

COAG Export Ban SA Discussion Paper

Addendum to the SA Waste and Resource Recovery
Infrastructure Plan



Document verification

Date	Version	Title	Prepared by	Approved by
28/02/20	V1	COAG Export Ban SA Discussion Paper	K Le Gallou & K Heinrich	M Rawson
17/04/20	V2	COAG Export Ban SA Discussion Paper	K Le Gallou & K Heinrich	M Rawson

Thank you to the industry organisations that provided information and insights into the implications and considerations of the ban, the impact of the changes in the global markets and COVID-19.

Important notes

This document has been prepared by Rawtec Pty Ltd (Rawtec) for a specific purpose and client (as named in this document) and is intended to be used solely for that purpose by that client.

The information contained within this document is based upon sources, experimentation and methodology which at the time of preparing this document were believed to be reasonably reliable and the accuracy of this information subsequent to this date may not necessarily be valid. This information is not to be relied upon or extrapolated beyond its intended purpose by the client or a third party unless it is confirmed in writing by Rawtec that it is permissible and appropriate to do so.

Unless expressly provided in this document, no part of this document may be reproduced or copied in any form or by any means without the prior written consent of Rawtec or the client.

The information in this document may be confidential and legally privileged. If you are not the intended recipient of this document (or parts thereof), or do not have permission from Rawtec or the client for access to it, please immediately notify Rawtec or the client and destroy the document (or parts thereof).

This document, parts thereof or the information contained therein must not be used in a misleading, deceptive, defamatory or inaccurate manner or in any way that may otherwise be prejudicial to Rawtec, including without limitation, in order to imply that Rawtec has endorsed a particular product or service.

Executive Summary

Recycling and resource recovery contribute significantly to employment and the South Australian economy. The history of leadership in the sector has led to the attraction of investment and expertise to the state. This investment has not only been in resource recovery activities but remanufacturing outputs into new products.

The Australian Federal Government has committed to phasing out the export of non-value-added materials from Australia. This includes:

- Unprocessed glass - January 2021
- Mixed plastics - July 2021
- Whole used tyres - December 2021
- Unprocessed single resin/polymer plastics - July 2022
- Mixed and unsorted paper and cardboard - July 2024

Business as usual models are not sustainable, and Australia must fast track the development of its local resource recovery and remanufacturing industry. South Australia is well positioned to expand its resource recovery and remanufacturing experience and expertise. With the requisite skills, knowledge and commitment, investing in the SA resource recovery industry will bring about national economic and environmental benefits.

Fibre - The fibre stream (mixed paper and cardboard) is the most sensitive to the proposed export ban. An estimated 229,700 tonnes are recovered for recycling. An estimated 60,000 to 70,000 tonnes are mixed paper and cardboard materials. SA relies on sorting and baling fibre for export given there is no local infrastructure to remanufacture this fibre. Exports are 99 per cent of the recovered fibre products (50% sent interstate and 49% overseas). Interstate papermills already receive enough recycled fibre to meet their needs. The ban must be accompanied with investment in recycling infrastructure and local market development.

Plastics - There are no foreseeable negative impacts of the ban on mixed plastics for South Australia. Only 2,100 tonnes of mixed plastics were exported in the 2018/19 FY. These volumes are expected to be able to be managed via existing processors in the State. Similarly, processing of single polymers can be managed through current infrastructure.

SA is well placed to become a national recycling hub for recovered plastics, with experienced processors and additional processing capacity.

Glass - Banning the export of glass will have little to no impact on South Australia. There are no known tonnes exported overseas, and only a small volume is exported interstate (15,000 tonnes). The opportunity for glass re-manufacturing is further improving systems to recover glass and improving transport efficiencies to make more recycled cullet available for re-manufacturing.

Tyres - Banning the export of tyres will have little to no impact on South Australia from a processing capacity perspective. Tyres are processed in SA into tyre derived fuel (TDF) and sent interstate to be processed into crumb rubber. During the 2018/19 financial year there were small volumes exported overseas. A business recently commenced operations that bales and exports tyres that may be adversely affected from a ban. However overall, the sector has enough capacity to manage the tonnes of tyres produced in SA annually without exporting whole tyres.

COVID-19

The impacts of COVID-19 in Australia since February/March 2020 has added another dynamic to the resource recovery industry. Falling commodity prices, volatile markets, compromised business continuity, overseas processing and recycling facility closures, and a freeze on investments impact SA processors and manufacturers

COVID-19 presents challenges to the industry, but it is anticipated that it will result in uncertainty and investment delays rather than fundamental changes. It may take time to return confidence and investment that allows industry to be prepared to domestically to meet the bans.

Contents

- Executive Summary 3
- 1. South Australia’s Resource Recovery Industry 6
- 2. Fibre..... 8
 - 2.1. Tonnes and material flow..... 8
 - 2.2. Processing and remanufacturing infrastructure10
 - 2.3. Implications of the export ban.....11
 - 2.4. Industry views.....11
 - 2.5. Prices and market demand.....12
 - 2.6. Opportunities for SA as a recycling hub.....12
 - 2.7. Recommendations.....12
- 3. Plastics13
 - 3.1. Tonnes and current flows.....13
 - 3.2. Processing and remanufacturing infrastructure14
 - 3.3. Implications of the export ban.....16
 - 3.4. Industry views.....16
 - 3.5. Prices and market demand.....17
 - 3.6. Opportunities for SA as a recycling hub.....18
 - 3.7. Recommendations.....18
- 4. Glass19
 - 4.1. Tonnes and material flow.....19
 - 4.2. Processing and remanufacturing infrastructure20
 - 4.3. Implications of the export ban.....21
 - 4.4. Industry views.....21
 - 4.5. Prices and market demand.....22
 - 4.6. Opportunities for SA as a recycling hub.....22
 - 4.7. Recommendations.....22
- 5. Tyres23
 - 5.1. Tonnes and current flows.....23
 - 5.2. Processing and remanufacturing infrastructure25
 - 5.3. Implications of the export ban.....25
 - 5.4. Industry views from select consultations25
 - 5.5. Prices and market demand.....26
 - 5.6. Opportunities for SA as a recycling hub.....26
 - 5.7. Recommendations.....26
- 6. Appendix 1 - Sankey diagrams of material flows.....27
- 7. Appendix 2 - Additional information.....27



1. South Australia's Resource Recovery Industry

The global resource recovery industry has gone through upheavals in recent times. In addition, The Australian Federal Government has committed to phasing out the export of non-value-added materials from Australia. This includes:

- Unprocessed glass - January 2021
- Mixed plastics - July 2021
- Whole used tyres - December 2021
- Unprocessed single resin/polymer plastics - July 2022
- Mixed and unsorted paper and cardboard - July 2024

Business as usual models are not sustainable, and Australia must fast track the development of its local resource recovery and remanufacturing industry.

South Australia has a long history of national leadership in the recycling and resource recovery sector. This includes the nation's first container deposit scheme in 1977, plastic bag ban in 2009 and landfill material bans from 2010 (including fluorescent lights and E-waste). The strong relationship between industry and government has help SA consistently achieve the highest landfill diversion rate of any state and territory.

Recycling and resource recovery contribute significantly to employment and the South Australian economy. The history of leadership in the sector has led to the attraction of investment and expertise to the state. This investment has not only been in resource recovery activities but remanufacturing outputs into new products.

South Australia is well positioned to expand its resource recovery and remanufacturing experience and expertise. With the requisite skills, knowledge, and commitment, investing in the SA resource recovery industry will bring about national economic and environmental benefits.

Project background

This report presents the challenges and opportunities for SA's resource recovery industry. Information is taken from 2018/19 SA Recycling Activity Survey and targeted consultation with key organisations. These discussions took place in January and February 2020 and the information reflects this period.

The impacts of COVID-19 in Australia since February/March 2020 has added another dynamic to the resource recovery industry. The changes to the Australian and global economy have had an impact on local processors and manufacturers:

- Global commodity prices have fallen, and the markets are volatile. Record low oil prices has also reduced the costs of virgin plastic production, making it difficult for recycled plastics to compete on a price basis.
- Business continuity has been significantly compromised. International manufacturers and recyclers are seeing a slow in demand. Some have been forced to close.
- Freeze on investment decisions due to the high level of uncertainty in the market.

Considering that many Australian businesses and industries are in a holding pattern until mid to late 2020, there have been suggestions that the timelines for the bans could be extended to accommodate this. This may allow confidence and investment to be strengthened and allow the industry to be prepared domestically to meet the bans.

2. Fibre

The fibre stream is the most sensitive to the proposed export ban. There is an oversupply of fibre in the Australia market (i.e. due to imported packaging) and local manufacturers receive enough recovered fibre to meet the demand for recycled-content products. Therefore, it is important to ensure any proposed bans are accompanied with investment in recycling infrastructure and local market development.

2.1. Tonnes and material flow

Table 1 outlines the estimated tonnes of fibre generated in SA and the material flow and destination for recovered fibre. Figure 1 in Appendix 1 provides a visual representation of the flow of glass in SA.

An estimated 291,400 tonnes are generated in SA with approximately 79 per cent recovered for recycling (229,700 tonnes). An estimated 60,000 to 70,000 tonnes per year is mixed paper cardboard and would be impacted by the export ban.

The balance of fibre materials generated (61,700 tonnes) is unrecovered in SA and disposed of to landfill. A small proportion of unrecovered fibre may also be converted into an alternative fuel but could not be quantified. Figure 1 overleaf provides a visual representation of the flow of fibre in SA

Table 1: Estimated tonnes and flow of fibre materials for the 2018/19 FY year

Stage	Pathway	2018/19 tonnes	Description
Generation in SA	Recovered	229,700	An estimated 79% of fibre material is recovered.
	Unrecovered	61,700	Calculated based on the 2018/19 landfill volumes, most recent C&I and C&D landfill audit data from 2007 and recent kerbside audits.
	Total	291,400	
Aggregators of recovered fibre	MRFs	62,400	Note this is the material that is sorted, separated and recovered. Of the 229,700 recovered in SA, approximately 525 tonnes (0.2%) were Container Deposit Scheme (CS) containers (Liquid Paperboard - LPB).
	C&I	167,300	
	Interstate imports	20	A small volume of LPB is imported from interstate
Processing/ destination for recovered fibre	SA	1,300	A small proportion of fibre is remanufactured in SA.
	Interstate	116,300	Approximately half of recovered paper is sent interstate and the other half, directly overseas.
	Overseas	112,100	

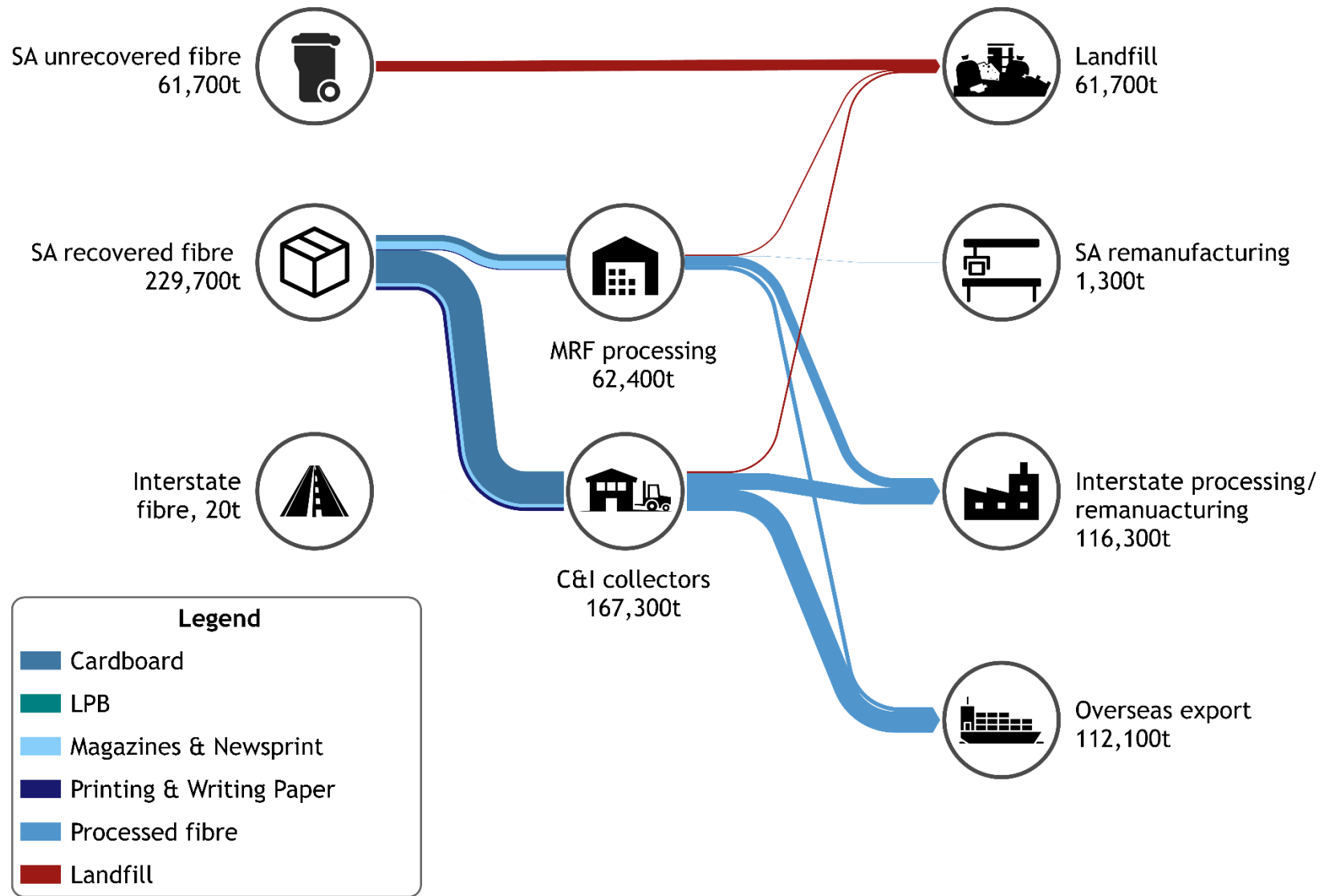


Figure 1: Overview of fibre material flow through SA

2.2. Processing and remanufacturing infrastructure

During the 2018/19 FY, South Australia exported 99 per cent of the recovered fibre products (50% interstate, 49% overseas). SA relies on sorting and baling this material for export as there is no local infrastructure to remanufacture this fibre. Only 1 per cent is remanufactured locally into pet litter.

Two interstate papermills receive recovered fibre from SA. They receive enough material to meet their manufacturing needs for the manufacture of recycled-content products. There are alternative options for SA's fibre if it cannot be absorbed into the established papermills (discussed below).

New papermill

The estimated investment for a new papermill is order of hundreds of millions and it requires a secure and constant feedstock for continuous operation. To support a new papermill, an estimated minimum of 500,000 tonnes would likely be required each year.¹ Based on this, SA does not have the feedstock for an investment of this size and would require interstate tonnes of fibre.

There must also be a market for the recycled paper products. Currently there is no additional domestic demand for further volumes of paper. Analysis of the market feasibility for the export of (recycled paper) would need to be completed to assess whether it is price competitive due to labour and transport costs.

Other processing/remanufacturing infrastructure

A papermill is not the only processing or remanufacturing option for fibre. Secondary processing of fibre through a 'polishing plant' can increase the quality of the material (e.g. outputs from a MRF) and may be viable. The further sorting and processing to remove contamination and meet quality standards can lead to a more valuable commodity which could then open new markets. This processing option requires a smaller capital outlay (and estimated in tens of millions) and could be viable for 50,000-100,000 tonnes of fibre products. Based on this estimate, SA could have enough tonnes to underpin this investment, however, this again requires a market for the material.

Additional processing of fibre into pulp is another processing option that could be further explored for SA. A wet lap system produces a wet fibre pulp product, whereas a dry lap has additional steps to remove the moisture prior to shipping. Both plants would require an estimated minimum of 150,000 tonnes of fibre but would also benefit from additional tonnes (which could be sourced from interstate). Dry lap processing has a higher capital cost than wet lap, but both would be significantly more than a polishing plant and actual costs would need to be determined through a feasibility study.

¹ This is an estimation and a detailed feasibility study would provide additional insight into the minimum requirements.

2.3. Implications of the export ban

There are serious implications for the SA resource recovery and recycling industry if there was a ban on mixed paper and cardboard exports and no additional investment in the industry:

- There would be an oversupply of recovered fibre in the market (material manufactured in Australia and imported from overseas through consumer goods). This could lead to a significant price drop and mean councils and other industry players become price takers.
- If councils and other industry players are not willing to pay the set price, or papermills choose not to increase their intake of recovered fibre, then there is a risk that this material would be downgraded into alternative fuels or sent to landfill.
- Some C&I collectors in SA may cease collecting fibre if exports of the material are banned.

2.4. Industry views

Additional insights were shared on the current and future industry:

- The export ban should not be applied to clean, sorted paper and cardboard. Stringent export standards already dictate the quality required to access international markets. These markets should be available if the standards can be met.
- Continued collection of fibre by commercial collectors depends on:
 1. The customer's (source of the fibre) willingness to pay for collection as costs increase
 2. Viable markets for the end material.

If the economics do not add up, then commercial collectors would cease collecting/receiving material from their customers. If exports of clean and sorted fibre are available, business would continue as usual.

- Packaging manufacturers should contribute to the costs of managing their products. This could be a fee for every unit of packaging in Australia which could then be used to cover the costs of recycling.
- Packaging that accompanies imported consumer goods (e.g. cardboard packaging from imported electronic goods) should be able to be sent back to the point of origin if it's clean and sorted.
- A distinction could be made between domestic and commercial sources of fibre. This would reflect that the difference in quality between the two sources, with domestic fibre requiring further processing to reduce contamination.

2.5. Prices and market demand

The market demand and prices for fibre streams has undergone radical change recently and continuously varies. Table 2 outlines the estimated market prices and market demand for fibre as of January/February 2020.

Table 2: Estimated market price and demand for fibre as of Jan/Feb 2020

Material	Price as of Jan/Feb 2020	Australian markets	Market demand	End products
Cardboard	\$100 tonne	Market is saturated	Overseas markets still viable if the contamination limits can be achieved.	Remanufactured fibre products.
Mixed paper	\$0 or a cost tonne	Market is saturated	Low demand and contamination are issues.	Remanufactured fibre products.

2.6. Opportunities for SA as a recycling hub

There are currently limited opportunities for SA to become a recycling hub for recovered fibre. A new papermill requires significant investment and requires end markets for the outputs. SA also does not have enough tonnes of recovered material to underpin this investment and would need to import significant volumes of material to make this viable.

Further processing of mixed paper and cardboard may be an opportunity for SA prior to exporting (either interstate or overseas). A polishing plant is likely the lowest capital cost (\$10-\$20 million) and only requires 50,000 to 100,000 tonnes of fibre. This could also help attract mixed fibre from interstate (e.g. from WA, NT and Vic border).

A pulp plant (wet or dry lap) would require greater investment than a polishing plant and would also require 150,000+ tonnes of material to ensure its viability. This would likely require fibre from interstate (WA, NT and Vic border) to underpin the investment.

Any reprocessing/remanufacturing options would need to ensure that materials can meet international export standards and be price competitive in the market to be feasible.

2.7. Recommendations

1. Ensure clean and sorted baled fibre meeting global export standards are excluded from the proposed export ban.
2. Explore opportunities for further processing infrastructure to meet export standards.
3. Explore opportunities to expand and mandate product stewardship for fibre packaging materials.



3. Plastics

South Australia is well placed in the plastics recycling sector. There is an experienced processor that recommenced operations in 2018/19 FY and another business currently installing local processing capacity (previously only an exporter). Considering this, there is little negative impact on the proposed ban of mixed plastics exports.

There is significant opportunity to market SA as a destination for plastic processing and receive mixed and source separated materials that are currently being exported overseas. SA currently has excess processing capacity. Additional investment could support local expertise and increase processing capacity even further. Developing local markets for all recovered plastic polymers is key to ensure the viability of local processing and reducing the need for virgin materials.

3.1. Tonnes and current flows

An estimated 78,700 tonnes of plastics were generated in the 2018/18 financial year, with only 31,100 tonnes being recovered (Table 3). Approximately 17,000 tonnes of this material were mixed plastics. Most of this (88 per cent) is processed in SA, seven percent exported interstate and five per cent exported overseas. Approximately half of all recovered plastics were exported; 5,500 tonnes sent interstate and 10,300 tonnes sent to overseas markets. Exported mixed plastics is 13 per cent (2,100 tonnes) of the exported total. Figure 2 overleaf provides a visual representation of the flow of plastics in SA

Table 3: Estimated tonnes and flow of plastics for the 2018/19 FY year

Stage	Pathway	2018/19 tonnes	Description
Generation in SA	Recovered	31,100	Only an estimated 40% of plastics are recovered.
	Unrecovered	47,600	Calculated based on the 2018/19 landfill volumes, most recent C&I and C&D landfill audit data from 2007 and recent kerbside audits.
	Total	78,700	
Aggregators of recovered plastics	MRFs	3,500	Note this is the material that is sorted, separated and recovered. Of the 31,100 tonnes recovered in SA, approximately 13 per cent is CDS containers (3,980t).
	C&I	27,600	
	Interstate imports	2,100	
Processing/ destination for recovered plastics	SA	17,400	A large proportion of this material was turned into Process Engineered Fuel and used in cement production This proportion may decrease as other processors increase their capacity.
	Interstate	5,500	
	Overseas	10,300	This includes 2,100 tonnes of mixed plastics

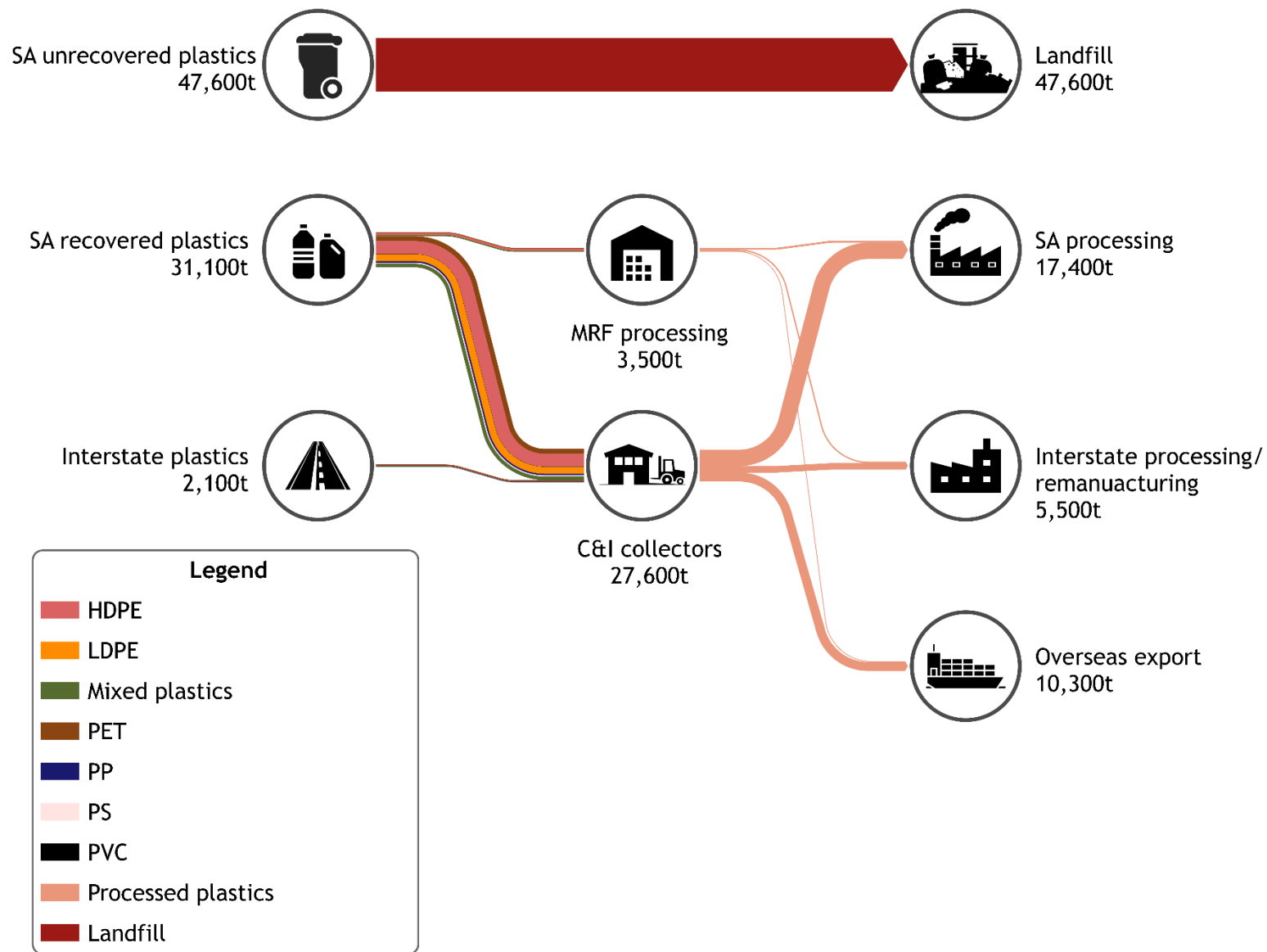


Figure 2: Overview of plastics material flow through SA

3.2. Processing and remanufacturing infrastructure

There are three main processing pathways in South Australia. Currently, the largest proportion of recovered plastics are turned into Processed Engineered Fuel (PEF) that is used to displace natural gas in local cement manufacture.

The remainder is processed locally by two companies. One processor was only operating for part of the FY and will be increasing its throughput. This plant can process baled mixed plastics from MRFs into individual polymer streams as well as process individual polymers. The second processor is commissioning infrastructure to sort, wash and granulate individual polymers and largely sources these from the commercial and industrial sector (although regularly seeks alternative sources).

There is significant capacity for processing recovered plastics in SA and the volume of locally granulated plastic is expected to increase next FY. Once both processors are fully online, then SA will be able to process significantly greater volumes than what is currently being recovered in SA. This will require either increased recovery of plastics and/or importing plastics from interstate to process locally.

Additional tonnes of plastic and further investment would also mean the processors can further increase their capacities.

Table 4 provides identifies remanufacturing using recycled plastics in SA. There are at least four businesses that remanufacture recycled plastics into new products, however their annual throughput is unknown. This includes remanufacturers that make bins, wood-composite products and plastic pilings. Recovered plastics may also be used in trial asphalt/road projects.

Table 4: Indicative plastics remanufacturing activities in SA (2018/19 FY) and current and future capacity

Type	2018/19 throughput of recycled materials	Current capacity for recycled materials	Planned capacity for recycled materials	Notes
	<i>tpa</i>	<i>tpa</i>	<i>tpa</i>	
Remanufacturing in SA	Minimum of 3,000	-	-	2018/19 volumes are based on responses to the Recycle Activity Survey and additional volumes may be reprocessed locally. Values are unknown for current and future capacity.



3.3. Implications of the export ban

There are no foreseeable negative impacts on the ban of mixed plastics for South Australia. Only 2,100 tonnes of mixed plastics were exported in the 2018/19 FY. These volumes are expected to be able to be managed via existing processors in the State.

The potential positive implications of the ban are for the state to become a national plastics recycling hub through receiving and processing plastics that are generated interstate.

3.4. Industry views

Additional insights were shared on the current and future industry:

- The price of virgin materials is generally lower than recycled and creates a barrier for companies. Introducing mandatory recycled content targets/levels would help to ensure recycled materials can compete price with the cost of virgin materials.
- More government assistance is needed for the whole industry to develop, not just councils (e.g. market development, mandated recycled content targets, infrastructure investment).
- There is interest in importing material from interstate:
 - Potentially from Darwin, Victorian border towns (e.g. Mildura)
 - Growth of the feedstock for SA can only come from interstate.
 - The cost of transport is the most significant barrier, varying from \$30-\$100 per tonne.
- SA is well placed to develop an industry for processing recovered mixed plastics as we already have the experience and technical processes. A base volume of ~120,000 tonnes of mixed plastics will encourage new remanufacturing businesses and support the case to process other plastic materials.
- The fast-moving consumer goods (FMCG) sector limits the ability to process materials from other sectors. FMCG companies only want to use their own recycled plastics, not plastic from other sources.
- Capital for infrastructure is the limiting factor to further expanding capacity. The demand for recycled materials would also need to improve to underpin additional growth and investment.



3.5. Prices and market demand

The prices and market demand are directly impact by the price of virgin materials. The current price in Asia is low, meaning recycled material is generally not competitive.

Table 5: Estimated market price and demand for plastics as of Jan/Feb 2020

Material	Approx. price in Jan/Feb 2020	Australian markets	Market demand	End products
PET	\$200 - \$400 tonne	Local demand exists, but only one remanufacturing location - Smithfield RPET	Only market for clear PET. All coloured PET exported.	Food grade bottles and containers, other packaging
HDPE	\$300 - \$600 tonne	Qld, NSW, WA and Vic.	Competitive market to enter. Insights from SE Asian markets is that China has slowed purchasing of pellets.	Extrusion (corrugated pipe), cable cover slip sheet
PVC	\$100 tonne	None currently	Only overseas markets	
LDPE	\$250 tonne	Some used locally in Melbourne (mostly to increase the sustainability of products for marketing value)	At this stage there is weak/no demand. Limited infrastructure established in SA or interstate to take in current form.	Pipe
PP	\$300 tonne	Nursery and construction products - Vic, NSW, SA	Markets available, but very limited	Nursery and construction
PS	\$500 tonne	Local manufacturers can take it but must be very clean.	No demand	
MIX	\$0 tonne	Sorting opportunities in SA and some local remanufacturers attempting to keep the material local.	Low if still mixed	



3.6. Opportunities for SA as a recycling hub

SA is well placed to become a national recycling hub for recovered plastics, with experienced processors and existing additional processing capacity. This processing capacity could be further expanded through capital investment in plant and equipment. SA could position itself as an importer of recovered plastic and export value-added products into the circular economy. This could in turn attract new remanufacturing businesses to the state.

An additional benefit of recycling mixed plastic in SA is that any residual volumes that cannot be recovered and recycled from processing or remanufacturing could potentially be used as an alternative fuel and therefore be kept out of landfill.

3.7. Recommendations

1. State and federal governments to consider financial support to further expand and develop processing capacity in SA, consolidating the state's position as a national recycling hub for recycling plastics.
2. Explore opportunities to support cost-effective transport of recovered plastics into SA for processing into value added materials.
3. Explore opportunities to attract additional remanufacturing capabilities in SA to locally use recovered and processed recycled plastics.
4. Work with state and federal governments to mandate minimum standards for recycled content in products.
5. Identify and consider banning plastic products/packaging (e.g. multi-layered packaging) that are difficult or unable to be recycled.



4. Glass

Banning the export of glass will have little to no impact on South Australia. There are no known tonnes exported overseas, and only a small volume is exported interstate. The opportunity for glass re-manufacturing is further improving systems to recover glass and improving transport efficiencies to make more recycled cullet available for re-manufacturing.

4.1. Tonnes and material flow

Table 6 outlines the estimated tonnes of glass generated in SA and the material flow and destination for recovered glass. Approximately 83,300 tonnes were generated in SA in the 2018/19 financial year. Recovered glass is 89 per cent of the total generated, with the remainder being sent to landfill.

Most of what is recovered in SA is first beneficiated² and then remanufactured into glass bottles and containers locally. In addition, approximately 58,200 tonnes of material is imported from interstate for processing into glass bottle and containers. A small volume of material (15,000 tonnes) is sent interstate and processed into road base. Figure 3 overleaf provides a visual representation of the flow of glass in SA.

Table 6: Estimated tonnes and flow of glass for the 2018/19 FY year

Stage	Pathway	2018/19 tonnes	Description
Generation in SA	Recovered	74,000	Material is recovered from the kerbside system via MRFs and through commercial & industrial collectors.
	Unrecovered	9,300	Calculated based on the 2018/19 landfill volumes, most recent C&I and C&D landfill audit data from 2007 and recent kerbside audits.
	Total	83,300	
Aggregators of recovered glass	MRFs	14,100	Note this is the material that is sorted, separated and recovered.
	C&I	59,900	Of the 74,000 tonnes recovered in SA, approximately 45 per cent is CDS containers (33,100 tonnes).
	Interstate imports	58,200	Some of the tonnes imported needs to be beneficiated prior to use.
Processing/ destination for recovered glass	SA	117,300	Two manufacturers use the recycled glass cullet to make glass bottles/containers.
	Interstate	15,000	Most of the glass sent interstate is assumed to be processed into road base.
	Overseas	0	No glass from SA is being exported overseas.

² Beneficiation is processing and treating the recovered glass to remove contamination (e.g. labels, metals) prior to remanufacturing

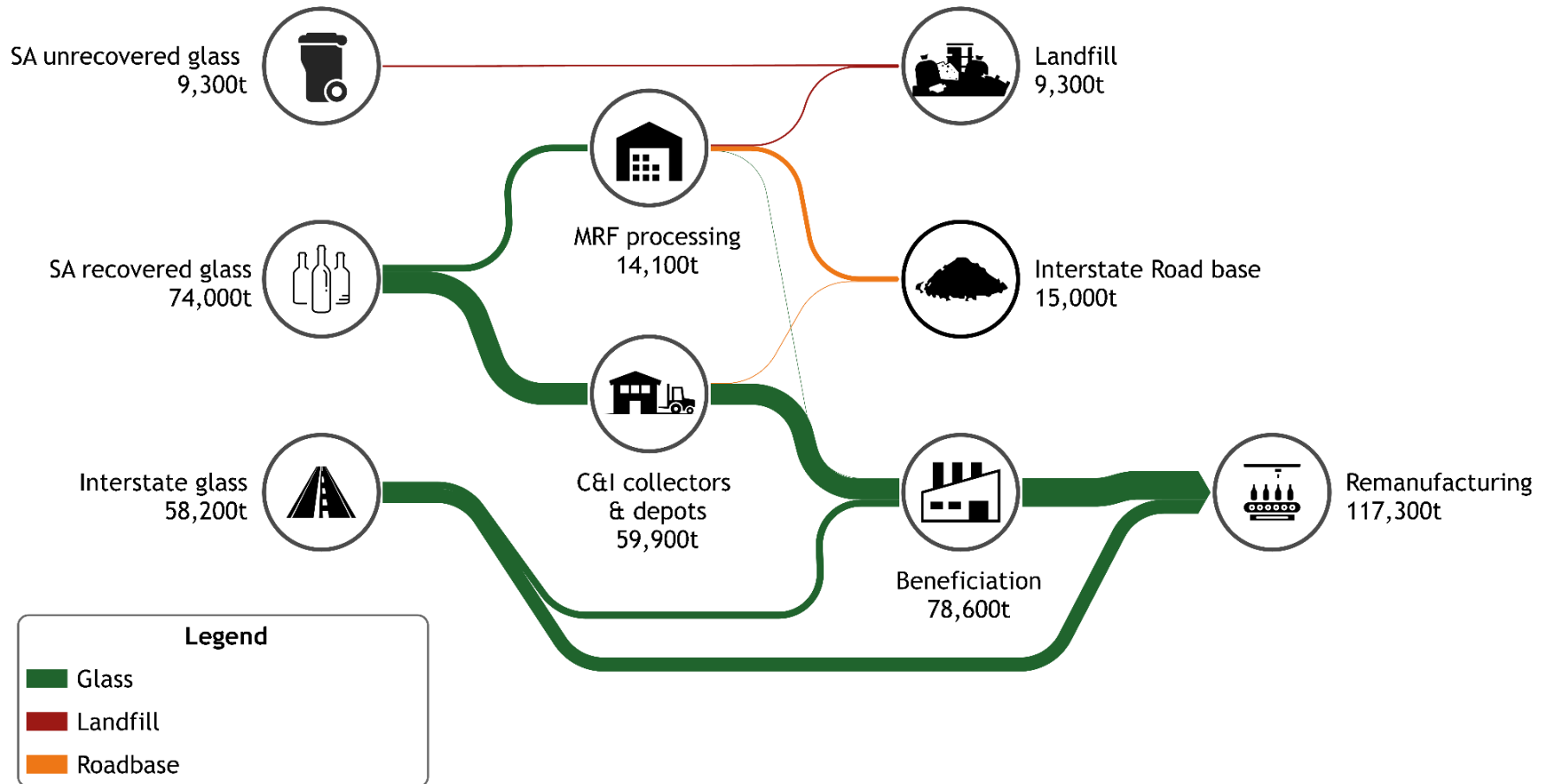


Figure 3: Overview of the glass material flow through SA³

³ Note that landfill volumes capture all materials even if they first go via another facility (e.g. glass fines from a MRF).

4.2. Processing and remanufacturing infrastructure

It is understood that current processing capacity is nearing its maximum output. Increasing glass beneficiation capacity and investment in colour sorting technology in SA would have positive effects on the amount of recycled cullet that could be processed (including from interstate sources).

Only 20 per cent of glass recovered in SA is sent interstate and likely becomes road base (e.g. glass fines crushed further into sand). The remainder of the material recovered and imported is remanufactured into new bottles at two local bottle manufacturers.

There is a very strong demand for recycled glass cullet above what is currently available. Remanufacturers could receive significantly higher volumes and the current level of recycled content in their products is low and they are targeting much higher levels. The main constraint on this is availability of the material. Increasing materials recovered in SA and sourcing materials from interstate could provide increase material availability.

4.3. Implications of the export ban

There are no major implications in banning of glass exports as there was no known material exported overseas by SA businesses.

4.4. Industry views

Additional insights were shared on the current and future industry:

- The sector is already aiming for high levels of recycled content in their products. Mandated recycled content legislation would have an adverse effect and create an artificial market and make this progress very challenging.
- Supply of recycled cullet is the limiting factor for increasing the recycled content of bottles. There are no technical or manufacturing barriers preventing increased use of recycled glass (>70% is possible).
- Increasing levels of recycled glass is limited by the volumes of material collected in SA (a high proportion of wine bottles are exported) and the cost of transport of material from states where material is currently available.
- Introduction of a Victorian container deposit scheme is expected to greatly increase the accessibility of material and the necessary volumes (recently announced for 2023). It is anticipated that transporting material from Victoria would be more cost efficient than current material sources (from NSW).



4.5. Prices and market demand

South Australia has been insulated from low prices that the Eastern states have been experiencing. This is largely due to the quality of sorted glass from the longstanding SA container deposit scheme. Based on Victorian data, mixed glass has a negative value (i.e. businesses must pay the processors to receive the material).

Table 7: Estimated market price and demand for glass as of Jan/Feb 2020

Material	Price in Jan/Feb 2020	Australian markets	Market demand	End products
Glass (colour sorted)	\$100 tonne	Two manufacturers in SA that could take large quantities.	Very strong for colour sorted material.	<ul style="list-style-type: none">• Glass bottles, containers
Mixed glass	-\$30 tonne	Small volumes can be used in coloured glass bottles.	Low	<ul style="list-style-type: none">• Road base• Limited use in glass bottles and containers

4.6. Opportunities for SA as a recycling hub

South Australia is in a very strong position to become the glass recycling hub of Australia. One of the largest manufacturing plants in the southern hemisphere is located an hour out of Adelaide. The industry itself is driving high recycled content targets in its products and is only limited by the logistics and cost of importing more glass and beneficiation capacity.

4.7. Recommendations

South Australia is well placed for glass remanufacturing capability and capacity. Both SA remanufacturers have indicated strong demand for recycled cullet and the ability to displace virgin materials if the feedstock was readily available. The following initiatives would increase the supply of recycled glass available to local remanufacturers:

1. Increase source separation of glass and avoid resources entering landfill.
2. Improve the cost effectiveness of transporting glass from interstate.
3. Potentially install colour sorting infrastructure to manage increased interstate imports.
4. Increase beneficiation capacity within SA - either through expansion to current infrastructure or the development of new facilities.



5. Tyres

Banning the export of whole tyres will have little to no impact on South Australia from a processing capacity perspective. Tyres are processed in SA into tyre derived fuel (TDF) and sent interstate to be processed into crumb rubber. During the 2018/19 financial year there were small volumes exported overseas. There is a business that recently commenced operations that bales and exports tyres that may be adversely affected from a ban. Overall, the sector has enough capacity to manage the tonnes of tyres produced in SA annually without exporting whole tyres.

5.1. Tonnes and current flows

Table 8 outlines the estimated tonnes of glass generated in SA and the material flow and destination for recovered tyres. An estimated 19,600 tonnes of tyres is generated each year in SA. It is estimated that five per cent of tyres are illegally stockpiled or landfilled each year. Figure 4 overleaf provides a visual representation of the flow of tyres in SA.

Table 8: Estimated tonnes and flow of tyres for the 2018/19 FY year

Stage	Pathway	2018/19 tonnes	Description
Generation in SA	Recovered	18,600	
	Unrecovered	1,000	Estimated based on discussion with industry that 5-10% of tyres may be illegally stockpiled or landfilled (either shredded or whole).
	Total	19,600	
Aggregators of recovered tyres	MRFs	-	Single tyres may come through transfer stations occasionally, but the anticipated volumes are insignificant.
	C&I	18,600	
	Interstate imports	400	A small proportion of tyres are brought from interstate.
Processing/ destination for recovered tyres	SA	14,700	Car tyres are shredded and processed into Tyre Derived Fuel which is then exported overseas.
	Interstate	3,800	Truck tyres are sent interstate to be processed into crumb rubber.
	Overseas	500	A small volume of casings is exported into the re-tread market.

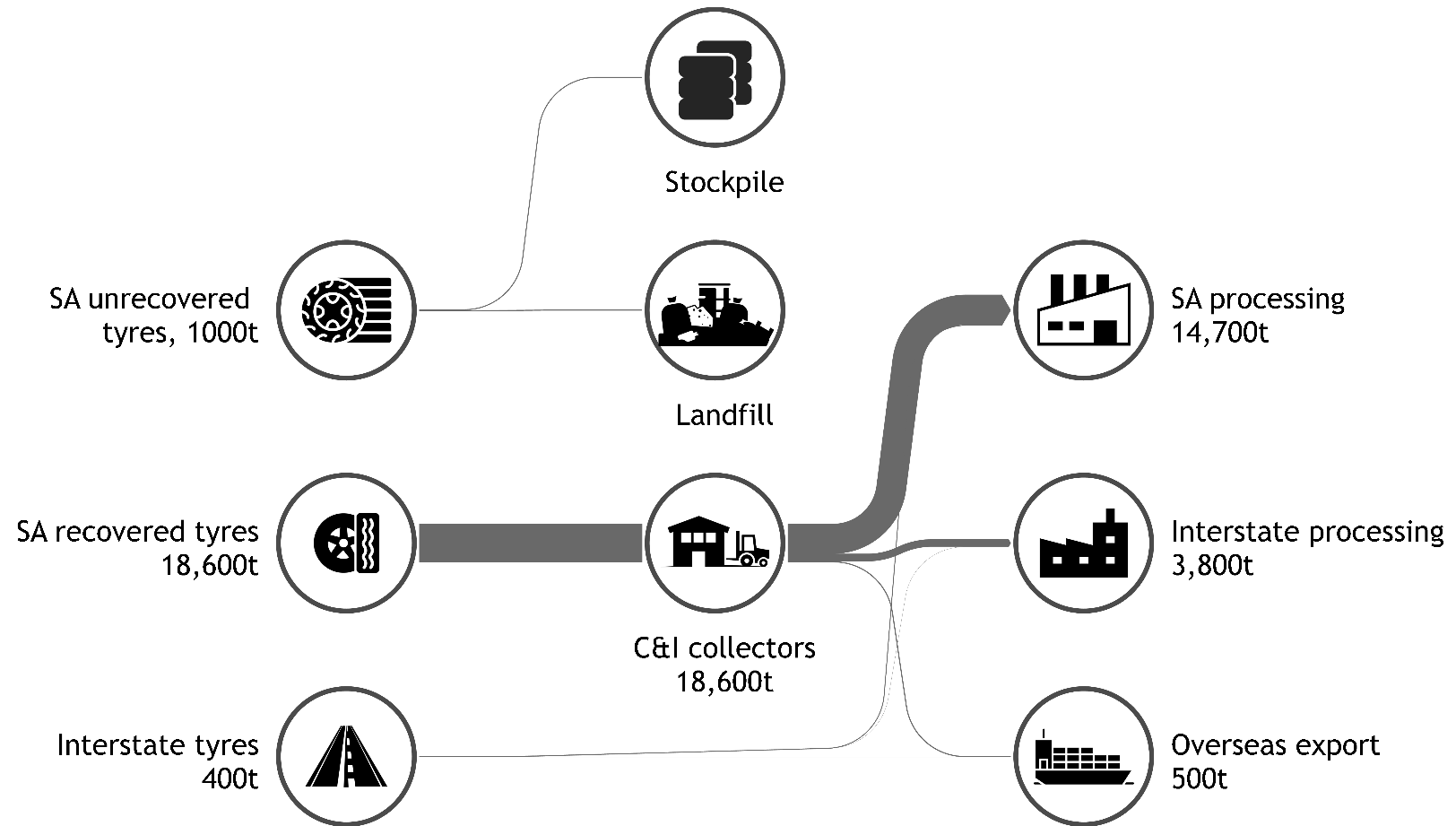


Figure 4: Overview of tyres material flow through SA

5.2. Processing and remanufacturing infrastructure

There are two tyre collectors currently in the SA market, one who bales and exports whole tyres and another who processes tyres locally and interstate and exports casings. The processing capacity within SA is significantly greater than the current volumes of recovered tyres.

The use of tyres is also currently being trialled in local road projects and there is an unknown quantity of tyres that are being used.

5.3. Implications of the export ban

Banning whole tyre exports appears to have no major processing, landfill or stockpiling implications in SA:

- There is excess capacity to process the tyres generated annually in SA into tyre derived fuel (TDF).
- Higher value truck tyres are sent interstate for processing into crumb rubber which will likely continue.
- The proposed ban may lead to greater market concentration. Only one company in SA has existing capacity to process tyres into TDF.
- Additional infrastructure investment in SA is unlikely. This is due to low overall volumes and no demand for TDF in Australia. If there were to be a concerted effort to absorb crumb rubber into local roads infrastructure, then a small level of investment for local crumb processing may be viable.

5.4. Industry views from select consultations

- The export ban of baled tyres should be brought forward and be the first item to be banned. This could be brought forward to July 2020.
- There are well established international markets for TDF.
- There is no market for TDF in Australia.
 - There may be opportunities for large manufacturers with significant energy/heat requirements (cement kilns, paper mills, breweries, sugar/confectioners) to use TDF. This would require investment for a discreet feed-in system.
 - Negative public perception around burning tyres is prominent. Developing the social license to use tyres as a fuel source is required.
- Exported whole tyres can often be processed using environmentally unsound methods overseas.
- The domestic use of crumb rubber could increase significantly:
 - Crumb could be used in roads, rail ballast and drainage aggregate.
 - Greater use has been limited by a conservative approach, despite the benefits being accepted and well understood.

5.5. Prices and market demand

Table 9 outlines the estimated value of tyre commodities and the markets and demand. TDF has a low value due to the costs of processing and transport. As there are no local markets, all TDF in Australia is exported overseas.

Crumb rubber is a small but growing market in Australia. It can be used in a range of applications, however its use in roads has been limited to date by conservative approaches.

Table 9: Estimated market price and demand for tyres as of Jan/Feb 2020

Material	Price in Jan/Feb 2020	Australian markets	Market demand	End products
TDF	\$3 /tonne	No domestic markets	Well established international markets, cost of transport significant.	<ul style="list-style-type: none"> • TDF
Crumb rubber	\$600 /tonne	Small, but growing	Growing. Processing of passenger tyres will be required as the market grows	<ul style="list-style-type: none"> • Road additive/base • Drainage aggregate • Rail ballast • Sporting/playground surface

5.6. Opportunities for SA as a recycling hub

SA can manage the volumes of tyres produced annually. If there were commitments to use volumes of crumb rubber in SA, then there may be an opportunity for a small-scale plant that processes that material and uses it locally.

Unless there is a local market for TDF, it is unlikely that bringing large volumes of tyres from interstate would be viable. A key opportunity is to explore the use of TDF in energy intensive processing and manufacturing.

5.7. Recommendations

1. Explore market development opportunities for crumb rubber into State and Local government infrastructure projects.
2. Explore opportunities to develop TDF capacity for high energy users



6. Appendix 1 - Additional information

MRF Infrastructure

SA has adequate capacity to sort materials collected through the kerbside bin system (Table 10). The two MRFs servicing Metropolitan Adelaide are located North of the CBD (in Edinburgh and Wingfield). This means that material collected from South of Adelaide must be transported North.

There are two new MRFs planned to be built by SA Local Government organisations (in the North at Kilburn and South at McLaren Vale). When completed, an additional of 85,000 tonnes per annum sorting capacity will come online which will create an oversupply of capacity. The MRF in McLaren Vale may help reduce transport costs for councils located South of Adelaide.

Table 10: MRF capabilities in South Australia

Material Recovery Facilities		2018/19 throughput of materials	Estimated current capacity	2018/19 capacity gap/excess	Planned capacity
		<i>tpa</i>	<i>tpa</i>	<i>tpa</i>	<i>tpa</i>
Existing SA MRFs	Edinburgh, Wingfield & Mt Gambier	121,100	180,000	58,900	-
Future SA MRFs	Kilburn & McLaren Vale	-	-	-	85,000

