

Recovered Resources Market Bulletin

November 2019

Victorian Market Intelligence Pilot Project (edition #08)



This report was prepared for the Waste Management and Resource Recovery Association of Australia (WMRR) and Sustainability Victoria (SV) by Envisage Works, IndustryEdge and Sustainable Resource Use (SRU).

While reasonable efforts have been made to ensure that the contents of this publication are factually correct, WMRR and Sustainability Victoria gives no warranty regarding its accuracy, completeness, currency or suitability for any particular purpose and to the extent permitted by law, does not accept any liability for loss or damages incurred as a result of reliance placed upon the content of this publication.

This publication is provided on the basis that all persons accessing it undertake responsibility for assessing the relevance and accuracy of its content.

This report is licensed under a Creative Commons Attribution 4.0 Australia licence. In essence, you are free to copy, distribute and adapt the work, as long as you attribute the work and abide by the other licence terms. Go to <http://creativecommons.org/licenses/by/4.0/> to view a copy of this licence.

Accessibility

This document is available online in PDF format at <https://www.sustainability.vic.gov.au/Business/Investment-facilitation/Recovered-resources-market-bulletin>

Release date

November 2019

CONTENTS

CONTENTS	3
Summary	4
Market overview	4
Kerbside recycling markets: October developments	5
Overview of kerbside recovery and the challenges	6
<hr/>	
1. Introduction	7
1.1 About this bulletin	7
Who is this bulletin for?	7
Structure of the bulletin	8
History and context	8
1.2 Overview of kerbside recycling flows	8
1.3 Market risks, opportunities and activities	11
1.4 Export market review	14
1.5 Overview of status of countries with scrap import restrictions	15
<hr/>	
2. Resource markets	16
2.1 Kerbside recovered paper & paperboard (~27 kt/month)	16
2.2 Kerbside recovered glass packaging (~10 kt/month)	20
2.3 Kerbside recovered plastic packaging (~4 kt/month)	23
2.4 Kerbside recovered metal packaging (~1 kt/month)	26
<hr/>	
3. Special topic areas	30
3.1 The challenges with using more recovered fibre locally	30
3.2 Increasing the post-consumer recycled content in packaging	32
<hr/>	
4. Supporting material	33

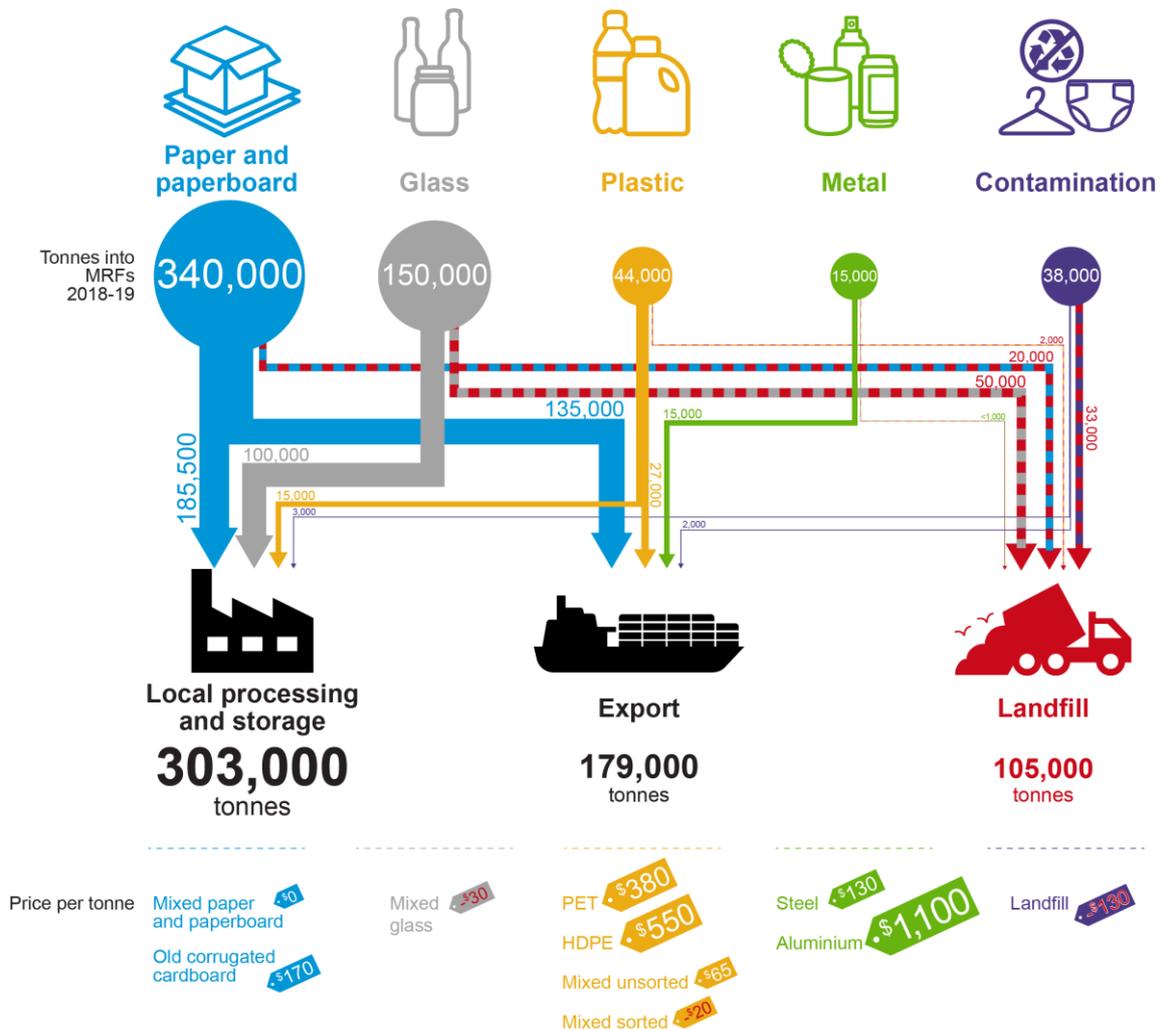
Summary

Market overview

In 2018–19 there was around 600,000 tonnes of recycling collected from Victorian kerbsides for recycling. Typically 15–20 per cent of this goes to landfill after sorting at material recovery facilities (MRFs). The sorted materials are then either exported, or processed locally (with some to landfill), and are then used in manufacturing new products.

However, losses to landfill have increased across August–October by approximately 15,000 tonnes per month, due to the closure of the SKM Recycling sorting facilities. This is material that was sent directly from kerbside collection to landfill.

Figure 1 – Flows of kerbside collection materials in Victoria



There is currently an estimated 200,000–300,000 tonnes of kerbside recyclables in metro storage (including glass), and an estimated 20,000–40,000 tonnes of stored recyclables was sent to landfill from the SKM Recycling facilities during September and October. This is in addition to the 15,000 tonnes/month direct from kerbside to landfill. The fate of the material still in storage across Melbourne is not clear, but some is likely destined for landfill disposal.

Victoria has a relatively heavy reliance on the export of recyclable materials. In September 2019 Victoria's exports were:

- 38% of national scrap paper & paperboard (36,000 tonnes of 94,000 tonnes). Down from 42% in August and 48% in July 2019.

- 40% per cent of national scrap plastic (4,000 tonnes of 10,000 tonnes). Down from 42% in August and 48% in July 2019.

The continued fall in Victorian proportional exports probably reflects the increase in disposal to landfill due to the closure of SKM Recycling.

The exports include material sourced through commercial and industrial collections (not only municipal kerbside collected materials). However, the data above illustrate the strong dependency of Victorian scrap markets on export markets, and the continuing need for additional local remanufacturing capacity and demand in Victoria.

Kerbside recycling markets: October developments

Market-wide

Development 1 – The closure of SKM Recycling has resulted in around 60% of the material previously sorted by SKM going to landfill (around 15,000 tonnes/month) across August, September, and into October. The other 40% was diverted to other MRFs. However, this direct kerbside to landfill disposal has approximately halved as of mid-October due to the SKM Laverton facility resuming operations.

Development 2 – SKM storage, both at MRFs and in third party owned warehouses, of unsorted and sorted kerbside material is reported to be approximately 200,000–300,000 tonnes (including glass). Facility clean-ups have been completed across September and October which have resulted in an estimated 20,000–40,000 tonnes going to landfill to enable facilities to start operating. The eventual fate of material in warehouse storage and the glass stockpile at SKM sister company Glass Recovery Services (GRS) is currently uncertain.

Development 3 – Cleanaway purchased SKM Recycling in early October. The SKM Laverton MRF resumed operations in mid-October. The Coolaroo MRF reopened in late November. The Geelong MRF reopening date is unknown.

Development 4 – Exports of Victorian kerbside materials are at the lowest levels for many years. A situation intensified by the closure of SKM Recycling across August–October.

Development 5 – On 8 November 2019, Commonwealth, state and territory Environment Ministers agreed that waste plastic, paper, glass and tyres that have not been processed into a value-added material should be subject to a ban on export. By early 2020 advice on final timetables, definitions and response strategies will be considered by Ministers.

Paper & paperboard

Development 6 – There has been softening of some export prices into October, most notably for Old Corrugated Containers (OCC), due to external factors not related to recovery markets.

Development 7 – Collectors are reporting kerbside paper stream contamination rates at around 20% and higher in some instances, resulting in some material being immediately sent to landfill.

Glass packaging

Development 8 - Increased quantities of kerbside glass are now going into roadbase and asphalt construction applications, with drawdown of long-term glass stockpiles now occurring. The quantities are possibly in the order of 400–700 tonnes per day at the current time.

Development 9 – The ongoing closure of Glass Recycling Services (GRS) is resulting in a major shortfall in infrastructure to prepare kerbside glass for recycling back into packaging, sourced from either storage or new collections.

Plastic packaging

Development 10 – Export markets for MRF sorted baled PET (1) and HDPE (2) plastic packaging appear to have fallen across both August and September. Export reported prices for PET bottles also fell.

Development 11 – Exports to Indonesia in particular have fallen significantly over the last few months.

Metal packaging

No developments to mention.

Overview of kerbside recovery and the challenges

The following table summarises kerbside material flows and the market challenges.

Table 1 – Market snapshot for 2018–19

MRF outputs ^a	Sorted quantity (t)	Proportion	Destination(s) ^c	Approx. \$ per tonne (end-September 2019) ^d	The market challenges
Paper & paperboard	320,000	54%	135,000 tonnes export (38% drop on 2016–17) 185,000 t to local processing or storage	~\$0 for mixed paper & paperboard \$100 newsprint & magazine \$155 old corrugated paperboard \$75 for boxboard	The international markets for unsorted kerbside paper have collapsed (the material has no value), and Australian reprocessors can't take any more of this material. Significant stockpiling and disposal to landfill occurring.
Glass packaging	100,000	17%	~2,000 tonnes export (100% increase on 2016–17) 98,000 t to local processing or storage	-\$30 /tonne for mixed glass to beneficiation Approx. \$75 /tonne for source separated glass	Most Victorian glass packaging is sorted into a single 'mixed glass' product. This has been a low-value product for many years, with limited demand. Significant stockpiling occurring.
Plastic packaging	42,000	7%	27,000 tonnes export (27% drop on 2016–17) 15,000 t to local processing or storage	\$300 for PET (1) \$600 for HDPE (2) \$65 for mixed (1–7) -\$20 for mixed (3–7)	Markets for clean PET and HDPE are good, but around a third of plastics are sorted into a 'mixed plastic' product. The international markets for mixed plastics have collapsed. Significant stockpiling.
Metal packaging	10,000	2%	~100% to export	\$128 for steel cans \$1050 for aluminium	Markets for aluminium and steel packaging are fairly steady.
Contamination and sorting losses	120,000 ^b	20%	All to landfill	-\$130 for landfill	Around 15–20% of material going into MRFs is sent to landfill. This is made up of unrecyclable contaminants (sorting losses), lost recyclables (mostly glass). This landfill component is a significant cost impost on MRF operators. This estimate is of a typical gate fee (including levy) and excludes handling and transport costs.
Total	~590,000				This is the estimated total amount going in and out of Victorian MRFs in 2018–19.

a) Data are generally for 2018–19, except as otherwise identified. Derived by Envisage Works from 2018-19 ABS data, extrapolated 2017-18 SV (2019), and industry consultation.

b) Includes an estimated 20,000 tonnes of compliance related disposal to landfill in 2018–19.

c) Approximated full year 2018–19 exports, based on July 2018 to June 2019 data.

d) Prices are indicative typical spot price values and can be highly variable on a day-to-day basis.

1. Introduction

1.1 About this bulletin

This is number 8 of 12 monthly bulletins that Sustainability Victoria (SV) and the Waste Management and Resource Recovery Association of Australia (WMRR) are providing to the community, industry and government with an overview of the kerbside recycling markets in Victoria.

This work was commissioned by the Victorian Government to inform strategic investment and decision making by the waste and resource recovery sector.

These bulletins provide an up-to-date picture of the health of the markets, the ongoing challenges and opportunities, and action taken to improve the resilience and recovery performance of kerbside recycling.

The bulletins are a synthesis of monthly updates of ABS export data and published market reports, and more in-depth quarterly updates informed by extensive consultation with industry, government and community stakeholders.

Each bulletin includes a monthly update that includes:

- market overview and current developments
- export data and receiving country updates
- commodity price tracking
- kerbside quantity flow approximations
- market developments and activity updates.

This bulletin #8 includes updates related to ABS export data to the end of September 2019, and pricing updates to the end of October 2019.

A deeper look at two special topics is provided. The special topics explored in Section 3 for this month are:

- The challenges with using more recovered fibre locally.
- Increasing the post-consumer recycled content in packaging.

Please contact SV (Kelly Wickham at kelly.wickham@sustainability.vic.gov.au) if you have any comments or questions.

Who is this bulletin for?

This bulletin is for anyone with an interest in kerbside recycling in Victoria. It presents a holistic overview of material flows and related markets, through generation, sorting, reprocessing, re-manufacturing and end-product markets.

[Bulletin #1](#) presents details of the stakeholders involved in kerbside recycling, and the roles that they can play in shifting kerbside recycling and markets to a more resilient and sustainable.

Structure of the bulletin

This bulletin has seven sections:

- **Market summary** – An overview of kerbside material flows, \$ values, and the key issues, opportunities and activities.
- **Introductory section** (this section) – A more detailed and integrated overview of kerbside material markets across all material types (paper & paperboard, glass packaging, plastic packaging and metal packaging).
- **Material specific sections** – Four sections on each material groups (paper & paperboard, glass packaging, plastic packaging and metal packaging). Each section provides: an overview of the material markets; the latest available information on prices, demand and supply; commentary on the key product end-markets for recovered materials; export and/or interstate market activity; and a summary of market risks, opportunities and developments.
- **Special topic areas** – A deeper look at a couple of special topic areas each month.

History and context

Around half the world's kerbside packaging was received by China until the end of 2017. While the current recycling market shocks may be the most significant, across even the past decade there have been downturns in the recycled materials market caused by the:

- Global Financial Crisis (GFC) in 2009
- new Chinese regulations in 2011 aimed at reducing the imports of highly contaminated scrap materials
- aggressive enforcement in 2013 by the Chinese of the 2011 regulations, through a campaign known as 'Operation Green Fence'.

A key aspect of the export restrictions is a maximum contamination threshold of 0.5 per cent for imported bales of scrap mixed paper & paperboard and mixed plastics. This threshold is very low and MRFs internationally, including Victorian MRFs, are not capable of meeting the 0.5 per cent contamination threshold.

See [bulletin #1](#) for a more detailed outline of the history and context of the issues explored in these bulletins. All the bulletins are available [here](#).

1.2 Overview of kerbside recycling flows

Victorian collection of material from kerbside collection and sorting systems has been steady over the past three years at around 600,000 tonnes per year. After operating losses of 100,000 tonnes of contaminant material and unrecovered recyclables, an estimated 500,000 tonnes are available for reprocessing in a typical year. Paper grades and glass account for 85 per cent or more of this processed material by weight.

Not all of the 500,000 tonnes of sorted recyclables are necessarily then processed further into materials ready for the manufacture of new products. Significant quantities of sorted recyclables can then be placed into storage due to poor markets or operational problems. Storage of recyclables is also explored throughout this bulletin, with quantity estimates provided at the material level where available.

Figure 1.2.1 – Victorian MRF outputs by material category (tonnes)

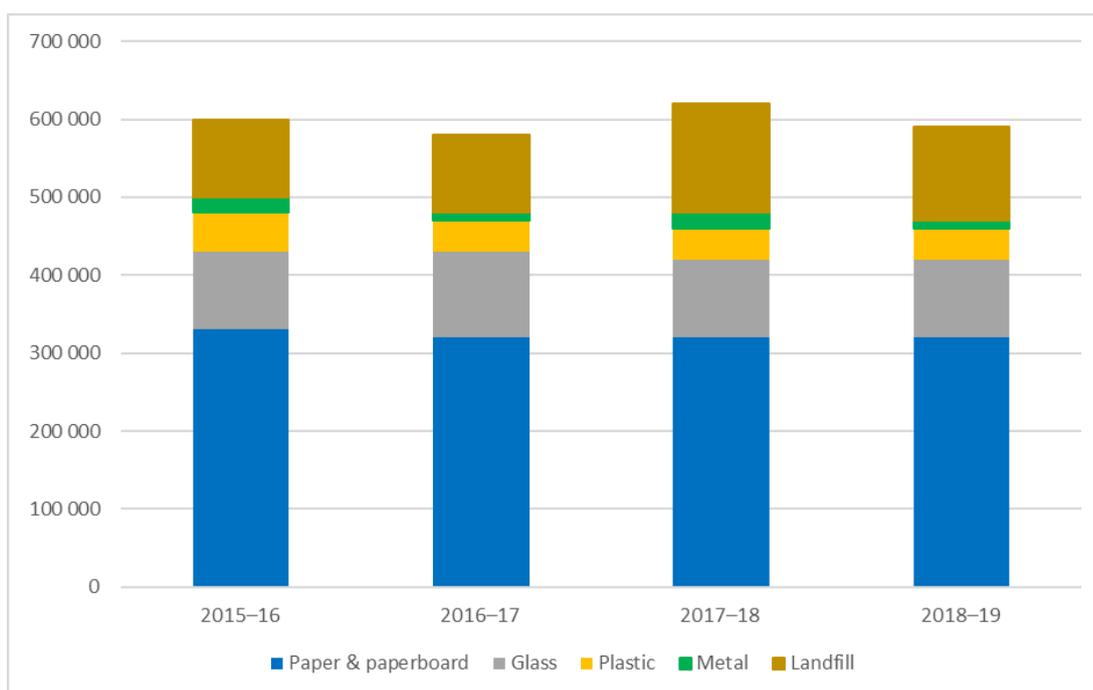


Table 1.2.1 – Victorian MRF outputs by material category (tonnes)

Material category	2015-16 (tonnes)	2016-17 (tonnes)	2017-18 (tonnes)	2018-19 (tonnes)
Paper & paperboard	330 000	320 000	320 000	320 000
Glass	100 000	110 000	100 000	100 000
Plastic	50 000	40 000	40 000	40 000
Metal	20 000	10 000	20 000	10 000
Landfill	100 000	100 000	140 000 ^a	120 000 ^a
Totals	600 000	580 000	620 000	590 000

Source: SV (2017; 2018; 2019) and industry consultation.

a) Includes an estimated 30–40,000 tonnes of fire-related losses in July 2017, and 20,000 tonnes of licence compliance related disposal in March 2019.

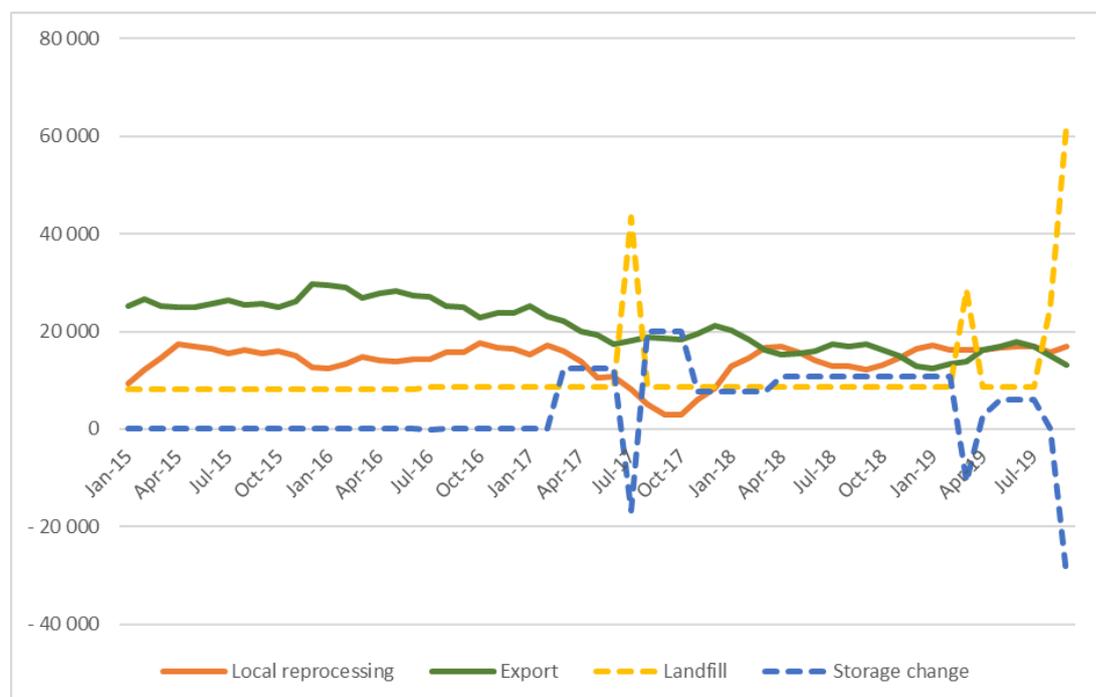
Figure 1.2.2 presents indicative monthly data on the destinations of Victorian MRF outputs. Exports of kerbside materials fell in 2017 and then more sharply in 2018, with some steadying of exports, albeit at a much lower level, across January–June 2019. However, exports have fallen across July and August and are now approaching the lowest level since the beginning of 2015.

There appears to have been some response by the local reprocessing sector in taking up previously exported material since the beginning of 2018, and also responding with new capacity builds. This new capacity, primarily in glass (to construction) and plastics reprocessing, should start to have a significant impact on Victorian recovery rates during the 2020 calendar year.

However, with the closure of the three SKM MRFs in Coolaroo, Laverton and Geelong (from late July 2019), it is estimated that around 15,000 tonnes/month of kerbside recyclables were sent to landfill (around 60% of the 28,000 tonnes/month that SKM was receiving) across August, September and into October 2019. The other 40% was diverted to other MRFs.

The SKM Laverton MRF resumed operations from mid-October and it is understood that the direct kerbside to landfill disposal has approximately halved with the reopening of the Laverton facility. The Coolaroo MRF reopened very recently in late November.

Figure 1.2.2 – Destination of Victorian MRF outputs from kerbside sources (tonnes/month)



Note 1: Data in the table above have been estimated based on publicly available sources, with totals verified through consultation.

Note 2: Historical total monthly MRF outputs have been approximated to enable comparison with monthly ABS customs export data. 'Local reprocessing', 'Landfill' and 'Storage change' estimates are indicative only.

Note 3: The 'Storage change' plot is an estimation of the change in material stored or stockpiled in that month.

Note 4: Storage includes estimates of both sorted and baled materials, and unsorted (but baled) materials. It excludes longer-term stored materials from before January 2015, which is most significantly legacy glass storage.

Note 5: Landfill estimates include MRF licence compliance related disposal to landfill, and fire related losses to atmosphere. Landfill data presented are an approximation based on annual waste to landfill rates.

Source: ABS (2019) and Envisage Works.

Of the 33 councils that were serviced by SKM, 10 found alternative sorting arrangements, and the kerbside recyclables of the other 23 were going to landfill (prior to the reopening of the Laverton facility). Six of the 23 councils are now using the reopened Laverton facility.

Cleanaway purchased SKM Recycling in early October, and it is anticipated that many of the councils without existing sorting arrangements will recontract with Cleanaway. The Metropolitan Waste and Resource Recovery Group (MWRRG) is providing significant support to councils in negotiating these recontracting arrangements.

SKM MRF site clean-ups occurred across September and October, which resulted in possibly 20,000–40,000 tonnes going to landfill to enable facilities to start operating.

SKM storage, both at MRFs and in third party owned warehouses, of unsorted and sorted kerbside material is reported to be approximately 200,000 tonnes (including glass). There are not any reports currently on the fate of material in warehouse storage.

1.3 Market risks, opportunities and activities

Reduction in export market outlets has not yet been matched by an expansion of domestic reprocessing and remanufacturing activity, or local demand for the recovered materials. However, this is starting to change, as discussed below.

Sorted mixed kerbside paper, MRF sorted glass and mixed kerbside plastics, all have very poor markets, insufficient local processing capacity, and insufficient end-market demand for the recovered materials. It is worth noting that construction related processing capacity and end-markets for glass may now be sufficient to meet to available supply, albeit into a low-value application, however, this hasn't been confirmed.

This is a particular issue for Victoria given its heavy reliance on exporting kerbside materials. In September Victoria made up an estimated 37% of Australian exports of scrap materials that might have a kerbside source, down from the 41% in September and 48% in July, probably due in part to SKM not operating so resulting in the disposal of kerbside material directly to landfill that was previously sorted by SKM Recycling.

Other jurisdictions have avoided or mitigated their respective exposures to the overseas import restrictions though a range of different strategies including; stockpiling, the greater use of landfill (possibly), CDS collections (reducing the quantities of MRF sorted materials), expansion of remanufacturing capacity, and more sophisticated MRF sorting capabilities.

As raised in previous bulletins and now exhibited through the latest developments with SKM, the storage of kerbside materials represents a significant risk to the companies holding these materials. This now includes at least five warehouse space providers to SKM.

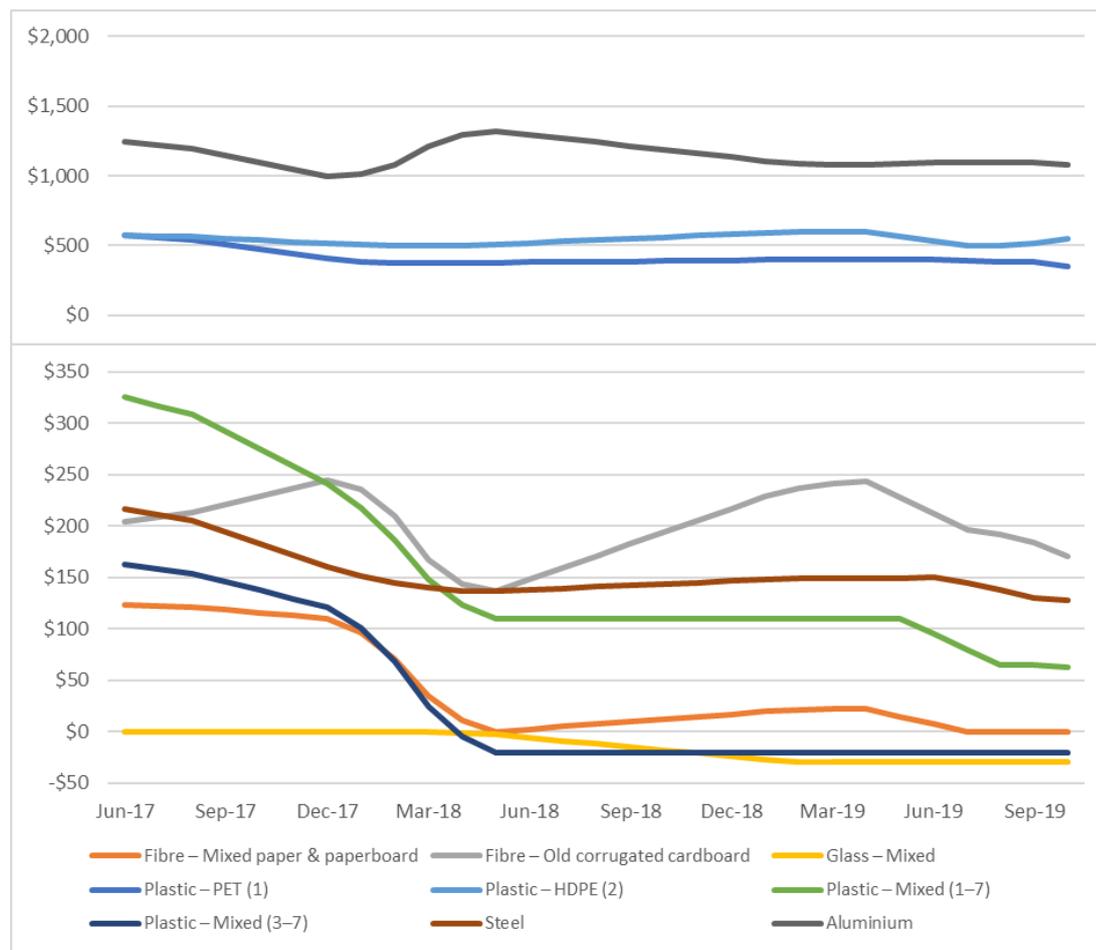
More positively there are secondary reprocessing facilities (taking sorted materials from MRFs) coming online or in the pipeline which can supply reprocessed materials to local or overseas manufacturing facilities.

Examples of these facilities include the Alex Fraser glass recycling facility in Laverton North, and Advanced Circular Polymers (ACP) plastics reprocessing plant in Somerton. In addition, large-scale food grade PET and HPDE recycling plants are under development by PACT Group (Astron Sustainability) and Martogg Group.

In October there were no noteworthy changes to import conditions/restrictions with our major scrap material trading partners. However, there continues to be a high risk over the medium and longer term of overseas scrap markets tightening further, rather than restrictions loosening.

Both Indonesia and Malaysia reported across May and June they were returning scrap plastics to Australia for not meeting import specifications. There were over 200 tonnes of scrap plastics reported as 're-imported' to Victoria in September. However, the country of origin was not reported. Another 36 tonnes were specifically reported as imported from Indonesia.

Figure 1.3.1 – Victorian recovered kerbside materials commodity values (\$/tonne)



Source: Industry consultation and published sources. Prices are at the out-going MRF gate and to end-August 2019. Prices are indicative only.

Table 1.3.1 provides pricing on selected virgin material commodities that are (generally) competing with recycled material. It is important to note that the kerbside material commodity values presented in Figure 1.3.1 are estimated prices at the out-going MRF gate, and prior to any secondary processing (along with the associated processing costs).

Table 1.3.1 – Virgin material commodity values end October 2019 (\$/tonne)

Material category	Value	Comments
Fibre – Bleached softwood kraft (BSK) pulp	\$800–\$850	BSK and BHK pulps are not directly competing with recycled fibre in the Australian market. Values provided to give some context on virgin pulp prices.
Fibre – Bleached hardwood kraft (BHK) pulp	\$700–\$750	
Glass – Virgin material inputs	\$550–\$650	Estimate based on typical flint glass composition.
Plastic – PET (1) virgin resin	\$1,350–\$1,450	-
Plastic – HDPE (2) virgin resin	\$1,700–\$1,800	-
Plastic – PVC (3) virgin resin	\$1,000–\$1,200	Unplasticised PVC.
Plastic – LDPE (4) virgin resin	\$1,700–\$1,800	-
Plastic – PP (5) virgin resin	\$1,600–\$1,700	-
Plastic – PS (6) virgin resin	\$1,900–\$2,000	-
Steel	\$350–\$400	London Metal Exchange (LME) scrap steel price
Aluminium	\$1,700–\$1,800	LME aluminium alloy

To contextualise the differences between the recovered and virgin commodity prices, provided in the following table is an indicative analysis of cost of recycling PET bottles to flake and high-quality food contact grade PET pellets.

Table 1.3.2 – Indicative costs for recycling PET bottles

Cost component	Cost (\$/tonne of product)	Comments
Purchase cost	\$500	Sorted PET bottles (1.3 tonnes to produce 1.0 tonne of PET pellets).
Transport	\$40	Transport from the MRF to the reprocessing facility. Assumed around 100 km. Includes handling.
Sorting, chipping and hot washing (flake production)	\$300–\$400	Opex and capex estimate. Includes float separation, rinsing and drying.
Decontamination, extrusion and pelletising (pellets production)	\$400–\$500	Opex and capex estimate. Assumed suitable for food-grade applications or fibre spinning.
Landfill cost	\$40	Disposal of residual processing wastes (~20% of incoming material).
Total	\$1,300–\$1,500	Approximate production cost^a.

a) Co-product processing cost or sale value (e.g. recovered HDPE bottle caps) is not considered.

As can be seen from the table above the value proposition for the recycling of PET bottles back into a virgin PET resin competing product is not obviously a good one, especially with virgin PET resin at some of its lowest prices over the last decade (currently around ~AUD1400). It's important to keep in mind that the production pathways of primary (virgin) PET resin and (equivalent) recycle-based resin are almost completely different, and there is no inherent reason for the recycle-based resin to be cheaper.

In addition, plastics manufacturers sometimes report that recycled plastics have to be around 10–20 per cent cheaper than virgin resin to justify the additional purchasing, handling, processing and quality assurance costs.

Similarly, in the following tables are indicative analyses of the cost of recycling MRF sorted glass packaging back into cullet ready for new glass packaging manufacturing, and paper & cardboard back into new papers for fibre-based packaging production.

The value propositions for using recycled glass and fibre back into packaging are typically better than for PET.

Table 1.3.3 – Indicative costs for recycling glass packaging

Cost component	Cost (\$/tonne of product)	Comments
Purchase cost	-\$50	Unsorted kerbside glass at the ingoing MRF gate. Assumed typical gate fee for councils.
MRF sorting cost	\$100–\$150	Approximate MRF cost for sorting 1.5 tonnes of glass, with assumed 20% lost to landfill at the MRF level.
Transport	\$20	Transport from the MRF to the beneficiation facility of 1.2 tonnes. Assumed around 50 km return.
Beneficiation	\$150–\$200	Approximate cost for sorting/colour separation of MRF sorted mixed glass, with assumed 15% lost to landfill.
Transport	\$20	Transport from beneficiation facility to the glass bottle manufacturer of 1.0 tonnes. Assumed 50 km return.
Landfill cost	\$100	Disposal of both sorting and processing wastes (~35% of collected glass).
Total	\$340–\$440	Approximate production cost^a.

a) Note that the cost excludes the kerbside collection cost.

Table 1.3.4 – Indicative costs for recycling fibre-based packaging (based on mixed kerbside paper & cardboard)

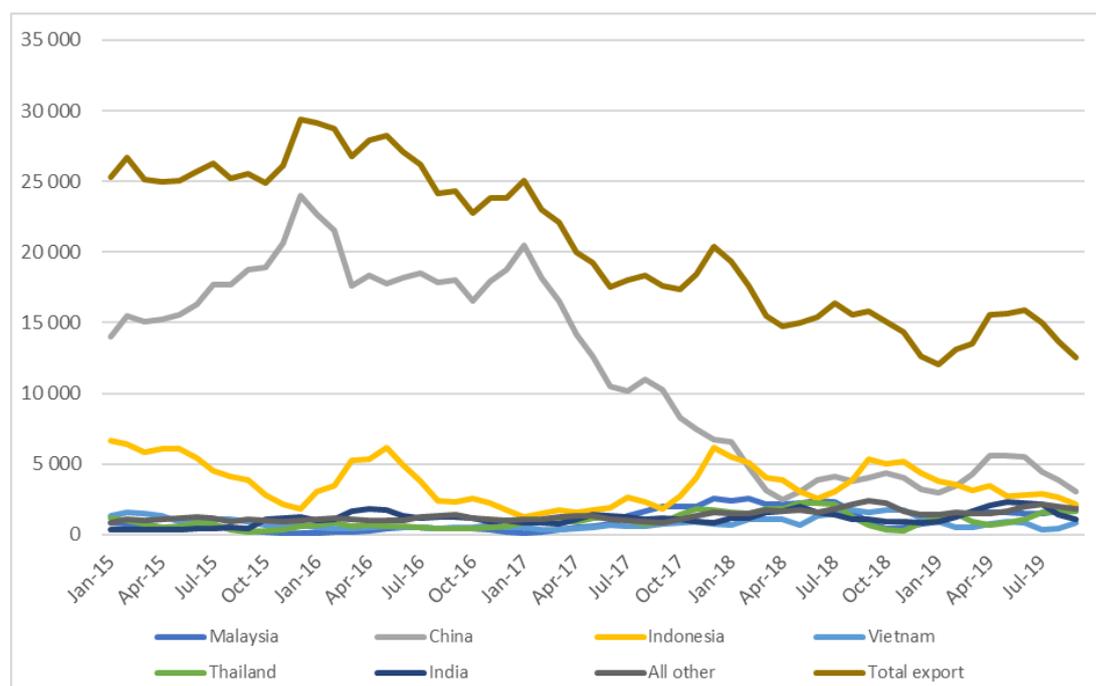
Cost component	Cost (\$/tonne of product)	Comments
Purchase cost	-\$50	Unsorted kerbside paper & cardboard at the ingoing MRF gate of 1.4 tonnes. Assumed typical gate fee for councils.
MRF sorting cost	\$100–\$150	Approximate MRF cost for sorting 1.4 tonnes of mixed paper & paperboard with assumed 10% lost to landfill at the MRF level.
Transport	\$20	Transport from the MRF to the paper mill of 1.25 tonnes. Assumed around 50 km return.
Stock preparation and board production	\$300–\$350	Approximate cost for pulping and paper production, with assumed 20% lost to landfill.
Reel handling, storage & delivery to box plant	\$130	Transport from paper mill to box forming facility of 1.0 tonnes.
Landfill cost	\$80	Disposal of both sorting and processing wastes (~30% of collected paper & paperboard).
Total	\$580–\$680	Approximate production cost^a.

a) Note that the cost excludes the kerbside collection cost.

1.4 Export market review

Victorian exports of kerbside recovered material have dropped by 50 per cent over the last three years. These falls have been driven entirely by lost sales to China, with the fall in export of bales of mixed paper & paperboard the main products contributing to the export reduction. From February to April 2019 there was some recovery in exports from the low in January 2019, with exports falling markedly across July–September, potentially due to the temporary closure of SKM Recycling.

Figure 1.4.1 – Victorian recovered kerbside materials, to export country (t/month)



Source: ABS (2019) and Envisage Works

Table 1.4.2 – Annual Victorian recovered kerbside materials, to export country (tonnes/yr)

Country ^a	2015–16 (tonnes)	2016–17 (tonnes)	2017–18 (tonnes)	2018–19 (tonnes)
China	234 000	200 000	78 000	51 000
Malaysia	3 000	5 000	25 000	15 000
Indonesia	47 000	25 000	44 000	46 000
Vietnam	8 000	6 000	10 000	14 000
Thailand	6 000	9 000	19 000	12 000
India	14 000	13 000	16 000	17 000
All other	12 000	14 000	16 000	21 000
Total	324 000	272 000	208 000	176 000

Source: ABS (2019) and Envisage Works

a) Countries ranked by September 2019 Australian exports

Table 1.4.3 – Most recent monthly change in Victorian recovered kerbside materials, to export country (tonnes/month)

Country	July 2019 (tonnes)	August 2019 (tonnes)	% change (%)
China	3 800	3 000	-21%
Malaysia	1 700	2 000	18%
Indonesia	2 700	2 200	-19%
Vietnam	400	800	100%
Thailand	1 600	1 700	6%
India	1 500	1 100	-27%
All other	2 000	1 800	-10%
Total	13 700	12 600	-8%

Source: ABS (2019) and Envisage Works

1.5 Overview of status of countries with scrap import restrictions

Provided here is an overview of the status (as of October 2019) of countries that receive major kerbside related scrap exports from Australia (there are no changes from bulletin #7):

- **Bangladesh** – No identified changes in import conditions. There have been no specific import restrictions identified for paper and paperboard, and the identified requirement for scrap plastics imports is that they do not contain any toxic or radioactive substances.
- **China (restrictions on scrap plastic, paper, metals, and other types of scrap)** – The Chinese import restrictions or outright bans that began in March 2018 (but started to impact sales months earlier), became more extensive at the end of 2018, and will extend further at the end of 2019, with completed bans on a range of scrap materials foreshadowed in mid-2019 and early 2020.
- **India (restrictions on scrap plastics)** – India announced bans in March 2019 prohibiting scrap 'solid plastic' from being imported into the country, including in special economic zones. Exports of kerbside plastics from Victoria to India are negligible, so this will not reduce exports. However, India is less likely to start importing significant quantities of scrap plastics.

- **Indonesia (new inspection regime)** – It was reported in early bulletins that as of 1 April 2019 all (100 per cent) scrap paper imports into Indonesia will be inspected at ports (up from around 10 per cent previously). However, in practice, it appears so far that inspection rates are somewhat elevated, rather than covering all imports. The contamination threshold (impurity limit) is 0.5 per cent, which is the same as China. Indonesia has sent some kerbside materials back to Australia, but the specific material type and quantity is not yet known.
- **Malaysia (restrictions on scrap plastics)** – Restrictions implemented from July 2018, with a significant impact on scrap plastics imports. Many import permits revoked following these restrictions coming into force. In May 2019, reports circulated in the media regarding further import restrictions for waste plastics. The Malaysian Environment Minister noted that plastics will be returned to their country of origin. Malaysia has sent some kerbside materials back to Australia, but the specific material type and quantity is not yet known.
- **Taiwan (restrictions on scrap paper and plastics)** – Restrictions implemented from October 2018, with only old corrugated paperboard (OCC) and other higher quality grades accepted. There are also restrictions on scrap plastics. Little material from Victoria has been shipped to Taiwan.
- **Thailand (restrictions on scrap plastics)** – Restrictions implemented from August 2018, to escalate over the next two years, with tighter controls on e-waste imports also foreshadowed. Low quality plastic waste imports may be banned from 2021.
- **Vietnam (restrictions scrap plastic, paper, metals and other types of scrap)** – Restrictions implemented from around August 2018, with further tightening of scrap imports from late February 2019. Low quality plastic waste imports may be banned from 2025.

2. Resource markets

2.1 Kerbside recovered paper & paperboard (~27 kt/month)

Market developments this month

Development 1 – There has been softening of some export prices into October, most notably for Old Corrugated Containers (OCC), due to external factors not related to recovery markets.

Development 2 – Collectors are reporting kerbside paper stream contamination rates at around 20% in some instances, resulting in some material being immediately sent to landfill.

No other developments of note to mention.

Material overview and market summary

For detailed sector overview and information see [bulletin #1](#).

Prices of most of the major grades of recovered paper and paperboard continue to deteriorate. Most recently, price pressure has been applied to export prices for unbleached kraft supply (Old Corrugated Containers or OCC). The softening appears to be driven by external factors, notably a mild downturn in Chinese industrial production and the falling price of virgin pulp. At a certain price for each form and grade of fibre, substitution can apply.

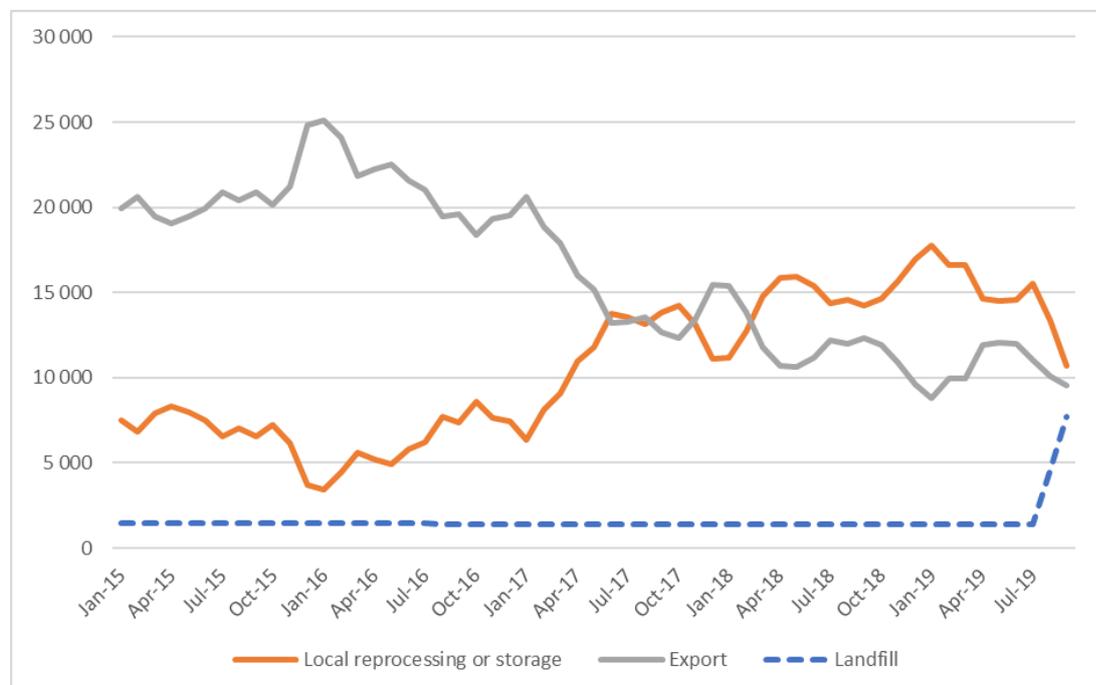
Fibre substitution is not only a linear activity. That is, a paper manufacturer may substitute from a virgin pulp grade to a recovered paper grade absolutely, but they may also blend recovered paper with virgin pulp for some paper grades.

An example is linerboard for the manufacture of corrugated boxes. Kraftliner refers to linerboard manufactured from up to 100% virgin pulp, but in many instances is blended with a proportion of recovered fibre. From the other direction, Testliner refers to linerboard manufactured from 100% recovered fibre, but may include a proportion of virgin fibre for reasons including strength and stability.

As the relative costs of fibre from different sources change over time, so also do the patterns of utilisation for each grade of paper and paperboard change. This impacts on market volumes and prices, both domestic and export.

Reports of extreme levels of contamination with other materials, food and general rubbish have been increasing in recent months. Most recently, a significant collector reported kerbside volumes with around 20% contamination. They reported sorting was unviable at that level of contamination, and with no known market, the material would be sent to landfill.

Figure 2.1.1 – Destination of Victorian MRF outputs (tonnes/month) – Kerbside paper & paperboard



Note 1: Historical total monthly MRF outputs have been approximated in Figure 2.1.1 to enable comparison with monthly ABS customs export data. The overall trends are the key aspect of the figure.

Note 2: The combined 'Local reprocessing or storage' estimate is indicative only, and these fates will be presented separately if this level of data becomes available. Landfill excludes disposal from storage and is an approximation based on annual waste to landfill rates.

Source: ABS (2019) and Envisage Works

Prices, demand and supply

The supply-side for kerbside collected mixed recovered paper continues to be very challenging. Movements of material for market-related end-uses are negligible. With contamination rates approaching 20% in some instances (see above), collectors are shifting material direct to landfill.

General softening in prices for recovered paper have thus far impacted exports more than other markets. However, a flow on must be anticipated into domestic markets, with the likely exception being the specialty, highest quality and sought-after materials.

One example of this is the market for Sorted Office Paper (SOP), where demand exceeds supply and prices remain buoyant for what is a small and declining volume of 'best quality' material.

Declining export prices for Old Corrugated Cartons (OCC) will only be reflected domestically over longer time horizons. This is because the significant volume of supply is contracted between major suppliers and collectors and end-users. Spot prices are under some pressure, but these represent smaller and occasional volumes.

Key end-markets and related specifications

There are as yet no new end-markets for kerbside recovered paper. Recovered paper markets more widely operate to seasonal and cyclical demand factors, and factors related to the general health of the Australian economy. This is particularly the case for packaging grades of paper and paperboard.

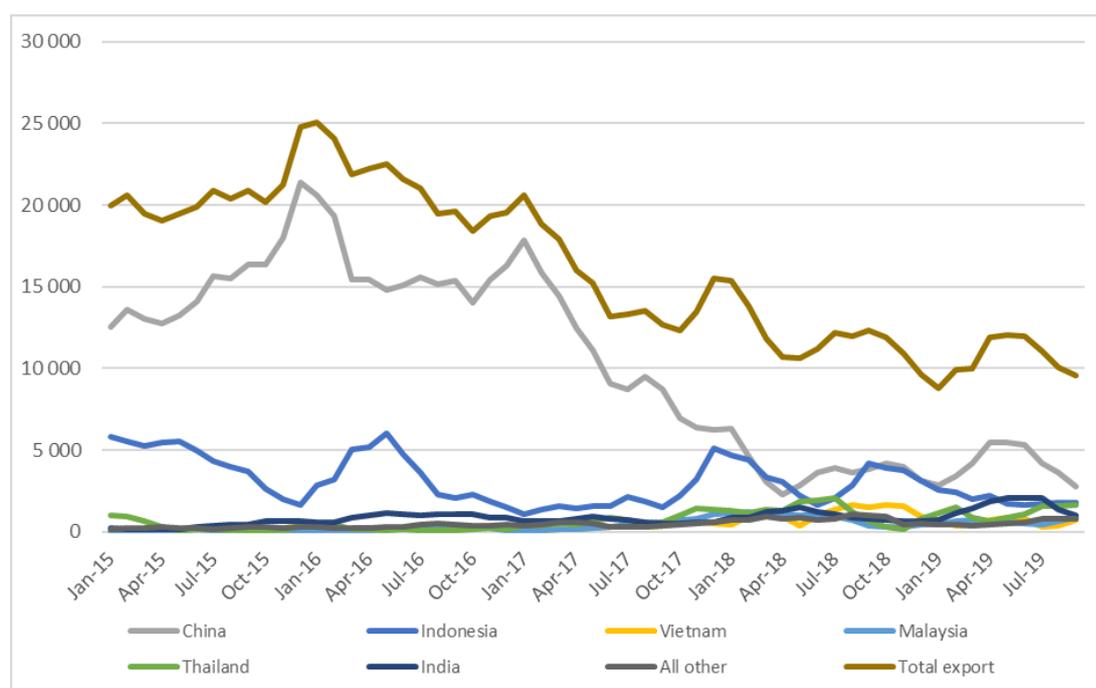
Unless secondary sorting of MRF mixed paper & paperboard (to multiple higher quality grades) meets the requirements of a local or international market, it will not find an end market.

While the influence of contract volumes and prices in the domestic market remains an important feature on the supply-side, its influence is currently waning, due to softer local demand for some grades and declining prices in international markets. The result is that recovered paper suppliers have diminished options for selling most grades.

Export and interstate market review

In September, kerbside related exports from Victoria fell below 10,000 tonnes, and total recovered paper exports from Victoria totalled 36,000 tonnes (kerbside plus all other sources). This result was down on August by a total 1,000 tonnes, most of which was lower kerbside exports.

Figure 2.1.2 – Victorian recovered kerbside paper & paperboard, to export country (tonnes/month)



Source: ABS (2019) and Envisage Works

Table 2.1.1 – Annual Victorian recovered kerbside paper & paperboard, to export country (tonnes/yr)

Country ^a	2015–16 (tonnes)	2016–17 (tonnes)	2017–18 (tonnes)	2018–19 (tonnes)
China	204 000	173 000	69 000	49 000
Thailand	45 000	22 000	35 000	32 000
Indonesia	2 000	4 000	14 000	11 000
India	8 000	10 000	10 000	14 000
Vietnam	1 000	2 000	1 000	1 000
Malaysia	1 000	2 000	11 000	7 000
All other	4 000	6 000	13 000	19 000
Total	265 000	219 000	153 000	133 000

Source: ABS (2019) and Envisage Works

a) Countries ranked by September 2019 exports.

Table 2.1.2 – Most recent monthly change in Victorian recovered paper & paperboard, to export country (tonnes/month)

Country	August 2019 (tonnes)	September 2019 (tonnes)	% change (%)
China	3 600	2 800	-22%
Indonesia	1 800	1 700	-6%
Vietnam	300	700	133%
Malaysia	700	900	29%
Thailand	1 500	1 600	7%
India	1 400	1 000	-29%
All other	800	800	0%
Total	10 100	9 500	-6%

Source: ABS (2019) and Envisage Works

Market risks, opportunities and activities

Commercial and financial risks for the recovered paper sector have not abated in the last month. Whether the costs of collection, stockpiling and landfill on the supply-side, or the process received for the material on the demand-side, the sector offers only limited current incentives for participants.

Landfill volumes are reported to be increasing, mainly because generally soft markets are being met with kerbside supply that is reportedly contaminated more extensively, rather than less.

Despite landfill costs, operators appear to have little choice other than landfill in many instances, with storage only delaying the inevitable and sorting being too expensive for what are at best, uncertain markets. Even the best prices for kerbside recovered material do not cover the costs of sorting and handling.

Secondary sorting is not an exercise that operators can engage in as a matter of speculation. The opportunity from secondary sorting is specific to the customer, and needs to be properly understood from a commercial and quality perspective, before any detailed sorting can be undertaken.

Like all opportunities, there are risks. In a market where the margins are small, the financial risks of secondary sorting are significant.

2.2 Kerbside recovered glass packaging (~10 kt/month)

Market developments this month

Development 1 – The ongoing closure of Glass Recycling Services (GRS) is resulting in a major shortfall in infrastructure to prepare kerbside glass for packaging use, both from storage and new collections.

Development 2 – Some kerbside glass was exported from Victoria (and other jurisdictions) to Bangladesh and Malaysia across July–September 2019.

Development 3 – A number of Victorian councils and other stakeholders continue to trial or consider adoption of a separate collection of glass. This includes metropolitan and regional councils.

Development 4 - Increased quantities of kerbside glass, both from storage and new collections, are now going into road-base and asphalt construction applications. The quantities are possibly in the order of 400–700 tonnes per day at the current time.

Material overview and market summary

For detailed sector overview and information see [bulletin #1](#).

Victorian glass packaging consumption was likely to have been around 250,000–300,000 tonnes in 2018–19. The total national demand for recycled glass back into packaging at present is around 350,000–400,000 tonnes, and in Victoria demand of 80,000–120,000 tonnes.

Over the past 5–10 years or so there has been some small growth in imports of both filled and empty (for local filling) glass packaging, which displaced domestic production, reducing demand for recovered glass for use in local packaging production. This shift to imports has flattened off over the last couple of years.

Over the last 12 months or more there has been some intermittent export of glass cullet from Victoria to Malaysia and Bangladesh. It is possible that this glass has been sorted (beneficiated). The fate of the glass is unknown, but if it has been beneficiated then is probably being used to manufacture new glass packaging.

A proportion of glass collected through commingled kerbside collections is going to beneficiation (sorting and sizing processes) and cullet feed at Owens-Illinois (O-I) glass plant in Spotswood.

The ongoing closure of GRS is currently resulting in significantly increased quantities of recovered glass from the Cleanaway (formerly SKM) MRFs in Laverton and Coolaroo going to the Alex Fraser glass recycling plant in Laverton for crushing into road base and asphalt construction applications as a sand product (see [bulletin #3](#) for details on the new Alex Fraser facility). The quantities are possibly in the order of 400–700 tonnes per day at the current time.

The Alex Fraser Laverton facility is capable of processing 800 tonne per day into asphalt and other construction applications. In August Alex Fraser also received Resource Recovery Infrastructure Fund support for a recycled glass related upgrade at its Clarinda facility in the southeast of Melbourne. The application into road construction is also taking significant amounts from long standing stockpiles.

There are at least two other sites in Melbourne providing glass material into road products. This includes the Repurposeit site in Epping. The demand for this sand replacement product is high as it competes well on price and quality with quarried sand.

The charge applied for glass into road construction facilities means these are not competing directly with glass back into packaging. Alex Fraser have stated they are not interested in taking glass that is of a quality for use in glass packaging production.

Sorted glass from MRFs that is to be recycled back into packaging is then required to be sent to one of six beneficiation plants nationally (three located in Victoria). With the GRS beneficiation site not receiving glass, the capacity at the remaining two beneficiation plants is not sufficient to supply the cullet required for glass packaging production.

This is resulting in interstate transfers of cullet to meet furnace needs. It is possible that if the constrained beneficiation issue is not resolved, the interstate import of cullet could be required soon.

There remains a large stockpile of glass at the closed GRS plant in Coolaroo of approximately 150,000–200,000 tonnes. The stockpile of glass at GRS is a concern both to safety and a viable recycling outcome. There is a current ban on recycled glass entering the GRS site, but no ban on current material on site being processed and delivered.

The losses of glass in collection and sorting has motivated several councils to consider collecting glass packaging at kerbside in a separate container. This also improves the quality of paper and cardboard by removing small glass fragments from the recycled fibre.

The City of Yarra has operated a trial collection from 1,000 households with strong resident compliance in sorting glass separate. The material is going to the new MRF operated by APR in Truganina, which is configured to sort a glass free commingled stream. At least three other metropolitan and three regional councils are now actively trialling or introducing the separate collections.

Victorian Government is currently undertaking an extensive cost benefit analysis on a range of potential changes to kerbside systems, including separate glass collection. Recent engagement between government and key stakeholders has broadly supported glass separate collection. Further details on this analysis will be reported as they become available.

Prices, demand and supply

Gate fee rates for MRFs sending material for beneficiation can vary, based on quality and quantities. Gate fees of \$0 /tonne (EXW MRF¹) to -\$30 /tonne (EXW MRF) are reported, if the glass is going to beneficiation. Prices are even lower if the glass is going into other applications (such as construction).

There is a small amount of separated glass going directly from pubs and clubs to beneficiation. This material is cleaner and generates a gate price of approximately \$70 per tonne.

Following beneficiation O-I then receives the glass cullet from beneficiation plants in most major cities nationally, including Melbourne. The price paid by O-I to these facilities has remained largely unchanged in recent years. However, the specific price paid varies based on a number of factors such as:

- Transport costs.
- The beneficiation costs of removing contaminants.
- The beneficiation costs of colour sorting.
- Demand for each cullet colour in different jurisdictions.
- Price of virgin materials.

The cost of beneficiation is estimated at around \$150–\$200 per tonne but is dependent on the source and processing requirement of the incoming glass packaging.

Cullet makes up 37 per cent of the input to O-I glass manufacture in Victoria. Higher cullet input reduces energy use and furnace wear. O-I report they are targeting 50–60 per cent cullet composition, and can technically accept an even higher ratio, particularly for amber and green glass production.

Glass reprocessors report that due to reduced energy use and furnace maintenance costs, increased cullet use provides savings compared with the use of virgin materials.

Key end-markets and related specifications

Beyond taking used glass packaging back into packaging production, there are a range of other secondary markets that can be used, but these do not offer a high market price. These include glass into asphalt, road base material and sand for construction, abrasives, and filter media.

Table 2.2.1 provides indicative estimates (by glass colour) of MRF recovery. Note that in Victoria almost all of this is sorted by MRFs into a single mixed glass product, which is then colour sorted and beneficiated for new packaging manufacturing or sent to construction applications.

¹ EXW MRF means that the sale price is an estimate at the outgoing gate of the MRF.

Table 2.2.1 – Victorian MRF outputs (average monthly generation in 2018–19) – Glass packaging, by colour

Material type	Quantity (tonnes/mth)
Glass – Amber	2,600
Glass – Flint	4,100
Glass – Green	2,000
Glass sorting losses	3,700
Total	12,400

Source: Envisage Works, SV (2019) and industry consultation

Export and interstate market review

As outlined previously there was some export of Victorian kerbside glass packaging to Malaysia and Bangladesh across April–September (typically around 1,000–2,000 tonnes/month, but occasionally much less).

Glass cullet is generally not exported due to its low value and significant weight relative to shipping costs. It is not anticipated that significant export markets will eventuate.

There is often a mismatch in demand for different colours in different states and territories. A major example of this is green glass is in oversupply in Sydney and Melbourne, so some is transported to Adelaide for wine bottle production.

Market risks, opportunities and activities

The closure and transfer of ownership of SKM sorting facilities to Cleanaway, has now resulted in the sorted packaging glass being sent to Alex Fraser for use as a sand substitute in asphalt.

It is understood that at least one of the other beneficiation plant operators in Victoria has begun operating extra shifts to beneficiate the glass sorted from diverted kerbside commingled recyclables.

The risks to glass recycling relate to the fact that there is significantly more glass in supply than there is beneficiation capacity and demand back into packaging. The two Australian glass packaging manufacturers do not require all the local and imported glass packaging for beer, wine and food that is potentially available. Other end-markets for the glass, such as the construction sector, are needed, even though this results in the glass being down-cycled into construction materials.

There is around 1.2–1.3 million tonnes of glass packaging consumption in Australia. Around 1.2 million tonnes is manufactured locally, of which around 0.2 million tonnes is subsequently exported, but an additional 0.2–0.3 million tonnes of packaging glass is imported. It is estimated that 350,000 tonnes of the local manufacturing material requirement is met from recycled glass cullet.

The commingling of glass with other recyclable materials and contaminants results in low quality glass from kerbside-sourced glass and also affects the value and markets for recovered paper and plastics.

The experience of other States and Territories suggests that glass packaging returned through container deposit schemes is cleaner and has a higher demand and value compared with glass from MRFs. This material still requires beneficiation for contaminant control, sizing and colour sorting, and at this stage is not all being returned to glass packaging.

All mainland states other than Victoria will have container deposit schemes (CDS) implemented by 2020, and there is a notable risk that this will undermine demand for kerbside glass from Victoria once these schemes are implemented. However, even all of this CDS glass in other jurisdictions is not being purchased by the glass packaging manufacturers in Australia, leading to stockpiles of CDS glass from time to time.

2.3 Kerbside recovered plastic packaging (~4 kt/month)

Market developments this month

Development 1 – Export markets for MRF sorted baled PET (1) and HDPE (2) plastic packaging appear to have fallen across both August and September. Export reported prices for PET bottles also fell.

Development 2 – Exports to Indonesia in particular have fallen significantly over the last few months.

Material overview and market summary

For detailed sector overview and information see [bulletin #1](#).

During 2018–19, around 200,000 tonnes of consumer plastics packaging was used in Victoria, but much of this is not suitable for kerbside recycling (e.g. flexible packaging formats). This packaging is both produced here and also imported from overseas. A large proportion of the resin used in local packaging manufacture is also imported. For example, there is no local production of virgin PET resin at all.

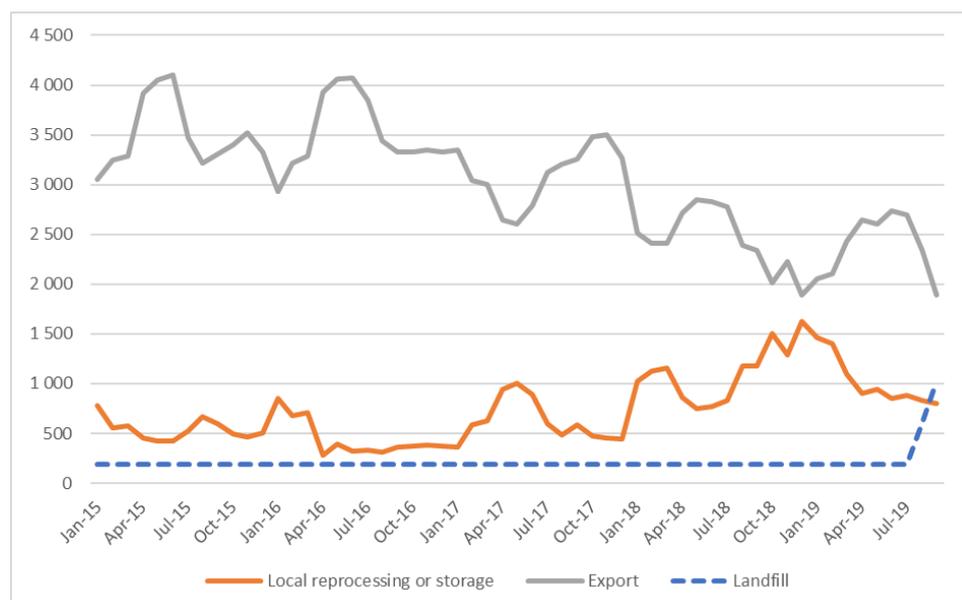
Plastics collected through kerbside collections are generally sent to MRFs and sorted from commingled recycling into either a single mixed plastics grade (1–7 plastic-polymer mix), or more commonly three grades, which are PET, HDPE and the residual mixed plastics grade (a 3–7 plastic-polymer mix, but with some residual quantities of PET and HDPE still present).

Baled PET and HDPE packaging is processed and remanufactured locally, and also exported to a wide range of countries. The main overseas destinations in September 2019 were Malaysia (67%), China (12%) and Taiwan (7%).

Indonesian receivals saw significant falls in August and September. Malaysia receivals of Australian shipments were fairly steady across February–August, and rose in September.

Figure 2.3.1 provides data on the change in exports of kerbside recovered plastic packaging since the beginning of 2015. There was a fall in exports of around 40–50 per cent across 2018, most of which would have been mixed plastic bales. A significant proportion of this material has been diverted into storage, where much of it probably still remains. In addition, across September and October large quantities of stored recyclables at the SKM MRF facilities in Laverton and Coolaroo have been disposed of to landfill, including large quantities of plastic packaging.

Figure 2.3.1 – Destination of Victorian MRF outputs (tonnes/month) – Kerbside plastic packaging



Note 1: Historical total monthly MRF outputs have been approximated in the figure above to enable comparison with monthly ABS customs export data. The overall trends are the key aspect of the figure.

Note 2: The combined 'Local reprocessing or storage' estimate is indicative only, and these fates will be presented separately if this level of data becomes available. Landfill excludes disposal from storage and is an approximation based on annual waste to landfill rates.

Source: ABS (2019) and Envisage Works

Prices, demand and supply

There continues to be reasonably strong local and export markets for clean PET bales that are collected and sorted to specification, with prices holding fairly steady over the July–September quarter at \$350–\$400 /tonne (EXW MRF²). However, spot prices in October may have dipped to the \$300–\$350 /tonne level.

The price of recycled resin is linked to the price for virgin resin. In the case of PET, the virgin price generally increased across 2018, in part due to China utilising more of this material as it received less imported recyclate, however virgin prices did see some significant falls starting in October 2018 and continuing into early 2019. PET resin prices have since steadied, with no significant changes seen in October, and possibly some modest PET resin price increases.

The situation is better for HDPE, with markets and pricing for washed and flaked/pelletised material remaining strong. Prices have improved somewhat over September to around the \$550 /tonne level, and then further across October (\$600 /tonne). Virgin resin prices have been fairly steady since the first quarter of 2018 at around \$1,700–\$1,800 /tonne.

The market for mixed plastic packaging bales continues to be very poor at \$0 /tonne or less, assuming it can be sold.

Key end-markets and related specifications

Exported plastics packaging has specifications relating mostly to contamination levels. The positive sorting of PET and HDPE that is undertaken at MRFs allows the baled material to generally meet these specifications without major difficulty or manual sorting input.

Previously plastics packaging has been overwhelmingly exported to China, until the latest round of restrictions. Over the last quarter, Malaysia has been the largest destination for Victoria kerbside plastics (overtaking Indonesia in the previous quarter), followed by Indonesia and Taiwan currently.

Table 2.3.1 provides indicative estimates (by grade) of MRF recovered plastic packaging. Most rigid packaging in Victoria is positively polymer sorted for PET and HPDE, leaving a residual 3–7 polymer stream that is baled, this is also referred to as a 2:2:6 bale (i.e. 20 per cent PET, 20 per cent HDPE and 60 per cent other polymer types). Many of these 2:2:6 bales are in or entering storage, with the eventual fate unclear.

Table 2.3.1 – Victorian MRF outputs (avg. monthly generation in 2018–19) – Plastic packaging, by polymer

Material type	Quantity (tonnes/mth)
Plastic – PET (1)	1,100
Plastic – HDPE (2)	1,300
Plastic – Mixed (1–7)	0
Plastic – Mixed (3–7)	1,200
Plastic – LDPE film	0
Plastic – Other	0
Plastic sorting losses	200
Total	3,800

Source: Envisage Works, SV (2019) and industry consultation

² EXW MRF means that the sale price is an estimate at the outgoing gate of the MRF.

Export and interstate market review

Plastic packaging exports from Australia compete in receiving countries with plastics from the US, Europe and many other countries. It is destined for wherever the demand requires material for production. Generally, demand and pricing will increase or decrease based on worldwide supply and demand conditions.

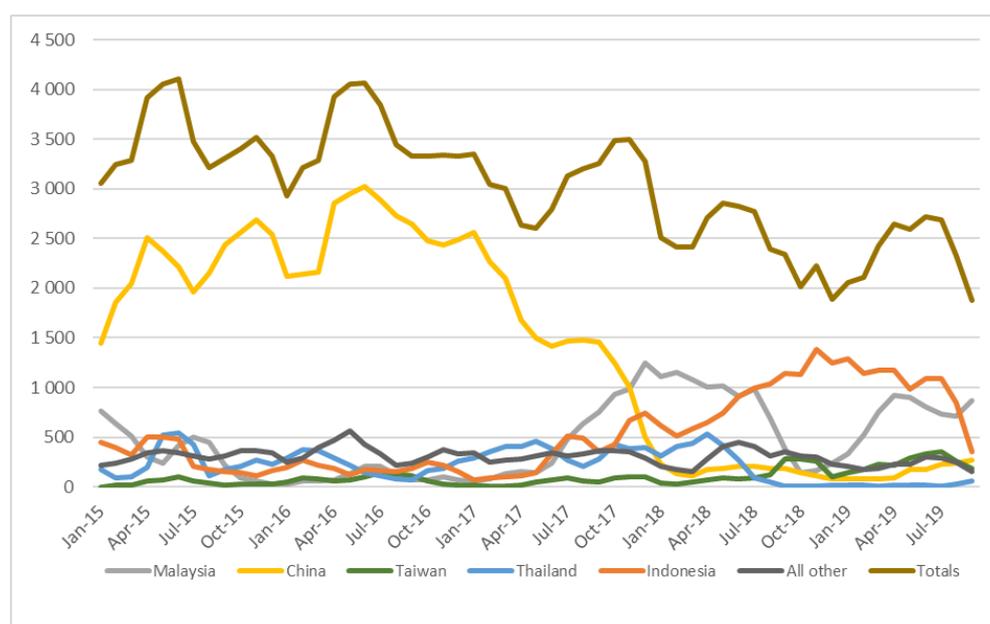
China, as a traditionally large export market destination, effectively ceased the acceptance of all scrap plastics relative to its early demand. India, Malaysia, Thailand and Vietnam have also all introduced import restrictions or bans on the imports of scrap plastics.

Scrap plastic imports into Indonesia fell markedly in August and September, which is a development to watch. Imports into Malaysia are fairly steady or increasing.

Exports of kerbside recovered mixed plastic packaging have dropped dramatically over the past few years (see Table 2.3.2).

The falls since the 2016–17 year were driven entirely by lost sales to China, with exports to Indonesia and Malaysia taking up some of this material.

Figure 3.3.2 – Victorian recovered kerbside plastic packaging, export country (t/month)



Source: ABS (2019) and Envisage Works

Table 2.3.2 – Annual Victorian recovered kerbside plastics, to export country (tonnes/yr)

Country ^a	2015–16 (tonnes)	2016–17 (tonnes)	2017–18 (tonnes)	2018–19 (tonnes)
Indonesia	2 000	2 000	7 000	14 000
Malaysia	2 000	1 000	11 000	7 000
China	30 000	27 000	8 000	2 000
Taiwan	1 000	1 000	1 000	2 000
All other	7 000	7 000	8 000	3 000
Total	42 000	38 000	35 000	28 000

Source: ABS (2019) and Envisage Works

a) Countries ranked by August 2019 exports.

Table 2.3.3 – Most recent monthly change in Victorian recovered plastics, to export country (tonnes/month)

Country	August 2019 (tonnes)	September 2019 (tonnes)	% change (%)
Indonesia	800	400	-50%
Malaysia	700	900	29%
China	200	300	50%
Taiwan	300	200	-33%
All other	200	100	-50%
Total	2 200	2 000	-9%

Source: ABS (2019) and Envisage Works

Market risks, opportunities and activities

The closure of SKM may result in around 1,000–2,000 tonnes/month of packaging plastics sent to landfill, based on 40% of SKM's prior receipts of commingled recyclables being diverted to other MRF facilities for sorting.

2.4 Kerbside recovered metal packaging (~1 kt/month)

Market developments this month

Development 1 – Tin-plated steel packaging prices were steady across September and October, but remain at the lowest level seen for nearly two years.

Development 2 – Scrap aluminium can packaging prices fell a little in October, to around \$1,050 /tonne.

Development 3 – Export quantities for metals are fairly steady across January to September 2019.

Material overview and market summary

For detailed sector overview and information see [bulletin #1](#).

Steel and aluminium cans, mostly recovered through kerbside recycling collections from households, account for only a small fraction of overall metals recovery from Victoria.

MRFs are well equipped to separate these materials from household collections into marketable grades of recycle, which although small in volume (around 3–4 per cent of the average household recycling bin) represent a valuable source of revenue for MRFs.

Recovered steel packaging is considered a low-value form of steel scrap, but it still sought after in overseas markets, but not by local smelter operators.

Aluminium beverage cans have been a key component of kerbside recycling systems since their beginning. CDS in other states and territories have reduced the amount of aluminium cans coming back through kerbside collections by as much as 25%, having an impact on MRF revenue.

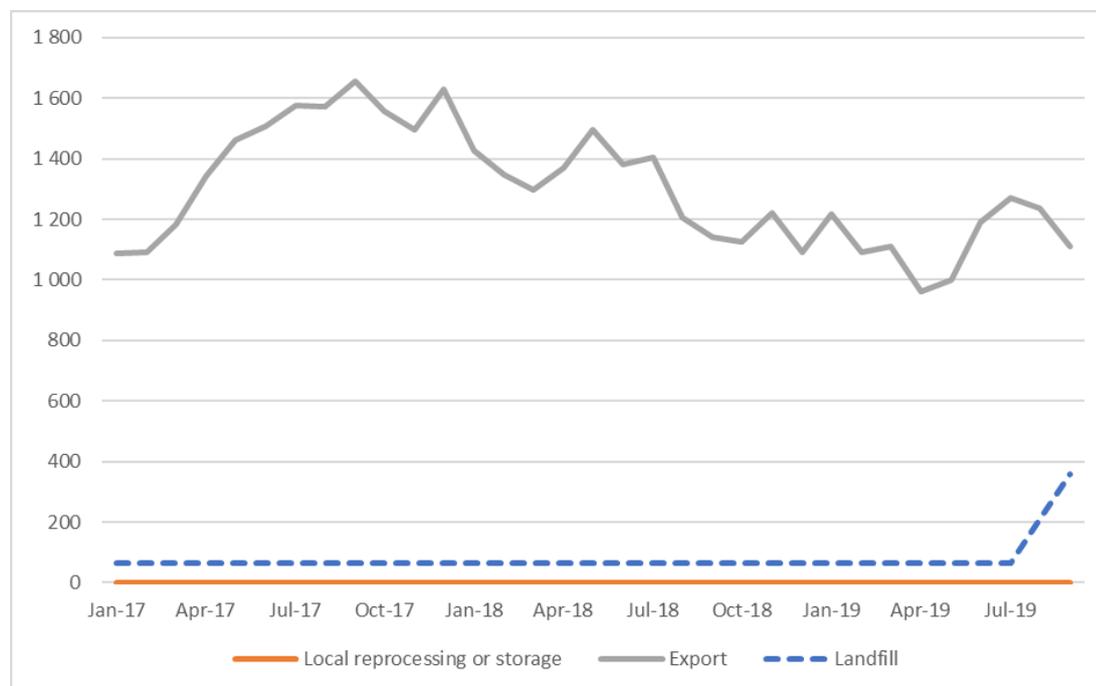
There is no longer any tin-plated steel sheet or aluminium can sheet produced in Australia, with all of it imported.

The baled steel and aluminium packaging is sent to a wide range of countries, with the main destinations over the past few years being South Korea, Taiwan, India and Malaysia. Almost all recovered metal packaging is sold into export markets, with no Victorian tin-plated steel or aluminium packaging identified as being reprocessed in Australia.

Australia's scrap metal exports are not experiencing difficulties comparable to some other recycling streams in the wake of the Chinese National Sword restrictions. This is due in part to China not being a major destination for these materials prior to the National Sword import restrictions, and scrap metal packaging being only a very small part of scrap metal markets globally.

Figure 2.4.1 provides data on the change in exports of kerbside recovered metal packaging since the beginning of 2017. Exports have been trending somewhat downwards since the beginning of 2018, but have recovered over the last few months.

Figure 2.4.1 – Destination of Victorian MRF outputs (tonnes/month) – Metal packaging



Note 1: Historical total monthly MRF outputs have been approximated in the figure above to enable comparison with monthly ABS customs export data. The overall trends are the key aspect of the figure.

Note 2: The combined 'Local reprocessing or storage estimate is indicative only, and these fates will be presented separately if this level of data becomes available. Landfill excludes disposal from storage and is an approximation based on annual waste to landfill rates.

Source: ABS (2019) and Envisage Works

Prices, demand and supply

There is now little steel or aluminium packaging scrap reprocessed in Australia. However, international markets for these commodities remain strong.

There is no significant distressed storage of steel or aluminium packaging.

There are no limits on quantity of steel or aluminium packaging into any international markets. The nature of the mechanised sorting at MRFs means there should generally be little contaminant material (apart from some product residue) and therefore minimal market concerns. That said, tin-plate steel packaging is not reprocessed in Australia, is low value, and there are reports of high levels of contamination. It is at some risk of future import restrictions by receiving countries.

The price of steel packaging is strongly linked to global steel pricing. The current price received for baled steel packaging is approximately \$130 /tonne (EXW MRF).

The price of shipped aluminium packaging is linked to virgin aluminium pricing. The current price received for baled aluminium beverage cans is approximately \$1000–\$1100 (EXW MRF).

Key end-markets and related specifications

Exported steel packaging has specifications relating to contamination levels and bale density. The sorting that is undertaken at MRFs allows the baled material to meet these specifications without major difficulty or manual sorting input. A similar situation exists for aluminium packaging.

Generally, steel and aluminium packaging is recycled back into the respective scrap metal pools and go into durable applications such as vehicles, building materials and many other products.

Table 2.4.1 provides indicative estimates (by metal type) of MRF recovered metal packaging.

Table 2.4.1 – Victorian MRF outputs (average monthly generation in 2018–19) – Metal packaging

Material type	Quantity (tonnes/mth)
Steel	900
Aluminium	300
Metal sorting losses	100
Total	1,300

Source: Envisage Works, SV (2019) and industry consultation

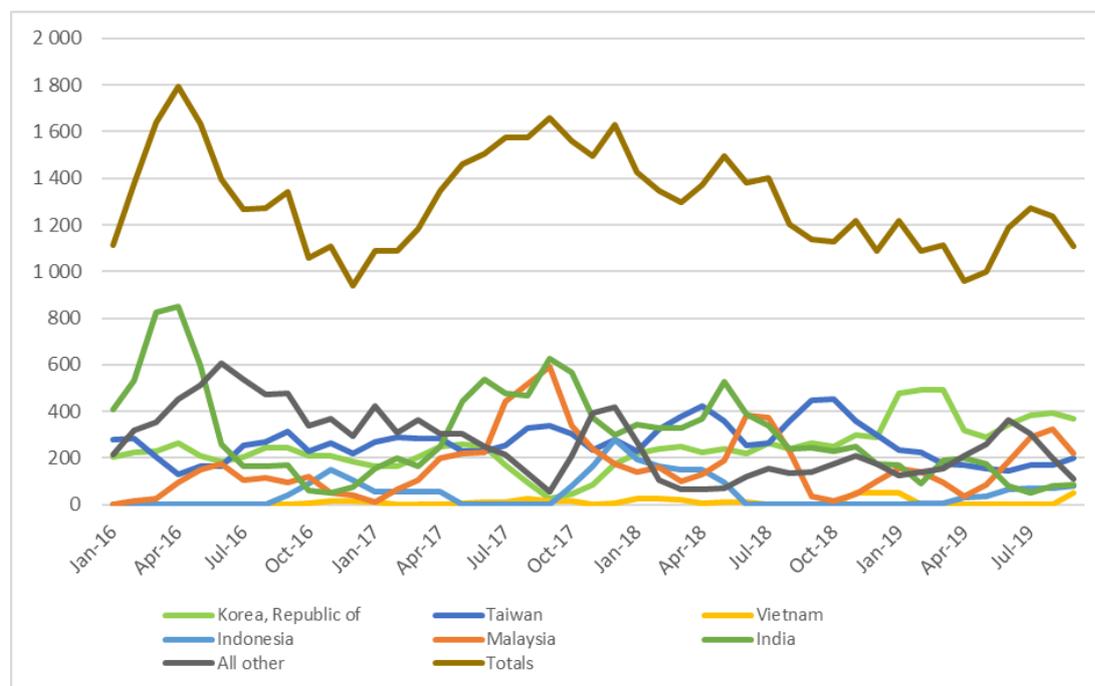
Export and interstate market review

The exported steel and aluminium packaging are sold into large markets with most metal coming from non-packaging sources. The material flows from all countries and is destined for wherever the demand requires material for production. Unlike some other materials, there is no way of knowing the origin of the steel or aluminium in new product. Demand and pricing can increase or decrease based on worldwide supply and demand conditions.

If a large market such as China suffered a contraction in economic activity, this could result in price reductions. The worldwide virgin steel and aluminium production capacities are also changing and a contraction or expansion in capacity will influence pricing.

Exports of kerbside recovered metal packaging have remained fairly steady over the last few years, but with a dip in 2018–19, and some recovery since. The reason for this dip in exports is unknown but may be related to MRF sorting shutdowns.

Figure 2.4.2 – Victorian recovered kerbside metal packaging, to export country (tonnes/month)



Source: ABS (2019) and Envisage Works

Table 2.3.2 – Annual Victorian recovered kerbside metals, to export country (tonnes/yr)

Country ^a	2015–16 (tonnes)	2016–17 (tonnes)	2017–18 (tonnes)	2018–19 (tonnes)
Malaysia		0	1 000	3 000
Korea, Republic of		3 000	3 000	2 000
Taiwan		3 000	3 000	4 000
India		5 000	2 000	5 000
Indonesia		0	1 000	1 000
All other	7 000	5 000	2 000	2 000
Total	18 000	15 000	17 000	12 000

Source: ABS (2019) and Envisage Works

a) Countries ranked by August 2019 exports.

Table 2.3.3 – Most recent monthly change in Victorian recovered plastics, to export country (tonnes/month)

Country	August 2019 (tonnes)	September 2019 (tonnes)	% change (%)
Malaysia	300	200	-33%
Korea, Republic of	400	400	0%
Taiwan	200	200	0%
India	100	100	0%
Indonesia	100	100	0%
All other	200	100	-50%
Total	1 300	1 100	-15%

Source: ABS (2019) and Envisage Works

Market risks, opportunities and activities

The global steel and aluminium markets have both been able to consistently absorb metal packaging from kerbside systems, better than the local or global markets for any of the other packaging materials. This is primarily due to the lack of barriers in using MRF-sourced metal packaging into most steel and aluminium market outlets.

However, it is worth noting that there is no longer any reprocessing of tin-plate steel or aluminium packaging in Australia. Should import restrictions change in receiving countries Australia is highly exposed to the ramifications.

If there was a dramatic negative shift in supply/demand at a global level, this could lead to significant price reductions for baled steel or aluminium packaging. However, there is no reason to believe that this is currently a risk.

3. Special topic areas

Each monthly bulletin examines a couple of special topic areas. These provide a deeper examination of specific issues of interest to a broad audience, while updating and building on the core information and time-series data that are integral to the bulletin each month.

This bulletin looks at:

- The challenges with using more recovered fibre locally.
- Increasing the post-consumer recycled content in packaging.

Refer to the earlier bulletins for the special topics explored in those editions.

3.1 The challenges with using more recovered fibre locally

In response to export constraints like those experienced in the last two years for recovered paper and paperboard (along with the other recyclates), a regular and often heard response is ‘why don’t we just use it here?’

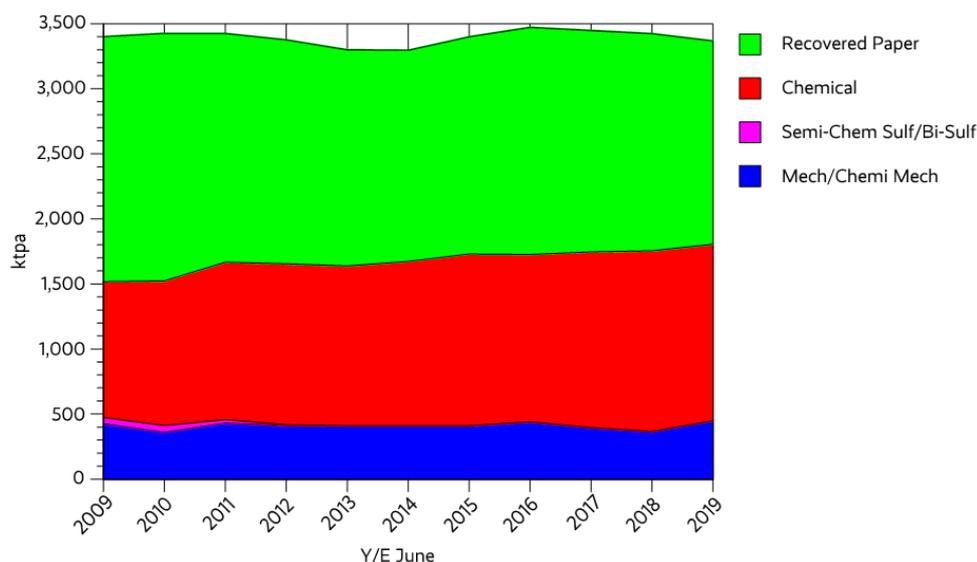
The short answer is that Australia’s paper and paperboard manufacturers use all the recovered paper they can already. Exports mainly (but not only) arise after domestic demand has been filled. We should note that Australia imports virtually no recovered paper, but it does import large quantities of packaging around goods like fridges, televisions and everything else. That increases the supply of recoverable fibre, if nothing else.

For sustainability reasons, but also because recovered fibre is typically cheaper than virgin fibre (but not always), Australian manufacturers used 1.6 million tonnes of recovered paper in 2018-19. Exports totalled 1.1 million over the same year.

In most years, Australia uses around equal proportions of recovered fibre and virgin fibre pulp³. In 2018–19, IndustryEdge calculates the recovered paper proportion was 48.1%, largely consistent with previous years, as the chart shows.

The chart also shows the two main types of pulp used in Australia (Chemical and Mechanical).

Figure 2.4.2 – Australian consumption of virgin pulp & recovered paper: 2009 – 2019



Source: ABS, company reports & IndustryEdge research and analysis

³ Virgin or ‘first use’ fibre pulp is typically derived from harvested timber and has not been used for any purpose previously.

There are four main grades of paper and paperboard, and each uses different forms of pulp and recovered paper. The table below provides this detail.

Table 3.1.1 – Paper grades, pulps and applications

Main paper grade	Sub-grades	Pulp type (Main/Other)	Est. recovered paper %
Newsprint	-	Mechanical	<20%
Printing & Communication	Magazines & Catalogues	Mechanical / Chemical	+/-15%
	Office inc. Copy	Chemical	<15%
	Printing	Chemical / Mechanical	<10%
Tissue	-	Chemical	<3%
Packaging & Industrial	Corrugated Cartons	Chemical	>50%
	Folding Boxes	Chemical / Mechanical	<20%
	Sacks & Bags	Chemical	<10%

Source: IndustryEdge, including estimates

So, what are some of the practical limits to paper and paperboard manufacturers using more recovered paper? The fundamental limitation is that like all materials, over time, fibre degrades. It is often said that fibre can be recycled up to seven times, but in practice, that depends on many variables, including the type and extent of service the fibre has previously done. This might be best considered as the inherent quality of the recovered fibre.

Of course, some paper and paperboard cannot be recycled at all. Toilet and kitchen paper for instance is not and can't be recycled (they are designed to hold fluids, as well as hygiene reasons). Other products are also difficult to recycle, for example coffee cups and other fibre-based packaging formats that have plastic film coatings, and contain nominal if any fibre.

There are other main issues that impact use of recovered paper:

- Regardless of the inherent quality of the fibre, contamination from other recyclables (especially glass) and food further degrades the quality of fibre and can render large quantities entirely unusable.
- Best quality recovered fibre (usually derived from pre-consumer sources) is internationally sought after and can command higher prices than local mills are able to pay, especially when compared with virgin fibre inputs.
- Specific grades of recovered paper required for production processes may not be consumed in the local market to the level required to provide consistent supply to local manufacturers.

How could paper manufacturers use more recovered fibre?

The *big prize* is increased use of recovered paper to manufacture packaging paper and paperboard, ultimately to be used to manufacture corrugated cartons. There are other examples and grades, but the largest volume of material recovered and exported is Old Corrugated Containers (OCC). Essentially that only lends itself – at any volume at least – to go back into new corrugated cartons.

With the emerging circular economy, it might be that governments, major brands and significant manufacturers will need to deselect less recyclable materials for packaging, and mandate the use of

fibre packaging, to provide the demand side driver for investments that typically cost hundreds of millions of dollars.

If there is one action that could *immediately* increase local use of recovered paper, it is increased mandating and procurement by government, of recycled content office and printing papers. In total, across Australia, governments are the largest users of printing and communication paper grades, including copy paper. The sector has spare capacity, just waiting for demand to meet its capabilities.

3.2 Increasing the post-consumer recycled content in packaging

In 2018 Australian State and Federal governments established the 2025 National Packaging Targets to create a new sustainable pathway for the way we manage packaging in Australia. One of the four targets, to be achieved by 2025, is **30% of average recycled content included in packaging**.

The drive for recycled content is based partly on providing market outlets for collected packaging. It is also founded in the environmental gains that come from displacing virgin materials from packaging. For paper this means reduced forestry activity. Reduced virgin material in glass and metals delivers large energy gains. Reducing plastic virgin material cuts our demand for fossil hydrocarbons.

Recent data on packaging consumption and recycling shows the average recycled content included in all packaging is currently 35%. While this meets the overall target, the results for different materials show a stark contrast between plastics (2% at present) and other materials, with the plastics post-consumer recycled content being much lower than paper & paperboard, glass and metals based packaging formats.

The low level of post-consumer recycled content in plastic is one that is likely to get major attention from the Australian Packaging Covenant Organisation (APCO) in the near future. Similarly, the potential to increase the recycled content in glass (approximately 35%) is seen as achievable with the cooperation of packaging manufacturers and brand owners in the glass bottle and jar sector.

Several recent developments would give confidence of a better packaging recycled content outcome:

- Coca Cola has set a goal that by the end of 2019, 70% of its plastic bottles will be made entirely from recycled plastic.
- Unilever has committed to halve the use of virgin plastic in their packaging by 2025.
- Pact Group will offer 30 per cent recycled content across its packaging portfolio by 2025.
- Other brands are adopting higher content on specific plastic packaging types.

It will be important to see how much of this is post-consumer material. Often material listed as recycled is pre-consumer material that is derived from production waste. While the recycling of this represents good housekeeping, the financial viability of our recycling systems rely on utilising post-consumer material. It is vital that recycled content is utilising post-consumer material.

This is likely to get a boost with major plastics recycling plant upgrades making more recycled content plastic suitable for food content packaging available in 2020. In addition to large plants by existing recyclers, Martogg Group and Astron Sustainability, Coca Cola has indicated it may build a plant to supply recycled PET to its own operations. Ideally this will be Australian recycled material and not imported, given the pending export bans.

Packaging manufacturers are reporting that many brand owners are now keen to see higher recycled content in their packaging.

APCO is currently assessing the best way to acknowledge those utilising recycled materials in their packaging, including through a recycled content label on packaging underpinned by independent verification.

Some packaging will always be best recycled into other non-packaging applications. Examples of this include glass into asphalt and road marking paint, plastics into furniture, building products and road surfaces, and metals into automotive and building applications.

It is recognised by government and the retail and packaging industries that increasing (Australian) recycled content provides a pull through market effect to help drive a more circular approach with increased recycling levels. Based on this, the plastic packaging recycled content rate of 2.2% will need to increase rapidly.

4. Supporting material

Please refer to the document *Supporting resources – Glossary and references* for a detailed glossary of the terms used throughout the bulletins, and a listing of the references and other sources drawn on in the development of the bulletins.

This document is available for download at:

<https://www.sustainability.vic.gov.au/Business/Investment-facilitation/Recovered-resources-market-bulletin>.