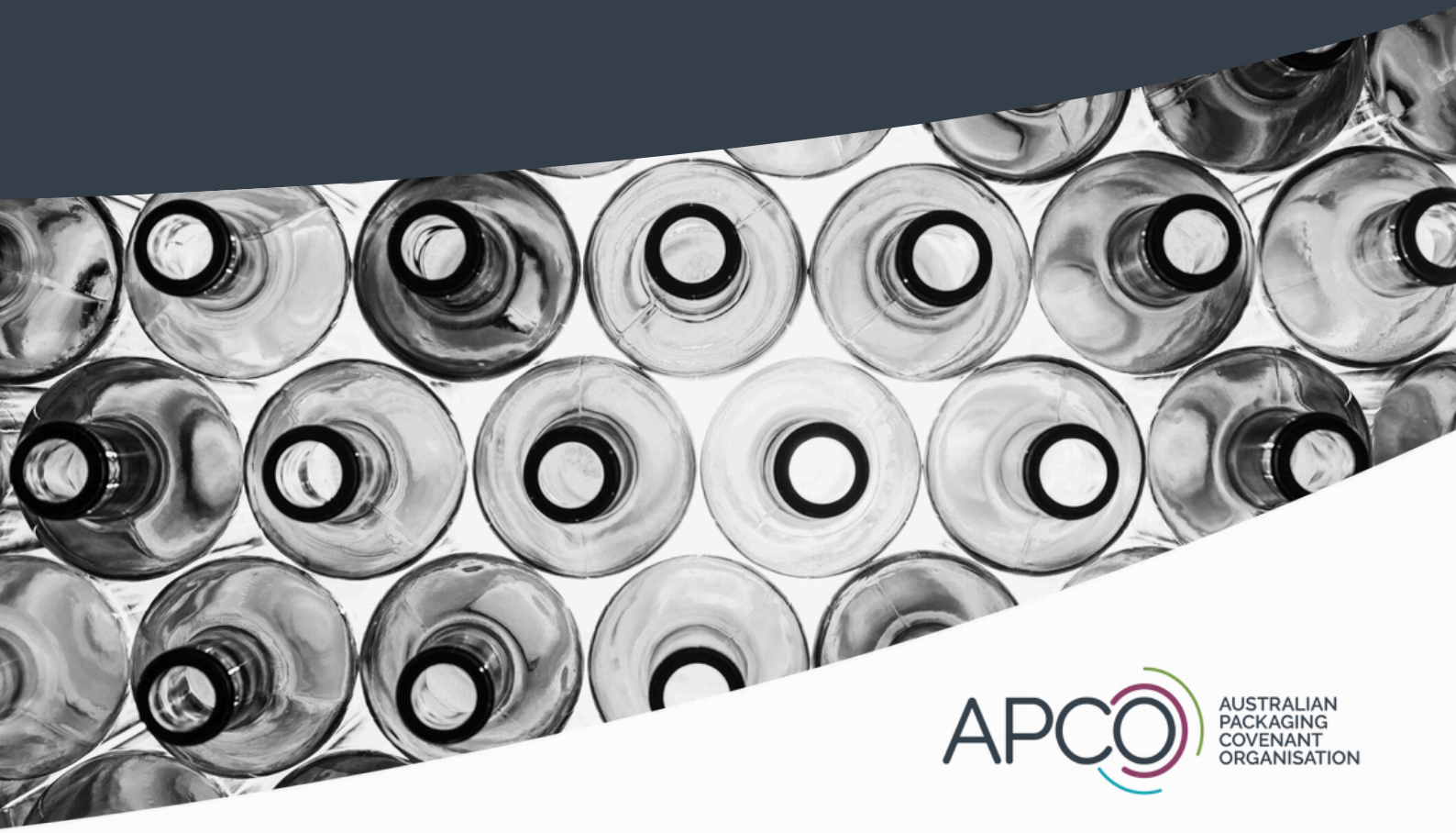
Version 1: December 2024

AUSTRALIAN PACKAGING CONSUMPTION & RECOVERY DATA 2022-23



APCO AUSTRALIAN PACKAGING COVENANT ORGANISATION

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Acknowledgements

We acknowledge and thank the packaging manufacturing and reprocessing companies, and other packaging related stakeholders 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.

Authors

Report prepared by Blue Environment and IndustryEdge on behalf of APCO.

Contents

EXECUTIVE SUMMARY

Background

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 National Packaging Targets (2025 Targets).

This report provides packaging consumption and recovery data for Australia for financial year 2022–23, to inform the measurement of progress towards the 2025 Targets. This is the sixth iteration of the annual report, which began in the 2017–18 base year.

The data in this report is also intended to improve the sustainability of packaging by supporting strategic planning across the lifecycle of packaging – design, manufacturing, use, disposal, and end-of-life.

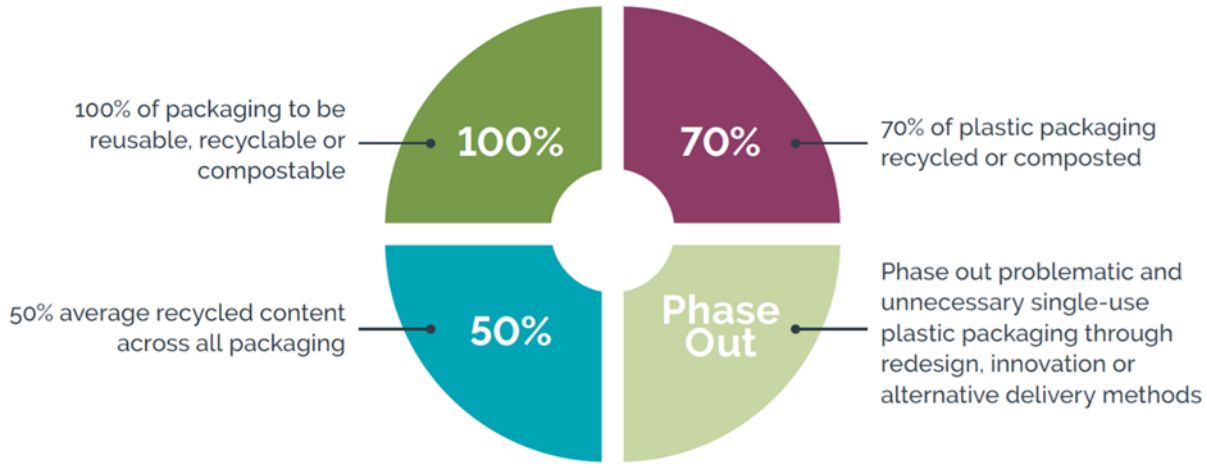

Figure ES-1 – Australia's 2025 National Packaging Targets.

Please note: In the tables presented in this report, minor discrepancies may occur between summed totals and the apparent sums of the component items in tables. This is because summed totals and percentage values are calculated using component item values prior to rounding.

Packaging consumption in 2022–23

Total packaging placed on market (POM) in Australia in 2022–23 is estimated at 7.04 million tonnes (±9%). POM means that the packaging has been made available to the end-consumer (including business users). It includes locally manufactured and imported packaging (filled or unfilled).

The materials making up the 7.04 million tonnes of packaging POM in 2022–23 were paper & paperboard (54.0%), plastic packaging (18.0%), glass packaging (15.7%), wood packaging (8.0%), and metal packaging (4.3%).

Estimates for packaging POM by material group are provided in **Table ES-1** and **Figure ES-2**. The aggregated accuracy range estimates for each of the material groups are also provided as error bars in **Figure ES-2**.

Table ES-1 – Packaging POM in 2022–23, by material group.

Material group	POM			Accuracy range
	(tonnes)	(%)	(kg/person)	(±%)
Paper & paperboard	3,805,000	54.0%	143	7%
Glass	1,105,000	15.7%	41	7%
Plastic	1,265,000	18.0%	47	17%
Metal	302,000	4.3%	11	9%
Wood	562,000	8.0%	21	16%
Total	**7,040,000**	**100.0%**	**264**	**9%**

The accuracy ranges are weighted sum averages of packaging manufacturer reported estimates of the level of accuracy (±%) of the tonnages of packaging POM. The accuracy range provides an estimate of the range within which the true value can be found, with the reported value being the best estimate of the true value.

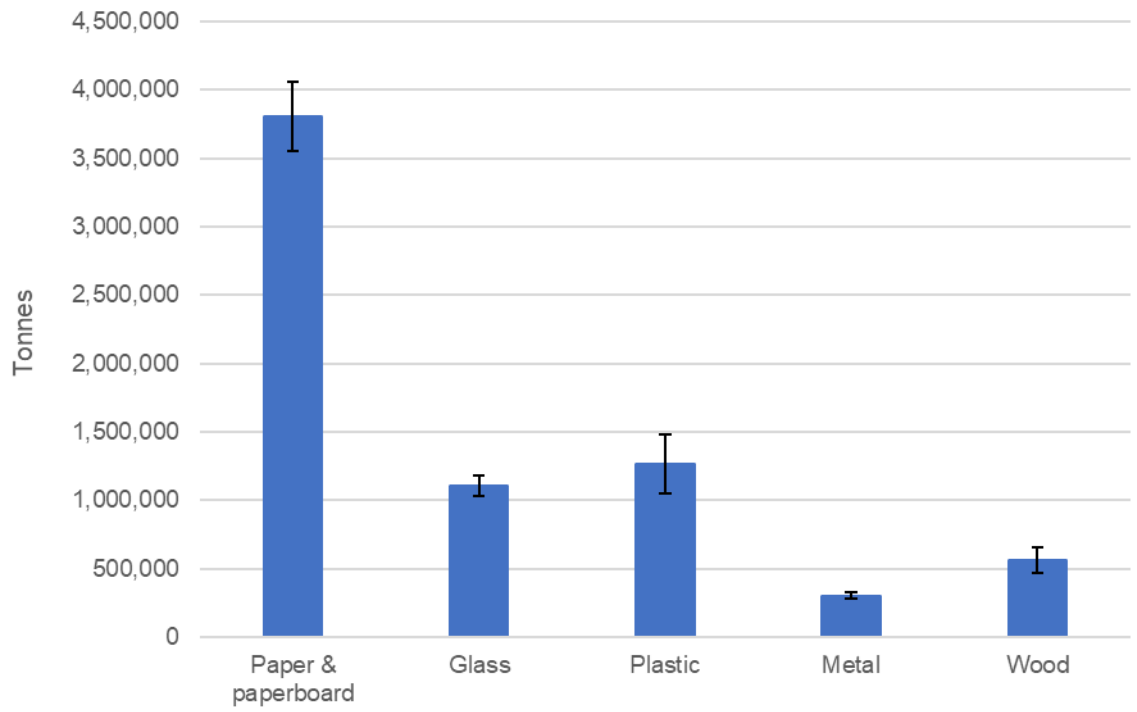

Figure ES-2 – Packaging POM in 2022–23, by material group.

In 2022–23, the estimated packaging POM was 1% higher than the 2021–22 estimate of 6.98 million tonnes. **Table ES-2** compares POM data by material group from 2017–18 to 2022–23.

The most significant changes in packaging POM were a 4% increase in paper & paperboard packaging POM (up 151,000 tonnes), a 3% decrease in glass packaging POM (down 38,000 tonnes), and a 1% decrease in plastic packaging POM (down 12,000 tonnes).

Table ES-2 – Packaging POM from 2017–18 to 2022–23, by material group, including the percentage change between 2021–22 and 2022–23.

Year	Paper & paperboard	Glass	Plastic	Metal	Wood	Total	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(kg/person)
2017–18	2,901,000	1,273,000	1,067,000	213,000	NR[a]	**5,453,000**	**218**
2018–19	3,262,000	1,283,000	1,000,000	246,000	124,000	**5,916,000**	**234**
2019–20	3,277,000	1,156,000	1,124,000	248,000	462,000	**6,266,000**	**244**
2020–21	3,387,000	1,283,000	1,179,000	254,000	638,000	**6,740,000**	**262**
2021–22	3,654,000	1,143,000	1,277,000	298,000	612,000	**6,984,000**	**269**
2022–23	3,805,000	1,105,000	1,265,000	302,000	562,000	**7,040,000**	**264**
Change (%)	**4%**	**-3%**	**-1%**	**1%**	**-8%**	**1%**	**-2%**

a) NR (not reported) – Wood packaging data was not collected in 2017–18.

Packaging recovery in 2022–23

Total Australian post-consumer packaging recovery in 2022–23 is estimated at 3.91 million tonnes (±13%). This recovery estimate is measured at the out-going gate of the secondary processing facility for the used packaging.

Of the packaging recovered in 2022–23, nearly two thirds were paper & paperboard packaging (63.2%), followed by glass packaging (19.5%), wood packaging (7.3%), plastic packaging (6.0%) and metal packaging (4.0%).

Estimates for post-consumer packaging recovery by material group are provided in **Table ES-3** and **Figure ES-3**. The estimates include post-consumer packaging collected through municipal solid waste (MSW), commercial and industrial (C&I), and container deposit scheme (CDS) collection services.

Table ES-3 – Post-consumer packaging recovery in 2022–23, by material group.

Material group	Recovery			Accuracy range
	(tonnes)	(%)[a]	(kg/person)	(±%)
Paper & paperboard	2,469,000	63.2%	93	13%
Glass	761,000	19.5%	29	11%
Plastic	234,000	6.0%	9	7%
Metal	156,000	4.0%	6	19%
Wood	286,000	7.3%	11	20%
Total	**3,907,000**	**100.0%**	**147**	**13%**

a) Percent contribution to the total amount of packaging recovered, not the individual material recovery rate.

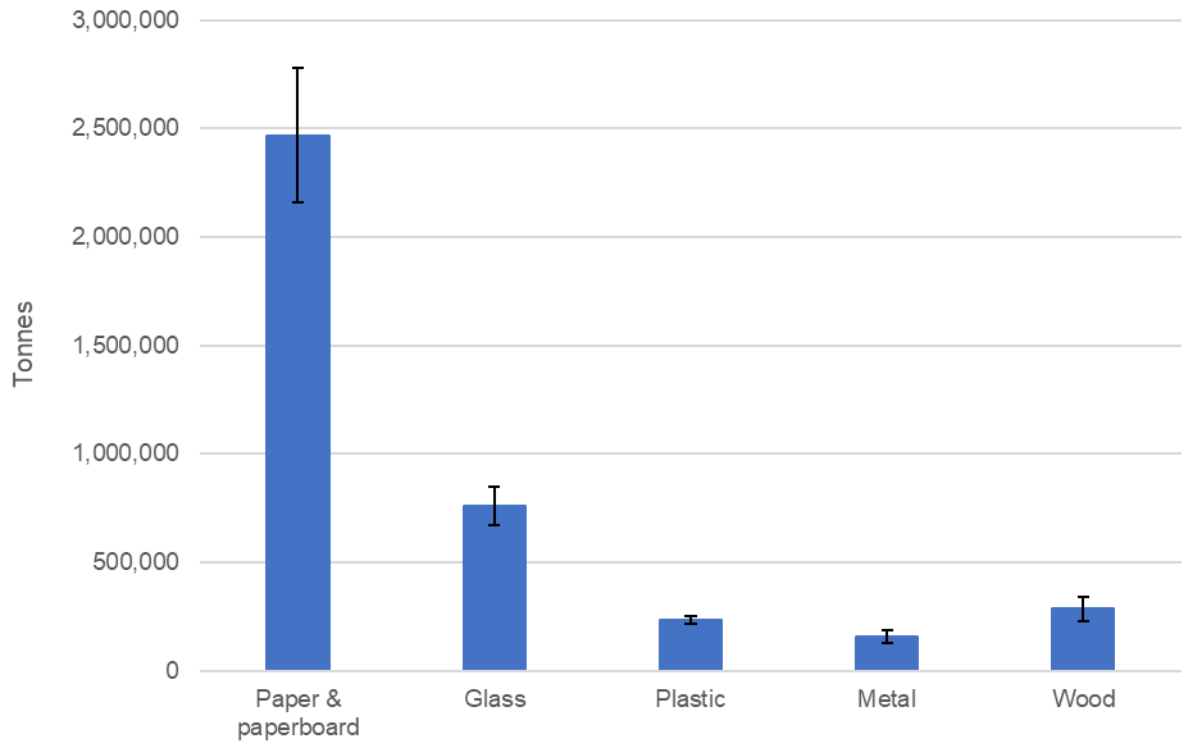

Figure ES-3 – Post-consumer packaging recovery in 2022–23, by material group.

Table ES-4 compares recovery data by material group from 2017–18 to 2022–23. Packaging recovery in 2022–23 was 3.91 million tonnes, which was steady relative to the 2021–22 packaging recovery estimate of 3.91 million tonnes.

The changes in recovery included 6% growth in the recovery of glass packaging. Paper & paperboard recovery was effectively flat, and plastic packaging recovery fell by 9%.

Table ES-4 – Post-consumer packaging recovery from 2017–18 to 2022–23, by material group, including the percentage change between 2021–22 and 2022–23.

Year	Paper & paperboard	Glass	Plastic	Metal	Wood	Total	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(kg/person)
2017–18	1,817,000	582,000	173,000	102,000	NR[a]	**2,673,000**	**107**
2018–19	2,045,000	574,000	182,000	137,000	44,000	**2,982,000**	**118**
2019–20	2,229,000	699,000	179,000	139,000	171,000	**3,416,000**	**133**
2020–21	2,370,000	805,000	207,000	147,000	260,000	**3,788,000**	**147**
2021–22	2,502,000	718,000	258,000	151,000	277,000	**3,907,000**	**150**
2022–23	2,469,000	761,000	234,000	156,000	286,000	**3,907,000**	**147**
Change (%)	**-1%**	**6%**	**-9%**	**3%**	**3%**	**0%**	**-2%**

a) NR (not reported) – Wood packaging data was not collected in 2017–18.

Packaging recovery rates in 2022–23

The Australian post-consumer packaging recovery rate in 2022–23 is estimated at 56%. This is based on the recovery measured at the out-going gate of the secondary processing facility for the used packaging, divided by the packaging POM.

Glass packaging had the highest recovery rate (for the first time) at 69%, followed by paper & paperboard packaging (65%), metal packaging (52%), wood packaging (51%), and plastic packaging (19%).

Table ES-5 – Post-consumer packaging recovery rates in 2022–23, by material group.

Material group	POM	Recovery	Recovery rate
	(tonnes)	(tonnes)	(%)
Paper & paperboard	3,805,000	2,469,000	65%
Glass	1,105,000	761,000	69%
Plastic	1,265,000	234,000	19%
Metal	302,000	156,000	52%
Wood	562,000	286,000	51%
Total	**7,040,000**	**3,907,000**	**56%**

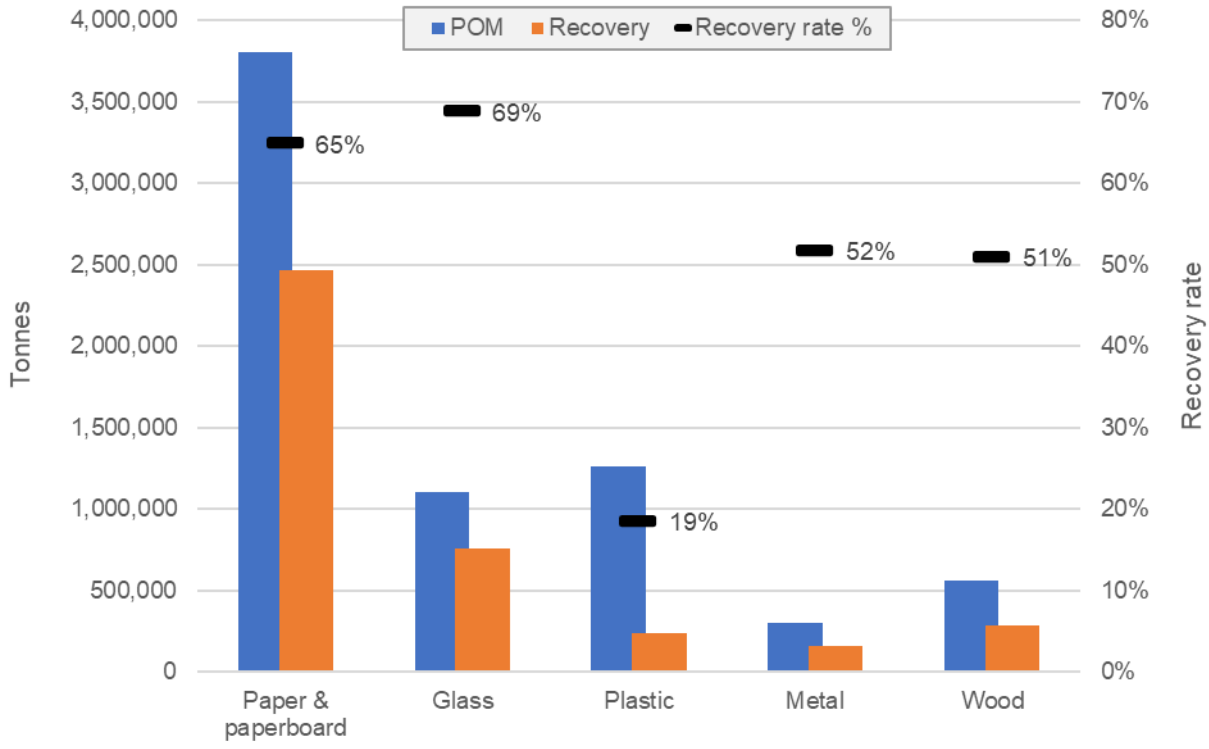

Figure ES-4 – Comparison of packaging POM, packaging recovery and post-consumer packaging recovery rates in 2022–23, by material group.

Table ES-6 and **Figure ES-5** compare recovery rates by material group from 2017–18 to 2022–23. In 2022–23 there were increases in recovery rates for glass, metal and wood packaging, but decreases for paper & paperboard and plastic packaging. Overall, the total national post-consumer packaging recovery rate was steady between 2021–22 and 2022–23.

Table ES-6 – Post-consumer packaging recovery rates from 2017–18 to 2022–23, by material group.

Year	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
	(%)	(%)	(%)	(%)	(%)	(%)
2017–18	63%	46%	16%	48%	NR[b]	**49%**
2018–19	63%	45%	18%	56%	36%	**50%**
2019–20	68%	60%	16%	56%	37%	**55%**
2020–21	70%	63%	18%	58%	41%	**56%**
2021–22	68%	63%	20%	51%	45%	**56%**
2022–23	65%	69%	19%	52%	51%	**56%**
Change (%)[a]	**-4%**	**6%**	**-2%**	**1%**	**6%**	**0%**

a) % change values are calculated prior to rounding the annual values.
b) NR (not reported) – Wood packaging data was not collected in 2017–18.

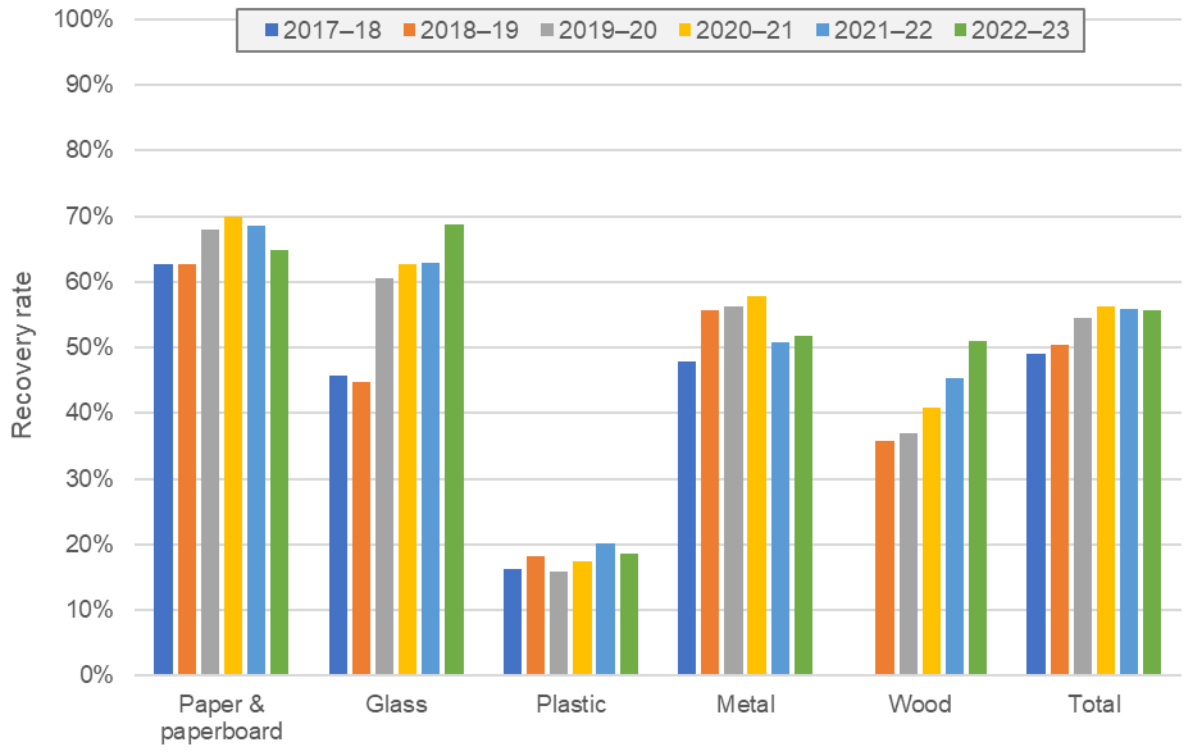

Figure ES-5 – Post-consumer packaging recovery rates from 2017–18 to 2022–23, by material group.

Packaging recycled content in 2022–23

Estimates of the recycled content incorporated into packaging POM in 2022–23, by material group, are provided in **Table ES-7** and **Figure ES-6**. The post-consumer recycled (PCR) content across all packaging (excluding wood) was 2.82 million tonnes (44% of total packaging POM), the

pre-consumer recycled content was 0.67 million tonnes (10%), and 2.99 million tonnes (46%) was sourced from virgin (primary) feedstocks.

Table ES-7 – Packaging POM in 2022–23, by material group (excluding wood) and recycled content.

Material group	Post-consumer source		Pre-consumer source		Virgin source		Total
	(tonnes)	%	(tonnes)	%	(tonnes)	%	(tonnes)
Paper & paperboard	2,124,000	56%	528,000	14%	1,153,000	30%	3,805,000
Glass	555,000	50%	46,000	4%	505,000	46%	1,105,000
Plastic	106,000	8%	26,000	2%	1,133,000	90%	1,265,000
Metal	35,000	12%	73,000	24%	194,000	64%	302,000
Total	**2,819,000**	**44%**	**673,000**	**10%**	**2,985,000**	**46%**	**6,478,000**

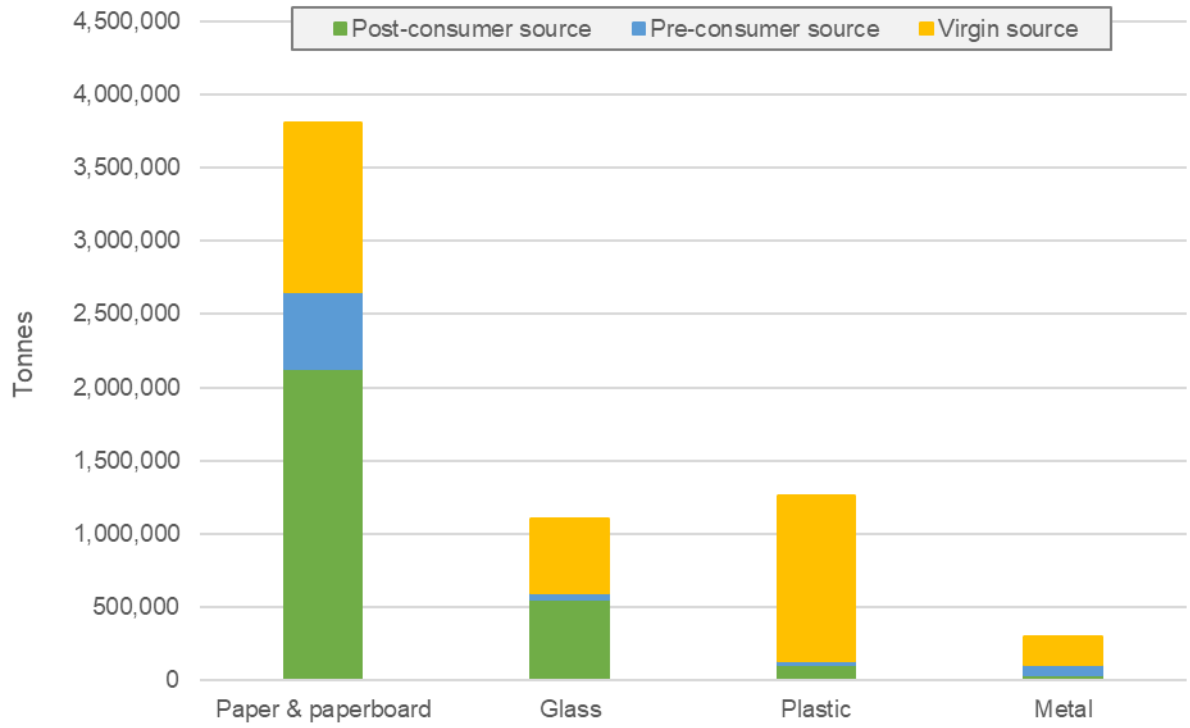

Figure ES-6 – Packaging POM in 2022–23, by material group (excluding wood) and recycled content.

Table ES-8 compares the estimated PCR content of packaging by material group from 2017–18 to 2022–23.

In 2022–23 the total quantity of PCR content in packaging increased by an estimated 248,000 tonnes (10%) compared to the previous year. The PCR content of packaging, excluding wood, was 44% in 2022–23 compared with 40% in 2021–22.

This increase in the PCR content was due to increases of 134 kt of recycled fibre content, 86 kt of recycled glass content, and 32 kt of recycled plastic content. However, there was a decrease in the PCR content of metal packaging of 5 kt.

Table ES-8 – Packaging PCR content from 2017–18 to 2022–23, as a percentage of packaging POM, by material group (excluding wood).

Year	Unit	Paper & paperboard	Glass	Plastic	Metal	Total
2017–18	Tonnes	1,421,000	407,000	23,000	64,000	**1,915,000**
2017–18	% POM	49%	32%	2%	30%	**35%**
2018–19	Tonnes	1,667,000	474,000	37,000	59,000	**2,237,000**
2018–19	% POM	51%	37%	4%	24%	**38%**
2019–20	Tonnes	1,768,000	428,000	36,000	28,000	**2,260,000**
2019–20	% POM	54%	37%	3%	11%	**39%**
2020–21	Tonnes	1,801,000	480,000	36,000	37,000	**2,354,000**
2020–21	% POM	53%	37%	3%	15%	**39%**
2021–22	Tonnes	1,990,000	469,000	74,000	40,000	**2,572,000**
2021–22	% POM	54%	41%	6%	13%	**40%**
2022–23	Tonnes	2,124,000	555,000	106,000	35,000	**2,819,000**
2022–23	% POM	56%	50%	8%	12%	**44%**

Packaging recycling potential in 2022–23

Estimates of packaging recycling potential classified by material group are provided in **Table ES-9** and **Figure ES-7**. Throughout the report the term *packaging recycling potential* is used as an umbrella term for reusable, recyclable, or compostable packaging.

The method for determining packaging recycling potential uses a scoring framework based on three criteria:

- the availability of a collection system,
- whether the material is technically recyclable, i.e., it can be sorted and recycled, and
- the availability of end markets.

Using this framework, each packaging format was classified as having either good recycling potential, poor (limited) recycling potential or being not recyclable. Packaging classified as having poor recycling potential does not meet, or only slightly meets, one or more criteria.

The total “good recycling potential” score each year is calculated as a proportion of the total quantity placed on market that achieved a “good recycling potential” score. As such, some year on year change is due to the changing proportions of packaging placed on market, rather than system level changes that impact the “good recycling potential” of a particular packaging format.

Reusable packaging (used within established reusable packaging systems) and certified compostable plastic packaging are allocated with the single-use packaging that achieves a good recycling potential classification score.

It is estimated that 6.06 million tonnes (86%) of packaging POM in 2022–23 had good recycling potential. This was dominated by paper & paperboard (of which 94% had good recycling potential) and glass (of which 100% had good recycling potential). Almost all metal packaging (98%) was classified as having good recycling potential. Wood packaging had 90% classified as having good recycling potential.

Only 46% of plastic packaging was classified as having good recycling potential. However, this was an improvement from 42% in 2021–22.

Around 0.84 million tonnes (12%) of packaging was classified as having poor recycling potential or not being recyclable.

The recycling potential status of another 0.14 million tonnes of packaging, which was entirely plastic packaging, could not be determined. It is likely that most of this packaging would tend towards having poor recycling potential or not being recyclable.

Table ES-9 – Packaging POM in 2022–23, by recycling potential classification and material group.

Material group	Good recycling potential		Poor recycling potential		Not recyclable		Unknown		Total	
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)
Paper & paperboard	3,568,000	94%	181,000	5%	56,000	1%	0	0%	3,805,000	100%
Glass	1,105,000	100%	0	0%	0	0%	0	0%	1,105,000	100%
Plastic	579,000	46%	409,000	32%	138,000	11%	139,000	11%	1,265,000	100%
Metal	296,000	98%	6,000	2%	0	0%	0	0%	302,000	100%
Wood	508,000	90%	0	0%	54,000	10%	0	0%	562,000	100%
Total	**6,056,000**	**86%**	**597,000**	**8%**	**248,000**	**4%**	**139,000**	**2%**	**7,040,000**	**100%**

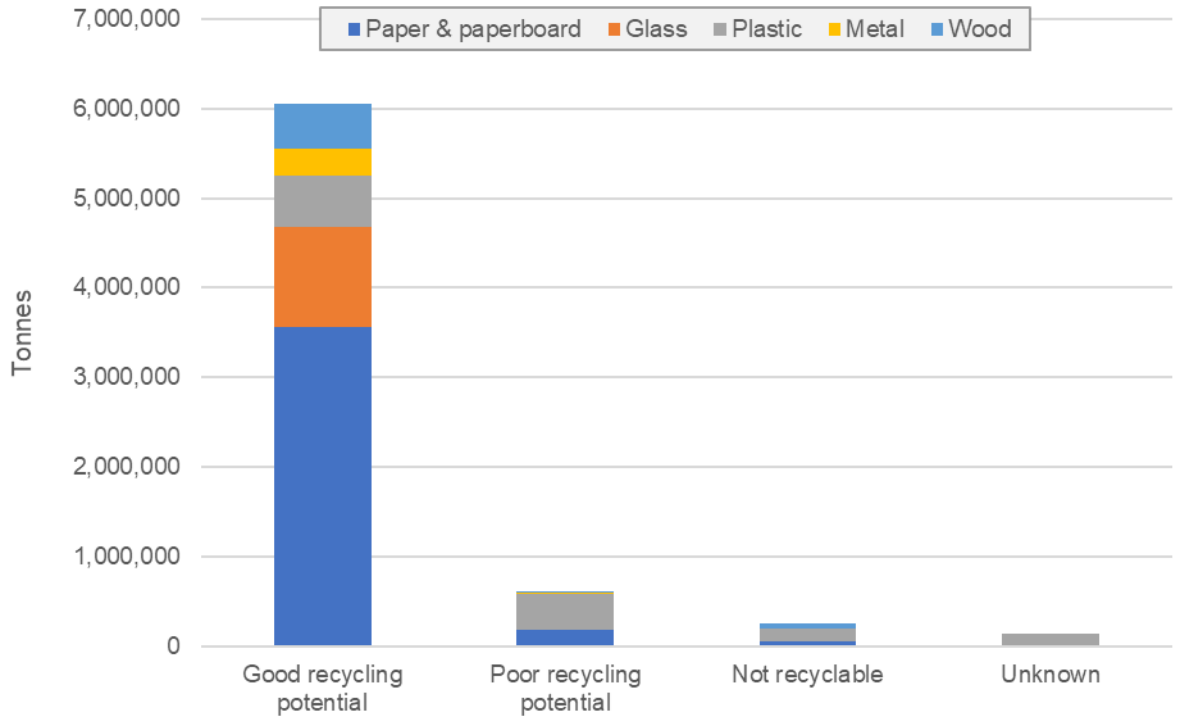

Figure ES-7 – Packaging POM in 2022–23, by recycling potential classification and material group.

Table ES-10 compares the 2017–18 to 2022–23 quantities of packaging with a good recycling potential classification.

Table ES-10 – Packaging with a 'good recycling potential' classification from 2017–18 to 2022–23, by material group.

Year	Unit	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
2017–18	Tonnes	2,682,000	1,273,000	627,000	201,000	NRa	**4,783,000**
2017–18	% POM	92%	100%	59%	95%	NRa	**88%**
2018–19	Tonnes	2,962,000	1,283,000	663,000	243,000	121,000	**5,273,000**
2018–19	% POM	91%	100%	66%	99%	98%	**89%**
2019–20	Tonnes	2,961,000	1,156,000	676,000	240,000	359,000	**5,392,000**
2019–20	% POM	90%	100%	60%	97%	78%	**86%**
2020–21	Tonnes	3,147,000	1,283,000	710,000	253,000	427,000	**5,820,000**
2020–21	% POM	93%	100%	60%	100%	67%	**86%**
2021–22	Tonnes	3,410,000	1,143,000	533,000	297,000	459,000	**5,842,000**
2021–22	% POM	93%	100%	42%	100%	75%	**84%**
2022–23	Tonnes	3,568,000	1,105,000	579,000	296,000	508,000	**6,056,000**
2022–23	% POM	94%	100%	46%	98%	90%	**86%**

a) NR (not reported) – Wood packaging data was not collected in 2017–18.

Progress towards the 2025 National Packaging Targets

Table ES-11 provides a summary of the 2025 Targets and the 2017–18 to 2022–23 results against each target.

Table ES-11 – Summary of the 2025 National Packaging Targets and progress to 2022–23.

Target	Target	2017–18 result	2018–19 result	2019–20 result	2020–21 result	2021–22 result	2022–23 result
100% of all Australia's packaging will be reusable, recyclable or compostable	**100%**	88%	89%	86%	86%	84%	86%
70% of Australia's plastic packaging will be recycled or composted	**70%**	16%	18%	16%	18%	20%	19%
50% average recycled content will be included across packaging[a]	**50%**	35%	38%	39%	39%	40%	44%
Problematic and unnecessary single-use plastic packaging will be phased out[b,c]	**Reduction in priority items**	Baseline	-41%	-31%	-28%	-33%	-40%

a) Post-consumer recycled content only. Does not include wood or manufacturing scrap (pre-consumer) recycled content.

b) Priority items considered include PVC, PS, EPS, oxo-degradable plastics, and retail shopping bags POM.

c) These estimates are subject to a relatively large accuracy range and high year-on-year reporting volatility. Estimated value is relative to the baseline year (2017–18).

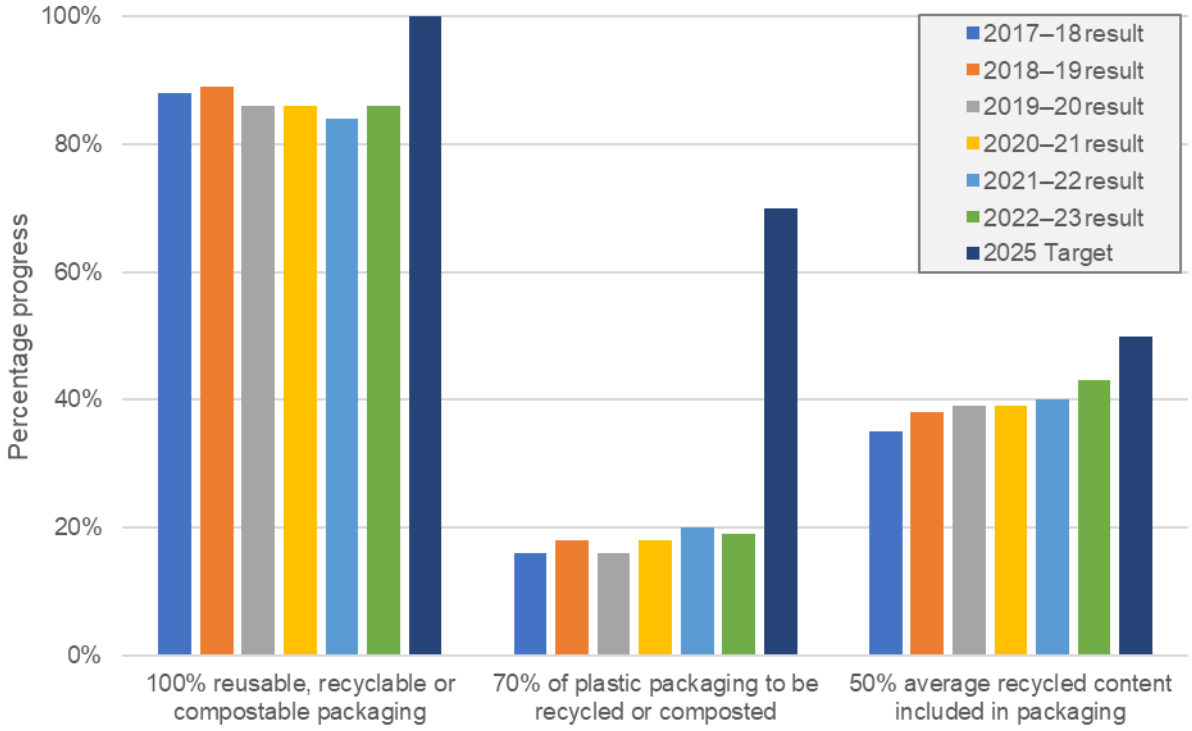

Figure ES-8 – Summary of the 2025 Targets and progress to 2022–23.

1 INTRODUCTION

1.1 This project

This report provides packaging consumption and recovery data for Australia for the 2022–23 financial year (July 2022 to June 2023). This is the sixth iteration of the Packaging Consumption and Recovery Data Report published by the Australian Packaging Covenant Organisation (APCO). The previous annual reports are for the 2017–18 (baseline) to 2021–22 financial years.

This report quantifies packaging placed on market (POM), packaging recovery rates, recycling potential, reuse and losses in the system. The data helps to inform progress towards the 2025 National Packaging Targets (2025 Targets) and support strategic planning across all levels of the lifecycle of packaging, across design, manufacturing, use, disposal and end-of-life.

The 2025 Targets are:

- 100% reusable, recyclable or compostable packaging.
- 70% of plastic packaging will be recycled or composted.
- 50% average recycled content included in packaging.
- Phase out of problematic and unnecessary single-use plastic packaging.

This report also provides trends and insights across the packaging value chain.

Additional data is provided in the following appendices:

- **Appendix A** – Glossary of terms and abbreviations used throughout this report.
- **Appendix B** – Project method.
- **Appendix C** – Consumption and recovery data by state and territory.
- **Appendix D** – Employment and facility capacity data.
- **Appendix E** – Container deposit eligible packaging data.
- **Appendix F** – Supporting data tables.

1.2 Data limitations and interpretation

In the tables presented in this report, minor discrepancies may occur between summed totals and the apparent sums of the component items in tables, as summed totals and percentage values are calculated using component item values prior to rounding.

Data in this report should be interpreted as having a maximum of three significant figures. However, to obtain a balance between the proper statement of the accuracy of the data, while minimising the apparent summation discrepancies previously mentioned, mass data in this report has generally been rounded to the nearest 1,000 tonnes.

The accuracy ranges provided in this report are weighted sum averages of the estimated levels of accuracy (±%) reported by packaging manufacturers and reprocessors about their reported packaging material POM or total amount reprocessed. The accuracy range provides an estimate of the range within which the true value can be found, with the reported value being the best estimate of the true value.

In essence, small year-on-year changes in data may be based on data volatility, and so the underlying data uncertainties mean that care should be taken with assigning too much weight to these small movements. However, more weight can be placed on larger year-on-year shifts or consistent trends over a number of years, especially where these shifts or trends are consistent with known significant movements in the market.

2 PACKAGING FLOWS

2.1 Consumption

Packaging POM for 2022–23

Total packaging POM in Australia in 2022–23 is estimated at 7.04 million tonnes (±9%). Estimates for packaging POM by material group are provided in **Table 1** and **Figure 1**. The aggregated accuracy range estimates for each of the material groups are also provided as error bars in **Figure 1**. The estimates include B2C and B2B packaging.

Of the 7.04 million tonnes of packaging POM in 2022–23, more than half was paper & paperboard packaging (54.0%), followed by plastic packaging (18.0%), glass packaging (15.7%), wood packaging (8.0%), and metal packaging (4.3%).

Refer to **Appendix A** for the glossary of terms and abbreviations used throughout this report.

Table 1 – Packaging POM in 2022–23, by material group.

Material group	POM			Accuracy range
	(tonnes)	(%)	(kg/person)	(±%)
Paper & paperboard	3,805,000	54.0%	143	7%
Glass	1,105,000	15.7%	41	7%
Plastic	1,265,000	18.0%	47	17%
Metal	302,000	4.3%	11	9%
Wood	562,000	8.0%	21	16%
Total	**7,040,000**	**100.0%**	**264**	**9%**

POM means that the packaging has been made available to the end-consumer (including business users), and the subsequent disposal follows the intended use of the packaging, also known as 'post-consumer' disposal. Packaging losses prior to the point of POM are considered 'pre-consumer' losses and are not included in **Table 1**.

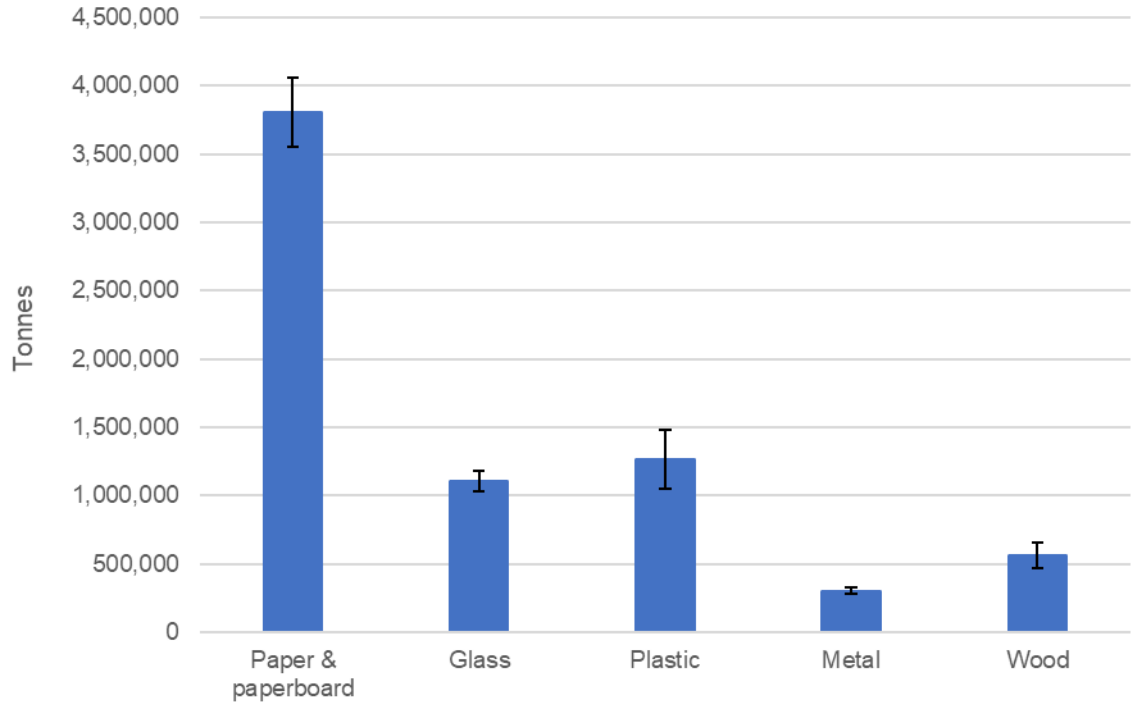

Figure 1 – Packaging POM in 2022–23, by material group.

Time-series POM data from 2017–18 to 2022–23

Table 2 and **Figure 2** compare the POM data by material group from 2017–18 to 2022–23. In 2022–23, packaging POM increased by 1% compared to the 2021–22 estimate of 6.98 million tonnes. Packaging POM per person decreased by 2% across the two years.

The most significant changes in packaging POM were a 4% increase in paper & paperboard packaging POM (up 151,000 tonnes), a 3% decrease in glass packaging POM (down 38,000 tonnes), and a 1% decrease in plastic packaging POM (down 12,000 tonnes).

Table 2 – Packaging POM from 2017–18 to 2022–23, by material group, including the percentage change between 2021–22 and 2022–23.

Year	Paper & paperboard	Glass	Plastic	Metal	Wood	Total	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(kg/person)
2017–18	2,901,000	1,273,000	1,067,000	213,000	NR[a]	**5,453,000**	**218**
2018–19	3,262,000	1,283,000	1,000,000	246,000	124,000	**5,916,000**	**234**
2019–20	3,277,000	1,156,000	1,124,000	248,000	462,000	**6,266,000**	**244**
2020–21	3,387,000	1,283,000	1,179,000	254,000	638,000	**6,740,000**	**262**
2021–22	3,654,000	1,143,000	1,277,000	298,000	612,000	**6,984,000**	**269**
2022–23	3,805,000	1,105,000	1,265,000	302,000	562,000	**7,040,000**	**264**
Change (%)	**4%**	**-3%**	**-1%**	**1%**	**-8%**	**1%**	**-2%**

a) NR (not reported) – Wood packaging data was not collected in 2017–18.

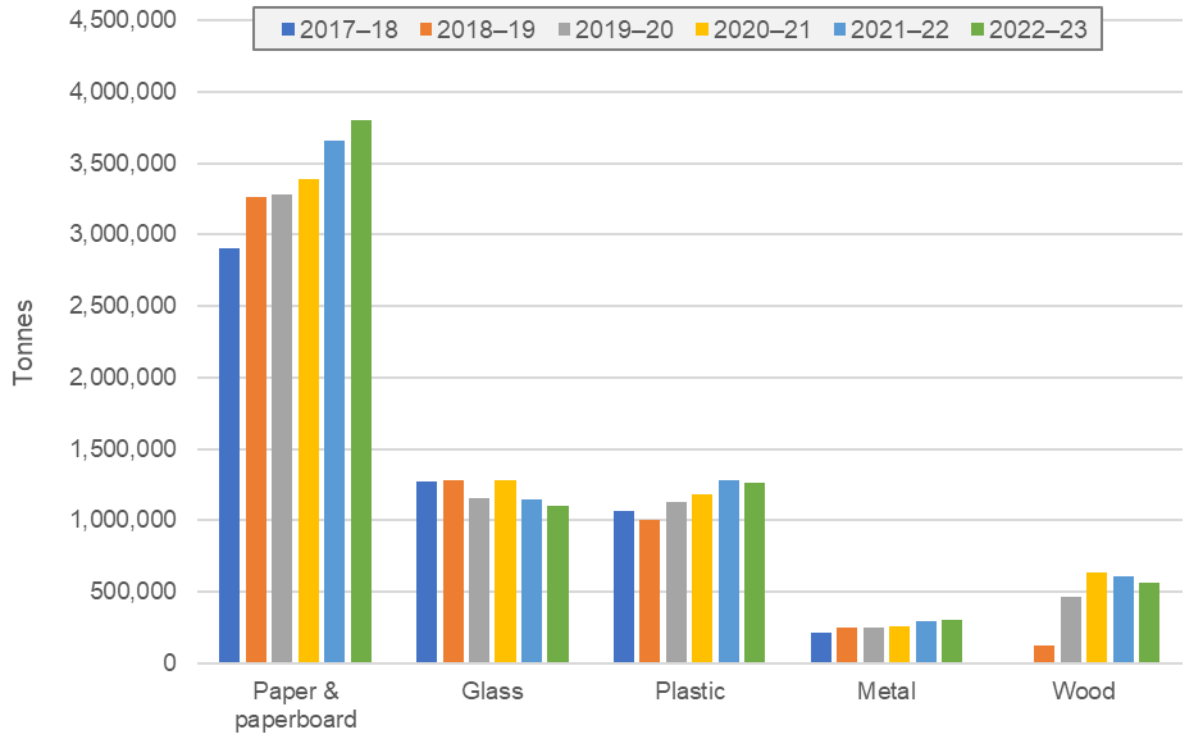

Figure 2 – Packaging POM from 2017–18 to 2022–23, by material group.

There is a strong trend in the increased use of paper & paperboard and a less significant trend in the increased use of plastic, although for the first time since 2018–19 plastic POM decreased in 2022–23 compared to the previous year. Metal packaging is also trending upwards. There is possibly a downwards trend in the use of glass packaging. Wood packaging shows strong year on year increases prior to 2020–21, but this is most likely due to improved survey coverage. Note that wood packaging data was not collected in 2017–18.

2.2 Recovery

Packaging recovery for 2022–23

Total Australian post-consumer packaging recovery in 2022–23 is estimated at 3.91 million tonnes (±13%).

Of the packaging recovered in 2022–23, nearly two thirds was paper & paperboard packaging (63.2%), followed by glass packaging (19.5%), wood packaging (7.3%), plastic packaging (6.0%) and metal packaging (4.0%).

Estimates for post-consumer packaging recovery by material group are provided in **Table 3** and **Figure 3**. The aggregated accuracy range estimates for each of the material groups are also provided. The estimates include post-consumer packaging collected through MSW, C&I and CDS collection services, and are presented by collection service in **Table 4**.

Table 3 – Post-consumer packaging recovery in 2022–23, by material group.

Material group	Recovery			Accuracy range
	(tonnes)	(%)[a]	(kg/person)	(±%)
Paper & paperboard	2,469,000	63.2%	93	13%
Glass	761,000	19.5%	29	11%
Plastic	234,000	6.0%	9	7%
Metal	156,000	4.0%	6	19%
Wood	286,000	7.3%	11	20%
Total	**3,907,000**	**100.0%**	**147**	**13%**

a) Percent contribution to the total amount of packaging recovered, not the individual material recovery rate.

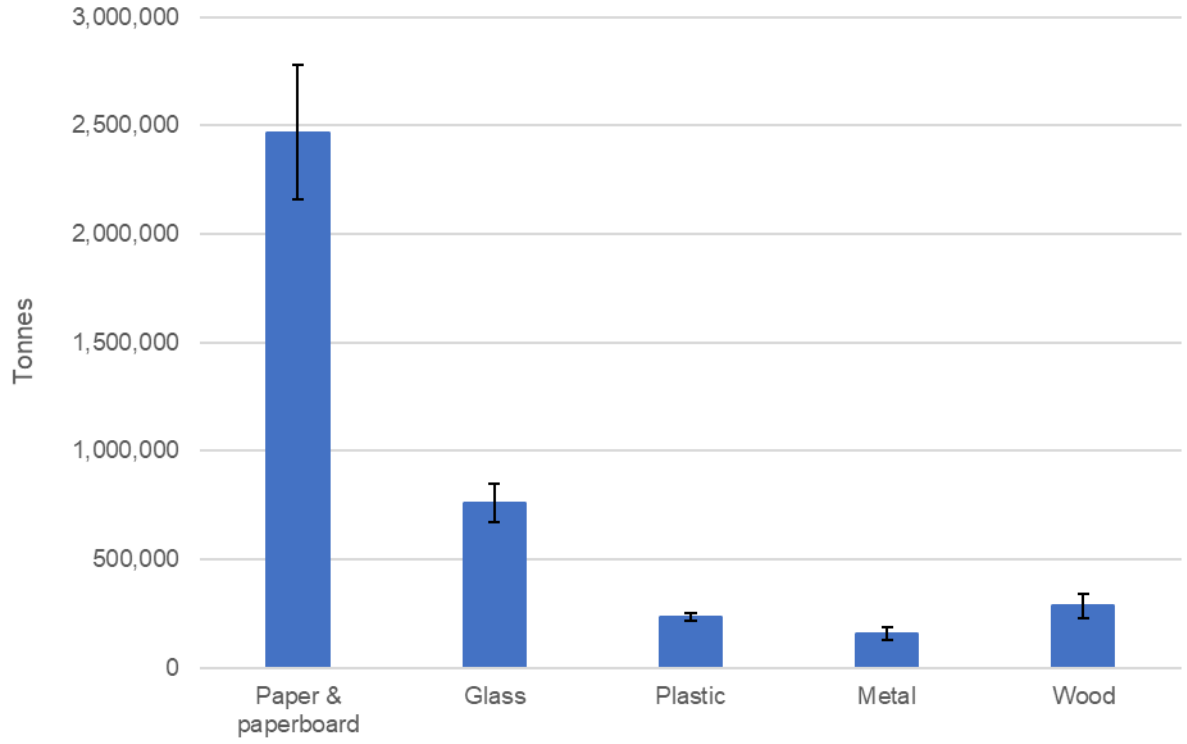

Figure 3 – Post-consumer packaging recovery in 2022–23, by material group.

Table 4 – Post-consumer packaging recovery in 2022–23, by material group and collection service.

Material group	Collection service					Total
	MSW[a]	C&I[a]	C&D[a]	CDS[a]	Other	
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Paper & paperboard	1,132,000	1,310,000	0	2,000	25,000	2,469,000
Glass	485,000	0	0	276,000	0	761,000
Plastic	135,000	59,000	0	38,000	3,000	234,000
Metal	99,000	18,000	1,000	38,000	0	156,000
Wood	0	286,000	0	0	0	286,000
Total (tonnes)	**1,851,000**	**1,673,000**	**1,000**	**355,000**	**28,000**	**3,907,000**
Total (%)	**47.4%**	**42.8%**	**0.0%**	**9.1%**	**0.7%**	**100.0%**

a) MSW – municipal solid waste / C&I – commercial and industrial / C&D – construction and demolition / CDS – container deposit scheme.

Time-series recovery data from 2017–18 to 2022–23

Table 5 and **Figure 4** compare recovery data by material group from 2017–18 to 2022–23. Packaging recovery in 2022–23 was 3.91 million tonnes, which was steady relative to the 2021–22 packaging recovery estimate of 3.91 million tonnes.

The changes in recovery included 6% growth in the recovery of glass packaging. Paper & paperboard recovery was effectively flat, and plastic packaging recovery fell by 9%.

Table 5 – Post-consumer packaging recovery from 2017–18 to 2022–23, by material group, including the percentage change between 2021–22 and 2022–23.

Year	Paper & paperboard	Glass	Plastic	Metal	Wood	Total	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(kg/person)
2017–18	1,817,000	582,000	173,000	102,000	NR[a]	**2,673,000**	**107**
2018–19	2,045,000	574,000	182,000	137,000	44,000	**2,982,000**	**118**
2019–20	2,229,000	699,000	179,000	139,000	171,000	**3,416,000**	**133**
2020–21	2,370,000	805,000	207,000	147,000	260,000	**3,788,000**	**147**
2021–22	2,502,000	718,000	258,000	151,000	277,000	**3,907,000**	**150**
2022–23	2,469,000	761,000	234,000	156,000	286,000	**3,907,000**	**147**
Change (%)	**-1%**	**6%**	**-9%**	**3%**	**3%**	**0%**	**-2%**

a) NR (not reported) – Wood packaging data was not collected in 2017–18.

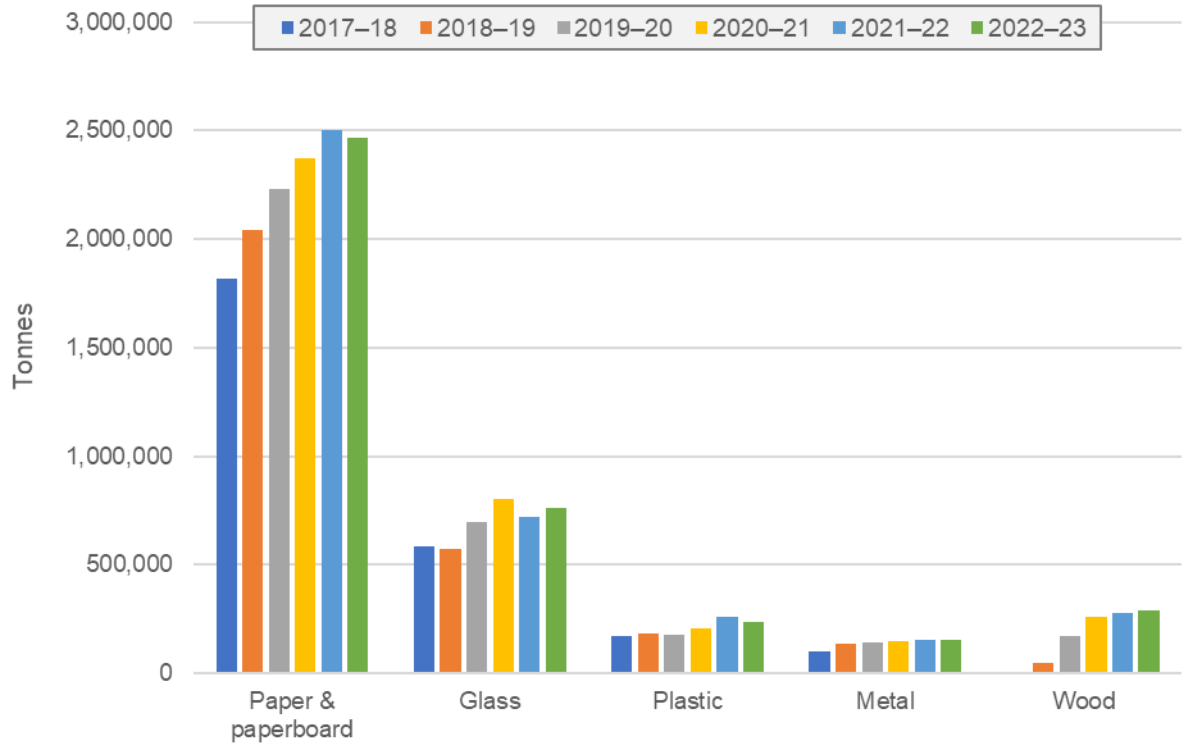

Figure 4 – Post-consumer packaging recovery from 2017–18 to 2022–23, by material group.

Recovery rates

Estimates for post-consumer packaging recovery rates by material group are provided in **Table 6** and **Figure 5**.

The post-consumer packaging recovery rate for all packaging in 2022–23 is estimated to be 56%. This is based on recovery as measured at the out-going gate of the secondary processing facility for the used packaging as a percentage of packaging POM in the same year.

Glass packaging had the highest recovery rate at 69%, followed by paper & paperboard packaging (65%), metal packaging (52%), wood packaging (51%), and plastic packaging (19%).

Table 6 – Packaging POM, post-consumer packaging recovery and post-consumer packaging recovery rates in 2022–23, by material group.

Material group	POM	Recovery	Recovery rate
	(tonnes)	(tonnes)	(%)
Paper & paperboard	3,805,000	2,469,000	65%
Glass	1,105,000	761,000	69%
Plastic	1,265,000	234,000	19%
Metal	302,000	156,000	52%
Wood	562,000	286,000	51%
Total	**7,040,000**	**3,907,000**	**56%**

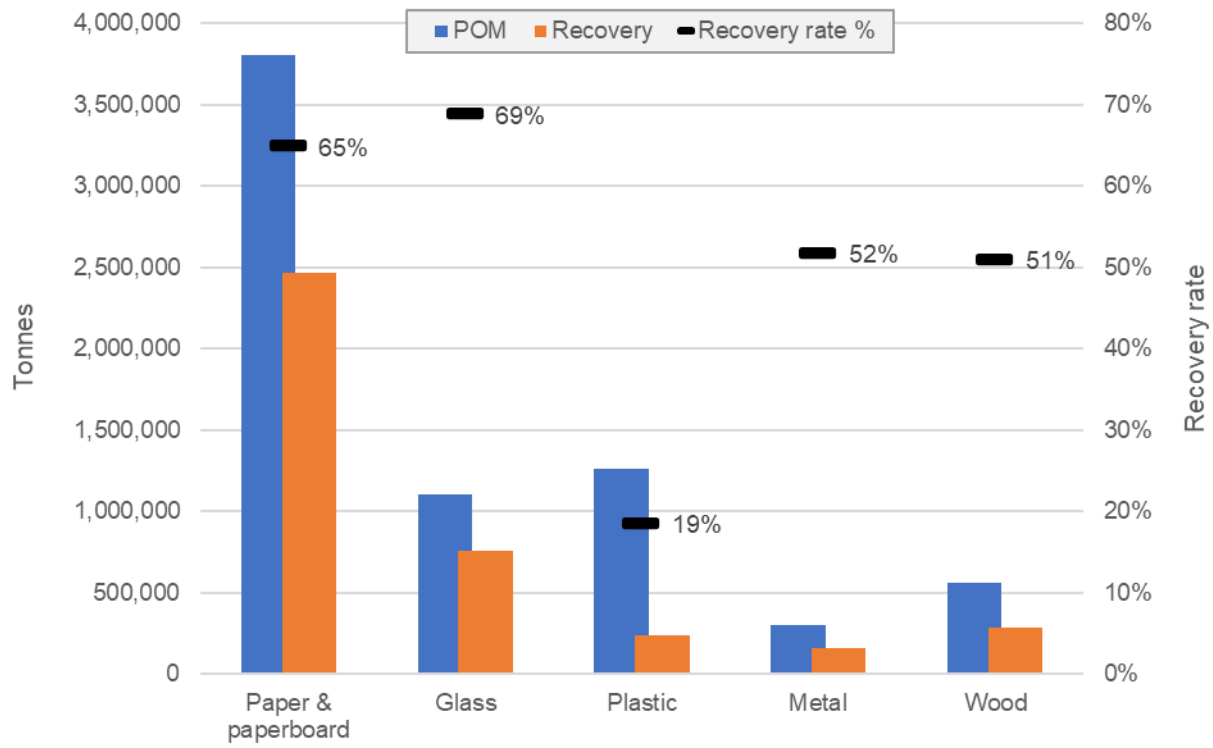

Figure 5 – Packaging POM, post-consumer packaging recovery and post-consumer packaging recovery rates in 2022–23, by material group.

Time-series recovery rates from 2017–18 to 2022–23

Table 7 and **Figure 6** compare recovery rates by material group from 2017–18 to 2022–23. In 2022−23 there were increases in recovery rates for glass, metal and wood, but decreases for paper & paperboard and plastic. Overall, the total national post-consumer packaging recovery rate has been steady from 2021–22.

Table 7 – Post-consumer packaging recovery rates from 2017–18 to 2022–23, by material group, including the percentage change between 2021–22 and 2022–23.

Year	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
	(%)	(%)	(%)	(%)	(%)	(%)
2017–18	63%	46%	16%	48%	NR[b]	**49%**
2018–19	63%	45%	18%	56%	36%	**50%**
2019–20	68%	60%	16%	56%	37%	**55%**
2020–21	70%	63%	18%	58%	41%	**56%**
2021–22	68%	63%	20%	51%	45%	**56%**
2022–23	65%	69%	19%	52%	51%	**56%**
Change (%)[a]	**-4%**	**6%**	**-2%**	**1%**	**6%**	**0%**

a) % change values are calculated prior to rounding the annual values.

b) NR (not reported) – Wood packaging data was not collected in 2017–18.

The underlying accuracy ranges for the POM and recovery estimates mean that it is not possible to state with certainty that a real decrease in the recovery rate for plastic packaging has occurred between the two years, or that a real increase in the recovery rate for metal packaging has occurred. However, a significant increase in the glass recovery rate has likely occurred, which is consistent with developments in the glass recovery market. Finally, it is somewhat likely that a minor real decrease in the paper & paperboard recovery rate has occurred.

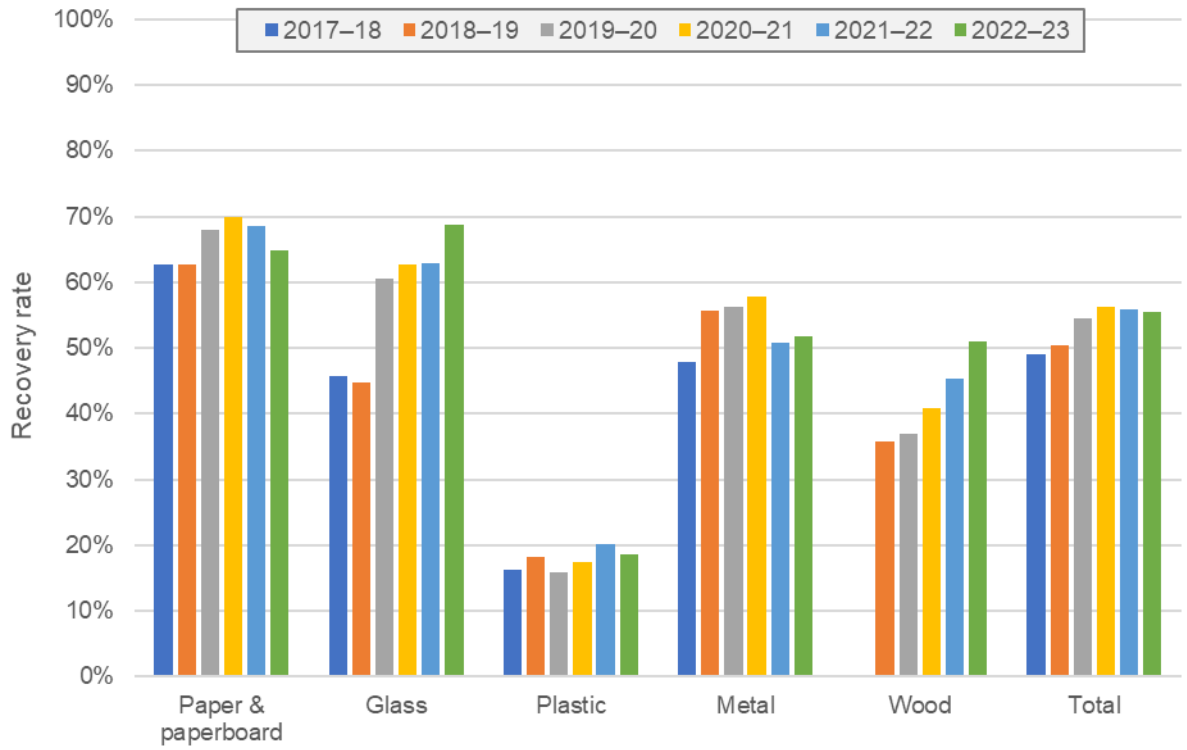

Figure 6 – Post-consumer packaging recovery rates from 2017–18 to 2022–23, by material group.

2.3 Recycled content

Packaging recycled content for 2022–23

Estimates of the recycled content incorporated into packaging POM in 2022–23, by material group, are provided in **Table 8** and **Figure 7**. The post-consumer recycled (PCR) content across all packaging (excluding wood) was 2.82 million tonnes, or 44% of total packaging POM. The pre-consumer recycled content was 0.67 million tonnes (10%), and 2.99 million tonnes (46%) was sourced from virgin (primary) feedstocks.

Table 8 – Packaging POM in 2022–23, by material group (excluding wood) and recycled content.

Material group	Post-consumer source		Pre-consumer source		Virgin source		Total
	(tonnes)	%	(tonnes)	%	(tonnes)	%	(tonnes)
Paper & paperboard	2,124,000	56%	528,000	14%	1,153,000	30%	3,805,000
Glass	555,000	50%	46,000	4%	505,000	46%	1,105,000
Plastic	106,000	8%	26,000	2%	1,133,000	90%	1,265,000
Metal	35,000	12%	73,000	24%	194,000	64%	302,000
Total	**2,819,000**	**44%**	**673,000**	**10%**	**2,985,000**	**46%**	**6,478,000**

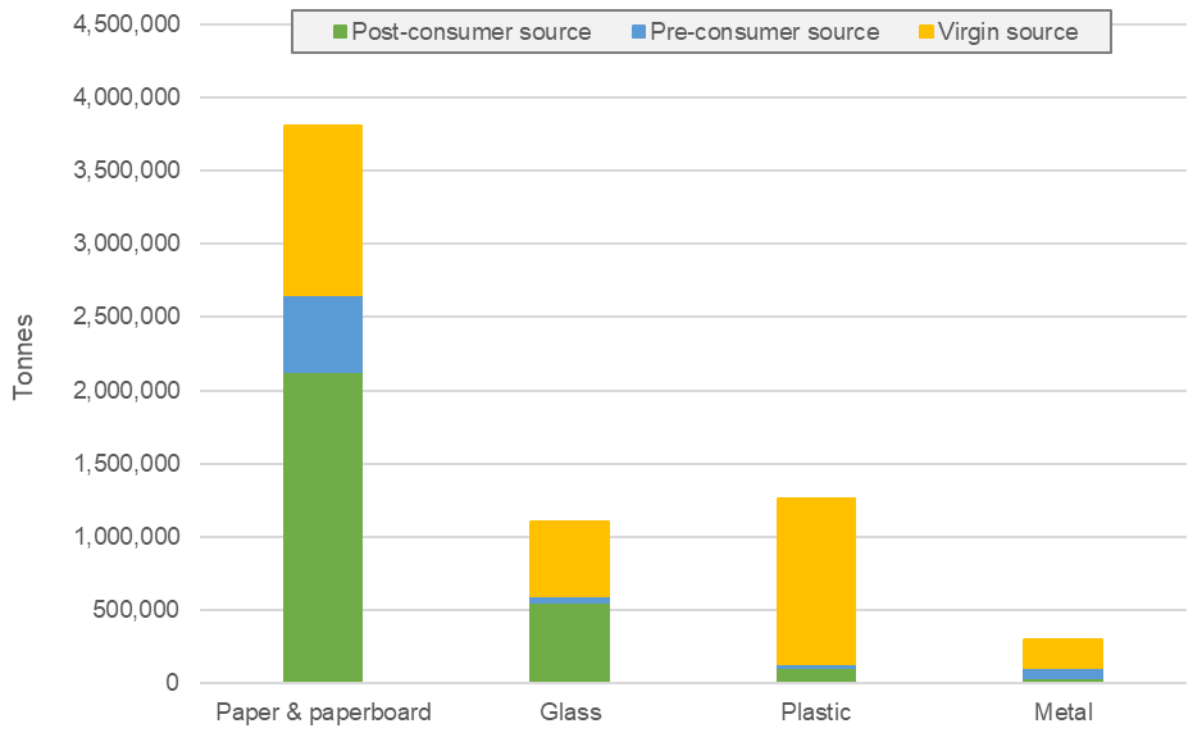

Figure 7 – Packaging POM in 2022–23, by material group (excluding wood) and recycled content.

Time-series recycled content data from 2017–18 to 2022–23

Table 9 and **Figure 8** compare the PCR content of packaging by material group from 2017–18 to 2022–23. In 2022–23 the total quantity of PCR content in packaging increased by an estimated 247,000 tonnes (10%) compared to the previous year. The PCR content of packaging, excluding wood, was 44% in 2022–23 compared with 40% in 2021–22.

Table 9 – Packaging PCR content from 2017–18 to 2022–23, as a percentage of packaging POM, by material group (excluding wood).

Year	Unit	Paper & paperboard	Glass	Plastic	Metal	Total
2017–18	Tonnes	1,421,000	407,000	23,000	64,000	**1,915,000**
2017–18	% POM	49%	32%	2%	30%	**35%**
2018–19	Tonnes	1,667,000	474,000	37,000	59,000	**2,237,000**
2018–19	% POM	51%	37%	4%	24%	**38%**
2019–20	Tonnes	1,768,000	428,000	36,000	28,000	**2,260,000**
2019–20	% POM	54%	37%	3%	11%	**39%**
2020–21	Tonnes	1,801,000	480,000	36,000	37,000	**2,354,000**
2020–21	% POM	53%	37%	3%	15%	**39%**
2021–22	Tonnes	1,990,000	469,000	74,000	40,000	**2,572,000**
2021–22	% POM	54%	41%	6%	13%	**40%**
2022–23	Tonnes	2,124,000	555,000	106,000	35,000	**2,819,000**
2022–23	% POM	56%	50%	8%	12%	**44%**

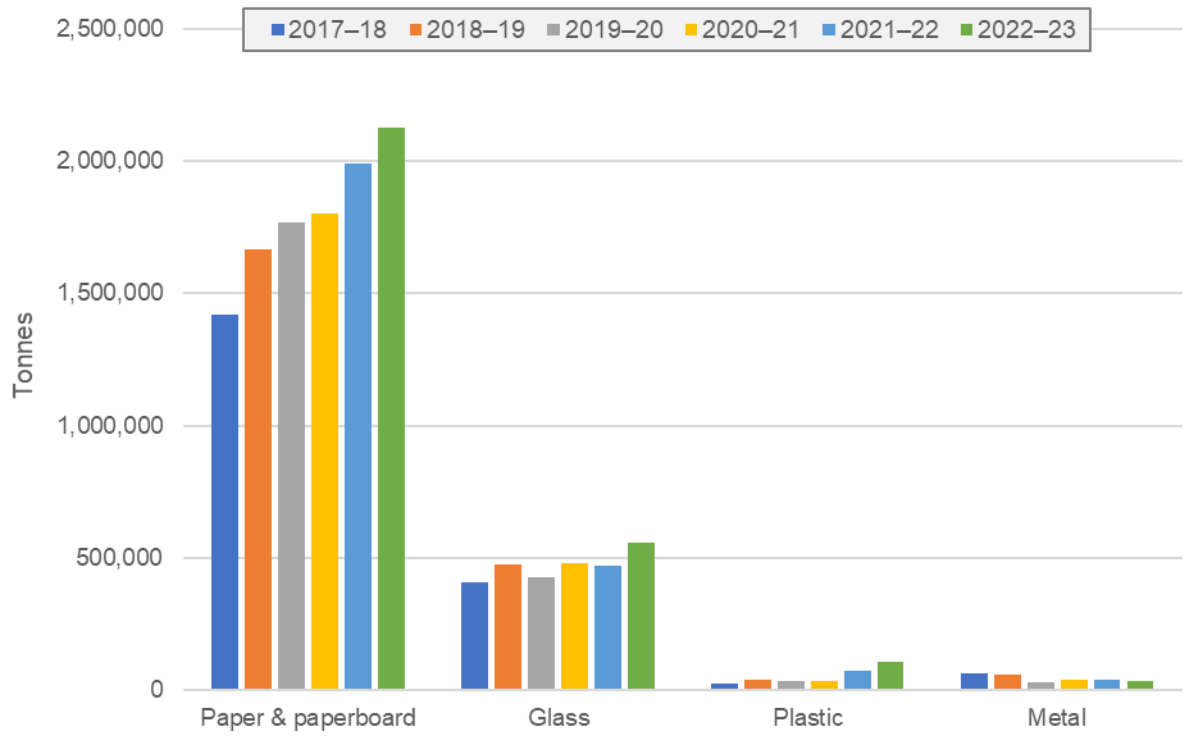

Figure 8 – Packaging PCR content from 2017–18 to 2022–23, by material group (excluding wood).

2.4 Recycling potential

Packaging recycling potential in 2022–23

In this section of the report packaging POM in 2022–23 is classified according to recycling potential. The detailed method for determining recycling potential is outlined in **Appendix B**. Throughout the report the term *packaging recycling potential* is used as an umbrella term for reusable, recyclable or compostable packaging.

Reusable packaging (used within established reusable packaging systems) and certified compostable plastic packaging are allocated with the single-use packaging that achieves a good recycling potential classification score.

Packaging recycling potential by material group is provided in **Table 10** and **Figure 9**. It is estimated that 6.06 million tonnes (86%) of packaging POM in 2022–23 had good recycling potential (or was reusable or certified compostable). This was dominated by paper & paperboard (of which 94% had good recycling potential) and glass (of which 100% had good recycling potential). Effectively all metal packaging (98%) and most wood packaging (90%) were classified as having good recycling potential.

Only 46% of plastic packaging was classified as having good recycling potential. Although this was an increase from 2021–22 (42%).

Around 0.84 million tonnes (12%) of packaging was classified as having poor recycling potential or not being recyclable.

The recycling potential status of another 0.14 million tonnes of packaging, which was entirely plastic packaging, could not be determined. It is likely that most of this packaging would tend towards having poor recycling potential or not being recyclable.

Table 10 – Packaging POM in 2022–23, by recycling potential classification and material group.

Material group	Good recycling potential		Poor recycling potential		Not recyclable		Unknown		Total	
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)
Paper & paperboard	3,568,000	94%	181,000	5%	56,000	1%	0	0%	3,805,000	100%
Glass	1,105,000	100%	0	0%	0	0%	0	0%	1,105,000	100%
Plastic	579,000	46%	409,000	32%	138,000	11%	139,000	11%	1,265,000	100%
Metal	296,000	98%	6,000	2%	0	0%	0	0%	302,000	100%
Wood	508,000	90%	0	0%	54,000	10%	0	0%	562,000	100%
Total	**6,056,000**	**86%**	**597,000**	**8%**	**248,000**	**4%**	**139,000**	**2%**	**7,040,000**	**100%**

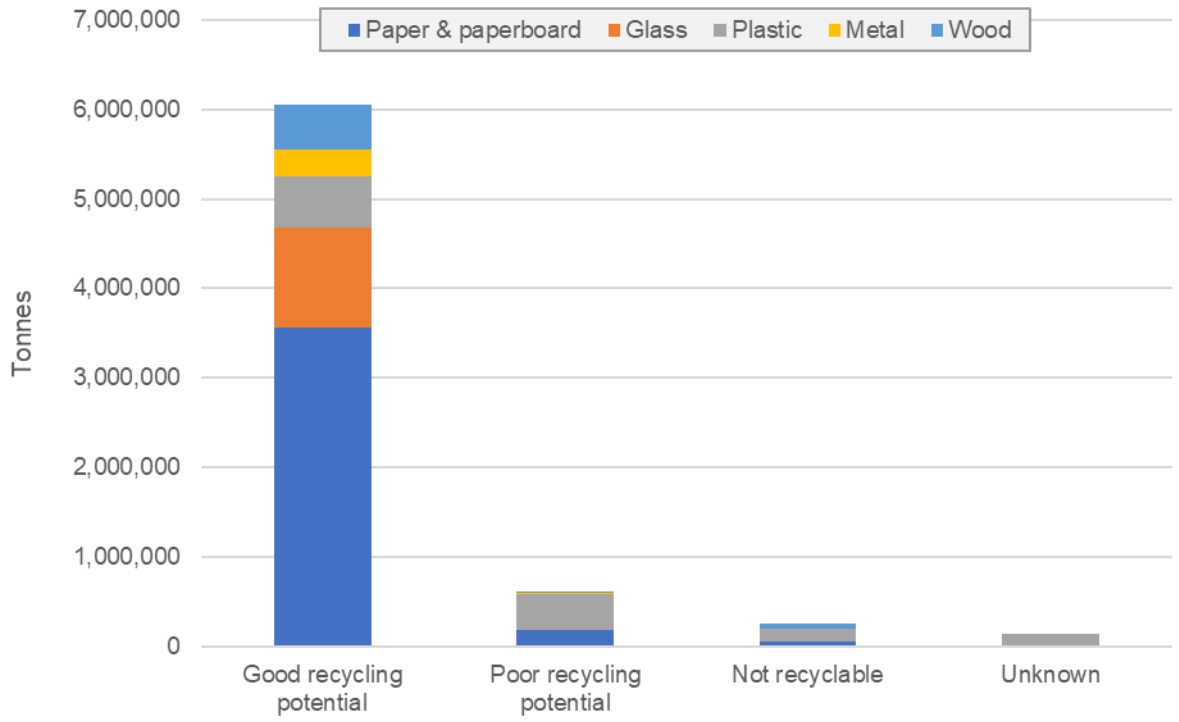

Figure 9 – Packaging POM in 2022–23, by recycling potential classification and material group.

Time-series recycling potential data from 2017–18 to 2022–23

Table 11 and **Figure 10** compare the 2017–18 to 2022–23 quantities of packaging with a good recycling potential classification. The most noteworthy change was the sharp fall in the good recycling potential classification of plastic packaging between 2020–21 and 2021–22 due to the cessation of the REDcycle program.

Table 11 – Packaging POM with a 'good recycling potential' classification from 2017–18 to 2022–23, including a percentage relative to total POM, by material group.

Year	Unit	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
2017–18	Tonnes	2,682,000	1,273,000	627,000	201,000	NRa	**4,783,000**
2017–18	% POM	92%	100%	59%	95%	NRa	**88%**
2018–19	Tonnes	2,962,000	1,283,000	663,000	243,000	121,000	**5,273,000**
2018–19	% POM	91%	100%	66%	99%	98%	**89%**
2019–20	Tonnes	2,961,000	1,156,000	676,000	240,000	359,000	**5,392,000**
2019–20	% POM	90%	100%	60%	97%	78%	**86%**
2020–21	Tonnes	3,147,000	1,283,000	710,000	253,000	427,000	**5,820,000**
2020–21	% POM	93%	100%	60%	100%	67%	**86%**
2021–22	Tonnes	3,410,000	1,143,000	533,000	297,000	459,000	**5,842,000**
2021–22	% POM	93%	100%	42%	100%	75%	**84%**
2022–23	Tonnes	3,568,000	1,105,000	579,000	296,000	508,000	**6,056,000**
2022–23	% POM	94%	100%	46%	98%	90%	**86%**

a) NR (not reported) – Wood packaging data was not collected in 2017–18.

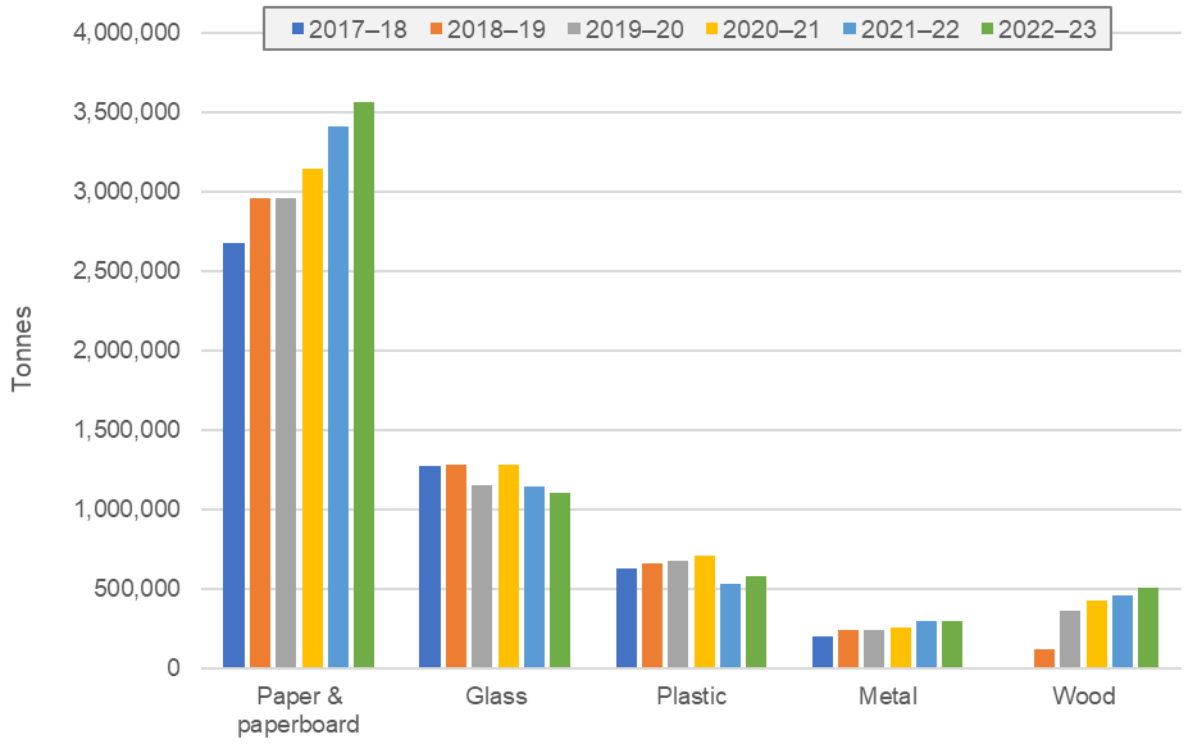

Figure 10 – Packaging POM with a 'good recycling potential' classification from 2017–18 to 2022–23, by material group.

2.5 Reprocessing capacity

Table 12 and **Figure 11** compare the projections of packaging POM and local reprocessing capacity across 2022–23 to 2027–28, by material group.

Total packaging POM is anticipated to increase from 7.04 million tonnes in 2022–23 to 8.57 million tonnes in 2027–28, which equates to a compound annual growth rate of 4.0%/yr. Total local packaging reprocessing capacity is projected to increase from 3.45 million tonnes in 2022–23 to 4.36 million tonnes in 2027–28, which is annual growth at a higher rate than packaging POM at 4.8%/yr.

In 2022–23, total local reprocessing capacity was estimated to be 47% of total packaging POM. By 2027–28, capacity is projected to be 51% of packaging POM.

Glass, plastic and paper & paperboard packaging will see local capacity growth across the next few years. Relative to 2022–23, increases by 2027–28 are expected to be:

- plastic packaging – 398,000 tonnes
- glass packaging – 304,000 tonnes
- paper & paperboard packaging – 214,000 tonnes.

Table 12 – Packaging POM and reprocessing capacity from 2022–23 to 2027–28, by material group.

Year	Parameter	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
		(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
2022–23	POM	3,805,000	1,105,000	1,265,000	302,000	562,000	**7,040,000**
2022–23	Capacity	1,663,000	1,102,000	343,000	22,000	316,000	**3,445,000**
2023–24	POM	3,957,000	1,154,000	1,303,000	308,000	596,000	**7,317,000**
2023–24	Capacity	1,663,000	1,102,000	343,000	22,000	316,000	**3,445,000**
2024–25	POM	4,115,000	1,205,000	1,343,000	314,000	631,000	**7,608,000**
2024–25	Capacity	1,663,000	1,143,000	411,000	23,000	316,000	**3,555,000**
2025–26	POM	4,281,000	1,258,000	1,384,000	320,000	669,000	**7,913,000**
2025–26	Capacity	1,868,000	1,206,000	604,000	23,000	316,000	**4,017,000**
2026–27	POM	4,455,000	1,314,000	1,428,000	326,000	709,000	**8,233,000**
2026–27	Capacity	1,877,000	1,406,000	695,000	23,000	316,000	**4,316,000**
2027–28	POM	4,637,000	1,373,000	1,474,000	333,000	752,000	**8,569,000**
2027–28	Capacity	1,877,000	1,406,000	741,000	23,000	316,000	**4,363,000**
5-yr CAGR	POM	**4.0%**	**4.4%**	**3.1%**	**2.0%**	**6.0%**	**4.0%**
5-yr CAGR	Capacity	**2.5%**	**5.0%**	**16.7%**	**0.9%**	**0.0%**	**4.8%**

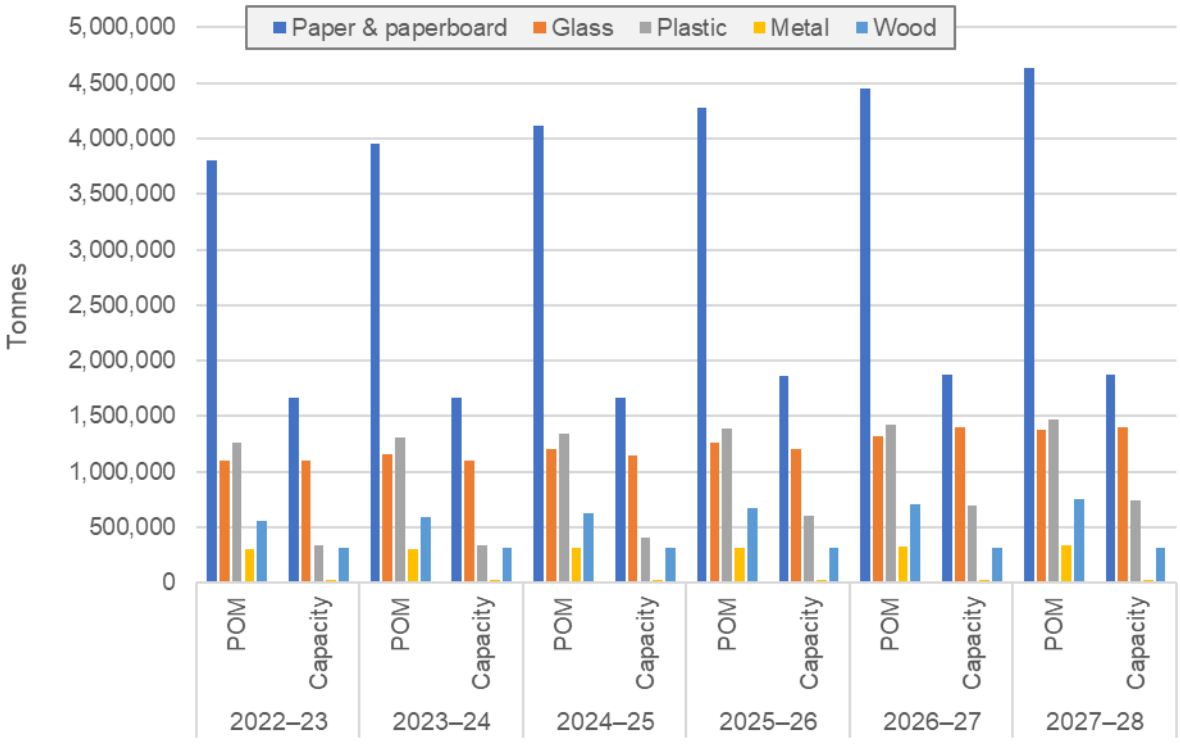

Figure 11 – Packaging POM and reprocessing capacity from 2022–23 to 2027–28, by material group.

3 TRENDS AND INSIGHTS

3.1 Overview

Global packaging regulation and policy are evolving rapidly, driven by increasing concerns and demands for environmental sustainability. One of the most significant trends is the push by consumers for sustainable packaging.

Many countries are implementing stricter regulations to reduce packaging waste and promote the use of recyclable and biodegradable materials. Another key trend is the harmonisation of regulations across regions to streamline compliance and improve system-level efficiencies. Digitalisation and transparency are also becoming crucial in packaging regulation to enhance traceability and ensure compliance with regulatory standards.

The Australian Government supported by states and territories has implemented several policies and programs to address packaging waste and drive broader system changes.

Since 2021 the Australian Government has introduced export bans on certain waste materials to encourage domestic recycling and processing, including restrictions on the export of glass, plastic and paper and cardboard. Supporting the transition to a strong domestic market, the Recycling Modernisation Fund (RMF) has been addressing waste infrastructure gaps in Australia by providing funding and securing co-investment.

Concurrently there is ongoing policy work on harmonisation of kerbside collection and container deposit schemes. The kerbside work aims to improve the efficiency and effectiveness of waste collection systems, ensuring that more recyclable materials (mostly packaging), are properly sorted and processed. Efforts to harmonize container deposit schemes across states and territories aim to streamline recycling processes and increase the recovery rates of beverage containers, and new state schemes have come online.

Australia has also taken steps to phase out problematic single-use plastics. All states and territories have enacted varying bans on single-use plastic items such as straws, cutlery and shopping bags. These bans are part of a broader strategy to reduce plastic pollution and promote the use of sustainable alternatives.

Reform of packaging regulation is in train, with policy options being consulted on by the federal government. Regulatory reform aims to support Australia's transition to a circular economy for packaging and drive investment in better packaging design and recovery systems, with a focus on enhancing packaging design for recyclability, improving recyclability labelling and increasing recycled content in packaging. This is supported by the National Framework for Recycled Content Traceability, that aims to improve trust in recycled materials.

The APCO 2030 Strategic Plan, unveiled in August 2024, aims to create economic incentives for material circularity and establish mechanisms to achieve national packaging targets. This plan introduces a new membership fee model based on eco-modulation, which provides an economic incentive for APCO members to reduce and improve their packaging. The funds raised will support high-quality collection, recycling, and packaging stewardship activities, aiming to reduce materials sent to landfill by 1 million tonnes by 2030 (APCO, 2024b, p. 45).

The rest of this section of the report provides analysis and commentary on the trends in packaging consumption, recovery and recovery rates for each major packaging material. These sections explore the trends for each major packaging material and discuss the likely packaging trends in coming years.

3.2 Fibre packaging

Across the 5-year period of 2017–18 to 2022–23 fibre packaging POM had a compound annual growth rate (CAGR) of 5.6%/yr, compared with annual growth in the population of 1.3%/yr over the same period. In mass terms, over the 5-year period fibre packaging POM grew from 2,901 kt to 3,805 kt. This CAGR of 5.6%/yr was well above the CAGR for total packaging POM (excluding wood packaging) over the same period of 3.5%/yr. Wood packaging POM is excluded from the 5-year CAGR calculation as this data was not collected in 2017–18.

These growth rates indicate that fibre packaging is gaining market share relative to glass and plastic packaging (5-year CAGRs of -2.8%% and 3.5% respectively). Overall fibre packaging gained a significant increase in market share, increasing from 53% in 2017–18 to 59% in 2022–23 (excluding wood packaging).

Over the same 5-year period the CAGR in fibre packaging recovery was 6.3%/yr, which is higher than the annual growth rate POM. In mass terms, over the 5-year period fibre packaging recovery grew from 1,817 kt to 2,469 kt (+36%). This increase in recovery was mainly driven by increases in the local reprocessing and use of the recovered fibre packaging, which grew by 59% (491 kt) over the 5-year period. This compares with export growth of 16% (160 kt) over the same period.

The primary driver for increased recovery of fibre packaging is growing domestic consumption, and the opportunity to substitute for domestically produced virgin fibre pulp.

The paper and paperboard sector is a long-established recycler, with the majority of facilities in Australia being supplied entirely by domestically recovered material. As a mature industry, there are few opportunities for investment in new primary reprocessing facilities, where world scale commences at around 0.5 million tonnes/yr of output. As Australia is a net exporter of recycled packaging grades, investment in additional primary processing is unlikely for many years.

As fibre packaging consumption has expanded in Australia, printing and communication paper consumption has declined, allowing one local paper machine to be converted to manufacture recycled corrugated packaging. Just as relevant, increased consumption has resulted in increased downstream investments in converting, especially of corrugated boxes.

The major recent investments, all of which relate to containerboard or recycled corrugated packaging production, include:

- Opal Australian Paper in Maryvale (Vic) – Conversion of a paper machine in 2022 from printing and communication paper to manufacture recycled grades of containerboard.
- Opal Fibre Packaging Australia in Wodonga (Vic) – New corrugating facility in 2023.
- Visy in Coolaroo (Vic) – Drum pulper installed in 2023 to increase throughput capacity and produce higher quality recovered fibre.
- Visy in Brisbane (Qld) – New corrugating facility in 2023.

Despite the growth in fibre packaging recovery, in mass terms the total fibre packaging disposed to landfill has grown over the same period. In 2017–18 there was an estimated 1,083 kt of fibre packaging sent to disposal, compared with 1,336 kt in 2022–23.

Provided in **Figure 12** is the available time-series data on fibre packaging POM and recovery quantities, and the recovery rate from 2017–18 to 2022–23. The recovery rate in 2022–23 was 65%, which was down on the 68% recovery rate estimated for 2021–22.

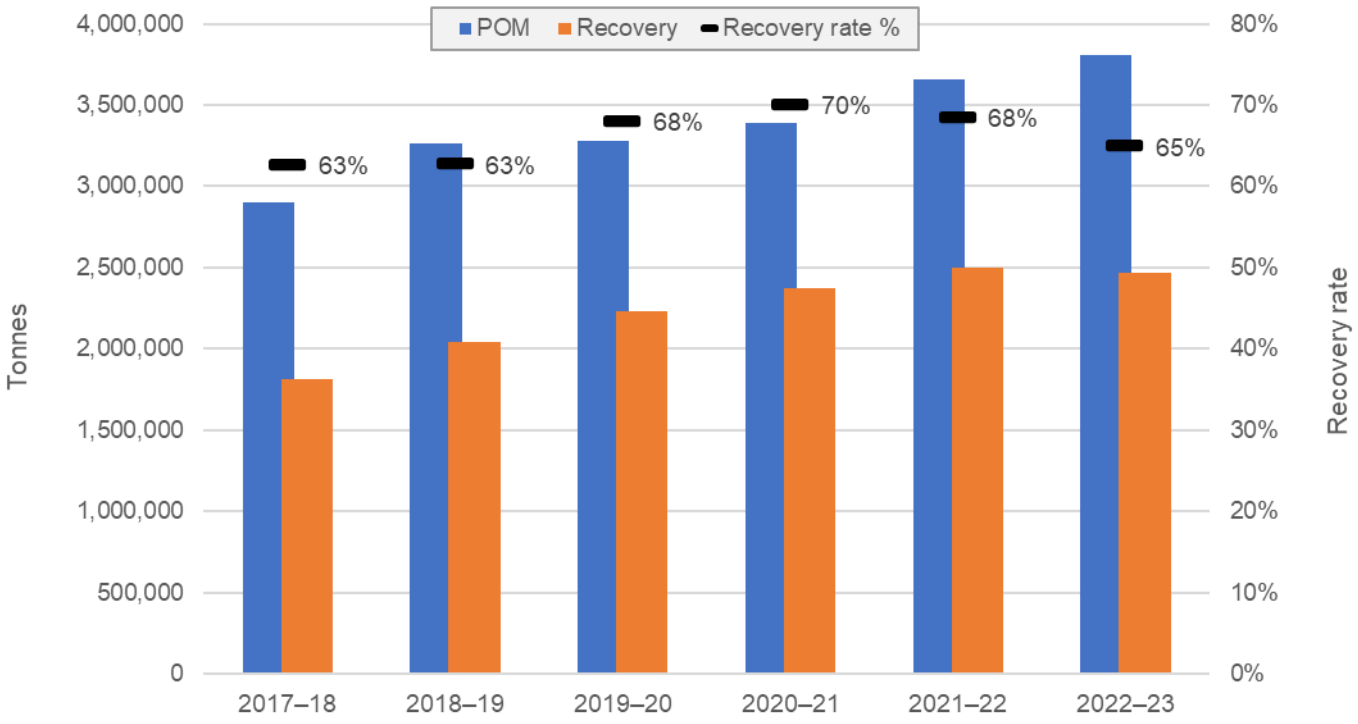

Figure 12 – Paper & paperboard packaging POM and recovery (mass basis), and recovery rate (% basis), from 2017–18 to 2022–23.

Out to 2027–28, fibre packaging manufacturers estimate that fibre packaging POM will continue to grow at a rate that continues to be well above population growth, with a 5-year projected CAGR POM of 4.0%/yr across the 2022–23 to 2027–28 period. The projected annual population growth is 1.4%/yr over the same period.

Across the 5-year period of 2022–23 to 2027–28 fibre packaging reprocessing capacity is projected to increase at an CAGR of 2.5%/yr, increasing from 1,663 kt/yr in 2022–23 to 1,877 kt/yr in 2027–28. Fibre packaging POM in 2027–28 is projected to be 4,637 kt, which means that the maximum possible local recovery rate would be 40% in 2027–28 at 100% utilisation of all reprocessing facilities projected to be in operation in 2027–28, and excluding export markets for unprocessed baled fibre packaging and local energy recovery related destinations.

In 2017–18 the average post-consumer recycled content of fibre packaging was 49%, with an estimated 1,421 kt of post-consumer recycled content incorporated into 2,901 kt of fibre packaging POM. In 2022–23 the post-consumer recycled content of fibre packaging had grown significantly to 56%, with 2,124 kt of post-consumer recycled content incorporated into 3,805 kt of fibre packaging POM.

As fibre packaging POM continues to grow, significant additional post-consumer recycled content will be required to maintain overall recycled content rates. For context, adopting a target of 58% post-consumer recycled content in fibre packaging by 2027–28 (APCO, 2024b, p. 44), at which time it is projected that fibre packaging POM will be 4,637 kt, will require 2,689 kt of post-consumer recycled content, which is a 27% increase on the 2022–23 quantity of 2,124 kt. This is significantly higher than the projected local fibre packaging reprocessing capacity by 2027–28 of 1,877 kt/yr.

Fibre packaging with a good recycling potential classification has increased from 92% in 2017–18 to 94% in 2022–23, compared with a packaging market average of 86% in 2022–23.

Market context and challenges

There are few items not packaged into corrugated boxes, including goods packaged in most other packaging materials and other forms of fibre packaging. For this reason fibre-based packaging represented 54% of all packaging POM in Australia in 2022–23.

Due to the large quantities and broad use in both the B2B and B2C sectors demand for corrugated packaging is closely linked to the state of the national economy. While corrugated packaging demand and therefore supply follows general economic trends, there are different trajectories for other forms of fibre packaging. These are discussed below.

Australia is entirely self-sufficient for the manufacturing of corrugated packaging to meet local demand, and is in fact a net exporter of both virgin and recycled fibre packaging substrates for the manufacture of corrugated boxes. Australia is also a net exporter of recovered fibre.

A large proportion of the fibre to meet local manufacturing demand comes from the substantial imports of manufactured goods of all types, most of which are delivered to Australia in corrugated boxes. In 2022–23 it is estimated that the quantity of corrugated packaging entering the Australian supply chain as imported filled packaging was nearly 1.3 million tonnes.

This creates a surplus of recovered fibre (most of which is itself manufactured from recycled fibre), which supplies local manufacturing sufficient to meet Australian needs, as well as significant exports of recovered paper and of finished recycled grades of paperboard.

This is different for the significant substrates of folding boxboard, cartonboard and polymer coated paperboards. These materials are almost entirely imported and include a relatively wide range of fibre-based substrates that are often laminated to produce a finished product. Trend growth in consumption of these board grades is less elastic than that for corrugated boxes, because they are deployed across a narrower range of finished goods.

Domestic manufacturing of kraft paper based paper bags and sacks has increased significantly in recent years, as the move away from single-use plastics has created increased use of the paper supermarket shopping bag. A mix of locally produced and imported bag and sack paper is being used to produce increased quantities of bags and sacks. This includes high-strength sacks, like those used for cement, flour and other heavy, loose products.

Australian production of moulded fibre products (e.g. egg cartons and fruit trays) is failing to keep pace with rapidly growing demand. In part, this a result of the local moulded fibre sector manufacturing entirely from recycled fibre. A wide range of food products that could be packaged in locally produced moulded fibre, are not, as brand owners, consumers and in some cases, regulators, specifying virgin fibre to be used for food contact purposes.

As a consequence, one of the growing lines of fully converted empty packaging imports, is moulded fibre products, with an ever-growing number of importers, from a very wide range of countries.

Across all fibre based packaging there has been significant growth in imports of fully-converted fibre packaging. Three years ago in 2019–20 imports were 117 kt/yr, but are estimated to have reached 189 kt/yr in 2022–23. These imports consist of a large number of relatively small transactions, with importers routinely ordering a single shipping container, or even less. This has potential consequences for fibre packaging recovery rates, as these small order formats, even though fibre-based, may be less compatible with Australian recovery systems.

The trend toward increased imports of finished packaging is likely to continue. However, these are still only around 5% of total fibre packaging used in the domestic economy, nearly all of which is otherwise supplied from domestic sources.

Although fibre packaging has relatively high recovery rates, over 1.3 million tonnes is still sent to landfill. APCO is considering how to support the increased collection and recycling of fibre by 2030 (APCO, 2024b, p. 20).

3.3 Glass packaging

Provided in **Figure 13** is the available time-series data on glass packaging POM and recovery quantities, and the recovery rate from 2017–18 to 2022–23. The glass recovery rate has increased significantly in 2022–23 (69%) from the 2021–22 estimate (63%), mainly driven by a strong increase in glass recovery, but also by a decrease in glass packaging POM.

This increased recovery is underpinned by maturing container deposit schemes nationally and increasing diversion of packaging glass back into both new glass packaging and into non-packaging applications, with strong crushed aggregate, sand and high-value non-packaging end-markets in place.

The rollout of the fourth kerbside bin in Victoria for glass packaging only, was likely also contributing to this strong increase in recovery. The Victorian Government announced the statewide introduction of separate glass collections from 2021, for full roll-out by all councils by 2027. As of June 2023, at least 7 Victorian councils had implemented separate glass collections.

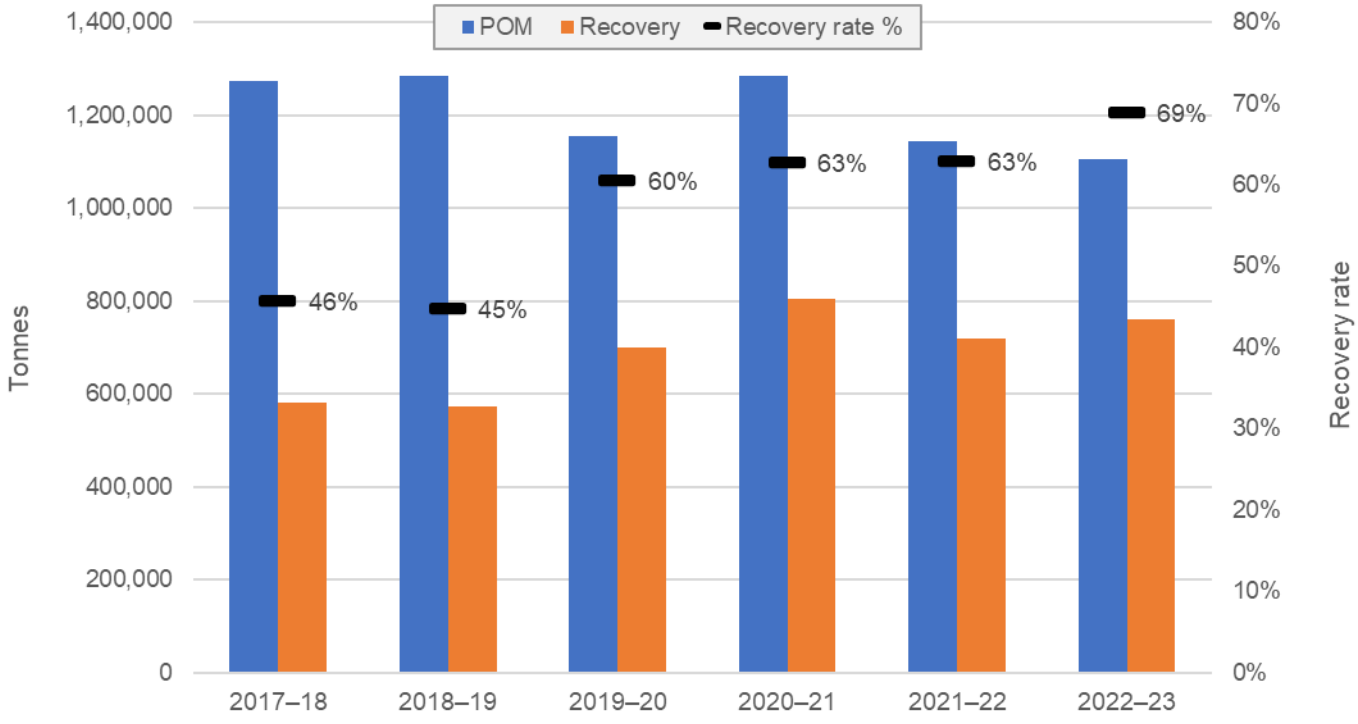

Figure 13 – Glass packaging POM and recovery (mass basis), and recovery rate (% basis), from 2017–18 to 2022–23.

In Australia glass packaging continues to be mainly recovered via commingled recycling bins. As mentioned above, Victoria has continued to see the roll out of ‘glass only’ purple bins, due to be in place for all councils by 2027.

Across the 2018–19 to 2022–23 period container deposit eligible glass packaging POM has increased from 319,000 tonnes to 456,000 tonnes (a 43% increase), and container deposit eligible glass packaging recovery has increased from 258,000 tonnes to 382,000 tonnes (a 48% increase). During this period the WA container deposit scheme came into operation, which contributed 55,000 tonnes (14%) to these significant increases.

Further large increases can be expected in 2023–24 due to the introduction of the Victorian scheme in November 2023. See Appendix E for more detail on container deposit scheme data across all the related packaging material types.

Glass beneficiation is an essential part of glass packaging recovery. The used packing glass is sorted (including colour sorting), cleaned, crushed and sized. The beneficiated glass is furnace-ready cullet, which is the input needed by a glass reprocessing facility to create new products.

Glass beneficiation capacity has seen significant growth in the past two years, particularly in southeastern Australia, with two significant projects beginning operation. These were a new South Australia facility in October 2022, and an upgraded Victorian facility in March 2024. In more detail, the publicly available information on these two facilities is as follows:

- Orora's glass beneficiation facility in Gawler, South Australia commenced operations in October 2022 with capacity to process 100,000–150,000 tonnes per year. Built around very high yield efficiencies this plant targets supply from cleaner container deposit segregated sources. Most of this glass is sourced from South Australia, but glass from other jurisdictions is also transported to this facility.
- Visy expanded its Laverton, Victoria based beneficiation facility, by an additional 100,000 tonnes to 200,000 tonnes per year (approximately doubling capacity). Operating since February 2024, this facility can optically sort glass down to 3 mm in size. The resulting cullet will be used by the glass packaging manufacture plant in Spotswood (Victoria) in support of Visy’s public target of an average of 70% recycled content in new glass packaging. While not influencing the 2022–23 packaging data, the impact of this facility should be evident in future reporting cycles.

The growth in beneficiation capacity may address the supply–demand imbalance of recent years, although the constrained bottle-to-bottle recycling market in Australia, with only five glass packaging manufacturing facilities will also play a role in the market.

Industry also continues to push up the post-consumer recycled content in glass packaging. The post-consumer recycled content of locally manufactured packaging glass increased from 32% in 2017–18 to an average of 50% in 2022–23, supporting demand for clean recovered glass and reducing the quantity of virgin material.

The impact of these additional facilities is expected to provide sufficient capacity for the quantity of container deposit eligible glass POM nationally, although this is not the only market for this glass. Crushed glass, as a glass sand replacement, has reportedly been growing nationally. This has been supported by changes to construction specifications, that have increased how much recycled glass sand can be used in road and rail construction.

Nationally, it is generally the more contaminated glass collected through MRFs that continues to be destined for road construction or landfill remediation, as container deposit sourced glass is preferred for beneficiation and new packaging manufacture. However, in regional areas, or jurisdictions not serviced by local beneficiation facilities, container deposit sourced glass is also often crushed for local use, due to the prohibitive cost of transporting the glass to beneficiation facilities that are hundreds or thousands of kilometres away. This can provide a viable recovery alternative, and increase recovery rates, where access to beneficiation is restricted by transport cost.

There are a number of high-value alternative products able to be manufactured from recovered packaging glass. Used packaging glass into fertiliser products is an example of a high value product, as is powdered glass into insulation and sand into filter medium. For non-vertically integrated MRF operators, even in metro areas, the crushed glass market can yield better returns than sending to beneficiation facilities to produce furnace ready glass cullet, providing an alternative viable market.

3.4 Plastic packaging

Across the 5-year period of 2017–18 to 2022–23 plastic packaging POM had a compound annual growth rate (CAGR) of 3.5%/yr, compared with annual growth in the population of 1.3%/yr over the same period. In mass terms, over the 5-year period plastic packaging POM grew from 1,067 kt to 1,265 kt. This CAGR of 3.5%/yr is the same as the CAGR for total packaging POM (excluding wood packaging) over the same period of 3.5%/yr.

This indicates that while plastic packaging may be losing market share to paper & paperboard and metal packaging (5-year CAGRs of 5.6% and 7.3% respectively) and gaining market share from glass packaging (5-year CAGR of -2.8%), overall plastic packaging is maintaining its share of the packaging market.

Over the same 5-year period the CAGR in plastic packaging recovery was 6.3%/yr. This is nearly double the annual growth rate in plastic packaging POM, but is off a low initial recovery rate. In mass terms, over the 5-year period plastic packaging recovery grew from 173 kt to 234 kt. This is 24 kt less than recovery in 2021–22.

This fall in recovery between 2021-22 and 2022-23 was mainly driven by reductions in the export of unprocessed used plastic packaging, following the introduction of the export restrictions on the export of unprocessed single-polymer bales of scrap plastics from July 2022, which were not offset in 2022–23 by new plastic reprocessing facilities nationally.

In landfill terms, in 2017–18 there was an estimated 894 kt of plastic packaging sent to landfill, compared with 1,030 kt in 2022–23. The quantity of plastic packaging sent to landfill in 2022–23 was a 1% increase on the 2021–22 quantity (1,019 kt).

Provided in **Figure 14** is the available time-series data on plastic packaging POM and recovery quantities, and the recovery rate from 2017–18 to 2022–23. There has been a small decrease in the plastic packaging recovery rate in 2022–23 (19%) relative to 2021–22 (20%).

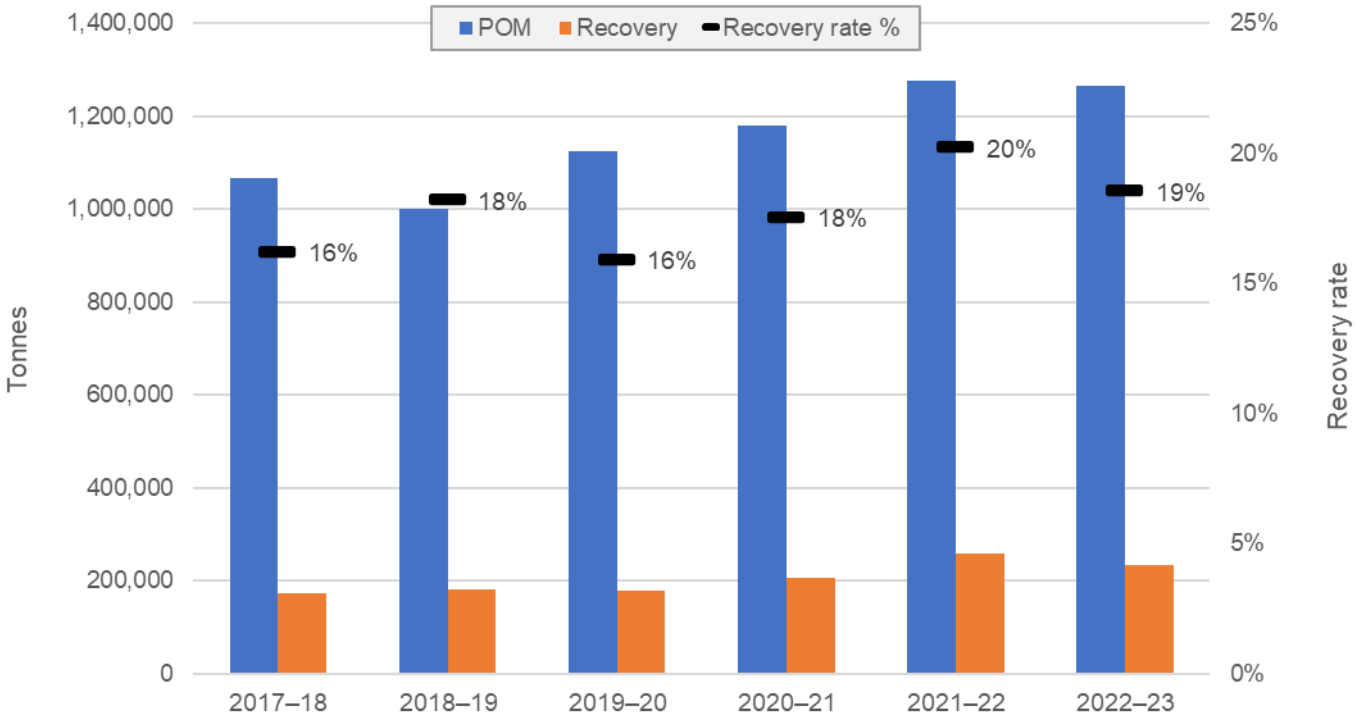

Figure 14 – Plastic packaging POM and recovery (mass basis), and recovery rate (% basis), from 2017–18 to 2022–23.

Out to 2027–28, plastic packaging manufacturers estimate that plastic packaging POM will continue to grow at a rate that continues to be well above population growth, with a 5-year projected CAGR POM of 3.1%/yr across the 2022–23 to 2027–28 period, compared with population growth of 1.4%/yr.

Across the 5-year period of 2022–23 to 2027–28 plastic packaging reprocessing capacity is projected to increase at an CAGR of 17%/yr, increasing from 343 kt/yr in 2022–23 to 741 kt/yr in 2027–28. Plastic packaging POM in 2027–28 is projected to be 1,474 kt, which means that the maximum possible local recovery rate would be 50% in 2027–28 at 100% utilisation of all reprocessing facilities projected to be in operation in 2027–28.

Additional reprocessing capacity is being realised from the establishment of new facilities and expanding capacity for existing facilities. Some major publicly reported examples include:

- Close the Loop in Reservoir (Vic). This facility targets flexible HDPE, LDPE and PP packaging for reprocessing.
- Circular Plastics Australia (Pact/Asahi/Cleanaway) has established plants in Albury (NSW), Altona (Vic) and Laverton (Vic). These facilities target rigid PET, HDPE and PP packaging for reprocessing.
- iQ Renew in Kundle Kundle (NSW). This facility targets flexible HDPE, LDPE and PP packaging for reprocessing.
- Licella in Altona (VIC). This facility will target flexible HDPE, LDPE and PP packaging for reprocessing.
- Re.Group in Hallam (Vic). This facility targets rigid PET, HDPE and PP packaging for reprocessing.
- Remondis in Jandakot (WA). This facility will target flexible LDPE packaging for reprocessing.

The projected increases in plastic packaging reprocessing capacity are being supported by the Recycling Modernisation Fund (RMF). In 2022–23 approximately 57 kt of capacity was commissioned for processing PET, HDPE and mixed polymer across nine facilities in NSW and Victoria.

In 2022–23 and 2023–24 the RMF plastics technology stream has focussed grants on harder to recycle plastics with up to $60 million available under the plastics technology stream. Many of these grants specifically target flexible plastic recovery. For the most part the positive impacts of this funding are expected to be realised in future reporting years.

In 2017–18 the average post-consumer recycled content of plastic packaging was 2%, with an estimated 23 kt of post-consumer recycled content incorporated into 1,067 kt of plastic packaging POM. In 2022–23 the post-consumer recycled content of plastic packaging had grown to 8%, with 106 kt of post-consumer recycled content incorporated into 1,265 kt of plastic packaging POM.

For context, adopting a target of 12% post-consumer recycled content in plastic packaging by 2027–28 (APCO, 2024b, p. 44), at which time it is projected that plastic packaging POM will be 1,474 kt, will require 177 kt of post-consumer recycled content, which is nearly a 70% increase on the 2022–23 quantity of 105 kt. However, as the projected plastic packaging reprocessing capacity by 2027–28 is 741 kt/yr, the availability of this quantity of high-quality post-consumer recycled content appears feasible.

Plastic packaging with a good recycling potential classification has decreased from 59% in 2017–18 to 46% in 2022–23, but would have been around 68% if not for the collapse of the REDcycle program.

Trends in rigid and flexible plastic packaging POM and recovery are considered separately below.

Rigid plastic packaging

In 2022–23 rigid plastic packaging POM was estimated at 724 kt. This quantity includes an estimate of plastic packaging POM for which the rigidity classification was unknown, but was likely rigid. This compares with an estimated 706 kt of rigid plastic packaging POM in 2021–22, which is around a 3% increase in consumption.

With respect to rigid plastic packaging recovery, during 2022–23 recovery of rigid plastic packaging was 200 kt, with a recovery rate 28%. This is a slight increase on the 196 kt recovered in 2021–22, also with a recovery rate of 28%.

For the foreseeable future it is anticipated that there will be gradual increases in the good recycling potential of rigid plastic packaging, due to continual improvements in rigid plastic packaging design and material selection, provided collection systems expand for C&I streams, and end-markets grow.

Flexible plastic packaging

In 2022–23 flexible plastic packaging POM was estimated at 540 kt. This quantity includes an estimate of plastic packaging POM for which the rigidity classification was unknown but was likely flexible. This compares with an estimated 574 kt of flexible plastic packaging POM in 2021–22, which is an apparent 6% decrease in consumption.

The reasons for this fairly significant (apparent) fall in flexible plastic packaging POM are not clear, and are not consistent with the available manufacturer estimates of market growth in flexible plastic packaging, which are generally in the range of +2–4%/yr over the next few years (depending on the material type / component group combination). However, it is possibly a combination of the following factors:

- Fibre-based forms of packaging are taking market share from plastic films. For example a significant proportion of shopping bags have transitioned from plastic to fibre over the last couple of years.
- Local flexible plastic packaging manufacturers are gaining market share over imports, so have a relatively bullish projections of market growth.
- Incremental levels of elimination and lightweighting are occurring.
- Residual COVID-19 impacts, for example inventory drawdowns.
- General year-on-year data reporting volatility.

With respect to flexible plastic packaging recovery, during 2022–23 recovery of flexible plastic packaging was 34 kt, with a recovery rate 6%. This is a significant fall on the 62 kt recovered in 2021–22, with a recovery rate of 11%. This fall was mainly due to an apparent fall in LDPE wrap recovery of 25 kt, which is mostly B2B LDPE pallet wrap.

Bales of LDPE pallet wrap have had export restrictions from July 2022, and while something in the order of 10–15 exemptions (to allow export) have been granted by the Department of Climate Change, Energy, the Environment and Water (DCCEEW), the export restrictions have still had an impact on LDPE pallet wrap recovery in 2022–23.

This has resulted in more of this LDPE wrap being sent to landfill relative to 2021–22, as it is less economic to export, particular for collectors that do not directly hold export exemptions. Possibly there was also a degree of stockpiling occurring over 2022–23, while collectors waited for export exemptions (or exemption renewals) to be granted, or for new local reprocessing capacity to start operations.

The recovery of B2C flexible plastic packaging appears to have held fairly steady in 2022–23 relative to 2021–22. However, there was a significant fall in recovery between 2020–21 and 2021–22, following the collapse of the REDcycle B2C flexible plastic collection scheme.

Recovery rates for B2C flexible plastic packaging are unlikely to improve in the next 2–3 years due to the need for significant developments in collection and sorting systems, reprocessing capacity, and end market availability. Until these improvements occur, many forms of flexible packaging will not achieve the classification of ‘good recycling potential’, even if technically recyclable by design.

Market context and challenges

Plastic packaging recovery has remained low for many years, fundamentally because the cost to recover and process many forms of used plastic packaging to a quality to replace virgin fossil-fuel based plastics is higher than the cost of the virgin plastics.

It is important to qualify this apparent cost differential, in that virgin plastics have two significant unpriced costs associated with production, which are those related to the greenhouse gas (GHG) emissions of fossil-fuel based plastics production, and of managing the plastics following disposal. Recycled plastics generally have lower GHG emissions associated with production (Blue Environment, 2023, p. 58), and have the cost of recovery embedded in the production cost.

The major challenges (excluding packaging redesign for recovery) that must be overcome to improve the recovery rate of plastic packaging are summarised in the APCO 2030 Strategic Plan (APCO, 2024b, p. 44):

- The absence of a collection and recycling pathway for household flexible plastics and the high economic cost of putting one in place.
- Challenges in collection and sortation of rigid polypropylene.
- The need to increase B2B collection and recycling.
- The need for substantial new sortation and reprocessing capacity particularly mechanical and chemical reprocessing for flexible plastics.
- End-market development.

3.5 Metal packaging

Metal packaging makes up the smallest proportion of packaging POM at only 4.3% (302,000 tonnes) of all packaging POM.

Provided in **Figure 15** is the available time-series data on metal packaging POM and recovery quantities, and the recovery rate from 2017–18 to 2022–23.

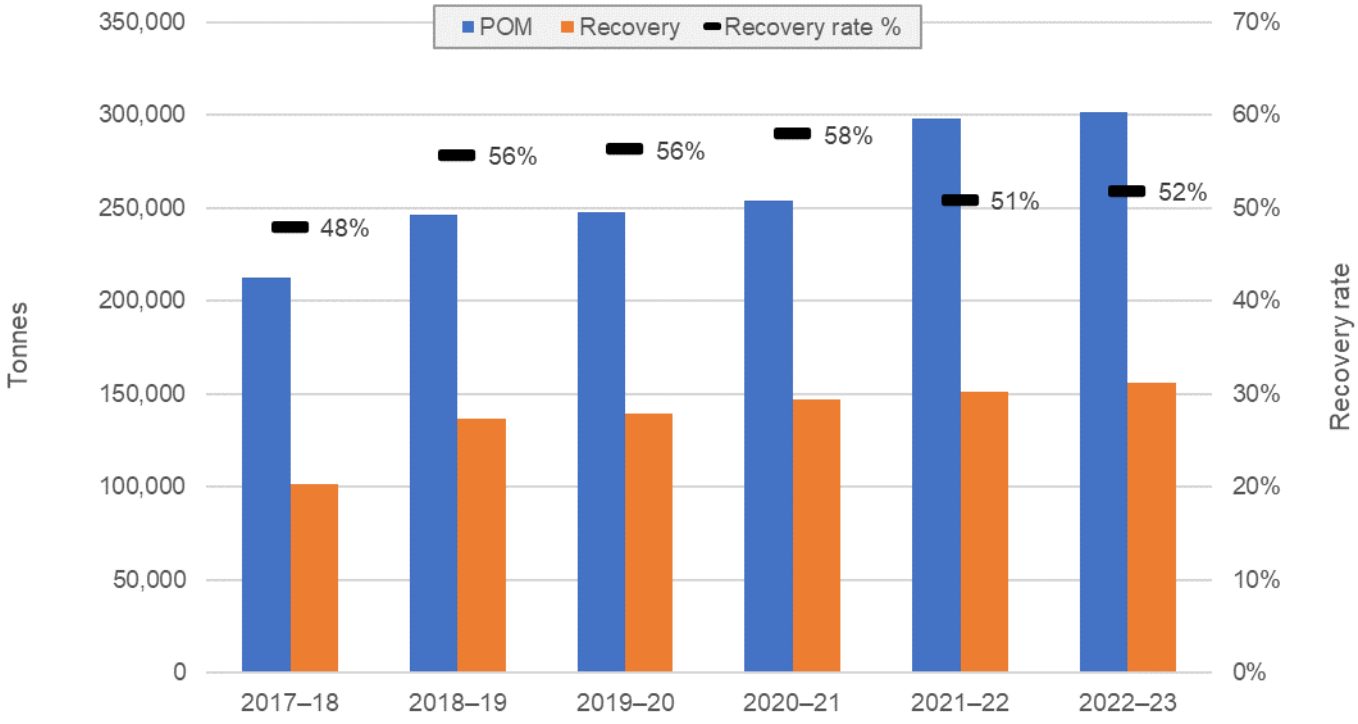

Figure 15 – Metal packaging POM and recovery (mass basis), and recovery rate (% basis), from 2017–18 to 2022–23.

Across the 2017–18 to 2022–23 period metal packaging POM has increased from 213,000 tonnes to 302,000 tonnes (a 42% increase) but recovery rates have remained static relative to 2021–22.

In Australia metal packaging is mainly recovered via commingled recycling bins and container deposit or business drum collection schemes. Metal packaging consumption is dominated by cans (87%) and barrels or drums at 10%. Tin-plate steel and beverage aluminium are the main types of metal used for production of the cans.

Recovered tin-plate steel packaging is considered a low value form of scrap steel and is not purchased by local smelter operators in any notable quantity and is almost entirely exported for smelting.

In comparison aluminium is a high value product and highly recyclable provided it is not heavily contaminated. However, used aluminium packaging is also almost entirely exported for overseas processing as well.

A significant point of difference to other packaging types is that almost all recovered metal packaging is sold into export markets. This is due to a combination of lack of interest in this material by local smelter operators, and the availability of deep export markets. Generally steel and aluminium packaging is recycled back into the respective post-consumer metal pools and go into durable applications such as vehicles, building materials and many other products, and little is specifically purchased for smelting back into packaging sheet grades.

In Australia Visy and Orora produce the majority of can packaging. Small quantities of empty cans (4.3%) are imported for local filling. The post-consumer recycled content incorporated into metal packaging is relatively low at approximately 12%. Current estimates of post-consumer recycled content in beverage aluminium and tin-plate steel are 22% and 10% respectively. This is much lower than what is reported as ‘easily achievable’ use of post-consumer recycled content which is estimated to be 90%.

Metal packaging reprocessing capacity projections cannot be determined, due to almost all metal packaging being exported, and there being no reported significant local (Australian) initiatives to increase the local reprocessing of either aluminium or tin-plate steel packaging. There have been limited scale pilots accepting aluminium can scrap into two local smelters. However, these appear unlikely to scale up in the medium to longer term. Export markets remain strong, although could be vulnerable to any future supply chain disruptions that result from global events, as was observed during the height of the COVID-19 pandemic.

Unlike tin-plated steel packaging, the local reprocessing capacity for mild steel packaging (e.g. 205 L drums) is unconstrained relative to the quantities of end-of-life drums requiring reprocessing.

3.6 Wood packaging

Like many packaging products, wood based (or timber) packaging is ubiquitous, but often ‘out of sight, out of mind’. This situation has changed over the last three years.

Most of the timber packaging is pallets, but also includes crates, cases and other packaging formats. As a packaging format, pallets are unusual as they are routinely supplied through proprietary pool systems, with individual pallets tracked through users (who pay rental charges) and including recovery and repair activities, so are an excellent example of a reusable packaging system.

Provided in **Figure 16** is the available time-series data on wood packaging POM and recovery quantities, and the recovery rate from 2019–20 to 2022–23.

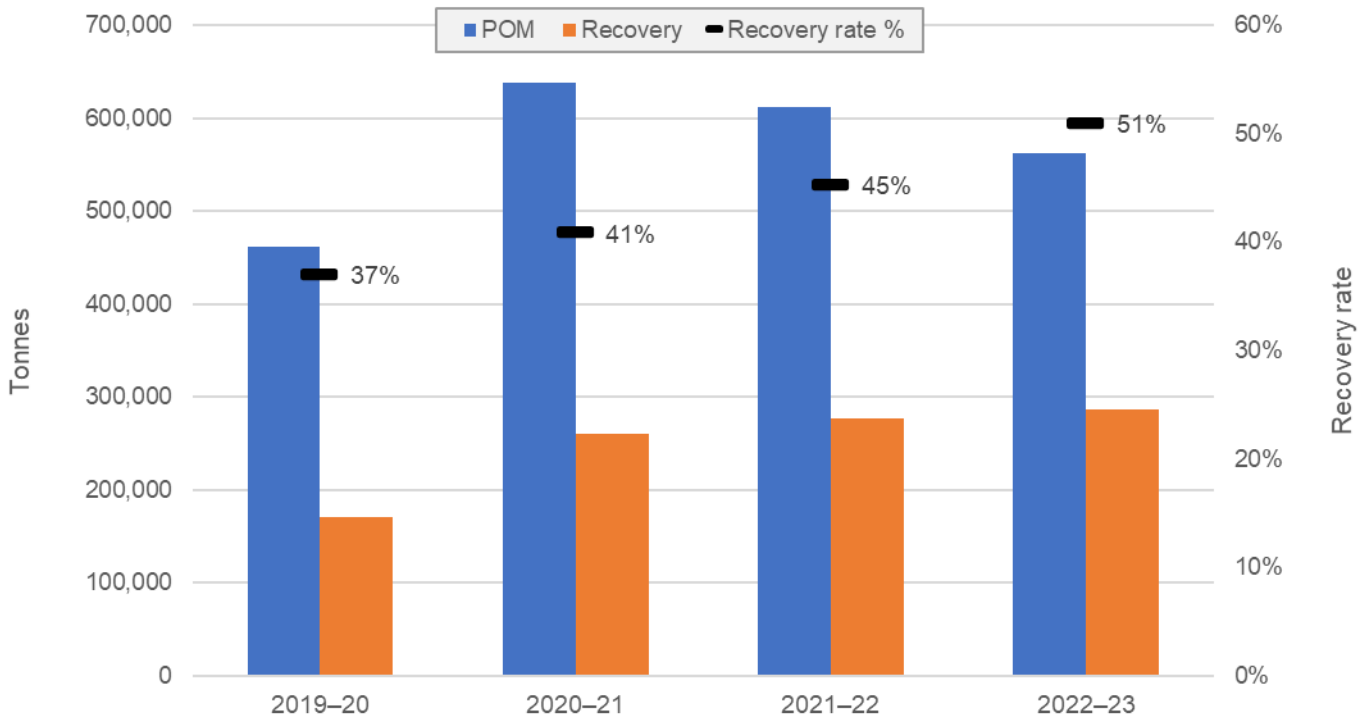

Figure 16 – Wood packaging POM and recovery (mass basis), and recovery rate (% basis), from 2019–20 to 2022–23.

Across the 2020–21 to 2022–23 period wood packaging POM has decreased from 638,000 tonnes to 562,000 tonnes (a 12% decrease). As noted, timber pallets are the majority of wood packaging, making up 461,000 tonnes in 2022–23. Factors influencing pallet material trends are discussed below.

Pallets can be manufactured from either hardwood or softwood, with the decision about which species used linked to the application and load. Hardwood pallets are typically stronger, more durable and easier to repair than softwood pallets, but they are heavier. As a result, hardwood pallets are more likely to be used for heavier loads, over longer road distances, while softwood pallets are more likely to be used for international trade.

The main global pallet pool operator (CHEP) uses predominantly hardwood, while their domestic counterpart (Loscam) is dominated by softwood timber.

Most of Australia's hardwood pallets have historically been manufactured from timber harvested from southern Australia's native forests. In recent years, as state governments have restricted and closed (Victoria) access to native forests for forestry, the supply of pallet timber has dried up. In mid-2024, the largest manufacturer of hardwood pallets in Australia announced it would close later in 2024.

Already constrained by lack of access to resource, hardwood pallet manufacturers increased imports of pallets and pallet components across 2022 and 2023, with most being imported from South East Asian nations.

Because of their utility limitations (lower load bearing capacity and reduced durability), softwood pallets tend to last less time than hardwood pallets and are more difficult to repair. Efforts to replace the hardwood pallet supply with softwoods are challenged by these considerations. It follows that for the same level of service, more softwood pallets are required than would be the case for hardwood.

One consequence of this is that more softwood timber is required, each year, to manufacture pallets than for the same level of service as hardwood pallets. Australian softwood timber supply, all supplied from purpose grown plantations, is highly constrained, with its main application being to supply timber frames, trusses and other elements of houses, townhouses and low to mid-rise multi-residential dwellings. So there are limits to how much softwood can be supplied for the manufacture of packaging products in Australia.

Potentially the greatest change emerging in the market for timber packaging is the trend towards ‘single-use’ pallets. Though some are manufactured locally, the largest supply of these pallets comes from international shipments, landed in Australia in shipping containers, as packaging for imported goods.

These light-weight and often lower quality pallets are designed to be single use, are often constructed of two or more types of timber in the same pallet (solid sawn wood and fibreboard) and are delivered straight from the shipping container to individual customers. This latter circumstance results in them being spread across the country, in relatively small numbers at individual locations, with little or no prospect of them being recovered for re-use, or recycling due to the fibreboard content.

End-of-life recovery of wood-based packaging is increasing, with end-markets including mulches and the manufacture of wood panels (especially particleboard) that are typically used in the Australian built environment.

Some single-use pallets and other timber packaging material is recovered for energy production, including for cement kilns and other energy from waste facilities nationally.

Hardwood pallet supply in Australia are anticipated to decline by around 60% by 2025 (IndustryEdge, 2024), with softwood pallet supply increasing less than 10%. As a result, plastic, aluminium and steel pallets are anticipated to experience strong growth, along with increased imports of timber for manufacturing reusable pallets locally.

The major challenge that must be overcome to increase the recovery rate of wood packaging is responding to the emergence of single use pallets through collection, sorting and reprocessing pathways or policy settings that support reuse.

4 PACKAGING REUSE

4.1 Introduction

This year flows of eight reusable packaging systems have been quantified, which are the same systems as those quantified in 2021–22. This is a continuation of the 2018–19 pilot exercise, working towards fully incorporating reusable packaging flows into the core consumption and recovery dataset, along with the appropriate metrics to measure comparative flows of reusable and single-use packaging systems.

This is a complex measurement that requires more research on the most appropriate methodology. Refer to **Appendix B** for more detail on the reusable packaging systems quantification method.

The reusable packaging systems POM and recovery data quantified in this section of the report are also incorporated into the packaging flows data reported in Sections 2 and 3.

4.2 Reusable packaging system flows

Estimates of reusable packaging system flows in 2022–23 are provided in **Table 13** and **Figure 17**. Reusable timber pallets dominated the material flows for the quantified systems, across inputs (new pallets into use), pool size and outputs (end-of-life pallets leaving the pool).

After timber pallets, plastic pallets had the largest pool size, followed by drums, RPCs, IBCs and beer kegs.

Table 13 – Reusable packaging system flows in 2022–23.

Packaging system	Input flow		Pool size[a]		Output flow	
	(tonnes)	('000 units)	(tonnes)	('000 units)	(tonnes)	('000 units)
Beer kegs	1,000	90	15,100	1,290	200	20
Drums (200–205 L)	13,300	670	33,500	1,680	13,300	670
Rigid IBCs	8,700	240	13,200	320	8,700	240
Reusable plastic pallets	400	10	180,400	4,690	400	10
Reusable timber pallets	194,300	5,470	2,104,400	54,660	194,300	5,470
Dairy crates	1,100	980	11,000	9,760	1,100	980
RPCs	10,700	7,130	21,000	14,000	10,700	7,130
Reusable HDPE bags	6,900	488,820	400	28,200	6,900	488,820
Reusable LDPE bags	17,000	581,650	2,100	145,410	17,000	581,650
Reusable PP bags	700	7,450	200	14,890	700	7,450
Cups/mugs	400	2,640	1,000	11,250	400	2,640
Total	**254,500**	**1,095,100**	**2,382,300**	**286,100**	**253,800**	**1,095,100**

a) Estimated pool size at 30 June 2023.

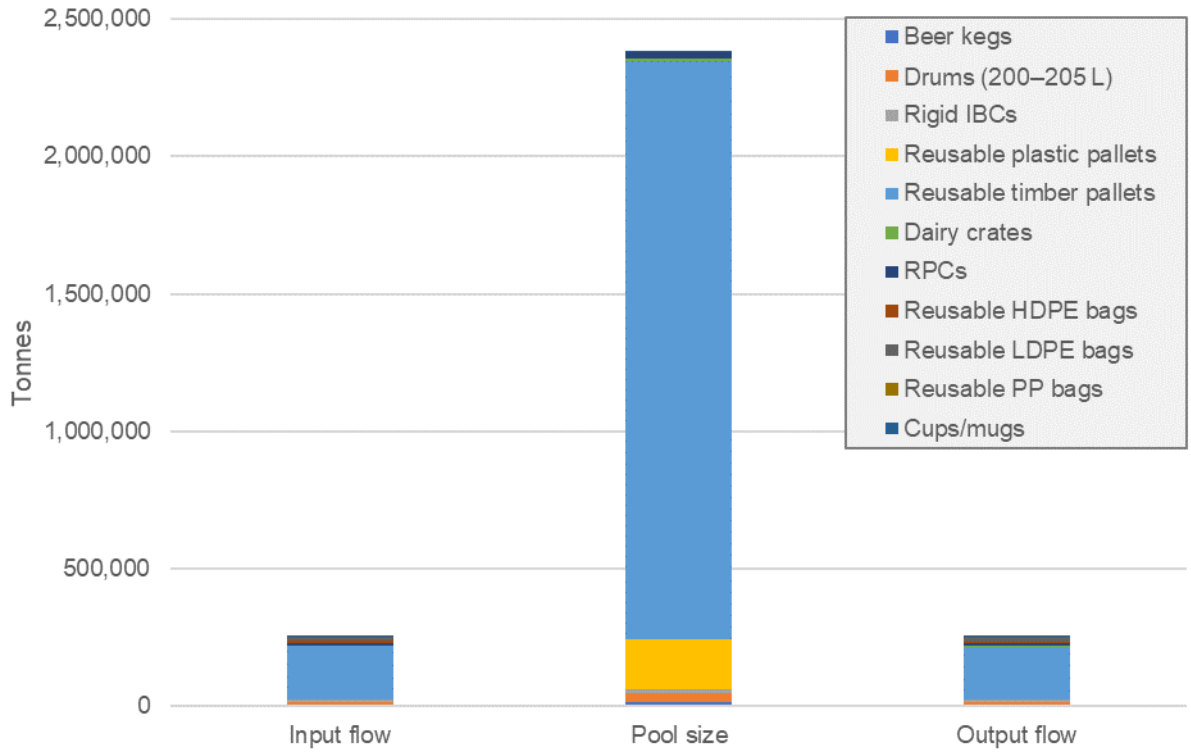

Figure 17 – Reusable packaging system flows in 2022–23.

Reusable packaging system inputs in 2022–23, by material group, are provided in **Table 14** and **Figure 18**. Wood was the most significant material input into the quantified systems, making up 74% of total inputs. Plastic made up 15% and metal contributed 11%.

Table 14 – Reusable packaging input flows in 2022–23, by packaging system and material group.

Packaging system	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beer kegs	0	0	0	1,000	0	**1,000**
Drums (200–205 L)	0	0	100	13,200	0	**13,300**
Rigid IBCs	0	0	600	8,100	0	**8,700**
Reusable plastic pallets	0	0	400	0	0	**400**
Reusable timber pallets	0	0	0	4,900	189,400	**194,300**
Dairy crates	0	0	1,100	0	0	**1,100**
RPCs	0	0	10,700	0	0	**10,700**
Reusable HDPE bags	0	0	6,900	0	0	**6,900**
Reusable LDPE bags	0	0	17,000	0	0	**17,000**
Reusable PP bags	0	0	700	0	0	**700**
Cups/mugs	0	200	200	0	0	**400**
Total (tonnes)	**0**	**200**	**37,800**	**27,200**	**189,400**	**254,500**
Total (%)	**0.0%**	**0.1%**	**14.8%**	**10.7%**	**74.4%**	**100.0%**

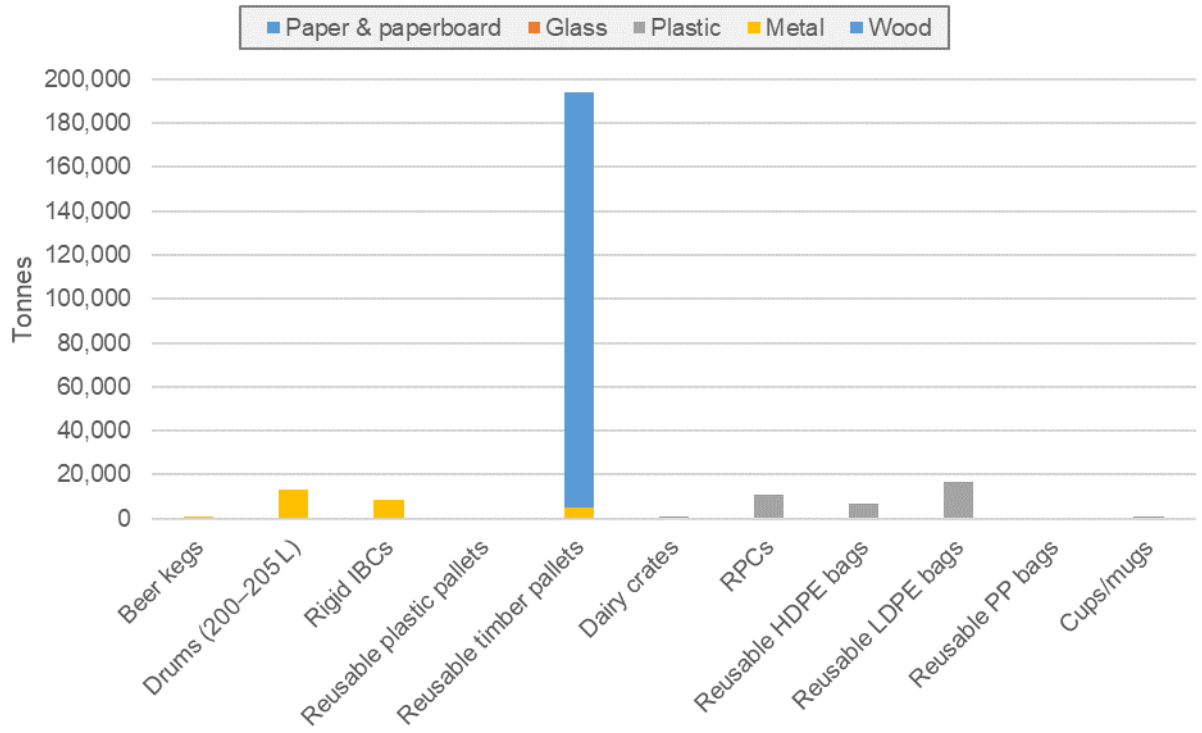

Figure 18 – Reusable packaging input flows in 2022–23, by packaging system and material group.

Reusable packaging system outputs in 2022–23, by end-of-life destination, are provided in **Table 15** and **Figure 19**. The most significant destination was 146,000 tonnes of timber pallets to mulching or composting, which was 57% of total output flows. Overall diversion of outputs to recovery fates was 68%, reflecting the high rates of recovery that are achievable with (mostly) closed system reusable packaging flows.

Table 15 – Reusable packaging system end-of-life destinations in 2022–23.

Packaging system	Recycling	Composting	Landfill	System leakage	Other	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beer kegs	100	0	0	120	0	**240**
Drums (200–205 L)	10,000	0	0	660	2,700	**13,270**
Rigid IBCs	8,600	0	200	0	0	**8,730**
Reusable plastic pallets	400	0	0	20	0	**430**
Reusable timber pallets	0	145,720	38,900	4,860	4,900	**194,290**
Dairy crates	1,000	0	0	110	0	**1,100**
RPCs	5,300	0	0	5,350	0	**10,700**
Reusable HDPE bags	200	0	6,700	0	0	**6,940**
Reusable LDPE bags	600	0	16,400	0	0	**16,980**
Reusable PP bags	0	0	700	0	0	**700**
Cups/mugs	0	0	400	0	0	**380**
Total (tonnes)	**26,200**	**145,720**	**63,300**	**11,120**	**7,600**	**253,800**
Total (%)	**10%**	**57%**	**25%**	**4.4%**	**3%**	**100%**

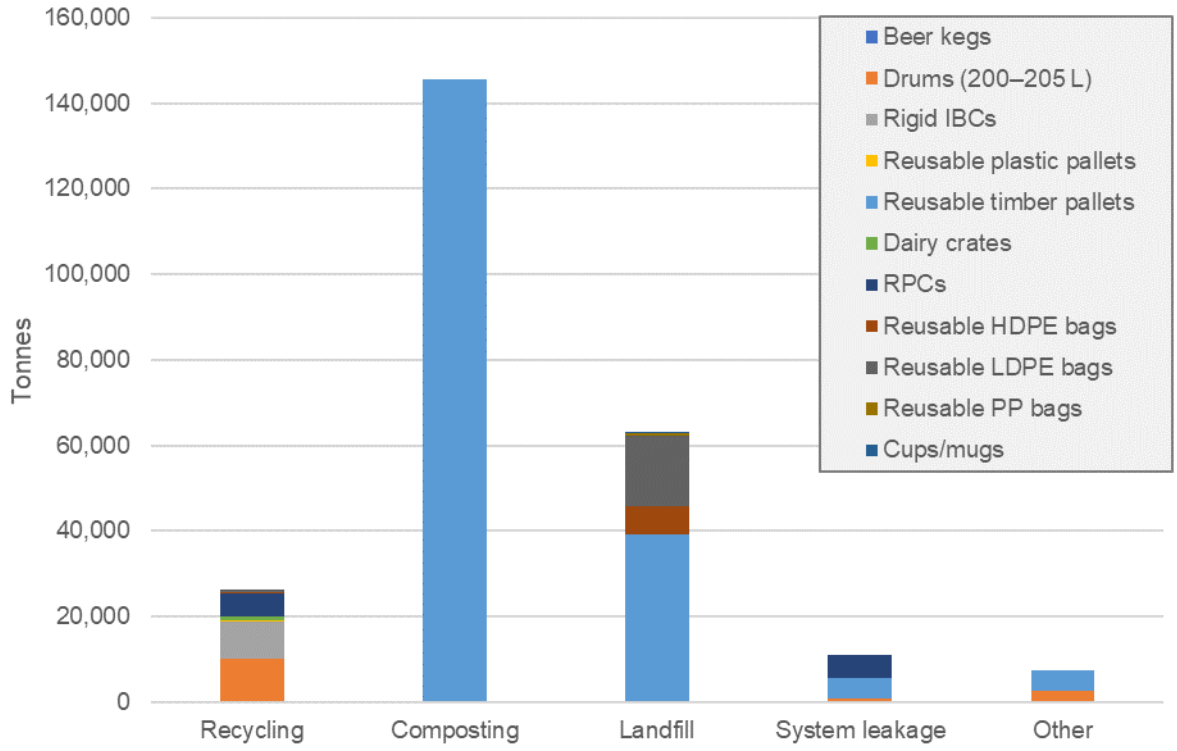

Figure 19 – Reusable packaging system end-of-life destinations in 2022–23.

4.3 Reusable packaging system use phase parameters

Provided in **Table 16** is a summary of significant use phase parameters for the quantified reusable packaging systems. Beer kegs, dairy crates, and RPCs in particular, have long lifespans coupled with relatively high rotations (use cycles) per year.

Table 16 – Reusable packaging system use phase parameters.

Packaging system	Average weight	Average lifespan	Rotations	Rotation time	Average deliverable volume
	(kg/unit)	(yr)	(rotations /life cycle)	(rotations/yr)	(litres/rotation)
Beer kegs	11.567	28	85	3.0	50
Drums (200–205 L)	16.167	3	3	1.0	200
Rigid IBCs	27.750	2	3	2.0	1,000
Reusable plastic pallets	34.250	10	50	5.0	1,000
Reusable timber pallets	36.250	10	37	3.7	1,000
Dairy crates	1.125	10	120	12.0	18
RPCs	1.500	10	140	14.0	10
Reusable HDPE bags	0.014	0	3	52.0	14
Reusable LDPE bags	0.029	0	3	12.0	14
Reusable PP bags	0.094	2	104	52.0	17
Cups/mugs	0.191	4	1,000	250.0	0
Simple average (unweighted)	**13.179**	**7**	**141**	**37.0**	**302**

4.4 Avoided single-use packaging

This section provides indicative estimates of the quantities of single-use packaging that are avoided by using the quantified reusable packaging systems.

The reusable packaging systems have differing levels of competition with the alternative single-use packaging systems. However, this substitutability aspect has been ignored for the purposes of this exercise, which was to determine the theoretical performance of reusable packaging systems relative to single-use packaging systems, in terms of the comparative material flows.

Provided in **Table 17** and **Figure 20** are estimates of the single-use packaging avoided by each reusable packaging rotation, by material group. IBCs avoided the most single-use packaging (the competing product was a single-use IBC), reflecting the importance of reusing IBCs wherever possible.

Table 17 – Single-use packaging avoided per reusable packaging rotation, by material group and packaging system.

Packaging system	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)
Beer kegs	3.2	14.4	0.0	1.6	0.0	19.2
Drums (200–205 L)	0.0	0.0	0.2	7.9	0.0	8.0
Rigid IBCs	0.0	0.0	0.0	41.0	0.0	41.0
Reusable plastic pallets	0.0	0.0	0.0	0.0	20.0	20.0
Reusable timber pallets	0.0	0.0	0.0	0.0	20.0	20.0
Dairy crates	0.5	0.0	0.0	0.0	0.0	0.5
RPCs	0.4	0.0	0.0	0.0	0.0	0.4
Reusable HDPE bags	0.000	0.000	0.007	0.000	0.000	0.007
Reusable LDPE bags	0.000	0.000	0.007	0.000	0.000	0.007
Reusable PP bags	0.000	0.000	0.009	0.000	0.000	0.009
Cups/mugs	0.010	0.000	0.003	0.000	0.000	0.013

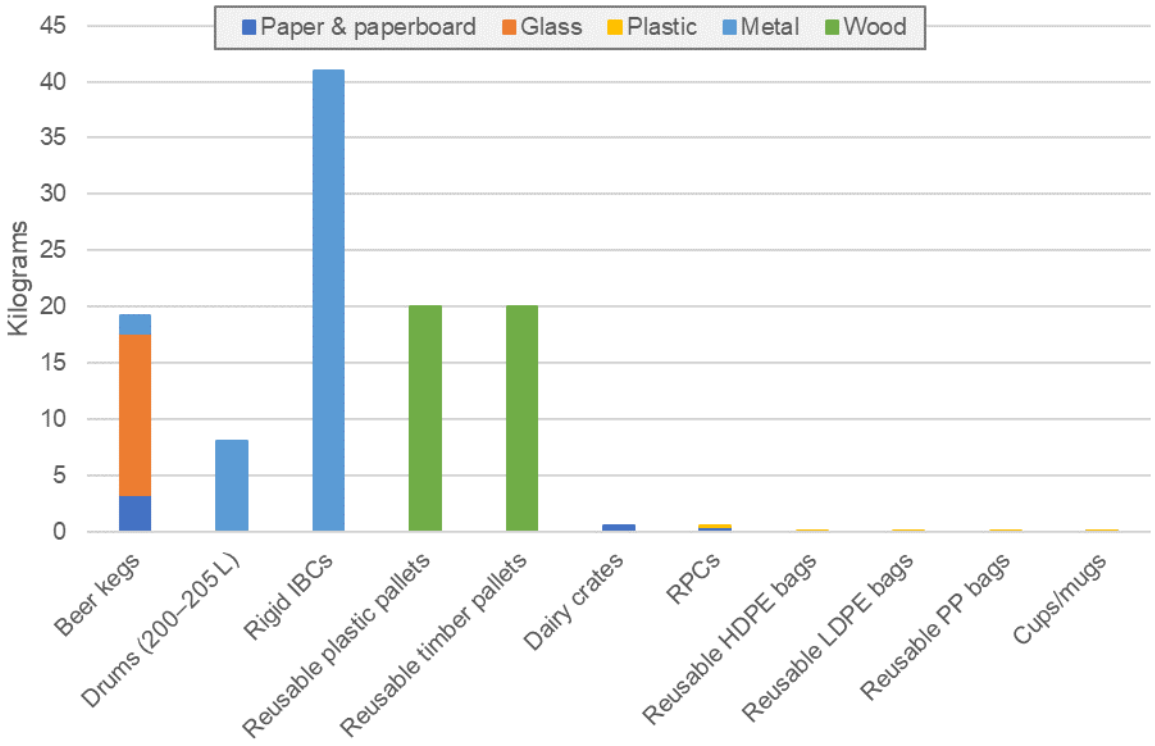

Figure 20 – Single-use packaging avoided per reusable packaging rotation, by material group and packaging system.

Provided in **Table 18** and **Figure 21** are estimates of the total quantities of single-use packaging avoided in 2022–23, through the use of the eight quantified reusable packaging systems.

The quantified reusable packaging systems avoided the use of an estimated 4.78 million tonnes of single-use packaging. Approximately 93% of the avoided single-use packaging consumption benefit is provided by reusable pallets and plastic crates. The net theoretical reduction in packaging use was 4.53 million tonnes, as there were 254,500 tonnes of reusable packaging inputs in 2022–23 (Table 13).

Table 18 – Total single-use packaging avoided in 2022–23 through use of the quantified reusable packaging systems.

Packaging system	Paper & paperboard	Glass	Plastic	Metal	Wood	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beer kegs	12,500	55,700	0	6,300	0	74,500
Drums (200–205 L)	0	0	300	13,200	0	13,400
Rigid IBCs	0	0	0	26,300	0	26,300
Reusable plastic pallets	0	0	0	0	468,500	468,500
Reusable timber pallets	0	0	0	0	3,990,200	3,990,200
Dairy crates	58,600	0	0	0	0	58,600
RPCs	85,200	0	1,700	0	0	86,900
Reusable HDPE bags	0	0	10,700	0	0	10,700
Reusable LDPE bags	0	0	12,700	0	0	12,700
Reusable PP bags	0	0	6,800	0	0	6,800
Cups/mugs	27,600	0	8,200	0	0	35,700
Total (tonnes)	**183,900.0**	**55,700.0**	**40,300.0**	**45,800.0**	**4,458,700.0**	**4,784,400.0**
Total (%)	**3.8%**	**1.2%**	**0.8%**	**1.0%**	**93.2%**	**100.0%**

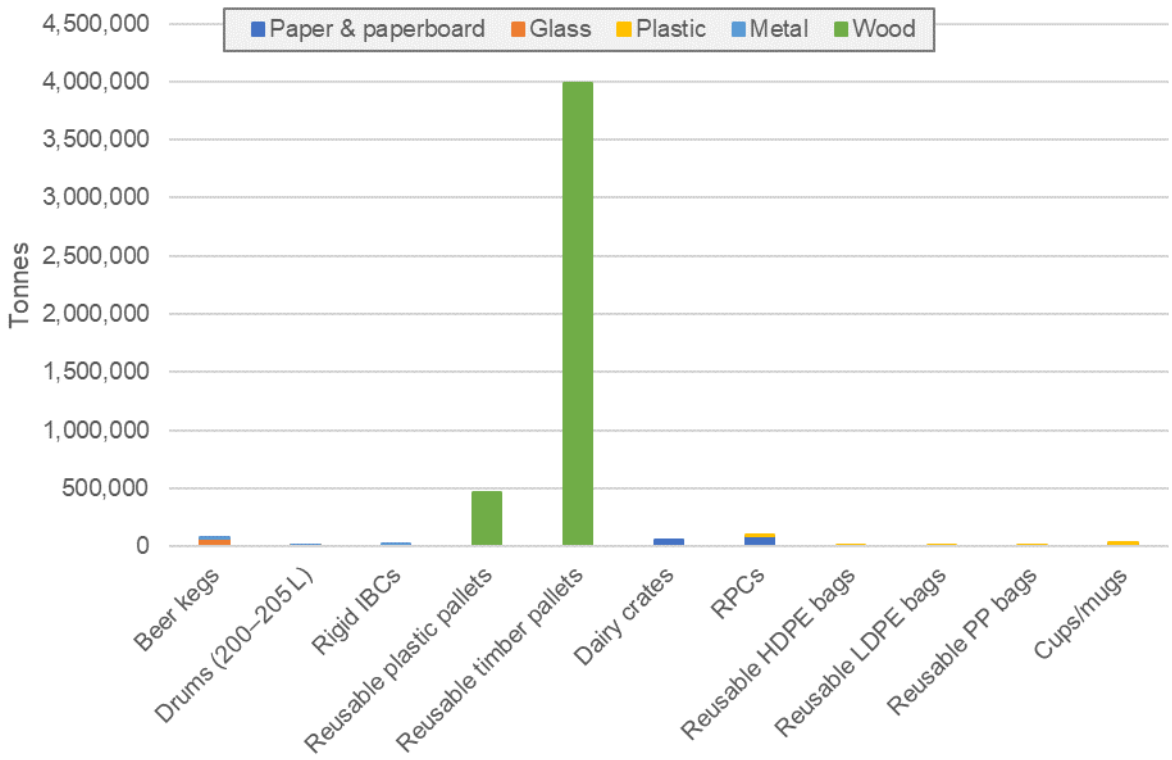

Figure 21 – Total single-use packaging avoided in 2022–23 through use of the quantified reusable packaging systems.

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APPENDIX A – GLOSSARY OF TERMS AND ABBREVIATIONS

Table A-1 – Glossary of terms and abbreviations.

Term	Definition
Beneficiation (of glass)	Processing of used glass packaging. The beneficiation process includes sorting (including colour sorting), cleaning, crushing and sizing. Beneficiated glass is considered “furnace-ready” for sale to glass product manufacturers.
Biodegradable	A generic term that indicates a polymer is biologically available for microbial decomposition, with no detail on breakdown products, time or extent of degradation or end environments.
Bioplastics	Plastics that are biobased, biodegradable or both. Bioplastics fall into three broad groupings, which are: biobased (but not biodegradable); biodegradable (but not biobased); or biobased and biodegradable. Conventional polymers (e.g. PET and HDPE) can also be fully or partially ‘biobased’.
Business-to-business (B2B) packaging	Packaging used for the containment, protection, or handling of product where the end-customer, prior to the packaging reaching end-of-life, is a business or institution. Typically includes the secondary and tertiary packaging that is used to move products between businesses prior to sale to end-consumers but can also include primary packaging if the business is the end-user. Same meaning as 'Commercial packaging'. Also see 'Packaging' and 'Business-to-consumer (B2C) packaging'.
Business-to-consumer (B2C) packaging	Packaging used for the containment, protection, marketing, or handling of product where the end-customer, prior to the packaging reaching end-of-life, is a consumer (i.e., a person). Includes the primary packaging that is sold to end-consumer, and possibly some secondary packaging, but excludes any B2B packaging that is part of the packaging system. Same meaning as 'Consumer packaging'. Also see 'Packaging' and 'Business-to-business (B2B) packaging'. B2C packaging can be split into two categories related to the location of used packaging generation, which are 'At home' and 'Away-from-home (AfH)'. At home packaging includes any packaging that is likely or known to be generated as used packaging at homes, and so will enter residential waste management systems. AfH packaging includes any packaging that is likely or known to be generated as used packaging in non-residential settings, and so will enter commercial waste management systems.
CAGR	See the ‘Compound annual growth rate’ entry.
Certified compostable	Means that claims of compliance with Australian Standard 4736-2006, compostable and biodegradable plastics – “Biodegradable plastics suitable for composting and other microbial treatment” and Australian Standard AS 5810-2010 Home Composting – “Biodegradable plastics suitable for home composting” have been verified.
Circular economy	The circular economy concept is a systems approach to material/energy flows that extends significantly on the ‘waste hierarchy’, with the objective being to decouple economic growth/development from the use of non-renewable resources (including energy). It is a concept that extends to cover the entire life cycle of products and services, including design. It assumes that the current approach of incremental and fractured improvements in materials and energy efficiency are not sufficient to achieve the potential (much larger) economic and environmental gains that are available.
Closed-loop recycling	Material from a product system is recycled in the same product system and is of the same quality and functionality as the original material. In terms of end-of-life fates, closed-loop recycling will typically provide greatest environmental benefits, with the key attribute being the displacement (competition with) virgin resource extraction. Also see 'Open-loop recycling' and 'Downcycling'.
Collection	Packaging materials collected for recycling.

Term	Definition
Collection efficiency	Materials collected for recycling divided by total packaging waste entering the collection system.
Commercial and industrial (C&I) waste	Solid inert waste generated from trade, commercial and industrial activities including the government sector. It includes waste from offices, manufacturing, factories, schools, universities, state and government operations and small to medium enterprises e.g. food waste.
Commercial packaging	The same meaning as 'Business-to-business' (B2B) packaging.
Commingled recyclables	Materials combined generally for the purposes of collection, mainly through municipal collection services. Includes plastic bottles, other plastics, paper, glass and metal containers. Commingled recyclable materials require sorting after collection before they can be reprocessed. Can also be called commingled materials.
Compostable packaging	A packaging or packaging component (1) is compostable if it is certified to AS4736 or a similar standard for commercial composting, and if its successful post-consumer (2) collection, (sorting), and composting is proven to work in practice and at scale (3). Also see the related 'Recyclable packaging' and 'Reusable packaging' definitions. Supporting notes: 1. ISO 18601:2013: A packaging component is a part of packaging that can be separated by hand or by using simple physical means (e.g. a cap, a lid and (non in-mould) labels). 2. ISO 14021 clarifies post-consumer material as material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. 3. 'At scale' implies that there are significant and relevant geographical areas, as measured by population size, where the packaging is actually composted in practice.
Composted (packaging)	Packaging that underwent degradation by biological processes during composting to yield CO_2, water, inorganic compounds and biomass at a rate consistent with other known compostable materials and leaves no visible, distinguishable or toxic residue, in accordance with accepted industry standards (1). Supporting notes: 1. Accepted industry standards include standards referred in the above definitions 'Compostable packaging – industrial' and 'Compostable packaging – home'. Reference to accepted industry standards is to ensure packaging can fully degrade within specified periods of time in the conditions of standard composting system and does not alter the quality of compost.
Compound annual growth rate (CAGR)	The CAGR is a term for the ratio that provides a constant rate of growth, each year, over a defined time period of two or more years. CAGR is equivalent to the more generic exponential growth rate when the exponential growth interval is one year. The CAGR is useful as it provides a smoothed rate of growth over a number of years, reducing the impact of year-on-year growth data volatility.
Construction and demolition (C&D) waste	Solid inert waste generated from residential and commercial construction and demolition activities e.g. bricks and concrete.
Consumer packaging	Packaging used for the containment, protection, marketing, or handling of product where the end-customer, prior to the packaging reaching end-of-life, is a consumer (i.e., a person). Includes the primary packaging that is sold to end-consumer, and possibly some secondary packaging, but excludes any B2B packaging that is part of the packaging system. Same meaning as 'Business-to-consumer (B2C) packaging'. Also see 'Packaging' and 'Business-to-business (B2B) packaging'.

Term	Definition
	It is worth noting that the *National Environment Protection (Used Packaging Materials) Measure 2011* (the NEPM) defines *consumer packaging* to mean all packaging products made of any material, or combination of materials, for the containment, protection, marketing, or handling of consumer products. This includes: • Primary packaging – materials directly containing the product. • Secondary packaging – materials used to contain single or multiple primary packed products. • Tertiary packaging – materials used to distribute packaged and unpackaged products. This NEPM definition for consumer packaging is different from that adopted for consumer packaging (and B2C packaging) in this study in that the adopted definition excludes all tertiary packaging, even if it is part of the (upstream) consumer packaging system.
Consumption	Total use of product by Australian industry and consumers. Includes locally made and used product, imported product and locally utilised recyclate. Does not include locally made product that is exported.
Consumption of packaging	Packaging put onto the market in Australia from local and imported sources. Because most packaging is single-use, it is assumed that packaging consumed equates to packaging waste generated. Does not include locally made product that is exported for sale.
Container deposit scheme (CDS) collection	Separate collection system for container deposit eligible glass, metal, paper and plastic containers.
Contaminants – Out throws	A sorted scrap (bale) related term. Recyclable materials that are unsuitable for inclusion in the sorted grade (product) in which they are present, but can be sorted, separated and/or removed easily during the recycling process. Out throws generally have significantly higher allowable thresholds, compared to prohibited materials, in bale specifications for sorted recycled material commodities. Also see ‘Contaminants – Prohibited materials’ entry.
Contaminants – Prohibited materials	A sorted scrap (bale) related term. Unrecyclable materials that are unsuitable for inclusion in the sorted grade (product) in which they are present, and cannot be sorted, separated and/or removed during the recycling process. Prohibited materials cause adverse impacts on end-products and may damage the recycling facilities. Prohibited materials generally have significantly lower allowable thresholds, compared to out throws, in bale specifications for sorted recycled material commodities. Also see ‘Contaminants – Out throws’ entry.
Converter	Company which converts material inputs into a finished packaging product (whether filled or unfilled).
Cullet	Sorted glass feedstock resulting from the beneficiation process of mixed container glass. Generally consists of sorted streams of amber, flint and green glass of particle size greater that 5–10 mm depending on the capacity of the beneficiation plant.
Delamination	The process of splitting a composite material into its component parts e.g. laminated glass.
Disposal	Discarding solid waste to landfill or incineration (without energy recovery).
Diversion rate	Recovery (at a defined point) as a percentage of end-of-life disposal. Also see 'Recovery rate' and 'Recycling rate'.
Domestic	Material from domestic (household) sources.

Term	Definition
Downcycling	Recycled material is of lower quality and functionality than the original material(s). Materials are recycled into different applications with less stringent performance specifications, and where the recycled materials are typically substituting for (competing with) materials other than the original high quality virgin materials. Examples of this include the recycling of mixed polymer rigid plastics, e.g. a mixture of HDPE, low-density polyethylene (LDPE) and polypropylene (PP) into timber substitute products (e.g. outdoor furniture, pallets and fencing), where the recovered plastics are competing primarily with timber as the alternative material. Down-cycled materials are potentially more difficult to recycle at end-of-life (although they often have long functional lifespans), and are more likely to be disposed to landfill at end-of-life. Also see 'Closed-loop recycling' and 'Open-loop recycling'.
Drop off centre/site	A facility where households can drop off selected materials and household items for recycling and reuse. Also called drop off facilities.
End user (of recycled content raw materials)	A user of raw materials that have a recycled content. Examples of end users include plastic product manufacturers that use recycled polymer in their products, or agricultural producers that purchased composted organics as a soil conditioner/fertiliser.
Energy from waste (EfW)	The terms ‘energy recovery from waste’, ‘waste to energy’ or ‘energy from waste’ can be used interchangeably to describe a number of treatment processes and technologies used to generate a usable form of energy from waste materials. Examples of usable forms of energy include electricity, heat and transport fuels.
Energy recovery	A waste fate in which a substantial portion of energy value in a waste is recovered.
Energy recovery facility	A facility that captures, on average, more than 20% of the embodied energy in the waste it receives for beneficial use.
Export for reprocessing	Material sent for reprocessing overseas.
Feedstock	Raw material used to manufacture products. Material varies depending on what is being produced.
Feedstock (chemical) recycling	The use of chemical processes such as pyrolysis to convert scrap plastics into a hydrocarbon gas or liquid (often a polymer to monomer conversion) that is usable as a fuel or as an input for manufacturing plastics resins.
Fines (glass)	Unsorted sub-5–10 mm glass material left over from the glass beneficiation process. It can contain contamination including plastics and small pieces of metals. These fines can be further processed to produce a glass sand product which has a number of uses.
Finished goods	Finished goods are goods that are ready to be consumed or distributed. Finished goods have generally completed the manufacturing process but have not yet been sold or distributed to the end user, and is no processing required in term of the goods after this stage by the seller. However, there may be instances that seller finished goods become buyer raw materials. An example of finished (packaging) goods includes imports of cardboard boxes around goods such as TVs. Also see ‘Semi-finished goods’.
Flexible packaging	Soft (flexible) plastics are generally defined as plastics that can be scrunched into a ball, unlike ‘rigid’ plastics such as bottles and tubs, which are moulded and hold their shape. Also refer to the 'Rigid packaging' entry.
Foam packaging	Foam plastic packaging is in a lightweight cellular form resulting from introduction of gas bubbles during manufacture. Foam packaging is typically used to reduce shock and vibration or abrasion. The most common example used in packaging is expanded polystyrene (EPS).
Food organics	Food waste from households or industry, including food processing waste, out- of-date or off-specification food, meat, fruit and vegetable scraps. Excludes liquid wastes.

Term	Definition
Garden organics	Organics derived from garden sources e.g. grass clippings, tree prunings. Also known as green organics.
Generated material/waste	Materials or waste originating from a point source or source of origin.
Green organics	See garden organics.
Greenhouse gases	Gases, including carbon dioxide and methane, that trap heat in the earth's atmosphere, affecting weather and climate patterns.
Hard waste	The term applied to household garbage that is not usually accepted in kerbside garbage bins by local councils e.g. old fridges and mattresses.
Hazardous waste	Waste with potentially adverse impacts on human health and the environment.
Household	Material from domestic (household) sources.
In the gate	Material entering a facility for reprocessing. This may include material that is unusable due to contamination. In the gate material that is subsequently sent to landfill is generally either a combination of gross contamination (i.e. materials that should not have been presented and are not recyclable at the receiving facility) and/or designated scrap plastics that were not recovered into product due to cross contamination with unrecyclable materials or losses due to other types of production inefficiencies (e.g. losses to trade waste). Also see 'Out the gate'.
Incinerator	A site and/or process that facilitates disposal of waste streams through burning, without producing another useful end product or capturing value from the waste material.
Internal use	Recyclate processed and used within the one company.
In-vessel composting	Composting technology involving the use of a fully enclosed chamber or vessel in which the composting process is controlled by regulating the rate of mechanical aeration. Aeration assists in heat removal, temperature control and oxygenation of the mass. Aeration is provided to the chamber by a blower fan which can work in a positive (blowing) and/or negative (sucking) mode. Rate of aeration can be controlled with temperature, oxygen or carbon dioxide feedback signals.
Kerbside waste/ collection	Waste collected by local councils from residential properties, including garbage, commingled recyclables and garden organics, but excluding hard waste.
Kraft paper	Kraft paper is paper, or paperboard (cardboard) produced from chemical pulp produced in the kraft process. It is commonly used in paper sacks, food and other paper-based wraps (including burger wraps and similar). Kraft pulp is normally darker than other wood pulps, but it can be bleached to make white papers.
Landfill	Discharge or deposit of solid wastes onto land that cannot be practically removed from the waste stream.
Liquid paperboard (LPB)	Liquid paperboard (LPB) is a fibre-based packaging board that is designed to hold a liquid. It commonly comes in two main types, which are gable-topped LPB (plastic polymer layer / paperboard layer / plastic polymer layer), and aseptic LPB (plastic polymer layer / paperboard layer / aluminium foil layer / plastic polymer layer). Also see Polymer-coated paperboard (PCPB).
Local material utilisation	Materials recovered and reprocessed (recyclate) for use within Australia for the manufacture of new products.
Local material utilisation rate	Materials recovered for local manufacturing of new product divided by total packaging waste entering the system.
Local use	Recyclate used within Australia by an Australian company in the manufacture of a new product.
Local/Locally	In Australia.

Term	Definition
Material flow analysis (MFA)	Material flow analysis (MFA) is a mass balanced based analytical method to quantify flows and stocks of materials or substances for a well-defined system and time period. MFA is also referred to as substance flow analysis (SFA).
Material recycling	Reprocessing, by means of a manufacturing process, of a used packaging material into a product, a component incorporated into a product, or a secondary (recycled) raw material
Materials recovered	Materials diverted from landfill for use or reprocessing irrespective of where the recovery or reprocessing takes place.
Materials recovery facility (MRF)	A centre for the receipt, sorting and transfer of materials recovered from the waste stream prior to transport to another facility for recovery and management. At a MRF materials may undergo mechanical treatment for sorting by characteristics such as density, size, magnetism and optical characteristics, and may include cleaning and compression. Materials may be received as mixed streams such as commingled recyclables from households and businesses or single streams such as metals.
Mechanical recycling	The use of physical processes such as sorting, chipping, grinding, washing and extruding to convert scrap plastics to a usable input for the manufacture of new products.
Mild steel	Mild steel is defined as having no more than 2% carbon and no other functional alloying elements. Mild steel is also referred to as ‘carbon steel’.
Mixed paper	Post-consumer kerbside mix of fibre based packaging and non-packaging papers. Includes materials such as magazine, newspaper, marketing, some old corrugated cardboard (OCC) and others fibre-based formats. Typically has high levels of contamination, of which broken glass is a particular issue.
Mixed plastics	Post-consumer kerbside mix of plastics based packaging and non-packaging plastic items. Includes materials such as bottles, containers and other packaging formats consisting of all the major polymer groups. Often undergoes a polymer sort at MRFs or post-MRFs to positively recover a limited range of polymer types, typically PET and HDPE. Often has moderate to high levels of contamination.
Municipal solid waste (MSW)	Solid waste generated from municipal and residential activities, and including waste collected by, or on behalf of, a municipal council. Excludes dedicated container deposit scheme (CDS) collections or drop-off by consumers or businesses.
Non-packaging / durable	Long-term use item; not designed to be single use or disposable within a 12-month period.
OCC	Old, corrugated cardboard (unbleached kraft).
ONP	Old newsprint.
Open-loop recycling	Material from a product system is recycled into a different product system and may be of lower quality and functionality than the original material. Importantly, the recycled materials substitute for, and avoid the use of virgin materials in the new applications. Examples of this in Australia include the recycling of PET bottles into fibre for use in clothing and other textiles, and high-density polyethylene (HDPE) milk bottles into mobile garbage bins and milk crates. Open-loop recycling can be as environmental beneficial as closed-loop recycling. Also see 'Closed-loop recycling' and 'Downcycling'.
Optical sorting	Technologies used to sort glass by colour type, and plastics by polymer type.
Organic material	Plant or animal matter, e.g. grass clippings, tree prunings and food waste, originating from domestic or industrial sources.
Organics recycling	The treatment of separately collected organics waste by anaerobic digestion, composting or vermiculture.
Out the gate	Material leaving a facility following reprocessing and excluding most contamination. Also see ‘In the gate’.

Term	Definition
Oxo-degradable or photo-degradable	Conventional fossil-based polymers (usually polyethylene or polypropylene) that have additives incorporated into the polymer at low rates (2-3%) to provide highly accelerated fragmentation of the plastic in sunlight or in the presence of oxygen or in an anaerobic environment.
Packaging	Material used for the containment, protection, marketing or handling of product. Includes primary, secondary and tertiary/freight packaging in both consumer and industrial packaging applications.
Packaging assembly	A collection of packaging components that are intended to function as a single packaging unit. For example, a single-use glass soft-drink bottle is typically a packaging assembly consisting of; a glass bottle, a metal or plastic closure and a paper or plastic label. Also see 'Packaging component'.
Packaging component	A part of a packaging assembly that can be separated by hand or by using simple physical means. Also see 'Packaging assembly'.
Packaging constituent	A part from which a packaging assembly or its components are made and which cannot be separated by hand or by using simple physical means.
Packaging level	Identifies the hierarchical level of the packaging assembly, i.e. primary, secondary or tertiary. **Primary packaging**, also known as consumer or retail packaging, refers to the layer/s that contain and protect individual product units up to the point of sale (e.g. bag, bottle, jar, box etc.) and that are removed for use. Primary packaging also includes any packaging given to consumers at the point of retail sales (e.g. retail bag, tissue paper etc.) as well as packaging delivered to consumers with online sales (e.g. bag, cushioning, box etc.). **Secondary packaging** is additional to the primary packaging and is used to protect and collate individual product units during storage, transport and distribution. This may include shelf-ready packaging (SRP), also known as retail-ready packaging (RRP) or counter- top display units (CDUs), containing multiple product units and used for retail display. **Tertiary packaging** is used in the protection and shipping of a product. This type of packaging is also known as distribution packaging, transport packaging and business-to-business (B2B packaging). It consists of packaging and components such as cardboard cartons, pallets, slip sheets, stretch wrap, strapping and any labels.
Packaging system	Complete set of packaging for a packaged good, encompassing one or more of the following that are applicable (depending on the packaged goods): Primary packaging, Secondary packaging, Tertiary (distribution or transport) packaging.
Paper & paperboard	Paperboard is a group term related to papers (including multi-ply papers) that have been manufactured specifically for packaging purposes. Paper is both an input into paperboard manufacturing and can be a packaging product in its own right.
PE-HD or HDPE	High-density polyethylene (PIC 2). Typically referred to as HDPE.
PE-LD or LDPE	Low-density polyethylene (PIC 4). Typically referred to as LDPE.
PE-LLD or LLDPE	Linear low-density polyethylene (PIC 4). Typically referred to as LLDPE.
PET	Polyethylene terephthalate (PIC 1).
PIC	Plastic identification code. Also referred to as the resin identification code (RIC) in some other countries.
Placed on market (POM)	Packaging is defined as being 'placed on market' (POM) when it is first made available to the end-consumer, and disposal is following the intended full use of the packaging and can be considered 'post-consumer'. Packaging losses prior to the point of POM are considered pre-consumer losses.
Polymer coated paperboard (PCPB)	Paper-based packaging with a polymer coating for water resistance and structural integrity, generally, polyethylene (PE) or polylactic acid (PLA). Aseptic PCPB containers also contain a foil/metallised film layer.

Term	Definition
Post-consumer domestic	Used material from household sources. Mostly packaging material from kerbside recycling collections.
Post-consumer industrial	Used material from non-household sources.
Post-consumer recycled content (PCR)	The post-consumer recycled content of packaging placed on market is sourced from end-of-life materials generated by households or by commercial, industrial and institutional facilities.
Post-consumer used packaging	ISO 14021 defines post-consumer material as material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. It excludes pre-consumer material (e.g. production scrap).
PP	Polypropylene (PIC 5).
Pre-consumer recycled content	The pre-consumer recycled content of packaging placed on market is sourced from scrap materials generated during manufacturing (excluding rework). The compositional profile of the pre-consumer recycled content of the material is typically the same as that of the packaging material POM, and reflects the composition of the incoming material into the packaging manufacturing. That is, it can have a proportion of virgin, pre-consumer and post-consumer content. If manufacturing processes, including scrap reprocessing processes, are considered a single black box, then the sources of pre-consumer materials upstream from manufacturing processes are either virgin or post-consumer sourced materials only.
Pre-consumer scrap packaging	Scrap off-cuts and off-specification materials in the manufacturing industry which are collected for reprocessing at a different facility. Does not include material that is recycled directly back into manufacturing processes at the same facility. Does not include material that has reached the end-consumer, whether domestic, commercial or industrial.
PREP	Packaging Recycling potential Evaluation Portal (PREP) is an online platform used to verify if packaging is or is not recyclable in Australian and New Zealand kerbside collections.
Primary material	See ‘Virgin material’.
Problematic	Can be considered a ‘contaminant’ in the recycling facility because it is either 1) not one of the requested materials 2) causes problems e.g. getting entangled in machinery 3) reduces the quality of the recyclate or some other reason.
Process derived fuels	Also called process engineered fuel (PEF) or refuse derived fuel (RDF), is a fuel produced after basic processing in a MRF or MBT to increase the calorific value and remove recyclable materials and contaminants of municipal solid waste, commercial and industrial waste and construction and demolition waste.
Processing facilities	Facilities which either receive materials directly from collection systems or from recovery facilities for further sorting and/or processing to provide material for use in the generation of new products.
Product stewardship	A concept of shared responsibility by all sectors involved in the manufacture, distribution, use and disposal of products, which seeks to ensure value is recovered from products at the end of life.
PS-E or EPS	Expanded polystyrene (PIC 6). Typically referred to as EPS.
Public place recycling	Recycling facilities found in public areas, such as parks, reserves, transport hubs, shopping centres and sport and entertainment venues, that allow the community to recycle when away from home.
Putrescible waste	Waste that readily decomposes, including food waste and organic waste from gardens.
PVC	Polyvinyl chloride (PIC 3).
Pyrolysis	Thermal breakdown of waste in the absence of air, to produce char, pyrolysis oil and syngas e.g. the conversion of wood into charcoal.

Term	Definition
Recover / recovery / resource recovery	The process of recovering resources from waste for reuse or reprocessing. This includes collection, sorting and aggregation of materials. To convert waste into a reusable material.
Recovery rate	Recovery (at a defined point) as a percentage of end-of-life disposal. Similar meaning to 'Recycling rate' but can include material into composting and energy recovery. Excludes reused products. Also see 'Diversion rate' and 'Recycling rate'.
Recyclable packaging	A packaging (1) or packaging component (2,3) is recyclable if its successful post-consumer (4) collection, sorting, and recycling is proven to work in practice and at scale. Also see the related ‘Compostable packaging’ and ‘Reusable packaging’ definitions. Supporting notes: 1. A package can be considered recyclable if its main packaging components, are recyclable according to the above definition, and if the remaining minor components are compatible with the recycling process and do not hinder the recycling potential of the main components. The PREP design tool provides information on recycling potential of packaging through kerbside collection services. 2. A packaging component is a part of packaging that can be separated by hand or by using simple physical means (ISO 18601), e.g. a cap, a lid and (non in-mould) labels. 3. A packaging component can only be considered recyclable if that entire component, excluding minor incidental constituents (5), is recyclable according to the definition above. If just one material of a multi-material component is recyclable, one can only claim recycling potential of that material, not of the component as a whole (in line with ISO 14021). 4. ISO 14021 defines post-consumer material as material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. It excludes pre-consumer material (e.g. production scrap). 5. ISO 18601:2013: A packaging constituent is a part from which packaging or its components are made and which cannot be separated by hand or by using simple physical means (e.g. a layer of a multi-layered pack or an in-mould label).
Recycling potential	See the 'Recyclable packaging' entry.
Recyclate	Scrap material either before or after reprocessing.
Recycle/Recyclables/Recycling	In common practice the term is used to cover a wide range of activities, including collection, sorting, reprocessing and reuse.
Recycled (packaging)	Packaging is recycled if at least 70% of its weight is recycled into a product, a component incorporated into a product, or a secondary (recycled) raw material.
Recycled content	Is the proportion, by mass, of pre-consumer and post-consumer recycled (PCR) 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. The amount of renewable or recycled material is expressed as a percentage of the quantity of packaging material put onto the market.
Recycling	Activities in which solid wastes are collected, sorted, processed (including through composting), and converted into raw materials to be used in the production of new products (the amount of solid waste recycled is net of any residuals disposed). Excludes energy recovery and stockpiles.

Term	Definition
Recycling rate	Recovery (at a defined point) as a percentage of end-of-life disposal. Similar meaning to 'Recovery rate' but excludes material into energy recovery and reused products. Also see 'Diversion rate' and 'Reprocessing rate'.
Refuse derived fuels	Refer to ‘Process derived fuels’.
Reprocess / reprocessing	To put a material that has been used through an industrial process to change it so that it can be used again.
Reprocessor / reprocessing facility / reprocessing infrastructure	Facility that uses an industrial process to change the physical structure and properties of a waste material so it can be used again. This can include facilities that dismantle products, such as tyres, e-waste and mattresses, and energy from waste facilities that use materials to generate energy.
Resale centre / shop	A centre/shop that enables the sale and subsequent reuse of good quality, saleable products and materials that were disposed of by their previous owner.
Residual waste	Residual material that remains after any source separation or reprocessing activities of recyclable materials or garden organics. Waste that is left over after suitable materials have been recovered for reuse and recycling. This generally means the environmental or economic costs of further separating and cleaning the waste are greater than any potential benefit of doing so.
Resin	Raw plastic polymer material.
Resource recovery	Total materials recovered including materials sent to recycling and energy recovery, including export and stockpiling, net of contaminants and residual wastes sent to disposal.
Resource recovery infrastructure	Facility that receives and manages materials to enable them to be reused or reprocessed. This includes drop off points, resale centres, resource recovery centres, transfer stations and materials recovery facilities.
Resource recovery rate	The proportion calculated by dividing resource recovery by waste generation (also referred to as the ‘recovery rate’).
Reusable packaging	Packaging or packaging component which has been designed to accomplish or proves its ability to accomplish a minimum number of trips or rotations in a system for reuse. Also see the related ‘Compostable packaging’ and ‘Recyclable packaging’ definitions. Supporting notes: 1. A trip is defined as transfer of packaging, from filling/loading to emptying/unloading. A rotation is defined as a cycle undergone by reusable packaging from filling/loading to filling/loading (ISO 18603). 2. The minimum number of trips or rotations refers to the fact that the ‘system for reuse’ in place should be proven to work in practice, i.e. that a significant share of the package is actually reused (measured e.g. by an average reuse rate or an average number of use-cycles per package). 3. A system for reuse is defined as established arrangements (organisational, technical or financial) which ensure the possibility of reuse, in closed-loop, open-loop or in a hybrid system (ISO 18603). 4. Reuse is an operation by which packaging is refilled or used for the same purpose for which it was conceived, enabling the packaging to be refilled (ISO 18603). Also refer to the 'Single-use packaging' entry.
Reuse	Recovering value from a discarded resource without processing or remanufacture e.g. garments sold though opportunity shops.
Rigid packaging	Rigid plastic packaging such as bottles and tubs, which are (generally) moulded and hold their shape. Also refer to the 'Flexible packaging' entry.

Term	Definition
Scrap packaging	Used packaging that has been recovered for reprocessing but has not yet been reprocessed.
Secondary processing	A process undertaken after sorting in which a recovered material is put through an industrial process to change it so that it can be used as an input for the manufacture of new products. Also see ‘Reprocessor’.
Sectors / industry sectors	Groupings of industries used to generalise patterns in waste generation and disposal e.g. construction and demolition, food services including food retail and food manufacturing, small to medium enterprises.
Semi-finished goods	Semi-finished goods are also known as intermediate goods or producer goods. Semi-finished products are goods that are used as inputs in the production of other goods including final goods. In the production process, semi-finished goods either become part of the final product, or are changed beyond recognition in the process. Semi-finished goods are sold between industries, and are not directly sold to the ultimate end-user of products made from the semi-finished goods. Examples of semi-finished (packaging) goods include imports of large format rolls of film for local conversion into plastic bags. Or imports of tin-plated steel rolls for local conversion into steel cans. Also see ‘Finished goods’.
Single-use packaging	Single-use packaging is defined as a packaging system or packaging component which has been principally designed to accomplish a single trip, even if some form of reuse is possible. Single-use packaging does not meet the definitional requirements of ISO 18603:2013 (Packaging and the environment – Reuse) as reusable packaging. Also refer to the 'Reusable packaging' entry.
Soft plastics packaging	Soft (flexible) plastics are generally defined as plastics that can be scrunched into a ball, unlike ‘rigid’ plastics such as bottles and tubs, which are moulded and hold their shape.
Solid industrial waste (SIW)	Solid waste generated from commercial, industrial or trade activities, including waste from factories, offices, schools, universities, state and federal government operations and commercial construction and demolition work. Excludes MSW and hazardous wastes.
Solid inert waste	Solid inert waste is hard waste that has a negligible activity or effect on the environment. The waste may be either a municipal or industrial waste.
Solid waste	Non-hazardous, non-prescribed, solid waste materials, ranging from municipal garbage to industrial waste.
Sorting / primary sorting	A process typically between collection (recovery) and reprocessing in which collected end-of-life materials are sorted (or disassembled) into more usable and economically valuable material fractions. Material recovery facilities (MRFs) are sorting facilities.
Sorting efficiency	Material processed at MRF or CDS divided by total packaging waste entering the system.
Source separation	The practice of segregating materials into discrete material streams prior to collection by, or delivery to, processing facilities.
Source stream	Either MSW, C&I, C&D or CDS.
Stockpile	Unprocessed or processed material where 500 tonnes or more of the same material has been held for more than six months.
Stockpiling	Storage of materials in line with the 'stockpile' definition.
Transfer coefficient	A derived factor that defines the partitioning of an input entering a process into a transformed material stream (e.g. the separation of PET from kerbside recycling materials at MRF).
Transfer station	Facility which receives materials from the waste stream for possible segregation, consolidation, or compaction for bulk transport for resource recovery, treatment or disposal facilities.
Unprocessed material	Material that is unrefined and has not been through any process of recycling.

Term	Definition
Virgin material	Material that has been sourced through primary resource extraction. Virgin materials are often referred to as primary materials. Virgin materials are not sourced from recycled materials (sometimes called secondary materials). For example, ‘virgin’ steel is manufactured from iron ore, and ‘virgin’ paper is manufactured from plantation sourced wood fibre.
Waste	Any discarded, rejected, unwanted, surplus, or abandoned matter, including where intended for recycling, reprocessing, recovery, purification or sale. Anything that is no longer valued by its owner for use or sale, and which is, or will be, discarded. In this document, the term 'solid waste' refers to non-hazardous, solid waste materials ranging from municipal garbage to industrial waste.
Waste packaging export	Export of (typically baled) scrap packaging materials sent offshore for reprocessing.
Waste to energy	Refer to ‘Energy from waste’.

APPENDIX B – PROJECT METHOD

Provided in this appendix is an overview of the project method, changes in the method in 2022–23 relative to previous years, and tabulations of the main packaging material and component lists adopted to frame the data collection and reporting for the study.

B.1 Data sources

Packaging consumption and recovery data was obtained from a combination of sources. The main data sources and the related reporting contributions are summarised in **Table B-1**.

Table B-1 – Data sources and reporting outputs.

Data source	Data collection method	Primary reporting contributions
Packaging manufacturers and importers	National survey undertaken as part of this project.	• Packaging POM. • Recycled content. • Recovery rate. • Packaging POM projections.
Packaging reprocessing facility operators	National survey undertaken as part of this project.	• Packaging recovery. • Recovery rate. • Packaging recovery projections.
Container deposit scheme (CDS) operators	National survey undertaken as part of this project.	• National CD eligible packaging dataset (Appendix E). • Quantification of CDS recovery collection services.
Reusable packaging system operators and users	Selective survey undertaken as part of this project.	• Packaging reuse.
Organics recyclers and energy recovery facility operators interview form	Selective survey undertaken as part of this project.	• Packaging recovery. • Recovery rate.
Australian import and export data	Australian Customs import/export[1] data extracts (ABS & IndustryEdge, 2024a; 2024b).	• Packaging POM. • Packaging recovery. • Recovery rate.
Population (census) data	Australian Bureau of Statistics published population data (ABS, 2024a).	• Per capita estimates of packaging POM and recovery.

1. Australian Harmonized Tariff Item Statistical Code data (imports) / Australian Harmonized Export Commodity Classification data (exports).

B.2 Data collection and stakeholder consultation

Survey forms were prepared for the stakeholder groups listed above. Stakeholders to be surveyed were identified through previous survey contacts, APCO Membership lists and the project team's industry knowledge. A summary of the packaging manufacturer and reprocessor survey outcomes by organisation type is provided in **Table B-2**. All manufacturers and reprocessors that were identified were contacted.

Table B-2 – Packaging manufacturer, reprocessor and other survey responses (facility count).

Organisation type	Complete – interview /phone/e-mail	Complete – estimated	No response or decline	Total
Manufacturer – fibre	13	0	0	13
Manufacturer – glass	6	0	0	6
Manufacturer – metals	13	2	0	15
Manufacturer – plastics	73	12	11	96
Manufacturer – wood	0	0	0	0
Reprocessor – fibre	12	3	0	15
Reprocessor – glass	17	3	1	21
Reprocessor – metals	3	3	1	7
Reprocessor – plastics	97	3	1	101
Reprocessor – organics	5	1	1	7
Container deposit scheme (CDS) operator	6	0	0	6
Energy recovery – WtE[a] fuel manufacturer	2	1	0	3
Industry group	2	0	2	4
Reusable packaging system operator	11	2	3	16
Reusable packaging system user	0	3	1	4
Total	**260**	**33**	**21**	**314**
Total (%)	**83%**	**11%**	**7%**	**100%**

a) WtE – Waste-to-energy.

Generally, where a significant organisation declined to provide a response, or did not respond within the survey period, it was possible to estimate the level of activity based on publicly available data or through consultation with others in the industry.

It was not possible to estimate production for 12 non-responding plastic packaging manufacturers. However, estimates of packaging POM were scaled based on whole of market estimates of packaging consumption in 2022–23 available through the Australian Plastics Flows and Fates Study 2022–23 (Blue Environment, 2024).

B.3 Determination of packaging consumption

Australian packaging consumption from local sources was determined through a national survey of packaging manufacturers to obtain data on the following packaging attributes:

- Packaging POM by material type.
- Estimated accuracy range of reported POM, by material type.
- Location of material source – local or overseas.
- Packaging manufacturing losses to recovery or landfill.
- Packaging component group – bottle or jar, carton or box, closure, tub, tray or punnet, etc.
- Single-use / reusable packaging allocation.
- Degradability rating.
- Composition of flexible plastic packaging (as relevant).

- Recycled content source – post-consumer, pre-consumer or virgin (primary).
- Potential future post-consumer recycled content – easily achievable and maximum achievable.
- Packaging jurisdiction of use.
- Packaging sector of use, allocated to:
    - Business-to-consumer (B2C) – At home.
    - B2C – Away-from-home (AfH).
    - Business-to-business (B2B).
- Packaging suitability for food contact applications.
- Market growth and capacity change estimates.

POM means that the packaging has been made available to the end-consumer (including business users). The subsequent disposal is following the intended use of the packaging and is considered 'post-consumer' disposal. Packaging losses prior to the point of POM are considered ‘pre-consumer’ losses.

Australian consumption of packaging through the import of finished goods and the import of semi-finished packaging (e.g. sheets of paperboards and rolls of plastic film for local filling) were determined through an extensive analysis of Australian import and export data for the 2022–23 financial year. This was based on the review and analysis of 3,900 Customs import codes and 2,600 export codes.

Codes over threshold values for either quantity or dollar value were allocated on a line-by-line basis to packaging material types and components and converted to an estimated equivalent packaging mass basis.

These allocations were based on code descriptors, or where this did not provide sufficient detail, on supporting research (online and instore) and manufacturer reports of their quantities of imported and exported packaging. Where no other data was available, standard conversions were applied to convert imports/exports of products into equivalent packaging quantities.

There were two main categories of codes that were allocated through the quantification framework:

- **Codes where the imported/exported product is the packaging** – Allocations were undertaken of the (packaging) product to: material type, packaging component, sector of use, data accuracy rating and other data attributes. These codes were also assessed under the following category.
- **Codes where the imported/exported product is contained in primary, secondary and tertiary packaging** – Allocations were undertaken of the packaging (on the product) to: material type, packaging component, sector of use, data accuracy rating and other data attributes.

Due to the relatively sparse information that was available to support many code allocations, the data accuracy rating for these allocations was often low to very low, which is quantified in the aggregated accuracy range estimates that are reported.

B.4 Determination of packaging recovery

Australian packaging recovery was determined through a national survey of packaging reprocessors to obtain data on the following packaging attributes:

- Recovery by material type.

- Estimated accuracy range of reported recovery, by material type.
- Level of reprocessing undertaken by facility.
- Packaging reprocessing losses to (downstream) recycling or landfill.
- Post-consumer or pre-consumer material source.
- Waste source sector by collection service: municipal solid waste (MSW), commercial and industrial (C&I) waste, construction and demolition (C&D) waste, and container deposit scheme (CDS) collection services.
- Rigid/flexible classification for reprocessed plastic packaging.
- Packaging source jurisdiction (state or territory).
- Packaging component group – bottle or jar, carton or box, closure, tub, tray or punnet, etc.
- Single-use / reusable packaging material source.
- Material use application for processed product – packaging or non-packaging.
- Recovered packaging material suitability for food contact applications.
- Reprocessing capacity – current and planned changes.
- Stockpile estimates.

The location in the value chain at which recovery is measured is stated in all cases. Recovery is generally measured at the out-going gate of the secondary processing facility for the used packaging. This is the point that the processed material is typically 'input ready' for the manufacture of new packaging or other products. Examples of secondary processing facilities include paper mills, glass beneficiation facilities, plastics washing and flaking facilities, and metal smelting facilities.

For materials other than metals, overseas processing losses associated with the export of sorted but unprocessed materials have been estimated based on the losses reported by local operators of secondary processing facilities.

For metals, overseas processing losses associated with the export of sorted but unprocessed materials have been estimated based on advice by local aluminium reprocessors and information from Antrekowitsch, et al. (2014) for aluminium and steel packaging losses respectively.

Packaging recovery includes quantities of post-consumer plastic and wood packaging sent to energy recovery in 2022–23.

Packaging recovery also includes estimates of recovery through composting facilities. This is primarily single-use wood packaging, fibre-based packaging (e.g. cardboard), and very small quantities of compostable plastics packaging.

B.5 Determination of packaging recovery rates

The packaging recovery rates determined in this report are generally based on the post-consumer packaging recovery measured at the out-going gate of the secondary processing facility (including WtE fuel manufacturers) for the used packaging, divided by packaging POM by material group/type.

The exception to this is packaging to organics reprocessing, for which the post-consumer packaging recovery is measured at the in-coming gate of the secondary processing facility.

It is important to note that in the determination of recovery rates, packaging POM is assumed to be equivalent to post-consumer used packaging. That is, all packaging POM in 2022–23, also reached end-of-life and was made available for recovery in 2022–23. This is largely the case for single-use packaging, but is less applicable to some forms of longer lived packaging in reusable packaging systems.

B.6 Determination of packaging recycling potential

The determination of packaging recycling potential supports the evaluation of progress against the following 2025 Target:

- 100% reusable, recyclable or compostable packaging.

Throughout the report the term *packaging recycling potential* is used as an umbrella term for reusable, recyclable, or compostable packaging.

The method for determining packaging recycling potential uses scores based on the Packaging Recycling potential Evaluation Portal (PREP) assessment framework and APCO advice. Generalised PREP extracted scores have been developed for each packaging material type and packaging component combination.

A recycling potential classification scoring framework has been developed for both B2C and B2B packaging sectors of use. The assessment framework is based on scoring against the following three criteria:

- Collection system widely available (C).
- Sortable and technically recyclable (S/T).
- End-market available for recovered material (M).

An overall 'recycling potential' classification score has been determined for each single-use packaging format, based on the scores for the three criteria above. The overall score is simply the lowest of the three criteria scores.

The B2C and B2B packaging sector scoring frameworks are summarised in the following tables. The primary difference is in the description of the collection system criteria.

Table B-3 – Recycling potential classification score basis for each criterion – B2C packaging.

Classification (score)	**C**	**S/T**	**M**
Good recycling potential (2)	The material is widely collected at kerbside (>80% of the kerbside population has access to a council service), or is a certified compostable plastic.	The material can be readily sorted at a MRF and causes no significant issues for reprocessors, or is a certified compostable plastic.	There is a well-established market for the use of the recycled material, or is a certified compostable plastic.
Poor recycling potential (1)	The material is less widely accepted at kerbside (between 60–80% of the kerbside population has access to a council service).	The material can be readily sorted at a MRF but will cause some issues for reprocessors leading to a loss of value.	The material will be classified as an outthrow or it will have a reduced market value that makes its recovery marginal.
Not recyclable (0)	The material is not widely accepted at kerbside (<60% of the kerbside population has access to a council service).	The material can either not be readily sorted at a MRF or it impacts on the recovery of other materials at the reprocessor.	It is not economical to separate this material for use in other applications.

Table B-4– Recycling potential classification score basis for each criterion – B2B packaging.

Classification (score)	C	S/T	M
Good recycling potential (2)	Collection services for the material (to recovery) are offered by the major commercial collectors in metropolitan areas, at a similar or lower cost than landfill services.	The material can be readily sorted at a C&I MRF and causes no significant issues for reprocessors.	There is a well-established market for the use of the recycled material.
Poor recycling potential (1)	Collection services for the material (to recovery) might be offered by major commercial collectors but at higher cost than landfill services or availability of services is more limited.	The material can be readily sorted at a C&I MRF but will cause some issues for reprocessors leading to a loss of value.	The material will be classified as an outthrow or it will have a reduced market value that makes its recovery marginal.
Not recyclable (0)	No collection services for the material (to recovery) are offered by the major commercial collectors.	The material can either not be readily sorted at a C&I MRF or it impacts on the recovery of other materials at the reprocessor.	It is not economical to separate this material for use in other applications.

The scoring frameworks outlined in the previous two tables apply to single-use packaging only. Reusable packaging (used within established reusable packaging systems) and certified compostable plastic packaging are allocated with the single-use packaging that achieves a good recycling potential classification score.

B.7 Determination of reusable packaging

The quantification for the determination of reusable packaging has been framed by the following ISO standard:

- ISO 18603:2013 Packaging and the environment – Reuse (ISO, 2013).

In ISO (2013, p. 1) reusable packaging is defined as:

> *Packaging or packaging component which has been designed to accomplish or proves its ability to accomplish a minimum number of trips or rotations in a system for reuse.*

ISO (2013, p. 3) requires that the following conditions are met in order for a claim of 'reusable' to be appropriate:

> *a) that the design of the packaging enables the principal components to accomplish a number of trips or rotations in normally predictable conditions of use;*
>
> *b) that the packaging is capable of being successfully reconditioned in accordance with the requirements of Annex B (including removal/replacement of damaged components, appropriate cleaning or washing, inspection and inspection of fitness-for-purpose, and re-entry into the reuse system) and,*
>
> *c) that a system, necessary to support reuse, is available in markets in which the packaging is placed, as appropriate.*

The established Australian reusable packaging systems that fit the criteria above (with some minor exceptions) and have been quantified this year are:

- **Kegs** – Beer kegs only.
- **Drums (200–205 litre)** – All reusable steel and plastic drums in the 200–205 litre volumetric capacity range (44 gallon UK or 55 gallon US).
- **Intermediate bulk containers (IBCs)** – All rigid IBCs are assumed to be reusable (rather than single-use) packaging.

- **Milk crates** – Non-collapsible plastic crates. Limited to dairy applications only.
- **Pallets** – Reusable timber and plastic pallets only, including display pallets. Single-use pallets are excluded.
- **Returnable plastic crates (RPCs)** – Collapsible plastic crates. Limited to major supermarket systems only (e.g. ALDI, Coles and Woolworths).
- **Reusable shopping bags** – Reusable non-woven PP bags, and reusable HDPE and LDPE bags (supermarket type).
- **Reusable coffee cups** – Reusable coffee cups used in an AfH setting where they could be reasonably expected to have avoided the use of a single-use coffee cup.

Due to circular flows and often long lifespans, quantification of reusable packaging systems requires metrics that measure mass flows, the same as single-use packaging flow quantifications, but extended to measure the service delivered by reusable packaging per cycle.

Strictly speaking single-use packaging systems should also require this determination of the service delivered per (single-use) cycle, to enable the monitoring of changes in packaging system product to packaging ratio efficiencies (e.g. quantify the impact of single-use packaging light-weighting). It has not been considered necessary to track this metric in the past.

However, this changes once it is of interest to quantify and track single-use and reusable packaging system flows in an integrated manner. The common denominator becomes the service provided by packaging systems, which then supports the following mass-based comparisons:

- Service performance between single-use and reusable packaging systems based on mass flows of packaging standardised to product flows.
- Single-use and reusable packaging system inputs and outputs standardised to product flows.
- Service performance efficiency changes for packaging systems, standardised to product flows, between different time periods.

A purpose of this quantification of eight reusable packaging systems is to advance the consideration of this system performance measure.

The data collection plan adopted for the reusable packaging quantifications is outlined in the following table.

Table B-5 – Data plan for packaging reuse quantification (2022–23 target year).

Data requirement	Data purposes	Data sources
General reusable packaging system description.	General overview of the system.	Surveys of major pool operators and/or users, including: Major breweries (3). Major supermarkets (3). Major dairy-processing related organisations (1). Major pool operators (5). Major reusable plastic bag suppliers (2). Reusable packaging manufacturers (4).
Quantity of new reusable packaging POM in 2022–23.	Reusable packaging pool inputs in 2022–23.	
Quantity of reusable packaging leaving the reusable packaging pool (stocks) to end-of-life (EoL) fate in 2022–23.	Reusable packaging pool outputs in 2022–23 and fate.	
Average lifespan of reusable packaging.	Support estimation of pool size and service delivered by packaging.	
Average number of reuse cycles prior to reaching EoL or otherwise leaving the pool.	Support estimation of pool size and service delivered by packaging.	
Reusable packaging cycle time.	Support estimation of pool size and service delivered by packaging.	
Total pool size in 2022–23.	Support estimation of pool size.	
Other details.	Reusable packaging materials, packaging weights, and product weights. Competing single-use packaging types. System reconditioning descriptions including: removal/replacement of damaged components, appropriate cleaning or washing, inspection of fitness-for-purpose, and re-entry into the reuse system.	

The metrics that have been quantified in this section of the report are:

- Pool (stocks) size in 2022–23 (tonnes and number).
- New reusable packaging entering service (inputs) in 2022–23 (tonnes and number).
- Old reusable packaging exiting service (outputs) in 2022–23 (tonnes and number) and fate.
- Reusable packaging cycle time, cycle number and average service life.
- Indicative estimates of avoided single-use packaging consumption through use of the assessed reusable packaging systems.

B.8 Comparability of 2022–23 data with previous years

The scope and calculation methods have been applied as consistently as possible across all packaging material types and components. However, it is important to note that there are a number of changes that have been adopted that may impact the comparability between the 2017–18 to 2022–23 datasets. The changes have all been adopted to improve the utility, quality and depth of the packaging quantification dataset.

Scope or method changes between 2021–22 and 2022–23

The noteworthy change this year was:

- **Enhanced data on the composition of flexible plastic packaging has been collected for the first time in 2022–23** – Packaging manufacturers were surveyed on the composition of flexible plastic packaging POM in terms of mono-material and multi-layered films, and what proportions were polyethylene (PE), polypropylene (PP) and other polymer types. This data may feature in future iterations of this report.

Refer to previous reports for details on scope or method changes between the 2017–18 to 2021–22 reports.

B.9 Definitional lists

The lists of packaging material type labels applied during data collection, analysis and reporting are provided in **Table B-6**.

Two separate lists are provided for the consumption and recovery/disposal lifecycle stages. These are as consistent as possible, while reflecting the difficulties of disaggregating data collection, particularly at the recovery/disposal stage.

Table B-6 – Packaging material type and group lists.

Material types – Consumption related	Material type list – Collection or sorting output related	Material group
Boxboard/Cartonboard	Boxboard/Cartonboard	Paper & paperboard
Corrugated cardboard	Corrugated cardboard	Paper & paperboard
High wet strength carrier board	High wet strength carrier board	Paper & paperboard
Kraft paper	Kraft paper	Paper & paperboard
Moulded fibreboard	Moulded fibreboard	Paper & paperboard
Polymer coated paperboard – Aseptic	Polymer coated paperboard – Aseptic	Paper & paperboard
Polymer coated paperboard – Gable top	Polymer coated paperboard – Gable top	Paper & paperboard
Polymer coated paperboard – Cold cup	Polymer coated paperboard – Cold cup	Paper & paperboard
Polymer coated paperboard – Hot cup	Polymer coated paperboard – Hot cup	Paper & paperboard
Polymer coated paperboard – Other	Polymer coated paperboard – Other	Paper & paperboard
Polymer coated paper	Polymer coated paper	Paper & paperboard
Other fibre packaging	Other fibre packaging	Paper & paperboard
Not applicable	Paper & paperboard – Mixed	Paper & paperboard
Newsprint & magazine	Newsprint & magazine	Paper & paperboard
Other fibre non-packaging	Other fibre non-packaging	Paper & paperboard
Glass – Amber	Glass – Amber	Glass
Glass – Flint	Glass – Flint	Glass
Glass – Green	Glass – Green	Glass
Not applicable	Glass – Mixed	Glass
Glass – Other	Glass – Other	Glass
Plastic – PET (1) – Natural	Plastic – PET (1) – Natural	Plastic
Plastic – PET (1) – Coloured – Transparent	Plastic – PET (1) – Coloured – Transparent	Plastic
Plastic – PET (1) – Coloured – Opaque	Plastic – PET (1) – Coloured – Opaque	Plastic
Plastic – HDPE (2) – Natural	Plastic – HDPE (2) – Natural	Plastic
Plastic – HDPE (2) – Coloured	Plastic – HDPE (2) – Coloured	Plastic
Plastic – PVC (3)	Plastic – PVC (3)	Plastic
Plastic – LDPE (4)	Plastic – LDPE (4)	Plastic
Plastic – PP (5) – Natural	Plastic – PP (5) – Natural	Plastic

Material types – Consumption related	Material type list – Collection or sorting output related	Material group
Plastic – PP (5) – Coloured	Plastic – PP (5) – Coloured	Plastic
Plastic – PS (6)	Plastic – PS (6)	Plastic
Plastic – EPS (6)	Plastic – EPS (6)	Plastic
Plastic – Bioplastic – Compostable (7)	Plastic – Bioplastic – Compostable (7)	Plastic
Plastic – Other (7)	Plastic – Other (7)	Plastic
Not applicable	Plastic – Mixed (1–7)	Plastic
Not applicable	Plastic – Mixed (3–7)	Plastic
Not applicable	Plastic – Mixed	Plastic
Plastic – Unidentified	Plastic – Unidentified	Plastic
Plastic – Non-packaging	Plastic – Non-packaging	Plastic
Aluminium – Beverage	Aluminium – Beverage	Metal
Aluminium – Non-beverage	Aluminium – Non-beverage	Metal
Aluminium – Other	Aluminium – Other	Metal
Steel – Tin-plate steel	Steel – Tin-plate steel	Metal
Steel – Mild steel	Steel – Mild steel	Metal
Steel – Stainless steel	Steel – Stainless steel	Metal
Steel – Other	Steel – Other	Metal
Metal – Other	Metal – Other	Metal
Fibreboard – Low-density	Fibreboard	Wood
Fibreboard – Medium-density	Fibreboard	Wood
Fibreboard – High-density	Fibreboard	Wood
Fibreboard – Oriented strand board	Fibreboard	Wood
Wood – Hard	Wood – Hard	Wood
Wood – Soft	Wood – Soft	Wood
Wood – Plywood	Wood – Plywood	Wood
Wood – Other	Wood – Other	Wood
Ceramic	Ceramic	Other
Cloth or fabric	Cloth or fabric	Other
Composite	Composite	Other
Other material into packaging	Other material into packaging	Other
Other material into non-packaging	Other material into non-packaging	Other
Not applicable	Commingled recyclables	Commingled recyclables
Not applicable	Food organics and/or garden organics	Organics
Contamination	Contamination	Other
Waste to landfill	Waste to landfill	Mixed wastes
Unknown	Unknown	Unknown

Table B-7 – Packaging component groups.

Packaging component groups	In scope?	Comments
Bag or pouch	Yes	Includes bags, bladders, envelopes, liners, nets, pouches (including peel pouches) and sachets
Barrel or drum	Yes	Barrels includes barrels, casks and kegs. Drums are plastic and steel containers of >20 L. Note that barrels, casks and kegs are not classified as drums. This group includes rigid intermediate bulk container (RIBC) and flexible intermediate bulk containers (FIBC).
Bottle or jar	Yes	See Table B-7 entries for more details.
Can	Yes	A metallic and generally cylindrical container of unspecified size. Includes aerosol containers.
Carton or box	Yes	See Table B-7 entries for more details.
Closure	Yes	See Table B-7 entries for more details.
Label or seal	Yes	See Table B-7 entries for more details.
Pallet or bin	Yes	Group for larger format packaging types not covered elsewhere.
Returnable plastic crate (RPC)	Yes	Returnable plastic crate (RPC).
Shopping bag	Yes	See Table B-7 entries for more details.
Tableware	Yes	Includes plates, bowls, straws, stirrers, cups, cup lids and cutlery, all intended for single-use.
Tub, tray or punnet	Yes	See Table B-7 entries for more details.
Tube or cartridge	Yes	See Table B-7 entries for more details.
Wrap	Yes	See Table B-7 entries for more details.
Other packaging component	No	See Table B-7 entries for more details.

Provided in **Table B-8** is the list of packaging components, and the related groups (as summarised in **Table B-7**) adopted this year. Note that project reporting is generally not at the component level, but rather at the component group level summarised in **Table B-7**, except as identified elsewhere in this report.

Table B-8 – Packaging components.

Component	Component group	In scope?	Comments
Bag	Bag or pouch	Yes	A preformed, flexible container, generally enclosed on all but one side, which forms an opening that may or may not be sealed after filling.
Liner	Bag or pouch	Yes	A liner is any layer of material that is not acting as a bag or wrapper, but is being used to protect or separate contents from outer packaging. Can be found as inner linings of liquid or pressurised containers (B2C), or as lining cartons in B2B use. Note, bags or wrappers may also be used, where liners are present.
Net	Bag or pouch	Yes	A container of meshwork material made from threads or strips twisted or woven to form a regular pattern with spaces between the threads that is used for holding, carrying, trapping, or confining something.
Pouch	Bag or pouch	Yes	A preformed, flexible container, typically enclosed with a gusset seal at the bottom of the pack can be shaped/arranged to allow the pack to stand on shelf. Pouches are currently used in a wide range of packaging. Specifically, pouches can be for single-serve food item and as such may have integrated mouthpiece, which is not detachable. 'Pouch' also includes 'Envelopes', which are a predominantly flat container of flexible material having only two faces, and joined at three edges to form an enclosure. The non-joined edge provides a filling opening, which may later be closed

Component	Component group	In scope?	Comments
			by a gummed or adhesive flap, heat seal, tie string, metal clasp, or other methods. Also includes packages used for sterile products which may be torn open without touching the product inside (peel pouches).
Sachet	Bag or pouch	Yes	A small, sealed bag or packet containing a small quantity of a product, usually food related.
Barrel, cask or keg	Barrel or drum	Yes	This packaging component includes barrels, casks and kegs. Packaging of circular cross-section, with greater length than breadth, with convex sides and two ends of equal diameter. A barrel is normally made of wooden staves bound together with hoops. Note that barrels, casks and kegs are not classified as drums.
Drum	Barrel or drum	Yes	Plastic and steel containers of ≥20 L. Cylindrical packaging whose bottom end is permanently fixed to the body and top end (head) is either removable or non-removable. Note that barrels, casks and kegs are not classified as drums.
IBC – flexible	Barrel or drum	Yes	A non-rigid container used for transport and storage of fluids and other bulk materials. The construction of the IBC container and the materials used are chosen depending on the application, but is typically woven polypropylene fabric reinforced with nylon or polyester strapping.
IBC – rigid	Barrel or drum	Yes	A rigid intermediate bulk container (RIBC) that is attached to a pallet or has the pallet integrated into the RIBC. The container is used for the transport and storage of fluids and other bulk materials. The construction of the IBC container and the materials used are chosen depending on the application. There are various types available in the marketplace: Foldable (collapsible) IBC Container, Plastic composite IBC Container, Wire Cage IBC Container, Steel IBC Container, and Stainless steel IBC Container.
Pail	Barrel or drum	Yes	Plastic or tin-plate steel containers of ≤20 L. Cylindrical packaging whose bottom end is permanently fixed to the body and top end (lid), if present, is removable.
Bottle	Bottle or jar	Yes	A container having a round neck of relatively smaller diameter than the body and an opening capable of holding a closure for retention of the contents. Specifically, a narrow-necked container as compared with a jug, jar or wide-mouth container. The cross section of the bottle may be round, oval, square, oblong, or a combination of these. The bottle may also have an integrated handle. Bottles generally are made of glass or plastics, but can also be earthenware or metal. Bottle may be disposable, recyclable, returnable, or reusable.
Jar	Bottle or jar	Yes	A rigid container made of glass, stone, earthenware, plastic or other appropriate material with a large opening, which is used to store products, (e.g. jams, cosmetics). Usually with a secure closure
Jug	Bottle or jar	Yes	A rigid container with a handle, and large opening or spout for holding and pouring liquids, generally with no secure closure. They can be cylindrical, round, oval, square, oblong, or a combination of these.
Aerosol	Can	Yes	A gas-tight, pressure-resistant container with a valve and propellant. When the valve is opened, propellant forces the product from the container in a fine or coarse spray pattern or stream. (e.g. a spray can dispensing paint, furniture polish, etc, under pressure). It does not include atomizers, because atomizers do not rely on a pressurised container to propel product from the container.
Can	Can	Yes	A metallic and generally cylindrical container of unspecified size. Generally unpressurised.
Box	Carton or box	Yes	A non-specific term used to refer to a rigid, three-dimensional container with closed faces that completely enclose its contents and may be made out of any material.
Carton	Carton or box	Yes	A non-specific term for an open or re-closable container used mostly for perishable foods (e.g. eggs, or fruit). Includes aseptic PCPB packs or 'bricks', which are defined as rectangular-shaped, stackable packages designed primarily for liquids such as juice or milk. Includes gable top PCPB cartons, which are rectangular-shaped, non-stackable packages designed primarily for liquids such as juice or milk.
Crate (single-use)	Carton or box	Yes	A non-specific term usually referring to a rigid three-dimensional container with semi-closed faces that enclose its contents for

Component	Component group	In scope?	Comments
			shipment or storage. Crates could have an open or closed top and may have internal dividers.
Wrap or basket	Carton or box	Yes	Cardboard (typically) wraps and baskets for beer, soft drink, ready to drink pre-mix beverages, and multi-packs of single-serve food containers or tins. Note that non-beverage 'wrappers' are defined as a separate packaging component, and in a different component group.
Closure	Closure	Yes	Lids, caps, stoppers and all other closures.
Hook, kimble, affixing item	Closure	Yes	Includes: hooks for hanging clothing or displays; plastic kimbles that attach tags, accessories, and similar to clothing; string or other methods of attaching tags and accessories to clothing; and any other item that is used to link, attach or fix something temporarily to a product prior to sale.
Label	Label or seal	Yes	Separately affixed labels, that is, labels that are a separate component and are not printed directly onto packaging components with other major functions. Can include stickers,
Seal	Label or seal	Yes	Containment, freshness or safety seals on rigid containers. Usually plastic, polymer coated paper/paperboard, or aluminium foil.
Bin	Pallet or bin	Yes	A three-dimensional container which either has a pallet platform permanently attached at its base or alternatively requires a platform for its handling and storage as due to its constitution it cannot be handled without it. Also referred to as a 'pallet box'.
Cage	Pallet or bin	Yes	Includes containers enclosed on at least one side by a grating of wires or bars that lets in air and light.
Pallet	Pallet or bin	Yes	A platform used to hold or transport unit loads.
Skid	Pallet or bin	Yes	A group of parallel runners (usually made from timber) attached to a single top-desk or the undersides of boxes, crates, and machines to allow entry of platform trucks or fork lift tines. Unlike a pallet, a skid has no bottom deck.
Stillage	Pallet or bin	Yes	Includes containers enclosed on at least one side by a grating of wires or bars that lets in air and light.
Collapsible – RPC	Returnable plastic crate (RPC)	Yes	Collapsible RPCs typically used as B2B shelf ready packaging for transporting fruit and vegetables from farms to supermarkets. Also known as 'Reusable plastic crates'.
Non-collapsible – dairy	Returnable plastic crate (RPC)	Yes	Non-collapsible RPCs typically used as B2B shelf ready packaging for transporting milk bottles from dairy-processing companies to supermarkets.
Non-collapsible – non-dairy	Returnable plastic crate (RPC)	Yes	Non-collapsible RPCs typically used as B2B shelf ready packaging for transporting baked goods to retail outlets. The major example is bread trays.
Produce bag	Shopping bag	Yes	A bag intended for single-use, without handles, for holding fresh produce.
Reusable bag	Shopping bag	Yes	A bag with handles, intended for carrying shopping, multiple uses are possible.
Single-use bag	Shopping bag	Yes	A bag with handles, intended for carrying shopping and for single-use.
Other shopping bag	Shopping bag	Yes	Any other shopping bag, not already described in other categories.
Bowl	Tableware	Yes	Any size bowl, intended for single-use for takeaway food.
Cup	Tableware	Yes	Any size cup, intended for single-use for takeaway drinks. Can be made from polymer-coated paperboard (PCPB), polystyrene (PS) or expanded polystyrene (EPS).
Cup lid	Tableware	Yes	A closure for single-use cup, commonly made from polystyrene. Can also be from polypropylene (PP) or bioplastic (PLA).
Cutlery	Tableware	Yes	Any type of utensil, usually fork, knife, or spoon, or combination of two, intended for single-use. Can be part of a shelf product, or accompany take-away food. Usually made from plastic or wood(other stuff…?).
Plate	Tableware	Yes	Any size plate, intended for single-use for takeaway food.
Stirrer	Tableware	Yes	Intended for single-use, to stir drinks. Usually made of plastic.
Straw	Tableware	Yes	Any size straw, intended for single-use. Usually plastic or waxed paper.

Component	Component group	In scope?	Comments
Blister pack	Tub, tray or punnet	Yes	A type of packaging in which the item is secured between a thermoformed dome or “bubble” (usually transparent plastic) and a paperboard surface or “carrier.” This packaging component relates to the plastic bubble component only, not any non-plastic carrier. Attachment to the carrier may be by stapling, heat- sealing, gluing, or other means. In other instances, the blister folds over the product in clam-shell fashion to form an enclosing container. Blisters are often thermoformed from polyvinyl chloride. However, almost any thermoplastic can be thermoformed into a blister. Where a blister pack is made from a plastic polymer the packaging is usually thermoformed (sheet plastic is heated to soften and then placed into a mould).
Carrier	Tub, tray or punnet	Yes	The base of a blister pack. The base is what the preformed shape attaches to, by stapling, heat- sealing, gluing, or other means. The carrier is usually made of boxboard/cartonboard and often has labelling printed on it.
Pot	Tub, tray or punnet	Yes	A flat-bottomed container that has a base of any shape and which may or not be closed with a lid. Pots are usually made of cardboard, plastic, ceramic, metal or other materials and may be used for a wide array of products such as cosmetics, food/liquids, dairy products, plants.
Punnet or clamshell	Tub, tray or punnet	Yes	A punnet is a small box or square basket for the transport and sale of fruit and vegetables, typically for small fruits such as berries. Punnets can consist of a base only, a separable base and lid, or be a one-piece container consisting of a base and lid joined by a hinge area which allows the pack to come together to close. A clamshell is typically a one-piece container consisting of a base and lid joined by a hinge area which allows the pack to come together to close. The clamshell format is often also used in takeaway food packaging. NOTE: Punnets have base and closure of same material, so they are considered to be same component and weighed together. This is consistent with how the clamshell format is weighed. Where a punnet or clamshell is made from a plastic polymer the packaging is usually thermoformed (sheet plastic is heated to soften and then placed into a mould).
Tray	Tub, tray or punnet	Yes	A shallow container, usually rectangular, which may or may not have a cover, and is used for displaying or carrying items. The base is bigger than the height. It may have moulded pockets or forms for holding contents. Where a tray is made from a plastic polymer the packaging is usually thermoformed (sheet plastic is heated to soften and then placed into a mould).
Tub	Tub, tray or punnet	Yes	A flat-bottomed container that has a base of any shape and which may or not be closed with a lid. The height is usually greater than the base. Usually made of paper, plastic or other materials, these containers are typically used to contain mostly (but not exclusively) foods such as ice cream, margarine, yoghurt, sour cream, confections, etc. Includes 'cups', usually for smaller volume product.
Cartridge	Tube or cartridge	Yes	A rigid cylindrical container holding an item or substance, typically designed for insertion into a delivery mechanism.
Tube – flexible	Tube or cartridge	Yes	A flexible cylindrical container sealed on one end that could be closed with a cap or dispenser on the other end.
Tube – rigid	Tube or cartridge	Yes	A rigid cylindrical component for holding product around the outside, typically designed for holding and dispensing yarn, string or flexible films. Includes consumer packaging 'Reels' and 'Rolls'.
Fodder film or net wrap	Wrap	Yes	A plastic film or netting around a round or rectangular bale of agricultural fodder (e.g. hay) to protect the fodder from weather, maintain the bale integrity, and/or generally protect the fodder. Often referred to as silage wrap.
Pallet wrap	Wrap	Yes	A high-tensile plastic film, stretched and wrapped repeatedly around a pallet item or group of items to secure and maintain unit integrity. The use of stretch film to tightly wrap the pallet load is to bind, protect and immobilise it for further handling or shipping. This is specifically B2B use.
Shrink wrap	Wrap	Yes	A plastic film around an item or group of items which is heated causing the film to shrink, securing the film. The use of shrunken film to tightly wrap a package or a unit load in order to bind, protect and immobilise it for further handling or shipping.

Component	Component group	In scope?	Comments
Sleeve	Wrap	Yes	A non-rigid container usually made of paper, cardboard or plastic, that is open-ended and is slid over the contents for protection or presentation.
Strapping or banding	Wrap	Yes	Something used to bind, tie, or encircle the item or its packaging to secure and maintain unit integrity. Includes packaging tape. Includes baling twine, and other forms of packaging twines.
Stretch wrap	Wrap	Yes	A high-tensile plastic film, stretched and wrapped around an item or group of items to secure and maintain unit integrity. The use of stretch film to tightly wrap a package or a unit load in order to bind, protect and immobilise it for further storage, handling or shipping. This mainly includes B2C use.
Wrapper	Wrap	Yes	The process of enclosing all or part of an item with layers of flexible wrapping material (e.g. chocolate blocks). Does not include items which are shrink-wrapped or vacuum-packed. Note that cardboard beverage 'wraps' are defined as a separate packaging component, and in a different component group.
Absorbent	Other component group	Yes	Pouches, sachets or similar filled with an absorbent material or chemical for absorbing liquids or gases. Often used to extend the shelf-life of fresh foods but also used with clothing, electronic items, papergoods and other products.
Applicator	Other component group	Yes	Includes balls for roll-on deodorants, pump dispensers from sprays and atomizers, and the tubing and springs that accompany such, and any other fitting that is used to apply a product. Also includes plastic components used to present goods at point of sale, such as plastic components used to present and hold disposable razors and razor blades.
Basket	Other component group	No	A semi rigid container usually open at the top traditionally used for gathering, shipping and marketing agricultural products.
Coat hanger	Other component group	Yes	Coat hangers for clothes.
Dunnage	Other component group	No	Loose wood, matting, or similar material used to keep a cargo in position during sea, road or air transport.
Rack	Other component group	No	A nonspecific term identifying a framework or stand for carrying, holding, or storing items. Commonly on wheels and primarily used in the logistical functions to deliver items such as hanging garments, or items on shelves such as dairy products and bakery items and flowers.
Reel	Other component group	Yes	A B2B spool on which thread, wire, film, etc, is wound. Any device on which a material may be wound. Usually has flanged ends and is used for shipping or processing purposes.
Slip sheet	Other component group	Yes	A strong sheet of plastic, cardboard or other material which may be grabbed, hooked or attached to a forklift or other transportation equipment. The slip sheet is used to pull the products stacked on top of it, i.e. to remove all products from a pallet in one action.
Void fill	Other component group	Yes	Materials use to prevent goods from moving around and being damaged within secondary freight packaging (typically corrugated cardboard boxes). Types of void fill include bubble wrap, creased kraft paper and EPS foam.
Other component	Other component group	Yes	Packaging components not currently specified on the list.

Table B-9 provides a reference list of identified reusable packaging systems known to be operating in Australia during 2022–23.

Table B-9 – Reusable packaging systems.

Reusable packaging system	Packaging level	Sector of use	Profiled in 2022–23	Comments
Kegs for beer & cider	Primary	B2B	Yes	-
Kegs for milk	Primary	B2B + B2C	No	Anticipated to be profiled in 2023–24.
Plastic crates – Collapsible – RPCs	Secondary	B2B	Yes	-

Reusable packaging system	Packaging level	Sector of use	Profiled in 2022–23	Comments
Plastic crates – Non-collapsible – Dairy	Secondary	B2B	Yes	-
Reusable pallets – Plastic	Tertiary	B2B	Yes	Includes display pallets.
Reusable pallets – Timber	Tertiary	B2B	Yes	Includes display pallets.
Reusable shopping bags – LDPE bags (supermarket type)	Secondary	B2C	Yes	-
Reusable shopping bags – Non-woven PP bags	Secondary	B2C	Yes	-
Barrels and drums	Primary	B2B	Yes	Excludes beer kegs (and kegs for other beverages) and IBCs.
Beverage bottles	Primary	B2C	No	-
Coat hangers	Primary	B2C	No	-
Cups/mugs	Primary	B2C	Yes	-
Gas cylinders – BBQ gas bottles	Primary	B2C	No	-
Gas cylinders – Compressed CO2 cylinders for home beverage carbonation	Primary	B2C	No	For example Sodastream.
Intermediate bulk containers	Tertiary	B2B	Yes	-
Kegs – Other beverages	Primary	B2B	No	-
Metal stillages	Tertiary	B2B	No	-
Pallet slip sheets, wrapping and strapping	Tertiary	B2B	No	-
Plastic crates – Non-collapsible – Non-dairy	Secondary	B2B	No	For example the AusPost fluted polypropylene crate system.
Plastic crates – Trays	Secondary	B2B	No	For example bread trays.
Produce bins	Tertiary	B2B	No	-
Reusable consumer packaging	Primary	B2C	No	For example the Zero Co refillable cleaning and personal care products packaging system.
Tableware	Primary	B2C	No	-
Toner cartridges	Primary	B2C + B2B	No	-

APPENDIX C – JURISDICTIONAL DATA

This section provides consumption (POM) and recovery data for Australia (**Table C-1**) and for each of the states and territories (**Tables C-2 to C-9**).

The state/territory level data reported here was primarily captured through the two main surveys, on packaging manufacturers (POM data), and packaging reprocessing facility operators (recovery data). As part of both surveys, respondents were surveyed on the destination (for POM) and source (for recovery), by jurisdiction.

Many of the packaging manufacturers, particularly the larger manufacturers, could not provide accurate data on the destination jurisdictions for their packaging. For these respondents, packaging POM was allocated to states/territories on a per capita basis.

Imports of packaging POM (both empty and filled) were allocated to states/territories on a per capita basis.

Australian Customs data on scrap packaging exports was also obtained and analysed at the state/territory source level to provide information on the source jurisdiction for exported scrap packaging.

Table C-1 – Australian packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	3,805,000	2,469,000	65%
Glass	1,105,000	761,000	69%
Plastic	1,265,000	234,000	19%
Metal	302,000	156,000	52%
Wood	562,000	286,000	51%
Total	**7,040,000**	**3,907,000**	**56%**

Table C-2 – ACT packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	66,000	47,000	71%
Glass	19,000	7,000	38%[1]
Plastic	21,000	2,000	9%
Metal	5,000	2,000	49%
Wood	10,000	0	0%
Paper & paperboard	**121,000**	**58,000**	**48%**

1. The recovery and recovery rate of glass packaging, as reported in the table, are likely lower than the true values due to packaging material being transferred to other jurisdictions for reprocessing (e.g. NSW), but the true source state jurisdiction is not known or reported by reprocessors in the receiving jurisdictions.

Table C-3 – NSW packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	1,213,000	803,000	66%
Glass	346,000	195,000	56%
Plastic	391,000	71,000	18%
Metal	110,000	43,000	39%
Wood	176,000	68,000	38%
Total	**2,235,000**	**1,180,000**	**53%**

Table C-4 – NT packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	36,000	5,000	14%
Glass	10,000	5,000	43%
Plastic	11,000	1,000	4%
Metal	2,000	2,000	63%
Wood	5,000	0	0%
Total	**65,000**	**12,000**	**18%**

Table C-5 – QLD packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	768,000	654,000	85%
Glass	227,000	118,000	52%
Plastic	259,000	23,000	9%
Metal	54,000	41,000	75%
Wood	115,000	95,000	83%
Total	**1,423,000**	**931,000**	**65%**

Table C-6 – SA packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	261,000	156,000	60%
Glass	77,000	NR	NR
Plastic	87,000	17,000	19%
Metal	19,000	11,000	60%
Wood	39,000	36,000	92%
Total	**483,000**	**321,000**	**66%**

Table C-7 – TAS packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	81,000	37,000	45%
Glass	24,000	0	0%
Plastic	28,000	2,000	8%
Metal	6,000	3,000	59%
Wood	12,000	1,000	9%
Total	**150,000**	**43,000**	**29%**

1. The recovery and recovery rate of glass packaging, as reported in the table, are likely lower than the true values due to packaging material being transferred to other jurisdictions for reprocessing (e.g. Vic), but the true source state jurisdiction is not known or reported by reprocessors in the receiving jurisdictions.

Table C-8 – VIC packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	976,000	629,000	64%
Glass	283,000	257,000	91%
Plastic	335,000	104,000	31%
Metal	79,000	38,000	49%
Wood	144,000	75,000	52%
Total	**1,816,000**	**1,103,000**	**61%**

Table C-9 – WA packaging consumption and recovery data in 2022–23, by material group.

Material group	POM (tonnes)	Recovery (tonnes)	Recovery rate (%)
Paper & paperboard	406,000	140,000	35%
Glass	120,000	78,000	65%
Plastic	131,000	15,000	11%
Metal	29,000	16,000	56%
Wood	61,000	11,000	19%
Total	**746,000**	**261,000**	**35%**

APPENDIX D – EMPLOYMENT AND CAPACITY DATA

This year the project included a quantification of 2022–23 packaging industry employment and facility capacity (existing and planned). This included:

- Packaging related employment by companies undertaking packaging manufacturing or reprocessing.
- Packaging related facility capacity (existing and planned). Planned capacity increases are those that relate to increased use of post-consumer packaging in manufacturing or post-consumer packaging reprocessing, and where capital works are approved and funded.

D.1 Packaging industry employment

Estimates of 2022–23 packaging related employment in terms of equivalent full-time employees (EFTE) are provided in **Table D-1** and **Table D-2**, by organisation type, for packaging manufacturers and reprocessors respectively. Employment is also normalised to 10,000 tonnes (or 10 kilotonnes, or 10 kt) of throughput to provide a standard basis for comparisons.

Table D-1 – Number of employees involved in packaging manufacturing related activities.

Organisation type	Employment	Normalised employment
	(EFTE)	(EFTE/10 kt)
Manufacturer – fibre	2,580	12.6
Manufacturer – glass	1,730	20.0
Manufacturer – metals	880	36.3
Manufacturer – plastics	7,720	100.2
Manufacturer – wood	370	10.0
Total	**13,280**	**31.0**

Table D-2 – Number of employees involved in packaging reprocessing related activities.

Organisation type	Employment	Normalised employment
	(EFTE)	(EFTE/10 kt)
Reprocessor – fibre	1,250	9.5
Reprocessor – glass	780	10.3
Reprocessor – metals	0	0.0
Reprocessor – plastics	540	37.8
Reprocessor – wood	150	0.0
Total	**2,720**	**10.8**

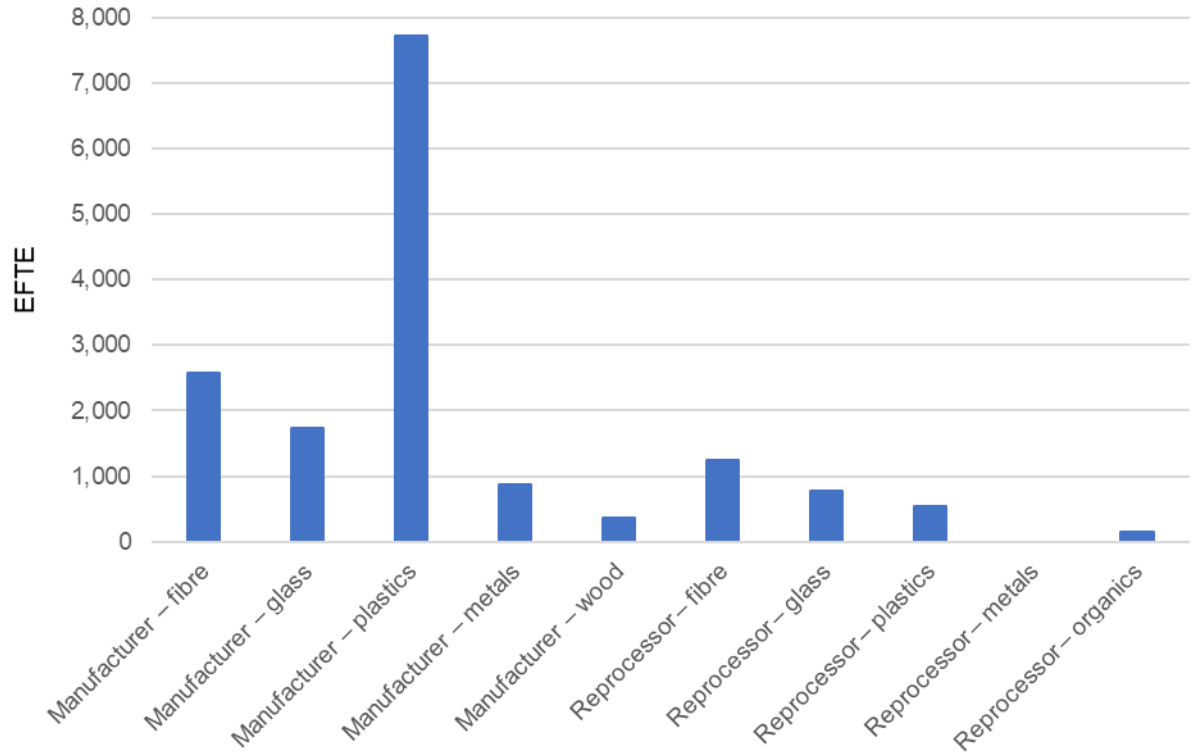

Figure D-1 – Number of employees involved in packaging related activities.

D.2 Facility capacities

D.2.1 Packaging manufacturers

Packaging manufacturers were surveyed to collect data on facilities (by count and quantity) with funded and approved plans to increase the use of post-consumer recycled content in packaging over the next few years. The summary results by facility count are provided in **Table D-3**, and by quantity of increased use of post-consumer packaging (tonnes) in **Table D-4**.

There are two major shifts between the 2021–22 and 2022–23 surveys:

- Glass packaging – In the 2022–23 survey glass packaging manufacturers reported plans to increase PCR content by 111,000 tonnes over the next few years.
- Plastic packaging – In the 2022–23 survey plastic packaging manufacturers reported plans to increase PCR content by 32,000 tonnes over the next few years.
- Metal packaging – In the 2022–23 survey metal packaging manufacturers reported plans to increase PCR content by 16,000 tonnes over the next few years.

Table D-3 – Number of manufacturing facilities with funded and approved plans to increase use of PCR content in packaging over the next few years, by material group.

Material group	Yes	No	Maybe	No response	Total
	(count)	(count)	(count)	(count)	(count)
Paper & paperboard	0	10	0	36	**46**
Glass	5	1	0	1	**7**
Plastic	37	80	11	37	**165**
Metal	1	10	1	6	**18**
Wood	0	0	0	5	**5**
Total	**43**	**101**	**12**	**85**	**241**

Table D-4 – Total tonnes of PCR content expected based on manufacturing facilities with funded and approved plans to increase use of PCR content in packaging over the next few years, by material group.

Material group	Yes	No	Maybe	No response	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Paper & paperboard	0	N/A	0	N/A	**0**
Glass	111,000	N/A	0	N/A	**111,000**
Plastic	32,000	N/A	0	N/A	**32,000**
Metal	16,000	N/A	0	N/A	**16,000**
Wood	0	N/A	0	N/A	**0**
Total	**159,000**	**N/A**	**0**	**N/A**	**159,000**

D.2.2 Packaging reprocessors – Existing capacity

Packaging reprocessors were surveyed to collect data on their average reprocessing capacity utilisation in 2022–23, by material type and capacity utilisation category. The summary results by utilisation category are provided in **Table D-5** and **Figure D-2**. The tonnages reported are the reprocessing throughput for the facilities that reported under each capacity utilisation category. These quantities are then converted to estimated 'spare' capacities in **Table D-5** and **Figure D-5**.

Table D-5 – Average reprocessing capacity utilisation in 2022–23, by material group and capacity utilisation category.

Material group	At <25% capacity	At <50% capacity	At 50% capacity	At 75% capacity	At 90% capacity	At capacity	No response	Not applicable[a]	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Paper & paperboard	700	0	200	500	3,700	860,100	727,500	876,800	**2,469,400**
Glass	2,600	6,900	113,000	83,900	0	460,100	93,300	1,100	**761,000**
Plastic	5,600	11,700	4,200	48,600	29,000	26,500	56,300	52,500	**234,400**
Metal	200	0	0	0	1,800	0	17,600	136,700	**156,200**
Wood	0	0	1,500	4,500	0	0	0	280,400	**286,400**
Total	**9,000**	**18,600**	**118,900**	**137,600**	**34,500**	**1,346,600**	**894,700**	**1,347,500**	**3,907,400**

a) The 'Not applicable' quantity is mostly exported material. For wood packaging it refers to mulching and composting facilities.

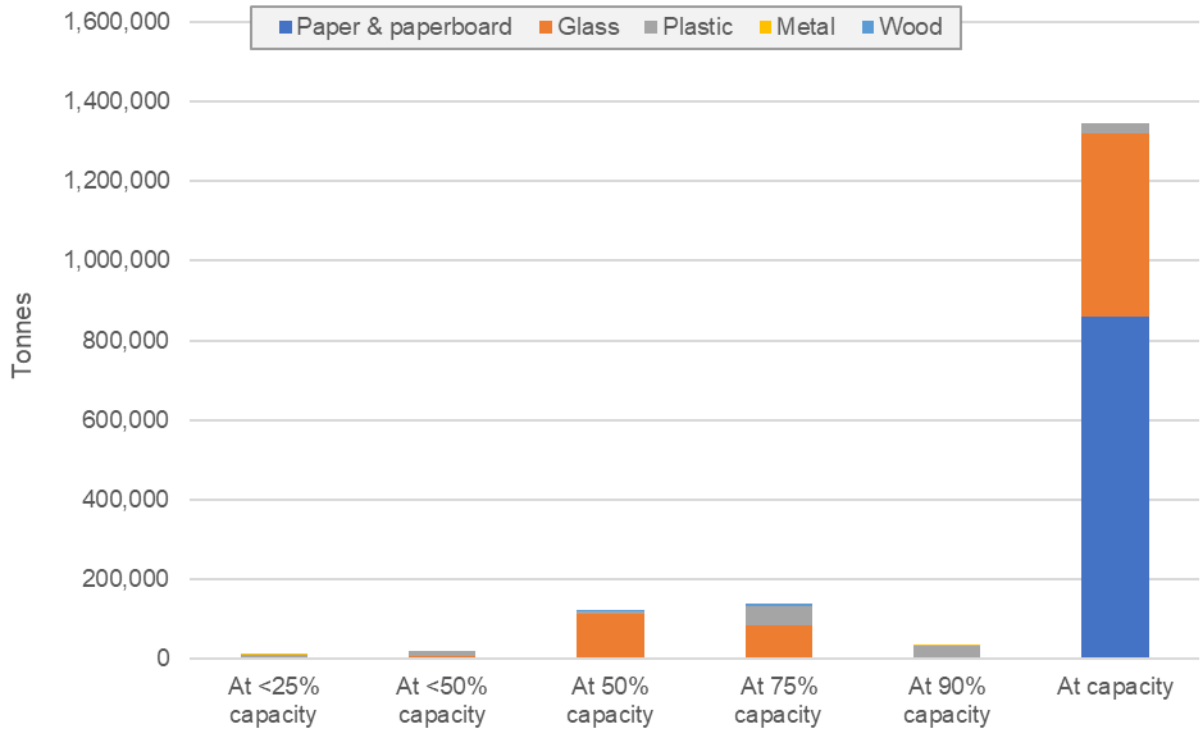

Figure D-2 – Average reprocessing capacity utilisation in 2022–23, by material group and capacity utilisation category (tonnes).

Table D-6 and **Figure D-3** present the estimated quantities of spare reprocessing capacity nationally in 2022–23. Total reported spare capacity was 306 kt, which is around 8% of local reprocessing. There would also have been some additional spare capacity at those reprocessors that did not report their capacity utilisation. These reprocessors made up 23% of local reprocessing.

Table D-6 – Spare reprocessing capacity utilisation in 2022–23, by material group and capacity utilisation category.

Material group	At <25% capacity[a]	At <50% capacity[a]	At 50% capacity	At 75% capacity	At 90% capacity	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Paper & paperboard	5,900	0	200	200	400	**6,700**
Glass	23,700	20,700	113,000	28,000	0	**185,400**
Plastic	50,200	35,100	4,200	16,200	3,200	**109,000**
Metal	1,500	0	0	0	200	**1,700**
Wood	0	0	1,500	1,500	0	**3,000**
Total	**81,400**	**55,900**	**118,900**	**45,900**	**3,800**	**305,800**

a) Reprocessors that reported being at less than 25% capacity were assumed to be at 10% capacity utilisation, and at less than 50% capacity were assumed to be at 25% capacity utilisation, in calculating spare capacity.

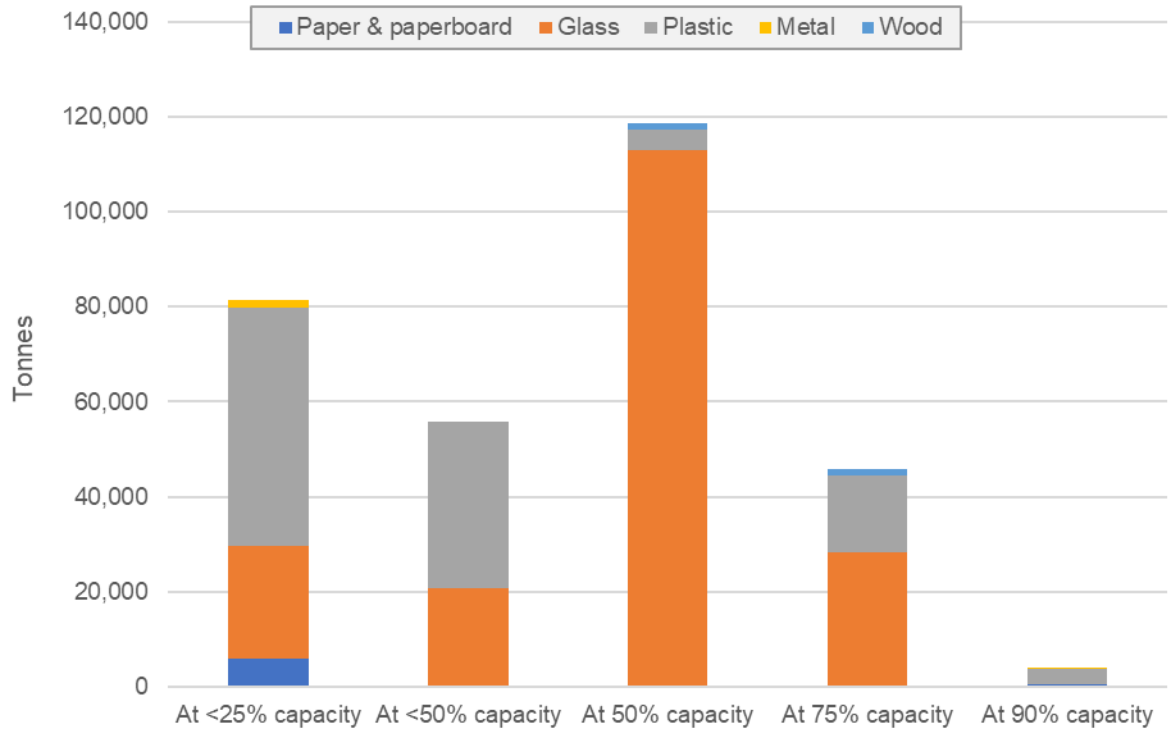

Figure D-3 – Spare reprocessing capacity utilisation in 2022–23, by material group and capacity utilisation category (tonnes).

D.2.3 Packaging reprocessors – Planned new capacity

Packaging reprocessors were surveyed to collect data on their funded and approved plans to increase reprocessing capacity over the next few years, by material type. The summary results by material group are provided in **Table D-7** and **Figure D-4**.

There was 1,347 kt of new reprocessing capacity reported to be in the pipeline, 36% of which was related to plastic packaging and 32% to glass packaging reprocessing. This is a 12% increase on the planned new capacity (1,205 kt) reported for the 2021–22 packaging quantification study.

The expected reprocessing capacity for plastics (+487,000 tonnes) is a 22% increase on the projected increase in the 2021–22 survey (400,000 tonnes).

Table D-7 – Expected increase in reprocessing capacity over the next few years, by material group.

Material group	Quantity (tonnes)
Paper & paperboard	**428,000**
Glass	**431,000**
Plastic	**487,000**
Metal	**1,000**
Wood	**0**
Total	**1,347,000**

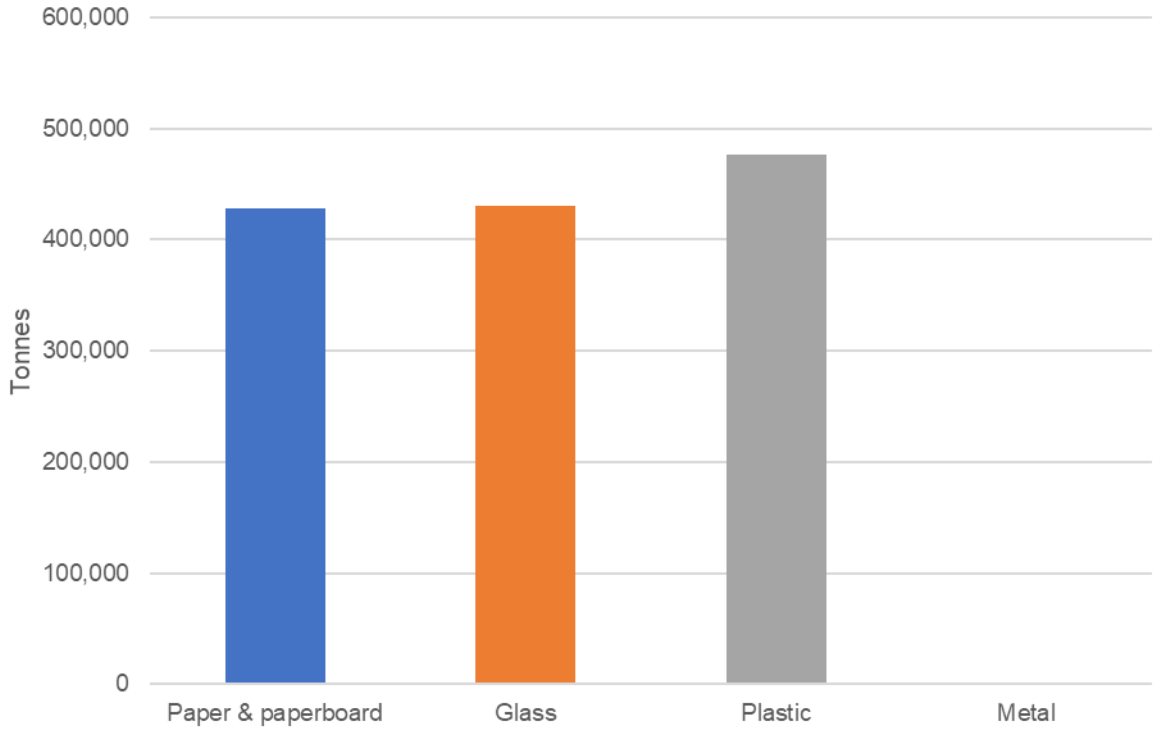

Figure D-4 – Expected increase in reprocessing capacity over the next few years, by material group (tonnes).

APPENDIX E – CONTAINER DEPOSIT ELIGIBLE PACKAGING DATA

This year the project has included the quantification of 2022–23 flows of container deposit (CD) eligible packaging, both POM and recovered by collection pathway.

The CD scheme operational dates covered by the data in this appendix are:

- ACT is full year 2022–23 (launched 30 June 2018).
- NSW is full year 2022–23 (launched 1 December 2017).
- NT is full year 2022–23 (launched 3 January 2012).
- QLD is full year 2022–23 (launched 1 November 2018).
- SA is full year 2022–23 (launched in 1977).
- TAS scheme to commence in 2025 or later (no data in this appendix).
- VIC scheme commenced November 2023 (no data in this appendix).
- WA is full year 2022–23 (launched 1 October 2020).

The data provided in this section includes (in terms of both tonnes and package counts):

- CD eligible packaging POM by jurisdiction (Section E.1).
- CD eligible packaging redeemed via depots and reverse vending machines (Section E.2.1).
- CD eligible packaging redeemed via MRFs (Section E.2.2).
- CD eligible packaging unredeemed packaging recovered via MRFs and other pathways (Section E.2.3).
- Total recovery of CD eligible packaging via all collection routes (Section E.2.4).
- Reprocessing destinations for CD eligible packaging (Section E.2.5).
- CD eligible packaging to landfill (Section E.3).

E.1 CD eligible packaging POM

Table E-1 – CD eligible packaging POM in 2022–23 by material type and jurisdiction (tonnes).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	860	20,880	850	28,810	5,880	8,320	65,610
Tin-plate steel	10	320	10	150	0	80	560
Amber glass	2,350	59,190	1,630	56,130	10,900	21,930	152,130
Flint glass	2,350	59,190	1,630	56,130	10,900	21,930	152,130
Green glass	2,350	59,190	1,630	56,130	10,900	21,930	152,130
PET (1) – Natural	880	21,760	690	26,230	4,830	6,650	61,050
PET (1) – Transparent	200	4,840	150	2,280	1,070	550	9,090
PET (1) – Opaque	10	270	10	0	60	0	350
HDPE (2) – Natural	70	1,440	90	2,410	380	550	4,940
HDPE (2) – Coloured	10	320	20	530	80	120	1,080
Other plastic (7)	0	10	0	0	0	0	10
PCPB – Aseptic	110	2,140	70	2,470	970	1,210	6,980
PCPB – Gable top	30	540	70	620	140	300	1,690
Other material	0	30	0	0	0	10	40
Total	**9,250**	**230,110**	**6,870**	**231,900**	**46,120**	**83,570**	**607,810**

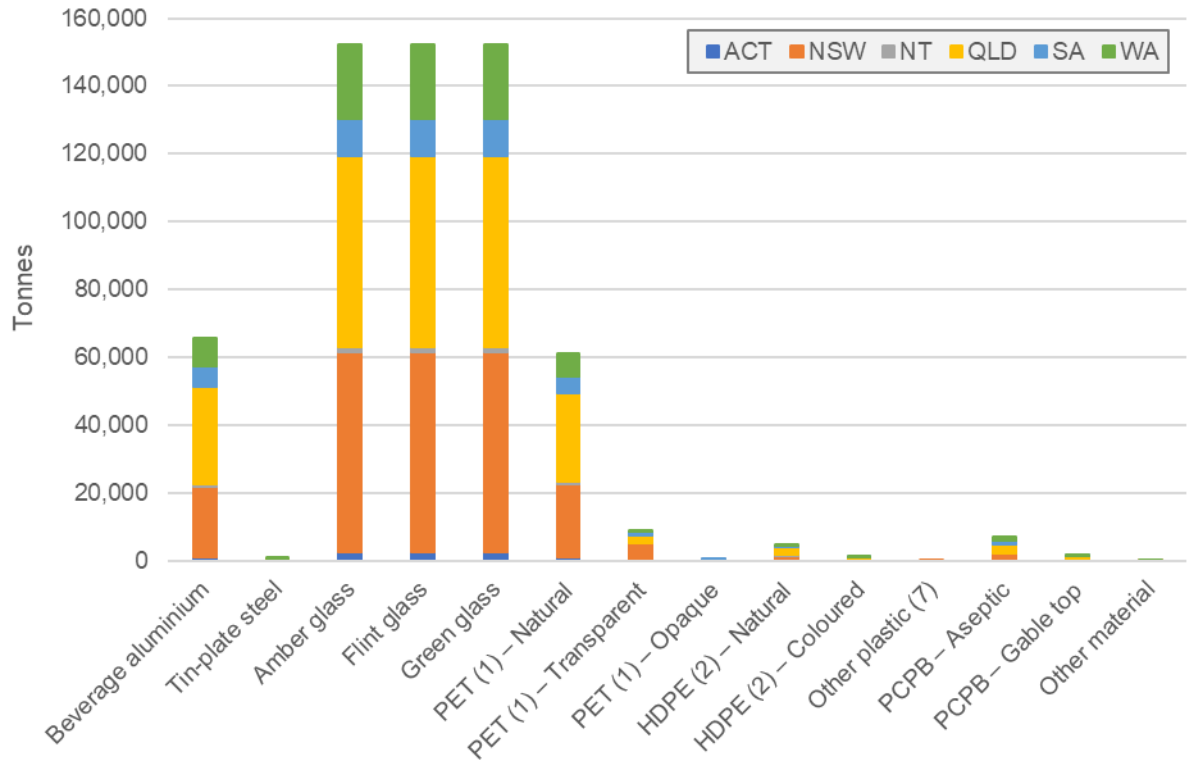

Figure E-1 – CD eligible packaging POM in 2022–23 by material type and jurisdiction (tonnes).

Table E-2 – CD eligible packaging POM in 2022–23 by material type and jurisdiction (million packs).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)
Beverage aluminium	62.545	1,513.047	61.880	1,398.478	430.879	610.586	4,077.416
Tin-plate steel	0.253	7.166	0.152	3.485	0.000	1.890	12.946
Amber glass	10.437	262.710	7.237	196.533	49.021	108.985	634.922
Flint glass	10.437	262.710	7.237	196.533	49.021	108.985	634.922
Green glass	10.437	262.710	7.237	196.533	49.021	108.985	634.922
PET (1) – Natural	37.286	918.242	29.295	753.809	182.555	390.600	2,311.787
PET (1) – Transparent	8.286	204.054	6.510	65.549	40.568	32.192	357.158
PET (1) – Opaque	0.460	11.336	0.362	0.000	2.254	0.000	14.412
HDPE (2) – Natural	2.156	46.984	2.995	68.502	19.550	19.960	160.148
HDPE (2) – Coloured	0.473	10.313	0.658	15.037	4.292	4.381	35.154
Other plastic (7)	0.062	1.129	0.000	0.000	0.000	0.000	1.192
PCPB – Aseptic	8.131	155.185	5.259	118.219	40.470	64.168	391.433
PCPB – Gable top	2.033	38.796	5.259	29.555	11.405	16.042	103.090
Other material	0.309	2.413	0.000	0.000	0.000	0.422	3.144
Total	**153.305**	**3,696.795**	**134.081**	**3,042.235**	**879.034**	**1,467.196**	**9,372.646**

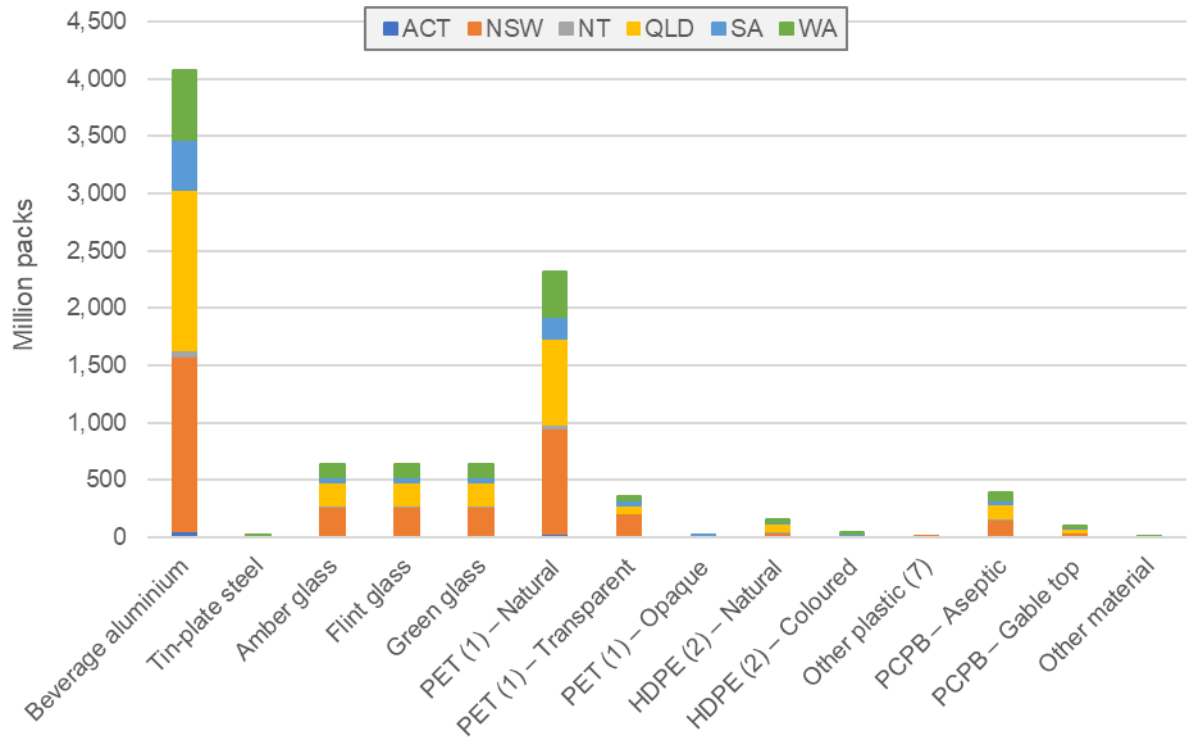

Figure E-2 – CD eligible packaging POM in 2022–23 by material type and jurisdiction (million packs).

E.2 CD eligible packaging recovery

E.2.1 Redeemed recovery via depots and reverse vending machines

Table E-3 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via depots and reverse vending machines (tonnes).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	480	11,810	740	17,320	4,490	4,710	39,550
Tin-plate steel	0	120	0	40	0	40	210
Amber glass	1,000	33,490	1,630	33,450	9,330	13,940	92,840
Flint glass	1,000	33,490	1,630	33,450	9,330	13,940	92,840
Green glass	1,000	33,490	1,630	33,450	9,330	13,940	92,840
PET (1) – Natural	310	10,960	410	12,990	2,960	3,220	30,830
PET (1) – Transparent	70	2,440	90	1,130	660	270	4,650
PET (1) – Opaque	0	140	10	0	40	0	180
HDPE (2) – Natural	20	540	20	900	240	170	1,900
HDPE (2) – Coloured	10	120	10	200	50	40	420
Other plastic (7)	0	0	0	0	0	0	0
PCPB – Aseptic	20	380	30	590	490	290	1,800
PCPB – Gable top	10	100	30	150	70	70	420
Other material	0	0	0	0	0	0	0
Total	**3,920**	**127,070**	**6,220**	**133,670**	**37,000**	**50,610**	**358,490**
Redemption rate (%)[1]	**42.4%**	**55.2%**	**90.6%**	**57.6%**	**80.2%**	**60.6%**	**59.0%**

1. Redemption % is relative to CD eligible packaging POM.

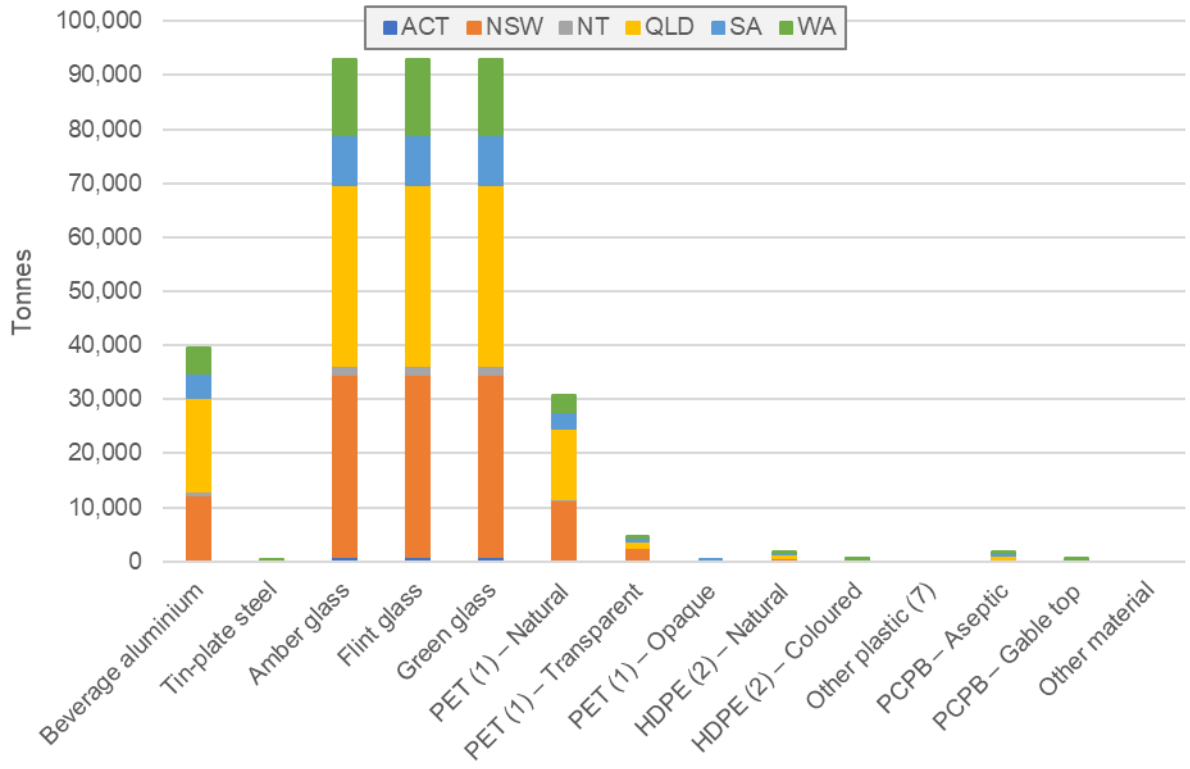

Figure E-3 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via depots and reverse vending machines (tonnes).

Table E-4 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via depots and reverse vending machines (million packs).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)
Beverage aluminium	35.003	855.902	53.752	840.762	329.047	345.287	2,459.752
Tin-plate steel	0.018	2.615	0.041	1.029	0.000	1.079	4.782
Amber glass	4.438	148.651	7.237	117.129	41.962	69.271	388.687
Flint glass	4.438	148.651	7.237	117.129	41.962	69.271	388.687
Green glass	4.438	148.651	7.237	117.129	41.962	69.271	388.687
PET (1) – Natural	12.892	462.461	17.104	373.202	111.829	188.933	1,166.421
PET (1) – Transparent	2.865	102.769	3.801	32.452	24.851	15.571	182.309
PET (1) – Opaque	0.159	5.709	0.211	0.000	1.381	0.000	7.460
HDPE (2) – Natural	0.799	17.671	0.755	25.565	12.383	6.084	63.256
HDPE (2) – Coloured	0.175	3.879	0.166	5.612	2.718	1.335	13.885
Other plastic (7)	0.000	0.017	0.000	0.000	0.000	0.000	0.017
PCPB – Aseptic	1.670	27.742	2.147	28.250	20.427	15.233	95.470
PCPB – Gable top	0.417	6.936	2.147	7.062	5.761	3.808	26.132
Other material	0.000	0.178	0.000	0.000	0.000	0.118	0.296
Total	**67.312**	**1,931.831**	**101.833**	**1,665.323**	**634.281**	**785.261**	**5,185.842**
Redemption rate (%)[1]	**43.9%**	**52.3%**	**75.9%**	**54.7%**	**72.2%**	**53.5%**	**55.3%**

1. Redemption % is relative to CD eligible packaging POM.

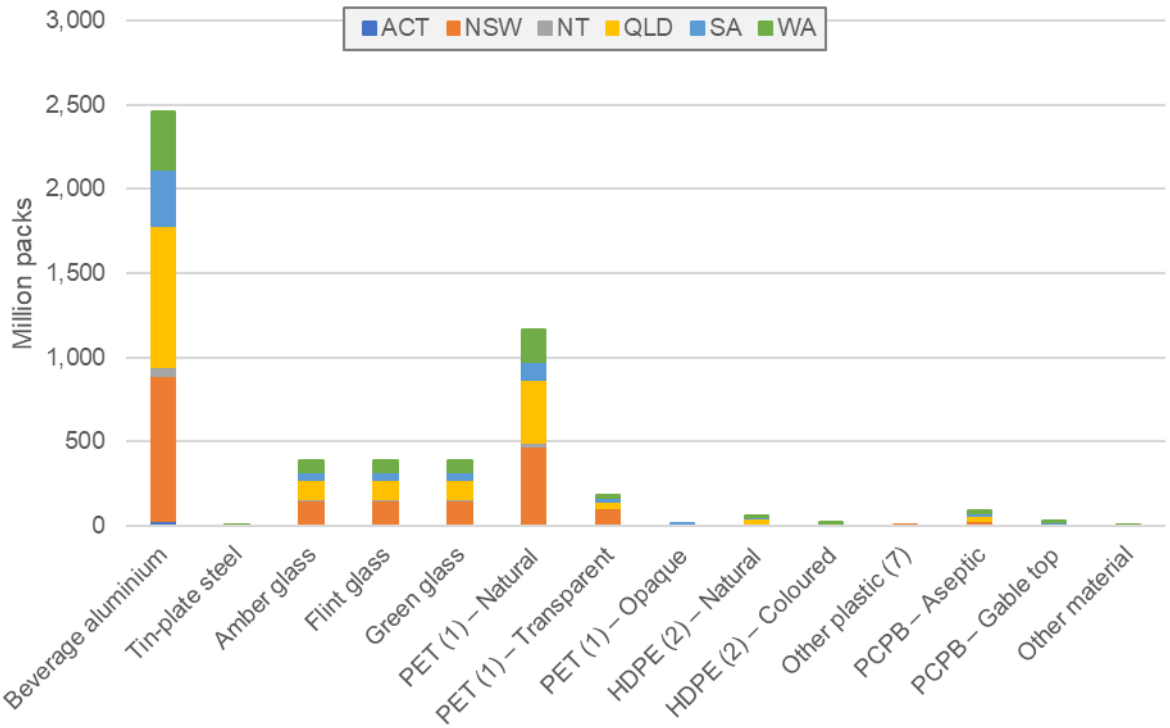

Figure E-4 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via depots and reverse vending machines (million packs).

E.2.2 Redeemed recovery via MRFs

Table E-5 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via MRFs (tonnes).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	220	2,350	0	1,890	160	730	5,340
Tin-plate steel	0	0	0	0	0	0	0
Amber glass	610	10,530	0	11,820	0	3,150	26,120
Flint glass	610	10,530	0	11,820	0	3,150	26,120
Green glass	610	10,530	0	11,820	0	3,150	26,120
PET (1) – Natural	270	2,580	0	1,320	210	580	4,950
PET (1) – Transparent	60	570	0	110	50	50	840
PET (1) – Opaque	0	30	0	0	0	0	40
HDPE (2) – Natural	30	270	0	440	0	100	850
HDPE (2) – Coloured	10	60	0	100	0	20	190
Other plastic (7)	0	0	0	0	0	0	0
PCPB – Aseptic	0	0	0	0	0	0	0
PCPB – Gable top	0	0	0	0	0	0	0
Other material	0	0	0	0	0	0	0
Total	**2,440**	**37,460**	**0**	**39,330**	**410**	**10,920**	**90,560**
Redemption rate (%)[1]	**26.4%**	**16.3%**	**0.0%**	**17.0%**	**1.0%**	**13.1%**	**15.0%**

1. Redemption % is relative to CD eligible packaging POM.

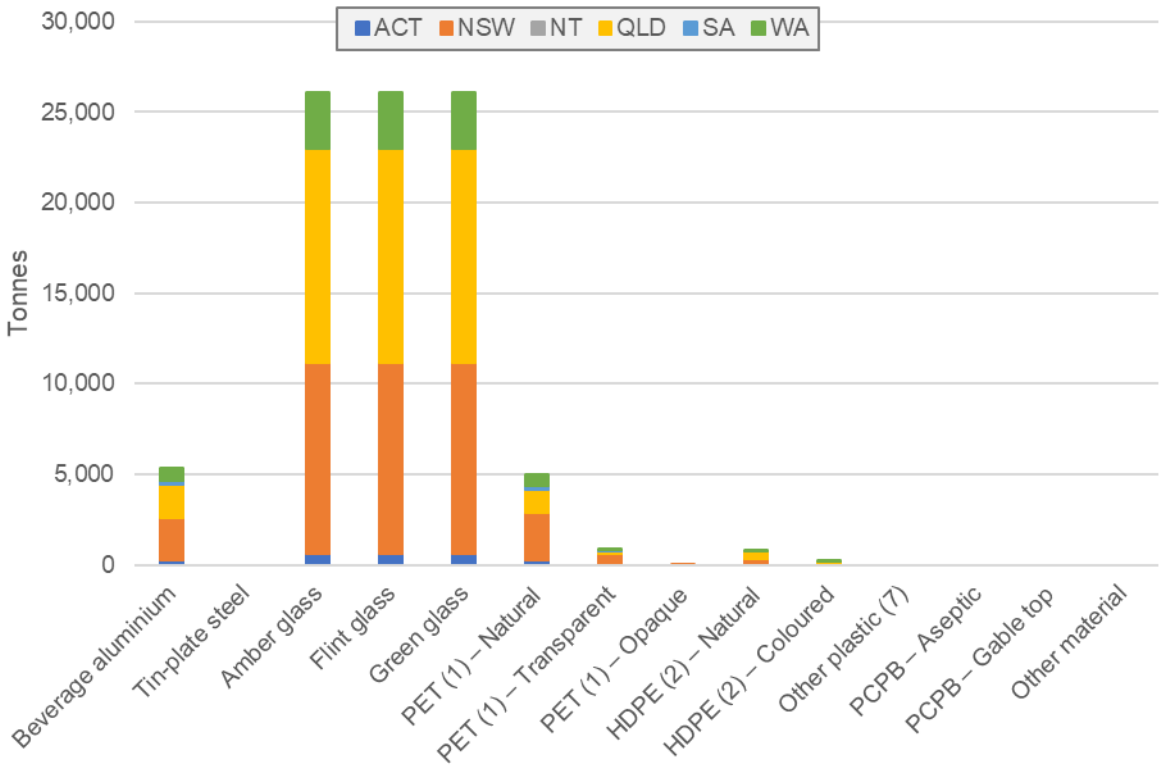

Figure E-5 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via MRFs (tonnes).

Table E-6 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via MRFs (million packs).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)
Beverage aluminium	16.023	169.984	0.000	91.784	11.664	53.304	342.759
Tin-plate steel	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Amber glass	2.727	46.757	0.000	41.389	0.000	15.639	106.512
Flint glass	2.727	46.757	0.000	41.389	0.000	15.639	106.512
Green glass	2.727	46.757	0.000	41.389	0.000	15.639	106.512
PET (1) – Natural	11.365	108.792	0.000	37.953	7.767	34.060	199.938
PET (1) – Transparent	2.526	24.176	0.000	3.300	1.726	2.807	34.535
PET (1) – Opaque	0.140	1.343	0.000	0.000	0.096	0.000	1.579
HDPE (2) – Natural	1.077	8.884	0.000	12.539	0.000	3.788	26.288
HDPE (2) – Coloured	0.236	1.950	0.000	2.752	0.000	0.832	5.771
Other plastic (7)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PCPB – Aseptic	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PCPB – Gable top	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other material	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	**39.549**	**455.401**	**0.000**	**272.496**	**21.253**	**141.710**	**930.408**
Redemption rate (%)[1]	**25.8%**	**12.3%**	**0.0%**	**9.0%**	**2.4%**	**9.7%**	**9.9%**

1. Redemption % is relative to CD eligible packaging POM.

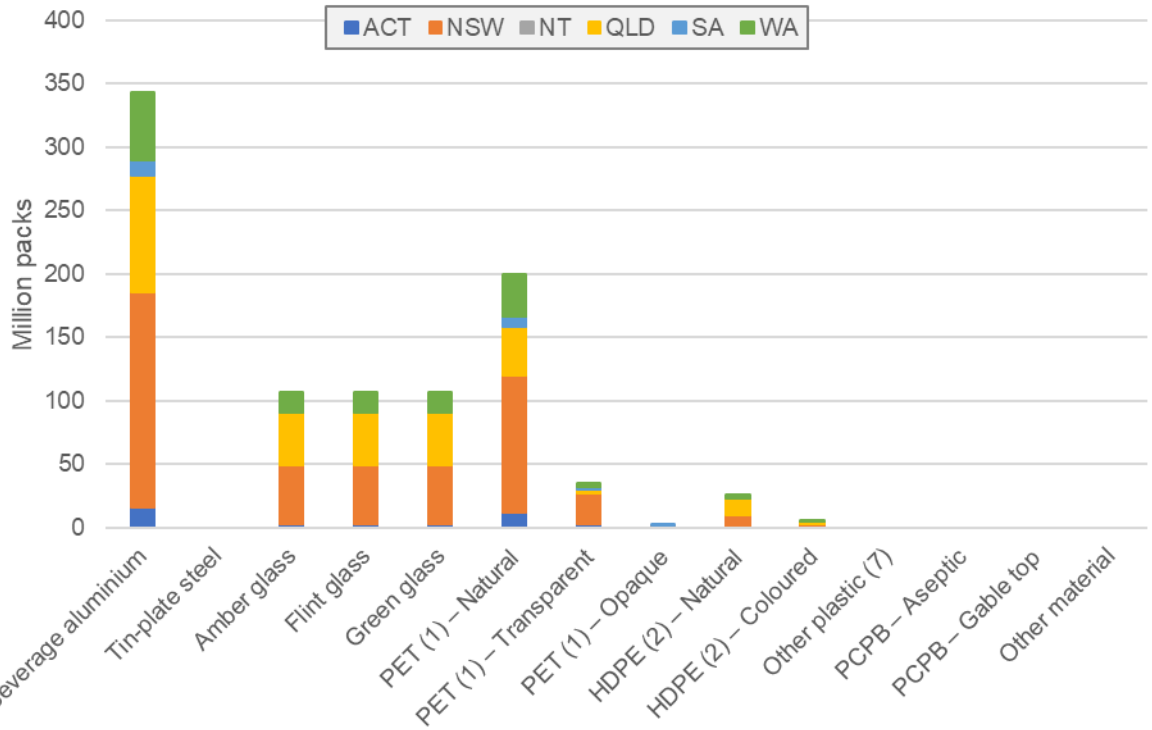

Figure E-6 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Redeemed recovery via MRFs (million packs).

E.2.3 Unredeemed recovery via MRFs and other pathways

While most CD eligible packaging recovery in 2022–23 was via pathways that triggered the payment of a redeemed deposit, this was not always the case. There are a number of unredeemed recovery pathways that exist, with differing levels of applicability to different jurisdictions. These unredeemed recovery pathways included:

- MRF recovery where the MRF operators may not have claimed the deposits for internal operational or administrative reasons.
- MRF recovery where the published methods for claiming deposits in mixed CD eligible / CD ineligible streams did not cover all material types (e.g., LPB packaging), or otherwise had particular exceptions.
- MRF recovery of CD eligible packaging recovered from some C&I sources.
- CD eligible packaging recovered through away-from-home recycling bins or events related recycling, in some circumstances.
- Alternative Waste Treatment (AWT) or Mechanical Biological Treatment (MBT) facility recovery of CD eligible packaging.

Provided here are estimates of the recovery of unredeemed but CD eligible packaging during 2022–23. It is important to note that the earlier estimates of CD eligible packaging POM and redeemed CD eligible packaging are highly accurate as they are based on detailed regulated monthly or quarterly reporting. However, the recovery estimates of unredeemed CD eligible packaging are estimates derived from industry surveys and are less precise.

Table E-7 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Unredeemed recovery via MRFs and other pathways (tonnes).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	0	1,250	0	1,730	230	500	3,710
Tin-plate steel	0	0	0	10	0	0	10
Amber glass	0	3,550	0	3,370	0	1,320	8,230
Flint glass	0	3,550	0	3,370	0	1,320	8,230
Green glass	0	3,550	0	3,370	0	1,320	8,230
PET (1) – Natural	50	1,310	40	1,570	290	400	3,660
PET (1) – Transparent	10	290	10	140	60	30	550
PET (1) – Opaque	0	20	0	0	0	0	20
HDPE (2) – Natural	0	90	10	140	20	30	300
HDPE (2) – Coloured	0	20	0	30	0	10	70
Other plastic (7)	0	0	0	0	0	0	0
PCPB – Aseptic	0	0	0	0	0	0	0
PCPB – Gable top	0	0	0	0	0	0	0
Other material	0	0	0	0	0	0	0
Total	**70**	**13,620**	**60**	**13,720**	**610**	**4,920**	**33,010**
Recovery rate (%)[1]	**0.8%**	**5.9%**	**0.9%**	**5.9%**	**1.4%**	**5.9%**	**5.5%**

1. Recovery % is relative to CD eligible packaging POM.

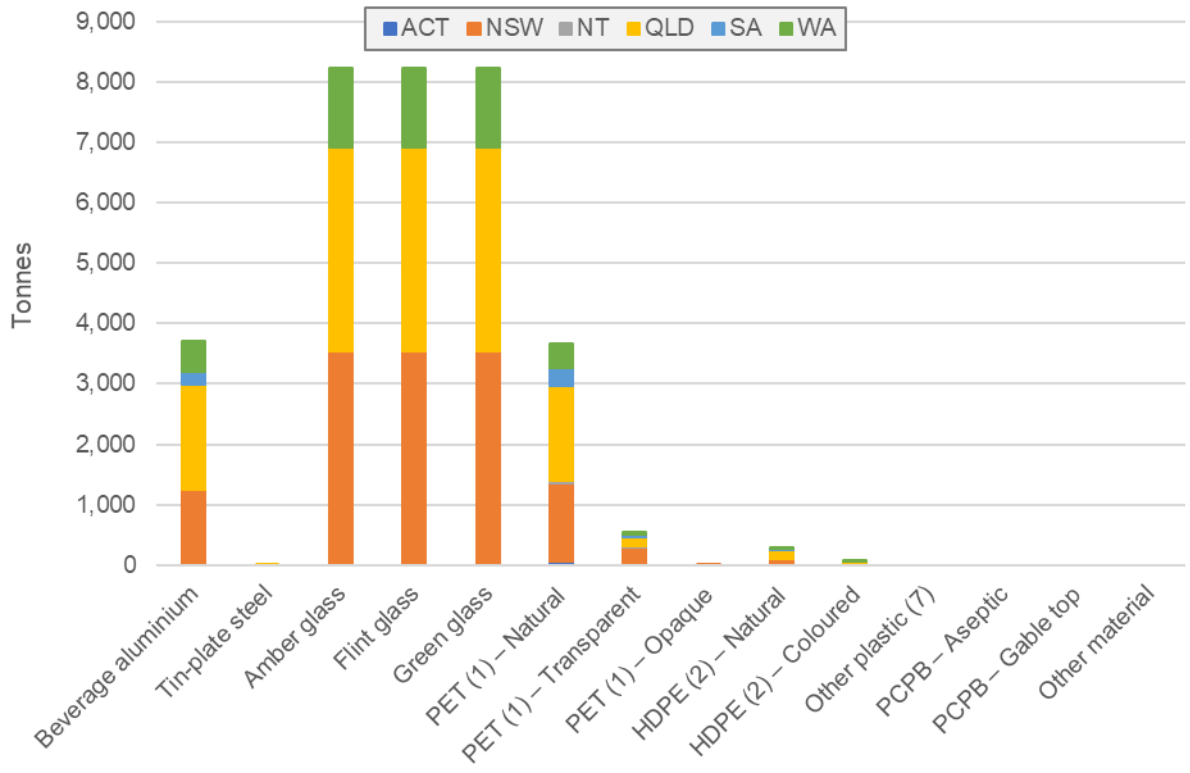

Figure E-7 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Unredeemed recovery via MRFs and other pathways (tonnes).

Table E-8 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Unredeemed recovery via MRFs and other pathways (million packs).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)
Beverage aluminium	0.000	90.783	0.000	83.909	16.592	36.635	227.919
Tin-plate steel	0.065	0.000	0.010	0.121	0.000	0.000	0.195
Amber glass	0.000	15.763	0.000	11.792	0.000	6.539	34.094
Flint glass	0.000	15.763	0.000	11.792	0.000	6.539	34.094
Green glass	0.000	15.763	0.000	11.792	0.000	6.539	34.094
PET (1) – Natural	2.237	55.095	1.758	45.229	10.953	23.436	138.707
PET (1) – Transparent	0.497	12.243	0.391	3.933	2.434	1.931	21.429
PET (1) – Opaque	0.028	0.680	0.022	0.000	0.135	0.000	0.865
HDPE (2) – Natural	0.129	2.819	0.180	4.110	1.173	1.198	9.609
HDPE (2) – Coloured	0.028	0.619	0.039	0.902	0.257	0.263	2.109
Other plastic (7)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PCPB – Aseptic	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PCPB – Gable top	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other material	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	**2.985**	**209.526**	**2.399**	**173.579**	**31.545**	**83.080**	**503.115**
Recovery rate (%)[1]	**1.9%**	**5.7%**	**1.8%**	**5.7%**	**3.6%**	**5.7%**	**5.4%**

1. Recovery % is relative to CD eligible packaging POM.

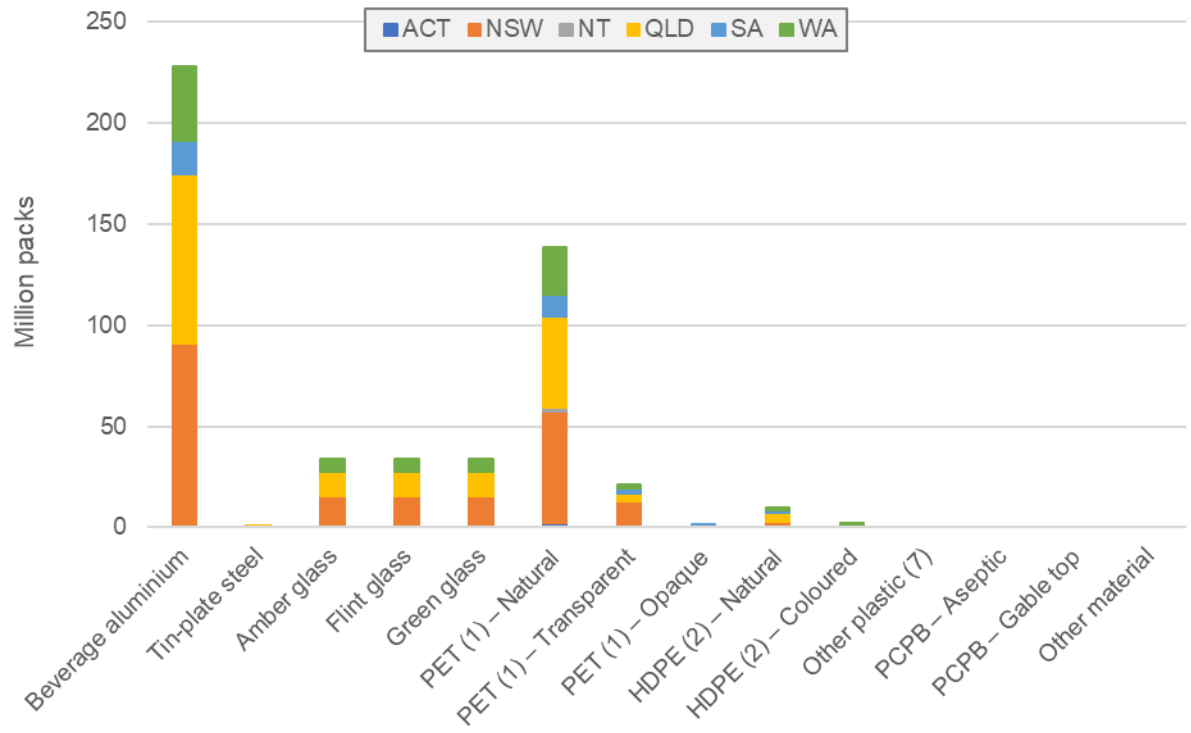

Figure E-8 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Unredeemed recovery via MRFs and other pathways (million packs).

E.2.4 Total recovery via all collection routes

Table E-9 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Total recovery via all collection routes (tonnes).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	700	15,410	740	20,940	4,880	5,930	48,600
Tin-plate steel	0	120	0	50	0	40	220
Amber glass	1,610	47,580	1,630	48,640	9,330	18,400	127,200
Flint glass	1,610	47,580	1,630	48,640	9,330	18,400	127,200
Green glass	1,610	47,580	1,630	48,640	9,330	18,400	127,200
PET (1) – Natural	630	14,840	450	15,880	3,450	4,190	39,450
PET (1) – Transparent	140	3,300	100	1,380	770	350	6,030
PET (1) – Opaque	10	180	10	0	40	0	240
HDPE (2) – Natural	60	900	30	1,490	260	310	3,040
HDPE (2) – Coloured	10	200	10	330	60	70	670
Other plastic (7)	0	0	0	0	0	0	0
PCPB – Aseptic	20	380	30	590	490	290	1,800
PCPB – Gable top	10	100	30	150	70	70	420
Other material	0	0	0	0	0	0	0
Total	**6,430**	**178,160**	**6,280**	**186,730**	**38,020**	**66,450**	**482,070**
Recovery rate (%)[1]	**69.5%**	**77.4%**	**91.5%**	**80.5%**	**82.4%**	**79.5%**	**79.3%**

1. Recovery % is relative to CD eligible packaging POM.

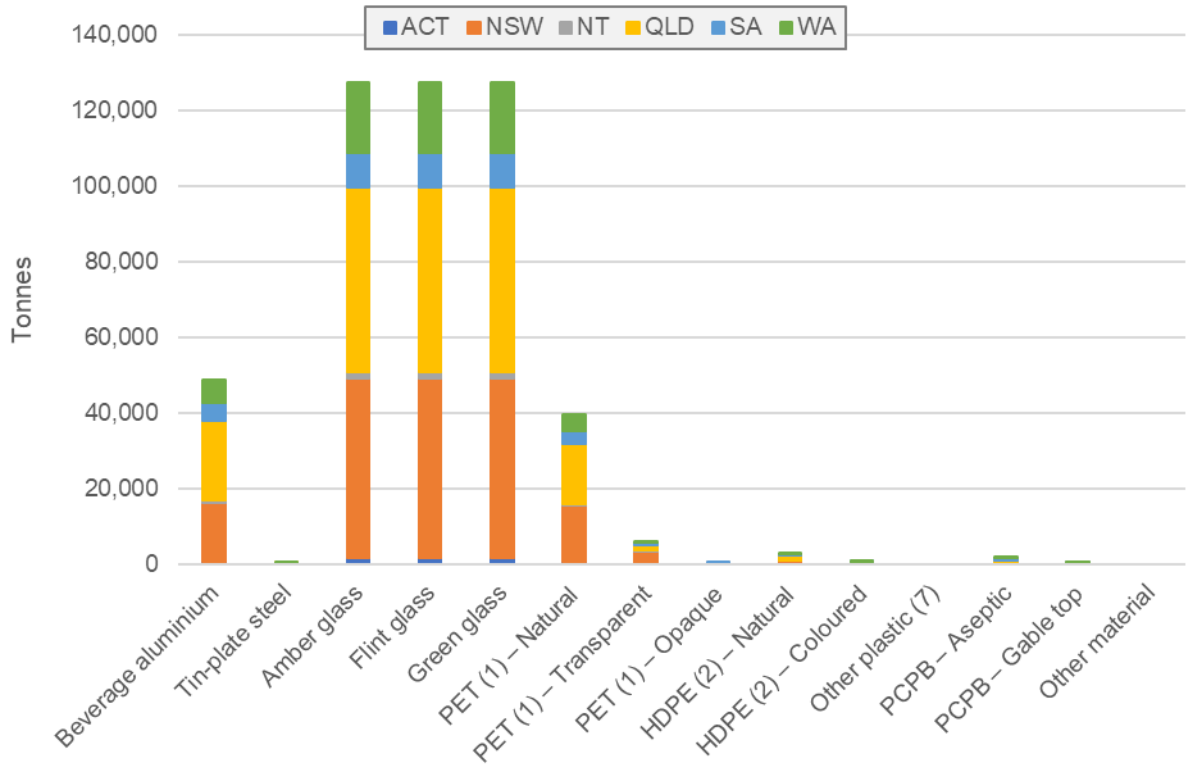

Figure E-9 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Total recovery via all collection routes (tonnes).

Table E-10 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Total recovery via all collection routes (million packs).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)
Beverage aluminium	51.026	1,116.670	53.752	1,016.454	357.303	435.226	3,030.430
Tin-plate steel	0.084	2.615	0.050	1.150	0.000	1.079	4.977
Amber glass	7.165	211.170	7.237	170.310	41.962	91.449	529.293
Flint glass	7.165	211.170	7.237	170.310	41.962	91.449	529.293
Green glass	7.165	211.170	7.237	170.310	41.962	91.449	529.293
PET (1) – Natural	26.494	626.348	18.861	456.384	130.549	246.429	1,505.066
PET (1) – Transparent	5.888	139.188	4.191	39.686	29.011	20.310	238.274
PET (1) – Opaque	0.327	7.733	0.233	0.000	1.612	0.000	9.904
HDPE (2) – Natural	2.005	29.374	0.935	42.214	13.556	11.070	99.152
HDPE (2) – Coloured	0.440	6.448	0.205	9.266	2.976	2.430	21.765
Other plastic (7)	0.000	0.017	0.000	0.000	0.000	0.000	0.017
PCPB – Aseptic	1.670	27.742	2.147	28.250	20.427	15.233	95.470
PCPB – Gable top	0.417	6.936	2.147	7.062	5.761	3.808	26.132
Other material	0.000	0.178	0.000	0.000	0.000	0.118	0.296
Total	**109.846**	**2,596.758**	**104.232**	**2,111.398**	**687.079**	**1,010.051**	**6,619.364**
Recovery rate (%)[1]	**71.7%**	**70.2%**	**77.7%**	**69.4%**	**78.2%**	**68.8%**	**70.6%**

1. Recovery % is relative to CD eligible packaging POM.

Note: These recovery rates may differ from published figures available elsewhere as they included estimates for non-redeemed CD eligible packaging that is collected through MRFs.

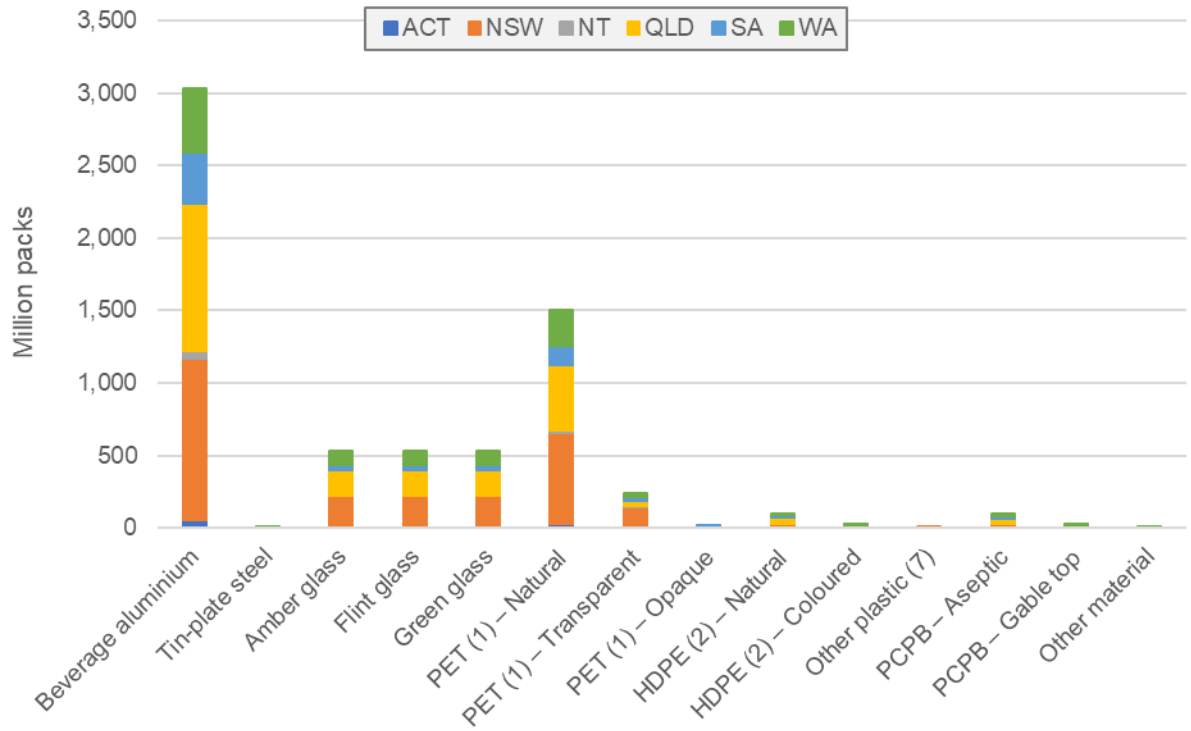

Figure E-10 – CD eligible packaging recovery in 2022–23 by material type and jurisdiction – Total recovery via all collection routes (million packs).

E.2.5 Reprocessing destination

Table E-11 – CD eligible packaging reprocessing destination in 2022–23 by material type (tonnes).

Material type	Local	Overseas	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	0	48,600	0	48,600
Tin-plate steel	30	180	0	220
Amber glass	127,200	0	0	127,200
Flint glass	127,200	0	0	127,200
Green glass	127,200	0	0	127,200
PET (1) – Natural	38,080	1,370	0	39,450
PET (1) – Transparent	5,920	110	0	6,030
PET (1) – Opaque	240	0	0	240
HDPE (2) – Natural	2,630	360	60	3,040
HDPE (2) – Coloured	580	80	10	670
Other plastic (7)	0	0	0	0
PCPB – Aseptic	810	970	20	1,800
PCPB – Gable top	180	220	20	420
Other material	0	0	0	0
Total	**430,050**	**51,900**	**120**	**482,070**

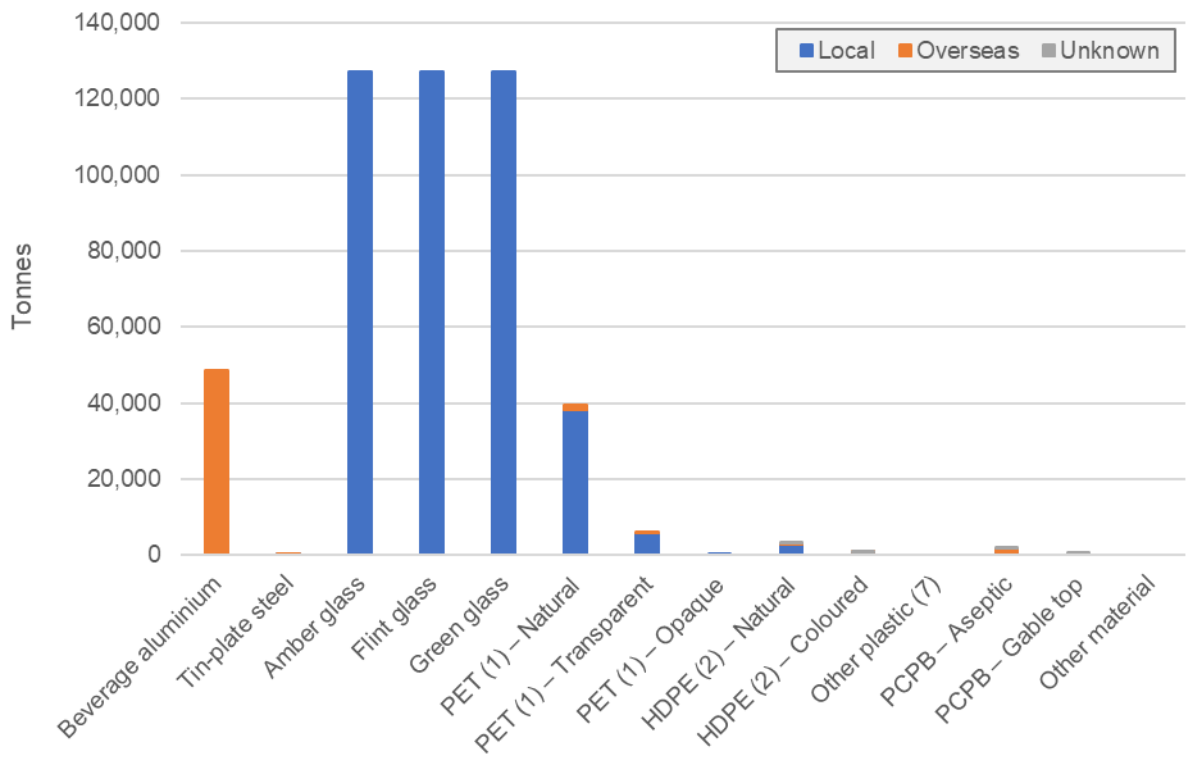

Figure E-11 – CD eligible packaging reprocessing destination in 2022–23 by material type (tonnes).

E.3 CD eligible packaging to landfill

The following tables provide estimates of CD eligible packaging disposed to landfill. These quantities are almost entirely based on estimates of CD eligible packaging disposal to landfill at the household level, and public place disposal where recycling systems are not available.

Table E-12 – CD eligible packaging to landfill in 2022–23 by material type and jurisdiction (tonnes).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	160	5,470	110	7,870	1,000	2,390	17,010
Tin-plate steel	10	200	0	100	0	30	350
Amber glass	740	11,610	0	7,490	1,570	3,530	24,940
Flint glass	740	11,610	0	7,490	1,570	3,530	24,940
Green glass	740	11,610	0	7,490	1,570	3,530	24,940
PET (1) – Natural	260	6,920	250	10,350	1,380	2,450	21,600
PET (1) – Transparent	60	1,540	50	900	310	200	3,060
PET (1) – Opaque	0	90	0	0	20	0	110
HDPE (2) – Natural	0	540	60	930	120	250	1,890
HDPE (2) – Coloured	0	120	10	200	30	50	420
Other plastic (7)	0	10	0	0	0	0	10
PCPB – Aseptic	90	1,760	40	1,880	480	920	5,180
PCPB – Gable top	20	440	40	470	70	230	1,270
Other material	0	30	0	0	0	0	40
Total	**2,820**	**51,950**	**580**	**45,170**	**8,100**	**17,120**	**125,740**

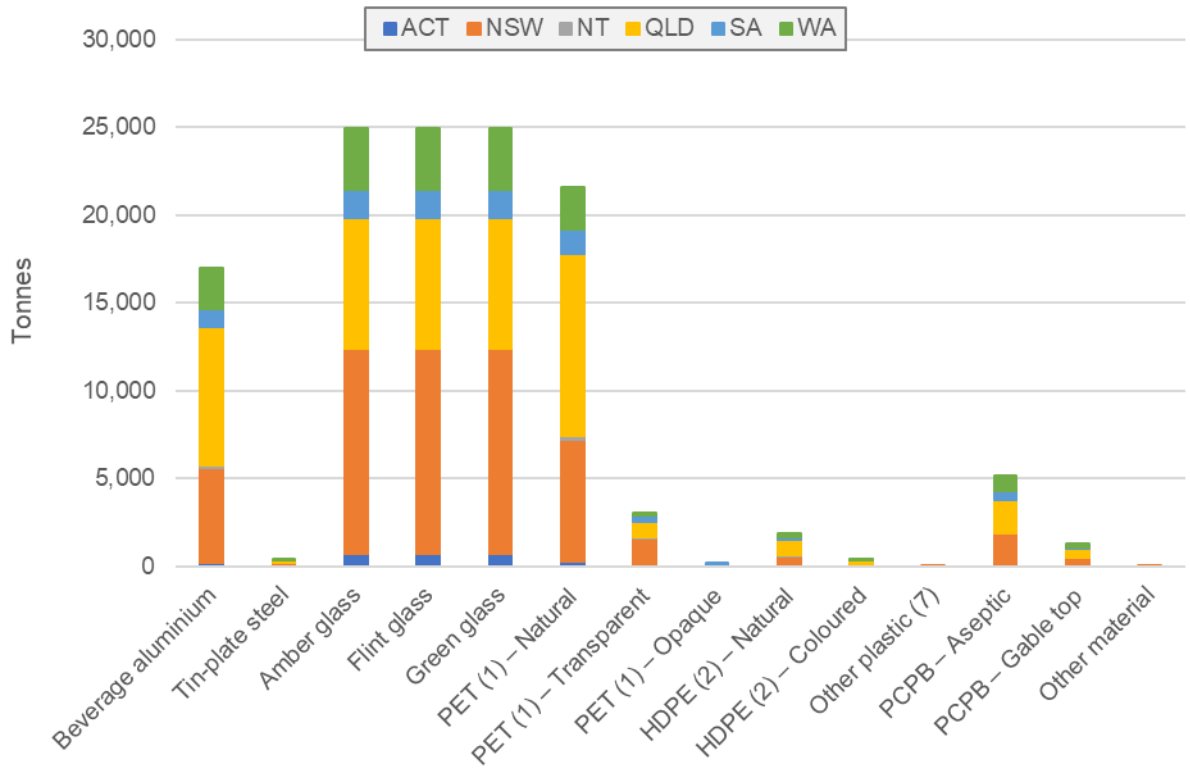

Figure E-12 – CD eligible packaging to landfill in 2022–23 by material type and jurisdiction (tonnes).

Table E-13 – CD eligible packaging to landfill in 2022–23 by material type and jurisdiction (million packs).

Material type	ACT	NSW	NT	QLD	SA	WA	Total
	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)	(million packs)
Beverage aluminium	11.519	396.377	8.129	382.024	73.576	175.360	1,046.986
Tin-plate steel	0.170	4.551	0.102	2.335	0.000	0.811	7.969
Amber glass	3.272	51.540	0.000	26.223	7.059	17.536	105.629
Flint glass	3.272	51.540	0.000	26.223	7.059	17.536	105.629
Green glass	3.272	51.540	0.000	26.223	7.059	17.536	105.629
PET (1) – Natural	10.792	291.894	10.434	297.424	52.006	144.170	806.720
PET (1) – Transparent	2.398	64.865	2.319	25.863	11.557	11.882	118.884
PET (1) – Opaque	0.133	3.604	0.129	0.000	0.642	0.000	4.508
HDPE (2) – Natural	0.152	17.609	2.061	26.289	5.995	8.890	60.996
HDPE (2) – Coloured	0.033	3.865	0.452	5.771	1.316	1.951	13.389
Other plastic (7)	0.062	1.113	0.000	0.000	0.000	0.000	1.175
PCPB – Aseptic	6.461	127.443	3.112	89.969	20.043	48.934	295.963
PCPB – Gable top	1.615	31.861	3.112	22.492	5.643	12.234	76.958
Other material	0.309	2.235	0.000	0.000	0.000	0.304	2.848
Total	**43.459**	**1,100.037**	**29.850**	**930.837**	**191.955**	**457.145**	**2,753.282**

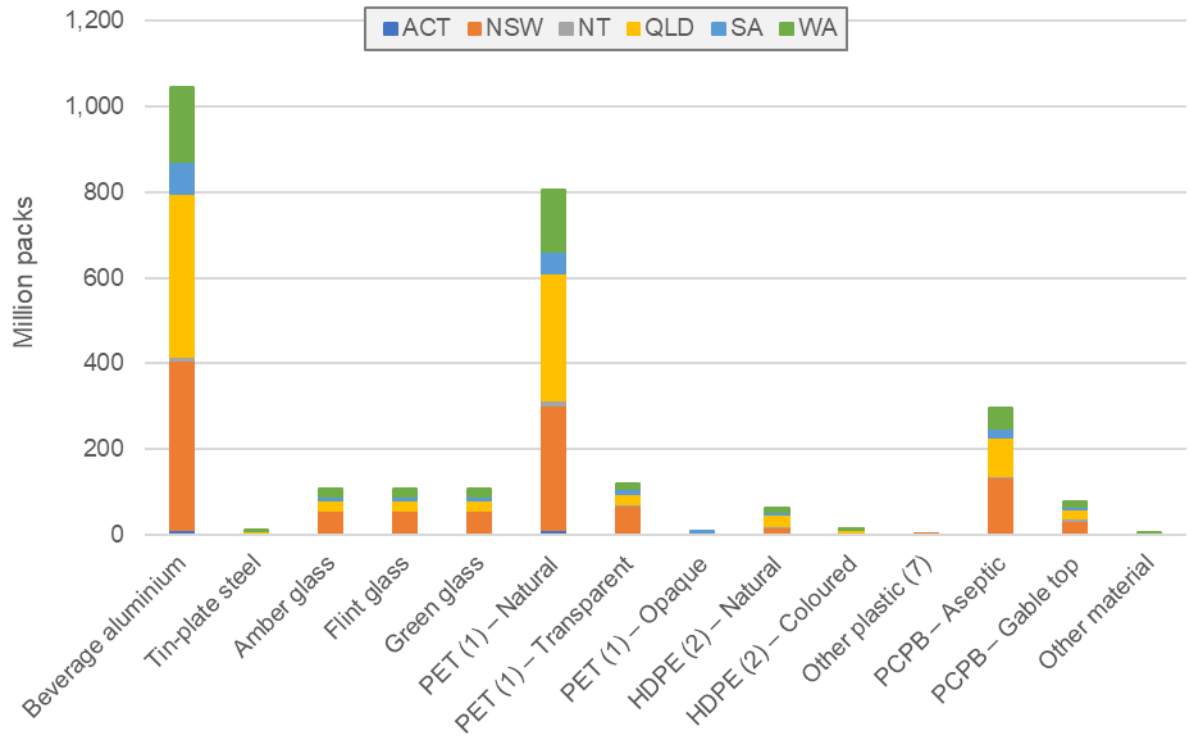

Figure E-13 – CD eligible packaging to landfill in 2022–23 by material type and jurisdiction (million packs).

APPENDIX F – SUPPORTING DATA TABLES

F.1 Paper & paperboard packaging in 2022–23

Placed on market

Table F-1 – Paper & paperboard packaging POM (mass and per capita bases) from 2017–18 to 2022–23, by material type.

Material type	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Boxboard/ Cartonboard	181,000	7.3	288,000	11.3	316,000	12.3	315,000	12.2	320,000	12.3	301,000	11.3
Corrugated cardboard	2,408,000	96.4	2,544,000	100.4	2,513,000	98.0	2,539,000	98.8	2,772,000	106.6	2,897,000	108.7
HWS[b] carrierboard	15,000	0.6	20,000	0.8	25,000	1.0	31,000	1.2	25,000	1.0	23,000	0.9
Kraft paper	63,000	2.5	195,000	7.7	180,000	7.0	246,000	9.6	290,000	11.2	330,000	12.4
Moulded fibreboard	50,000	2.0	51,000	2.0	56,000	2.2	63,000	2.4	65,000	2.5	73,000	2.8
PCPB[c] – Aseptic	38,000	1.5	38,000	1.5	40,000	1.6	49,000	1.9	51,000	2.0	43,000	1.6
PCPB – Gable top	12,000	0.5	12,000	0.5	12,000	0.5	15,000	0.6	16,000	0.6	13,000	0.5
PCPB – Cold cup	6,000	0.2	6,000	0.2	13,000	0.5	8,000	0.3	8,000	0.3	9,000	0.3
PCPB – Hot cup	12,000	0.5	12,000	0.5	23,000	0.9	18,000	0.7	20,000	0.7	22,000	0.8
PCPB – Other	4,000	0.1	4,000	0.1	4,000	0.2	4,000	0.1	6,000	0.2	3,000	0.1
Polymer coated paper	112,000	4.5	94,000	3.7	1,000	0.1	1,000	0.1	1,000	0.1	2,000	0.1
Other fibre packaging[d]	0	0.0	0	0.0	95,000	3.7	99,000	3.9	80,000	3.1	89,000	3.3
Total	**2,901,000**	**116.2**	**3,262,000**	**128.8**	**3,277,000**	**127.8**	**3,387,000**	**131.9**	**3,654,000**	**140.5**	**3,805,000**	**142.8**

a) kg/p – kilograms per person.
b) HWS – High wet strength.
c) PCPB – Polymer coated paperboard.
d) Examples of other fibre packaging include paper bags and food wraps.

Table F-2 – Paper & paperboard packaging POM in 2022–23, by material type and sector of use.

Material type	B2C – At home[a]	B2C – AfH[a]	B2B[a]	Other or unknown	Total[b]	
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Boxboard/Cartonboard	241,000	7,000	53,000	0	301,000	7.9%
Corrugated cardboard	585,000	417,000	1,875,000	20,000	2,897,000	76.1%
HWS carrierboard	11,000	12,000	0	0	23,000	0.6%
Kraft paper	154,000	39,000	137,000	0	330,000	8.7%
Moulded fibreboard	40,000	3,000	30,000	0	73,000	1.9%
PCPB – Aseptic	26,000	4,000	11,000	2,000	43,000	1.1%
PCPB – Gable top	8,000	1,000	3,000	1,000	13,000	0.3%
PCPB – Cold cup	1,000	7,000	1,000	0	9,000	0.2%
PCPB – Hot cup	4,000	15,000	3,000	1,000	22,000	0.6%
PCPB – Other	0	2,000	0	0	3,000	0.1%
Polymer coated paper	0	1,000	0	0	2,000	0.1%
Other fibre packaging	1,000	6,000	62,000	20,000	89,000	2.3%
Total (tonnes)	**1,072,000**	**515,000**	**2,174,000**	**44,000**	**3,805,000**	-
Total (%)	**28.2%**	**13.5%**	**57.1%**	**1.2%**	**-**	**100.0%**

a) Business-to-consumer (B2C) – At home | Business-to-consumer (B2C) – Away-from-home (AfH) | Business-to-business (B2B).

Table F-3 – Paper & paperboard packaging POM in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Boxboard/Cartonboard	0	0	0	0	286,000	0	0	0	0	0	6,000	9,000	0	0	0	0	301,000
Corrugated cardboard	0	0	0	0	2,897,000	0	0	0	0	0	0	0	0	0	0	0	2,897,000
HWS carrierboard	1,000	0	0	0	18,000	0	0	0	0	0	0	5,000	0	0	0	0	23,000
Kraft paper	138,000	0	0	55,000	0	0	0	0	0	27,000	0	0	0	48,000	62,000	0	330,000
Moulded fibreboard	0	0	0	0	0	0	0	0	0	0	1,000	72,000	0	0	0	0	73,000
PCPB – Aseptic	0	0	0	0	43,000	0	0	0	0	0	0	0	0	0	0	0	43,000
PCPB – Gable top	0	0	0	0	13,000	0	0	0	0	0	0	0	0	0	0	0	13,000
PCPB – Cold cup	0	0	0	0	0	0	0	0	0	0	9,000	0	0	0	0	0	9,000
PCPB – Hot cup	0	0	0	0	0	0	0	0	0	0	22,000	0	0	0	0	0	22,000
PCPB – Other	0	0	0	0	0	0	0	0	0	0	2,000	0	0	0	1,000	0	3,000
Polymer coated paper	1,000	0	0	0	0	0	0	0	0	0	0	0	0	1,000	0	0	2,000
Other fibre packaging	1,000	0	0	0	0	0	0	0	0	0	0	0	0	32,000	56,000	0	89,000
Total (tonnes)	**141,000**	**0**	**0**	**55,000**	**3,258,000**	**0**	**0**	**0**	**0**	**27,000**	**39,000**	**86,000**	**0**	**81,000**	**119,000**	**0**	**3,805,000**
Total (%)	**3.7%**	**0.0%**	**0.0%**	**1.4%**	**85.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.7%**	**1.0%**	**2.3%**	**0.0%**	**2.1%**	**3.1%**	**0.0%**	**100.0%**

Table F-4 – Paper & paperboard packaging POM in 2022–23, by material type and recycled content.

Material type	Post-consumer source		Pre-consumer source		Virgin source		Total
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)
Boxboard/Cartonboard	106,000	35%	73,000	24%	122,000	41%	301,000
Corrugated cardboard	1,920,000	66%	383,000	13%	594,000	21%	2,897,000
HWS carrierboard	0	0%	2,000	8%	22,000	92%	23,000
Kraft paper	19,000	6%	57,000	17%	255,000	77%	330,000
Moulded fibreboard	62,000	85%	4,000	6%	7,000	10%	73,000
PCPB – Aseptic	0	0%	0	0%	43,000	100%	43,000
PCPB – Gable top	0	0%	0	0%	13,000	100%	13,000
PCPB – Cold cup	0	0%	1,000	7%	8,000	93%	9,000
PCPB – Hot cup	0	0%	2,000	8%	20,000	92%	22,000
PCPB – Other	0	2%	0	2%	2,000	97%	3,000
Polymer coated paper	0	0%	0	0%	2,000	100%	2,000
Other fibre packaging	17,000	19%	7,000	7%	65,000	73%	89,000
Total	**2,124,000**	**56%**	**528,000**	**14%**	**1,153,000**	**30%**	**3,805,000**

Recovery

Table F-5 – Paper & paperboard packaging recovery from 2017–18 to 2022–23, by material type.

Material type	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Boxboard/Cartonboard	98,000	3.9	131,000	5.2	107,000	4.2	108,000	4.2	114,000	4.4	107,000	4.0
Corrugated cardboard	1,663,000	66.6	1,849,000	73.0	1,988,000	77.5	2,114,000	82.3	2,150,000	82.7	2,119,000	79.5
Polymer coated paperboard	14,000	0.6	5,000	0.2	5,000	0.2	2,000	0.1	3,000	0.1	5,000	0.2
Other fibre packaging	42,000	1.7	60,000	2.4	128,000	5.0	145,000	5.6	236,000	9.1	240,000	9.0
Total	**1,817,000**	**72.8**	**2,045,000**	**80.7**	**2,229,000**	**86.9**	**2,370,000**	**92.3**	**2,502,000**	**96.2**	**2,469,000**	**92.6**

a) kg/p – kilograms per person.

b) 'Other fibre packaging' includes packaging types such as wraps, bags, pallet slips and void fill.

Table F-6 – Paper & paperboard packaging recovery in 2022–23, by material type and collection service.

Material type	Collection service				Total	
	MSW[a]	C&I[a]	CDS[a]	Other		
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Boxboard/Cartonboard	69,000	37,000	0	0	106,000	4.3%
Corrugated cardboard	915,000	1,179,000	0	24,000	2,118,000	85.9%
Polymer coated paperboard	1,000	0	2,000	1,000	4,000	0.2%
Other fibre packaging	146,000	93,000	0	0	239,000	9.7%
Total (tonnes)	**1,132,000**	**1,310,000**	**2,000**	**25,000**	**2,467,000**	-
Total (%)	**45.8%**	**53.0%**	**0.1%**	**1.0%**	**-**	**100.0%**

a) Municipal solid waste (MSW), commercial and industrial (C&I) waste, and container deposit scheme (CDS) collection services.

Table F-7 – Paper & paperboard packaging recovery in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	tonnes	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Boxboard/Cartonboard	0	0	0	0	107,000	0	0	0	0	0	0	0	0	0	0	0	107,000
Corrugated cardboard	0	0	0	0	2,119,000	0	0	0	0	0	0	0	0	0	0	0	2,119,000
HWS carrierboard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kraft paper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moulded fibreboard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCPB – Aseptic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCPB – Gable top	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCPB – Cold cup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCPB – Hot cup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCPB – Other	0	0	0	0	3,000	0	0	0	0	0	1,000	0	0	0	0	0	4,000
Polymer coated paper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other fibre packaging	45,000	0	0	0	8,000	0	0	0	0	0	0	39,000	0	49,000	99,000	0	240,000
Total (tonnes)	**45,000**	**0**	**0**	**0**	**2,236,000**	**0**	**0**	**0**	**0**	**0**	**1,000**	**39,000**	**0**	**49,000**	**99,000**	**0**	**2,469,000**
Total (%)	**1.8%**	**0.0%**	**0.0%**	**0.0%**	**90.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**	**0.0%**	**2.0%**	**4.0%**	**0.0%**	**100.0%**

Table F-8 – Paper & paperboard packaging recovery in 2022–23, by material type and destination of material.

Material type	Local	Overseas	Unknown destinations	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Boxboard/Cartonboard	32,000	74,000	1,000	107,000
Corrugated cardboard	1,134,000	985,000	0	2,119,000
HWS carrierboard	0	0	0	0
Kraft paper	0	0	0	0
Moulded fibreboard	0	0	0	0
PCPB – Aseptic	0	0	0	0
PCPB – Gable top	0	0	0	0
PCPB – Cold cup	0	0	0	0
PCPB – Hot cup	0	0	0	0
PCPB – Other	0	4,000	0	4,000
Polymer coated paper	0	0	0	0
Other fibre packaging	153,000	86,000	0	240,000
Total (tonnes)	**1,321,000**	**1,148,000**	**1,000**	**2,469,000**
Total (%)	**53.5%**	**46.5%**	**0.0%**	**100.0%**

Table F-9 – Post-consumer paper & paperboard packaging recovery rates in 2022–23, by material type.

Material type	POM	Recovery	Recovery rate
	(tonnes)	(tonnes)	(%)
Boxboard/Cartonboard	301,000	107,000	35%
Corrugated cardboard	2,897,000	2,119,000	73%
Polymer coated paper	91,000	5,000	5%
Other fibre packaging	516,000	240,000	46%
Total	**3,805,000**	**2,469,000**	**65%**

Table F-10 – Paper & paperboard packaging POM (mass and per capita bases) from 2020–21 to 2027–28, by material type.

Material type	2020–21		2021–22		2022–23		2023–24		2024–25		2025–26		2026–27		2027–28		5-yr CAGR[b]
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(%/yr)
Boxboard/Cartonboard	315,000	12.2	320,000	12.3	301,000	11.3	313,000	11.6	325,000	11.9	338,000	12.2	351,000	12.5	365,000	12.8	4.0%
Corrugated cardboard	2,539,000	98.8	2,772,000	106.6	2,897,000	108.7	3,005,000	111.4	3,116,000	113.8	3,232,000	116.2	3,351,000	118.9	3,476,000	121.6	3.7%
HWS[c] carrierboard	31,000	1.2	25,000	1.0	23,000	0.9	24,000	0.9	25,000	0.9	26,000	0.9	27,000	1.0	29,000	1.0	4.0%
Kraft paper	246,000	9.6	290,000	11.2	330,000	12.4	345,000	12.8	361,000	13.2	377,000	13.6	394,000	14.0	412,000	14.4	4.5%
Moulded fibreboard	63,000	2.4	65,000	2.5	73,000	2.8	84,000	3.1	97,000	3.5	111,000	4.0	128,000	4.5	147,000	5.1	14.8%
PCPB[d] – Aseptic	49,000	1.9	51,000	2.0	43,000	1.6	45,000	1.7	47,000	1.7	49,000	1.7	51,000	1.8	53,000	1.8	4.0%
PCPB – Gable top	15,000	0.6	16,000	0.6	13,000	0.5	14,000	0.5	14,000	0.5	15,000	0.5	15,000	0.5	16,000	0.6	4.0%
PCPB – Cold cup	8,000	0.3	8,000	0.3	9,000	0.3	9,000	0.3	9,000	0.3	9,000	0.3	9,000	0.3	9,000	0.3	1.3%
PCPB – Hot cup	18,000	0.7	20,000	0.7	22,000	0.8	22,000	0.8	23,000	0.9	24,000	0.9	25,000	0.9	26,000	0.9	4.0%
PCPB – Other	4,000	0.1	6,000	0.2	3,000	0.1	3,000	0.1	3,000	0.1	3,000	0.1	4,000	0.1	4,000	0.1	10.0%
Polymer coated paper	1,000	0.1	1,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	4.0%
Other fibre packaging[c]	99,000	3.9	80,000	3.1	89,000	3.3	90,000	3.4	92,000	3.4	94,000	3.4	96,000	3.4	98,000	3.4	2.1%
Total	**3,387,000**	**131.9**	**3,654,000**	**140.5**	**3,805,000**	**142.8**	**3,957,000**	**146.7**	**4,115,000**	**150.2**	**4,281,000**	**154.0**	**4,455,000**	**158.0**	**4,637,000**	**162.3**	**4.0%**

a) kg/p – kilograms per person.

b) CAGR – compound annual growth rate.

c) Examples of other fibre packaging POM include paper bags and food wraps.

Table F-11 – Paper & paperboard packaging reprocessing capacity projections from 2022–23 to 2027–28, by material type.

Material type	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	5 year CAGR[a]
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%/yr)
Boxboard/Cartonboard	39,000	39,000	39,000	54,000	54,000	54,000	6.5%
Corrugated cardboard	1,438,000	1,438,000	1,438,000	1,612,000	1,612,000	1,612,000	2.3%
HWS carrierboard	No data	No data	No data	No data	No data	No data	N/A
Kraft paper	No data	No data	No data	No data	No data	No data	N/A
Moulded fibreboard	No data	No data	No data	No data	No data	No data	N/A
PCPB – Aseptic	5,000	5,000	5,000	5,000	11,000	11,000	18.5%
PCPB – Gable top	2,000	2,000	2,000	2,000	4,000	4,000	18.5%
PCPB – Cold cup	<500	<500	<500	<500	<500	<500	18.5%
PCPB – Hot cup	<500	<500	<500	<500	<500	<500	18.5%
Polymer coated paperboard	1,000	1,000	1,000	1,000	1,000	1,000	5.8%
Polymer coated paper	0	0	0	0	0	0	N/A
Other fibre packaging	178,000	178,000	178,000	194,000	194,000	194,000	1.7%
Total	**1,663,000**	**1,663,000**	**1,663,000**	**1,868,000**	**1,877,000**	**1,877,000**	**2.5%**

a) CAGR – compound annual growth rate.

F.2 Glass packaging in 2022–23

Placed on market

Table F-12 – Glass packaging POM (mass and per capita bases) from 2017–18 to 2022–23, by material type.

Material type	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Amber glass	438,000	17.5	381,000	15.0	334,000	13.0	233,000	9.1	181,000	7.0	258,000	9.7
Flint glass	471,000	18.9	643,000	25.4	606,000	23.6	605,000	23.6	494,000	19.0	448,000	16.8
Green glass[b]	364,000	14.6	258,000	10.2	216,000	8.4	445,000	17.3	468,000	18.0	399,000	15.0
Total	**1,273,000**	**51.0**	**1,283,000**	**50.6**	**1,156,000**	**45.1**	**1,283,000**	**50.0**	**1,143,000**	**44.0**	**1,105,000**	**41.5**

a) kg/p – kilograms per person.

b) Includes very small quantities of other glass colours (e.g. blue glass).

Table F-13 – Glass packaging POM in 2022–23, by material type and sector of use.

Material type	B2C – At home[a]	B2C – AfH[a]	B2B[a]	Other or unknown	Total	
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Amber glass	169,000	89,000	0	0	258,000	23.4%
Flint glass	345,000	99,000	4,000	0	448,000	40.6%
Green glass	267,000	129,000	3,000	0	399,000	36.1%
Total (tonnes)	**781,000**	**318,000**	**6,000**	**0**	**1,105,000**	**-**
Total (%)	**70.7%**	**28.7%**	**0.6%**	**0.0%**	**-**	**100.0%**

a) Business-to-consumer (B2C) – At home | Business-to-consumer (B2C) – Away-from-home (AfH) | Business-to-business (B2B).

Table F-14 – Glass packaging POM in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Amber glass	0	0	258,000	0	0	0	0	0	0	0	0	0	0	0	0	0	258,000
Flint glass	0	0	448,000	0	0	0	0	0	0	0	0	0	0	0	0	0	448,000
Green glass	0	0	399,000	0	0	0	0	0	0	0	0	0	0	0	0	0	399,000
Total (tonnes)	**0**	**0**	**1,105,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,105,000**
Total (%)	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Table F-15 – Glass packaging POM in 2022–23, by material type and recycled content.

Material type	Post-consumer source		Pre-consumer source		Virgin source		Total
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)
Amber glass	167,000	65%	10,000	4%	81,000	31%	258,000
Flint glass	166,000	37%	18,000	4%	265,000	59%	448,000
Green glass	222,000	56%	18,000	4%	159,000	40%	399,000
Total	**555,000**	**50%**	**46,000**	**4%**	**505,000**	**46%**	**1,105,000**

Recovery

Table F-16 – Glass packaging recovery from 2017–18 to 2022–23, by material type.

Material type	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Amber glass	189,000	5.8	174,000	6.9	202,000	7.9	202,000	7.9	174,000	6.7	245,000	9.2
Flint glass	212,000	6.5	283,000	11.2	366,000	14.3	374,000	14.6	315,000	12.1	268,000	10.1
Green glass	180,000	5.5	117,000	4.6	131,000	5.1	228,000	8.9	230,000	8.8	247,000	9.3
Total	**582,000**	**23.3**	**574,000**	**22.6**	**699,000**	**27.3**	**805,000**	**31.3**	**718,000**	**27.6**	**761,000**	**28.6**

a) kg/p – kilograms per person.

Table F-17 – Glass packaging recovery in 2022–23, by material type and collection service.

Material type	Collection service				Total	
	MSW[a]	C&I[a]	CDS[a]	Other		
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Amber glass	153,000	0	92,000	0	245,000	32.2%
Flint glass	176,000	0	92,000	0	268,000	35.2%
Green glass	155,000	0	92,000	0	247,000	32.5%
Total (tonnes)	**485,000**	**0**	**276,000**	**0**	**761,000**	-
Total (%)	**63.7%**	**0.0%**	**36.3%**	**0.0%**	**-**	100.0%

a) Municipal solid waste (MSW), commercial and industrial (C&I) waste, and container deposit scheme (CDS) collection services.

Table F-18 – Glass packaging recovery in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Amber glass	0	0	245,000	0	0	0	0	0	0	0	0	0	0	0	0	0	245,000
Flint glass	0	0	268,000	0	0	0	0	0	0	0	0	0	0	0	0	0	268,000
Green glass	0	0	247,000	0	0	0	0	0	0	0	0	0	0	0	0	0	247,000
Total (tonnes)	**0**	**0**	**761,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**761,000**
Total (%)	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Table F-19 – Glass packaging recovery in 2022–23, by material type and destination of material.

Material type	Local	Overseas	Unknown destinations	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Amber glass	245,000	<500	0	245,000
Flint glass	268,000	<500	0	268,000
Green glass	247,000	<500	0	247,000
Total (tonnes)	**760,000**	**1,000**	**0**	**761,000**
Total (%)	**99.9%**	**0.1%**	**0.0%**	**100.0%**

Table F-20 – Post-consumer glass packaging recovery rates in 2022–23, by material type.

Material type	POM	Recovery	Recovery rate
	(tonnes)	(tonnes)	(%)
Amber glass	258,000	245,000	95%
Flint glass	448,000	268,000	60%
Green glass	399,000	247,000	62%
Total	**1,105,000**	**761,000**	**69%**

Projections

Table F-21 – Glass packaging POM (mass and per capita bases) from 2020–21 to 2027–28, by material type.

Material type	2020–21		2021–22		2022–23		2023–24		2024–25		2025–26		2026–27		2027–28		5-yr CAGR[b]
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(%/yr)
Amber glass	233,000	9.1	181,000	7.0	258,000	9.7	272,000	10.1	287,000	10.5	302,000	10.9	318,000	11.3	335,000	11.7	5.3%
Flint glass	605,000	23.6	494,000	19.0	448,000	16.8	472,000	17.5	498,000	18.2	524,000	18.9	552,000	19.6	581,000	20.3	5.3%
Green glass	445,000	17.3	468,000	18.0	399,000	15.0	410,000	15.2	421,000	15.4	432,000	15.6	444,000	15.8	457,000	16.0	2.8%
Total	**1,283,000**	**50.0**	**1,143,000**	**44.0**	**1,105,000**	**41.5**	**1,154,000**	**42.8**	**1,205,000**	**44.0**	**1,258,000**	**45.3**	**1,314,000**	**46.6**	**1,373,000**	**48.0**	**3.7%**

a) kg/p – kilograms per person.

b) CAGR – compound annual growth rate.

Table F-22 – Glass packaging reprocessing capacity projections from 2022–23 to 2027–28, by material type.

Material type	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	5 year CAGR[a]
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%/yr)
Amber glass	318,000	318,000	328,000	343,000	392,000	392,000	4.3%
Flint glass	410,000	410,000	426,000	451,000	530,000	530,000	5.3%
Green glass	374,000	374,000	389,000	412,000	485,000	485,000	5.3%
Total	**1,102,000**	**1,102,000**	**1,143,000**	**1,206,000**	**1,406,000**	**1,406,000**	**5.0%**

a) CAGR – compound annual growth rate.

F.3 Plastic packaging in 2022–23

Placed on market

Table F-23 – Plastic packaging POM (mass and per capita bases) from 2017–18 to 2022–23, by material type.

Material type[a]	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[b]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
PET (1)	132,000	5.3	154,000	6.1	163,000	6.4	149,000	5.8	179,000	6.9	203,000	7.6
HDPE (2)	351,000	14.1	316,000	12.5	275,000	10.7	287,000	11.2	332,000	12.8	292,000	11.0
PVC (3)	20,000	0.8	15,000	0.6	17,000	0.7	15,000	0.6	11,000	0.4	10,000	0.4
LDPE (4)	254,000	10.2	233,000	9.2	276,000	10.7	331,000	12.9	328,000	12.6	308,000	11.5
PP (5)	164,000	6.6	155,000	6.1	218,000	8.5	215,000	8.4	253,000	9.7	265,000	9.9
PS (6)	11,000	0.5	11,000	0.4	17,000	0.7	17,000	0.7	17,000	0.6	14,000	0.5
EPS (6)	22,000	0.9	16,000	0.6	23,000	0.9	29,000	1.1	30,000	1.1	28,000	1.0
Bioplastic (7)	1,000	0.0	6,000	0.3	9,000	0.3	4,000	0.1	2,000	0.1	5,000	0.2
Other (7)	111,000	4.4	16,000	0.6	20,000	0.8	21,000	0.8	17,000	0.7	17,000	0.6
Unidentified	NR[c]	NR	78,000	3.1	107,000	4.2	111,000	4.3	109,000	4.2	124,000	4.7
Total	**1,067,000**	**42.7**	**1,000,000**	**39.5**	**1,124,000**	**43.8**	**1,179,000**	**45.9**	**1,277,000**	**49.1**	**1,265,000**	**47.5**

a) PET (1) – Polyethylene terephthalate (PIC 1) | HDPE (2) – High-density polyethylene (PIC 2) | PVC (3) – Polyvinyl chloride (PIC 3) | LDPE (4) – Low-density polyethylene (PIC 4) | PP (5) – Polypropylene (PIC 5) | PS (6) – Polystyrene (PIC 6) | EPS (6) – Expanded polystyrene (PIC 6). PIC – Plastic identification code.

b) kg/p – kilograms per person.

c) NR – not reported.

Table F-24 – Plastic packaging POM in 2022–23, by material type and sector of use.

Material type	B2C – At home[a]	B2C – AfH[a]	B2B[a]	Other or unknown	Total	
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
PET (1)	177,000	17,000	9,000	0	203,000	16.0%
HDPE (2)	220,000	8,000	65,000	0	292,000	23.1%
PVC (3)	5,000	0	5,000	0	10,000	0.8%
LDPE (4)	202,000	8,000	98,000	0	308,000	24.3%
PP (5)	172,000	10,000	83,000	0	265,000	20.9%
PS (6)	7,000	7,000	0	0	14,000	1.1%
EPS (6)	12,000	0	16,000	0	28,000	2.2%
Bioplastic (7)	2,000	2,000	0	0	5,000	0.4%
Other (7)	16,000	0	1,000	0	17,000	1.3%
Unidentified	108,000	1,000	16,000	0	124,000	9.8%
Total (tonnes)	**921,000**	**52,000**	**292,000**	**0**	**1,265,000**	-
Total (%)	**72.8%**	**4.1%**	**23.1%**	**0.0%**	**100.0%**	100.0%

a) Business-to-consumer (B2C) – At home | Business-to-consumer (B2C) – Away-from-home (AfH) | Business-to-business (B2B).

Table F-25 – Plastic packaging POM in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
PET (1) – Natural	2,000	0	117,000	0	0	0	0	0	0	0	4,000	38,000	0	2,000	1,000	4,000	168,000
PET (1) – Transparent	0	0	18,000	0	0	0	0	0	0	0	0	2,000	0	0	0	1,000	21,000
PET (1) – Opaque	0	0	1,000	0	0	0	0	0	0	0	5,000	0	0	8,000	0	0	14,000
HDPE (2) – Natural	4,000	6,000	130,000	0	0	5,000	0	1,000	0	2,000	0	0	0	3,000	1,000	18,000	171,000
HDPE (2) – Coloured	55,000	6,000	38,000	0	0	1,000	0	1,000	0	7,000	0	0	11,000	0	2,000	0	122,000
PVC (3)	1,000	0	1,000	0	0	1,000	0	0	0	0	0	0	0	6,000	0	1,000	10,000
LDPE (4)	163,000	0	4,000	0	0	4,000	0	1,000	0	20,000	0	1,000	0	102,000	1,000	11,000	308,000
PP (5) – Natural	8,000	1,000	2,000	0	0	7,000	17,000	0	0	0	2,000	45,000	0	24,000	1,000	22,000	128,000
PP (5) – Coloured	13,000	17,000	0	0	0	4,000	2,000	1,000	4,000	1,000	1,000	61,000	0	6,000	9,000	18,000	137,000
PS (6)	0	0	0	0	0	1,000	0	0	0	0	7,000	6,000	0	0	0	1,000	14,000
EPS (6)	0	0	0	0	12,000	0	0	0	0	0	0	0	0	0	16,000	0	28,000
Bioplastic (7)	0	0	0	0	0	0	0	0	0	0	2,000	2,000	0	0	1,000	0	5,000
Other (7)	2,000	0	0	0	0	0	0	0	0	0	0	0	0	10,000	5,000	0	17,000
Unidentified	36,000	0	14,000	0	0	28,000	0	0	0	0	0	0	0	0	2,000	44,000	124,000
Total (tonnes)	**285,000**	**31,000**	**325,000**	**0**	**12,000**	**52,000**	**19,000**	**4,000**	**4,000**	**30,000**	**19,000**	**154,000**	**11,000**	**162,000**	**39,000**	**119,000**	**1,265,000**
Total (%)	**22.5%**	**2.5%**	**25.7%**	**0.0%**	**0.9%**	**4.1%**	**1.5%**	**0.3%**	**0.4%**	**2.4%**	**1.5%**	**12.2%**	**0.9%**	**12.8%**	**3.1%**	**9.4%**	**100.0%**

Table F-26 – Plastic packaging POM in 2022–23, by material type and rigid/flexible classification.

Material type	Rigid	Flexible	Total
	(tonnes)	(tonnes)	(tonnes)
PET (1) – Natural	163,000	4,000	**167,000**
PET (1) – Transparent	21,000	0	**21,000**
PET (1) – Opaque	6,000	8,000	**14,000**
HDPE (2) – Natural	161,000	10,000	**171,000**
HDPE (2) – Coloured	60,000	62,000	**122,000**
PVC (3)	2,000	7,000	**9,000**
LDPE (4)	11,000	296,000	**307,000**
PP (5) – Natural	69,000	59,000	**128,000**
PP (5) – Coloured	112,000	25,000	**137,000**
PS (6)	14,000	0	**14,000**
EPS (6)	28,000	0	**28,000**
Bioplastic (7)	4,000	1,000	**5,000**
Other (7)	5,000	12,000	**17,000**
Unidentified	68,000	56,000	**124,000**
Total (tonnes)	**724,000**	**540,000**	**1,264,000**
Total (%)	**57.3%**	**42.7%**	**100.0%**

Table F-27 – Plastic packaging POM in 2022–23, by material type and recycled content.

Material type	Post-consumer source		Pre-consumer source		Virgin source		Total
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)
PET (1) – Natural	48,000	29%	7,000	4%	112,000	67%	168,000
PET (1) – Transparent	1,000	4%	0	1%	20,000	95%	21,000
PET (1) – Opaque	0	1%	0	0%	14,000	99%	14,000
HDPE (2) – Natural	9,000	5%	5,000	3%	157,000	92%	171,000
HDPE (2) – Coloured	6,000	5%	7,000	6%	109,000	90%	122,000
PVC (3)	0	3%	0	0%	9,000	97%	10,000
LDPE (4)	6,000	2%	7,000	2%	295,000	96%	308,000
PP (5) – Natural	1,000	1%	0	0%	127,000	99%	128,000
PP (5) – Coloured	34,000	25%	0	0%	103,000	75%	137,000
PS (6)	0	1%	0	1%	14,000	98%	14,000
EPS (6)	0	0%	0	0%	28,000	100%	28,000
Bioplastic (7)	0	0%	0	5%	4,000	95%	5,000
Other (7)	0	0%	0	0%	17,000	100%	17,000
Unidentified	0	0%	0	0%	124,000	100%	124,000
Total	**106,000**	**8%**	**26,000**	**2%**	**1,133,000**	**90%**	**1,265,000**

Table F-28 – Plastic packaging POM suitable for food contact applications, by material type.

Material type	Into food contact applications or suitable for food contact applications		Not suitable for food contact applications		Unknown suitability for food contact applications		Total
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)
PET (1) – Natural	136,000	81%	1,000	1%	30,000	18%	168,000
PET (1) – Transparent	18,000	84%	0	0%	3,000	16%	21,000
PET (1) – Opaque	10,000	72%	0	0%	4,000	28%	14,000
HDPE (2) – Natural	138,000	81%	23,000	14%	10,000	6%	171,000
HDPE (2) – Coloured	102,000	84%	20,000	16%	0	0%	122,000
PVC (3)	9,000	89%	1,000	8%	0	3%	10,000
LDPE (4)	278,000	90%	25,000	8%	5,000	2%	308,000
PP (5) – Natural	120,000	94%	2,000	1%	6,000	5%	128,000
PP (5) – Coloured	88,000	65%	48,000	35%	0	0%	137,000
PS (6)	14,000	100%	0	0%	0	0%	14,000
EPS (6)	28,000	100%	0	0%	0	0%	28,000
Bioplastic (7)	4,000	91%	0	9%	0	0%	5,000
Other (7)	16,000	96%	0	0%	1,000	4%	17,000
Unidentified	120,000	96%	2,000	2%	2,000	2%	124,000
Total	**1,081,000**	**85%**	**122,000**	**10%**	**62,000**	**5%**	**1,265,000**

Table F-29 – Plastic packaging recovery from 2017–18 to 2022–23, by material type.

Material type[a]	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
PET (1)	57,000	2.3	55,000	2.2	55,000	2.2	58,000	2.2	90,000	3.5	81,000	3.1
HDPE (2)	66,000	2.7	73,000	2.9	60,000	2.3	66,000	2.6	71,000	2.7	79,000	2.9
PVC (3)	1,000	0.1	1,000	0.0	2,000	0.1	0	0.0	0	0.0	0	0.0
LDPE (4)	28,000	1.1	22,000	0.8	15,000	0.6	32,000	2.6	60,000	2.3	32,000	1.2
PP (5)	12,000	0.5	21,000	0.8	20,000	0.8	30,000	0.0	19,000	0.7	34,000	1.3
PS (6)	2,000	0.1	3,000	0.1	4,000	0.2	2,000	0.0	1,000	0.0	1,000	0.0
EPS (6)	4,000	0.2	4,000	0.2	4,000	0.2	9,000	1.2	5,000	0.2	7,000	0.3
Bioplastic (7)	0	0.0	0	0.0	0	0.0	0	1.2	0	0.0	0	0.0
Other (7)	1,000	0.1	0	0.0	1,000	0.0	0	0.0	4,000	0.2	0	0.0
Unidentified	NR[c]	NR	3,000	0.1	17,000	0.7	10,000	0.1	7,000	0.3	0	0.0
Total	**173,000**	**6.9**	**182,000**	**7.2**	**179,000**	**7.0**	**207,000**	**8.0**	**258,000**	**9.9**	**234,000**	**8.8**

a) PET (1) – Polyethylene terephthalate (PIC 1) | HDPE (2) – High-density polyethylene (PIC 2) | PVC (3) – Polyvinyl chloride (PIC 3) | LDPE (4) – Low-density polyethylene (PIC 4) | PP (5) – Polypropylene (PIC 5) | PS (6) – Polystyrene (PIC 6) | EPS (6) – Expanded polystyrene (PIC 6). PIC – Plastic identification code.

b) kg/p – kilograms per person.

c) NR – not reported.

Table F-30 – Plastic packaging recovery in 2022–23, by material type and collection service.

Material type	Collection service				Total	
	MSW[a]	C&I[a]	CDS[a]	Other		
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
PET (1)	46,000	0	36,000	0	81,000	34.6%
HDPE (2)	65,000	11,000	2,000	1,000	79,000	33.8%
PVC (3)	<500	0	0	<500	0	0.0%
LDPE (4)	2,000	29,000	0	1,000	32,000	13.7%
PP (5)	23,000	11,000	0	0	34,000	14.5%
PS (6)	<500	1,000	0	<500	1,000	0.4%
EPS (6)	0	7,000	0	<500	7,000	3.0%
Bioplastic (7)	<500	<500	0	0	0	0.0%
Other (7)	<500	0	0	<500	0	0.0%
Unidentified	<500	0	0	<500	0	0.0%
Total (tonnes)	**135,000**	**59,000**	**38,000**	**3,000**	**234,000**	-
Total (%)	**57.6%**	**25.1%**	**16.2%**	**1.1%**	**100.0%**	100.0%

a) Municipal solid waste (MSW), commercial and industrial (C&I) waste, and container deposit scheme (CDS) collection services.

Table F-31 – Plastic packaging recovery in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
PET (1) – Natural	0	0	70,000	0	0	0	0	0	0	0	0	3,000	0	0	0	0	73,000
PET (1) – Transparent	0	0	6,000	0	0	0	0	0	0	0	0	0	0	0	0	0	6,000
PET (1) – Opaque	0	0	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	2,000
HDPE (2) – Natural	0	2,000	43,000	0	0	1,000	0	0	0	0	0	2,000	0	0	0	0	49,000
HDPE (2) – Coloured	0	4,000	21,000	0	0	1,000	0	1,000	1,000	0	0	1,000	0	1,000	0	0	29,000
PVC (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LDPE (4)	1,000	0	0	0	0	0	0	0	0	0	0	0	0	30,000	0	0	32,000
PP (5) – Natural	0	0	3,000	0	0	0	0	0	0	0	0	9,000	0	0	0	0	12,000
PP (5) – Coloured	1,000	1,000	1,000	0	0	0	0	3,000	1,000	0	0	15,000	0	1,000	0	0	22,000
PS (6)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000	0	1,000
EPS (6)	0	0	0	0	3,000	0	0	0	0	0	0	0	0	0	4,000	0	7,000
Bioplastic (7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other (7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (tonnes)	**3,000**	**7,000**	**145,000**	**0**	**3,000**	**2,000**	**0**	**4,000**	**2,000**	**0**	**0**	**31,000**	**0**	**31,000**	**5,000**	**0**	**234,000**
Total (%)	**1.1%**	**3.2%**	**62.1%**	**0.0%**	**1.4%**	**1.0%**	**0.0%**	**1.7%**	**0.8%**	**0.1%**	**0.1%**	**13.2%**	**0.0%**	**13.4%**	**2.1%**	**0.0%**	**100.0%**

Table F-32 – Plastic packaging recovery in 2022–23, by material type and destination of material.

Material type	Local	Overseas	Unknown destinations	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)
PET (1) – Natural	48,000	22,000	3,000	73,000
PET (1) – Transparent	4,000	2,000	0	6,000
PET (1) – Opaque	1,000	1,000	0	2,000
HDPE (2) – Natural	31,000	15,000	4,000	49,000
HDPE (2) – Coloured	18,000	9,000	3,000	29,000
PVC (3)	0	0	0	0
LDPE (4)	8,000	24,000	0	32,000
PP (5) – Natural	10,000	1,000	1,000	12,000
PP (5) – Coloured	21,000	1,000	0	22,000
PS (6)	0	0	0	1,000
EPS (6)	1,000	6,000	0	7,000
Bioplastic (7)	0	0	0	0
Other (7)	0	0	0	0
Unidentified	0	0	0	0
Total (tonnes)	**144,000**	**80,000**	**11,000**	**234,000**
Total (%)	**61.3%**	**34.2%**	**4.6%**	**100.0%**

Table F-33 – Plastic packaging recovery in 2022–23, by material type and rigid/flexible classification.

Material type	Rigid	Flexible	Total
	(tonnes)	(tonnes)	(tonnes)
PET (1) – Natural	73,000	0	73,000
PET (1) – Transparent	6,000	0	6,000
PET (1) – Opaque	2,000	0	2,000
HDPE (2) – Natural	49,000	0	49,000
HDPE (2) – Coloured	28,000	1,000	29,000
PVC (3)	0	0	0
LDPE (4)	0	32,000	32,000
PP (5) – Natural	12,000	0	12,100
PP (5) – Coloured	21,000	1,000	22,000
PS (6)	1,000	0	1,000
EPS (6)	7,000	0	7,000
Bioplastic (7)	0	0	0
Other (7)	0	0	0
Unidentified	0	0	0
Total (tonnes)	**200,000**	**34,000**	**234,000**
Total (%)	**85.4%**	**14.6%**	**100.0%**

Table F-34 – Plastic packaging recovery suitable for food contact applications, by material type.

Material type	Into food contact applications or suitable for food contact applications		Not suitable for food contact applications		Unknown suitability for food contact applications		Total
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)
PET (1) – Natural	47,000	65%	4,000	5%	22,000	30%	73,000
PET (1) – Transparent	4,000	72%	2,000	26%	0	3%	6,000
PET (1) – Opaque	0	16%	2,000	84%	0	0%	2,000
HDPE (2) – Natural	12,000	24%	21,000	44%	16,000	32%	49,000
HDPE (2) – Coloured	0	0%	24,000	82%	5,000	18%	29,000
PVC (3)	0	0%	0	100%	0	0%	0
LDPE (4)	0	0%	9,000	27%	23,000	73%	32,000
PP (5) – Natural	0	0%	9,000	78%	3,000	22%	12,000
PP (5) – Coloured	0	0%	22,000	100%	0	0%	22,000
PS (6)	0	0%	0	58%	0	42%	1,000
EPS (6)	0	0%	3,000	47%	4,000	53%	7,000
Bioplastic (7)	0	0%	0	100%	0	0%	0
Other (7)	0	0%	0	100%	0	0%	0
Unidentified	0	0%	0	0%	0	100%	0
Total	**64,000**	**27%**	**97,000**	**41%**	**74,000**	**32%**	**234,000**

Table F-35 – Post-consumer plastic packaging recovery rates in 2022–23, by material type.

Material type	POM	Recovery	Recovery rate
	(tonnes)	(tonnes)	(%)
PET (1) – Natural	168,000	73,000	44%
PET (1) – Transparent	21,000	6,000	28%
PET (1) – Opaque	14,000	2,000	13%
HDPE (2) – Natural	171,000	49,000	29%
HDPE (2) – Coloured	122,000	29,000	24%
PVC (3)	10,000	0	1%
LDPE (4)	308,000	32,000	10%
PP (5) – Natural	128,000	12,000	9%
PP (5) – Coloured	137,000	22,000	16%
PS (6)	14,000	1,000	5%
EPS (6)	28,000	7,000	26%
Bioplastic (7)	5,000	0	4%
Other (7)	17,000	0	0%
Unidentified	124,000	0	0%
Total	**1,265,000**	**234,000**	**19%**

Projections

Table F-36 – Plastic packaging POM (mass and per capita bases) from 2020–21 to 2027–28, by material type.

Material type	2020–21		2021–22		2022–23		2023–24		2024–25		2025–26		2026–27		2027–28		5-yr CAGR[b]
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(%/yr)
PET (1)	149,000	5.8	179,000	6.9	203,000	7.6	210,000	7.8	217,000	7.9	224,000	8.1	232,000	8.2	241,000	8.4	3.5%
HDPE (2)	287,000	11.2	332,000	12.8	292,000	11.0	303,000	11.2	314,000	11.5	325,000	11.7	337,000	12.0	350,000	12.2	3.7%
PVC (3)	15,000	0.6	11,000	0.4	10,000	0.4	9,000	0.3	8,000	0.3	8,000	0.3	7,000	0.3	7,000	0.2	-6.6%
LDPE (4)	331,000	12.9	328,000	12.6	308,000	11.5	320,000	11.9	333,000	12.2	347,000	12.5	361,000	12.8	375,000	13.1	4.1%
PP (5)	215,000	8.4	253,000	9.7	265,000	9.9	268,000	9.9	272,000	9.9	276,000	9.9	280,000	9.9	284,000	9.9	1.4%
PS (6)	17,000	0.7	17,000	0.6	14,000	0.5	15,000	0.6	17,000	0.6	19,000	0.7	21,000	0.8	24,000	0.8	11.2%
EPS (6)	29,000	1.1	30,000	1.1	28,000	1.0	28,000	1.0	29,000	1.0	29,000	1.0	30,000	1.1	30,000	1.1	1.8%
Bioplastic (7)	4,000	0.1	2,000	0.1	5,000	0.2	5,000	0.2	6,000	0.2	7,000	0.3	8,000	0.3	9,000	0.3	14.2%
Other (7)	21,000	0.8	17,000	0.7	17,000	0.6	17,000	0.6	17,000	0.6	18,000	0.6	18,000	0.6	18,000	0.6	1.8%
Unidentified	111,000	4.3	109,000	4.2	124,000	4.7	127,000	4.7	129,000	4.7	131,000	4.7	133,000	4.7	136,000	4.7	1.8%
Total	**1,179,000**	**45.9**	**1,277,000**	**49.1**	**1,265,000**	**47.5**	**1,303,000**	**48.3**	**1,343,000**	**49.0**	**1,384,000**	**49.8**	**1,428,000**	**50.6**	**1,474,000**	**51.6**	**3.1%**

a) kg/p – kilograms per person.

b) CAGR – compound annual growth rate

Table F-37 – Plastic packaging reprocessing capacity projections from 2022–23 to 2027–28, by material type.

Material type	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	5 year CAGR[a]
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%/yr)
PET (1)	95,000	95,000	120,000	126,000	126,000	126,000	5.8%
HDPE (2)	106,000	106,000	110,000	170,000	185,000	208,000	14.5%
PVC (3)	0	0	1,000	1,000	1,000	1,000	8.3%
LDPE (4)	38,000	38,000	67,000	130,000	188,000	195,000	38.5%
PP (5)	83,000	83,000	90,000	154,000	172,000	189,000	18.0%
PS (6)	2,000	2,000	2,000	2,000	2,000	2,000	5.2%
EPS (6)	18,000	18,000	18,000	18,000	18,000	18,000	0.2%
Bioplastic (7)	0	0	0	0	0	0	0.0%
Other (7)	0	0	2,000	2,000	2,000	2,000	40.8%
Unidentified	0	0	0	0	0	0	0.0%
Total	**343,000**	**343,000**	**411,000**	**604,000**	**695,000**	**741,000**	**16.7%**

a) CAGR – compound annual growth rate.

F.4 Metal packaging in 2022–23

Placed on market

Table F-38 – Metal packaging POM (mass and per capita bases) from 2017–18 to 2022–23, by material type.

Material type	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Beverage aluminium	79,000	3.2	86,000	3.4	82,000	3.2	95,000	3.7	100,000	3.9	102,000	3.8
Non-beverage aluminium	13,000	0.5	14,000	0.6	7,000	0.3	7,000	0.3	11,000	0.4	11,000	0.4
Aluminium – Other	NR[b]	NR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tin-plate steel	121,000	4.8	127,000	5.0	139,000	5.4	125,000	4.9	161,000	6.2	162,000	6.1
Mild steel	NR	NR	19,000	0.8	19,000	0.7	26,000	1.0	24,000	0.9	25,000	0.9
Stainless steel	NR	NR	0	0.0	1,000	0.0	0	0.0	1,000	0.1	2,000	0.1
Steel – Other	NR	NR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metal – Other	NR	NR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	**213,000**	**8.5**	**246,000**	**9.7**	**248,000**	**9.7**	**254,000**	**9.9**	**298,000**	**11.5**	**302,000**	**11.3**

a) kg/p – kilograms per person.
b) NR – not reported.

Table F-39 – Metal packaging POM in 2022–23, by material type and sector of use.

Material type	B2C – At home[a]	B2C – AfH[a]	B2B[a]	Other or unknown	Total	
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Beverage aluminium	67,000	35,000	0	0	102,000	33.7%
Non-beverage aluminium	10,000	1,000	0	0	11,000	3.6%
Tin-plate steel	121,000	1,000	40,000	0	162,000	53.6%
Mild steel	0	0	25,000	0	25,000	8.3%
Stainless steel	0	0	2,000	0	2,000	0.7%
Total (tonnes)	**198,000**	**37,000**	**67,000**	**0**	**302,000**	-
Total (%)	**65.5%**	**12.3%**	**22.2%**	**0.0%**	**-**	100.0%

a) Business-to-consumer (B2C) – At home | Business-to-consumer (B2C) – Away-from-home (AfH) | Business-to-business (B2B).

Table F-40 – Metal packaging POM in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	0	0	0	102,000	0	0	0	0	0	0	0	0	0	0	0	0	102,000
Non-beverage aluminium	0	0	0	6,000	0	1,000	0	0	0	0	0	3,000	0	0	0	0	11,000
Tin-plate steel	0	3,000	0	154,000	0	5,000	0	0	0	0	0	0	0	0	0	0	162,000
Mild steel	0	25,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,000
Stainless steel	0	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,000
Total (tonnes)	**0**	**30,000**	**0**	**262,000**	**0**	**6,000**	**0**	**0**	**0**	**0**	**0**	**3,000**	**0**	**0**	**0**	**0**	**302,000**
Total (%)	**0.0%**	**10.0%**	**0.0%**	**86.8%**	**0.0%**	**1.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.1%**	**0.1%**	**0.0%**	**0.0%**	**100.0%**

Table F-41 – Metal packaging POM in 2022–23, by material type and recycled content.

Material type	Post-consumer source		Pre-consumer source		Virgin source		Total
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)
Beverage aluminium	21,000	21%	48,000	47%	33,000	33%	102,000
Non-beverage aluminium	1,000	10%	3,000	25%	7,000	65%	11,000
Tin-plate steel	10,000	6%	21,000	13%	131,000	81%	162,000
Mild steel	3,000	10%	1,000	4%	22,000	86%	25,000
Stainless steel	<500	10%	<500	21%	2,000	69%	2,000
Total	**35,000**	**12%**	**73,000**	**24%**	**194,000**	**64%**	**302,000**

Recovery

Table F-42 – Metal packaging recovery from 2017–18 to 2022–23, by material type.

Material type	2017–18		2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Beverage aluminium	53,000	2.1	65,000	2.6	66,000	2.6	73,000	2.8	62,000	2.4	65,000	2.4
Non-beverage aluminium	4,000	0.2	3,000	0.1	3,000	0.1	3,000	0.1	3,000	0.1	3,000	0.1
Tin-plate steel	45,000	1.8	52,000	2.1	53,000	2.1	53,000	2.1	68,000	2.6	70,000	2.6
Mild steel	NR[b]	NR	17,000	0.7	17,000	0.7	18,000	0.7	18,000	0.7	18,000	0.7
Stainless steel	NR	NR	0	0.0	1,000	0.0	0	0.0	0	0.0	0	0.0
Total	**102,000**	**4.1**	**137,000**	**5.4**	**139,000**	**5.4**	**147,000**	**5.7**	**151,000**	**5.8**	**156,000**	**5.9**

a) kg/p – kilograms per person.
b) NR – not reported.

Table F-43 – Metal packaging recovery in 2022–23, by material type and collection service.

Material type	Collection service					Total	
	MSW[a]	C&I[a]	C&D	CDS[a]	Other		
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Beverage aluminium	27,000	0	0	38,000	0	65,000	41.7%
Non-beverage aluminium	3,000	0	0	0	0	3,000	1.9%
Tin-plate steel	70,000	0	0	0	0	70,000	44.9%
Mild steel	0	18,000	1,000	0	0	18,000	11.5%
Stainless steel	0	0	0	0	0	0	0.0%
Total (tonnes)	**99,000**	**18,000**	**1,000**	**38,000**	**0**	**156,000**	-
Total (%)	**63.5%**	**11.3%**	**0.3%**	**24.6%**	**0.2%**	**-**	100.0%

a) Municipal solid waste (MSW), commercial and industrial (C&I) waste, and container deposit scheme (CDS) collection services.

Table F-44 – Metal packaging recovery in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	0	0	0	65,000	0	0	0	0	0	0	0	0	0	0	0	0	65,000
Non-beverage aluminium	0	0	0	3,000	0	0	0	0	0	0	0	0	0	0	0	0	3,000
Tin-plate steel	0	0	0	70,000	0	0	0	0	0	0	0	0	0	0	0	0	70,000
Mild steel	0	17,000	0	0	0	0	0	2,000	0	0	0	0	0	0	0	0	18,000
Stainless steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (tonnes)	**0**	**17,000**	**0**	**138,000**	**0**	**0**	**0**	**2,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**156,000**
Total (%)	**0.0%**	**10.7%**	**0.0%**	**88.2%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**

Table F-45 – Metal packaging recovery in 2022–23, by material type and destination of material.

Material type	Local	Overseas	Unknown destinations	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Beverage aluminium	0	65,000	0	65,000
Non-beverage aluminium	0	3,000	0	3,000
Tin-plate steel	0	70,000	0	70,000
Mild steel	18,000	0	0	18,000
Stainless steel	0	0	0	0
Total (tonnes)	**19,000**	**138,000**	**0**	**156,000**
Total (%)	**11.9%**	**88.1%**	**0.0%**	**100.0%**

Table F-46 – Post-consumer metal packaging recovery rates in 2022–23, by material type.

Material type	POM	Recovery	Recovery rate
	(tonnes)	(tonnes)	(%)
Beverage aluminium	102,000	65,000	64%
Non-beverage aluminium	11,000	3,000	25%
Tin-plate steel	162,000	70,000	43%
Mild steel	25,000	18,000	73%
Stainless steel	2,000	0	0%
Total	**302,000**	**156,000**	**52%**

Projections

Table F-47 – Metal packaging POM (mass and per capita bases) from 2020–21 to 2027–28, by material type.

Material type	2020–21		2021–22		2022–23		2023–24		2024–25		2025–26		2026–27		2027–28		5-yr CAGR[b]
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(%/yr)
Beverage aluminium	95,000	3.7	100,000	3.9	102,000	3.8	103,000	3.8	105,000	3.8	106,000	3.8	108,000	3.8	110,000	3.8	1.5%
Non-beverage aluminium	7,000	0.3	11,000	0.4	11,000	0.4	11,000	0.4	11,000	0.4	11,000	0.4	12,000	0.4	12,000	0.4	1.8%
Tin-plate steel	125,000	4.9	161,000	6.2	162,000	6.1	166,000	6.1	169,000	6.2	173,000	6.2	177,000	6.3	181,000	6.3	2.3%
Mild steel	26,000	1.0	24,000	0.9	25,000	0.9	26,000	0.9	26,000	0.9	26,000	1.0	27,000	1.0	27,000	1.0	1.8%
Stainless steel	0	0.0	1,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	2,000	0.1	1.8%
Total	**254,000**	**9.9**	**298,000**	**11.5**	**302,000**	**11.3**	**308,000**	**11.4**	**314,000**	**11.5**	**320,000**	**11.5**	**326,000**	**11.6**	**333,000**	**11.6**	**2.0%**

a) kg/p – kilograms per person.
b) CAGR – compound annual growth rate.

Table F-48 – Metal packaging reprocessing capacity projections from 2022–23 to 2027–28, by material type.

Material type	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	5 year CAGR[a]
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%/yr)
Beverage aluminium	1,000	1,000	2,000	2,000	2,000	2,000	24.6%
Non-beverage aluminium	1,000	1,000	1,000	1,000	1,000	1,000	0.0%
Tin-plate steel	1,000	1,000	1,000	1,000	1,000	1,000	0.0%
Mild steel	19,000	19,000	19,000	19,000	19,000	19,000	0.0%
Stainless steel	0	0	0	0	0	0	N/A
Total	**22,000**	**22,000**	**23,000**	**23,000**	**23,000**	**23,000**	**1.4%**

a) CAGR – compound annual growth rate.

F.5 Wood packaging in 2022–23

Placed on market

Table F-49 – Wood packaging POM (mass and per capita bases) from 2018–19 to 2022–23, by material type.

Material type	2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Fibreboard – Low-density	0	0.0	50,000	2.0	94,000	3.7	42,000	1.6	33,000	1.2
Fibreboard – OSB[b]	0	0.0	50,000	2.0	37,000	1.5	25,000	1.0	20,000	0.7
Hardwood	6,000	0.3	81,000	3.1	60,000	2.3	63,000	2.4	90,000	3.4
Softwood	118,000	4.6	281,000	10.9	446,000	17.3	482,000	18.5	420,000	15.7
Total	**124,000**	**4.9**	**462,000**	**18.0**	**638,000**	**24.8**	**612,000**	**23.5**	**562,000**	**21.1**

a) kg/p – kilograms per person.
b) OSB – Oriented strand board.

Table F-50 – Wood packaging POM in 2022–23, by material type and sector of use.

Material type	B2C – At home[a]	B2C – AfH[a]	B2B[a]	Other or unknown	Total	
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Fibreboard – Low-density	0	0	33,000	0	33,000	5.9%
Fibreboard – OSB	0	0	20,000	0	20,000	3.5%
Hardwood	0	0	90,000	0	90,000	16.0%
Softwood	0	1,000	418,000	0	420,000	74.6%
Total (tonnes)	**0**	**1,000**	**561,000**	**0**	**562,000**	-
Total (%)	**0.0%**	**0.2%**	**99.8%**	**0.0%**	**-**	100.0%

a) Business-to-consumer (B2C) – At home | Business-to-consumer (B2C) – Away-from-home (AfH) | Business-to-business (B2B).

Table F-51 – Wood packaging POM in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Fibreboard – Low-density	0	0	0	0	0	0	0	33,000	0	0	0	0	0	0	0	0	33,000
Fibreboard – OSB	0	0	0	0	0	0	0	20,000	0	0	0	0	0	0	0	0	20,000
Hardwood	0	17,000	0	0	0	0	0	73,000	0	0	0	0	0	0	0	0	90,000
Softwood	0	0	0	0	83,000	0	0	335,000	0	0	1,000	0	0	0	0	0	420,000
Total (tonnes)	**0**	**17,000**	**0**	**0**	**83,000**	**0**	**0**	**461,000**	**0**	**0**	**1,000**	**0**	**0**	**0**	**0**	**0**	**562,000**
Total (%)	**0.0%**	**3.1%**	**0.0%**	**0.0%**	**14.8%**	**0.0%**	**0.0%**	**81.9%**	**0.0%**	**0.0%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**

Table F-52 – Wood packaging POM in 2022–23, by material type and recycled content.

Material type	Post-consumer source		Pre-consumer source		Virgin source		Total
	(tonnes)	(%)	(tonnes)	(%)	(tonnes)	(%)	(tonnes)
Fibreboard – Low-density	0	0%	0	0%	33,000	100%	33,000
Fibreboard – OSB	0	0%	0	0%	20,000	100%	20,000
Hardwood	0	0%	0	0%	90,000	100%	90,000
Softwood	0	0%	0	0%	420,000	100%	420,000
Total	**0**	**0%**	**0**	**0%**	**562,000**	**100%**	**562,000**

Recovery

Table F-53 – Wood packaging recovery from 2018–19 to 2022–23, by material type.

Material type	2018–19		2019–20		2020–21		2021–22		2022–23	
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)
Fibreboard	0	0.0	9,000	0.4	5,000	0.2	2,000	0.1	1,000	0.0
Hardwood	2,000	0.1	36,000	1.4	36,000	1.4	35,000	1.3	53,000	2.0
Softwood	42,000	1.7	125,000	4.9	219,000	8.5	240,000	9.2	233,000	8.7
Total	**44,000**	**1.8**	**171,000**	**6.6**	**260,000**	**10.1**	**277,000**	**10.7**	**286,000**	**10.7**

a) kg/p – kilograms per person.

Table F-54 – Wood packaging recovery in 2022–23, by material type and collection service.

Material type	Collection service				Total	
	MSW[a]	C&I[a]	C&D[a]	Other		
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%)
Fibreboard	0	1,000	0	0	1,000	0.3%
Hardwood	0	53,000	0	0	53,000	18.5%
Softwood	0	233,000	0	0	233,000	81.5%
Total (tonnes)	**0**	**286,000**	**0**	**0**	**286,000**	-
Total (%)	**0.0%**	**100.0%**	**0.0%**	**0.0%**	**-**	**100.0%**

a) Municipal solid waste (MSW), commercial and industrial (C&I) waste, and construction % demolition (C&D) collection services.

Table F-55 – Wood packaging recovery in 2022–23, by material type and component group.

Material type	Bag or pouch	Barrel or drum	Bottle or jar	Can	Carton or box	Closure	Label or seal	Pallet or bin	Returnable plastic crate (RPC)	Shopping bag	Tableware	Tub, tray or punnet	Tube or cartridge	Wrap	Other component group	Unknown	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Fibreboard	0	0	0	0	0	0	0	1,000	0	0	0	0	0	0	0	0	1,000
Hardwood	0	5,000	0	0	0	0	0	48,000	0	0	0	0	0	0	0	0	53,000
Softwood	0	0	0	0	0	0	0	233,000	0	0	0	0	0	0	0	0	233,000
Total (tonnes)	**0**	**5,000**	**0**	**0**	**0**	**0**	**0**	**282,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**286,000**
Total (%)	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**98.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**

Table F-56 – Wood packaging recovery in 2022–23, by material type and destination of material.

Material type	Local	Overseas	Unknown destinations	Total
	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Fibreboard	1,000	0	0	1,000
Hardwood	53,000	1,000	0	53,000
Softwood	232,000	1,000	0	233,000
Total (tonnes)	**285,000**	**1,000**	**0**	**286,000**
Total (%)	**99.6%**	**0.4%**	**0.0%**	**100.0%**

Table F-57 – Post-consumer wood packaging recovery rates in 2022–23, by material type.

Material type	POM	Recovery	Recovery rate
	(tonnes)	(tonnes)	(%)
Fibreboard	53,000	1,000	1%
Hardwood	90,000	53,000	59%
Softwood	420,000	233,000	55%
Total	**562,000**	**286,000**	**51%**

Projections

Table F-58 – Wood packaging POM (mass and per capita bases) from 2020–21 to 2027–28, by material type.

Material type	2020–21		2021–22		2022–23		2023–24		2024–25		2025–26		2026–27		2027–28		5-yr CAGR[b]
	(tonnes)	(kg/p)[a]	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(tonnes)	(kg/p)	(%/yr)
Fibreboard – Low-density	94,000	3.7	42,000	1.6	33,000	1.2	35,000	1.3	37,000	1.3	39,000	1.4	41,000	1.5	43,000	1.5	5.6%
Fibreboard – OSB[c]	37,000	1.5	25,000	1.0	20,000	0.7	20,000	0.8	21,000	0.8	22,000	0.8	23,000	0.8	24,000	0.8	4.0%
Hardwood	60,000	2.3	63,000	2.4	90,000	3.4	93,000	3.4	96,000	3.5	99,000	3.5	102,000	3.6	105,000	3.7	3.1%
Softwood	446,000	17.3	482,000	18.5	420,000	15.7	448,000	16.6	478,000	17.4	510,000	18.3	544,000	19.3	580,000	20.3	6.7%
Total	**638,000**	**24.8**	**612,000**	**23.5**	**562,000**	**21.1**	**596,000**	**22.1**	**631,000**	**23.1**	**669,000**	**24.1**	**709,000**	**25.2**	**752,000**	**26.3**	**6.0%**

a) kg/p – kilograms per person.

b) CAGR – compound annual growth rate.

c) OSB – Oriented strand board.

Table F-59 – Wood packaging reprocessing capacity projections from 2019–20 to 2027–28, by material type.

Material type	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	5 year CAGR[a]
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(%/yr)
Fibreboard	1,000	1,000	1,000	1,000	1,000	1,000	0.0%
Hardwood	40,000	40,000	40,000	40,000	40,000	40,000	0.0%
Softwood	275,000	275,000	275,000	275,000	275,000	275,000	0.0%
Total	**316,000**	**316,000**	**316,000**	**316,000**	**316,000**	**316,000**	**0.0%**

a) CAGR – compound annual growth rate.

F.6 Packaging losses to landfill in 2022–23

Packaging losses to landfill

Table F-60 – Post-consumer packaging to landfill in 2022–23, by material group.

Material group	POM	Landfill		Landfill rate
	(tonnes)	(tonnes)	(%)	(%)
Paper & paperboard	3,805,000	1,336,000	43%	35%
Glass	1,105,000	344,000	11%	31%
Plastic	1,265,000	1,030,000	33%	81%
Metal	302,000	146,000	5%	48%
Wood	562,000	276,000	9%	49%
Total	**7,040,000**	**3,132,000**	**100%**	**44%**

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