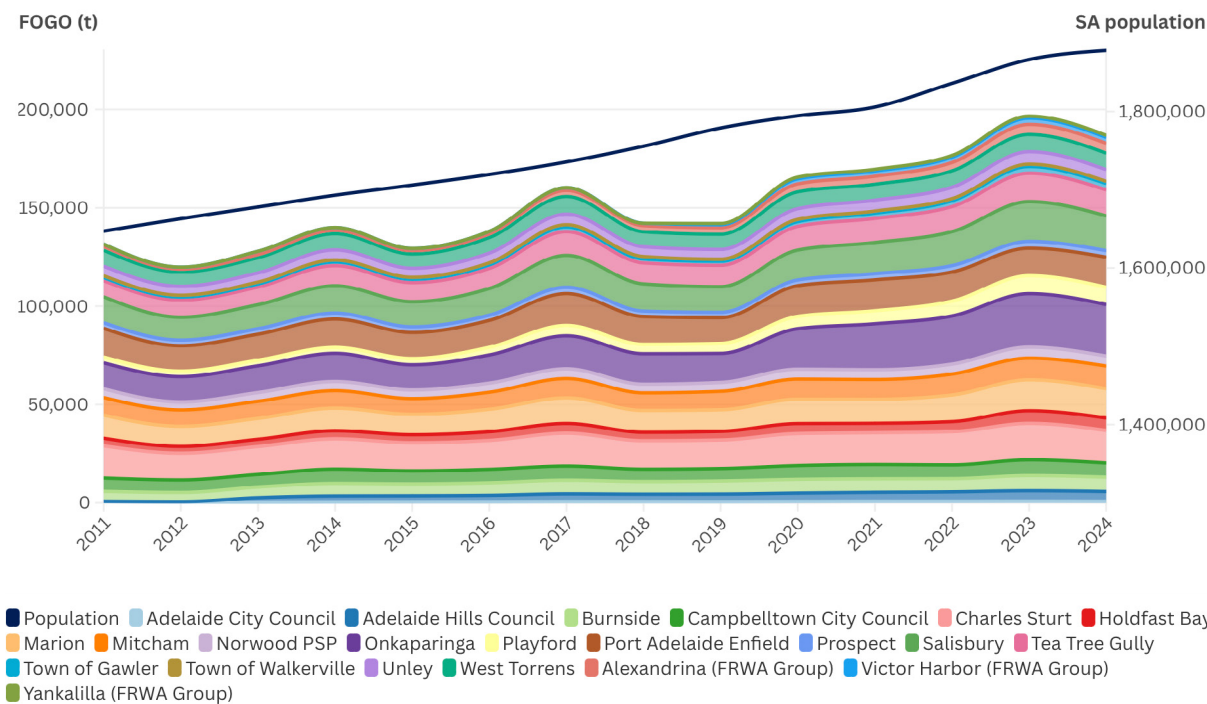


Figure 4: Changes to council kerbside FOGO collection volumes from 2011-2024

¹ The volumes presented in this longitudinal analysis differ by 8,924 tonnes for the year 2023/24. GISA conduct annual kerbside assessments where data input is sought from individual councils, separate from the EPA Mass Balance reporting from waste facilities. Hence the values in this longitudinal analysis differ slightly from previous material flow analysis but provide the FOGO volumes per council.

FOGO PROCESSING AND PRODUCTS

MARKET SPLITS

Three composting operators manage all FOGO feedstock collected in the region. Historically, the market has been dominated by two composters. However, a landfill operator entered the composting sector in 2022, shifting market splits and products produced.

Composters reported that all their RO products contain FOGO-derived material. Specific products, such as mulches and biochar (classified under Other Organic Products), are processed from the oversized woody components of FOGO only and are otherwise mostly green waste. One composter highlighted that one retailer has requested products without FOGO, as a contamination risk mitigation measure.

PRODUCT TYPES AND VALUE

In FY 2023/24 a total of 186,876 tonnes of FOGO-derived RO products went to the market in a combined estimated retail value of \$26.7 million (Figure 5). FOGO feedstock reduces in volume as it goes through the composting process by decomposition and moisture loss. Converting FOGO feedstock to RO products have different volume reduction ratios depending on the product. On average RO products had a potential value of \$136 per tonne of FOGO.

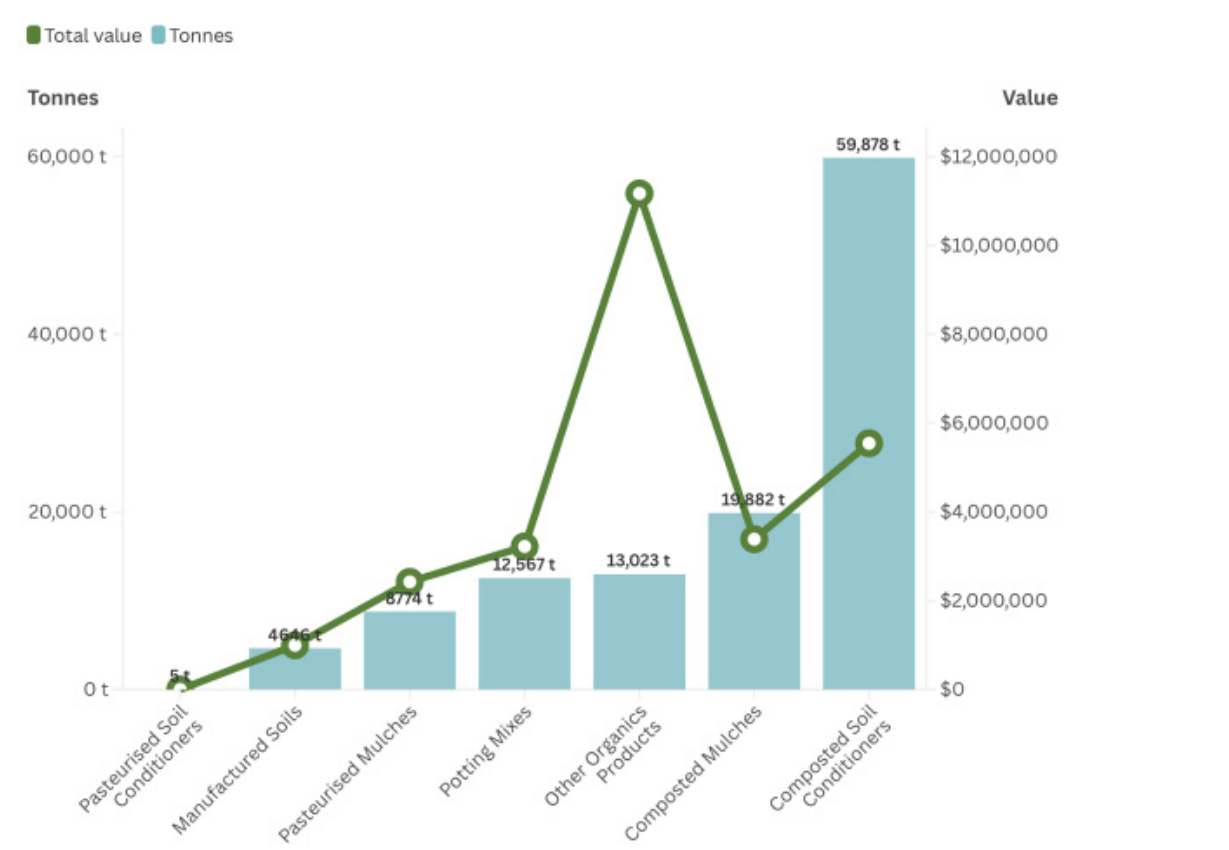


Figure 5: Volume of FOGO derived RO products (FY 2023/24)

The conversion from FOGO to products is provided in Table 2.

Table 2: FOGO feedstock to RO product conversion ratios (tonne of product/tonne of FOGO)

PRODUCT	CONVERSION RATE (TONNE OF PRODUCT/TONNE OF FOGO)
Compost / mulch	0.6 - 0.69
Pellets	0.5
Biochar	0.02



END USERS AND DESTINATIONS

The SA recycled organics survey data highlights the end users of FOGO-derived RO products include intensive agriculture, extensive agriculture, urban amenity, rehabilitation and enviro-remediation.

Intensive agriculture includes vegetable producers (in-field and glasshouses), viticulture and other horticultural crops. Extensive agriculture includes broadacre crops. Urban amenity includes landscaping businesses and residential uses. The use of FOGO-derived RO products for rehabilitation and enviro-remediation in operations currently only covers a small amount by one composter. This is separate from landfill capping or management.

As shown in Figure 6 intensive agriculture and urban amenity dominate usage. The engagement and analysis focused on these sectors.

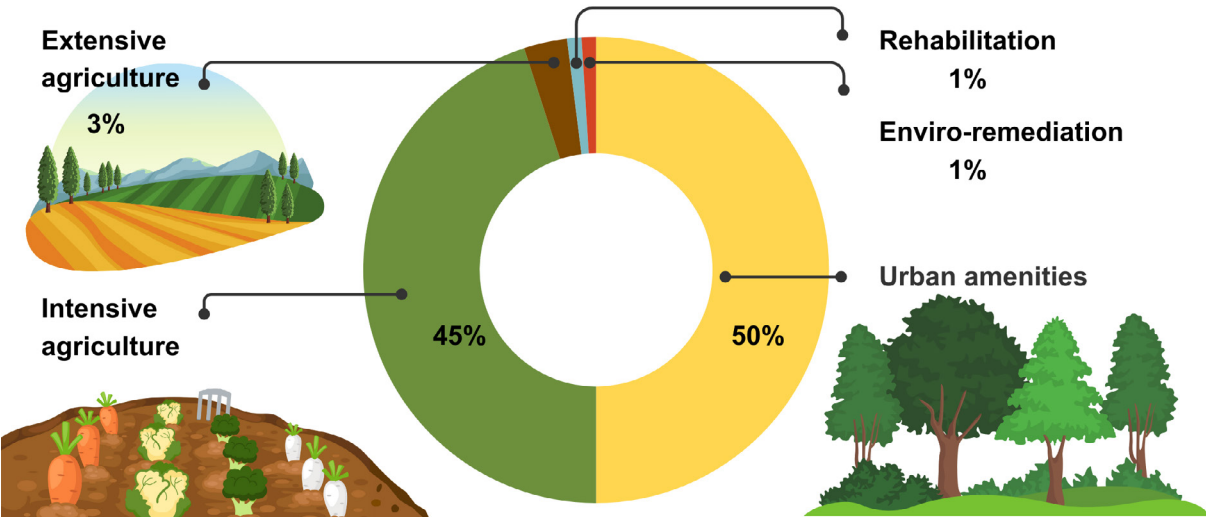
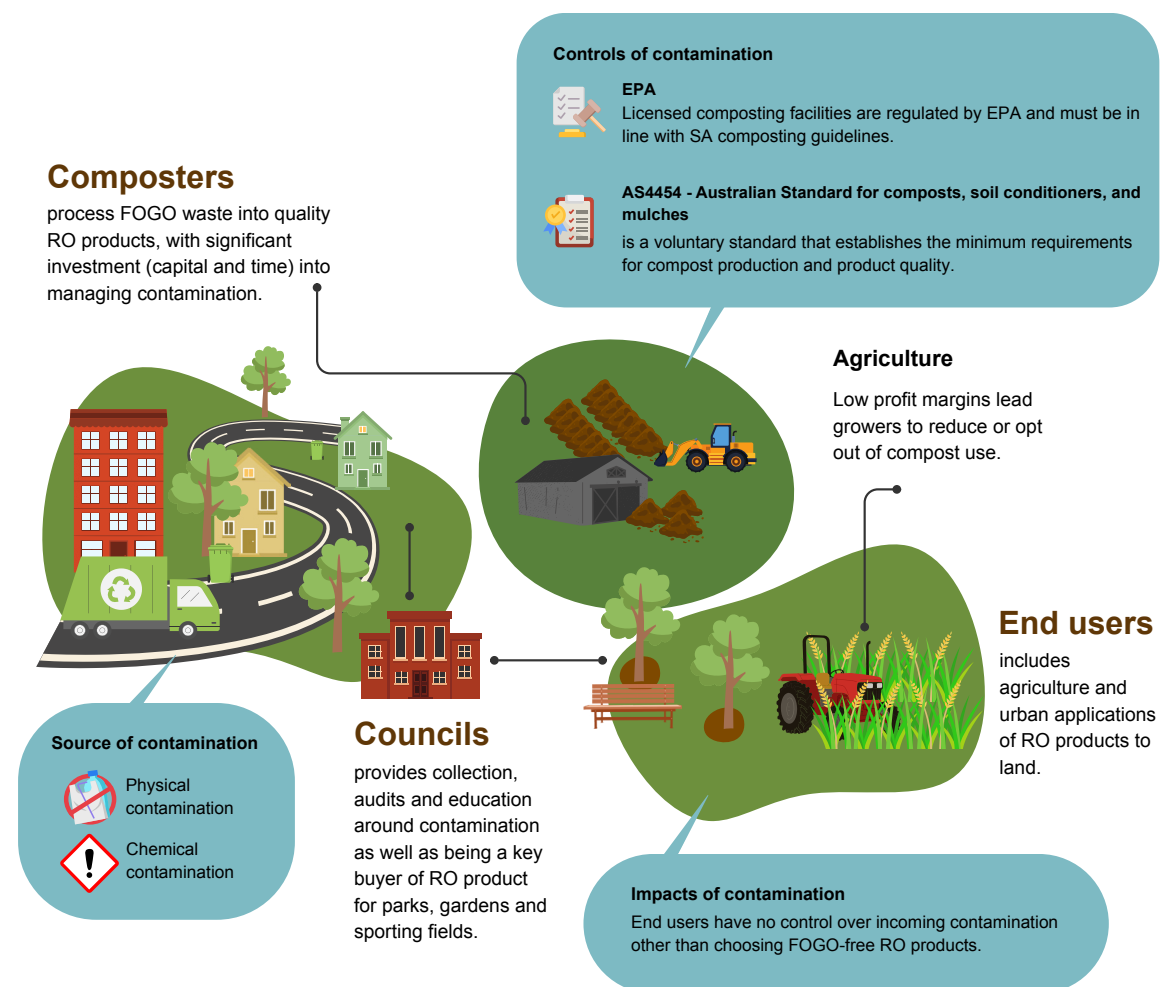


Figure 6: FOGO derived RO product use by sector (FY 2023/24)

Challenges and solutions

This section summaries the key challenges across the supply chain for achieving better RO capture, processing and use.

The key players and their role in contamination of RO products is depicted in Figure 7.



PHYSICAL CONTAMINATION

Physical contamination is the primary challenge for Councils, composters and end users of FOGO-derived RO products. Common contaminants include plastic bags, plastic packaging and containers, kitty litter, and general waste. SA councils report a FOGO contamination rate of 0.7% to 6.2%, although broader research suggests a maximum of 2% is required for acceptable compost quality.

Addressing contamination at the source is widely understood as the most effective way to ensure high-quality outputs, with councils focusing on monitoring and education.

Composters can reduce contamination by employing screening technologies, which are effective but much more costly and labour intensive. Once the products are marketed, end users have no control, relying instead on selecting low-contamination products.

Elsewhere in Australia, composters assess contamination in incoming loads and structure gate fees accordingly. Some composters use sliding-scale gate fees that adjust based on contamination levels. However, the competitive nature of the SA composting industry may discourage operators from enforcing such fees.

SA councils report a FOGO contamination rate of 0.7% to 6.2%, although research suggests a maximum of 2% is required for acceptable compost quality.

Figure 7: Supply chain and contamination implication in RO products

CHEMICAL CONTAMINATION

The composting sector is vulnerable to PFAS contamination, as processors have no practical means of reducing levels in their incoming streams.

Chemical contamination from substances like PFAS and asbestos was highlighted by some as an emerging issue. Notably it was highest concern for composters and AORA whilst end users typically trusted that the composters would deliver quality RO products. Broadly, it was considered a concern for the future rather than an immediate issue demanding attention.

Meanwhile, key developments across Australia, such as the PFAS NEMP 3.0⁴, review of AS4454 and Queensland regulation of PFAS in compost suggest that addressing the risk of PFAS in compost will become a significant and pressing issue. EPA is currently undertaking an assessment of PFAS in compost.²

There is arguably a low risk associated with PFAS in compost, in comparison with other sources such as food packaging and cosmetics³. The composting sector is vulnerable to PFAS contamination, as processors have no practical means of reducing levels in their incoming streams. Additionally, extensive testing programs would be prohibitively expensive and have turn-around times that are impractical for feedstock management.

2 EPA 2025, Pers comms
3 AORA 2023, "AORA Position Statement PFAS in Compost Product
4 PFAS National Environmental Management Plan (PFAS NEMP 3.0)

COUNCIL ROLE IN SOURCE CONTROL

Two key guidance documents, GISA's Guide to Kerbside Performance Reporting (2007) and SA Better Practice Guide: Sustainable Kerbside Services (2023), are central to service provision and reporting contamination. Currently, there is no consistent methodology across councils for auditing contamination, monitoring bin contents, or tracking contamination delivered to composting facilities. While research indicates that a small number of households are responsible for severe bin contamination, councils lack comprehensive and consistent data to monitor and address this issue effectively. Some councils have outdated contamination data, and inconsistencies in reporting make comparisons difficult.

Updating the Guide to Kerbside Performance Reporting to include FOGO-specific audit lists would improve the accuracy and consistency of reporting across SA. Emerging technologies, such as in-truck camera systems, could enhance real-time monitoring of contamination, providing councils with better data to drive interventions. Additionally, an update to the SA Better Practice Guide could introduce contamination limits for feedstocks as such guidance is not currently specified in AS4454.

Better and more frequent data on type, volume and location of contamination in FOGO bins can help councils target intervention at source.

STANDARDS AND REGULATION OVER THE COMPOSTING OPERATION

The main compost certification standard (AS4454) specifies limits of 0.05% plastic and 0.5% glass, but it is indicated that this may not be enough. In addition, the standard does not put a limit on incoming feedstocks.

Composting facilities processing more than 200 tonnes fall under the *Environmental Protection Act 1993*. The SA Composting Guidelines serves as the major regulatory framework over the composting industry and refers to the Australian Standard for Composts, Soil Conditioners, and Mulches (AS4454).

The AS4454 is under review, with concerns about its effectiveness in managing physical, chemical, and biological contamination. Key weaknesses identified include low uptake of certified product, absence of contamination limits for feedstock and limited guidance on emerging contaminants (e.g. PFAS). While SA composters claim third-party AS4454 accreditation, public availability of quality assurance data varies.

The SA Composting Guidelines outline feedstock management requirements, classifying food waste as Class A alongside green waste and biosolids. Other states separate food waste (FOGO) and treat it as higher risk, requiring stricter site and process controls. These states use end-of-waste frameworks to regulate compost quality, for higher risk feedstocks like FOGO.

Without financial support to adapt the new regulatory requirements, increased compliance costs could financially strain composters and risk market failure. Possible solutions include government grants to help the industry invest in better technologies and processes.

MARKETS FOR FOGO DERIVED RO PRODUCTS

Agricultural use of RO products arguably offer the most environmental benefits, but is also the most vulnerable market – with strong aversion to contamination and sensitivity to cost.

While current end users are evenly split between agricultural and urban applications, agricultural use appears to be more vulnerable.

The adoption of RO in agriculture is highly cost-sensitive. Current users are generally happy with the product but stated clearly that any contamination is unacceptable. As demonstrated by several growers, external market shocks, such as crop failures or market downturns, would likely lead to the immediate discontinuation of recycled organic use. Contamination remains a primary concern in agriculture, yet many growers tend to prioritise cost over contamination.

The market growth potential in agriculture is theoretically possible as there are many farmers who don't use RO products. Established composters have worked with the sector to demonstrate benefits and create specific products to meet the practical and nutritional needs of farmers. However, the uptake and practice change is slow and highly price sensitive. One potential market for growth is the high-value add pellets and blends that encompass other nutritional needs of farm applications.

Landscaping applications such as home gardens, landscaping, and construction tend to be more resilient markets for RO products. Councils are key buyers, using composted products for parks, gardens, and sporting fields, making AS4454 certification crucial to supporting the sector and ensuring circular solutions. In the short term, growth in this market could be encouraged through financial incentives. Additionally, clear educational messaging about FOGO-derived products plays a vital role in reinforcing source contamination control and improving overall product quality.

ADDITIONAL FEEDBACK

Additional feedback from the engagement with the three main stakeholder groups on the challenges and opportunities is summarised in Figure 8.

Council	Composter	End users
Diverting FOGO in landfill to composting Despite progress in FOGO collection, around 200,000 tonnes of food organics still end up in landfill each year due to barriers in residential uptake. Commercial FOGO services are an opportunity for further diversion.	Market share and competition Composters in the region face increasing competition due to shifts in council contracts and the entry of new market players.	Agriculture Low profit margins lead growers to require clear cost benefits to justify their use. They expressed serious concerns over physical contaminants like plastic and glass, pushing some growers toward non-FOGO derived RO products.
Weekly FOGO collections State policy currently mandates weekly collection of general waste, limiting councils' ability to shift to fortnightly collections. This restriction impacts the viability of offering a weekly FOGO service. This is despite trials demonstrating that reduced general waste collection frequency leads to increased diversion rates. These findings have prompted calls for a policy review to allow more flexible and locally responsive collection schedules.	Contamination processing While decontamination technologies exist, the high costs and reliance on composters to address contamination under current contracts make it difficult to produce consistently clean products.	
	Gate fees Compared to the eastern states of Australia, lower gate fees in South Australia constrain investments in contamination reduction technologies and product improvements.	Landscaping Strong sense of trust in the RO industry. Contamination and cost pressures leading some businesses to switch to lower-quality suppliers.

Figure 8: Challenges for Council, composters and end users



Opportunities

The SA government requires a robust recycled organic sector, that produces quality products, valued and used by agriculture and for other regenerative applications. Whilst the infrastructure in SA is established, there are many opportunities provided in Table 3 to improve the supply chain and build on what currently exists.

Table 3: Opportunities to grow the RO product sector

GROUP	INTERVENTION	TARGET	DETAIL
Investigations	Investigate avenues of program and grant funding from landfill levy funds to support the RO sector	GISA	
	Investigate the inclusion of RO products as part of the building code or sustainable building certifications	End users	
Market development	Provide technology grants to composters and collectors to improve the decontamination of RO products	Composters/ collectors	<ul style="list-style-type: none">Collectors can reject bins at the kerbside that are grossly contaminated
	Establish minimum procurement buy-back guarantees for RO products in council-composter contracts	Council/Composter	
	Provide clear information on the composition of products including attributes outside the AS4454 standard	Composters	
	Develop procurement specification for the use of RO products with architects and builder	End users	
	Incentivise the use of RO products through financial rebate schemes or grants to agriculture and urban end users	End users	
Regulations and guidelines	Encourage the adherence to the Sustainable Kerbside Services and update the guide	Councils	<ul style="list-style-type: none">Include due-diligence guidance for councils to know composter QA processes and certificationsConsider setting a level of acceptable feedstock contamination to level the playing field and direct the composting sector to all require auditing, monitoring and reporting of contaminationEstablish load contamination assessments – to enable better and timely data to encourage change by identifying areas and items that are contaminatingPenalise contamination of FOGO bins – including warning stickers and removal of FOGO service if contamination persists. Fines could also be consideredPromote stronger feedback loops for households that are contaminating bins – emails/notices, door knocks and fines
	Update the Guide to Kerbside Performance Reporting to include FOGO specific information	Councils	<ul style="list-style-type: none">Encourage/mandate annual kerbside audits of FOGO bins and improvement plansInclude key contaminants that may be a focus of the industry or education campaigns to track progress
	Mandate commercial food waste collections for businesses	EPA and business	<ul style="list-style-type: none">To achieve greater FOGO feedstock volumes and support the recycled organics sector
	Consider regulatory measures to remove misleading products that are not compostable and the potential for “greenwashing”	State government	<ul style="list-style-type: none">Regulate the acceptable plastic packaging to reduce confusion that they may be compostable. For example, ban appearances that “look” compostable (e.g. green bags), ban labelling that includes misleading terms such as “eco”, “degradable”, “earth friendly”, “Natural”
	Consider an end of waste code for RO products	EPA and composters	<ul style="list-style-type: none">Consider regulating the quality of the product and/or process to a higher degree to level the playing field for producing quality RO products
Education	Encourage explicit language around FOGO derived RO products	End users	
	Provide education of which parks and recreation locations are using compost – through signage, social media	Councils	
	Promote community events with schools, universities and other community spaces	Councils	
	Through Which Bin education and signage, show accepted compostable packaging and promote certification labels	Councils	
	Provide updated guidance for events and venues on compostable packaging and system set up	Councils	
Incentives	Incentivise councils to conduct annual bin audits	Councils	
	Incentivise contamination reduction with rewards for schools/ communities	Councils	

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