AUSTRALIAN PACKAGING COVENANT ORGANISATION

Recycled Content Guide

Version 2: August 2021

Contents

This is an interactive document. The top toolbar and contents buttons allow you to navigate through the different sections of the document.

Disclaimer

APCO and the contributing authors have prepared this report with a high-level of care and thoroughness and recommend that it is read in full. This report is based on generally accepted practices and standards at the time it was prepared. The method adopted, and sources of information used are outlined in this report, except where provided on a confidential basis. This report has been prepared for use by APCO, and only other third parties who have been authorised by APCO. APCO and the contributing authors are not liable for any loss or damage that may be occasioned directly or indirectly using, or reliance on, the contents of this publication. This report does not purport to give legal or financial advice. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Acknowledgements

We acknowledge and thank the packaging manufacturers, reprocessors, industry associations and specialists around Australia that took the time to respond to our information request for this project. The completion of this study was only possible because of your valuable and expert contributions.

Author

Development of this report was supported by One Planet Consulting for the Australian Packaging Covenant Organisation.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000
E apco@apco.org.au
P (02) 8381 3700

Executive Summary

This guide has been designed by the Australian Packaging Covenant Organisation (APCO) to support the growing number of individuals and companies considering ways to include recycled content in their packaging. It contains key considerations, as well as clear and practical information on how to incorporate recycled content.

Recycled content is the proportion (by mass-weight) of pre-consumer and post-consumer recycled material in packaging (AS/ISO 14021).

- 'Pre-consumer' material is material diverted from the waste stream during manufacturing (excluding rework).
- 'Post-consumer' material is material waste generated by households or by commercial, industrial and institutional facilities.

There are several reasons why recycled content is important. This includes:

- Meeting public expectations for recyclability and retaining their trust in our packaging recycling system by proving the pull through of resources.
- Using the power and effectiveness of market pull to improve all parts of the packaging supply chain (improving design, composition, labels, sorting and processing).
- Increasing the productivity of already manufactured materials, especially given increased scarcity of certain raw materials and the environmental impact of extraction.
- Lowering the environmental and climate impacts of packaging overall, including less litter.
- Forming a stronger, innovative, collaborative, globally competitive Australian packaging industry, including smarter jobs and companies focused on a circular system.

Recycled material can be used in a variety of packaging applications and ways. It should also be noted that contrary to some conceptions, recycled content can be used and is already used in Australia in food, beverage and medicinal product contact applications, albeit with tighter controls and testing than other product packaging such as clothing and hardware. Companies are continuing to innovate in materials, design, recycling chemistry and processing and are removing barriers to improve the circularity of packaging. Organisations should continue to strive for innovations to using recycled content and regularly review packaging formats for alternative options.

This guide has been arranged in two parts and should be used by businesses in the packaging supply chain who are on their journey to incorporating more recycled content into their packaging. The two parts are:

Part 1
Overview of Recycled Content in Packaging

Part 2
Incorporating Recycled Content by Material Type

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Introduction

This guide has been designed by the Australian Packaging Covenant Organisation (APCO) to support the growing number of individuals and companies considering ways to include recycled content in their packaging. It contains key considerations, as well as clear and practical information on how to incorporate recycled content.

There is growing momentum for all packaging to be circular, with expectations from government and public that packaging will be recyclable and incorporate recycled content, as per the **2025 National Packaging Targets** (Figure 1). This guide has been designed to specifically support the target of '50% average recycled content across all packaging in Australia by 2025'.

For further detail on the recycled content targets, refer to the **2025 Recycled Content Targets** resource.

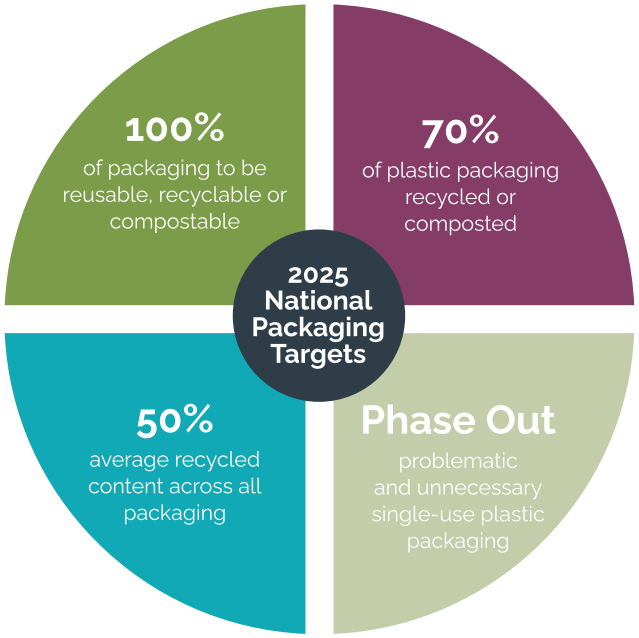

Figure 1 - Australia's 2025 National Packaging Targets

For ease of use, this guide has been arranged in two parts:

Part 1
Overview of Recycled Content in Packaging

Information on what recycled content is and why it's important, as well as detail on barriers, environmental benefits, verifications and claims, and steps to using more recycled content.

Part 2
Incorporating Recycled Content by Material Type

Per packaging material type, learn more about the key considerations of recycled content application, performance and appearance.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Part 1 - Overview of Recycled Content in Packaging

What is recycled content?

The formal definition used in Australia[1] and internationally for recycled content is:

> Recycled content is the proportion (by mass-weight) of pre-consumer and post-consumer recycled material in packaging (AS/ISO 14021).
>
> - 'Pre-consumer' material is material diverted from the waste stream during manufacturing (excluding rework).
> - 'Post-consumer' material is material waste generated by households or by commercial, industrial and institutional facilities.

In the past, recycled content included post-industrial scrap recirculated within the packaging manufacturing plant and pre-consumer packaging. However, it was realised that use of these materials represented good manufacturing efficiency and did not measure systemic improvement and packaging circularity.

It is now universally agreed that recycled content is both pre-consumer and post-consumer packaging that is sorted and reprocessed and made into packaging again. This new definition is driving change in all stages of the packaging system in Australia and internationally, including improvements in design and collection, as well as acceptability and traceability of recycled content within the supply chain.

Why is recycled content so important?

There are several reasons why recycled content is important. This includes:

- Meeting public expectations for recyclability and retaining their trust in our packaging recycling system by proving the pull through of resources.
- Using the power and effectiveness of market pull to improve all parts of the packaging supply chain (improving design, composition, labels, sorting and processing).
- Increasing the productivity of already manufactured materials, especially given increased scarcity of certain raw materials and the environmental impact of extraction.
- Lowering the environmental and climate impacts of packaging overall, including less litter.
- Forming a stronger, innovative, collaborative, globally competitive Australian packaging industry, including smarter jobs and companies focused on a circular system.

In addition, there are commitments for improved performance that our Australian packaging industry must meet:

- All packaging material types now have nationally agreed recycled content targets to be reached by 2025.[2]
- As set out within Section 10 Part C of the **Australian Packaging Covenant**, Signatories to the Covenant (also known as APCO Brand Owner Members) are obligated to "implement policies or procedures to buy products made from recycled materials".[3]

Companies exploring changes to their packaging with their suppliers should integrate the Sustainable Packaging Principles as set out within the **Sustainable Packaging Guidelines** (SPGs). In particular, Principle 5 – Use recycled materials, which aims to optimise the amount of recycled content in packaging, considering technical feasibility, consumer acceptability, regulatory requirements (e.g., food contact/safety) etc.[4]

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Do each of my packaging formats have to meet the recycled content 2025 Target?

Australia's recycled content 2025 Target aims for an average of 50% recycled content across all packaging streams. In 2020, recycled content targets were refined to target key packaging materials (Figure 2), in recognition that some material streams are more advanced than others to achieve recycled content integration, and to improve measurement and strategic action. Companies can use these targets to focus their efforts to improve performance, particularly with plastics.

To track progress in each material stream, APCO annually measures and reports the average amount of post-consumer recycled content as a percentage of the total quantity of packaging material put onto the Australian market.

Between 2018 and 2019, packaging in Australia had 38% average post-consumer recycled content (2,237,000 tonnes).[5]

MATERIAL	2018-2019 POST-CONSUMER RECYCLED CONTENT AVERAGE	2025 TARGET
ALL PACKAGING	38%	50%
PLASTICS	4%	20%
PET	14%	30%
HDPE	3%	20%
PP	2%	20%
FLEXIBLE PLASTICS	UNKNOWN	10%
PAPER	51%	60%
METALS	24%	35%
GLASS	37%	50%

Figure 2 - Australia's 2025 Recycled Content Packaging Targets and annual progress

While not all packaging formats and materials can currently easily accommodate recycled content, some can, and it is vital that all people and companies involved in designing, specifying, manufacturing and reprocessing packaging work to increase recycled content wherever possible.

These improvements will not only deliver on the targets but help shift Australian packaging to align with international standards and requirements. As part of a global packaging and recycling system, it is important that Australia produces packaging to international quality standards.

It is important to note that the 2025 National Packaging Target of '50% average recycled content in all packaging' applies to post-consumer recycled content only. This is to encourage and monitor the shift to increased circularity. APCO also recognises the importance of pre-consumer recycled content in packaging to support end markets for material that would otherwise go to landfill. Total recycled content in packaging was 50% in 2018-19, including both post-consumer (38%) and pre-consumer (12%).

It is important to note that these Targets are averages for the packaging industry. APCO Members do not need to achieve these recycled content percentages as a minimum for each of their packaging formats; businesses should be setting their own internal targets as per their own packaging applications to achieve as much recycled content as possible, to contribute to the national average.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Overcoming barriers to using recycled content

In some cases, there are barriers to using recycled content, however by investigating further, there are ways to overcome these. Some examples have been provided in Table 1 below.

Table 1: Barriers to using recycled content and how to overcome these.

Barrier	Response
Recycled content not being suitable for primary packaging of certain products.	Recycled content can be used for many different product types. For example, there is a common misconception that recycled content cannot be used for packaging for food and beverage products. This is not always the case, and in these scenarios, there are standards in place to ensure appropriate use of recycled content in these types of packaging to ensure it is safe to do so. These standards include established protocols for the sourcing, reprocessing, testing and tracing of quality materials. There is a long history, a high level of expertise and already a considerable amount of recycled content in food, beverage and medicinal product packaging. It is important to remember that in scenarios where recycled content is not appropriate for use in primary packaging, then use of recycled content should be considered for secondary and tertiary packaging such as shipping cartons.
Packaging formats not always being suitable for design with recycled content.	It can be difficult to include recycled content in some packaging formats, such as thin film packaging for food. Nevertheless, companies are continuing to innovate in materials, design, recycling chemistry and processing and are removing barriers to improve the circularity of packaging. Organisations should continue to strive for innovations and regularly review packaging formats for alternative options.
Suppliers indicating that it is too hard, costly, and difficult to have any recycled content included.	Suppliers may be reluctant to start to include recycled content in packaging, or it may be difficult to obtain suitable quantities or qualities for some or all your packaging. It may also be that some formats may not be suited to recycled content. It is important to keep informed about options to integrate recycled content and keep an open dialogue with current and future suppliers. Organisations should inform their suppliers of their intentions to integrate recycled content, discuss ideas, ask for and review new designs options. Setting public business targets that align with the 2025 Targets will support this dialogue and internal buy-in to progress.
Recycled content affecting the structural and functional characteristics of the packaging.	It is true that there are physical structural limitations on the proportion and quality of recycled content that can be included in packaging. A balance needs to be struck between recycled content and functionality. This balance is well understood by experts in Australia experienced in the physical properties of materials, chemistry, and testing regimes. Design changes may be required to compensate, or adjustments made to the packaging material to support the required function. This should not discourage companies from integrating recycled content as there is room for increased recycled content in a variety of materials and packaging before structural issues should arise.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Environmental benefits of recycled content in packaging

There are several environmental benefits to using recycled content. Looking at landfill and greenhouse gas (GHG) impacts alone, experts estimate that due to landfilling 2,934,000 tonnes of Australian packaging in 2018-19, an additional 1,950,490 tonnes of CO2 emissions were added to the atmosphere, equivalent to an additional 470,000 cars on the road.[6] By recovering more of this material and reprocessing to replace virgin material, this will directly cut emissions.

This calculation addresses GHG emissions associated with extraction of raw materials, manufacture of packaging, and decomposition of the material in landfill at end-of-life. Further environmental benefits result from a reduction in the use of water, chemicals, gasses etc. in production and use of virgin materials, and in land clearing for trees to generate new pulp or sands for new glass.

Figures in Table 2 below can be used by companies as generic figures to calculate climate impacts and savings from different material choices.

Table 2: Indicative GHG emissions that could be reduced through diverting landfilled packaging in 2018–19 to recycling, by material group.[7]

Material Group	Landfill (tonnes)	Emission factor t (CO2-e /t)	Avoided emissions (t CO2-e)
Paper & paperboard	1 218 000	0.169	205 790
Glass	709 000	0.528	374 470
Plastic	818 000	0.704	576 380
Metal	109 000	6.281	686 300
Wood	80 000	1.350	107 560
Total	**2 934 000**	**0.665**	**1 950 490**

Did you know?

Replacing virgin PET with recycled content PET (rPET) may reduce GHG emissions by 50%.[8]

GHG emissions associated with paper packaging sent to landfill is mainly from methane emissions arising from substitution in production and the decomposition of paper in landfill.

In 2004 it was estimated that replacing one tonne of virgin glass with cullet saved 1.17 tonnes of raw materials (700kg silica sand, 192kg limestone and dolomite, 207kg soda ash and 71kg other minerals) from being mined from the environment.[9]

Whilst metal packaging is the second smallest packaging material stream to end up in landfill and not recycled (other than timber for pallets) it has the highest GHG emission impact.[10]

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Verification and claims

The growing demand for recycled content is driving innovation and change in several ways. An increasing number of companies are working through their supply chains to verify the source and understand the amount of recycled material in their packaging. Governments and organisations around the world like APCO are developing certifications, specifications, and verifications to assist organisations in this way.

Organisations like the Australian Competition and Consumer Commission (ACCC) are also seeking evidence to evaluate these claims. This activity is leading to improved standards across the industry, shifting it from a 'waste' industry to a 'circular resources' industry.

When making public statements about recycled content in packaging, it is important that statements are honest, accurate and able to be substantiated.[11] The ACCC for example, cautions companies from misrepresentation[12] such as claiming '50% more recycled content' if recycled content volumes only increased from 1% to 1.5%. Best practice approaches recommend that companies seek independent legal advice in relation to any public claims.

Companies should be careful to address the definition of both pre-consumer and post-consumer recycled figures. If there is no post-consumer recycled content, it should be stated that the packaging uses pre-consumer material only. Accurate statements are important for public and customer expectations, reputation, trust and verification.

Did you know?

Some companies are securing cleaner streams of collected post-consumer material by forming joint venture partnerships or becoming more vertically integrated, with businesses having greater control at multiple stages in the supply chain.

How should we use recycled content in food, beverage and medicinal product packaging?

Recycled content is already used in Australia in food, beverage and medicinal product contact applications, albeit with tighter controls and testing than other product packaging such as clothing and hardware.

There are specific requirements for packaging of food, beverage, and medicinal products, many of which are international standards, defined by the two relevant bodies: Food Standards Australia New Zealand (FSANZ) and the Therapeutic Goods Administration (TGA). These standards and regulations in Australia and other countries are relevant to all packaging material types and formats. As recycled content in packaging increases around the world and the chemical complexity of inputs are better understood, there is a growing body of expertise, regulation, testing and certification programs providing guidance and assurance.

For further information and guidance in relation to restrictions and permissions for food, beverage and medicinal product packaging that includes recycled content:

- Food Standards Australia New Zealand, Australia New Zealand Food Standards Code, Standard 3.2.2 – Food Safety Practices and General Requirements, Clause 9.
- Therapeutic Goods Administration, Legislation and legislative instruments and specific information on labelling and packaging.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Steps to using more recycled content

To support you on your journey to successfully use more recycled content, consider the following steps.

1. See what others are doing

Many companies are making headway in the recycled content space for packaging. Look to these companies to see what may be possible for your own packaging. **Click here** to view a list of resources and case studies to support.

2. Start small

Investigate opportunities for increased use of recycled content. Speak with your suppliers to see what is currently possible and focus on starting from the outside-in, i.e. look at tertiary and secondary packaging initially rather than primary packaging.

3. Engage through tenders and specifications

Companies are beginning to include recycled content specifications in tender documentation for packaging. This encourages others in the supply chain to utilise recycled materials where possible.

4. Set your own targets for improvement

Establishing targets early in the journey will give you a goal to work towards. For example, you may have a target to 'increase recycled content to an average of 30% in all PET packaging within 2 years'.

5. Ensure that you have buy-in from your team

This will be a collaborative journey. Having buy-in from your team internally, particularly from your senior management, will help make this journey easier. Develop strategies and procedures, such as a 'buy recycled policy'. For APCO Brand Owner Members this will also support your obligation to 'implement policies or procedures to buy products made from recycled materials', as set out within Section 10 Part C of the Australian Packaging Covenant.[13]

6. Assess packaging

When assessing suitability of recycled content in packaging, utilise resources such as the Sustainable Packaging Guidelines (SPGs) and Lifecycle Assessments (LCAs).

7. Identify how to redesign your packaging to be the ideal source of recycled content

Close the loop - use the Packaging Recyclability Evaluation Portal (PREP) to ensure your recycled content packaging is also recyclable.

8. Perform trials

If you are unsure of limits for recycled content, work with experts, suppliers, and recycling facilities to conduct trials on different packaging formats. Work out what is best for your product.

9. Monitor, celebrate and promote your packaging successes

Share your achievements publicly to build awareness and inspire others of what is possible for use of recycled content in packaging.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Supporting resources

This guide is one of a series of APCO publications and tools to assist companies on their journey to more circular packaging, beyond integrating recycled content. These include:

This section is interactive. Click on the coloured headers or brands below for more information.

Sustainable Packaging Guidelines (SPGs)

Provides a series of 10 Sustainable Packaging Principles which businesses can use to review the sustainability of their packaging.

APCO Quickstart Guides

A series of Quickstart Guides on things to consider when designing for recyclability. Designing packaging for recyclability ensures that the materials are appropriately recycled and the output recyclate is of higher value to those seeking to use recycled content in their packaging.

Considerations for Compostable Plastic Packaging

An interactive set of guidelines to help businesses make informed choices when considering the use of compostable packaging.

Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging

A practical resource designed to help Australia's packaging supply chain phase out problematic and unnecessary single-use plastic packaging through innovative, sustainable solutions.

Australasian Recycling Label (ARL) Program

The ARL Program is available exclusively to APCO Members and has two elements.

- **The Packaging Recyclability Evaluation Portal (PREP)** - an online tool that assesses packaging recyclability in the Australian and New Zealand recovery systems.
- **The ARL** – an on-pack label that provides clear and simple instructions about how to recycle all of the separable packaging components.

Written and video case studies

For case studies on APCO Members highlighting use of recycled content, you may be interested in the following:

- **THE ICONIC** – written case study on how THE ICONIC chose a recycled content satchel.
- **Simplot Australia** – written case study on how Simplot Australia considers opportunities for use of recycled content in purchasing decisions.
- **Natures Organics** – written case study on Natures Organics, including detail on their use of recycled content within their product packaging.
- **Unilever Australia** – written case study on Unilever Australia's packaging sustainability, including use of recycled content.
- **Coca-Cola Amatil** – a video case study on how Coca-Cola Amatil are using research and innovation to help make a viable end market for recycled plastic.
- **Pact Group Holdings** – a video case study on how Pact Group utilise recycled content in their products.

Supporting Government Procurement of Recycled Materials

A report focused on the role of government procurement in driving demand for recycled materials, both as construction materials and as recycled content in packaging and other products.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Part 2 - Incorporating Recycled Content by Material Type

Click the material below to be taken to the relevant section of this guide.

In this part of the guide, brand owners, designers and manufacturers will find specific information on each material stream. Each material stream section covers detail on applications, performance and appearance of the recycled content material.

Rigid polyethylene terephthalate (PET)

Other plastics – polystyrene (PS), expanded polystyrene (EPS), polyvinyl chloride (PVC) and nylon

Rigid high density polyethylene (HDPE)

Paper and paperboard

Rigid polypropylene (PP)

Glass

Flexible plastics

Metals – aluminium and steel

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Rigid polyethylene terephthalate (PET)

Recycled content polyethylene terephthalate (rPET) is well integrated and growing in Australia's packaging industry, including in food and beverage contact packaging. Those considering using rPET can be confident that it is easy to substitute some rPET in place of virgin PET in packaging.

Did you know?

PET already has the highest rate of post-consumer recycled content in plastic packaging at 14% in 2018-19, and the 2025 Target for average recycled content in PET is 30%.[14]

Many manufacturers and brands are increasing the proportion of rPET and some have reached 100% rPET in some applications.

To enable greater recyclability and create more valuable recyclate, Australia's packaging industry is moving toward natural (clear) PET and phasing out use of colours that contaminate the natural PET recyclate stream, particularly opaque white or transparent colours like brown, black, green, red, and yellow.

Applications of rPET

While not all companies using PET packaging will attain the PET recycled content target of 30% in all of their packaging formats, every company has capacity to contribute to these national average targets by including rPET in their packaging where possible.

rPET is highly recyclable and can accommodate high rates of recycled content without detrimental impacts upon performance and appearance. Recent data shows the quantity and proportional share of PET in Australian packaging is increasing, with 154,000 tonnes in 2018-19.[15]

PET is popular for its characteristics as a clear plastic, resistance to solvents and its capability as a barrier to carbon dioxide (CO_2). Around 98% of PET packaging is used in consumer packaging, and almost exclusively for food and drink, hence it has high concentration in homes and workplaces and therefore high collection rates through comingled collections.[16] PET bottles are included in all container deposit schemes in Australia.

Packaging PET is predominantly in the form of bottles and jars (blow mold), as well as punnets and tubs (thermoform). Given the growing popularity of PET, some Australian companies are innovating and investigating ways to reprocess more bottle and thermoform PET.

Performance and appearance of rPET

A common misconception is that recycled content results in lower grade material. This is not necessarily the case and depends upon the application and functionality required. It is important to discuss and match physical and mechanical strength properties with packaging requirements.

There can be some degradation in rPET, and it depends upon the quality of feedstock and processing:

- Mixed colour feedstock (e.g., including browns in clear rPET) will result in coloured plastic.
- High quality, natural bottle PET feedstock (with no colour) will result in top grade clear rPET which can be used in the widest range of packaging applications.
- High temperature reprocessing can cause some degradation, which can be addressed by processors undertaking appropriate cleaning and drying of PET flake.[17]

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Rigid high density polyethylene (HDPE)

Packaging HDPE and recycled content HDPE (rHDPE) has a long history of use in Australia, with rigid HDPE being the most used rigid plastic in packaging in Australia.

Did you know?

HDPE is the most used rigid plastic in packaging with 286,000 tonnes used in 2018-19.[18]

73,000 tonnes of HDPE were collected (40%) in 2018-19, with 11,000 tonnes (3%) post-consumer recycled content.[19] Australian companies are strongly encouraged to increase rHDPE to reach the 2025 Target of 20%.

To enable greater recyclability, Australia's packaging industry is moving toward natural HDPE or light colours in household food applications, and phasing out use of contaminating optical brighteners, mineral fillers, and carbon black.

Applications of rHDPE

While not all companies using HDPE packaging will attain the 20% recycled content target in all their packaging, every company has capacity to contribute to the national average targets by including more rHDPE than they do currently. For example, this can be achieved by starting small with a commitment for 1-5% or lifting from 15% to 25%. Every action provides market confidence and stimulates investments and improvements through the packaging supply chain.

Performance and appearance of rHDPE

Brand owners are increasingly recognising that they can utilise rHDPE and adjust their specifications and appearance to accept more recycled content without detrimental impact upon sales. Already brand and marketing professionals are identifying suitable applications for rHDPE and promoting recycled content as part of their leadership and environmental credentials. Some have made on-pack statements aligned to the brand image: *'Our colour may change from time to time based on the recycled content'.*

There is some degradation caused in reprocessing HDPE and so it is important to discuss and match physical and mechanical strength properties with design and packaging requirements. Some companies mix rHDPE with virgin HDPE, and others include rHDPE as a sandwich core between virgin resin skin layers.

Some HDPE packaging uses ethylene vinyl alcohol (EVOH) as an oxygen barrier and this plastic has a lower melt temperature than HDPE, meaning it can burn during reprocessing causing blockages and damage to equipment and forming black specks in finished material. Companies should carefully consider whether it is necessary to include EVOH in HDPE or better to use a different polymer, to ensure a higher quality recyclate.

Colour appearance can be impacted when material is obtained from mixed collections and depends upon the sorting capacity of the processing facilities. For example:

- High quality, natural milk bottle HDPE feedstock (no colour) will result in top grade natural rHDPE.
- Light colour feedstock (whites, creams and yellows) will result in light cream or yellow rHDPE. These can be readily used in a wide range of non-food contact packaging applications like laundry detergent packaging.
- Mixed colour feedstock (including browns and blues) will result in darker rHDPE of grey, brown or black. These colours can be used in non-food contact applications such as B2B storage packaging or products like pipe.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Rigid polypropylene (PP)

As rigid PP is used extensively in packaging in Australia, recycled PP (rPP) is a priority material for development by brand owners, manufacturers and governments.

rPP is now in demand and in the spotlight, and there is momentum to improve design for recyclability, sorting and ramp up reprocessing to reach the 2025 Target for an average of 20% recycled content in PP packaging nationally.

Applications of rPP

PP is highly versatile as both clear and coloured, rigid and flexible. Over 90% of PP on the market is used in business-to-consumer (B2C) applications given its firm and fine edging for caps, ice-cream tubs, takeaway containers and plant pots.[22] There is a growing trend to use rPP in reusable industrial packaging like produce trays due to its ability to hold shape under load.

While not all companies using PP packaging will attain the 20% recycled content target in all their packaging, every company has capacity to contribute to the national average targets by including more rPP than they do currently. For example, this can be achieved by starting small with a commitment for 1-5% or lifting from 15% to 25%. Every action provides market confidence and stimulates investments and improvements through the packaging supply chain.

Performance and appearance of rPP

Brand owners are increasingly recognising that they can utilise rPP and adjust their specifications and appearance to accept more recycled content. Already brand and marketing professionals are promoting recycled content as part of their leadership and environmental credentials. Some have made on-pack statements aligned to the brand image: *'Our colour may change from time to time based on the recycled content'*.

Reprocessors and packaging manufacturers have found that rPP performs well in packaging, has a higher melt-flow index and is more appropriate for injection molding than thermoformed or blown applications. The chief performance issue of increased brittleness can be addressed with more rounded corners or mixing with virgin PP and additives for flexibility.

Did you know?

Rigid PP is a popular plastic in packaging with 116,000 tonnes used in 2018-19.[20]

To enable greater recyclability, Australia's packaging industry is moving toward natural PP or light colours in household food applications, and phasing out use of contaminating optical brighteners, mineral fillers, dark colours and carbon black.

21,000 tonnes of PP were collected (11.3%) in 2018-19, with 4,000 tonnes (2%) post-consumer recycled content.[21] Australian companies are strongly encouraged to increase rPP to support achievement of 20% average rPP on market by 2025 Target.

Given slight increased brittleness of rPP, it is commonly mixed with virgin PP and allocated to applications with greater tolerances or more rounded corners. Experts in Australia can advise and adapt packaging design and processing to address issues with rPP.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Flexible plastic packaging

Many businesses use a wide array of flexible plastics packaging. Given the poor circularity and high use of flexible plastics, brand owners are strongly encouraged to consider the design of flexible plastic packaging to suit existing recovery systems and buy back the recycled material where possible.

Flexible plastics present challenges for collection, recyclability, and recycled content. Brand owners are encouraged to have conversations with suppliers to identify ways to improve circularity of flexible packaging in Australia. This can be achieved through reuse, design for recyclability, improved collections and purchase of products packaging with recycled content.

Applications of recycled flexible plastics

Companies should assess the diversity of flexible plastics in use, including strapping, pallet wrap, liner bags etc., and determine where recycled content can be included. This is whether starting small with a commitment for 1-5%, lifting from 15% to 25% and buying finished packaging with recycled content like strapping. Every action provides market confidence and stimulates investments and improvements through the supply chain.

Performance and appearance of recycled flexible plastics

Currently recycled flexible material is typically grey or black or other dark colours. Well separated, clear or white flexible plastics are best as they can be used to make a wide range of plastics packaging or products in a wide range of colours, including layers in flexible opaque film.

Did you know?

As a group, flexible plastics make up 32.7% of all plastic packaging placed on the Australian market, however they have a low recovery rate of only 10.7% in 2018-19.[23]

Flexible plastics currently have the lowest rate of recycled content at 3% in 2018-19.[24] from pre-consumer sources, with the 2025 Target aiming for an average of 10%.

Export of untreated plastics will be banned from mid-2022 making it essential to expand collection and treatment in Australia to meet international standards.[25]

Brand owners and manufacturers should phase out non-compatible polymers and move toward mono PE and PP, non-toxic printing inks and easily removable non-compatible labels, to help create cleaner recycling streams and in turn greater use opportunity for the recyclate.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Other Plastics - PS, EPS, PVC and nylon

There are a few plastics that are not known to currently include recycled content in packaging and are unlikely to in the foreseeable future. These plastics are:

- Polystyrene (PS) (rigid)
- Expanded Polystyrene (EPS) (rigid)
- Nylon (rigid and flexible)
- Polyvinyl Chloride (PVC) (rigid and flexible)

In 2018, all levels of Australian Government, including representatives from local, state and territory and federal governments, came together with industry to launch Australia's 2025 Targets, providing a clear mandate to deliver a new sustainable pathway for packaging in Australia. This included a commitment to phase out problematic and unnecessary single-use plastic packaging through redesign, innovation, or alternative delivery methods.

APCO's **Action Plan for Problematic and Unnecessary Single-Use Plastics Packaging** provides clear facts and recommendations on each plastic and format for brand owners, designers and manufacturers.[26] It identifies several materials and specific packaging formats for phase out, reduction in use, replacement or innovation for increased recovery. These include:

PS rigid packaging

EPS packaging for food and beverage service and retail fresh produce (e.g., cups, plates, and trays)

EPS loose fill packaging

EPS moulded packaging for white/ brown goods and electronics

PVC rigid packaging

It is important to recognise that there are examples in Australia of some of these plastics in packaging being collected and reprocessed into other products, particularly when those plastics have high levels of use in other industry sectors, these are however specialised industry-backed collections and programs.

For the reasons given above and the general momentum of Australia's sustainable packaging industry, it is unlikely that packaging made with these plastics will include recycled content.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Paper and paperboard

Recycled paper has a long history in Australia and is very well established and integrated into packaging. Companies wanting to use recycled content will find a wide array of various formats and grades available with proportions ranging from 0 – 100%. Formats include such things as: polymer-coated paperboard, cardboard, high wet strength paperboard, corrugated cardboard, and moulded fibre (e.g., egg cartons).

Figures from 2018-19 put average post-consumer recycled content in paper and paperboard packaging at 51%,[27] with the 2025 Target for recycled content in paper set at 60%. This positive trend is being supported by industry and brand owners switching to use more recycled material in various packaging formats.

Applications of recycled paper and paperboard

Given paper packaging is a mature industry in Australia and already has a high rate of recycled content, brand owners should aim for higher than 60% average recycled content.

Currently almost all of Australia's recycled content 2025 Target is met through the collection of unbleached kraft paper, office paper and paperboard (largely old, corrugated cardboard boxes) from commercial and industrial sources (such as retail and offices).

The 2025 Targets will be achieved with innovation and collaborative work between brand owners, processors and designers, as well as designing for recyclability and improved collection and sorting.

Performance and appearance of recycled paper and paperboard

More can be done to increase recycled content by adjusting specifications and appearance without detrimental impact upon function and public acceptance of the packaging, particularly for some formats and applications.

The brown of recycled content has become widely recognised and accepted, and in some cases desirable for marketing and brand value. Recycled content can present a slightly uneven and inconsistent appearance with specks. Some brands choose paper from mills that has been dyed, de-inked or bleached to change or lighten the colour. Companies may choose a brighter outer layer and unbleached recycled content within the core. Print may be affected if being applied to recycled paper surfaces, such as corrugated cardboard.

Strength may be impacted by shorter fibres of recycled content, and additives such as starch or resin can be applied. The critical issues of strength and performance in packaging different product are being tested in Australia and internationally.

Did you know?

The majority of paper packaging formats can accommodate recycled content in varying proportions. The application of recycled content in packaging depends on function and the willingness of the brand owner to embrace a different look, feel and approach to packaging design.

Professional reprocessing by certified facilities is required for paper packaging in contact with food and medicinal products. Companies must comply with the Food Standard Code and/or Good Manufacturing Practice for Therapeutic Goods. For more on this, refer to **Part 1 of this guide.**

Paper is the dominant form of packaging in Australia, at 3,262,000 tonnes on the market in 2018-19 (55.1%).[28] 49% is locally sourced and manufactured[29] meaning there is considerable scope for companies to work with local suppliers on improving design, increasing recycled content and improving sorting and processing in Australia to reach the 2025 Targets.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Glass

Glass can have up to 100% recycled content without suffering degradation of material properties and is virtually identical to virgin glass. Recycled glass (rGlass) can and is readily used in food and medicine grade packaging in Australia. Average post-consumer recycled content rate for glass in 2018-19 was 37%,[30] with the 2025 Target for glass set at 50%.

Applications of rGlass

Australian glass production and consumption is high because Australia has a complete supply chain, from raw sand material mining to manufacture and beneficiation reprocessing.

Australia produces both conventional beverage bottles as well as specialty bottles and jars for juices, spirits and oils, and all can absorb recycled content when produced in accordance with food/medicine standards.

Performance and appearance of rGlass

The beneficiation process and bottle production processes are designed to produce high quality and homogenous material with minimal contamination carried through to the final package. In comparison to other packaging materials, recycled and virgin glass are virtually identical in performance.

An increasing number of brand owners are allowing some colour variability in their glass packaging acknowledging that this will enable greater recycled content and absolute precision in colour may not be evident to customers.

Did you know?

Nearly 70% glass packaging is produced in Australia from Australian ingredients.[31] rGlass reprocessed in Australia can be readily integrated into furnaces located across Australia and made into new packaging or diverted to make other products such as glasswool insulation or substituted for sand in concrete and roads.

Each tonne of rGlass used in glass packaging reduces Australia's GHG emissions by over half a tonne (0.528 tonnes) and the estimated commodity value lost to the Australian economy if not recycled is $45 per tonne.[32]

Glass packaging is almost exclusively used for consumer/household products and is therefore generally recovered from households and food/retail premises.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

Metal packaging - aluminium and steel

Almost all of Australia's aluminium and steel metal packaging is recyclable and its recycled content varies according to supply and demand across the globe.

Did you know?

In 2018-19, metal packaging had 24% post-consumer recycled content. The current 2025 Target for recycled content in metal packaging is 35%.[33]

Each tonne of recycled content metal (rMetal) reprocessed back into packaging reduces Australia's GHG emissions by 6.281 tonnes CO2-e given the immense amount of energy used to transform mined virgin ores into metal packaging. The estimated commodity value lost to the Australian economy when metal packaging is not recycled is $434 per tonne.[34]

Applications of rMetals

Given the structure and size of the metals industry and global material flows of virgin and recovered steel and aluminium, especially for industrial products like steel beams and aluminium window frames, the recycled content in packaging varies seasonally, within countries and foundries.

Recycled content in metal packaging is largely a function of the cost of scrap metal, energy to fire the furnaces and in the case of steel, the carbon content in shipments of virgin iron ore. Steelmakers and aluminium foundries will increase the proportion of recycled scrap when the price of energy and scrap is low. Aluminium cans typically can have more recycled content than steel packaging due to the production process for packaging steel.

Performance and appearance of rMetals

There is no negative impact upon performance or appearance of aluminium or steel as a result of recycled content. Some formats have less recycled content, due to the required alloys for functional performance.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

References

[1] Australian Packaging Covenant Organisation, 2020. Sustainable Packaging Guidelines (SPGs). Available at: https://documents.packagingcovenant.org.au/public-documents/Sustainable%20Packaging%20Guidelines%20(SPGs)

[2] Australian Packaging Covenant Organisation, 2020. 2025 Recycled Content Targets. Available at: https://documents.packagingcovenant.org.au/public-documents/2025%20Recycled%20Content%20Target

[3] Australian Packaging Covenant Organisation, 2020. Australian Packaging Covenant. Available at: http://documents.packagingcovenant.org.au/public-documents/Australian%20Packaging%20Covenant%201Jan2017

[4] Australian Packaging Covenant Organisation, 2020. Sustainable Packaging Guidelines (SPGs).

[5] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19. Available at: https://documents.packagingcovenant.org.au/public-documents/Australian%20Packaging%20Consumption%20And%20Recycling%20Data%202018-19

[6] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[7] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[8] Jared Paben, 2018. Quantifying environmental benefits of recycled plastic. Resource Recycling, Inc.. Available at: https://resource-recycling.com/plastics/2018/08/22/quantifying-environmental-benefits-of-recycled-plastic/

[9] British Glass Manufacturers Confederation, 2004. Glass Recycling - Life Cycle Carbon Dioxide Emissions. Available at: https://www.britglass.org.uk/sites/default/files/Glass-recycling-life-cycle-carbon-dioxide-emissions-report.pdf

[10] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[11] Australian Competition & Consumer Commission, 2020. Advertising and selling guide. Available at: https://www.accc.gov.au/publications/advertising-selling/advertising-and-selling-guide/marketing-claims-that-require-extra-care-premium-and-credence-claims/environmental-and-organic-claims

[12] Australian Competition and Consumer Commission, 2011. Green marketing and the Australian Consumer Law. Available at: https://www.accc.gov.au/system/files/Green%20marketing%20and%20the%20ACL.pdf

[13] Australian Packaging Covenant Organisation, 2017. Australian Packaging Covenant.

[14] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[15] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[16] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[17] Sustainable Packaging Coalition, 2020. Design for Recycled Content Guide. Available at: https://recycledcontent.org/

[18] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[19] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[20] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[21] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[22] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

References

[23] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[24] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[25] Department of Agriculture, Water and the Environment, 2021. Exports of Plastic Waste. Available at: https://www.environment.gov.au/protection/waste/exports/plastic

[26] Australian Packaging Covenant Organisation, 2020, Action Plan for Problematic and Unnecessary Single-Use Plastics Packaging. Available at: https://documents.packagingcovenant.org.au/public-documents/Action%20Plan%20for%20Problematic%20and%20Unnecessary%20Single-Use%20Plastic%20Packaging

[27] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[28] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[29] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[30] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[31] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[32] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[33] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

[34] Australian Packaging Covenant Organisation, 2021. Australian Packaging Consumption & Recycling Data 2018-19.

CONTACT
A Suite 1102, Level 11, 55 Clarence St, Sydney, NSW, 2000 E apco@apco.org.au P (02) 8381 3700

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

APCO