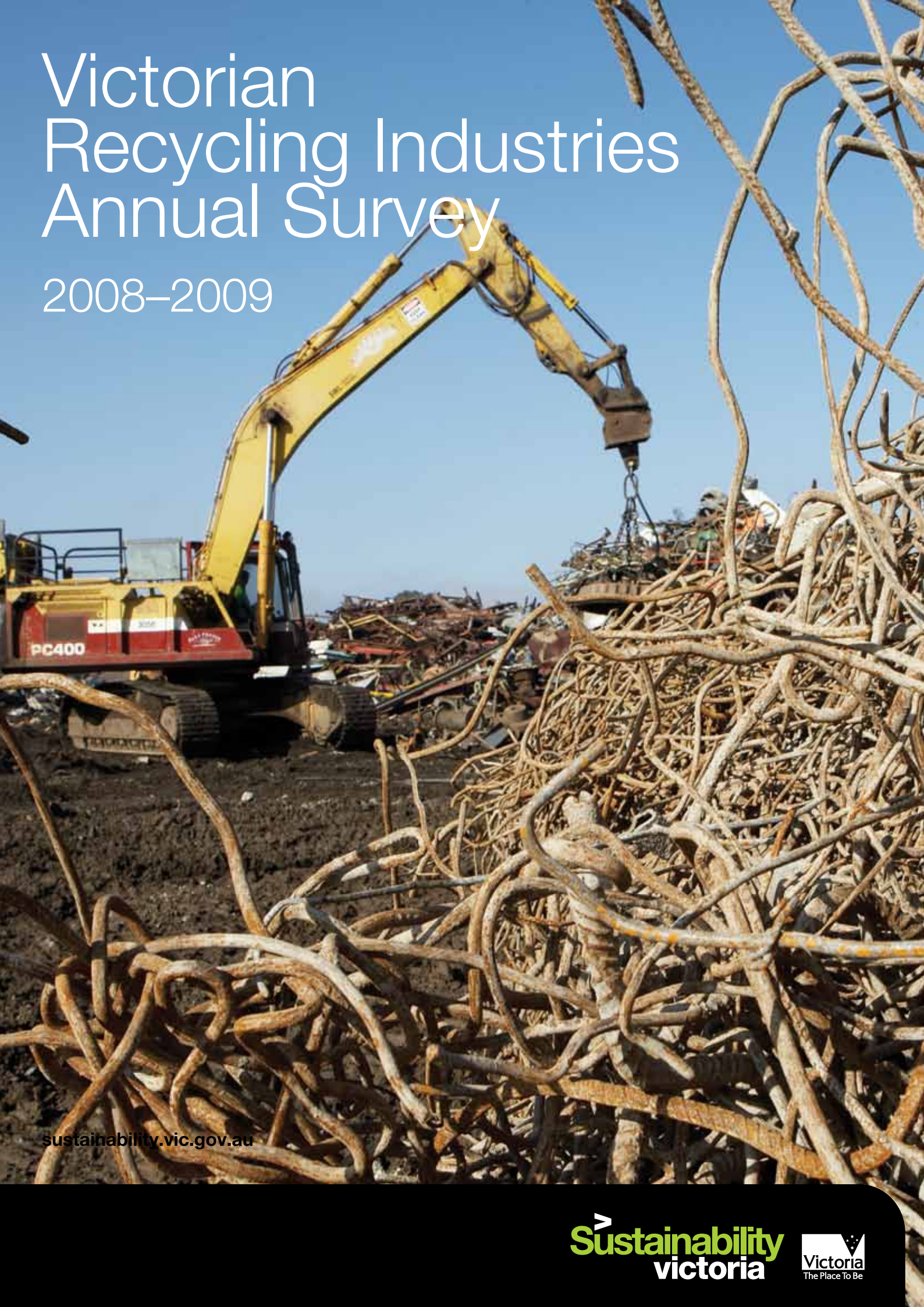


Victorian Recycling Industries Annual Survey

2008–2009



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Executive Summary

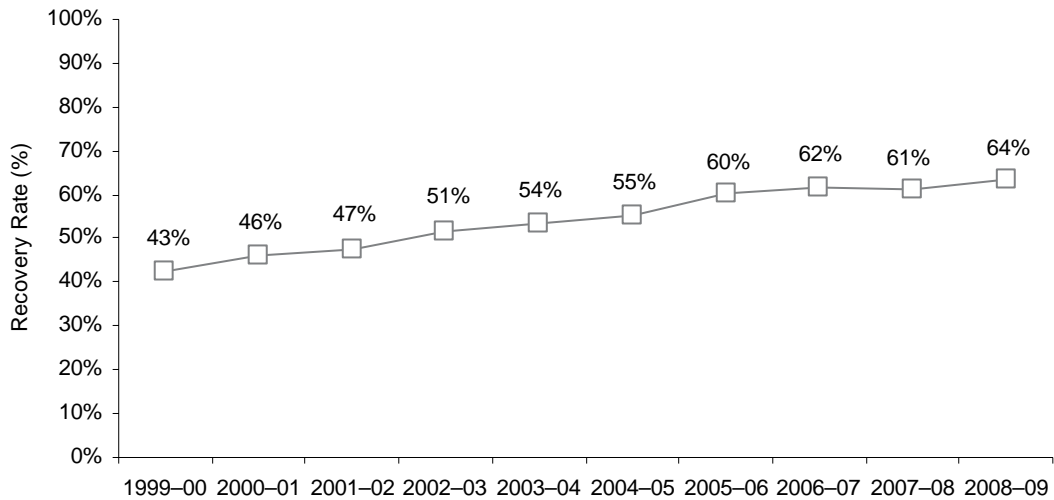
- > Recovery of material in Victoria for the 2008–09 financial year increased by 4% to 6.56 million tonnes. This increase came after a decrease in material recovery in the 2007–08 financial year, the first decrease since the 1999–00 period. Solid waste being disposed to Victorian licensed landfills decreased to 3.74 million tonnes, down almost 7% on the previous year (see Figure 1).

Figure 1 Waste Generation, Victorian 1999–00 to 2008–09



- > Victoria's recovery rate increased by three percentage points from 61% to 64% in 2008–09 (see Figure 2).

Figure 2 Resource recovery rate of solid waste, Victoria 1999–00 to 2008–09



> Main material increases

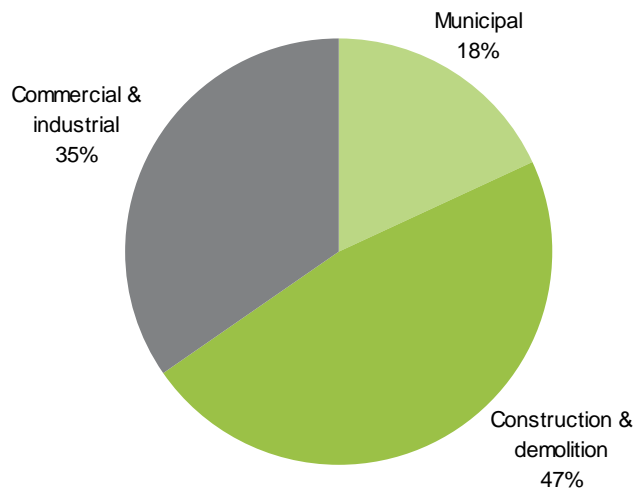
- The total quantity of organic waste material recovered and diverted from landfill in Victoria during the 2008–09 financial year increased to approximately 802,000 tonnes, up 33% from the previous year. Garden organics continues to make up the majority of organic waste material recovered. The large increase in organics recovery is not as noteworthy as the figures suggest as it can mostly be attributed to not receiving a survey response last year from a large recycled organics reprocessor.
- Victoria is still the leading Australian state in plastics recovery, due primarily to the recycling of large amounts of pre-consumer industrial manufacturing scrap. Plastics recovery in Victoria has increased by 21% to almost 144,000 tonnes for the 2008 calendar year.
- Recovery of construction and demolition waste material during 2008–09 increased by 4% to 3.15 million tonnes with concrete continuing to account for the majority of this material (55%).
- The total amount of waste paper recovered for recycling in Victoria increased by 19% to around 1.13 million tonnes. Export of paper / cardboard waste continues to increase, up 7% from the previous year.
- Glass containers (bottles and jars) and mixed glass waste constituted the majority of glass recovered at 90% of the total glass recovery which increased by 7% to almost 186,000 tonnes in 2008–09.

> Main material decreases

- Victorian metal waste recovery decreased to around 1.1 million tonnes in 2008–09, a decrease of 19% from 2007–08. The large decrease in metal recovery for reprocessing locally can be attributed to a significant drop in metal prices in late 2008.

> Of the material received for reprocessing during the 2008–09 financial year 82% was sourced from industry (commercial and industrial and construction and demolition) (see Figure 3).

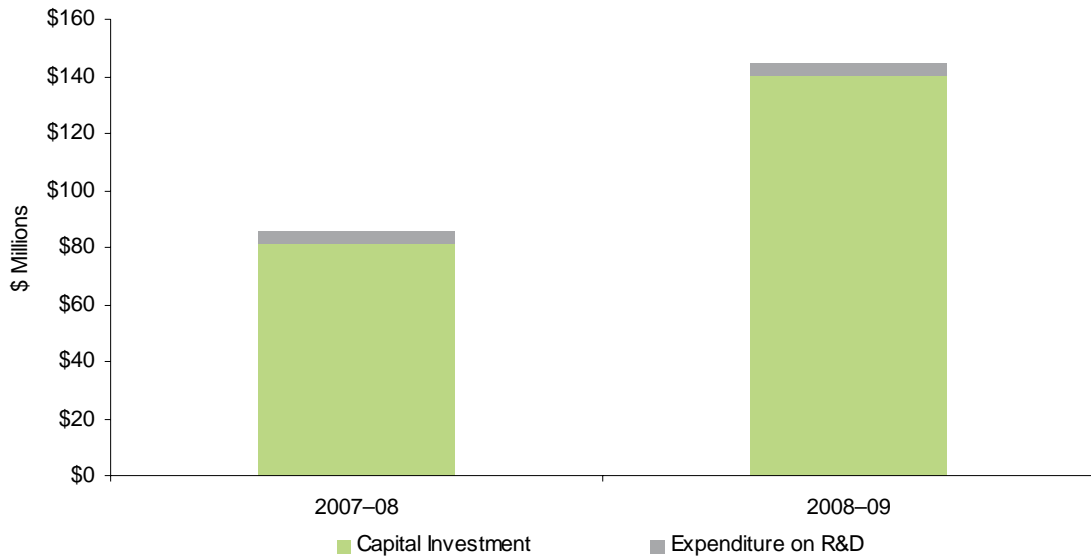
Figure 3 Sectors of secondary-use materials (by weight) received for reprocessing excluding imports, Victoria 2008–09



> Victoria's current reprocessing capacity is predominantly local, with 86% of waste material recovered in 2008–09 remaining in Victoria to be converted into new products by Victorian reprocessors. The remainder was exported interstate or overseas for reprocessing.

- > Life cycle Analysis (LCA) modelling¹ has shown the environmental benefits from reprocessing all material recovered in Victoria during 2008–09 would be equivalent to:
 - saving more than 75 million gigajoules of energy
 - preventing 3.5 million tonnes of greenhouse gases being emitted into the atmosphere
 - saving 50 thousand megalitres of water
- > Victoria's reprocessing industry reported contributing more than \$144 million to the state's economy during 2008–09 through capital investment and expenditure on research and development (R&D) (see Figure 4).

Figure 4 Level of capital investment and expenditure on R&D by Victoria's reprocessing industries, Victoria 2008–09



¹ RMIT University, Centre for Design, *Life Cycle Impact Data for Resource Recovery from C&I and C&D Waste in Victoria*, September 2005

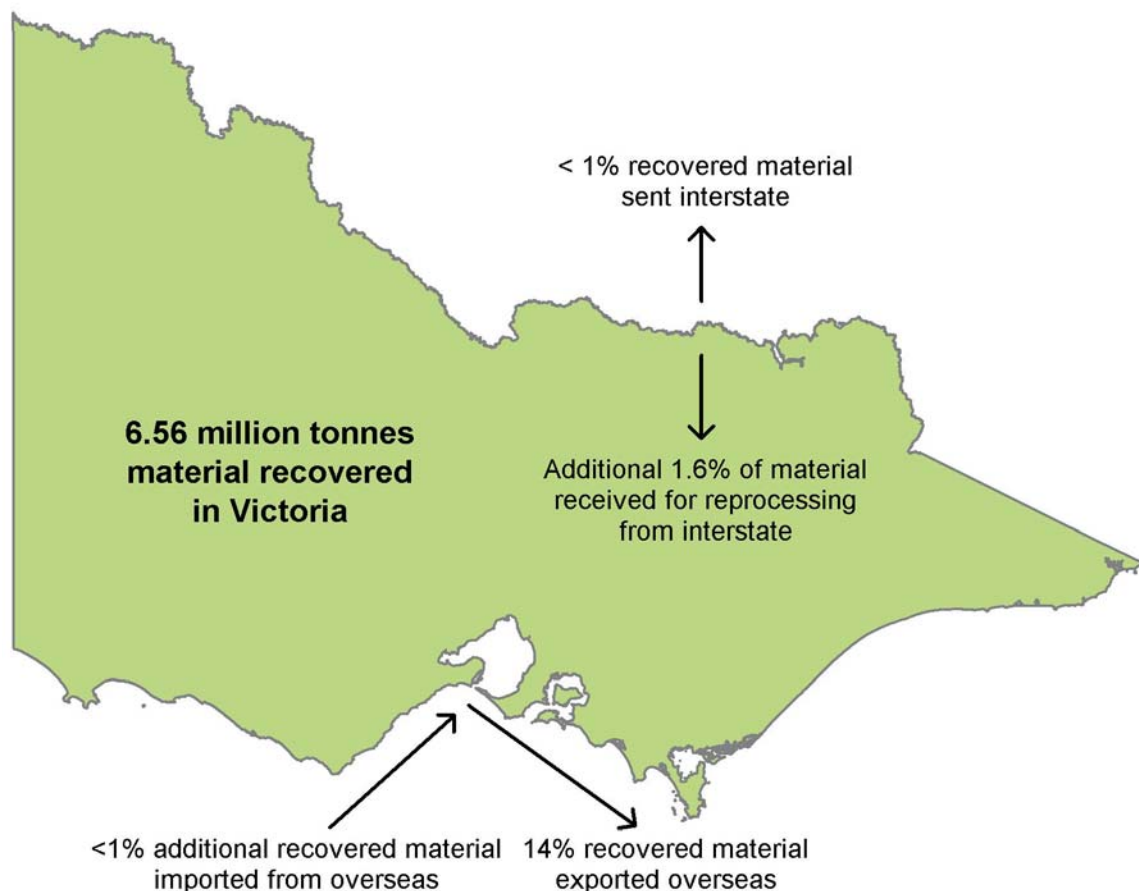
Introduction

As part of Sustainability Victoria's ongoing data collection and performance management program, information is collected annually on the Victorian reprocessing industry via a voluntary survey. Victorian reprocessors of secondary-use materials report on their reprocessing activities over the financial year for a number of purposes, including to:

- > monitor the performance of Victoria's recycling industry (reprocessors of waste materials) and material diversion from landfill each year and over time
- > provide an understanding of the current and historical state of waste material recovery and reprocessing across a number of sectors and material types
- > demonstrate the importance of the reprocessing industry to the Victorian economy
- > measure the performance of Victorian Government strategies
- > communicate the achievements of industry to government, business and the community
- > demonstrate the benefits of recycling

Recycling and reprocessing are well established activities in Victoria. The reprocessing industry recovers a wide range of recyclable materials from the waste stream for conversion into new products. Recovered waste materials are generated mostly from within Victoria with a small amount received from interstate. While Victoria's current reprocessing capacity is predominantly local, some waste material is exported interstate or overseas for reprocessing (see Figure 5).

Figure 5 Flow of waste material for reprocessing, Victoria 2008–09



Waste materials are sourced from three sectors: construction and demolition (C&D), commercial and industrial (C&I) and municipal. The primary reprocessing industries in Victoria are:

- > smelters of aluminium and steel
- > crushing plants and auxiliary screening of concrete, brick, asphalt and related materials
- > paper/cardboard and de-inking pulp mills
- > composting facilities
- > glass product producers
- > rubber product manufacturers
- > plastics converters

These and other reprocessing operations contribute to the Victorian economy in terms of employment and investment and also generate environmental benefits for the state. Reprocessing reduces greenhouse gases, saves water and energy, cuts air pollution and conserves resources and landfill space.

The survey commenced in August 2009 and sought data from 90 Victorian reprocessors, excluding 36 plastic reprocessors surveyed by Hyder Consulting as part of the *2009 National Plastics Recycling Survey*². A total of 72 reprocessors provided data for the survey (excluding plastics reprocessors), representing an 80% response rate. It is estimated that the 72 respondent reprocessors recover over 90% of the material recovered in Victoria by weight.

Sustainability Victoria has sought to verify information provided in survey returns with individual reprocessors where required however Sustainability Victoria is not in a position to validate underlying data in this report. Findings in this report are therefore subject to the accuracy of data provided by individual reprocessors. As such, care should be taken when comparing historical data. For more information on the survey approach, please refer to the detailed methodology in Appendix A.

² Hyder Consulting (2009), *2009 National Plastics Recycling Survey*, report to the Plastics and Chemicals Industries Association

Total waste material recovered for recycling

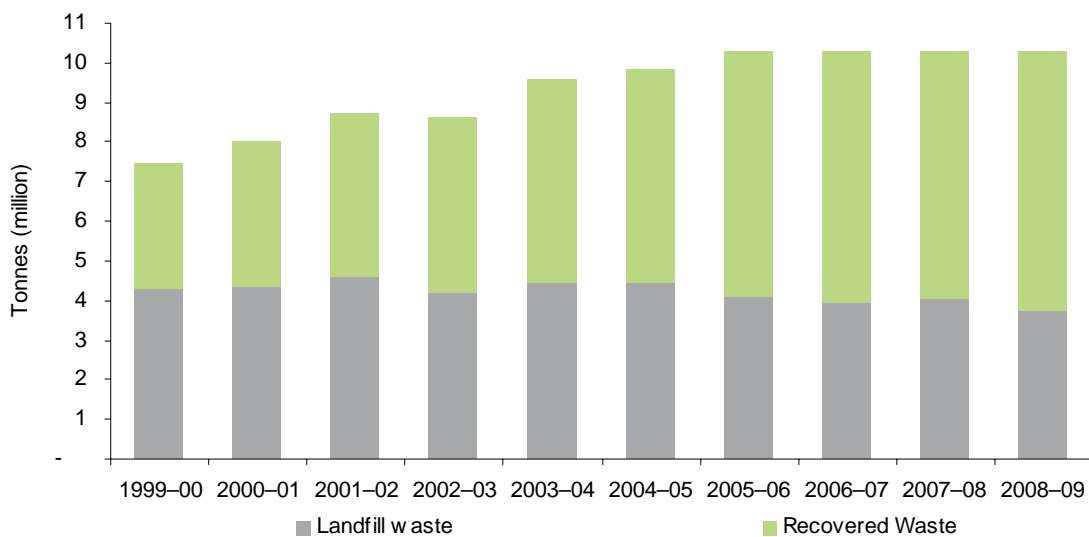
Recovery and trends

In 2008-09 there were lower external demands for goods, falling asset prices, tighter credit conditions and lower business and consumer confidence, all of which affected Australia's and Victoria's economic growth.

This marked the end of the commodity price boom that began in 2003. In the resource recovery sector prices for some materials like steel and cardboard dropped to a 20 year low. In some cases, the cost to collect materials was greater than the price of the materials, which led to a reduction in the amounts of materials recovered.

Despite this challenging economic climate, Victoria increased its diversion of waste material from landfill for reprocessing for the 2008-09 financial year from 6.28 to 6.56 million tonnes (see Figure 6). This represents an increase of approximately 4% on the previous financial year. Solid waste being disposed to Victorian licensed landfills decreased to 3.74 million tonnes³, down almost 7% from 4.01 million tonnes (see Figure 6). While recovery for recycling is an important element in sustainable resource use, and is helping to reduce the amount of waste disposed to landfill, the overall trend is still one of increasing overall waste generation⁴.

Figure 6 Waste Generation, Victorian 1999-00 to 2008-09



³ Text as stated by the EPA: The figure represents the amount of waste accepted at licensed Victorian landfills, excluding material used as cover. The *Environment Protection Act 1970* provides a rebate for cover material of 15% (at the relevant municipal rate) for each tonne of waste deposited at a landfill. The figures shown above were calculated by taking the tonnes of material received at landfills (including cover material sourced off site) and reducing this by 15% to allow for cover material. It is noted that some landfills source cover material on-site (e.g. from quarrying activities) and that this is not measured in the tonnes of waste received at landfills. Where landfills have claimed a recycling rebate, this has been subtracted from the figures. Prescribed waste (including low level contaminated soil) deposited to landfill, including where used as cover, is not included in the above figures.

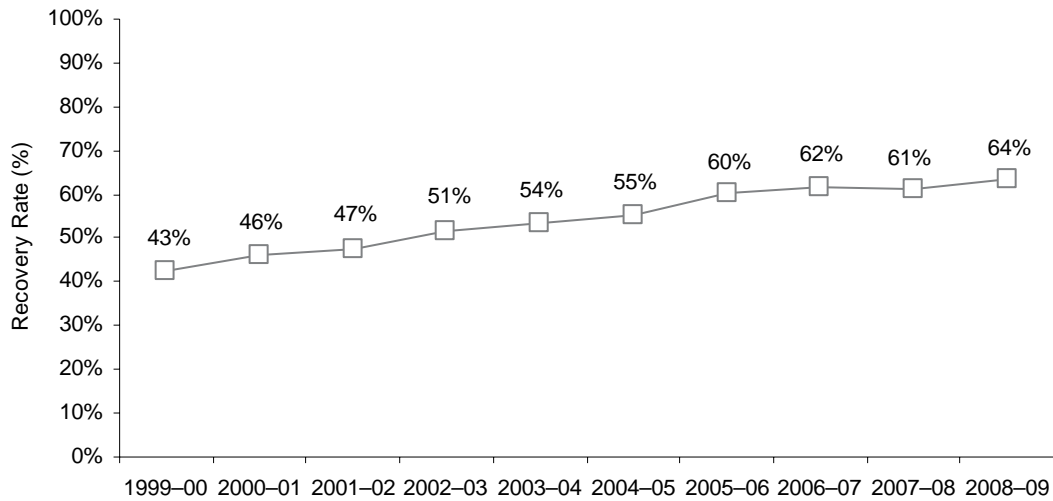
Waste resulting from the Black Saturday bushfires has not been included in this data, as the Government waived the landfill levy for this waste.

A number of reviews of landfill levy returns are currently being undertaken and therefore this data may be subject to change

⁴ Generation data is the sum of waste disposed to landfill and materials recovered from the waste stream for reprocessing.

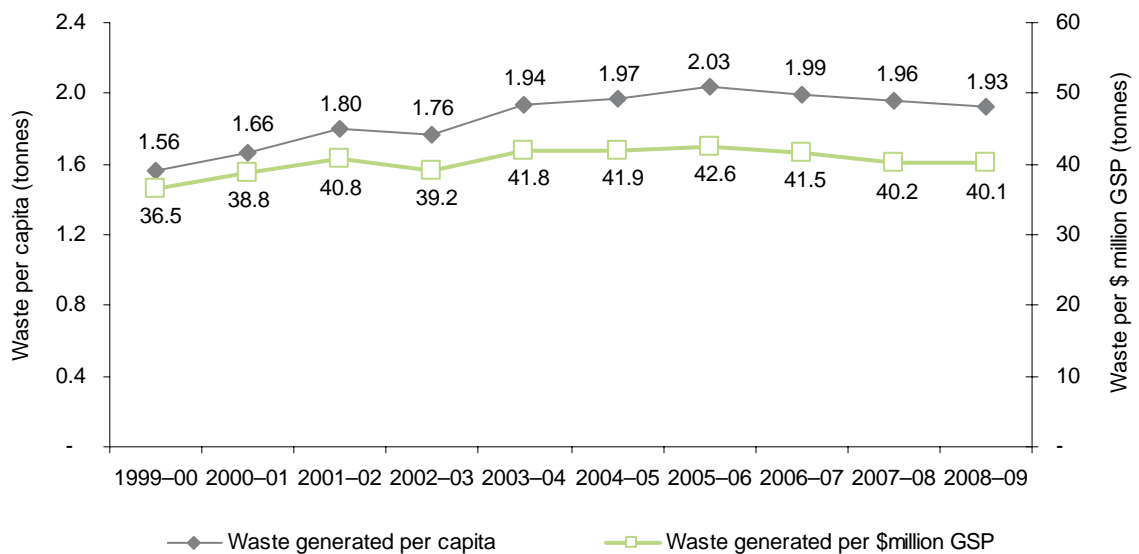
The increase in recovered material and the reduction in waste material being sent to landfill resulted in an overall resource recovery (recycling) rate⁵ of 64% for 2008–09 (see Figure 7).

Figure 7 Resource recovery rate of solid waste, Victoria 1999–00 to 2008–09



In the 2008–09 financial year, waste generation per capita remained below two tonnes after a peak in 2005–06. This means that on average each person⁶ in Victoria generated 1.93 tonnes of which 1.23 tonnes were recovered (see Figure 8). Waste generation relative to Gross State Product (GSP) also decreased for the third consecutive year down to 40.1 tonnes for every million dollars of GSP (see Figure 8).

Figure 8 Total waste generation relative to economic and population trends, Victoria 1999–00 to 2008–09



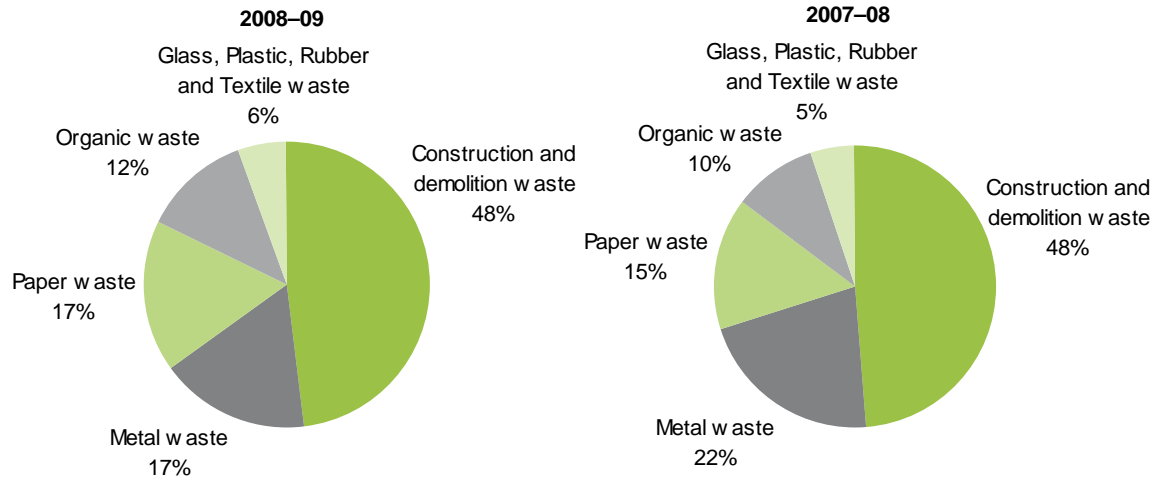
Note: projected figures for GSP and population reported in previous years have been rebased with updated information.

⁵ Resource recovery rate is calculated by dividing the quantity of material recovered for reprocessing by the quantity of waste generated, expressed as a percentage. Waste generated is the sum of waste disposed to landfill and materials recovered from the waste stream for reprocessing.

⁶ Based on the Victoria in Future projections 2008 – Population projections, Department of Planning and Community Development

The composition of waste material recovered in Victoria for reprocessing in the 2008–09 financial year is presented below in Figure 9. At 48% of total recovery (by weight), construction and demolition waste accounted for the greatest proportion of material recovered for reprocessing, the same proportion of total recovery as the previous year.

Figure 9 Composition of material (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08



A summary of waste material recovered in Victoria for reprocessing during the 2008–09 financial year is presented below in Table 1. Historical recovery data tonnages covering the past 10 years for each waste material type are presented in Appendix B.

Table 1 Waste material recovered for reprocessing, Victoria 2008–09 and 2007–08

Waste material	Total recovery in	Total recovery in	% Change on previous year
	Victoria 2008–09	Victoria 2007–08	
Tonnes ('000)			
Construction and demolition waste	3,155	3,047	4%
Metal waste	1,097	1,350	-19%
Paper / cardboard waste	1,132	954	19%
Organic waste	802	605	33%
Glass waste	186	174	7%
Rubber waste	37	26	42%
Textile waste	4	3	9%
Plastic waste	144	119	21%
Total waste	6,556	6,278	4%

Note: Percentage change on previous year has been based on actual figures rather than the rounded figures shown above

The recovery of construction and demolition waste materials increased in 2008–09 to over 3.15 million tonnes. Victorian metal waste recovery decreased by 19% or about 250,000 tonnes on the previous year's figure to a total just above one million tonnes. Recovery of both paper and glass increased in 2008–09 by 19% and 7% respectively. Organic waste material recovered in Victoria during the 2008–09 financial year jumped to approximately 802,000 tonnes, up 33% from the previous year. Information and explanations for changes in recovery levels for each of the waste material categories listed above are provided in later sections of this report.

Sources of recyclables

Excluding tonnages received from imports where the source sector is unknown, just under half of the waste materials received for reprocessing during the 2008–09 financial year were sourced from the construction and demolition (C&D) sector (see Figure 10). The combined industry sectors (commercial and industrial and construction and demolition) accounts for 82% of the waste material received for reprocessing in Victoria, down one percentage point from last year's figure of 83%. Recovery through these two sectors continues to reflect the recognised gains to business of recycling, particularly where large, homogenous streams of waste materials are available such as concrete, steel and cardboard.

Figure 10 Sectors of secondary-use materials (by weight) received for reprocessing, excluding imports, Victoria 2008–09 and 2007–08

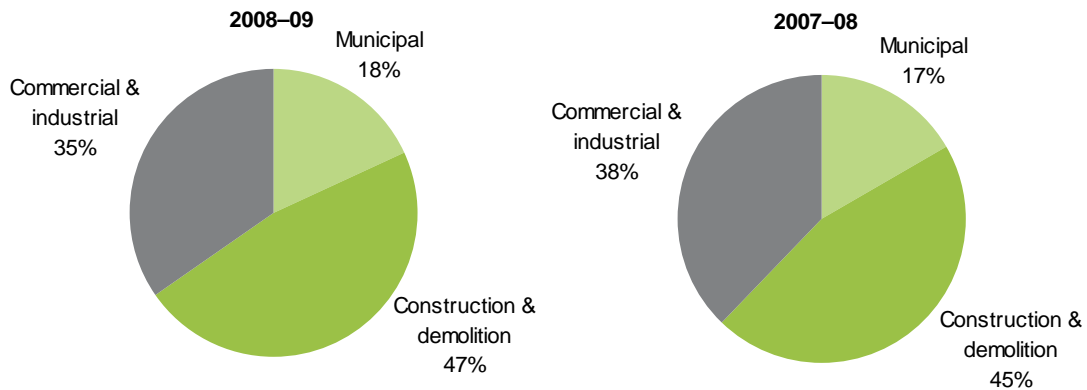


Table 2 details the tonnes of waste material recovered in Victoria for reprocessing from each source sector and waste material imported for reprocessing from interstate and overseas.

Table 2 Source sectors of waste material received by reprocessors, Victoria 2008-09

Waste material	Recovered from Victoria			Recovered from interstate & overseas
	Municipal	Commercial & industrial	Construction & demolition	Imports
Tonnes ('000)				
Construction and demolition waste	114	169	2,872	-
Metal waste	194	710	194	51
Paper / cardboard waste	284	848	-	38
Organic waste	369	396	37	7
Glass waste	161	25	-	-
Rubber waste	1	36	< 1	9
Textile waste	2	2	-	-
Plastic waste	51	89	4	9
Total waste	1,177	2,272	3,107	114

Note: Figures reported for the material received by source sector have been extrapolated to include the relative proportions derived from reported data and applied to surveys that did not provide a source sector for the different material types and the export data from the Australian Bureau of Statistics. These proportions were not applied to imports. Figures reported in the table have been rounded to the nearest thousand and individual columns may not add up to totals reported in total waste

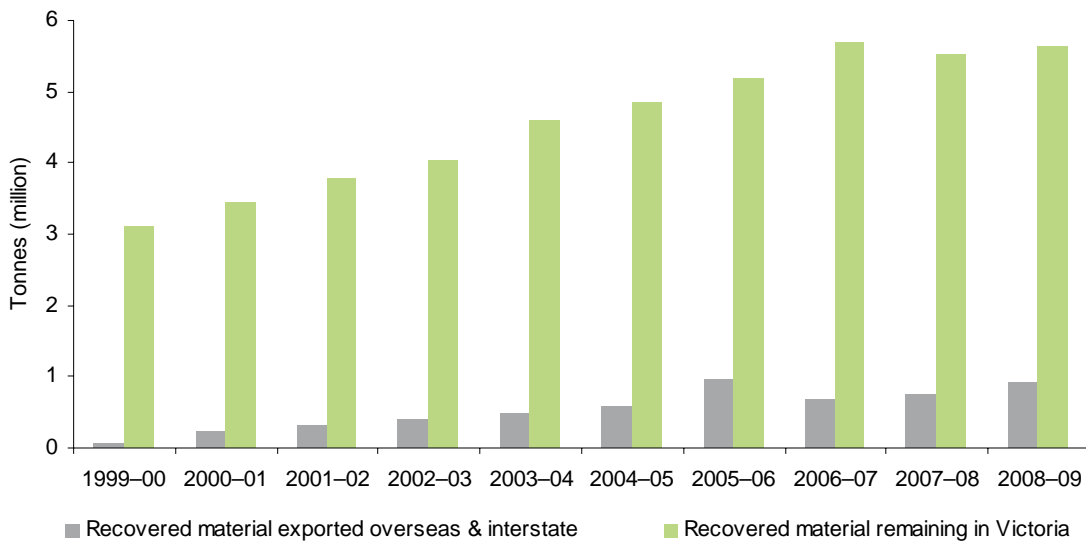
Reprocessing and exports

The survey results enable comparison between the quantity of waste material recovered for reprocessing locally in Victorian plants compared to that exported interstate or overseas for reprocessing. While exporting waste materials for reprocessing overseas is a growing industry, Victoria's current resource reprocessing capacity is still predominantly local (see Figure 11). The key waste materials exported are scrap metals, waste paper and plastics. These materials are globally traded commodities used in recycling operations worldwide.

During the 2008–09 financial year over 5.6 million tonnes of waste material recovered remained in Victoria to be reprocessed in Victorian plants. This represents an increase of 2% from the previous financial year of 5.5 million tonnes and accounts for 86% of all material recovered.

Waste material exported for reprocessing increased by 21% to almost 928,000 tonnes in 2008–09. This brings the amount exported for reprocessing close to that exported in 2005–06 (946,000 tonnes), the most exported since the survey started in 1999–00 (see Figure 11).

Figure 11 Waste material reprocessed in Victorian plants and exported overseas or interstate, Victoria 1999–00 to 2008–09



Product markets

Recovered waste materials, once they are reprocessed, are directed into different markets depending on the stage of life of that product.

Products from reprocessed waste materials such as metals and rubber are generally sold into the manufacturing industry, not as end products but for remanufacturing into a variety of other products.

Recovered glass and paper are generally remanufactured back into glass and paper.

Products such as those produced from construction and demolition waste material are generally considered end products and directed back into the construction industry for a range of different applications. This includes using recycled concrete, brick and rubble in constructing low-grade roads and pavements and as a substitute for virgin material used for sub-base.

Organic waste is processed at licensed facilities where it is turned into composted soil conditioner and mulch products. Often these materials are then blended with other soil products to be sold by nurseries or used in the landscaping industry. Increasingly, recycled organic products are being used in high value applications such as intensive horticulture and viticulture.

Plastics that are recovered from the waste stream for recycling are reprocessed into a large range of valuable materials, with applications for recycled plastics continually growing in Australia. The *National Plastics Recycling Survey 2009* listed the main products derived from Australian plastics reprocessing operations, as shown in Table 3.

Table 3 Summary of end-products for reprocessed plastics

Plastics ID code	Polymer	Major uses
1	PET	Beverage bottles
2	HDPE	Film, blow moulded containers, pipes
3	PVC	Pipe, floor coverings
4	L/LLDPE	Film (incl. builders & agricultural film, concrete lining, freight packaging, garbage bags, shopping bags), agricultural piping
5	PP	Crates, boxes and plant pots
6	PS	Bar chairs and industrial spools
6	EPS	Waffle pods for under slab construction of buildings
7	ABS/SAN	Injection moulded products
7	Polyurethane	Carpet underlay
7	Nylon	Injection moulding compound
7	Other and mixed	Agricultural piping

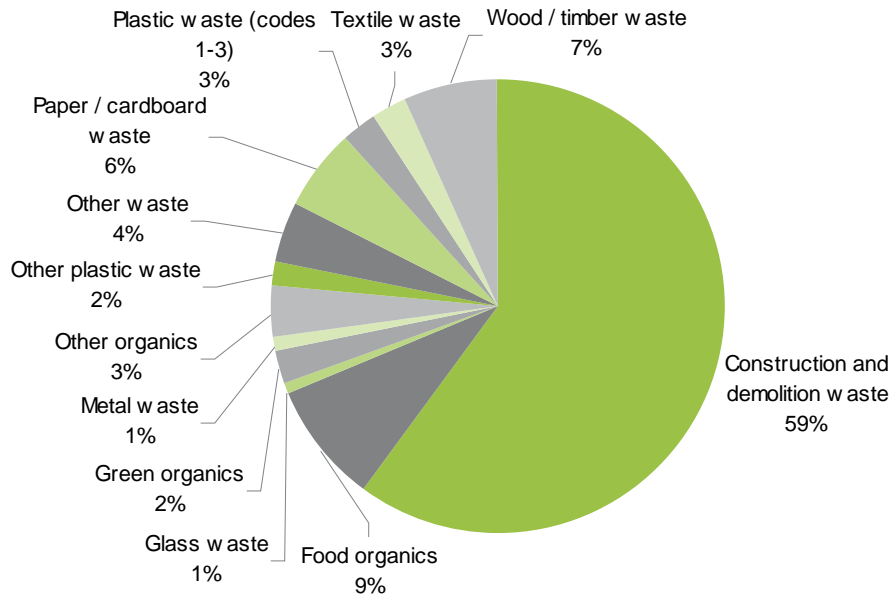
Source: Hyder Consulting (2009), *2009 National Plastics Recycling Survey*, report to the Plastics and Chemicals Industries Association

Composition of waste material sent to landfill

In May 2005, Sustainability Victoria commissioned a series of disposal based surveys of landfills in metropolitan and regional Victoria⁷. The project was designed to provide a profile of materials being disposed to landfill and to support the *Towards Zero Waste Strategy*.

The results from the audits indicate the following proportions (by weight) of the composition of various broad categories of material disposed to landfill (see Figure 12). Fifty nine percent of all material recorded from the disposal based waste survey was composed of construction and demolition waste. Food organics was the next largest category with 9% of the total.

Figure 12 Composition of waste to landfill (by weight), Victoria 2005



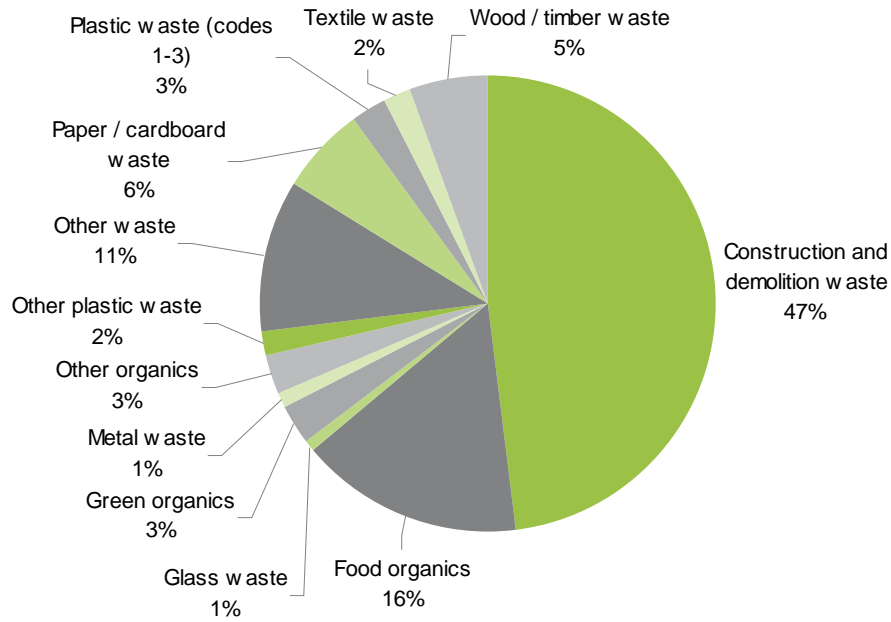
Note: Composition chart excludes prescribed waste; rebated cover material of 15% (clean fill) for each tonne of waste deposited at a landfill; domestic kerbside collections; and private loads from householders.

The disposal based waste survey did not include waste material from domestic kerbside collections and as such the food organics component is under reported. Information from recent bin audits⁸ undertaken by a number of local governments in 2008 indicate that food organics may be as high as 40% of the total waste disposed through kerbside collection. Figure 13 represents the additional composition of waste from domestic kerbside collections added to the total material of waste to landfill. The additional composition from domestic kerbside collections has almost doubled the relative proportion of food organics in the landfill waste stream from 9% to 16%.

⁷ Disposal Based Waste Survey 2005, Sustainability Victoria

⁸ Kerbside garbage composition: recent findings, sustainability Victoria

Figure 13 Composition of waste to landfill (by weight) including estimates from recent bin audits on domestic kerbside collection, Victoria 2005



Note: Composition chart excludes prescribed waste; rebated cover material of 15% (clean fill) for each tonne of waste deposited at a landfill; and private loads from householders. Included is information from recent bin audits (*Kerbside garbage composition: recent findings*, Sustainability Victoria) undertaken by a number of local governments in 2008 and applied to the domestic kerbside collection tonnages.

Environmental benefits of resource recovery

The recycling industry is making a substantial contribution to the improvement of our environment by cutting greenhouse gas emissions and delivering significant energy and water savings, as well as conserving non-renewable virgin resources.

Some of the greatest environmental benefits of recycling are in the conservation of energy and natural resources and the prevention of pollution when recycled material, rather than raw material, is used to make a new product. Manufacturing materials the second time around is much cleaner and less energy-intensive than when using raw materials.

Life cycle analysis (LCA) modelling⁹ has shown that by substituting secondary-use materials for virgin materials the environmental benefits from reprocessing all material recovered in 2008–09 would be equivalent to:

- > Victoria saving more than 75 million gigajoules of energy
- > preventing more than 3.5 million tonnes of greenhouse gases being emitted into the atmosphere (equivalent to taking 588,000 cars off the road)
- > saving 50,000 megalitres of water (enough to fill almost 20,000 Olympic-sized swimming pools)

Despite the increase in the amount of waste material recovered in 2008–09, environmental benefits in energy and greenhouse gas are lower than 2007–08 levels. This is mainly due to the decrease in recovery of metals as metal recycling reduces cumulative energy demand and global warming.

There was an increase in the amount of water saved due to an increase in recovery of paper and cardboard. Water savings are achieved by avoiding the production of virgin fibre pulp, traditionally a water intensive process.

Increased organics collection and composting reduce greenhouse gases by reducing methane emissions from landfills.

By reducing air and water pollution and saving energy, recycling offers an important environmental benefit: it helps to improve air and water quality and reduces emissions of greenhouse gases that contribute to global climate change.

⁹ RMIT University, Centre for Design, *Life Cycle Impact Data for Resource Recovery from C&I and C&D Waste in Victoria*, September 2005

Metal waste

Recovery and trends

Victorian metal waste recovery reached almost 1.1 million tonnes in 2008–09. This represents a decrease of 19% or about 250,000 tonnes from 2007–08. This is despite an increase of 37% in metal waste exported overseas to almost 450,000 tonnes. The large decrease in metal recovery for reprocessing locally can be attributed to a drop in metal prices in late 2008 to their lowest levels in 20 years. Information received suggests that the reduced metal prices did not cause an increase in metal waste being sent to landfill but resulted in the reprocessors reducing the amount of scrap metal they received, which forced collectors and generators of scrap metal to hold onto their metal waste until prices improved. Metal recovery is considered to have the highest recovery rate of all the material categories due to its high value as a resource.

Figure 14 below shows that Steel (including packaging steel) made up the greatest proportion of metal waste recovered up 12 percentage points to 82%. This increase is attributed to the reporting of the Other & mixed metal waste category which went from less than 1% in 2006–07 to 15% in 2007–08 and then back down to less than 1% for the current reporting year. The Aluminium (incl. cans), Batteries, and Non-ferrous metals categories remained proportionally consistent to the previous year.

Figure 14 Composition of metal wastes (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08

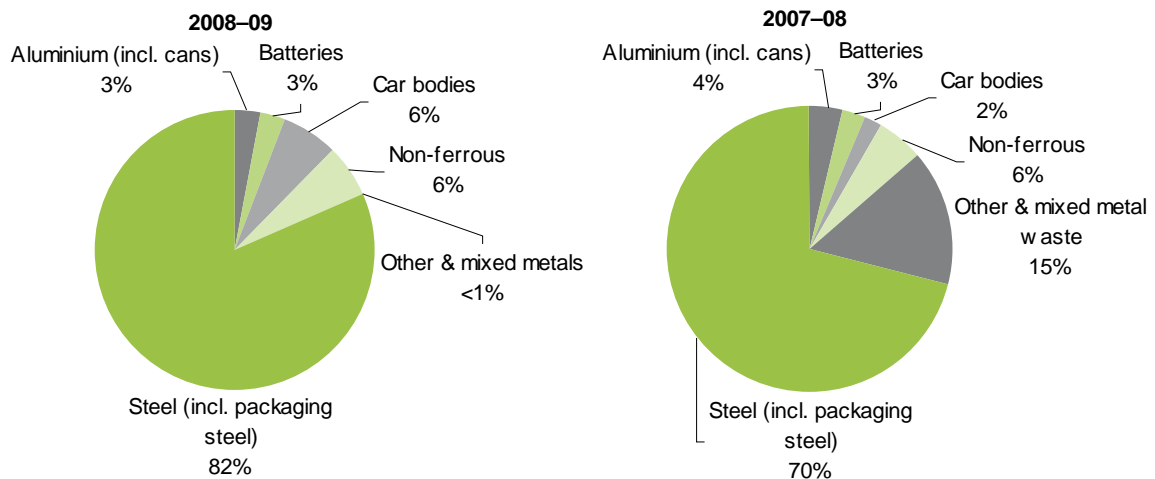
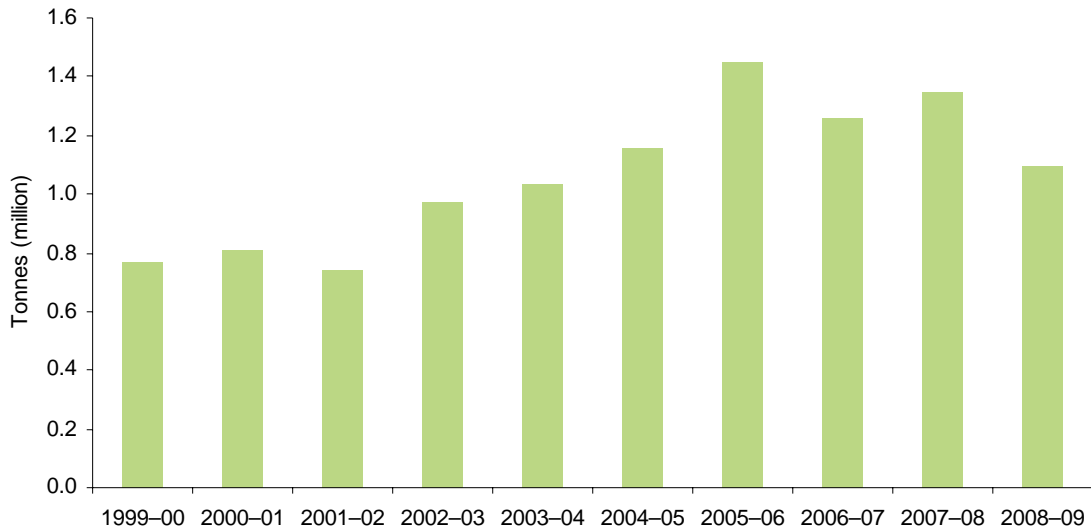


Figure 15 shows that overall the domestic and export markets for recyclable metals had been increasing over the previous six years until 2008–09, with a spike in 2005–06 due to a large increase in exports that year.

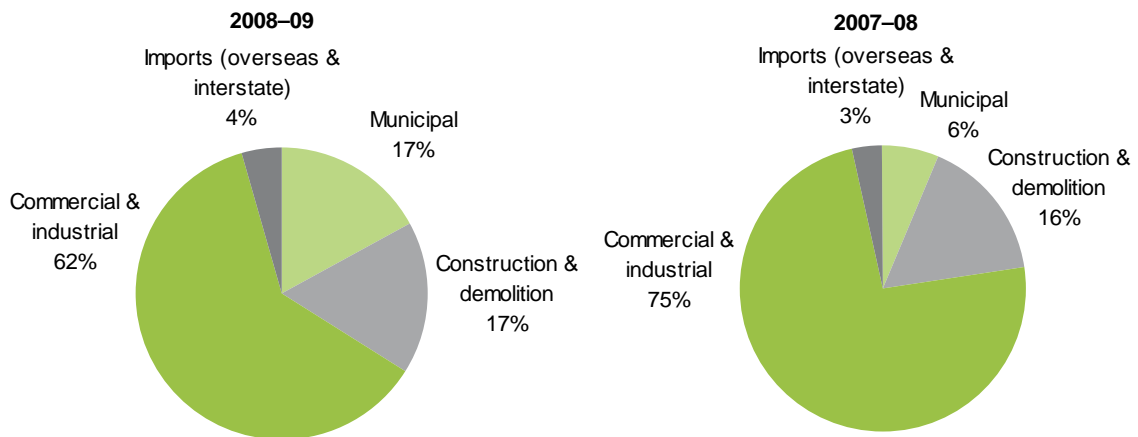
Figure 15 Metal waste recovered for reprocessing, Victoria 1999–00 to 2008–09



Sources of recyclables

Figure 16 shows that the sources of metal waste received for reprocessing remains predominantly from the commercial and industrial sector despite the drop of 13 percentage points to 62%. The proportion of material sourced from interstate or overseas increased to 4% in 2008–09. Material sourced from the municipal sector increased to 17%, up 11 percentage points, which is partly due to the drop in metals recovered through the commercial and industrial sector. Metals sourced from the construction and demolition sector remained steady increasing by one percentage point.

Figure 16 Source sector of metal waste (by weight) received for reprocessing, Victoria 2008–09 and 2007–08



Construction and demolition waste

Recovery and trends

Recovery of construction and demolition waste material during 2008–09 increased by 4%, or 108,000 tonnes, to 3.15 million tonnes. Concrete continued to account for the majority of this material (see Figure 17) and remained steady with a small increase of 1% in the amount of concrete recovered. All material categories making up the remainder of material recovered displayed similar composition to the previous year. In tonnage terms, the two largest changes were seen in Soil / sand and Asphalt with increases of 136% and 49% respectively. The large increase in Soil / sand may be due to an under reporting in 2007–08 (see Appendix B, Table 4).

Figure 17 Composition of construction and demolition waste (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08

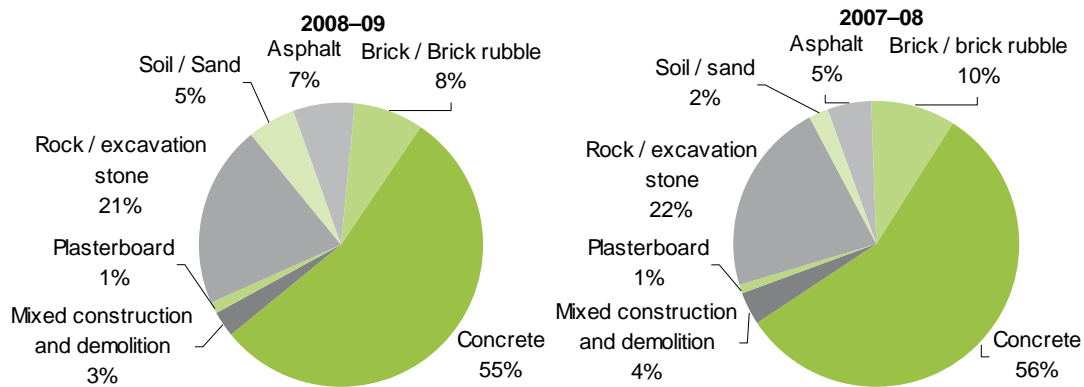


Figure 18 illustrates the historical trend in Victorian construction and demolition waste recovery over the past 10 years. Recovery in 2008–09 continued to show signs that it is becoming harder for the industry to sustain the strong growth displayed between 1999–00 and 2005–06. The current recovery rate of construction and demolition materials is considered to be high and the strong growth trend was expected to slow. Targeting the remaining tonnes still going to landfill will require further investment from the industry; the expansion and establishment of suburban collection points; and further extension of recycling services to the construction and demolition sector.

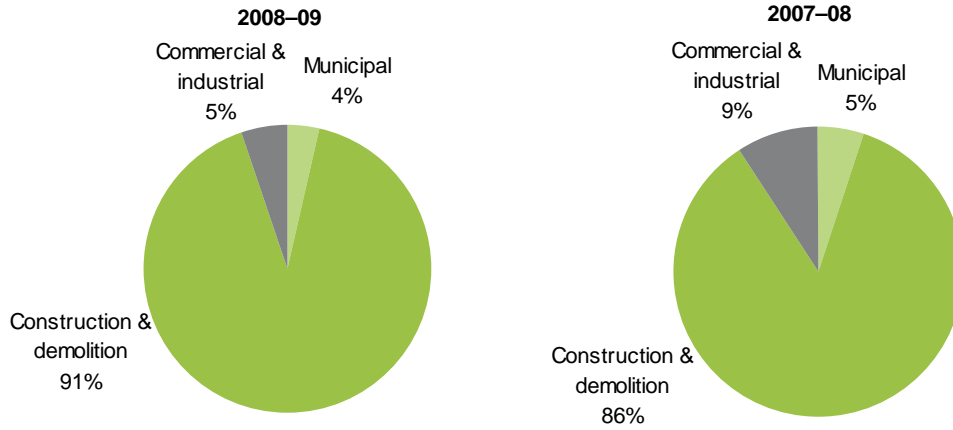
Figure 18 Construction and demolition waste recovered for reprocessing, Victoria 1999–00 to 2008–09



Sources of recyclables

Material from the construction and demolition sector understandably made up the bulk of recovery (91%), while a small amount still continues to be recovered through the commercial and industrial and municipal sectors (see Figure 19).

Figure 19 Sources of construction and demolition waste (by weight) received for reprocessing, Victoria 2008–09 and 2007–08



Concrete, brick rubble, asphalt, rock and excavation stone were primarily sourced from construction and demolition activities at commercial and civil sites that provide high-volume, largely homogenous streams of materials.

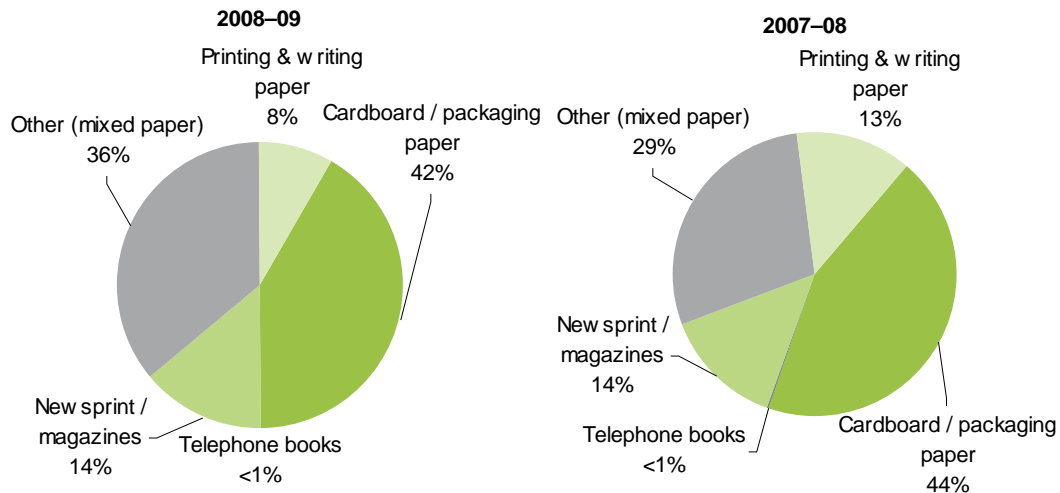
Most of the plasterboard recycled in Victoria is sourced from manufacturers as process off-cuts. However, an increasing number of waste service providers are recovering waste plasterboard from construction projects for recycling.

Paper / cardboard waste

Recovery and trends

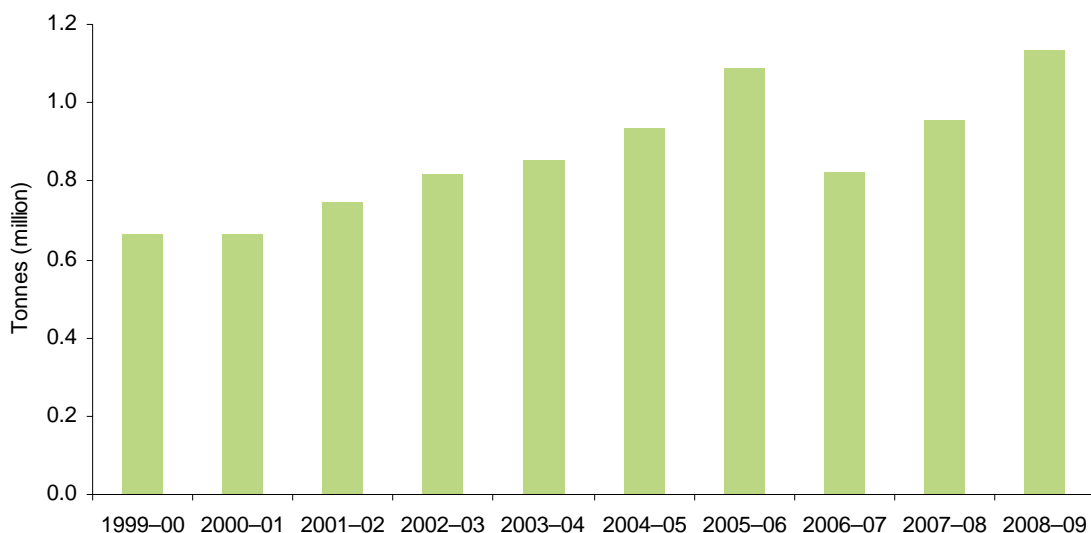
The total amount of waste paper recovered for recycling in Victoria has increased by 19% to around 1.13 million tonnes. This is the second time since conducting this survey that the total tonnes of paper and cardboard recovered has exceeded that of metals. Cardboard / packaging paper makes up the largest proportion representing 42% of all waste paper recovered (see Figure 20). Export of waste paper continues to increase, up 7% from the previous year.

Figure 20 Composition of paper / cardboard waste (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08



The recovery of Other (mixed paper) continues to increase and has become a larger proportion of the composition of paper recovered while Printing & writing paper continues to decrease in tonnes recovered. The decline in Printing & writing paper tonnes may be due to this waste material being mixed in with the Other (mixed paper) category for reporting. These two categories combined have increased by over 100,000 tonnes or 26% from the previous year.

Figure 21 Paper / cardboard waste recovered for reprocessing, Victoria 1999–00 to 2008–09

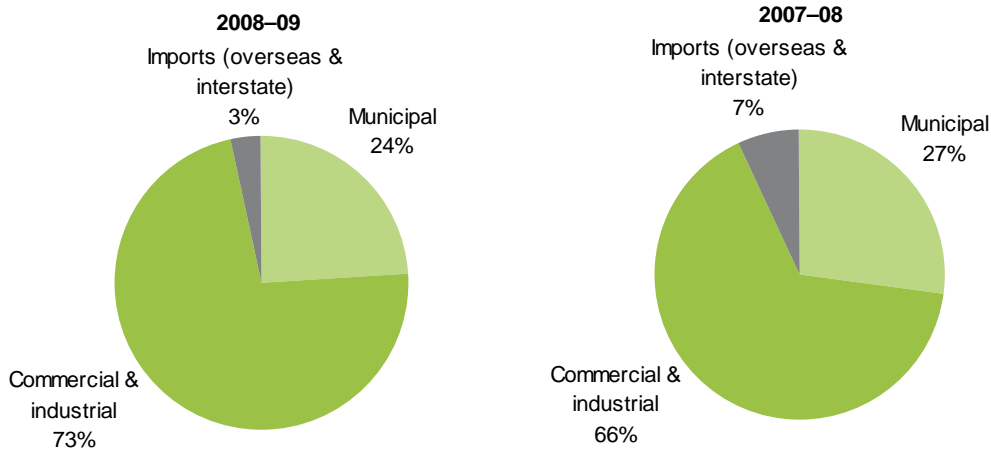


Note: Figures for periods 2004–05 and 2005–06 have been over reported but these amounts have not been able to be quantified.

Sources of recyclables

The largest proportion (73%) of waste paper received for reprocessing in 2008–09 was sourced from the commercial and industrial sector (see Figure 22). Waste paper sourced from the municipal sector (kerbside recycling) decreased from 27% to 24% as did imports dropping from 7% to 3%.

Figure 22 Source sectors of paper / cardboard waste (by weight) received for reprocessing, Victoria 2008–09 and 2007–08



Retailers and industrial facilities are important suppliers of cardboard and paper packaging to reprocessors, whilst most printing and writing paper comes from commercial collections from offices and schools.

Other (mixed paper), by contrast, was sourced predominantly from the municipal sector. These materials are mostly discarded in the home and are readily retrieved from the kerbside recycling system. Figures calculated from the *Victorian Local Government Annual Survey 2008–09* and *Kerbside Garbage Composition: Recent Findings*¹⁰, indicate that the recovery rate of paper within the municipal kerbside collection service offered by councils to residents is almost 80%.

¹⁰ Composition used to calculate the recovery rate of materials was taken from Figure 1. Garbage bin composition from bin audits of four metropolitan local governments, 2008

Organic waste

Recovery and trends

The total quantity of organic waste material recovered and diverted from landfill in Victoria during the 2008–09 financial year increased to approximately 802,000 tonnes, up 33% from the previous year. The large increase in organics recovery is not as noteworthy as the figures suggest as it can mostly be attributed to not receiving a survey response last year from a large recycled organics reprocessor.

Figure 23 shows that the majority of organic waste material recovered continues to be in the form of Garden organics (41%), a decrease of 10 percentage points but back to a similar proportion as seen in 2006–07. There was an increase in Wood & timber pallets / packaging in 2008–09 but together with Wood & timber (other than packaging) they make up a similar proportion to the previous year. A large recovery increase was apparent in Sawdust & other forestry residuals with levels back to those reported for the 2006–07 financial year (see Appendix B, Table 4). This is partly due to non-responses in 2007–08. Food organics at 2% continues to be the smallest proportion of organics recovered from the waste stream.

Figure 23 Composition of organic waste (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08

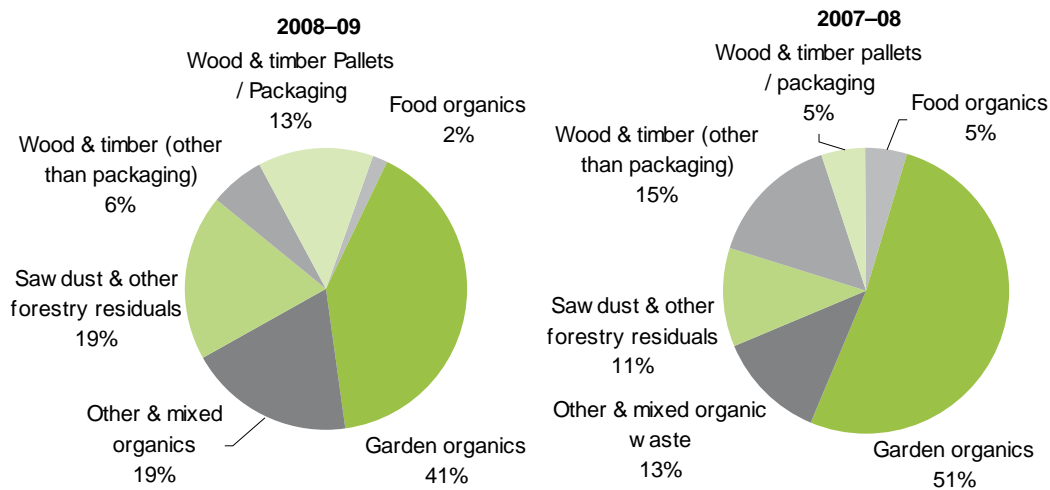
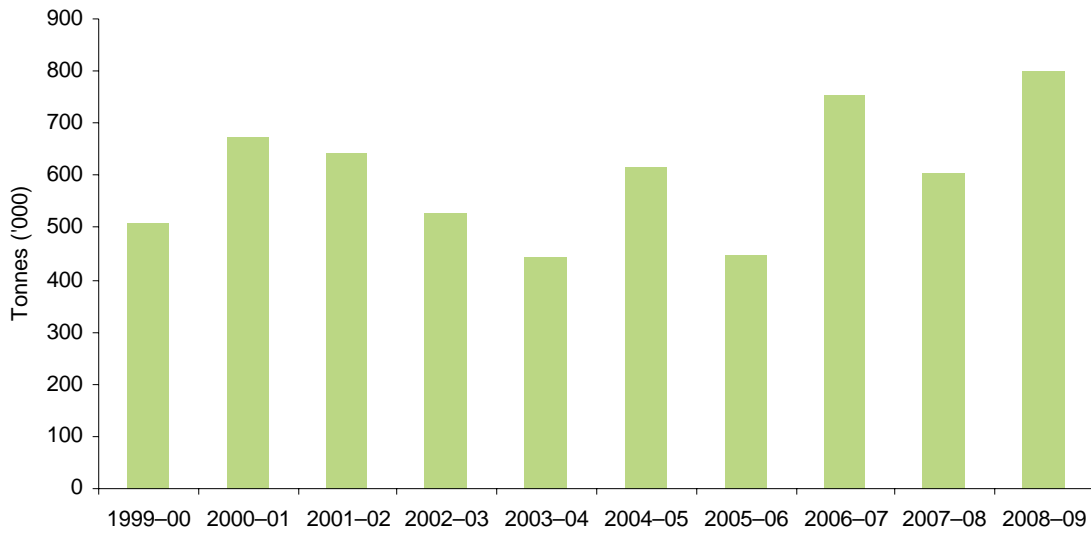


Figure 24 shows that since 2003–04 organics recovery, although fluctuating is generally trending upwards. The trendline does not accommodate the fluctuating data very well and it is difficult to estimate the trend for organic waste recovery. This is not to say that there are no natural fluctuations in organics data as, unlike other material categories, creation of organic waste can be partly linked to environmental factors such as the long-term drought in Victoria and legislated water restrictions.

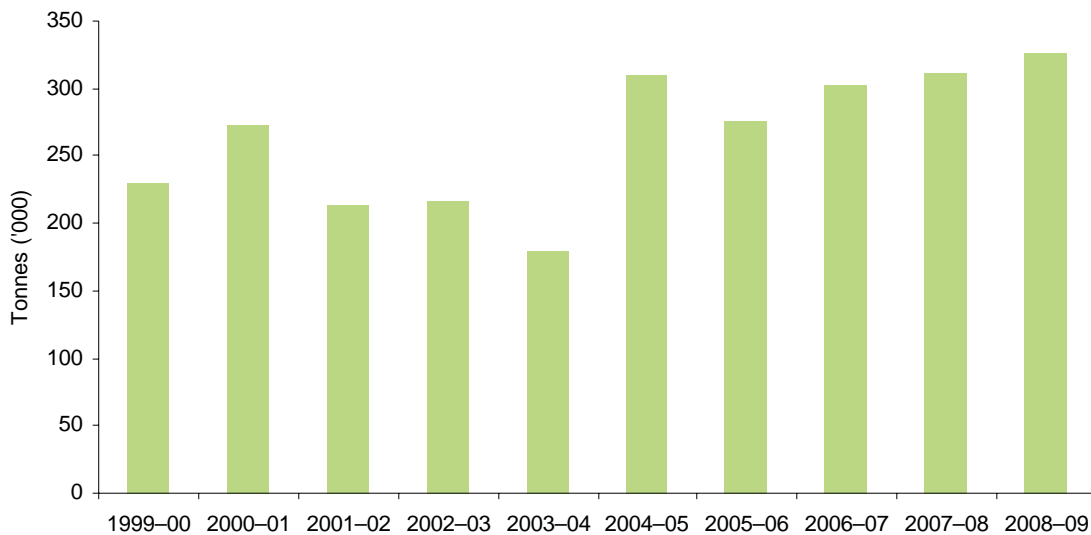
Figure 24 Organic waste recovered for reprocessing, Victoria 1999–00 to 2008–09



Note: Figures released prior to the 2002–03 financial year include prescribed industrial waste. Garden organics figures for 2003–04 and 2005–06 have been updated to more accurately reflect tonnes recorded in the *Local Government Data Collection Survey 2003–04* and *Victorian Local Government Data Collection 2005–06* reports.

Quantities of garden organics, which is mainly collected through the municipal sector, were at the highest level recorded since the survey began (see Figure 25), while the quantities of food organics recovered dropped again for the second year in a row. The drop in food waste recovery is due in part to the increasingly limited capacity within the compost industry to process food waste. Figure 25 shows that garden organics has trended upwards since 2003–04. During this time, there has been an expansion of the three bin system: one small bin for garbage, one large bin for recyclables and another large bin for green organics. This has encouraged householders to divert green organics from landfill.

Figure 25 Garden organic waste recovered for reprocessing, Victoria 1999–00 to 2008–09

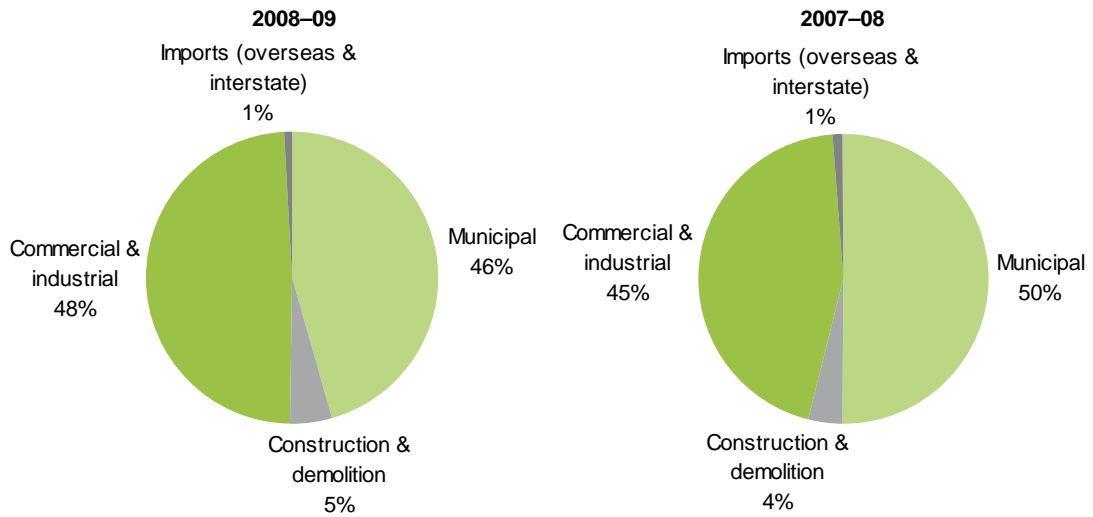


Note: Garden organics figures for 2003–04 and 2005–06 have been updated to more accurately reflect tonnes recorded in the *Local Government Data Collection Survey 2003–04* and *Victorian Local Government Data Collection 2005–06* reports.

Sources of recyclables

The larger proportion of organic waste material received for reprocessing in 2008–09 was sourced from the commercial and industrial sector (see Figure 26). This is due to an increase in the recovery of timber, sawdust and other forestry residuals that are predominantly sourced from this sector. The municipal sector provided an almost equal proportion at 46% comprised predominantly of garden organics (85%) recovered through municipal kerbside collections.

Figure 26 Source sectors organic waste (by weight) received for reprocessing, Victoria 2008–09 and 2007–08



Glass waste

Recovery and trends

The total quantity of glass recovered for reprocessing in Victoria in the 2008–09 financial year was almost 186,000 tonnes, an increase of 7%. Glass containers (bottles and jars) and Mixed glass waste constituted the majority of glass recovered at 90% of the total (see Figure 27). Based on historical records, it can be assumed that the Mixed glass waste category is dominated by glass containers with mixed glass as a category coming into affect in 2007–08 (see Appendix B, Table 4).

Figure 27 Composition of glass (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08

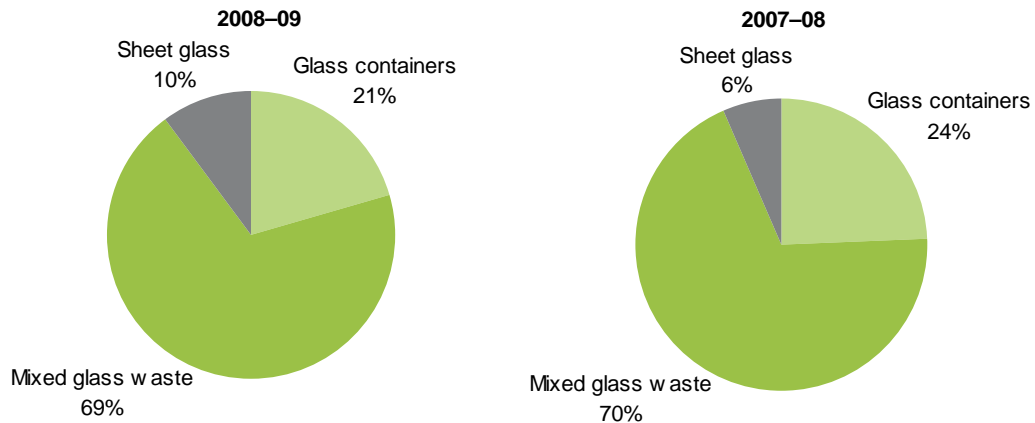
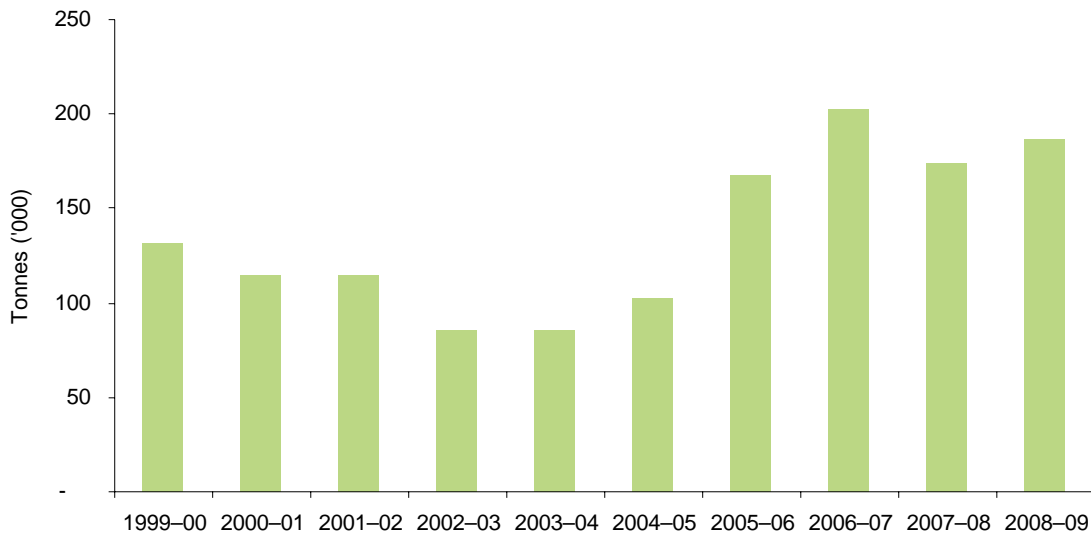


Figure 28 indicates that there was a jump in the recovery of glass in 2005–06. This increase was due to a Victorian Government assisted upgrade at the VISY Recycling glass recovery facility at Laverton. This upgrade has since allowed for consistently higher recovery of glass in Victoria.

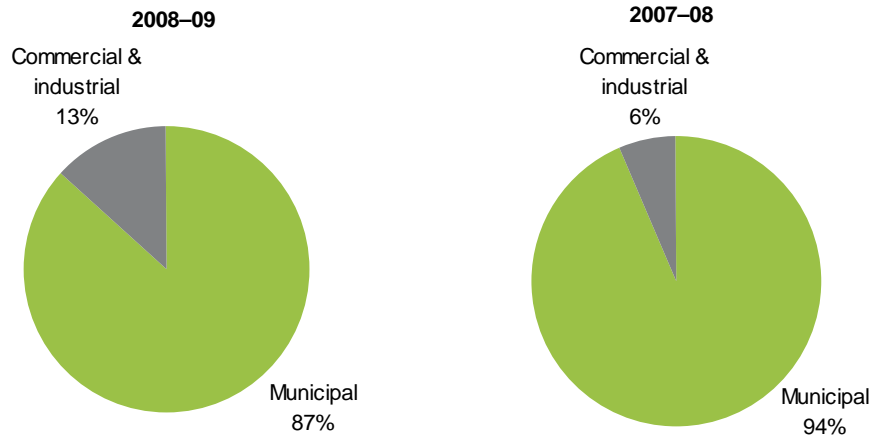
Figure 28 Glass recovered for reprocessing, Victoria 1999–00 to 2008–09



Sources of recyclables

Of the glass received for reprocessing during 2008–09, the majority was sourced from the municipal sector (87%), principally glass containers collected through the municipal kerbside collection service offered by councils to residents (see Figure 29). Figures calculated from the, *Victorian Local Government Annual Survey 2008–09* and *Kerbside Garbage Composition: Recent Findings*¹¹, indicate that the recovery rate of glass within the municipal kerbside collection service is around 85%. Sheet glass, by contrast, is not accepted through the municipal kerbside service and was received largely from the commercial and industrial sector in the form of windscreens, broken windows and off-cuts from the manufacture of glass products.

Figure 29 Source sectors of glass (by weight) received for reprocessing, Victoria 2008–09 and 2007–08



¹¹ Composition used to calculate the recovery rate of materials was taken from Figure 1. Garbage bin composition from bin audits of four metropolitan local governments, 2008

Plastic waste

Recovery and trends

The Plastics and Chemicals Industries Association (PACIA) collects data annually by calendar year on plastics reprocessing as part of its National Plastics Recycling Survey. Sustainability Victoria has incorporated the PACIA results¹² into this report.

The report states that plastics consumption in Victoria for the 2008 period was around 378,000 tonnes, based on a per capita estimation using national overall plastics consumption data. This gives an overall plastics recovery rate in Victoria of 38%.

Victoria is still the leading Australian state in plastics recovery, due primarily to the recycling of large amounts of pre-consumer industrial manufacturing scrap. Plastics recovery in Victoria has increased by 21% to almost 144,000 tonnes for the 2008 calendar year. Domestic and industrial packaging continues to dominate the recovered material (68%), a decrease of three percentage points from the previous financial year (71%) (see Figure 30).

Figure 30 Composition of plastic waste (by weight) recovered for reprocessing, Victoria 2008 and 2007

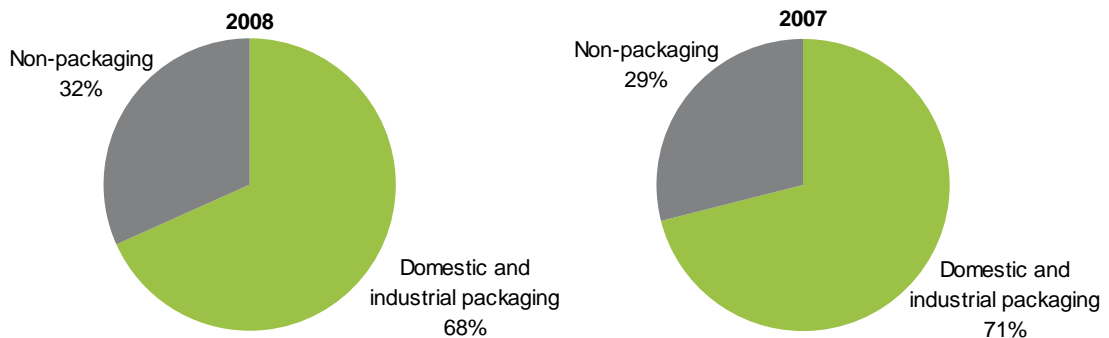


Figure 31 indicates that the recovery of plastic has been gradually increasing since 2000 with a large increase in 2008. No explanation for the large increase was provided in the *2009 National Plastics Recycling Survey* report.

Figure 31 Plastic waste recovered for reprocessing, Victoria 1999 to 2008



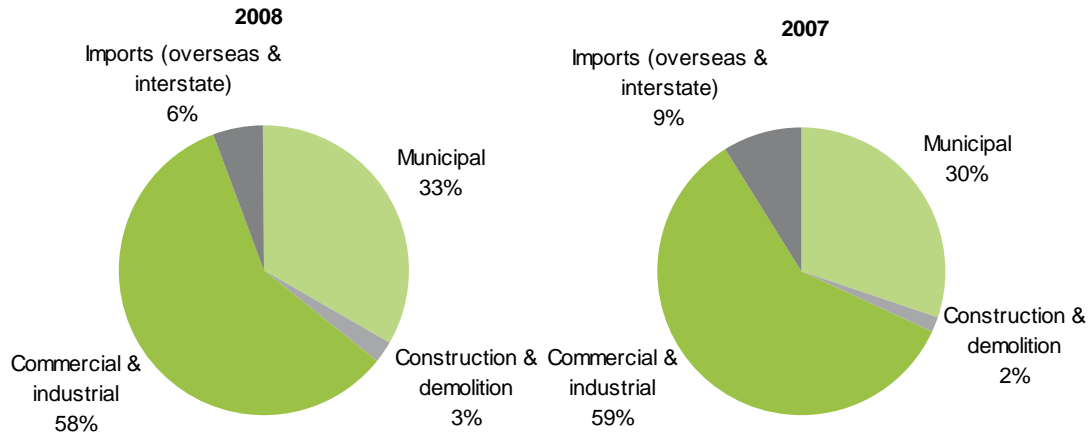
¹² Hyder Consulting (2009), *2009 National Plastics Recycling Survey*, report to the Plastics and Chemicals Industry Association

Sources of recyclables

The majority of plastics recycled during 2008 were sourced from the commercial and industrial sector (see Figure 32) due to the large manufacturing sector in the state. Most of the remaining plastic was sourced from the municipal sector - predominantly domestic packaging - where Victoria is collecting more than any other state in Australia.

Figures calculated from the, *Victorian Local Government Annual Survey 2008–09* and *Kerbside Garbage Composition: Recent Findings*¹³, indicate that the recovery rate of plastic within the municipal kerbside collection service offered by councils to residents is above 60%.

Figure 32 Source sectors of plastic waste received for reprocessing, Victoria 2008 and 2007



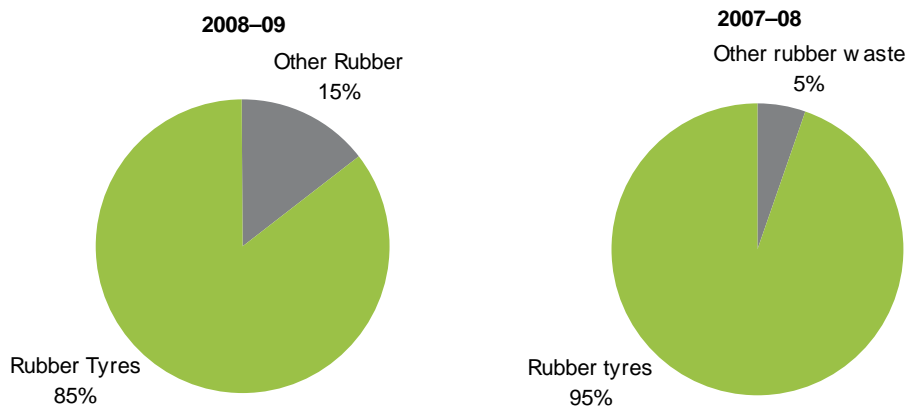
¹³ Composition used to calculate the recovery rate of materials was taken from Figure 1. Garbage bin composition from bin audits of four metropolitan local governments, 2008

Rubber waste

Recovery and trends

Over 37,000 tonnes of rubber waste was recovered in Victoria during the 2008–09 financial year, an increase of 42% from the previous year. Part of the large increase was due to an increase in export of rubber for reprocessing. Exports increased 1200% in 2008–09 going from around 300 tonnes in 2007–08 to almost 4,000 tonnes in 2008–09. There was also an increase in rubber recovered for reprocessing locally. Figure 33 shows that tyres constituted the majority of rubber diverted from landfill for reprocessing, representing 85% of the total. Other rubber waste, typically tyre buffings, tread ends, uncured rubber and extrusion waste accounted for the remainder.

Figure 33 Composition of rubber waste (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08



Rubber waste data has fluctuated greatly over the life of the survey. All the key rubber reprocessors have consistently responded to the survey since 2006–07 and it is believed that the totals reported for the past three years reflect the state of rubber recycling in Victoria more accurately than in previous years (see Figure 34).

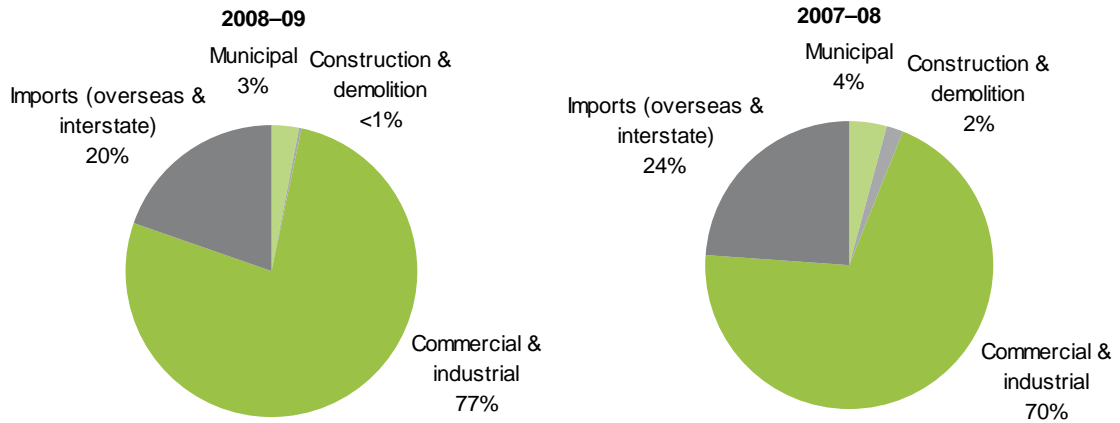
Figure 34 Rubber waste recovered for reprocessing, Victoria 1999–00 to 2008–09



Sources of recyclables

Most of the rubber waste received for reprocessing during 2008–09 (77%) was sourced from the commercial and industrial sector (see Figure 35). This was largely rubber tyres received from businesses that provide a collection service to manufacturers and retailers. The original source of the rubber prior to collection is unknown, although it could be assumed that a large proportion comes from domestic vehicles. Twenty per cent of rubber continues to be imported from interstate for reprocessing.

Figure 35 Source sectors of rubber waste (by weight) received for reprocessing, Victoria 2008–09 and 2007–08

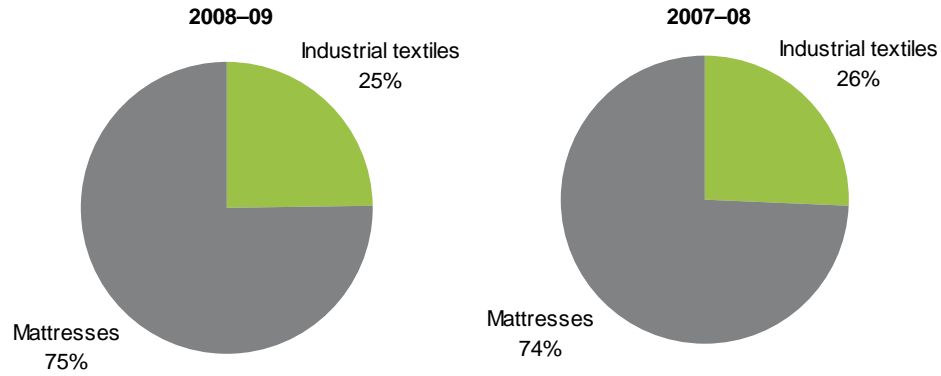


Textile waste

Recovery and trends

For the 2008–09 financial year almost 4,000 tonnes of textile waste was recovered for reprocessing. Mattresses accounted for three quarters of the material recovered (see Figure 36).

Figure 36 Composition of textile waste (by weight) recovered for reprocessing, Victoria 2008–09 and 2007–08



Textile waste recovery has fluctuated greatly since the survey began and hence Figure 37 only reports on the past six years of data. Care should be taken when making comparisons with some of the historical data (see Appendix B, Table 4) which is considered unreliable as only a very small proportion of textile reprocessors reported making it difficult to establish recovery trends and draw conclusions.

Figure 37 Textile waste recovered for reprocessing, Victoria 2003–04 to 2008–09



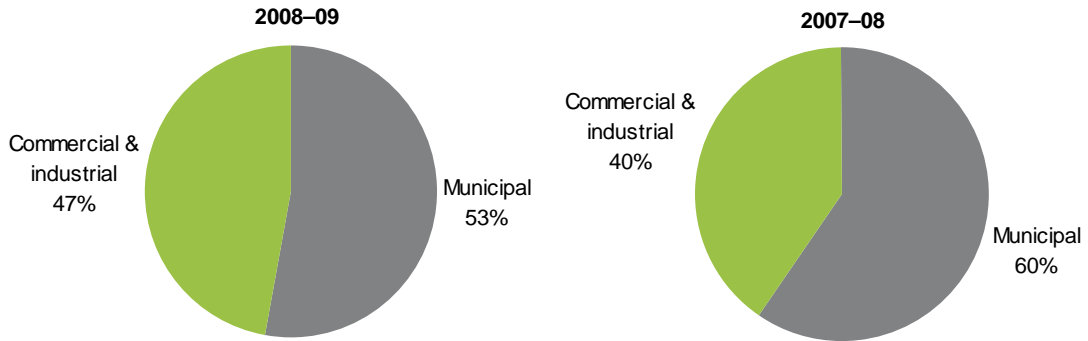
Note: Figures previous to 2003–04 financial year have been excluded from the survey as they are extreme compared to past six years.

It should be noted that recent data does not include textiles reused in their original state, such as clothing sold through second-hand or charity stores, or clothing exported as relief aid which may have been include in previous years.

Sources of recyclables

The survey results show that over half of all material received by Victoria's textile reprocessors was sourced from the municipal sector, with the remainder sourced from the commercial and industrial sector (see Figure 38).

Figure 38 Source sectors of textile waste (by weight) received for reprocessing, Victoria 2008–09 and 2007–08



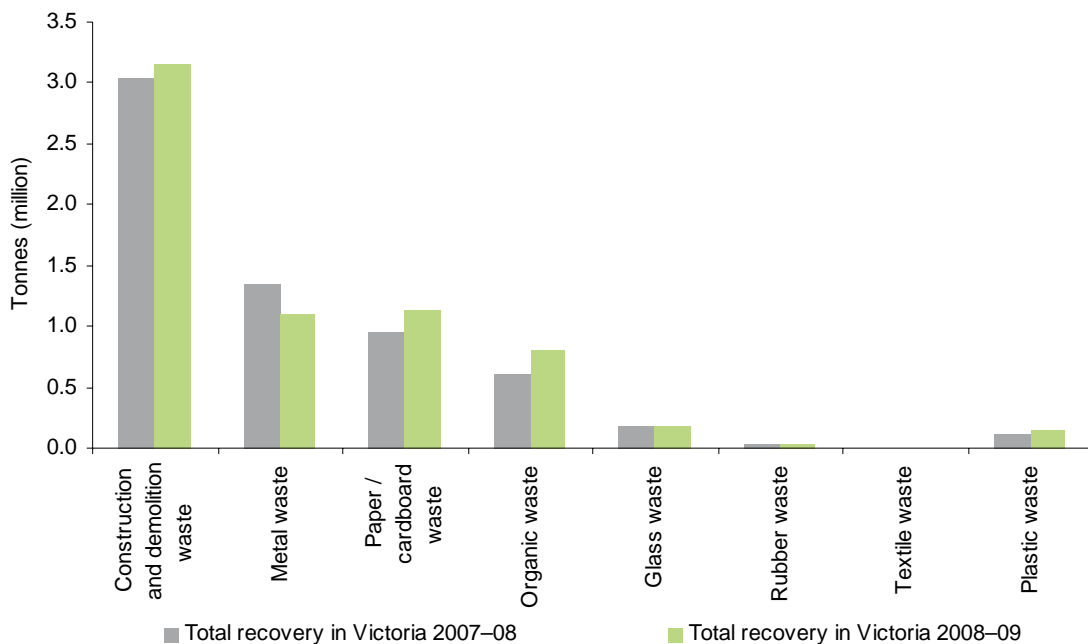
Conclusion

The results of the 2008–09 survey indicate that Victoria recovered and diverted from landfill 6.56 million tonnes of waste for reprocessing. This represents an increase of approximately 4% on the previous financial year and equates to an overall resource recovery (recycling) rate of 64%.

The combined waste material from the construction and demolition sector and commercial and industrial sector accounted for 82% of the waste materials recovered for reprocessing, excluding imports. Victoria’s current resource reprocessing capacity is predominantly local, with 86% of material recovered remaining in Victoria while waste material exported for reprocessing showed an increase of 21%.

Construction and demolition waste accounted for the greatest proportion of material recovered for reprocessing (see Figure 39), with an increase of 4% on the previous year to reach 3.15 million tonnes. The next two largest categories were metal waste (almost 1.1 million tonnes) and paper / cardboard waste (above 1.1 million tonnes). Metal waste showed a decrease of 19% and paper / cardboard waste an increase of 19% in the amount of material recovered. The recovery of metal waste was affected by metal prices which dropped to a 20 year low in late 2008. The total quantity of organic waste material recovered and diverted from landfill in Victoria during the 2008–09 financial year increased to approximately 802,000 tonnes, an increase of 33% from the previous year. The large increase in organics recovery is not as noteworthy as the figures suggest as it can mostly be attributed to not receiving a survey response last year from a large recycled organics reprocessor.

Figure 39 Waste material recovered for reprocessing in Victoria 2007–08 and 2008–09



Overall resource recovery in Victoria has increased and is heading towards targets set out in the Victorian Governments *Towards Zero Waste Strategy*.

Appendix A Survey methodology

The survey commenced in August 2009 and sought data from 90 Victorian reprocessors, excluding 36 plastic reprocessors surveyed by Hyder Consulting as part of the *2009 National Plastics Recycling Survey*¹⁴. A total of 72 out of the 90 reprocessors provided data for the survey, representing an 80% response rate. It is estimated that these responses covered greater than 90% of the industry by tonnes of recovered waste material.

To avoid double counting, this survey focuses only on the amount of material recovered for reprocessing and not on other stages of the material life cycle such as collection, sorting and manufacturing. This survey does not include materials that have been collected and baled only or resold in their original state for reuse, such as clothing sold through second-hand or charity stores. The omission of reused material is not in any way intended to undervalue this important activity, but is necessary to avoid double counting of material data and provide clear parameters for the quantification of recycling.

Victorian reprocessors of secondary-use materials (excluding plastic reprocessors) were identified and e-mailed or mailed a survey developed for each industry category. The survey asked respondents to provide information for the 2008–09 financial year on the:

- > amount of material being diverted from landfill (recovered) for reprocessing including
 - tonnes received by their Victorian site
 - tonnes received from other reprocessing facilities
 - tonnes imported and exported for reprocessing both interstate and overseas
 - tonnes stockpiled (unprocessed and processed)
 - tonnes reprocessed on-site
- > amount of material disposed to landfill due to contamination or as processing waste
- > sector from which the recovered material for reprocessing was received
- > major products made from their reprocessing operations and the subsequent markets (defined by the ANZSIC code divisions for all materials excluding organics) to which the products are sold
- > number of full-time equivalent staff directly employed in the company's recycling operations
- > level of expenditure on research and development as well as capital investment for activities associated with the reprocessing of secondary-use materials

With the exception of rubber, no data was included on materials used in energy recovery facilities.

Additional information was sought from the Australian Bureau of Statistics on the export of waste material from Australia to overseas markets for reprocessing during the 2008–09 financial year. This data aims to capture material exported from companies not surveyed by Sustainability Victoria, such as export traders.

Data on plastics recovery in Victoria was obtained from the Plastics and Chemicals Industries Association (PACIA) annual survey, *2009 National Plastics Recycling Survey*, and incorporated into this report.

¹⁴ Hyder Consulting (2009), *2009 National Plastics Recycling Survey*, report to the Plastics and Chemicals Industry Association

Data on solid waste disposed to Victorian licensed landfills was sourced from the EPA Victoria landfill levy returns. As stated by the EPA, the figure represents the amount of waste accepted at licensed Victorian landfills, excluding material used as cover. The Environment Protection Act 1970 provides a rebate for cover material of 15% (at the relevant municipal rate) for each tonne of waste deposited at a landfill. The figures shown above were calculated by taking the tonnes of material received at landfills (including cover material sourced off site) and reducing this by 15% to allow for cover material. It is noted that some landfills source cover material on-site (e.g. from quarrying activities) and that this is not measured in the tonnes of waste received at landfills. Where landfills have claimed a recycling rebate, this has been subtracted from the figures. Prescribed waste (including low level contaminated soil) deposited to landfill, including where used as cover, is not included in the above figures.

Waste resulting from the Black Saturday bushfires has not been included in this data, as the Government waived the landfill levy for this waste.

A number of reviews of landfill levy returns are currently being undertaken and therefore this data may be subject to change.

Where figures for garden organics have been supplied in cubic metres, conversion factors used to convert to tonnes have been based on the National Greenhouse Accounts (NGA) Factors, June 2009.

The survey measures and reports on data from responding reprocessors. No estimates are undertaken for non-responding companies. Variation from year to year could be due to the number of, and the size of the non-responding units and the impact they have on the overall data collected. All attempts have been made to include the large reprocessing operations to ensure that variation from year to year is minimised. Data was aggregated for reporting purposes at the state level to retain confidentiality.

From 2002–03 the food organics recovery data reported no longer includes any prescribed industrial waste figures such as meat waste generated from rendering processes or grease traps. Evaluation and cross-referencing of reported and actual data has led to adjustments of the previous financial years' data.

Appendix B Waste materials recovered for reprocessing

Table 4 Waste material recovered in Victoria for reprocessing over the past 10 years, Victoria 1999–99 to 2008–09

Waste material recovered	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	% change
											2007–08 to 2008–09
Tonnes ('000)											
Metal waste											
Aluminium (incl. cans)	35	44*	33	41	62	88	83	63	51	33	-36%
Batteries	-	-	29*	35	30	33	34	15	36	32	-11%
Car bodies	-	-	-	60	80	65	78	120	26	69	165%
Non-ferrous	35	24*	12*	28*	13	19	19	65	77	68	-11%
Other & mixed metals	-	-	-	-	-	-	-	1	206	1	-100%
Steel (incl. packaging steel)	698	745*	667	807	848	951	1,234	997	955	896	-6%
Total metal waste recovered	768	813*	741*	971*	1,032	1,157	1,448	1,261	1,350	1,097	-19%
Construction and demolition waste											
Asphalt	59	68	65	84	170	162	139	190	152	226	49%
Brick / brick rubble	228	318*	293	250	425	395	385	438	293	244	-17%
Concrete	577	811	942	1,161	1,525	1,477	1,734	1,695	1,717	1,731	1%
Mixed demolition and construction	-	-	-	-	-	-	-	81	111	91	-18%
Plasterboard	5	4	8	21	22	24	27	22	33	37	11%
Rock / excavation stone	-	56	359	293	428	367	419	505	668	656	-2%
Soil & sand	2	16	49	42	49	68	209	239	72	170	136%
Total construction and demolition waste recovered	871	1,273*	1,716	1,852	2,618	2,492	2,913	3,170	3,047	3,155	4%

* Evaluation and cross-referencing of reported and actual data has led to an adjustment of previous financial year data.

Note: Food organics recovery data from 2002–03 no longer includes any prescribed industrial waste figures such as meat waste generated from rendering processes or grease traps. Garden organics figures for 2003–04 and 2005–06 have been updated to more accurately reflect tonnes recorded in the *Local Government Data Collection Survey 2003–04* and the *Victorian Local Government Data Collection 2005–06* reports.

Table 4 continued

Waste material recovered	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	% change
											2007–08 to 2008–09
Tonnes ('000)											
Paper / cardboard waste											
Cardboard / paper packaging	490	388*	332*	414	366	376	461	389	422	468	11%
Newsprint / magazines	173	133*	187*	196	194	200	232	122	132	160	21%
Printing & writing paper	-	141*	136	174	246	262	238	73	124	93	-25%
Telephone books	-	-	-	10	10	9	10	2	1	<1	-90%
Other (mixed paper)	-	-	91*	24	34	90	146	236	275	410	49%
Total paper / cardboard waste recovered	663	662*	746*	818	850	937	1,087	822	954	1,132	19%
Organic waste											
Timber	49	151	171*	169	171	229	84	196	123	158	29%
Food organics	206	222	202	22	14	13	26	35	29	13	-57%
Garden organics	230	273	213	217	179*	310	276*	302	311	327	5%
Sawdust / forestry residuals	21	22	47	111	76	26	35	144	67	155	132%
Other	4	7	10	10	5	40	29	77	76	150	97%
Total organic waste recovered	510	675	643*	529	445*	618	450*	754	605	802	33%
Glass waste											
Glass containers	116	100	100	73	73	83	143	188	42	38	-9%
Sheet / laminated glass	15	14*	14	12	13	20	25	14	11	19	71%
Mixed glass waste	-	-	-	-	-	-	-	-	120	128	7%
Total glass waste recovered	131	114*	114	85	86	103	168	202	174	186	7%

* Evaluation and cross-referencing of reported and actual data has led to an adjustment of previous financial year data.

Note: Food organics recovery data from 2002–03 no longer includes any prescribed industrial waste figures such as meat waste generated from rendering processes or grease traps. Garden organics figures for 2003–04 and 2005–06 have been updated to more accurately reflect tonnes recorded in the *Local Government Data Collection Survey 2003–04* and the *Victorian Local Government Data Collection 2005–06* reports.

Table 4 continued

Waste material recovered	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	% change
											2007–08 to 2008–09
Tonnes ('000)											
Plastic waste recovered	35	83	92	69	96	95	109	111	119	144	21%
Rubber waste recovered	23	22*	18	21	11	22	17	30	26	37	42%
Textiles waste recovered	153	25*	53	84	4	4	2	8	3	4	9%
Other waste recovered	20	12	-	-	-	-	-	-	-	-	
Total all waste material recovered	3,174	3,679*	4,123*	4,429 *	5,143*	5,427	6,194*	6,358	6,278	6,556	4%

* Evaluation and cross-referencing of reported and actual data has led to an adjustment of previous financial year data.

Note: Food organics recovery data from 2002–03 no longer includes any prescribed industrial waste figures such as meat waste generated from rendering processes or grease traps. Garden organics figures for 2003–04 and 2005–06 have been updated to more accurately reflect tonnes recorded in the *Local Government Data Collection Survey 2003–04* and the *Victorian Local Government Data Collection 2005–06* reports.

Appendix C Participating Reprocessors

Sustainability Victoria would like to recognise and thank the following participants in the Victorian Recycling Industry Annual Survey. The list below does not indicate all reprocessors who participated in the survey but those that agreed to be recognised.

Allstone Quarries	Ecobricks	Peerless Holdings Pty Ltd
Ancor Recycling	Energymasta Pty Ltd	Pinegro Products Pty Ltd
Australian Native Landscapes	Enviroflex Pty Ltd	Plain Pallet Sales
Bark King Group Pty Ltd	Gippsland Water	Scatoplus
Barro Group P/L	Hillview Compost	Sims Aluminium
Boral Limited	Jackson Earthmoving	Sims Metal
Branin Pty Ltd	Local Mix Concrete	SITA
C&N Ruggiero	Maddingley Brown Coal	Southern Cross Recycling
Camperdown Compost Co	Mossrock Australia Ltd Pty	Tyre Crumb Australia
City Circle Recycling Pty Ltd	MRI (Aust) Pty Ltd	Tyrecycle Pty Ltd
Corio Waste	Natural Recovery Systems	Veolia Environmental Services
Delta Group	Norstar Steel Recyclers	Visy Recycling
DreamSafe Pty Ltd	OneSteel Recycling	Waste Converters Recycling

Appendix D Glossary

Commercial and industrial (C&I) waste: Comprises solid waste generated by the business sector as well as solid waste created by state and federal government entities, schools and tertiary institutions. Unless otherwise noted, C&I waste does not include waste from the construction and demolition (C&D) sector.

Commingled materials: Materials mixed together, such as plastic bottles with glass and metal containers. Commingled recyclable materials require sorting after collection before they can be recycled.

Construction and demolition (C&D) waste: Includes waste from residential, civil and commercial construction and demolition activities, such as fill material (e.g. soil), asphalt, bricks and timber. C&D waste excludes construction waste from owner/occupier renovations, which is included in the municipal waste stream. Unless otherwise noted, C&D waste does not include waste from the C&I sector.

Garden organics: Organics derived from garden sources e.g. grass clippings and tree prunings.

High density polyethylene (HDPE): A member of the polyethylene family of plastics, used to make products such as milk bottles, pipes and shopping bags. HDPE may be coloured or opaque.

Kerbside collection: Collection of household recyclable materials (separated or commingled) that are left at the kerbside for collection by local collection services.

Landfill: Sites that are licensed by the EPA Victoria for the disposal of materials (both waste and potentially recyclable materials). Also known as tips.

Linear low density polyethylene (LLDPE): A member of the polyolefin family of plastics, LLDPE is a strong and flexible plastic usually used in film for packaging, bags and for industrial products such as pressure pipe.

Low density polyethylene (LDPE): A member of the polyolefin family of plastics, LDPE is a flexible material usually used as film for packaging or as bags.

Mulch: Any composted or non-composted organic material, excluding plastic, which is suitable for placing on soil surfaces to restrict moisture loss from the soil and to provide a source of nutrients to aid plant growth.

Municipal waste: Solid waste generated from domestic premises (garbage and hard waste) and council activities such as street sweeping, litter collection and street tree lopping. Also includes waste dropped off at transfer stations and construction waste from residential owner/occupier renovations.

Non-ferrous metals: Those metals that contain very little or no iron (e.g. copper, brass and bronze).

Polyethylene terephthalate (PET): A clear, tough, light and shatterproof type of plastic, used to make products such as soft drink bottles, film packaging and fabrics.

Polypropylene (PP): A member of the polyolefin family of plastics. PP is light, rigid and glossy and is used to make products such as washing machine agitators, clear film packaging, carpet fibres and housewares.

Polystyrene (PS): A member of the styrene family of plastics, PS is easy to mould and is used to make refrigerator and washing machine components. It can be foamed to make single-use packaging, such as cups, meat and produce trays.

Polyvinyl chloride (PVC): A member of the vinyl family of plastics, PVC can be clear, flexible or rigid and is used to make products such as fruit juice bottles, credit cards, pipes and hoses.

Post-consumer material: Material generated by households or commercial, industrial or institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

Pre-consumer material: Material diverted from the waste stream during a manufacturing process. Excluded is reutilisation of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Prescribed waste and prescribed industrial (PIW) waste: Those wastes listed in the Environment Protection (Prescribed Waste) Regulations 1998 and subject to requirements under the industrial waste management policy (prescribed industrial waste) 2000. EPA Victoria closely regulates these wastes because of their potential adverse impacts on human health and the environment. Prescribed wastes carry special handling, storage, transport and often licensing requirements and attract substantially higher disposal levies than non-prescribed solid wastes.

Recovered material: Material that would have otherwise been disposed of as waste, but has instead been collected and recovered (reclaimed) as a material input, in lieu of a new primary material, for a recycling or manufacturing process.

Recovery rate: The recovery rate is the percentage of materials recovered for reprocessing from the total quantity of waste generated.

Recycling (term): used to cover a wide range of activities, including collection, sorting, reprocessing and manufacture into new products.

Reprocessing: Changing the physical structure and properties of a waste material that would otherwise have been sent to landfill, in order to add financial value to the processed material and enable it to be reused.

Solid waste: Non-hazardous, non-prescribed solid waste materials ranging from municipal garbage to industrial waste.

Waste generation: Generation of unwanted materials including recyclables as well as garbage.