



NATIONAL COMPOSTABLE PACKAGING STRATEGY

VERSION 1: JUNE 2021

Acknowledgements

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Disclaimer

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Executive Summary

Purpose

This document provides a national strategy for compostable packaging in Australia. The purpose of the strategy is to:

- provide clarity and strategic direction on the appropriate application of compostable packaging in Australia, particularly where it can support recovery of food waste, and
- identify actions that, taken collectively, will help to ensure that compostable packaging is recovered at end-of-life and has beneficial end uses.

Why do we need a strategy?

There is increasing interest from brand owners and retailers in compostable packaging as a potential solution to packaging waste and to meet the *2025 National Packaging Targets*. This presents both opportunities and risks. The recovery system for compostable packaging is currently under-developed nationally and has significant gaps, which include:

- use of 'biodegradable' packaging that is not compostable and will contaminate both the organics and material recycling streams,
- limited access in many areas by households and businesses to organics collection services that are able to process compostable packaging,

- the inability of users and organics recyclers to easily identify and distinguish compostable from non-compostable packaging, and
- limited ability of some organics recyclers to process compostable packaging into quality products with proven markets within standard processing times.

The strategy supports other initiatives to reduce the environmental impacts of packaging, including regulations in some jurisdictions to ban problematic single-use plastic products, such as straws and fragmentable plastics.




Outcomes and strategies

Systemic change needs to occur at three critical points in the packaging lifecycle – design, collection and recycling. The desired outcomes and proposed strategies to achieve these shifts are summarised in Table 1 below.

The development of an environmentally sustainable system for compostable packaging will require action by stakeholders across the packaging value chain. This

strategy outlines some of the actions being taken by three of the key stakeholder groups – brand owners and retailers through Australian Packaging Covenant Organisation (APCO), suppliers of compostable packaging through the Australasian Bioplastics Association (ABA), and organics processors through the Australian Organics Recycling Association (AORA) – as well as mutually reinforcing activities by other sectors including government.

Table 1. Summary of the desired outcomes and strategies.

LIFECYCLE STAGE	 OUTCOME 1: PACKAGING DESIGN AND PROCUREMENT	 OUTCOME 2: COLLECTION SYSTEMS	 OUTCOME 3: RECYCLING END MARKETS
Desired outcomes	<ul style="list-style-type: none"> All packaging that is not suitable for elimination or reuse is suitable for material recycling or composting. All components of a compostable package are compostable. Oxo-degradable (fragmentable) plastics are phased out. Certified compostable packaging is used to support recovery of food waste or where contamination with food scraps reduces the recovery outcomes of material recycling. Plastics packaging designed for organics recycling is all certified compostable to AS 4736 or AS 5810. Compostable packaging can be easily distinguished from its material recyclable counterparts. Business and consumers are educated to understand the difference between biodegradable and compostable packaging, and how to dispose of these materials correctly. 	<ul style="list-style-type: none"> Community and businesses have widespread access to an organics collection service that accepts certified compostable packaging. Consumers and the packaging industry are aware of what certified compostable packaging is, and how and when it should be used and recycled. Businesses that provide compostable packaging also utilise an organics (composting) recovery service. Compostable packaging is labelled for easy identification by consumers and composters. Households and business are educated about which types of compostable packaging can be added to their organics collection service. 	<ul style="list-style-type: none"> Organics recycling facilities can process all certified compostable packaging for beneficial reuse such as improving soil health, and can meet relevant compost product quality standards. Certified compostable packaging does not contaminate recycled organics products. Certified compostable packaging does not have any adverse effects on the local ecology when applied to land.
Strategies	<p>Strategy 1.1 Phase out fragmentable plastic packaging.</p> <p>Strategy 1.2 Educate the packaging value chain about appropriate use.</p> <p>Strategy 1.3 Eliminate false or misleading claims.</p>	<p>Strategy 2.1 Label for correct disposal.</p> <p>Strategy 2.2 Minimise contamination in organics collection services.</p> <p>Strategy 2.3 Increase collection of organics from the food service sector.</p>	<p>Strategy 3.1 Greater collaboration between the packaging and recovery sectors.</p> <p>Strategy 3.2 Undertake processing trials for compostable packaging.</p>

1

Introduction

1. Introduction

1.1. Purpose

This document provides a strategy for compostable packaging in Australia. The strategy outlines the actions to be taken collectively to ensure that certified compostable packaging is used appropriately and helps to facilitate a circular economy for packaging and food waste. This includes eliminating the use of non-certified 'biodegradable' packaging.

The purpose of the strategy is to:

- provide clarity and strategic direction on the appropriate application of certified compostable packaging in Australia, particularly where it can support recovery of food waste, and
- identify actions that taken collectively will help to ensure that compostable packaging is recovered at end-of-life and has beneficial end uses.

There is increasing interest from brand owners and retailers in compostable packaging as a potential solution to packaging waste and to meet the 2025 National Packaging Targets (2025 Targets). This presents both opportunities and risks.

While compostable packaging has an important role to play in the transition to a more sustainable packaging system, there is currently widespread confusion in the market about what is and is not compostable. Some organisations in the organics recycling industry have real concerns that programs to recover certified compostable packaging will lead to increased contamination of organics feedstock with non-compostable plastics. This has the potential to impact end markets for quality recycled organics.

The recovery system for compostable packaging is currently under-developed nationally and has significant gaps, which include:

- use of 'biodegradable' packaging that is not compostable and will contaminate both organics and material recycling streams,
- limited access in some areas for households and businesses to organics collection services that are able to process compostable packaging,
- the inability of users and organics recyclers to easily identify and distinguish compostable from non-compostable packaging, and
- limited ability of some organics recyclers to process compostable packaging into quality products with proven markets within standard processing times.



This strategy has been developed by the Australian Packaging Covenant Organisation (APCO), the Australian Organics Recycling Association (AORA) and the Australasian Bioplastics Association (ABA) in consultation with a wide range of stakeholders from industry and government. It builds on previous work including the strategies outlined in *Our Packaging Future*, the collective impact framework to achieve the 2025 Targets.

The strategy supports other initiatives to reduce the environmental impacts of packaging, including regulations in some jurisdictions to ban problematic single-use plastic products including fragmentable plastics. The ban on single-use plastic serviceware in *South Australia* also includes bioplastic alternatives.

It builds on three years' work by APCO, AORA and ABA, in consultation with industry and government stakeholders, including the release of the *Considerations for Compostable Packaging* document

in early 2020. This has been supported by the *National Waste Policy Action Plan (2019)* and *Our Packaging Future (2020)*. These key steps are shown in **Figure 1**.



Figure 1: Other initiatives that inform this strategy

1.2. Scope

The strategy covers the use and recovery of compostable packaging¹ manufactured from certified compostable plastics or polymer coated paperboard, as well as fibre (paper, cardboard, bagasse etc.). Certification to AS 4736² or AS 5810³ is required for compostable plastic packaging to support compliance with Australian Standards. Other products are relevant if they can be collected with packaging, for example certified compostable cutlery, stirrers or straws used in cafés or at public events, and comply with relevant legislation in each jurisdiction.

It should be noted, however, that these are all single-use materials and generate waste which should be avoided where possible in line with the waste hierarchy. Some state and territory governments have included cutlery, stirrers and straws in regulations or policies to phase out single-use plastics. In some jurisdictions these include products made from bioplastics.

Not all bioplastics, i.e., plastics made from a renewable material like corn or sugarcane, are compostable (**Figure 2**).

The strategy builds on ABA's extensive work program with government, organic recyclers, composters, industry groups, non-government organisations, brand owners and converters to further the understanding

and appropriate use of bioplastics. The ABA's program is supported by AORA and APCO as well as a cross section of suppliers, manufacturers and retailers.

Key terms including packaging, single-use, problematic and unnecessary are defined in the *Glossary*.

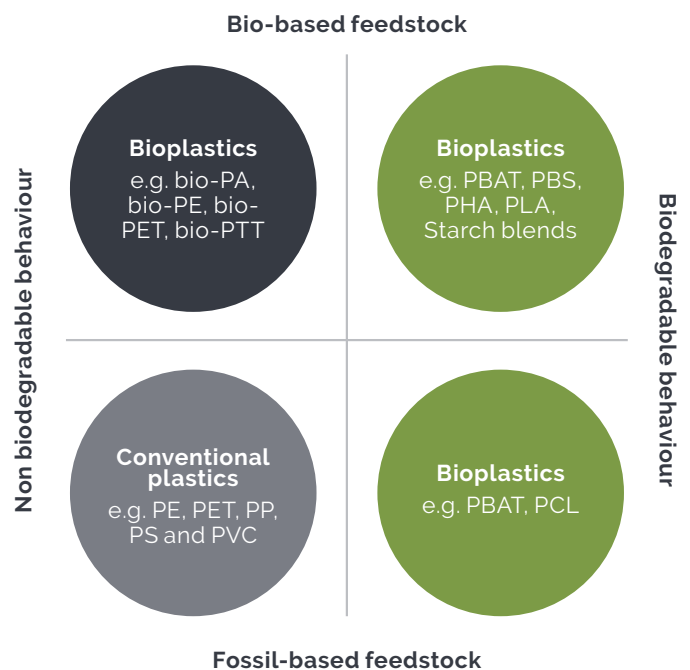


Figure 2: Types of bioplastics

¹ Packaging is defined in the National Environment Protection (Used Packaging Materials) Measure 2011 to mean all packaging products made of any material, or combination of materials, for the containment, protection, marketing or handling of consumer products.

² Australian Standard AS 4736-2006: Biodegradable plastics suitable for composting and other microbial treatment

³ Australian Standard AS 5810-2010: Biodegradable plastics suitable for home composting

1.3. Collective impact framework

Certified compostable packaging has the potential to support the transition to a sustainable packaging system if it is used appropriately and there are systems in place for recovery. This will require contributions from all key stakeholders:

- Brand owners and retailers should only use certified compostable packaging where elimination, reduction and material recycling are not feasible and it achieves an environmental benefit, supported by guidelines in *Considerations for Compostable Plastic Packaging*.
- Local councils should include information within their education programs on how to recycle correctly, including placing certified compostable packaging in the organics bin where this is accepted by the contractor, and other recyclable packaging in the recycling bin.

- Privately contracted commercial and industrial service providers also have a responsibility to educate on correct use of organics recovery systems in commercial settings.
- Consumers must be encouraged to dispose of compostable packaging appropriately, i.e., in a home composting system if the item is certified home compostable, or in an organics collection system if compostable packaging is one of the accepted materials.
- Organics recyclers need to have systems in place to ensure that compostable packaging is processed into quality end products and that any non-compostable packaging is removed.

Examples of the activities of stakeholders within the compostable packaging value chain are provided in **Figure 3**.

Considering the complexity of the packaging value chain, it is vital that stakeholders from different sectors commit to a common agenda to address the complex decisions, trade-offs and interdependencies in the circular economy that relate to compostable packaging.

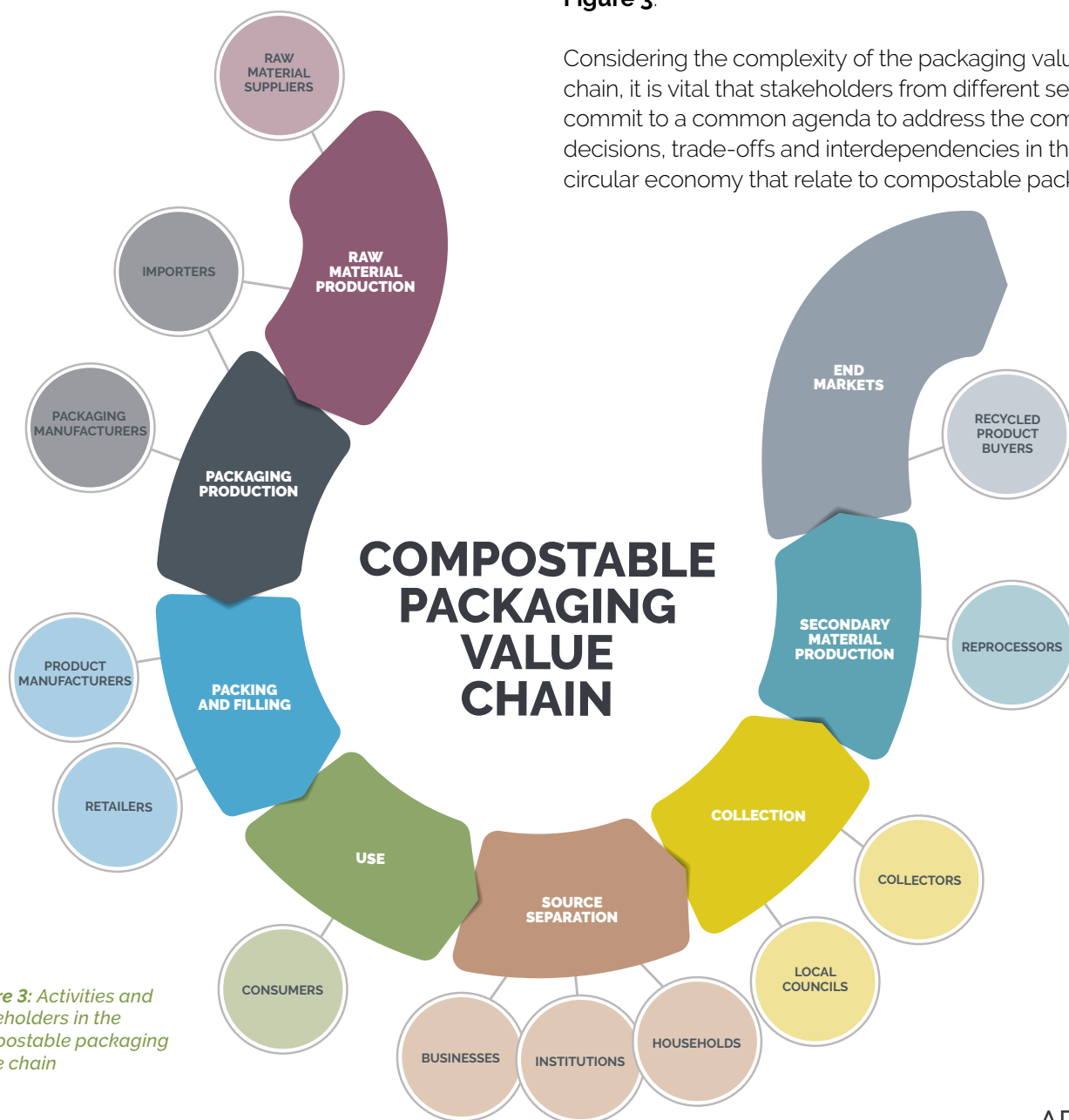


Figure 3: Activities and stakeholders in the compostable packaging value chain

1.4. Principles

Stakeholders consulted during the development of this strategy have reinforced the need for compostable packaging to be managed according to the following principles:

- Compostable packaging should only be used when it generates the **highest potential environmental value**, for example, to support the recovery of food waste or where conventional (material) recycling is impractical due to the amount of food residue or other factors.
- **Elimination, reduction, reuse and material recycling options should be considered first**, although highest environmental value will depend on individual circumstances (including the application of the packaging and available recycling capabilities).
- **A holistic systems approach** is required to ensure compostable packaging is only favoured in scenarios where it is practical to collect and process through organics recycling facilities, with minimal cross contamination of other waste streams. Packaging should only be called compostable if it is technically compostable (e.g., plastic packaging must be certified to Australian Standard AS4736 or AS 5810) and is successfully collected, sorted, and composted in practice and at scale.
- **To ensure high quality recycled products, it is necessary to avoid cross-contamination** between organics recovery systems (e.g., composting or anaerobic digestion) and mechanical recovery systems (e.g., plastic recycling). To support consumer education, packaging should be labelled as either compostable or recyclable, not both.
- **The use and recovery of compostable packaging must minimise impacts on the environment** at every stage, from the selection of raw materials through to processing and application of composted products to land.
- Adding packaging to the feedstock for organics recycling should **not reduce the quality and value or limit the application of composted end products**.

The risks associated with use of compostable packaging need to be evaluated and managed. These include industry 'greenwashing', inadequate processing capacity, not being able to sort compostable packaging from non-compostable packaging at processing facilities, gaps between processing times within Australian standards and current commercial operating times, and potential for increased contamination of composting processes with non-compostable packaging.



2

Current situation in Australia

2. Current situation in Australia

2.1. Compostable packaging use

While there is growing industry and consumer interest in the utilisation of compostable plastic packaging, there is also considerable confusion and misinformation in the market about materials labelled 'compostable', 'degradable' or 'biodegradable', and the correct disposal methods for these materials. A claim of compostability should only be made if the packaging is certified to one of the relevant Australian Standards and there is a system in place to recover it. The terms 'degradable' and 'biodegradable' should be avoided. Logos that indicate compliance with Australian Standards need to be clearly displayed.

According to APCO's report *Australian Packaging Consumption and Recycling Data 2018-19*, approximately 11,000 tonnes of packaging placed on the Australian market in 2018-19 was certified compostable plastic or fibre and another 1,000 tonnes of oxo-degradable or photo-degradable packaging, all from imported sources.

The ABA administers a *verification program* to the requirements of AS4736-2006 and AS5810-2010 for industrial and home composting, respectively. Independent accredited laboratories test and an independent technical auditor verifies that material meets all the following test requirements for AS 4736:

- Minimum of 90% biodegradation of plastic materials within 180 days in compost.
- Minimum of 90% of plastic materials should disintegrate into less than 2mm pieces in compost within 12 weeks.
- No toxic effect of the resulting compost on plants and earthworms.
- Hazardous substances such as heavy metals should not be present above the maximum allowed levels.
- Plastic materials should contain more than 50% volatile solids (i.e., organic materials).

Before an application for verification can proceed, the ABA also requires a declaration by the applicant that no organic fluorinated chemicals, such as per- and polyfluoroalkyl substances (PFAS) have been added to the material or product.

Following successful verification, licensed use of the ABA looped seedling and/or home compostable logo (**Figure 4**) is offered and can be printed on the finished product as proof of conformance with the requirements of the Standard. The logos include a unique number specific to each certification, which is trackable through ABA, to verify the valid use of the logo. Educational materials need to include this as a reference point for consumers to verify claims and identify potential greenwash on non-certified materials.



Figure 4: Logos indicating compliance with Australian Standards

2.2. Collection and recycling of organics

Australia generated around 5.09 million tonnes of organic waste in 2018-19, of which an estimated 22% was processed through composting or anaerobic digestion.⁴ Sources of recycled organics include:

- municipal waste - kerbside collection from households and council waste taken to drop-off centres,
- commercial and industrial (C&I) waste including timber and food organics, and
- construction and demolition (C&D), predominantly timber waste and offcuts.

The *National Waste Policy Action Plan* (2019), prepared by the Australian Government, state and territory governments and the Australian Local Government

Association, includes a target to halve the amount of organic waste sent to landfill by 2030. The policy includes a commitment to deliver a food organics and garden organics (FOGO) collection to households and businesses by 2023. In April 2021, the Australian Government estimated that only 30% of Australians currently have access to a full FOGO collection service, while over 70% per cent have access to a garden organics collection service.⁵

State, territory and local government initiatives to increase recovery of organics are summarised in **Table 2**.

Table 2. Government initiatives to increase recovery of organics

JURISDICTION	ORGANICS STRATEGY AND FOGO	NUMBER OF COUNCILS OFFERING FOGO, APRIL 2021	ACCEPT BIODEGRADABLE / COMPOSTABLE PACKAGING?
QLD	Strategic priority 2 in <i>The Waste Management and Resource Recovery Strategy</i> includes an action to develop an action plan for food and agricultural waste. The Organic Waste Action Plan including FOGO will be finalised in 2021.	One council (Ipswich)	<i>Ipswich Council</i> allows compostable kitchen caddy bags for collection of food organics.
NSW	<i>Cleaning Up Our Act: The Future for Waste and Resource Recovery in NSW</i> , an issues paper released in March 2020 to inform development of the 20-Year Waste Strategy (20-YWS), includes Option 2.1: Recovering food and garden organics. The 20-YWS is scheduled for release in 2021. The Net Zero Plan has a target of net zero emissions from organics waste in landfill by 2030. The \$24 million AWT transition package will support local councils and the alternative waste industry improve kerbside separation of FOGO.	41 councils	Certified compostable kitchen caddy bags provided or approved by council, e.g.: <i>Penrith City Council, Bega Valley, Shellharbour, Inner West Council (apartment buildings)</i> . <i>Randwick City Council</i> allows soiled pizza boxes as well as compostable kitchen caddy liners. <i>City of Sydney</i> is trialling food waste collection.
ACT	<i>The ACT Waste Management Strategy 2011-2025</i> includes Strategy 2.2: Recover organic and residual waste resources and 4.2: Minimise organic waste to landfill. Infrastructure options are still under consideration.	None	None

⁴ Department of Agriculture, Water and the Environment, 2021. *Recovering Organic Waste*. Available at: <https://www.environment.gov.au/protection/waste/food-waste/recovering-organic-waste>

⁵ Blue Environment, 2020. *National Waste Report, Report to Department of Agriculture, Water and Environment*, p. 42. Available at: <https://www.environment.gov.au/system/files/pages/5a160ae2-d3a9-480e-9344-4eac42ef9001/files/national-waste-report-2020.pdf>

JURISDICTION	ORGANICS STRATEGY AND FOGO	NUMBER OF COUNCILS OFFERING FOGO, APRIL 2021	ACCEPT BIODEGRADABLE / COMPOSTABLE PACKAGING?
VIC	<i>Recycling Victoria A new economy</i> policy and action plan includes 'Mandatory rollout of food and garden organics recovery services to households that don't already have access will commence in 2026-27, with all Victorians to have access to a bin or service by 2030'.	31 councils	<i>Macedon Ranges Shire</i> accepts compostable caddy liners, pizza boxes, soiled paper, compostable 'packaging and items' (cups, plates, cutlery etc) excluding plastic bags. Only Council approved compostable caddy liners accepted by <i>City of Boroondara</i> .
TAS	The <i>Draft Waste Action Plan (2019)</i> has an action to Develop an Organic Waste and Resource Recovery Strategy. The strategy is scheduled to be finalised in late 2021.	<i>Six councils</i>	Some reject all types of bags (<i>West Tamar Council, City of Launceston</i>) to avoid contamination, others allow certified compostable caddy liners (e.g. <i>Hobart City Council, which also accepts certified compostable cups, plates and cutlery</i>). <i>West Tamar</i> accepts pizza boxes and other greasy cardboard, and 'Compostable coffee cups ... if you are 100% certain there is no plastic lining'.
SA	<i>South Australia's Waste Strategy 2020-2025</i> aims to ensure segregated food and organic waste collection systems exist for residential, commercial and industrial premises in the Adelaide metropolitan area. <i>Valuing our Food Waste:</i> South Australia's strategy to reduce and divert household and business food waste (2021) includes <i>funding for councils to implement FOGO, a state-wide education program and measures to increase C&I collection systems</i> .	<i>33 councils</i> 100% of Adelaide metro councils; 29% of regional councils	<i>Certified compostable</i> packaging and food service ware is accepted in all 19 metropolitan council areas, and the 14 regional councils that have implemented FOGO systems.
WA	The Waste Authority has a <i>Position statement on FOGO collection systems</i> (August 2020) The <i>Waste Avoidance and Resource Recovery Strategy 2030</i> commits to all local governments in the Perth and Peel region having a FOGO service by 2025.	<i>Ten councils</i>	<i>FOGO Kerbside guidelines:</i> 'Kitchen caddy liners should meet the Australian Standard AS 4736-2006 Biodegradable plastics suitable for composting and other microbial treatment'.
NT	<i>NT EPA Waste Management Strategy 2015-2022</i> includes actions to increase recovery of organics although no mention of food waste or FOGO.	<i>None</i>	

2.3. Collection and recycling of compostable packaging

An estimated 1,500 tonnes of packaging were recovered through composting in 2018–19.⁶ Most of this was fibre-based packaging disposed of into organics collections. This is in addition to recovery of wooden packaging such as pallets, which are processed into mulches and soil conditioners.

A 2019 survey of organics processing facilities across Australia⁷ revealed that the main sources of compostable packaging are public events – such as festivals, community events in partnership with councils and zero waste events – which account for about 90% of the compostable packaging received at processing facilities. The remaining compostable packaging is collected from event venues, food sales outlets, supermarkets, and domestic organic recycling services provided by local government (including cardboard and paper food packaging wastes and certified compostable bags used to divert food waste).

Collection of compostable packaging from households relies on the availability of FOGO kerbside services and appropriate processing infrastructure. Some councils provide residents with compostable food caddy liners

as these have been found to boost participation.⁸ Some composters however, do not accept them.⁹

Waste management and composting businesses collect food organics from waste generators, such as fresh food markets, food manufacturers and restaurants. They may not accept compostable packaging as this depends on the individual organics recycler and their end markets.

In addition to home composting, the main organics recovery technologies are in-vessel composting (IVC), open air windrow (OAW) and anaerobic digestion. In-vessel composting is currently considered the best option for compostable packaging (**Table 3**), although this depends on the length of time that materials stay in the IVC process. Responses to an APCO survey in 2019 found that most facilities with in-vessel composting technology reported issues associated with packaging materials not breaking down sufficiently during processing.¹⁰ Some commercial operators use IVC followed by a period in OAW. OAW is subject to tighter regulatory controls because materials are exposed to the elements. Plastics, including compostable plastics, cannot be broken down in an anaerobic process.

Table 3. Organics recycling technologies and compostable packaging¹¹

ORGANICS PROCESSING TECHNOLOGY	CAPACITY TO PROCESS COMPOSTABLE PACKAGING
Home composting	Most home composts are not managed as 'hot' composts, and some bioplastics will not readily biodegrade at cooler temperatures. AS 5810-2010 provides standards to assess whether a material is degradable under home composting conditions.
In-vessel composting (IVC)	These technologies pasteurise, and sometimes mature, materials in enclosed vessels. Odour and litter risks are contained. These can operate at very high temperatures and aerate materials via pumped air, and then extract exhaust gases for odour treatment. Materials are often removed from vessels after 7-14 days and some compostable packaging formats may not have completely biodegraded and require further composting.
Open air windrow (OAW)	This involves turning piles to maintain aerobic conditions and to ensure all materials are exposed to thermophilic treatment. Open air management can result in offsite litter and odour issues, and some state regulators (NSW and Victoria) restrict open air management of materials containing food and higher odour risk materials. Most composting systems will include a period of turned windrow composting to mature composts after the initial hot stage, although some facilities will sell immature pasteurised materials direct to users who then mature materials.
Open or covered static aerated pile/windrow	This technology uses piles that are turned less frequently and are aerated via air pumped through the base of piles. Some systems use covers to contain odour and maintain moisture. Compostable packaging in open systems can pose a litter risk. Victoria and NSW regulate the use of this technology for materials containing food organics, at least at the initial hot composting phase.
Housed pile/windrow	These systems use turned or static pile composting in a housed shed. This contains odour and litter risks.
Anaerobic digestion (AD)	This technology recovers energy from bio-gas from bacterial degradation of organics. Other than some water-soluble starch-based packaging foams and film plastics, most compostable packaging formats will not biodegrade to a significant extent in an AD facility. Paper products may fall apart in an aqueous facility, but the paper fibres will not biodegrade much. Most bioplastics will not biodegrade.

⁶ APCO, 2021. Australian packaging consumption and recycling data 2018-19, p. 68. This may include some service ware as well as packaging.

⁷ Blue Environment, 2019. Packaging collection, sorting and recycling infrastructure. Report to APCO, unpublished.

⁸ GISA, 2020. South Australia's food waste strategy: valuing our food waste, Consultation draft p. 20

⁹ Grant, B., 2020. Getting FOGO right. Inside Waste, August/September 2020, p. 27.

¹⁰ Blue Environment, 2019. Packaging collection, sorting and recycling infrastructure. Report to APCO, unpublished, p. 36.

¹¹ Based on Blue Environment, 2019. Packaging collection, sorting and recycling infrastructure. Report to APCO, unpublished, p. 33.

ORGANICS PROCESSING TECHNOLOGY	CAPACITY TO PROCESS COMPOSTABLE PACKAGING
Mechanical biological treatments	These systems accept mixed residual waste and extract an organic rich fraction for biological treatment to make soil-conditioner and/or bio-gas using in-vessel processing. The extent to which compostable packaging would biodegrade by this process would depend on how much of it was extracted in the recyclables or landfill waste stream rather than the organics stream, as well as the period and conditions under which organics were processed.
Thermal energy recovery facilities	These technologies would recover energy from compostable (and combustible non-compostable) packaging.

AORA Victoria¹² has stated that the amount of contamination in kerbside and commercial and industrial (C&I) organics collections is heavily disrupting the composting industry and driving up sorting and processing costs by up to 60%. Contaminants include non-compostable plastics, glass, concrete and metals. Heavier materials like glass and concrete can be easily removed, but single-use plastics are particularly problematic.

Analysis of the content of 5,900 FOGO bins across 38 audits in NSW found contamination is on average 2.2% by weight.¹³ The most frequently cited contaminants were plastic, other organics (leather, rubber, oils), and containerised food. Contamination rates vary from household to household, with 92% of households in one audit having no contamination and other households having high contamination levels.

An audit of food and garden organics collected in Adelaide, South Australia found a similar level of contamination of around 2%.¹⁴

Organics recycling infrastructure needs to include contaminant management to produce quality output products for which there are markets. The Australian Standard for composts, soil conditioners and mulches (AS 4454 – 2012) is the benchmark standard for compost quality in Australia.¹⁵ Where composts are processed to meet or exceed the standard, the likelihood of residual material derived from compostable products is minimised or avoided.

Regulatory issues

There are some regulatory barriers to the recovery of compostable packaging in Australian organics recycling facilities. In some jurisdictions, compostable packaging cannot be accepted by organics recycling facilities. In NSW, for example, Resource Recovery Orders and Exemptions may be granted for the re-use

of waste where this can be shown to be beneficial and pose minimal risk of harm to the environment or human health. The *Compost Order 2016* specifies allowed inputs to the process and the *Compost Exemption 2016* specifies the maximum levels of plastics in compost being applied to land (although following an appropriate composting cycle, there should be no certified compostable plastic in the compost being applied to land). The current Order does not mention compostable plastics and a *specific application* is required for compostable plastic packaging to be allowed as an input waste stream to composting facilities (small amounts of incidental compostable plastic with the incoming food waste is accepted provided the final compost complies with the Exemption conditions). Council consent is also needed before licences can be issued or varied in NSW.

The NSW Environment Protection Agency (EPA) also recently banned the use of *mixed waste organic material* (alternative waste treatment [AWT] outputs) and has stated that it does not intend to grant any general exemptions or issue any related orders allowing AWT outputs to be used as a soil amendment on agricultural, mining rehabilitation or forestry land. Applications for new and alternative uses will be assessed on a case-by-case basis. This material is made from household general waste (red-lid bins).

The South Australian EPA recommends that the Australian Standard for composts, soil conditioners and mulches (AS 4454 – 2012) is adopted by all composters. Where composts are processed to meet or exceed the standard, the likelihood of residual material derived from compostable products is minimised/avoided.

There are also emerging issues in packaging that may need to be addressed in regulations to protect human health or the environment, such as PFAS compounds (e.g., waterproof coatings on takeaway food packaging).

¹² AORA Victoria, 2020. *Position Statement on Compostable Plastics in Organic Recovery Processes*, unpublished

¹³ Rawtec, 2020. *Analysis of NSW kerbside green lid bin audit data report*. Available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wasteregulation/fogo/green-bin-audit-2011-19.pdf?la=en&hash=EB4E21B1748BA82B6DF56EAF9B5A347372776946>

¹⁴ GISA, 2021. *Valuing our food waste: South Australia's strategy to reduce and divert household and business food waste*. Consultation draft, p. 36.

¹⁵ AORA, 2020. *International comparison of the Australian Standard for composts, soil conditioners and mulches (AS 4454-2012)*. Available at: https://www.aora.org.au/sites/default/files/uploaded-content/website-content/International_Comparison_AS4454_Final.pdf.

The background features a series of concentric, overlapping circles in various shades of green, creating a sense of depth and movement. A large, solid green circle is positioned on the left side, containing the number '3' and the title text. The overall design is clean and modern, with a focus on circular motifs.

3

Towards 2025: A roadmap towards circularity

3. Towards 2025: A roadmap towards circularity

3.1. Vision

Our Packaging Future contains the following vision for packaging circularity in Australia:

The whole packaging value chain collaborates to avoid packaging waste, keep packaging materials out of landfill and maximise the circular value of the materials, energy and labour within the local economy.



This strategy provides a roadmap towards this vision for compostable packaging.

3.2. Outcomes

The proposed outcomes for certified compostable packaging by 2025, linked to *Our Packaging Future*, are summarised in **Table 4**. The three outcomes are:

- packaging designed for circularity,
- improved collection and recycling systems, and
- expanded markets for used packaging.

Table 4. Proposed outcomes for compostable packaging

OUR PACKAGING FUTURE OUTCOMES	CURRENT STATE	OUTCOMES BY 2025
 <p>Packaging designed for circularity</p>	<p>Small quantities of certified compostable packaging in the market.</p> <p>Confusion in the market about biodegradable, degradable and compostable packaging.</p>	<ul style="list-style-type: none"> • All packaging that is not suitable for elimination or reuse is suitable for material recycling or composting. • All components of a compostable package are compostable. • Oxo-degradable (fragmentable) plastics are phased out. • Certified compostable packaging is used to support recovery of food waste or where contamination with food scraps reduces the recovery outcomes of material recycling. • Plastics packaging designed for organics recycling is all certified compostable to AS 4736 or AS 5810. • Compostable packaging can be easily distinguished from its material recyclable counterparts. • Business and consumers are educated to understand the difference between biodegradable and compostable packaging, and how to dispose of these materials correctly.
 <p>Improved collection and recycling systems</p>	<p>Many organics facilities unable to manage compostable packaging.</p> <p>Limited access to kerbside FOGO services.</p>	<ul style="list-style-type: none"> • Community and businesses have widespread access to an organics collection service that accepts certified compostable packaging. • Consumers and the packaging industry are aware of what certified compostable packaging is, and how and when it should be used and recycled. • Businesses that provide compostable packaging also utilise an organics (composting) recovery service. • Compostable packaging is labelled for easy identification by consumers and composters. • Households and business are educated about which types of compostable packaging can be added to their organics collection service.

OUR PACKAGING FUTURE OUTCOMES	CURRENT STATE	OUTCOMES BY 2025
 <p>Expanded markets for used packaging</p>	<p>Certification of compostable packaging does not necessarily mean it is able to be processed by all organics recyclers, potentially making it a contaminant in the process or in end products.</p>	<ul style="list-style-type: none"> • Organics recycling facilities can process certified compostable packaging for beneficial reuse, such as improving soil health, and meet relevant compost product quality standards. • Certified compostable packaging does not contaminate recycled organics products. • Certified compostable packaging does not have any adverse effects on the local ecology when applied to land.



3.3. Strategies

OUTCOME 1

PACKAGING DESIGN AND PROCUREMENT

Outcome 1 Packaging Design and Procurement

THE PROBLEMS BEING ADDRESSED

Plastics described as oxo-degradable, photo-degradable, enzyme mediated or landfill biodegradable are not compostable, devalue the end-product and limit end markets. If disposed of inappropriately in litter, they can break down into smaller pieces and add to microplastics pollution on land and in waterways.

Many companies do not understand differences between degradability and compostability and are using these materials in a way that do not achieve any environmental benefit and may be causing negative impacts. Claims that packaging is 'biodegradable' or 'compostable' where there is no system to collect and recycle it has the potential to mislead consumers and may be non-compliant with Australian Consumer Law.

Outcomes by 2025

- All packaging that is not suitable for elimination or reuse is suitable for material recycling or composting.
- All components of a compostable package are compostable.
- Oxo-degradable (fragmentable) plastics are phased out.
- Certified compostable packaging is used to support recovery of food waste or where contamination with food scraps reduces the recovery outcomes of material recycling.
- Plastics packaging designed for organics recycling is all certified compostable to AS 4736 or AS 5810.
- Compostable packaging can be easily distinguished from its material recyclable counterparts.
- Business and consumers are educated to understand the difference between biodegradable and compostable packaging, and how to dispose of these materials correctly.

STRATEGY 1.1

Phase out fragmentable (oxo-degradable) plastic packaging

Fragmentable plastics, often described as oxo-degradable, photo-degradable or enzyme mediated, are not compostable. If they enter the organics processing stream, they will devalue the end-product and limit end markets.

Claims of 'degradability', including 'oxo-degradable' and 'landfill degradable' have the potential to mislead consumers into thinking that the materials are compostable. Fragmentable plastics also have potential to contaminate material recycling programs for conventional plastics.

The materials will fragment into smaller pieces and may exacerbate problems associated with microplastics if they end up in the open environment.¹⁶ This is of particular concern when they end up as litter, or contaminate soils when compost is applied to land.

Existing initiatives

Many state and territory governments are taking action to ban non-compostable or fragmentable plastics (**Table 5**). This is reflected in the Australian Government's *National Plastics Plan*, which aims to phase out plastic packaging products with additive fragmentable technology that do not meet relevant compostable standards.

The ABA and AORA have published a *Joint Position Paper* on Certified Compostable Bioplastics that endorses the use of certified compostable plastics to support recovery of food waste, but opposes the use of fragmentable plastics as they are not certified compostable and are not biodegradable.

The ABA has also *published information* on the negative impacts of fragmentable plastics. *ABA has stated* that these products cannot be certified compostable and are not suitable for recovery in organics recycling facilities.

APCO has developed an *Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging*. The initial priority list for phase out includes fragmentable plastics, including oxo-degradable, oxo-biodegradable and enzyme-mediated materials that incorporate an additive to accelerate the fragmentation of the material into smaller pieces.¹⁷ This will support achievement of the *2025 Target* to phase out problematic and unnecessary single-use plastics.

The recently established *ANZPAC Plastics Pact* (ANZPAC) also has a target to 'Eliminate unnecessary and problematic plastic packaging through redesign, innovation and alternative (reuse) delivery models'. ANZPAC will address problematic plastics throughout the region, including New Zealand and the Pacific Islands.

Table 5. Government policies on oxo-degradable and compostable plastics (as of May 2021)

JURISDICTION	RELEVANT REGULATION OR CONSULTATION PAPER
All	The <i>communiqué from the Environment Ministers Meeting</i> on 15 April 2021 identified eight problematic and unnecessary plastic product types for industry to phase out nationally by 2025, including 'plastic products misleadingly termed as 'degradable''
Commonwealth	The <i>National Plastics Plan</i> includes an action to 'phase out plastic packaging products with additive fragmentable technology that do not meet relevant compostable standards' by July 2025.
NSW	The discussion paper <i>Cleaning Up Our Act: Redirecting the Future of Plastic in NSW, which</i> was released in March 2020 to inform development of NSW's Plastics Plan, flagged a priority action to address oxo-degradable plastics. The NSW Plastics Plan is due for release in 2021.

¹⁶ European Commission, 2017. *Study to provide information supplementing the study on the impact of 'oxo-degradable' plastic on the environment*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/ab9d2024-2fca-11e7-9412-01aa75ed71a1/language-en/format-PDF>

¹⁷ APCO, 2020. *Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging*. Available at: <https://documents.packagingcovenant.org.au/public-documents/Action%20Plan%20for%20Problematic%20and%20Unnecessary%20Single-Use%20Plastic%20Packaging>

JURISDICTION	RELEVANT REGULATION OR CONSULTATION PAPER
QLD	<i>Waste Reduction and Recycling Amendment Act 2017</i> defines 'A banned plastic shopping bag...made, in whole or part, of plastic (whether or not the plastic is degradable)'. Following release of the <i>Tackling plastic waste - Plastic Pollution Reduction Plan</i> (2020) the Government announced that oxo-degradable (fragmentable) items may be banned in future.
SA	<i>Single-use and Other Plastic Products (Waste Avoidance) Act 2020</i> prohibits the manufacture, production, distribution, sale and supply of the following: <ul style="list-style-type: none"> • From 1 March 2021: single-use plastic straws, cutlery and stirrers including bioplastic alternatives, and • From 1 March 2022: oxo-degradable plastic products.
ACT	The <i>Plastic Reduction Bill 2020</i> prohibits the use of single use plastic bags unless they are compostable (in accordance with Australian Standard AS 4736- and AS 5810). Oxo-degradable plastic products will be banned from 2022 .
VIC	The <i>Environment Protection Amendment Act 2019</i> bans the use of single use plastic bags 'that comprises, either wholly or partly, plastic, whether or not that plastic is ... degradable'. Single-use straws, cutlery, plates, drink-stirrers, expanded polystyrene food and drink containers, and cotton bud sticks will be banned from sale or supply in Victoria by February 2023. Oxo-degradable items will be included in the ban.
WA	<i>Western Australia's plan for plastics</i> flags oxo-degradable plastics for amended plastics regulations – state-wide phase out by late 2026.

ACTIONS

WHAT	WHO	WHEN
Monitor the progress of APCO Members in phasing out problematic and unnecessary single-use plastics, including fragmentable plastics, through the APCO Annual Reporting Tool.	APCO	Annual
Collect data on consumption and recovery of fragmentable plastic packaging to monitor the phase out of these materials.	APCO	Annual
Governments commit to phase out plastic packaging products with additive fragmentable technology that do not meet relevant compostable standards (National Plastics Plan).	Government	July 2022
Actively work to phase out problematic and unnecessary single use plastics, including fragmentable plastics, as identified by APCO and applicable state and territory jurisdiction legislation.	APCO Members	2025 or sooner, as per applicable regulation.

STRATEGY 1.2

Educate the packaging value chain on appropriate use of compostable packaging

Certified compostable packaging, whether manufactured from plastics or fibre-based materials, must be easily distinguishable from recyclable packaging, and only encouraged where there is an appropriate collection, processing infrastructure and end markets for this type of packaging, and where avoidance, reuse or other recovery outcomes are not feasible. A decision-making framework to help organisations decide whether or not to use compostable packaging is provided in *Considerations for Compostable Plastic Packaging*.

All compostable plastic packaging must be certified to Australian Standards AS4736-2006 or AS5810-2010 for industrial and home composting, respectively. There is an additional worm toxicity test in Australian Standards, compared to those used in other jurisdictions, which aims to ensure that they are safe for application to land. Testing requirements to support certification is undertaken on the packaging as a whole, including inks and other additives.

Standards may need to be updated as new evidence emerges about potential contaminants in compost, such as intentionally added PFAS which are not currently referenced in the standards.

At present compostable packaging should only be used where there is a benefit in using them e.g., to return any nutritional food material that remains in contact with the packaging or product to soil through organics recycling. This would suggest applications

such as liners for food caddies, brewing aids (tea bags and coffee pods), food service items, and packaging that is highly contaminated by food and currently poses significant challenges to recycle economically.

The aim should be to develop the simplest possible system to manage packaging and recovery of materials within understood parameters.

Venues with a closed packaging and waste management system, such as cafes, food courts, markets and festivals are an opportunity to improve effective collection and processing of compostable packaging. These systems also present important opportunities to adopt circular economy principles to avoid waste and minimise resource consumption by reducing packaging or transitioning to reusable packaging.



In the longer term, compostable packaging could be used in other retail packaging applications (i.e., not just in food service venues) where reuse or recycling options are not available, for example packaging that is heavily contaminated with food. Additional guidance for brand owners and retailers is provided in *Considerations for Compostable Plastic Packaging*. The wider application of compostable packaging can only occur in parallel with access to organic waste collections and processing capability for compostable packaging.

The use of compostable plastics for packaging formats with established recycling systems (e.g., PET bottles) is likely to result in contamination of the recycling stream, particularly if consumers cannot readily identify the difference between the compostable and non-compostable plastic types.

Compostable packaging needs to be designed and certified for composting, and wherever feasible all components should be compostable (e.g., a compostable lid on a compostable tray or cup).

Existing initiatives

Considerations for Compostable Plastic Packaging was developed by APCO, ABA and AORA in early 2020. It provides information on standards and certification, as well as a 'decision tree' to inform decisions on the suitability of packaging applications for either composting or traditional recycling routes.

APCO also developed the *Food Services Packaging Sustainability Guidelines* in 2019. The document includes information on appropriate use and recovery of compostable packaging for food service applications.

ANZPAC has a target for 100% of plastic packaging to be reusable, recyclable or compostable by 2025. The program of activities will include research and development of circular solutions for plastic packaging.

The ABA administers a voluntary verification scheme, for companies or individuals wishing to have their claims of compliance with the Australian Standard 4736-2006: Biodegradable plastics suitable for composting and other microbial treatment (AS 4736-2006) verified.

The ABA also administers a voluntary verification scheme for companies wishing to verify compliance with the Home Composting Australian Standard, AS 5810-2010: Biodegradable plastics suitable for home composting (AS 5810-2010).

The ABA provides advice to retailers and brand owners about appropriate use of compostable materials through resources published on their *website*. They also receive feedback from organics recyclers on products that are found to be non-compliant, and instruct manufacturers to take corrective action if they wish to continue using the seedling logo.

The *Australian Institute of Packaging* (AIP) runs a training course called 'The future of compostable packaging', which aims to build knowledge within the packaging industry on compostable materials, packaging design for compostability, certification and labelling.

Boomerang Alliance manages the *Plastic Free Places Program*, providing tailored solutions for food retailers, events and markets to eliminate single-use plastics, ensuring that the right partnerships are in place, addressing barriers to transition, and delivering measurable results. Some projects have assisted with the development of composting systems for food waste and compostable packaging.

ACTIONS

WHAT	WHO	WHEN
Promote <i>Considerations for Compostable Plastic Packaging</i> to inform decisions by brand owners and retailers on the suitability of packaging applications for composting.	APCO, ABA	Ongoing
Develop a partnership project with targeted food service organisations, for example shopping centres and major events to promote recovery of food waste and reduction, reuse, and recovery of packaging and service ware. The focus will be on using compostable packaging where packaging cannot be avoided, for example by using reusable crockery, and where source separated organics services are available.	APCO, ABA, AORA	2022
Undertake research on the use and potential impacts of PFAS in packaging.	Planet Ark, APCO, Australian Government	2021
Deliver training courses for the packaging industry on compostable packaging.	AIP	Annual

PROOF POINT

BOX 1 Tripod Coffee compostable coffee

Tripod Coffee pods are made of a biopolymer and are sealed with a paper lid and certified to AS 4736. On their website the company advises consumers to place the entire capsule into the green bin if their council accepts food scraps and compostable packaging, and provides a link to information on which councils accept compostable packaging.

For consumers without access to a FOGO service that accepts compostable packaging, Tripod Coffee provides individual consumers with the option of returning used pods through their Pod-to-Plant *Returns Program*. Returned pods, including the coffee grounds and packaging, are processed into organic fertiliser and green energy.

STRATEGY 1.3

Eliminate false or misleading claims

There are *strong market drivers* for companies to utilise compostable plastics in their packaging and to promote these attributes to consumers.¹⁸ A *global survey* by McKinsey & Company found that compostable plastic films have a strong global recognition as being sustainable.¹⁹ The potential to mislead consumers arises when the consumer believes the packaging is compostable but has little to no options to dispose in a composting system.

Confusion in labelling needs to be addressed. Claims that packaging is 'biodegradable' or 'compostable' where there is no system to collect and recycle it (meaning it will end up in landfill) have potential to mislead consumers and may be non-compliant with *Australian Consumer Law*.

In Australia, false and misleading claims about biodegradability or compostability are regulated under *Australian Consumer Law* by the *Australian Consumer and Competition Commission* (ACCC).

Companies also need to avoid any claims that could be perceived as 'greenwashing'. This has been defined as something that 'makes people believe that your company is doing more to protect the environment than it really is'.²⁰ The Total Environment Centre (TEC) note that this is 'often the result of ignorance and over-enthusiasm rather than deliberate deceit'.²¹ It is essential that companies making a claim about compostable packaging ensure that:

- the product is certified to the relevant Australian Standard,
- there is a convenient system in place to recovery it, i.e., a commercial composting service that accepts compostable packaging or other systems for recovery (e.g., home composting), and
- they educate their customers about correct disposal (see Strategy 2.1).

Existing initiatives

The ACCC's Green Marketing Guidelines advise companies that make environmental or green claims to ensure that their claims are scientifically sound and appropriately substantiated, and take action where necessary to protect consumers from false or misleading claims.²² An information sheet on claims regarding plastic bags is available on their website.²³

Compost Connect (previously *The Compost Network*) is being launched in 2021 as an online platform to provide businesses with access to Australian certified compostable products, services and information that will allow them to divert food waste and compostable packaging from landfill. This educational content will help to reduce greenwashing by informing businesses about regulatory requirements under Australian Consumer Law and by promoting suppliers of certified compostable packaging.

The TEC has published guidelines for companies on environmental claims called The Green Cred Checklist.²⁴ The Boomerang Alliance Plastic Free Places program also provides information for organisations and individual consumers on how to identify and avoid 'greenwashing'.²⁵

Consumer advocacy group, Choice, provides advice to consumers on claims and labels including 'biodegradable' and 'compostable' on looking for certified compostable plastics (or avoiding altogether if possible) and on how to dispose of them in home or commercial composting systems.²⁶

Advertising Standards of Australia can potentially act in response to complaints about advertising that contravenes the voluntary *Environmental Claims Code*.²⁷

¹⁸ Infinium Global Research, 2020. Bioplastics market. Available at: https://www.researchandmarkets.com/reports/5139248/bio-plastics-market-global-industry-analysis?utm_source=MC&utm_medium=Email&utm_code=mzr18eje&utm_ss=45&utm_campaign=1488663+-+Bio+Plastics+Market%3a+Global+Industry+Analysis+and+Forecasts+up+to+2026&utm_exec=adke277mtd

¹⁹ McKinsey & Company, 2020. Sustainability in packaging. Available at: <https://www.mckinsey.com/industries/paper-forest-products-and-packaging/our-insights/sustainability-in-packaging-inside-the-minds-of-us-consumers>

²⁰ Cambridge Dictionary, <https://dictionary.cambridge.org/dictionary/english/greenwash>

²¹ TEC, 2009. The Green Cred Checklist, p. 1. Available at: https://d3n8a8pro7vhm.cloudfront.net/boomerangalliance/pages/569/attachments/original/1486601436/cred_checklist-web.pdf?1486601436.

²² ACCC, 2011. Green marketing and the Australian Consumer Law. Available at: <https://www.accc.gov.au/system/files/Green%20marketing%20and%20the%20ACL.pdf>

²³ ACCC, 2010. Biodegradable, degradable and recyclable claims on plastic bags. Available at: <https://www.accc.gov.au/publications/business-snapshot/biodegradable-degradable-and-recyclable-claims-on-plastic-bags>

²⁴ TEC, 2009. The Green Cred Checklist, p. 1. Available at: https://d3n8a8pro7vhm.cloudfront.net/boomerangalliance/pages/569/attachments/original/1486601436/cred_checklist-web.pdf?1486601436.

²⁵ Boomerang Alliance, 2020. Are you being greenwashed? Available at <https://www.plasticfreeplaces.org/post/are-you-being-greenwashed-avoid-false-eco-packaging-claims>

²⁶ Choice, 2015. A greener plastic bag or nappy? Available at: <https://www.choice.com.au/shopping/packaging-labelling-and-advertising/packaging/articles/biodegradable-plastic>

²⁷ AANA, 2015. Environmental claims code. Available at <http://aana.com.au/content/uploads/2018/03/180316-Environmental-Claims-Code.pdf>

ACTIONS

WHAT	WHO	WHEN
Investigate changing ABA's certification logos from a registered trademark to a certification trademark to reinforce the validity of the logo's licence and the process that underpins the verification program.	ABA	2022
Educate APCO Members, on environmental claims and compliance with <i>Australian Consumer Law</i> .	APCO, ABA, AORA	2022

PROOF POINT

BOX 2 ACCC action on misleading claims about biodegradability

In 2011 the Federal Court in Adelaide declared that Goody Environment Pty Ltd engaged in misleading and deceptive conduct and made false representations about 'Goody' branded plastic bags.²⁸

From at least May 2009, Goody claimed that its 'Goody' branded plastic bags were biodegradable and compostable in accordance with the Australian Standard* and could be legally supplied in South Australia, when this was not the case because the bags:

- contained the heavy metal Molybdenum in amounts that exceeded the maximum concentration prescribed by the Australian Standard, and
- did not biodegrade, disintegrate, or compost in accordance with the criteria prescribed by the Australian Standard.

Goody undertook to refrain from making representations that plastic shopping bags promoted by or supplied by Goody, or on behalf of Goody, are biodegradable or compostable in accordance with the Australian Standard unless it has first obtained independent scientific testing of the actual plastic shopping bags which confirms that the bags do, in fact, meet the Australian Standard.

²⁸ ACCC, 2011. *Misleading conduct in relation to 'Goody' plastic bags*. Available at: <https://www.accc.gov.au/media-release/misleading-conduct-in-relation-to-goody-plastic-bags>



OUTCOME 2

COLLECTION
SYSTEMS

Outcome 2 Collection Systems

THE PROBLEMS BEING ADDRESSED

Compostable packaging has the potential to increase recovery of two problematic waste streams:

- Packaging contaminated with food waste, which is unable to be recycled and generally goes to landfill. Compostable packaging and food waste can potentially be recovered together as one stream.
- Food waste generated by households and food service businesses, which is a significant contributor to waste and greenhouse gas emissions. The food service sector is estimated to generate around 900,000 tonnes of organics waste each year.²⁹

There is a risk that increased use of compostable packaging will increase contamination of organics collections with non-compostable packaging. Packaging users need to be able to identify compostable packaging to enable correct disposal, as this is critical to managing contamination.

Outcomes by 2025

- Community and business have widespread access to an organics collection service that accepts certified compostable packaging.
- Consumers and the packaging industry are aware of what certified compostable packaging is, and how and when it should be used and recycled.
- Businesses that provide compostable packaging also utilise an organics (composting) recovery service.
- Compostable packaging is labelled for easy identification by consumers and composters.
- Households and business are educated about which types of compostable packaging can be added to their organics collection service.

²⁹ ABA, 2021. *The Compost Network*. Available at: <https://bioplastics.org.au/the-compost-network/>

STRATEGY 2.1

Label packaging for correct disposal

Compostability is seen by many consumers as a positive environmental attribute, but this does not always result in correct disposal behaviour.³⁰ Consumers need to be educated to dispose of certified compostable packaging in the right bin, i.e., in their household composting bin if it is certified to AS 5810, or in their kerbside organics bin if compostable packaging is accepted by the council and their contractor. They also need to understand which types of home composting systems are appropriate for compostable packaging.

The ABA's logos (**Figure 5**) indicate that packaging materials are compostable and meet the requirements of AS 4736 or AS 5810. They do not provide any explicit advice to consumers on how to dispose of the packaging correctly, although some brands do provide additional statements on correct disposal.

One of the challenges for organics recyclers is that

packaging often arrives in a fragmented state and it is not possible to see any logo or information to advise that the material is certified compostable. A visual cue would be preferred (particularly colours) however that would be difficult to implement.

Existing initiatives

The Boomerang Alliance is advocating for the adoption of clear consumer labelling for recyclability and compostability and claims of compostability to be backed up by certification to an Australian Standard.³¹

The Institute for Sustainable Futures (ISF) at the University of Technology Sydney has developed a decision guide for consumers on how to dispose of plastics packaging, including compostable materials.³²

WasteMINZ and Plastics NZ have published *Best Practice Guidelines for the Advertising of Compostable Products and Packaging*.

ACTIONS

WHAT	WHO	WHEN
Develop a more detailed guide to labelling compostable packaging.	ABA	2022
Update APCO's <i>Quickstart Guide to Labelling for Recovery</i> to include new labels for reuse and recycled content, and link to the new ABA guidelines (see above action).	APCO	2022
Promote the Quickstart Guide to Labelling for Recovery and ABA guidelines to APCO Members.	APCO	Ongoing

PROOF POINT

BOX 3 Australasian Bioplastics Association logos

Information on products that are certified to AS 4736 and AS 5810 are listed on the *ABA's website*. The website provides a full list of applicants, certification numbers, products verified and the validity of the certificate of compliance. These products are able to display the relevant logo (**Figure 5**).



Figure 5: Examples of the ABA's logos

³⁰ Tauflik at al, 2020. *The paradox between environmental appeal of bio-based plastic packaging for consumers and their disposal behaviour*. Available at: <https://tinyurl.com/y8gcxpfq>.

³¹ Boomerang Alliance, 2020. *Position statement on mandatory certifications and labelling*. Available at: https://16bec440-361f-46d5-9362-76f9485cf8dc.filesusr.com/ugd/6a1af1_e73f87155522448d8b6532b5c9c29b27.pdf

³² UTS, 2019. *Where can my plastics go?* Available at: <https://www.uts.edu.au/sites/default/files/2021-03/Infographics.pdf>

STRATEGY 2.2

Minimise contamination in organics collection services

Some local councils already accept compostable packaging in their FOGO kerbside collection service, particularly in South Australia, but most do not. There are several barriers that need to be addressed before compostable packaging can be accepted more widely in kerbside FOGO services, including:

- lack of visible identification and labelling on compostable packaging that would allow it to be easily differentiated from non-compostable packaging,
- a generally poor understanding amongst consumers about the difference between compostable and non-compostable materials, and
- concern amongst many organics recyclers that compostable packaging may negatively impact their operations or quality of end products.

FOGO services are being rolled out to households in more urban areas, which may provide an opportunity to extend collections of compostable packaging in future. The Victorian Government's *recycling strategy*, released in 2020, includes the mandatory rollout of FOGO recovery services to households, with all Victorians to have access to a bin or service by 2030.

Many councils that provide a FOGO service to residents also provide a kitchen caddy and compostable liner bags, which have been proven to increase household participation.³³ Some councils, particularly in South Australia (see *Box 4*) also allow residents to add certain types of compostable packaging. Most food and garden organics collected at kerbside in Adelaide have low contamination levels (about 2% for the metropolitan Adelaide area).³⁴

Contamination in organics collected from both municipal and commercial sources is a major challenge for organics recyclers. The Western Australian

Government noted that FOGO feedstocks commonly contain contamination such as food packaging and household waste.³⁵ A recent audit of household kerbside organics bins in NSW found an average of 2.2% contamination.³⁶ This ranged significantly, however, from 0.04% up to 17.8%.

All stakeholders in the compostable packaging recovery chain have a responsibility to educate users – households and businesses – on correct recycling:

- Brand owners through on-pack labelling and other forms of communication with customers (see Strategies 1.3 and 2.1).
- Local councils through the information they provide to residents on what they can put into each bin.
- State and territory governments through their educational programs, for example the South Australian Government's '*Which Bin*' initiative.
- Organics recyclers through clear instructions to councils and residents on whether they accept compostable products and packaging (and which types).

The rollout of compostable packaging in FOGO and other organics collection services needs to be undertaken gradually, to minimise consumer confusion and contamination, and only where:

- it has potential to increase organics recovery,
- collection and processing systems are in place and compliant with environmental regulations, and
- it is accompanied by education so compostable packaging ends up in the right place.

Adding items to the acceptable list for kerbside FOGO bins could be done on a product-by-product basis, for example starting with compostable kitchen caddy bags and pizza boxes contaminated with food.

³³ Zero Waste SA, 2010. *Valuing our food waste: South Australia's household food waste recycling pilot*. Available at: <https://www.greenindustries.sa.gov.au/resources/valuing-our-food-waste-sa-s-household-food-waste-recycling-pilot-2010>.

³⁴ Green Industries SA, 2020. *Valuing our food waste*, p. 36. Available at: *Most food and garden organics collected from Adelaide kerbsides have low contamination levels (about 2% for the metropolitan Adelaide area)*.

³⁵ Department of Water and Environmental Regulation, 2020. *Guideline best practice composting*, p. 24. Available at: https://consult.dwer.wa.gov.au/regulatory-capability/draft-guideline-better-practice-composting/user_uploads/guideline-better-practice-composting---final.pdf.

³⁶ Rawtec, 2020. *Analysis of kerbside green lid bin audit data report*. Available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wasteregulation/fogo/green-bin-audit-2011-19.pdf?la=en&hash=EB4E21B1748BA82B6DF56EAF9B5A347372776946>.

Existing initiatives

The *National Waste Policy Action Plan* includes a commitment to 'Deliver Food Organics and Garden Organics (FOGO) collection to households and businesses' (Action 6.4), led by state and territory governments and local government. The **2021-22 federal budget** announced \$67.0 million will be invested in new FOGO initiatives, establishing a Food Waste for Healthy Soils Fund to divert 3.4 million tonnes of organic material from landfill for productive use in agricultural soils.³⁷

The Victorian Government's *kerbside recycling reforms* will include the introduction of a standard four-bin kerbside collection service across Victoria. The four bins include commingled recycling, FOGO, glass and residual waste. The rollout of the new system will be accompanied by a state-wide education and behaviour change program.

One of the priorities in the *National Food Waste Strategy* is to promote behaviour change amongst consumers and business to reduce food waste. There may be potential to leverage these initiatives to promote use of certified compostable packaging where this will support increased diversion of food waste.

APCO and the Planet Ark Environmental Foundation (PAEF) will establish a dedicated forum for local government to discuss their role in building a circular economy for packaging. The Local Government Circular Economy Forum (LGCEF), to be established in 2021, will provide a facilitated platform for local government representatives to regularly engage on collaborative strategic approaches to the packaging sustainability and resource recovery challenges faced by councils, nationally. The forum will provide an opportunity for APCO, ABA and AORA to engage with local government on the strategies outlined in this document.

ACTIONS

WHAT	WHO	WHEN
Include compostable packaging in the National Consumer Education Campaign <i>Check It! Before You Chuck It</i> to build a better understanding of where and how to use and dispose of compostable packaging. This will seek to align with education in states and territories to avoid confusing the audience.	APCO	2021 and ongoing
Continue to educate APCO and ABA Members to ensure that they use compostable packaging appropriately: considering elimination, then reuse, and then material recyclability or compostability. If compostable packaging is the most appropriate it must be certified to a relevant Australian Standard and easy to distinguish (including labelling) from its recyclable counterparts.	ABA, APCO	Ongoing
Establish the LGCEF to engage and educate local government to build a shared understanding of issues relating to the use and recovery of compostable packaging.	APCO	2021
Educate industry, government, and community stakeholders through the <i>Compost for Soils</i> website.	AORA	Ongoing

³⁷ The Hon. Sussan Ley MP, 2021. Budget 2020-21: Supporting oceans, recycling, biodiversity and climate resilience. Media release 11 May. Available at <https://minister.ave.gov.au/ley/media-releases/budget-2021-22-supporting-oceans-recycling-biodiversity-and-climate-resilience>

PROOF POINT

BOX 4 HOUSEHOLD COLLECTIONS IN SOUTH AUSTRALIA

South Australia-based organics recyclers Jeffries and Peats Soil & Garden Supplies process material collected in organics bins from Metropolitan Adelaide councils and some regional areas into soil improvement products. Common agreement on acceptable compostable materials in these bins enables councils and the composters to provide consistent educational materials to residents.

Under the *Which Bin?* education campaign, led by Green Industries SA, residents are given clear advice on what can and cannot be placed in the organics bin. This includes the following examples of packaging and food service items that can be added to the green bin in addition to food waste and garden organics:

- egg cartons
- cardboard pizza boxes
- cardboard clam shells
- paper plates
- food contaminated paper bags
- paper towel, napkins and tissues
- bamboo plates and cutlery
- sugarcane or corn-starch products
- products that are Australian Standard certified 100% compostable (AS-4736 or AS-5810).

BOX 5 HOUSEHOLD DIVERSION IN ITALY

Australia can learn from successful international examples of area-wide food waste diversion combined with smart regulation.

Green Industries SA's food waste strategy features a case study from Italy, where households are offered a choice in collection frequencies and services and a segregated organics system, including new bins, kitchen caddies and free supplies of compostable liners. In addition, plastic bags for fruit, vegetables and bakery items have been banned nationwide and a mandatory small fee introduced for compostable alternatives.

An example of effectiveness is the city of Parma, which has increased waste diversion to about 90% with a low contamination rate (3-4%).

There are also indications that there are spin-off benefits for waste diversion. In Milan, data indicates that separate food waste collection has had a positive influence on other segregated waste streams.

Source: Green Industries SA (2021), *Valuing our food waste*: South Australia's strategy to reduce and divert household and business food waste, p. 28

BOX 6 INCREASED ACCESS TO COMPOSTABLE KITCHEN CADDY LINERS

In 2018 the South Australian Government funded a successful pilot to use compostable fresh produce bags in supermarkets for reuse as FOGO collection bags. Compostable bags replaced rolls of plastic produce bag in the supermarket and customers were asked to reuse the bags to collect food waste for placement in council-collected organics bins.³⁸

The South Australian Government is building on the compostable produce bag trial to other retail outlets, particularly where area-wide food waste collection systems have been implemented.³⁹ By early 2021 two large supermarkets had implemented the initiative on an ongoing basis.

³⁸ Rawtec, 2019. *Compostable bag supply via supermarkets pilot. City of Holdfast Bay and Green Industries SA*. Available at https://www.greenindustries.sa.gov.au/documents/Holdfast%20Bay%20Compostable%20Bag%20Trial_Project%20Report_Public_2%20June2020.pdf?downloadable=1

³⁹ South Australian Government, 2020. *Valuing our food waste: South Australia's strategy to reduce and divert household and business food waste*. Available at: <https://www.greenindustries.sa.gov.au/valuing-our-food-waste>

PROOF POINT

BOX 7 FOGO ROLLOUT IN REGIONAL NSW

The NSW Government is committed to reducing food waste from landfill. It has set a target under the *Net Zero Plan* Stage 1 for net zero emissions of organics waste from landfill by 2030 and has been providing grant funding to local councils to introduce new services since 2013 under the \$105.5 million 'Waste Less Recycle More' Organics Infrastructure Fund.

To date, \$25.8 million has been awarded to 63 projects to divert 187,000 tonnes of food and garden waste from kerbsides each year. Up to \$1.3 million was available to councils to introduce the service. The funding supports the infrastructure needed for the new services, such as bins and kitchen caddies, as well as community education and audits.

The NSW EPA commissioned an analysis of all FOGO and red lid audits undertaken in NSW since the services rolled out. The *green lid bin audit analysis* found average contamination of 2% with up to 90% of FOGO bins containing no contamination at all. The *red bin audit analysis* found households with a FOGO service generated less waste overall and improved performance in the yellow lid bin.

STRATEGY 2.3

Increase collection of organics from the food services sector

The food services sector has been an early adopter of compostable packaging in response to consumer concerns about the environmental impact of plastics, and an increasing number of government regulations relating to single-use items. This packaging, even when certified compostable, often ends up in landfill because the venue does not have a system in place for collection and processing by an organics recycling facility. There is also an issue of incompatible on-street infrastructure, i.e., customers who choose to takeaway may only have access to general waste bins and commingled recycling bins.

Increased collection of organics from commercial venues (e.g., cafes, food courts and events), through source-separated organics collection services, can be beneficial where avoidance and reuse of food and packaging are not viable. This will help to ensure that the full benefits of compostable packaging are achieved, and to increase the recovery of food waste.

Compostable food service packaging is currently most successfully captured where there is a closed system, i.e., where packaging can be controlled to ensure that it is all either recyclable or compostable, and where there is a collection system available for both food waste and certified compostable packaging. In future it may have broader applications, for example for packaging of pre-prepared meals after more households have access to a collection and recovery service.

The biggest barriers to increased recovery of compostable packaging from the food services sector, however, is the limited number of composters that are currently able to process this material and/or limited availability of collection services.

Existing initiatives

Compost Connect, launched in 2021, will provide businesses with access to Australian certified compostable products, services and information that will allow them to divert food waste and compostable packaging from landfill. The primary target is the food service industry. Businesses will be able to access information including:

- an interactive map enabling them to find local composters (similar to an initiative in *New Zealand*),
- a list of packaging suppliers certified to Australian Standards, and
- educational resources on design, certification and legislation.

Compost Connect received a grant from the Australian Government under the *National Product Stewardship Investment Fund*.

The South Australian Government's Waste Strategy 2020-2025 is proposing to consider additional items to be included under its Single-Use Plastics legislation for use at events and for home delivery and takeaway food.⁴⁰ The Government's *'Replace the Waste'* website provides information and resources to manufacturers, retailers and consumers on alternative items.

The Boomerang Alliance manages the *Plastic Free Places program*, which works in communities to directly reduce single-use plastic packaging by engaging and provide tailored solutions for food retailers, events and markets. Where organics recovery services are not available, they work with council in the development of commercial composting facilities and waste transport options.

⁴⁰ Green Industries SA, 2020. Supporting the circular economy: South Australia's waste strategy 2020-2025. Available at: <https://www.greenindustries.sa.gov.au/resources/sa-waste-strategy-2020-2025#:~:text=The%20Strategy%20will%20ensure%20high, supporting%20market%20development%20and%20remanufacturing>.

ACTIONS

WHAT	WHO	WHEN
Provide support to the food services sector to encourage recovery of food waste and compostable packaging through education and engagement (Strategy 1.2).	APCO	Ongoing
Provide a searchable database on organics recyclers through the Compost for Soils website.	AORA	Ongoing
Provide compostable packaging users with information on organics recyclers through the Compost Connect website.	Compost Connect	Commencing 2021

PROOF POINT

BOX 8 YELO CAFÉ

Yelo Café is a business that operates with sustainability and community at front of mind in the Perth suburbs of Trigg, Mount Hawthorn and Subiaco. The business sources their beans directly from ethical and sustainable coffee farms and serve their products in compostable takeaway packaging.

Yelo was one of the first organisations to sign up for BioPak's composting service for food service packaging. Under the service, customers are able to dispose of used coffee cups and BioPak compostable takeaway food packaging in specially designed collection bins placed at their local cafes or workplaces. The special compost bins are collected weekly and sent to commercial facilities to be composted. This diverts waste to landfill and in only eight weeks, it is turned into nutritious soil compost for gardens or farms.⁴¹

⁴¹ Biopak, 2018. Yelo teams up with Biopak for Australia's first coffee cup composting service. Available at: <https://www.biopak.com.au/blog/customer-stories/yelo-teams-up-with-biopak-for-australias-first-coffee-cup-composting-service-and-save-20-on-their-waste-bills>.



OUTCOME 3

RECYCLING AND
END MARKETS

Outcome 3 Recycling and End Markets

THE PROBLEMS BEING ADDRESSED

Adding compostable packaging to organics processing increases the potential for contamination with non-compostable packaging. This can result in visible fragments in the end-product, devaluing the product and limiting end markets. It can also add micro plastics to soil when the composted product is applied to land, with potential impacts on the environment and food production. Managing non-compostable materials adds to site operating costs. Not all facilities can process compostable packaging effectively, or differentiate between compostable and non-compostable items, which adds to contamination and limits organics recovery.

Outcomes by 2025

- Organics recycling facilities can process certified compostable packaging for beneficial reuse such as improving soil health and meet relevant compost product quality standards.
- Certified compostable packaging does not contaminate recycled organics products.
- Certified compostable packaging does not have any adverse effects on the local ecology.

STRATEGY 3.1

Greater collaboration between the packaging and recovery sectors

The organics recycling industry is growing as more jurisdictions and communities seek to divert green and food organics from landfill. Compostable packaging can be designed to support the recovery of food organics while also diverting single use packaging items from landfill. Fibre-based compostable packaging can also serve as a valuable source of carbon in the composting process.⁴²

The biggest barrier to increased recovery of compostable packaging is the limited number of composters that currently accept these materials in their feedstock due to concerns about increased contamination with non-compostable materials and associated costs.

Certification is only part of what can ensure good recovery outcomes for compostable packaging. Other elements of this are residence time (ensuring the time it takes to break down aligns with the processing available), the ratio of compostable packaging to organic material that a facility or process can accommodate, and the ability to distinguish a particular compostable packaging type from non-compostable versions of that packaging by both consumers and recovery facilities.

While labelling compostable packaging is important to provide information to consumers to be able to place it in the correct bin, processors do not rely on labelling to remove contaminants. Packaging often arrives in pieces and cannot be visually identified at the point of inspection. Automatic optical sorting technologies may provide a future solution, but the costs are currently prohibitive for most processors.

Effective use and recovery of compostable packaging will require more engagement and closer collaboration



between packaging manufacturers, brand owners and organics recyclers to understand and address these barriers. Governments also need to be involved:

- State and territory governments to ensure that the addition of compostable packaging to feedstock is compliant with existing and future legislation.
- Local councils to ensure that they understand the ability of organics recyclers to recover packaging (including kitchen caddy bags) and to provide appropriate advice to residents.

It is essential to ensure that the introduction of compostable packaging is compatible with the infrastructure for sorting and processing and does not devalue the end products. AORA has identified three priority actions to build a more sustainable recovery system for compostable packaging:

- Differentiate compostable products from non-compostable materials in a way that is highly visual and works for organics recyclers – a logo is not sufficient.
- Trial compostable packaging in targeted supply chains, such as shopping centres and food courts, to ensure that they don't increase contamination and increase food waste recovery.
- Take non-compostable and non-recyclable single-use plastics out of the market so it is more likely that what's left is compostable.

⁴² Sustainable Packaging Coalition, 2021. *Understanding the role of compostable packaging in North America*. Available at: <https://sustainablepackaging.org/wp-content/uploads/2021/01/UnderstandingCompostablePackagingGuide.pdf>

Existing initiatives

APCO formed a Working Group in 2018 with representatives from the packaging value chain and the organics recovery industry to identify the challenges and opportunities for compostable packaging. A *report* on these deliberations was published in early 2019.

In 2019, APCO commissioned research on the available infrastructure for processing compostable packaging. The consultants surveyed the 71 known Australian organics recycling facilities and, 52% (37) responded. Of the respondents, 68% (25) stated that they accept compostable packaging (some of whom were prepared to process it but currently do not regularly receive it) and 32% (12) said they do not. The total organics processed by these facilities was approximately 2.3 million tonnes per year, of which, recovered compostable packaging is estimated to be 1,500-2,000 tonnes per year, i.e., less than 0.1%.⁴³

Respondents to the APCO survey who did not accept compostable packaging gave several reasons, including concerns that:

- plastics that are not compostable to AS 4736 are sometimes labelled as 'degradable' or are coloured to resemble the compostable liners some councils use for food organics recovery systems,
- facility decontamination systems cannot readily differentiate compostable and non-compostable packaging, so remove both, adding to landfill disposal costs,
- packaging may not fully break down within the facility processing time,
- there may be contaminants inside compostable packaging,
- open air management of these materials may cause litter, and

- compostable film plastics can become wrapped onto screening and processing equipment.⁴⁴

Problems were reported with non-compostable packaging contamination in materials that were meant to be compostable. The main contaminants were plastics, glass, single item labels and barrier wrapping. Eight facilities surveyed that had previously received compostable packaging reported having stopped or strictly limited receipt of these materials.

Most facilities with in-vessel composting technology reported issues associated with packaging materials not breaking down sufficiently during processing. This is because of short retention times in composting vessels. Some items, such as thin compostable plastic films and cardboard and paper were reported to degrade rapidly, but heavier ply film and rigid plastics took longer to breakdown.

Most organics recyclers found it hard to distinguish between compostable and non-compostable items during pre-process screening. The non-compostable items do not break down and contaminate products. More than 80% of the organics recyclers reported being hesitant to accept compostable packaging in the future.

Despite these reservations, many of the organics recyclers surveyed said they would welcome the replacement of non-compostable film plastics and product labels and tags commonly used on retail fruit and vegetables, with compostable alternatives because these are already common contaminants of organics.

ACTIONS

WHAT	WHO	WHEN
Facilitate discussions across the entire value chain for compostable packaging including compostable resin suppliers, packaging manufacturers, brand owners, local government and organics recyclers to understand the recycling industry's concerns and how these can be addressed, for example through better labelling, trials or additional infrastructure.	ABA, AORA, APCO	Ongoing
Investigate developing a standard colour for certified compostable FOGO caddy liners. While lime green bags are supplied by many local councils, this colour is not universal.	ABA, AORA, APCO	2022
Publish case studies to share learnings from organics recyclers that already accept compostable packaging in FOGO.	Compost Connect	2022

⁴³ Blue Environment, 2019, p.35.

⁴⁴ Blue Environment, 2019, p.36.

PROOF POINT

BOX 9 PACKAGING INDUSTRY ENGAGEMENT WITH ORGANICS RECYCLERS

Over the past few years ABA and APCO have worked with key stakeholders in the value chain for compostable packaging to understand the needs of each sector – including packaging suppliers, foodservice businesses, organics processors and government regulators – and to ensure that compostable packaging is used appropriately and recovered at end of life.

This began with the work of the Biodegradable and Compostable Packaging Working Group in 2018, which provided the basis for future work. APCO, ABA and AORA then collaborated to develop a *guide* to inform better decisions on compostable packaging. The collaborative working relationship between the three organisations, in partnership with government, is continuing through the development of this strategy.



STRATEGY 3.2

Undertake further processing trials for compostable packaging

Recycled organic products, such as composts, soil amendments and mulches, are beneficial to support soil health and Australia's agriculture and horticulture industries. It is therefore vital that compostable plastic packaging and other items have certification to AS 4736 or AS 5810 to ensure they are not contaminating soils.

There is also a strong global push to monetise the natural capital of soil, and the Australian *National Soils Strategy* (in development) is likely to include this as an ambition. If done well, adding recycled organics to soil increases soil health and soil organic carbon, which increases the natural capital of the soil.

Although Australia has an industrial composting standard for packaging (AS 4736), much of Australia's organics recycling infrastructure is not set up to recognise or completely process compostable packaging. Consequently, and in combination with non-certified compostable packaging on the market, some organics recycling operators aim to remove all plastics from incoming feedstock. This can include certified compostable bin liners and certified compostable packaging with the aim of minimising the quantity of plastic fragments that could end up in their product.

Some organics recyclers are concerned that certified compostable packaging may not be compatible with commercial timeframes and are calling for trials to demonstrate that they do break down in accordance with the standards in a specific process in a commercial timeframe. If they break down at different rates, then some pre-processing or extended processing times may be required.



Photography supplied by BioPak

These concerns are shared by some government agencies with responsibility for regulating recycled products being applied to land. There is a view amongst some government agencies and organics recyclers that a certificate of compliance with AS 4736 is not sufficient to confirm that the packaging will compost according to the standard in a commercial processing environment. The NSW Government, for example, is seeking more scientific data to provide evidence of compliance with environmental regulations.

Other suggestions from government agencies during consultation for this strategy include:

- an investigation into whether the Australian Standards equate to a best practice benchmark and are fit for real-world purposes, and
- more research on compostable bio-based plastics, to determine:
 - if they break down into their component parts, or in

- a way similar to enzyme mediated plastics (i.e., into microplastics),
- their impacts (positive or negative) on the local ecology where the end market organic material is applied,
- if there are any negative effects on human health when used as land application for agriculture, and any long-term studies assessing this, and
- if additives can be included in compostable packaging to increase its value and usefulness as a compost feedstock.

Trials would help to determine the exact conditions and composting processes required for successful composting of these materials. This will determine which processors can compost them with their existing process, which processors may need to undertake upgrades and any alterations to the process that may

be required. To be successful, composting must also be undertaken in commercially viable timeframes, meet relevant quality standards and produce material that is still beneficial and accepted by customers.

The trials also need to consider which technologies and processes are working well and how the industry could adapt, including what infrastructure is required to expand acceptance of certified compostable packaging.

The *Compost Research and Education Foundation (CREF)* in the United States is currently inviting organics recyclers to undertake composting trials using a standard methodology, so that the data can be shared publicly. The trials will support certification by demonstrating 'real-world' performance under different conditions compared to the relevant Standard (**Table 6**).

Table 6. Distinctions between US field trials and certification⁴⁵

CERTIFICATION	US FIELD TESTING
Lab-based.	Real-world conditions.
180 days, 90% disintegration.	Duration varies by facility,
90% disintegration.	Certification of compostable packaging does not necessarily mean it is able to be processed by all organics recyclers, potentially making it a contaminant in the process or in end products.
'Ideal' temperature, moisture and duration.	(Widely!) variable temp, moisture and duration.
Toxicity check.	Relies on certified compostable products.
Ingredients and disintegration.	Disintegration only.

In New Zealand, Scion and WasteMINZ are *undertaking a practical study* to investigate the degradation of different materials in industrial and home composting systems. The research is designed to determine whether packaging certified as compostable according to European Standard EN 13432 will break down in New Zealand composting facilities within the required period and without detriment to the final compost product. The research is expected to be completed by mid-2021.

Existing initiatives

The NSW Environmental Trust funded a project being led by the CSIRO to investigate the compostability and environmental impact of compost produced from material containing compostable plastics bags and cutlery. The study commenced in 2019 and is expected to be completed in 2021.

Sustainability Victoria will undertake research in 2021 into the costs along the value chain of contamination in the materials collected in organics recycling bins and processing in collaboration with AORA Victoria (due for completion July). The goal is to determine the costs to councils of collecting non-compostable materials with organics; costs to the processor, and costs farmers after application (livestock, natural capital etc.).

In New Zealand, a practical study led by Scion aims to determine for both industrial and home composters whether materials certified as compostable will degrade within the time frame set by the standards in the New Zealand context. Although due for completion by mid-2021, these results may have limited value to Australia as they are not testing to the Australian Standards.

⁴⁵ Emily McGill, Presentation to Webinar: Will they break down in my facility? 11 December 2019, CREF, <https://www.compostfoundation.org/FieldTesting>.

ACTIONS

WHAT	WHO	WHEN
Invite stakeholders to visit organics recycling facilities to show how compostable packaging is being successfully recovered.	AORA/ABA	Ongoing
Share the outcomes of previous processing trials for compostable packaging where publicly available.	Compost Connect	Ongoing
Investigate potential for longer term research on the impacts of composts or soil amendment products that contain certified compostable packaging in soil.	AORA/ABA/APCO with government	2022
Investigate the potential to undertake additional composting trials with targeted supply chains to test outcomes for specific materials in different processing systems.	AORA/ABA/APCO with government	2022

PROOF POINT

BOX 10 MELBOURNE ZOO ON SITE PROCESSING

Zoos Victoria is working towards zero waste to landfill across their three locations. They will achieve this by ensuring all recyclable materials are separated and reused, recycled, composted or converted to energy.

Certified compostable packaging is used in all their food service outlets and once used, the packaging along with food scraps, mulch and animal poo gets processed using an in-vessel composter at their Multi Use Recycling Facility to create the high-quality compost – Zoo Gro.

By composting, Melbourne Zoo diverts two tonnes of organic material a day from landfill, helping Zoos Victoria to be the world's first carbon neutral zoological organisation.⁴⁶

⁴⁶ Biopak, 2017, Zero waste for Melbourne Zoo by 2019. Available at: <https://www.biopak.com.au/blog/customer-stories/zero-waste-from-melbourne-zoo-by-2019>.

4

Conclusions



4. Conclusions

Looking to the future, compostable packaging is one of the many strategies being pursued by the packaging value chain and government to achieve greater circularity for packaging. Continued innovation in compostable materials will improve functionality and allow these materials to replace non-recyclable materials in a wider range of applications where elimination and reuse are not feasible. Alongside these developments the national rollout of FOGO services to households and food collection services to businesses will help to ensure that these valuable materials can be recovered, rather than lost in landfills.

As this strategy highlights, however, these developments need to be supported by investments in packaging design, recovery infrastructure and education to ensure that compostable packaging achieves its potential to generate environmental and commercial benefits.

Glossary

Anaerobic Digestion (AD)

A technical process that breaks down organic matter (primarily food wastes) in the absence of oxygen to produce biogas for energy and organic digestate which is applied to agricultural land.

Bio-based plastics

Bio-based plastics are those with building blocks that are derived partly or wholly from plant-based feedstocks (see Starch-blended plastics). These are often also part of the group known as bioplastics. Not all bioplastics are made to be compostable.

Biodegradation

The breakdown of an organic chemical compound by micro-organisms. In the presence of oxygen, it becomes biomass, mineral salts, water and carbon dioxide. In the absence of oxygen organics become biomass, mineral salts, water, carbon dioxide and methane.

Biodegradable

A generic term that indicates a plastic is biologically available for microbial decomposition, with no detail on its breakdown outputs, time or extent of degradation or end environments.

Bioplastics

A broad term for plastics that are biobased, biodegradable or both. Bioplastics fall into one of three groups: Bio-based and biodegradable, Bio-based (but not biodegradable) and Biodegradable (but not bio-based). Conventional polymers (e.g., PET and HDPE) can also be fully or partially bio-based.

Certified compostable plastic

Plastic that biodegrades in industrial composting and is compliant with AS 4736:2006. Only plastic that is labelled as complying with home composting schemes should be composted in home composting systems.

Compostable packaging

Packaging that will break down into water, carbon dioxide and biomass over a comparatively short period of time if they have the right conditions (e.g., being in a compost system). Genuinely compostable products are certified to a standard to either break down in a home compost or commercial composting facilities.

Compostable plastic packaging

Packaging or item made to compost down through approved processes. It can be called compostable if it is certified to AS 4736 and if it is successfully collected, sorted, and composted in practice and at scale.

Fragmentable plastic

A material (however described) made of plastic which includes additives to accelerate the fragmentation of the material into smaller pieces, triggered by ultraviolet radiation or heat exposure, whether or not this is, or may be, followed by partial or complete breakdown of the material by microbial action.

Organics collection service

Collection service for waste organics which could include kerbside collection of food organics and garden organics (FOGO), food organics only (FO), or a commercial organics collection.

Oxo-degradable plastic

See 'Fragmentable plastic'.

Packaging

Packaging is defined in the National Environment Protection (Used Packaging Materials) Measure 2011 to mean all packaging products made of any material, or combination of materials, for the containment, protection, marketing or handling of consumer products.

Problematic plastic packaging

Packaging that, in Australia, is currently:

- Difficult to collect/recover for reuse, recycling or composting purposes; or
- A material that hinders, disrupts or obstructs opportunities to recover other materials or resources; or
- A significant contribution to the plastic litter problem; or
- Manufactured with, contains or has contained hazardous chemicals or materials (e.g., PFAS, BPA) that pose a significant risk to human health or the environment.

This type of packaging may not be considered problematic should emerging technologies result in effective collection/recovery for reuse, recycling or composting purposes, provided it can be removed from the environment.

Single-use plastic packaging

Packaging that is likely to be designed to be discarded after single use and is routinely disposed of after its contents have been unpacked or exhausted.

Unnecessary plastic packaging

Packaging that can currently be reduced or substituted with non-plastic fit-for-purpose alternatives and/or can be eliminated entirely without compromising the consumer's access to the product or causing undesirable environmental outcomes.

Note: There may be necessary case-by-case exemptions for packaging required for occupational, health and safety standards, including packaging regulated for specific industry use such as therapeutic and hazardous goods

About the partner organisations

The *Australian Packaging Covenant Organisation (APCO)* is a co-regulatory, not for profit organisation partnering with government and industry to reduce the environmental impact of packaging in Australia, through the promotion of sustainable packaging activities including sustainable design, recycling initiatives, waste to landfill reduction and circular economy projects.

The *Australian Organics Recycling Association Limited (AORA)* promotes and facilitates sustainable and cost-effective recycling of surplus organic material within a circular economy, with a membership encompassing recycled organics processing operators, state and local government representatives and industry stakeholders.

The *Australasian Bioplastics Association (ABA)* is the peak industry body for manufacturers, converters and distributors of bioplastic products and materials in Australia and New Zealand, championing certified compostable bioplastics and biobased bioplastics and supporting links to international bioplastics associations. The ABA administers voluntary verification schemes for claims of compliance with the Australian Standards 4736-2006 and AS 5810-2010, addressing industrial and home compostability respectively.



To contact APCO please visit our website
www.apco.org.au

