Zero Waste SA

Review of Recycling Activity in South Australia
Stage 1 - Quantification of Future Expansion Priorities

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NOLAN-ITU Pty Ltd ACN 067 785 853 ABN 76 067 785 853

P.O. Box 393 Level 1, 625 High St, East Kew Victoria 3102
Telephone: (03) 9859 3344 Facsimile: (03) 9859 3411

NOLAN-ITU PTY LTD
ACN 067 785 853
ABN 76 067 785 853

Melbourne

PO Box 393
Level 1, 625 High Street
East Kew VIC 3102

Tel: (03) 9859 3344 Fax: (03) 9859 3411

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EXECUTIVE SUMMARY

In 2003 over 2.1 million tonnes of material ranging from asphalt to textiles was recycled in South Australia.

This result shows that recycling volumes outstrip the volume of material sent to landfill, which was 1 161 327 tonnes in 2003/04. This gives a total diversion rate of 65%. This exceeds the diversion rate for Victoria, the only other state currently measuring total recycling activity. The figure is likely to be comparable to the best performing jurisdictions around the world.

The study of recycling activity, undertaken by Nolan-ITU was the first ever conducted in South Australia. It showed that the recycling volumes for concrete, bricks and rubble, steel and paper were the highest. Garden organics material was also recovered in very significant volumes. Although smaller in volume, the recycling rates for packaging materials – glass, aluminium, steel and plastics were at levels amongst the highest in Australia.

It found there was a broad range of opportunities to reduce waste levels through expanding recycling activity and other waste minimisation efforts. The study has identified priorities for improving waste diversion in the short and medium term.

Material	Type	Quantity (t)	Total Quantity (t)
Paper	Packaging & industrial	91 000	
	Printing & writing	12 300	
	Newsprint	31 300	
	Directory	1 300	135 900
Steel	Packaging	3 800	
	Other	300 000	303 800
Aluminium	Packaging	4 000	
	Other	15 000	19 000
Garden Organics		127 000	
Food Organics	Meat waste	74 000	201 000
Plastics	All polymers		15 000
Non ferrous metals (excl Alum)			13 000
Glass	Packaging		46 000
Concrete			875 000
Brick & Tile /Rubble & Soil			327 000
Asphalt			100 000
Timber	Structural and sawdust		116 000
Textiles	Clothing/ offcuts		4 000
Rubber	Tyres		100
Total Quantity			*2 155 800*

1 INTRODUCTION

Zero Waste SA is committed to improve the sustainability of recycling practices and systems in South Australia. As part of this program, it engaged Nolan-ITU Pty Ltd to review the recycling activity in South Australia for 2003 and to identify future expansion priorities. This project is also part funded by the National Packaging Covenant and is supported by the South Australian Jurisdictional Recycling Group.

Background

Over 1 million tonne of used materials as diverse as liquid paperboard and concrete are recycled in South Australia each year. While some organisations, within specific industry sectors, may know the volume of each material, generally the community, government and industry stakeholders are unaware of the scope and scale of total recycling.

The diversion of wastes from landfill is not primarily about increased longevity for landfills but in retaining resources for further use.

The results of the recycling activity study will assist in the development of the State Waste Strategy.

The first stage of this project is to identify the total tonnes of each material (or product) that is collected and recycled. The second stage is to take a range of 50 significant products and identify opportunities for increased recycling and broader waste minimisation. This will assist Zero Waste SA to work with the reprocessing industry to further increase in recycling and reduce waste disposal to landfill.

This report presents the Stage 1 outcomes.

Terms of Reference – Stage 1

The primary Stage 1 task is to identify the total quantity (by weight) of material collected and recycled in South Australia for the following range of materials in the 2003 calendar year.

Concrete	PP plastic	Cardboard
Asphalt	HDPE plastic	Liquidpaperboard
Bricks	PVC plastic	Printing and Writing paper
Steel	PS plastic	Timber
Aluminium	Other plastics	Garden organics
Glass	Newspaper	Food organics
PET Plastic	Magazine	
HDPE plastic	Telephone directories	

Zero Waste SA has requested that the confidentiality of company specific data must be maintained to ensure a full and accurate response from industry.

The project report is required to identify:

- levels of local reprocessing (industrial, pre consumer and post consumer);
- flows of recovered material into South Australia for reprocessing;
- flows of recovered material interstate for reprocessing;
- exported for reprocessing; and
- recycling activity trends and barriers.

Definition of Recycling

For this project, the definition of recycling was taken to exclude all in-house processing of materials within an operation and to exclude all forms of reuse. The vast majority of recycling involves a mechanical process (pulping, heating, composting etc). In the case of some timber, the recycling included use as a fuel, substituting a non-renewable fuel.

The exclusion of reuse is not made to down play the importance of this activity in resource conservation but to provide boundaries to this quantification of recycling. The project also excluded liquid recycling and recycling of biosolids and wool scour wastes.

2 METHODOLOGY

The 2003 recycling activity survey was conducted in three stages. These were:

1. Prepare a comprehensive list of stakeholders for each material covering the collection, sorting and reprocessing or exporting stages to source information. This is predominantly reprocessors. Where materials are reprocessed with a mixed feedstock, it has been necessary to obtain data from the sorting facilities. Contacts have also been made with companies preparing material for freighting interstate or overseas.
2. Obtain 2003 recycling estimates by contacting stakeholders. This has been achieved by telephone surveys supplemented by face to face interviews with key stakeholders in Adelaide. Where a range was provided the lower figure was adopted.
3. Aggregate data into totals for each material category and sub-category (as appropriate). This provides a total of each material recovered and ensures company specific information remains confidential.
4. Allocate an indication of the accuracy of the data for each material category and sub-category.
5. Report on the origin sector of the recovered material (household/municipal, C&I, building construction and demolition).
6. Report on recycling activity trends, market access and any inhibitors to increased activity.

For each material, quantities of stockpiled material at the start and end of 2003 have been estimated to ensure that this does not distort the difference between collected and processed quantities. Stockpiled material has not been included as being processed in 2003.

Recycling rates have been provided where the South Australian material consumption is known and the materials are not used in long term applications.

Where possible, 'latest available' data is utilised. Some stakeholders have provided 2003 data and some 2003/04 financial year data (including an extrapolation to incorporate June 2003).

The recycling activity estimates include materials generated in South Australia that are reprocessed in South Australia, interstate and overseas. It is noted that South Australia is an exporter of recyclables in some sectors (e.g. paper and metals).

All stakeholders, except two small plastics reprocessors, willingly provided data. For these companies an indicative estimate has been provided based upon our knowledge of the industry.

Data on the following aspects of the recycling activity has also been collated:

i) Destination of reprocessed material (within state, interstate, or overseas).

ii) Pre and post consumer recycling activity excluding wastage that is utilised on a processing site as a matter of course to the efficient operation of the site. Examples of this are paper mill 'broke' and plastics 'regrind'.

Verification and Analysis of Data

Double checking of the recycling activity data has been undertaken with relevant industry or industry associations. The estimates have been cross-checked with the results of previous studies and surveys to identify any significant changes to the quantities recycled. Verification will also take place with Zero Waste SA personnel at the second Steering Committee meeting.

3 PAPER AND CARDBOARD

There are a broad range of paper and cardboard grades. For this survey of recycling activity the paper was split into the following grades:

- packaging and industrial;
- newsprint;
- telephone directories; and
- printing and writing paper.

In 2003 South Australians consumed an estimated 309 000 tonnes of paper and cardboard.

3.1 Packaging and Industrial

Consumption

Packaging and Industrial is primarily corrugated cardboard box material used for industrial and consumer goods in outer packaging. It includes boxboard used for packaging of consumer goods as diverse as cereal and computer software. Also included in this category is liquid paperboard packaging used for beverage, food and other consumer goods packaging.

Total packaging grade consumption for SA in 2003 is estimated at 130 000 tonnes.

Recycling

Recovery and recycling of packaging grade paper was 91 000 in 2003. This material was recovered through commercial industry collections operated by Visy Recycling and Amcor (or their agents) and through household kerbside collections.

The recycling rate for 2003 is estimated at 70%. This is slightly higher than the national average recycling rate of 67.9%

Liquid Paperboard is used as a packaging medium for beverage, food and other consumer products. The quantity of this material recycled is small and often processed mixed with other grades. Therefore an accurate figure on liquid paperboard recycling in South Australia cannot be obtained.

3.2 Newsprint

Newsprint grade paper is produced in Australia and New Zealand for the use in the Australian market.

Consumption

The total 2003 consumption of newsprint, including newspaper magazines, in South Australia was 48 321 tonnes. Of this 6 400 tonne was production or distribution waste in the newspaper industry.

Recycling

All of the 6 400 tonne of production or distribution waste newsprint consumed was recovered and recycled in 2003. In addition 24 932 tonnes was collected from South Australian homes through kerbside collections and from other sites such as offices, libraries and hotels.

This resulted in a total recycling of newsprint of 31 398 tonnes.

Recycling Rate

The overall recycling rate for 2003 was therefore 65 %. This is marginally below most other states that have recycling rates ranging from 70% to 77%. The National recycling rate for 2003 was 73.5%.

Destination of Recovered Newsprint

The two key destinations of recovered newsprint are:

- Paper mills in South East Asia for newsprint production (18 000 tonne)
- Amcor, Norske Skog and Visy paper mills in Victoria and NSW.

Apart from a minimal amount going to insulation production in South Australia there is very little newsprint reprocessing activity in South Australia.

3.3 Telephone Directories

Consumption

The consumption of telephone directories for 2002 was 2850 tonnes. As the directories are much larger in capital cities, the vast majority of directory paper is generated in Adelaide

Recycling

1 300 tonnes of telephone directories were collected for reprocessing in South Australian during 2003. This estimate is based primarily on direct counts from material recovery facilities. As this method generally underestimates the quantity recovered, the 1 300 tonne recycled in 2003 may be an underestimate. Some material is recycled in South Australia into a kitty litter product.

Recycling Rate

The overall recycling rate for telephone directories in 2003 was 46%. This is lower than for some other states.

3.4 Printing & Writing Paper

Consumption

In 2003 South Australians used an estimated 104 000 tonne of printing and writing paper in the form of copy paper, books, magazines (excluding newspaper magazines), envelopes and other stationery. A proportion of this material is held in files and archives and therefore cannot be recovered.

Recycling

Collection of printing and writing grade paper is undertaken from commercial sites in Adelaide and a volume of this grade of paper also comes back through household collections. An estimated 12 300 tonnes collected and recycled.

Recycling Rate

The overall recycling rate for printing and writing paper in 2003 was therefore 12%. This recycling rate is below most other states.

Destination of Recovered Printing and Writing paper

Some of this material is exported while some is sent interstate for use in the production of printing and writing paper, tissues and coatings for packaging grade paper.

3.5 Summary

The level of paper and cardboard recycling activity in South Australia is summarised in Table 3.1.

Table 3.1: 2003 Paper and Cardboard Recycling Activity

Type	Quantity (tonne)	Recycling Rate (%)
Packaging and Industrial	91 000	70
Newsprint	31 300	65
Telephone Directories	1 300	46
Printing and Writing Paper	12 300	12
Total	135 900	44

4 PLASTICS

Plastics are a family of materials that are used in increasing quantities across a range of applications from agriculture to automotive to packaging. An estimated 91 000 tonnes of plastics are consumed each year in South Australia.

There is a broad range of plastics. For this survey of recycling activity, the plastics have been split into the following types:

- PET
- HDPE
- LDPE
- PVC
- PP
- PS
- Other plastics

There are a range of long term applications for plastics including building and plumbing products where the material utilised today may not enter the waste stream for 10-50 years, or longer. Therefore, the volume of plastics consumed is likely to be substantially higher than the volume disposed.

Across all polymers, there are well established plastics recycling outlets. This includes a number of reprocessing facilities in South Australia.

Each year PACIA conducts a national plastics recycling survey that identifies for each polymer:

- the total consumption across all applications;
- the total recovery including material sent to export for processing;
- the state where the material was collected; and
- the state where the material was processed.

In 2002, 15 000 tonnes of plastics were recovered in South Australia. On a per capita basis, this is amongst the highest of all states.

Nolan-ITU is currently completing this year's survey of recycling activity in 2003. The preliminary data shows a steady increase for both domestic and exported tonnes of waste plastics recycled.

Recycling activity is highest for rigid plastics packaging but also occurs for pre-consumer scrap and for a range of durable plastic applications.

Recycling quantities by polymer will be available from the current PACIA survey shortly.

5 METALS

This survey of the level of recycling activity in South Australia addresses the following metal categories:

- steel;
- aluminium; and
- non-ferrous metals.

5.1 Steel

Steel is recovered for recycling from a range of products including car bodies, appliances, industrial and agricultural equipment and building materials. Gas bottles, LPG fuel tanks, wire from fencing (agriculture and wineries) and paint cans are also recovered for recycling. LPG fuel tanks require degassing, the removal of valves and the drilling of a hole in the tank before crushing. Chemical drums are only received from suppliers who are known to correctly rinse the drums. Paint packaging is accepted without liquid residue.

Steel cans are also recovered though the kerbside collection system and CDL depots.

Consumption

Not known.

Recycling

The total quantity of scrap steel recycled in 2003 is estimated to be 303 000 tonnes. This includes 3 400 tonne of domestic steel packaging, based upon an extrapolation of the 2002 national steel can recycling survey, which was collected through kerbside collections and recovered at sorting facilities.

The level of recycling is relatively constant seasonally and is increasing annually. The dramatic increase in metal prices in late 2003 has had little impact on the level of recycling.

Destination of Recovered Steel

South Australia has an extensive network of scrap metal merchants who receive ferrous metal in a wide range of forms. This includes car bodies, appliances, industrial and agricultural equipment and building materials. Mobile crushing units also visit rural transfer stations and landfills for cars, appliances and other scrap.

This network of merchants feeds into two major Adelaide based scrap metal dealers, Simsmetal and Smorgon Steel (formally Metal Corp). Simsmetal has a shredding plant in Wingfield and Smorgon Steel is in the process of establishing a similar plant in the Wingfield area. This enables both companies to send scrap steel to a variety of mills for recycling in Australia and overseas.

Paint cans are accepted by Smorgon Steel but not by Simsmetal.

Some material is utilised in Adelaide by local forges. OneSteel also receives material at its Whyalla operation. The remainder is split between interstate and overseas destinations. Mills in Sydney, Melbourne and Tasmania receive half of the material that leaves South Australia with the remainder going to Asian mills (predominately China).

The domestic steel packaging (steel cans) is either reprocessed by Bluescope Steel in NSW, Smorgon Steel in Victoria or exported.

5.2 Aluminium

Waste aluminium is recovered from building material waste, automotive manufacture and other applications. Aluminium cans are also recovered through the kerbside collection system and CDL depots.

Consumption

Not known.

Recycling

The total quantity of aluminium recycled in 2003 is estimated to be 19 000 tonnes. This includes 4 000 tonne of packaging (beverage cans).

Recycling Rate

The recycling rate for beverage cans is very high due to its high resale value and the container deposit system.

Destination of Recovered Aluminium

A high proportion of landfill operators recover discarded scrap at the disposal point.

Like steel, the major destinations for scrap aluminium are Simsmetal and Smorgon Steel in metropolitan Adelaide. Most non-packaging aluminium scrap is sent to Melbourne for smelting with the remainder going into export markets.

Beverage cans are baled and sent to Yennora in NSW for use in beverage can production or to Geelong for general aluminium market applications.

5.3 Non ferrous

A wide range of non-ferrous metals are recovered and recycled each year in South Australia. These include stainless steel, lead, brass, copper, bronze, nickel and others. Some of these metals are worth over $2 000 tonne. Much of the material is recovered from industrial equipment, cables, and motors. Lead is recovered from automotive batteries.

Consumption

Not known.

Recycling

The total quantity of non-ferrous metals recovered in Australia in 2003/04 was 13 000 tonnes. In addition to this quantity, some computers and other electronic equipment is exported either as units for reuse or as components for reuse or recycling.

Included in the total recycling is over 4 000 tonnes of automotive batteries, 2500 tonne of copper and 2500 tonnes of stainless steel. The remaining 4000 tonnes comprises lead, brass, nickel and small quantities of precious and trace metals

Destination of Recovered non-ferrous

Automotive batteries are sent to Australian Refined Alloys in Melbourne for recycling. Brass is sent to Sydney for use in a smelter.

An estimated 30-50% of total non-ferrous is exported. This includes most cable that is sent to countries such as China for stripping of insulation.

6 GLASS

Glass packaging is used across a range of beverage and food applications and is recovered through the kerbside collection system and CDL depots. The CDL system for the redemption of beverage containers helps to deliver a strong glass recycling rate.

Consumption

The amount of glass packaging consumed in 2003 is estimated at 65 450 tonnes.

Recycling

The total quantity of glass packaging collected for recycling in 2003 is estimated to be 45 600 tonnes.

Recycling Rate

Recycling of glass packaging is therefore operating at a rate of 69%. This is higher than the estimated national recycling rate of 37%.

Destination of Recovered Glass

Glass packaging is returned through a combination of depots and collection centres as well as or through kerbside collections and sorting facilities. All glass is taken to a benefication centre where Visy Recycling produces a furnace ready cullet that is utilised by Amcor at its Gawler based glass making plant.

Increased recycling levels could be achieved with a greater promotional focus on non deposit material such as food and pharmaceutical packaging. In addition to the recycling of packaged glass, there are also very small quantities of window glass recycled as abrasives or into road marking paint.

7 CONSTRUCTION AND DEMOLITION

The major construction and demolition waste streams are:

- concrete;
- asphalt;
- bricks, rubble, and soil;
- timber; and
- steel.

The recycling activity for steel is addressed in Section 5.1 above.

As it is not possible to obtain reliable consumption data for many of these materials, estimates of recycling rates have not been calculated. Many of these materials are used in very long-term applications.

7.1 Concrete

The concrete recycling industry is a young but rapidly expanding one. Concrete recycling in South Australia has expanded rapidly since the establishment of large C&D recycling facilities in Adelaide about 10 years ago. Concrete is recovered from both large and small demolition projects.

Recycling Activity

The total quantity of concrete recovered in 2003/04 was 875 000 tonnes. Concrete is by far the most recycled material in South Australia. The quantity of concrete recycled is closely linked to the building/demolition cycle.

Destination

The industry is now dominated by 4 or 5 large processors in the metropolitan Adelaide region. Recovered concrete is crushed, steel reinforcing is removed, and then screened.

The industry is now equipped to provide material to precise specifications that are established for different construction applications. Applications include aggregate for road making and buildings. These are used as an alternative to quarry based products.

7.2 Bricks, Rubble and Soil

Many large demolition projects generate substantial volumes of bricks and stone rubble including elements of soil.

Recycling Activity

The total quantity of bricks, rubble, and soil recovered for recycling in 2003/04 was 327 000 tonnes. This does not include bricks that are recovered and cleaned for reuse.

Destination

Collected material is recovered at C&D recycling facilities. The material is crushed and screened to make a range of soil and aggregate products.

7.3 Asphalt

The recovery and recycling of asphalt has only occurred in significant volumes in recent years.

Recycling Activity

The total quantity of asphalt recovered for recycling in 2003/04 was estimated at 100 000 tonnes.

Destination

Collected material is recovered at C&D recycling facilities. Resource Co is by far the largest recycler of asphalt. Material is stockpiled and then crushed and screened to meet market specifications.

Recovered asphalt in used in cold batch road base applications.

7.4 Timber

Waste timber is generated in a number of forms. Structural timber is recovered from both residential and commercial demolition projects. Pallets, fencing and furniture are also sources of timber waste. There is also timber offcuts and sawdust generated from manufacturing processes and building construction sites.

Recycling Activity

The total quantity of timber recovered for recycling in 2003/04 was 116 000 tonnes. Companies handling timber include ResourceCo, Royal Park Salvage, Jeffries Group, Peats Soils and Garden Supplies and Perpetual Products.

Destination

Some material is chipped and sawdust is mixed with other material in composting facilities. A large quantity of timber is supplied to Adelaide Brighton Cement for use as a fuel in cement production. This application for timber is likely to expand.

7.5 Summary

Recycling Activity

The level of C&D recycling activity in South Australia in 2003/04 is summarised in Table 3.1.

Table 7.1: 2003/04 C&D Recycling Activity

Type	Quantity (tonne)
Concrete	875 000
Bricks, rubble, and soil	327 000
Asphalt	100 000
Timber	116 000
Total	1 418 000

8 ORGANICS

A significant quantity of garden and food organics are now composted and hence are diverted from landfill. For this survey other organic, such as municipal biosolids and wool scour wastes have not been included.

As for C&D wastes, it is not possible to obtain reliable consumption data for these materials, and hence estimates of recycling rates have not been calculated.

8.1 Garden Organics

Garden organics are recovered through kerbside collection systems in many Adelaide municipalities, and from drop off sites at transfer stations and most is delivered directly to composting facilities. Only composted organics are considered recycled in this survey.

Recycling Activity

The total quantity of garden organics recovered for recycling in 2003 was 127 000 tonnes. This is very high by national standards and reflects the professionalism of the key composting companies and greater development of sound market outlets.

Destination

Processing sites for garden organics are Jeffries Group, SA Composters, Natures Fertiliser, Van Shaiks, Adelaide Organic Recyclers, Alexandrina Council and Peats Soils and Garden Supplies. Some of these companies are in the process of developing new sites with increased capacity. In addition to garden organics, some sites process smaller quantities of timber, sawdust, food organics and horticultural material such as grape stalks.

8.2 Food Organics

A small quantity of vegetable based food waste is recovered and processed. A much larger volume of food waste comes from abattoir and butcher waste products.

Recycling Activity

The total quantity of abattoir and butcher waste recovered for recycling in 2003/04 was 74 000 tonnes.

Destination

Abattoir and butcher wastes are sent to rendering works on a handful of sites around the state. These sites are Conroys, Teys Brothers, Master Butchers, Tatiara and T and R Pastoral. The end product is stock feed.

9 OTHER MATERIALS

Other materials include textiles and tyres.

9.1 Textiles

Textiles in the form of clothing are widely recovered for reuse through major charities. Some of this clothing is supplied into second hand retail outlets and some is sold overseas for reuse as clothing. Some garments are not of a quality to re-sell and these are sent for recycling into rags.

Recycling Activity

The total quantity of textiles recovered for recycling in 2003 was 4 000 tonnes. This does not include resale for use as clothing. A proportion of textiles unsuitable for rag use was processed into felt. This has recently ceased and it is not clear if this material will go interstate or to waste.

Destination

Industrial Rag in Wingfield is a key reprocessor of textiles. Other material is sent interstate.

9.2 Tyres

Motor vehicle tyres have been recycled in Australia for the past ten years. The rubber content in truck tyres is higher than from passenger vehicle tyres. For this reason, it is these heavy vehicle tyres that are mechanically recycled in larger numbers. Car tyres, with a high textile content are more likely to be used as fuel.

Some tyres are shredded then crumbed before being used in tyre production, flooring, paving and as a drainage medium. In addition, whole tyres are used as a fuel for cement kilns. There is also a level of reuse of tyres through sale of second hand tyres and retreading. This reuse activity is not included in this survey.

Recycling Activity

The total quantity of tyres recovered for recycling in 2003 was less than 100 tonnes.

Destination

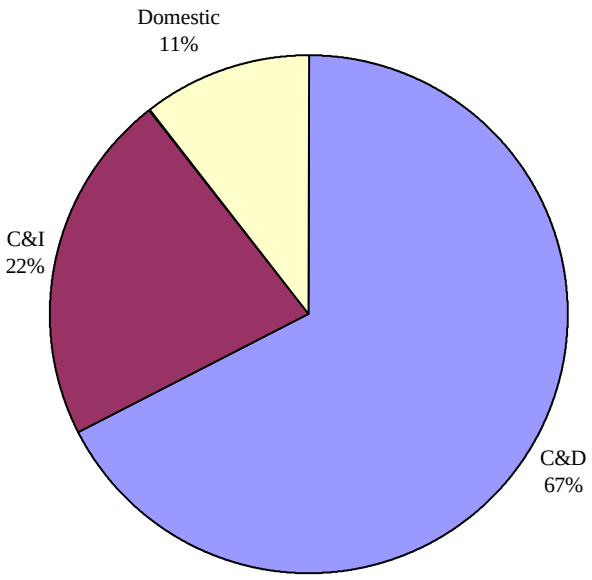
Some tyres recovered are now being recycled in Oakbank by Biofloat. This has commenced since 2003. Others are shipped to Victoria as there is no processing outlet for car tyres in South Australia. Tyres represent a key opportunity to build recycling activity and divert a significant waste.

10 RECYCLING BY SECTOR

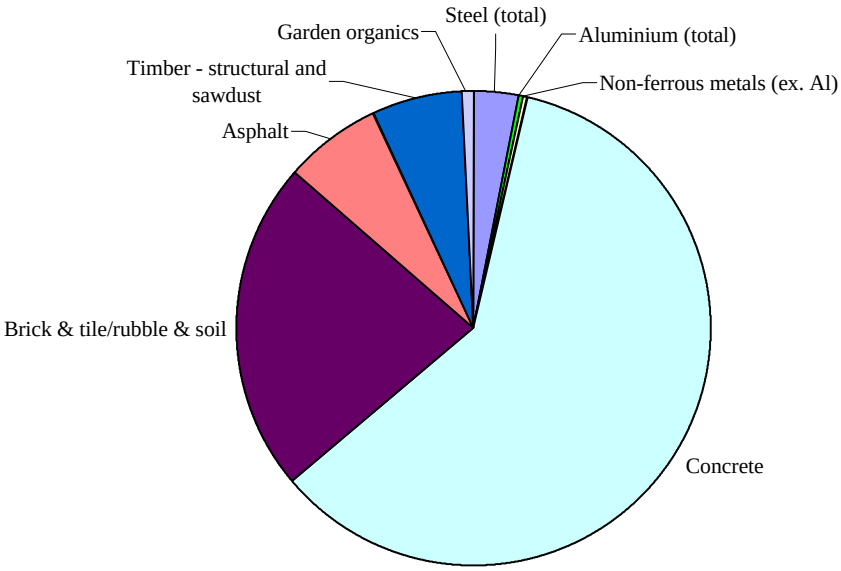
Australia waste is commonly grouped in the sectors Domestic, Commercial and Industrial, Construction and Demolition. Some materials are recovered purely from one of these sectors while most are drawn from the waste stream across two or all of these sectors. An estimate is therefore required for each material. For example, newsprint may be identified as coming 95% from domestic sources and 5% from C&I (offices, airports, and retail).

Based on this study of South Australian recycling, the following recycling by sector is established.

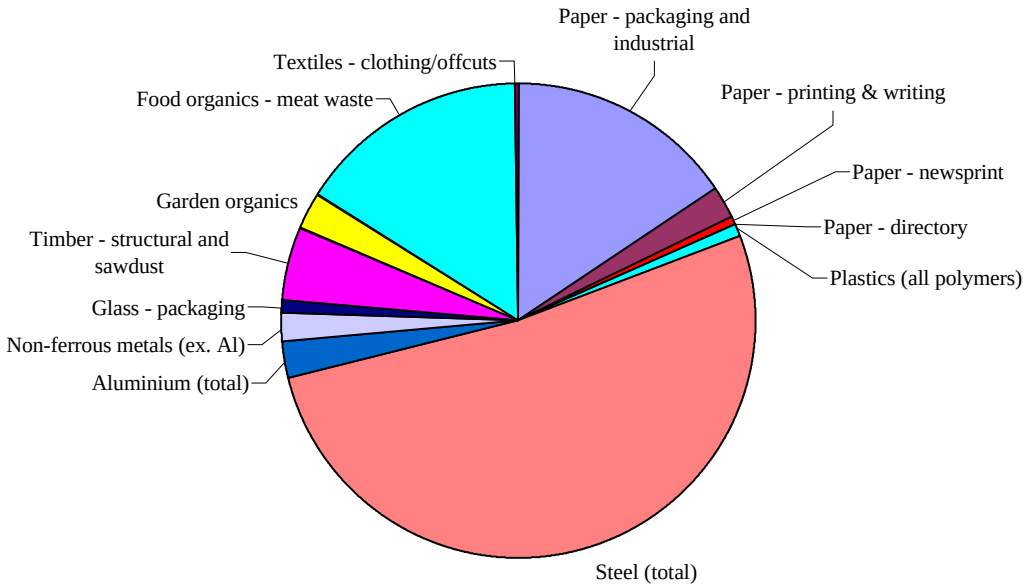
Sector Breakdowns by % Mass



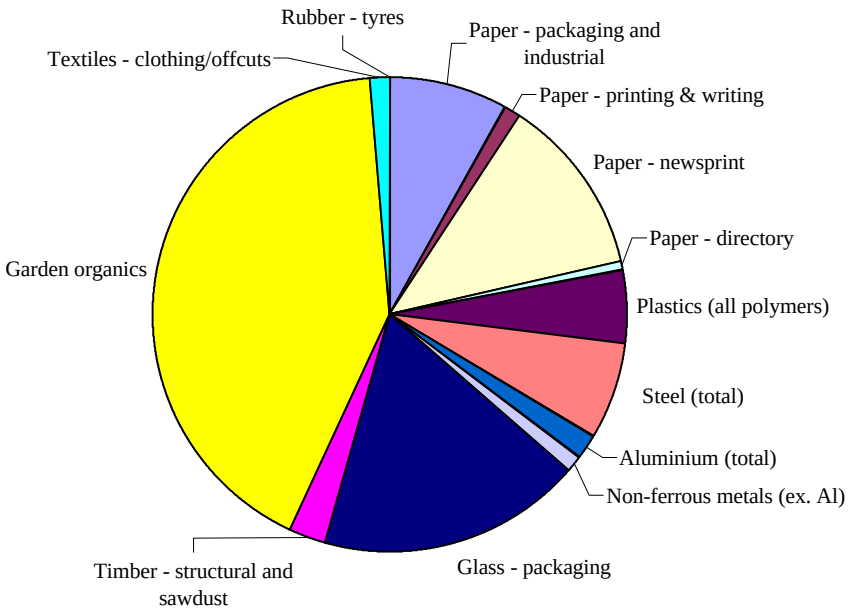
C&D Waste - Recovered Materials Breakdown by Mass



C&I Waste - Recovered Materials Breakdown by Mass



Domestic Waste - Recovered Materials Breakdown by Mass



11 CONCLUSIONS

11.1 Recycling Activity

The estimated recycling activity in South Australia in 2003 across all material types is presented in Table 11.1.

Table 11.1: Estimated 2003 Recycling Activity in South Australia

Material	Type	Quantity (t)	Total Quantity	Estimate Degree of Accuracy
Paper and Cardboard	Packaging and Industrial	91 000		High (<5%)
	Newsprint	31 300		High (<5%)
	Telephone Directories	1 300		Moderate(<20%)
	Printing & Writing Paper	12 300	135 900	High (<5%)
Steel	Packaging	3 800		V High (<2%)
	Other	300 000	303 800	High (<5%)
Aluminium	Packaging	4 000		High (<5%)
	Other	15 000	19 000	High (<5%)
Other non ferrous metals			13 000	High (<5%)
Garden Organics		127 000		Moderate(<20%)
Food Organics	Meat waste	74 000	201 000	Moderate(<20%)
Plastics	All polymers		15 000	V High (<2%)
Glass	Packaging		46 000	V High (<2%)
C&D wastes	Concrete	875 000		Moderate(<20%)
	Bricks, rubble & soil	327 000		Moderate(<20%)
	Asphalt	100 000		Moderate(<20%)
	Timber	116 000	1418 000	Moderate(<20%)
Textiles	Clothing offcuts		4 000	High (<5%)
Rubber	Tyres		100	V High (<2%)
Total Quantity			2 155 800	

The diversion and recycling of over 2.1 million tonnes of material, that would otherwise go to landfill and become lost resource, is an astounding achievement. This is particularly remarkable when it is compared to the total of waste sent to landfill of 1 161 327 tonnes in 2003/04. This gives South Australia an estimated waste diversion rate of 65%.

The large quantity of C&D materials (1.4 million tonne) dominate the overall recycling activity. South Australia has amongst the largest and most advanced processing sites in Australia handling this material.

Beyond C&D materials, there are also equally impressive results for other materials. A combined total of 192 000 tonnes of organic material is recovered and processed.

A further 335 000 tonnes of ferrous and non-ferrous metals are being recycled, as are 136 000 tonnes of paper and cardboard. In addition, South Australia has high recycling rates for beverage packaging such as glass, plastic and aluminium.

Stockpiled material

An analysis of material stockpiled at the start and end of 2003 was made to identify if this had a significant impact on recycling activity levels.

For almost all materials, the amount stockpiled was minimal (less than 5% of annual volumes) and similar levels of material were held at the beginning and end of the year. The one material that is significantly stockpiled is asphalt. The volume held on site is not increasing year to year and stockpiling is used to manage the fluctuations between material in and market use. There is no material that is stockpiled due to market impediments.

11.2 Trends

Estimates of changes in the level of recycling activity, where available, are presented in Table 11.2.

Table 11.2: Trends in South Australia Recycling Activity

Material	Type	Year 2003 Quantity (t)	3-5 year trend up to 2003
Paper and Cardboard	Packaging & Industrial	91 000	Moderate increase
	Newsprint	31 300	Moderate increase
	Telephone Directories	1 300	Major increase
	Printing & Writing Paper	12 300	Moderate increase
Steel	Packaging	3 822	Moderate increase
	Other	300 000	Moderate increase
Aluminium	Packaging	4 000	Moderate increase
	Other	15 000	Moderate increase
Other non ferrous metals	Lead, brass, copper, others	13 000	Moderate increase
Organics	Garden	127 000	Major increase
	Food (meat waste)	74 000	Moderate increase
Plastics	All polymers	15 000	Major increase
Glass	Packaging	46 000	Moderate increase
C&D wastes	Concrete	875 000	Major increase
	Bricks, rubble & soil	327 000	Major increase
	Asphalt	100 000	Major increase
	Timber	116 000	Major increase
Textiles	Clothing/ offcuts	4 000	Moderate increase
Rubber	Tyres	100	No increase

11.3 Destination

The end destination for reprocessing of recovered materials is shown in Table 11.3.

Table 11.3: End Destination for Reprocessing of Recovered Materials

Material	Type	Destination (%)		
		Within SA	Interstate	Export
Paper and Cardboard	Packaging and Industrial		40	60
	Newsprint		40	60
	Telephone Directories		100	
	Printing & Writing Paper		70	30
Steel	Packaging		100	
	Other	15	35	50
Aluminium	Packaging		100	
	Other		50	50
Other non ferrous metals			60	40
Garden Organics		100		
Food Organics	Meat waste	100		
Plastics	All polymers	65	10	25
Glass	Packaging	100		
Concrete		100		
Bricks, rubble & soil		100		
Asphalt		100		
Timber	Structural and sawdust	100		
Textiles	Clothing/ offcuts	50	50	
Rubber	Tyres		100	

11.4 Access and Inhibitors

In the coming years, the increased distances to landfill for much of Adelaide's waste should lead to further increases in these volumes. There is also further potential for increasing the recycling of all materials. This is particularly the case for materials such as rubber, printing and writing paper, food organics and plastics.

Paper and Cardboard

Reliance on Export Market

The South Australian market is used as a buffer market by Australian paper recyclers. As their needs rise and fall, export of South Australian paper is adjusted. This is a satisfactory arrangement unless the market in Australia and overseas both go into serious over supply. It appears that the global market for waste paper is now more reliable than in the early to mid 1990s and that unmanageable over supply is less likely.

Barriers and Opportunities

The vast majority of this waste paper is recovered through household collections. The lack of recycling collection container for all grades of paper in many South Australian municipalities impedes the recycling rate from households. To increase recovery from homes, the upgrading of kerbside recycling must continue together with down sizing of garbage bin capacity. It is noted that South Australia has the highest percentage of households with large garbage bins (240L) and no paper recycling container, of all capital cities.

There remains enormous potential to improve on the recycling performance from commercial sites (particularly for cardboard and printing and writing paper). These commercial sites include offices, railway stations, retail outlets and airports. A study of newsprint recycling in 2001 by Nolan-ITU for the PNEB showed that while commercial sites offered some potential for increased recycling, most of the remaining newsprint remained in the household garbage stream.

To improve the recycling performance of waste paper and cardboard from commercial sites a co-ordindated effort by both collection companies and waste generators is required to extend the number of sites serviced with a regular collection. Local Councils should also be encouraged to expand their kerbside recycling services to service small to medium commercial sites (some councils already do this) and this will result in an increased recycling of this material.

Plastics

Most SA plastics recyclers have capacity to reprocess higher volumes of some plastics if required. The volume of plastics going to export in China continues to grow but this is dependent on continued demand in this market.

Metals

There are no inhibiting factors on the market outlets for metals at this point. The new shredding facility currently being constructed by Smorgon Steel will enable an increased throughput by that company. The high export tonnes to China is dependent on the continued market demand in that country.

Glass

There is capacity for increased tonnes to be processed at the beneficiation facility and to be utilised at the glass manufacturing plant

C&D Wastes

It is anticipated that as distances to landfill increases in Adelaide the diversion of concrete for recycling will increase. The recovery of concrete should be a requirement of all construction and demolition projects for state and local government and for statutory authorities.

The closure of the Wingfield Waste Management Centre is likely to result in an increased level of concrete, brick rubble and asphalt diversion and recycling, as will the continued expansion in rural and regional centres.

Organics

New processing facilities are being developed in Adelaide and this will ensure adequate processing capacity is available for garden organics. Trials are commencing in South Australia and other state for the incorporation of food organics into kerbside organics collections. This has been shown to push the potential diversion rate from households to 80%.

Other

All tyres recovered are shipped to Victoria as there is no processing outlet in South Australia. The recycling rate of used tyres would increase significantly if there was a tyre reprocessing outlet in South Australia.

Adelaide Brighton Cement is currently taking small quantities of timber as fuel and offers a strong market prospect for tyre recycling.

12 REPORT LIMITATIONS

This report has been prepared in accordance with an agreement between ZeroWaste SA and Nolan-ITU.

The services performed by Nolan-ITU have been conducted in a manner consistent with the level of quality and skill generally exercised by members of its profession and consulting practices.

This report is solely for the use of ZeroWaste SA and any reliance of this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties or for other uses. This report shall only be presented in full and may not be used to support any other objectives than those set out in the report, except where written approval with comments are provided by Nolan-ITU.