Department of Environment and Heritage Protection

Recycling and waste in Queensland 2016

Queensland Government

Minister's foreword

The 2016 Recycling and waste in Queensland report provides important information and data about waste generation and resource recovery at both a state and regional level.

By gaining a better understanding of current trends in waste management we can better identify the challenges and opportunities before us.

As our population grows, and consumption increases, the total amount of waste we generate will continue to rise. Aside from long-term behavioural change, advances in technology will play an important role in improving resource recovery and recycling rates and contributing to economic and jobs growth, particularly in our regions.

The 2016 Recycling and Waste in Queensland report shows that Queenslanders increased their recycling effort for headline wastes by more than 370,000 tonnes, resulting in over 4 million tonnes of materials being diverted away from landfill.

While these efforts highlight the progress being made to reduce waste and increase recycling, there is more that needs to be done.

That is why the Queensland Government is undertaking a review of the current waste strategy and is working to deliver a number of key waste-reduction initiatives including the introduction of a plastic bag ban and a Container Refund Scheme in 2018 which will help improve recycling rates and reduce the impact of plastic litter on our environment, our wildlife and our communities. Other initiatives include re-instating regulation on the storage of used tyres, establishing a Centre of Excellence for Recycled Organics with the University of Queensland and developing regional and State waste infrastructure plans.

We all share a responsibility for improving our recovery and recycling rates. Households, commercial businesses, the waste industry and government all have a role to play and I'm confident that by working together we can improve our waste management practices and realise the associated environmental, economic and social benefits.

Steven Miles MP
Minister for Environment and Heritage Protection
Minister for National Parks and the Great Barrier Reef

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In 2015–2016...

9.2 million tonnes
of headline wastes reported

44%
overall recovery rate for **headline wastes**

81%
of materials recovered were recycled in **Queensland**

1.3m tonnes
of mixed domestic waste picked up by weekly council kerbside collection

Local governments sent **333 000 tonnes**
of paper and packaging to recyclers

55%
of tyres reported were recovered

It cost local governments **$17.7m**
to deal with **12,600 tonnes**
of illegally disposed of waste

60.5% increase
in the amount of waste from **interstate sources** sent to Queensland landfills

Introduction

This report presents data on, and trends in, waste disposal and recovery in Queensland during the 2015–16 financial year.

The data was derived from surveys submitted by 344 reporting entities, including local governments, private landfill operators, recyclers, organic processors, waste handlers, incinerator operators, and industrial and mining monofill operators, in compliance with the *Waste Reduction and Recycling Act 2011*'s mandatory annual reporting requirements.

More information about waste management policy and initiatives in Queensland is available from the Department of Environment and Heritage Protection website at www.ehp.qld.gov.au/waste.

Key findings of this report

Headline wastes

- 9.2 million tonnes of headline waste (municipal, commercial and industrial, and construction and demolition) were reported in 2015–16.
- Headline wastes increased by 8.6% from 2014–15. In comparison, Queensland's population grew by 1.3%[1] and its economy grew by 3.2%[2] during the same period.
- The overall recovery rate of 44.1% is an improvement on the 43.5% reported in 2014–15.
- Recovery rates for the headline waste streams:
  - 33% for municipal solid waste
  - 47% for commercial and industrial waste
  - 50% for construction and demolition waste.
- Private facilities (landfills, monofills, incinerators) disposed of 54% of headline wastes sent for disposal (up from 50% in 2014–15). In particular, private landfills disposed of:
  - 13% of the municipal solid waste
  - 53% of the commercial and industrial waste
  - 93% of the construction and demolition waste.

Local governments

- The 1.3 million tonnes of mixed domestic waste picked up by the weekly council kerbside collection is a 3% increase per capita from 2014–15 but an 8% decrease per capita since 2009–10.
- The 333,000 tonnes of paper and packaging materials sent to recyclers by local governments is a 7% increase from the 311,000 tonnes sent in 2014–15 (and a 1.13% increase per capita since 2009–10).
- 175,000 households had a regular kerbside green waste collection service—an increase from 154,000 in 2014–15. (In comparison, 1,570,000 households had a yellow top kerbside collection service for paper and packaging materials).
- 15,000 tonnes of waste were diverted from landfill through the operation of tip shops.
- It cost $17.7 million to clean up 12,600 tonnes of litter and illegally dumped waste in 2015–16.

Materials recovered

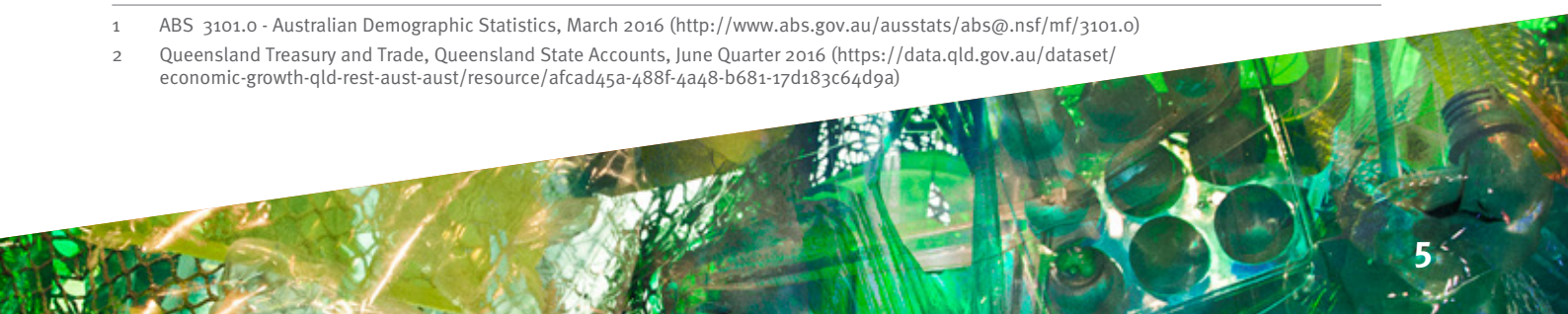
- Almost all of the 760,000 tonnes of segregated green waste reported was recovered (approximately 75% was classified as municipal solid waste).
- Approximately 30,400 tonnes of tyres (55% of the 55,600 tonnes reported) were recovered.
- Approximately 81% of the materials diverted from disposal in 2015–16 were recovered in Queensland.
- 6% were sent interstate for further processing.
- 14% were sent overseas for further processing.
- More than half of the paper, cardboard, non-packaging plastics, lead acid batteries, e-waste, ferrous and non-ferrous metals diverted from disposal were recycled outside of Queensland.
- Organic processors converted 1.49 million tonnes of inputs (such as green waste, timber, forestry residuals, biosolids, manure, grease trap waste, abattoir waste, drilling mud and ash) into products such as soil conditioners, manufactured soil, potting mixes and mulches.
- 206,000 tonnes of wastes (including green waste, timber, tyres, mineral oil and chemicals) were sent to energy recovery.

Other

- The 5.6 million tonnes of ash reported in 2015–16 was up 8% on the amount reported in 2014–15.
- 566,000 tonnes of waste from interstate sources was sent to landfills in Queensland—an increase from 353,000 tonnes in 2014–15.

1 ABS 3101.0 - Australian Demographic Statistics, March 2016 (http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0)

2 Queensland Treasury and Trade, Queensland State Accounts, June Quarter 2016 (https://data.qld.gov.au/dataset/economic-growth-qld-rest-aust-aust/resource/afcad45a-488f-4a48-b681-17d183c64d9a)



1. Summary account of municipal solid waste, commercial and industrial waste and construction and demolition waste generated in 2015–16

This section reports on headline waste, which includes three main streams: municipal solid waste, commercial and industrial waste and construction and demolition waste.

Reporting entities handled 9.2 million tonnes of general waste in 2015–16 (Figure 1.1). This is 726,000 tonnes more than the total reported in 2014–15. The overall recovery rate for general waste was 44.1%, an increase on the 43.5% achieved in 2014–15.

1.1 Municipal solid waste

Almost 860,000 tonnes (or 32.8%) of the 2.6 million tonnes of municipal solid waste reported in 2015–16 was recovered. This is an improvement on the 31.2% achieved in 2014–15 and can be attributed to increases in the amounts of green waste, and paper and packaging recovered by local governments.

The amount of litter and illegally dumped waste reported by local governments rose from 10,900 tonnes in 2014–15 to 12,600 tonnes in 2015–16. The $17.7 million clean-up expense to rate payers is a part of the public cost of illegal disposal.

Fifty-five councils provided data on the types of litter and illegally dumped waste collected. The most common types of waste identified were tyres (reported by 45% of councils), green waste (35%), cars (20%), asbestos (20%), furniture (20%), paper and packaging materials (18%), construction and demolition waste (16%) and mattresses (15%).

1.2 Commercial and industrial waste

Just over 1.3 million tonnes (or 47.2%) of the 2.8 million tonnes of commercial and industrial waste reported in 2015–16 was recovered. This is an improvement on the 41.3% recovery rate reported in 2014–15 and was due to a 248,000 tonne increase in the amount recovered combined with a 43,000 tonne decrease in the amount landfilled. Paper and packaging materials, scrap metal and green waste were the main materials recovered (Table 1.1).

1.3 Construction and demolition waste

Approximately 1.9 million tonnes (or 49.7%) of the 3.8 million tonnes of construction and demolition waste was reported in 2015–16 was recovered. This fall in the recovery rate from the 54.8% achieved in 2014–15 was partly due to a 392,000 tonne increase in the amount landfilled, echoing a 93% increase in the amount sent from interstate sources. If interstate waste was removed from the equation, the recovery rate would be 51.5%. Concrete was the main material recovered (Table 1.2).

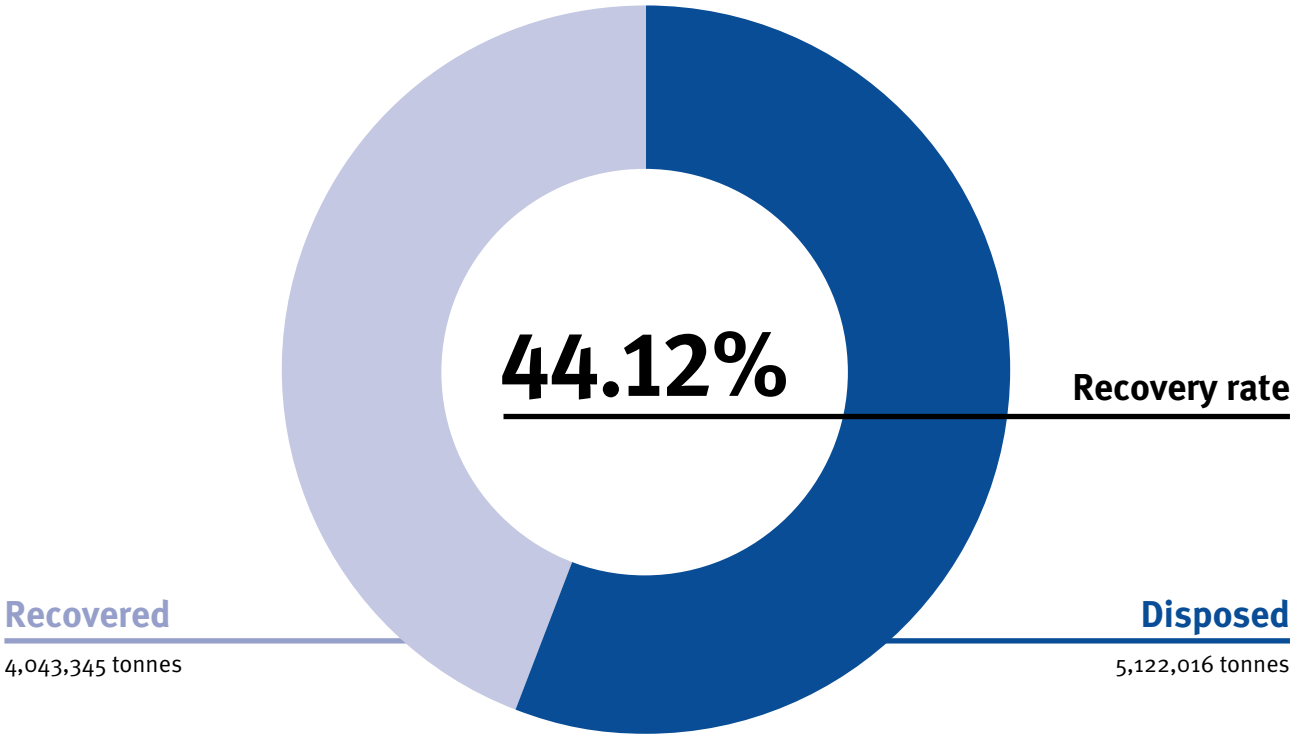
Table 1.1: Commercial and industrial waste materials recovered during 2015–16

Material	Amount recovered (tonnes)
Paper and packaging	400,226
Non-packaging glass	7,472
Non-packaging plastic	12,184
Ferrous scrap metal	308,272
Non-ferrous scrap metal	44,844
Timber	160,714
Green waste	281,755
Cotton gin trash	7,207
Food waste	19,149
Drilling mud	32,315
Tyres	30,374
Other rubber	198
Other mixed waste	12,722

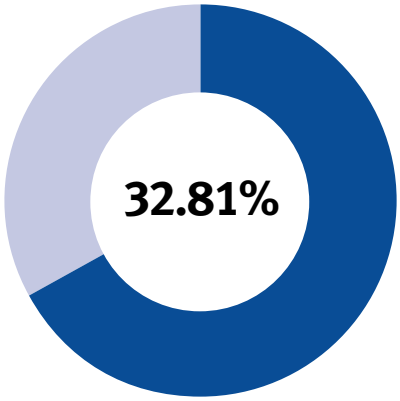
Table 1.2: Construction and demolition waste materials recovered during 2015–16

Material	Amount Recovered (tonnes)
Concrete	1,318,860
Asphalt	149,552
Bricks and tiles	84,017
Plasterboard	24,694
Timber	37,236
Non-packaging glass	7,472
Ferrous scrap metal	232,453
Non-ferrous scrap metal	11,760

Figure 1.1: Headline wastes generated and recovery rates in Queensland during 2015–16

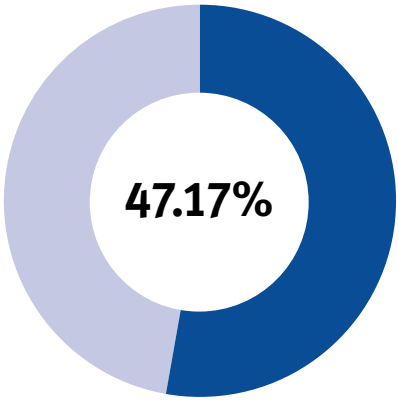


Municipal solid waste



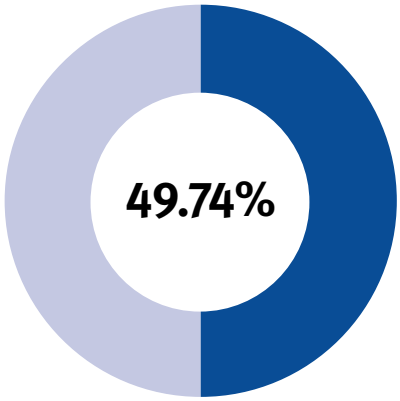
Recovered 859,870 tonnes
Disposed 1,761,021 tonnes

Commercial and industrial waste



Recovered 1,317,431 tonnes
Disposed 1,475,602 tonnes

Construction and demolition waste



Recovered 1,866,044 tonnes
Disposed 1,855,393 tonnes

2. Selected trends for headline waste streams

This section reviews the management of headline waste streams using a series of graphs to illustrate seven- to nine-year trends.

2.1 Kerbside domestic bin collection

In 2015–16, local governments provided kerbside bin collection services:

- for mixed waste (red bin lid) to 1,859,000 households
- for paper and packaging materials (yellow bin lid) to 1,570,000 households
- for green waste (green bin lid) to 175,000 households.

In effect, 84.5% of households with a red bin lid service also had a yellow bin lid service, while 9.4% had a green bin lid service. In comparison, 66,000 households had no waste bin service.

The numbers of mixed waste, and paper and packaging kerbside services have largely kept pace with population growth in Queensland, averaging 386 and 333 services per thousand people respectively during the past eight years (Figure 2.1).

In contrast, the number of kerbside green waste services has grown from 7 services per thousand people in 2008–09 (28,539) to 37 services per thousand people in 2015–16 (175,158). In addition, Ipswich City Council is now also collecting food waste via its green lid bin service.

A breakdown of local government bin services (by region) is available in Appendix 1.

Compared to 2014-15, there was a 33,000 tonne (2.8%) increase in the amount of mixed waste (red bin lid) sent to landfill; a 21,000 tonne (56%) increase in the amount of mixed waste (red bin lid) sent for recovery; a 9,000 tonne (2.7%) increase in the amount of paper and packaging (yellow bin lid) sent for recovery; and a 4,000 tonne (8.5%) increase in the amount of green waste sent for recovery.

Combining the amounts received with the number of bin services, local governments collected an average of 700 kg of mixed waste per red bin lid service, 220 kg of paper and packaging materials per yellow bin lid service, and 320 kg of green waste per green bin lid service.

Figure 2.2 shows the trends in the management of wastes collected by local governments from households. Note that the amounts sent for recovery are greater than the amounts actually recovered due to the generation of residuals in the recovery process.

While the amount of kerbside waste has fluctuated and was 1% lower in 2015–16 than in 2009–10, the amount of kerbside waste sent for recovery increased by 40% over the same period. This was due to an increase in the amount of paper and packaging sent and a number of councils commencing green waste collections.

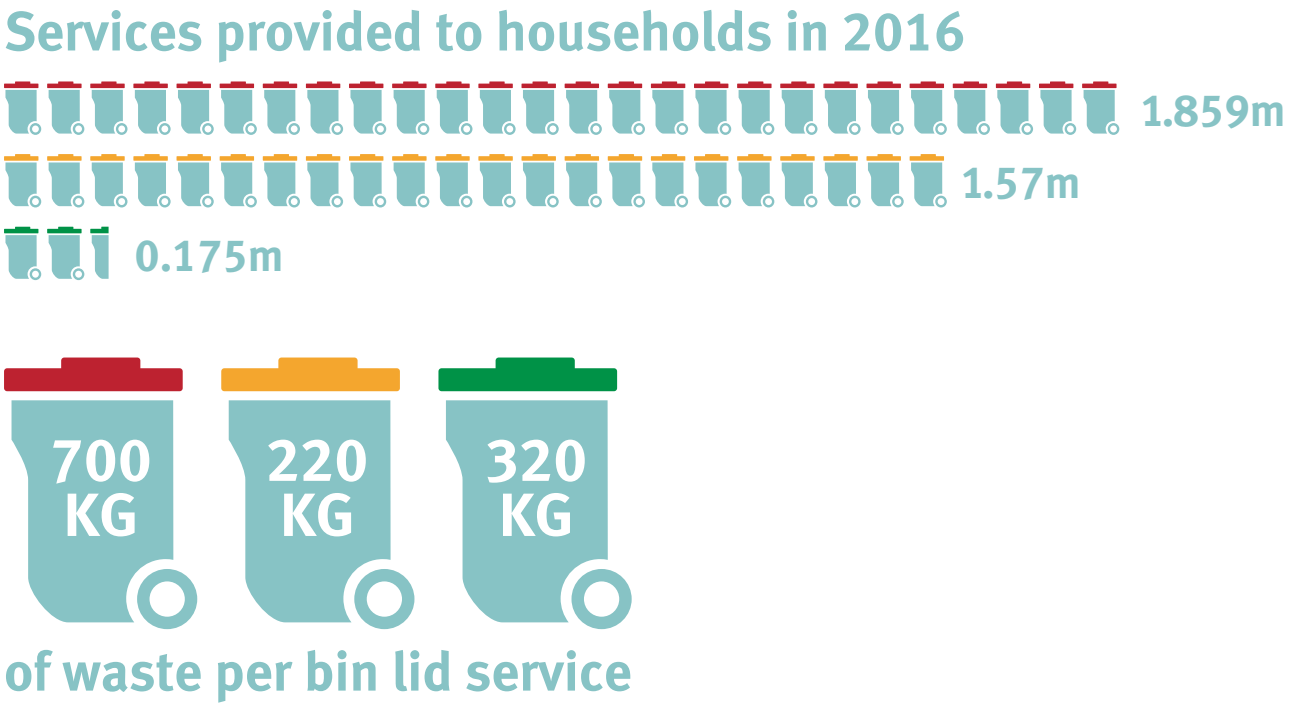


Figure 2.1: Trends in the provision of kerbside bin services by local governments (2009–16)

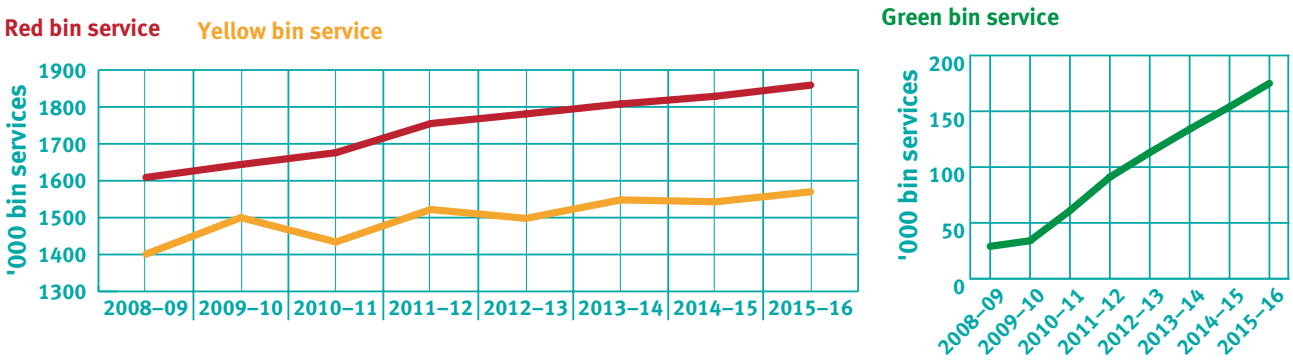
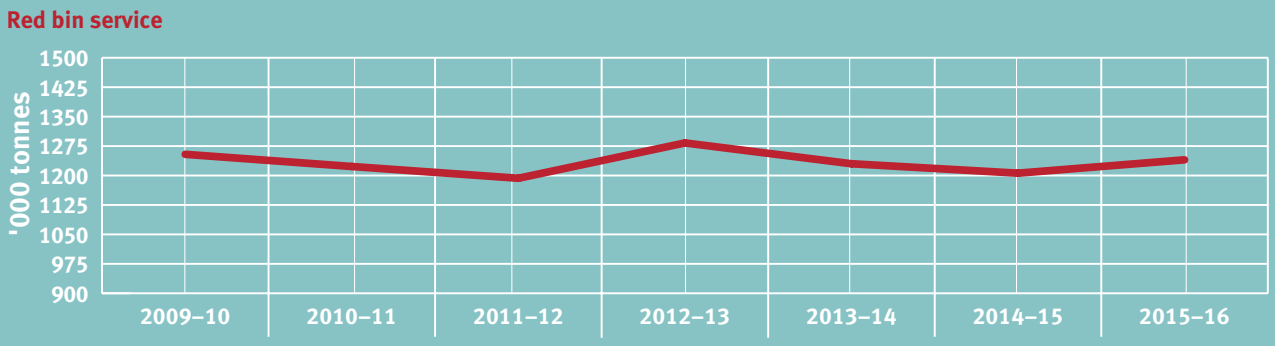
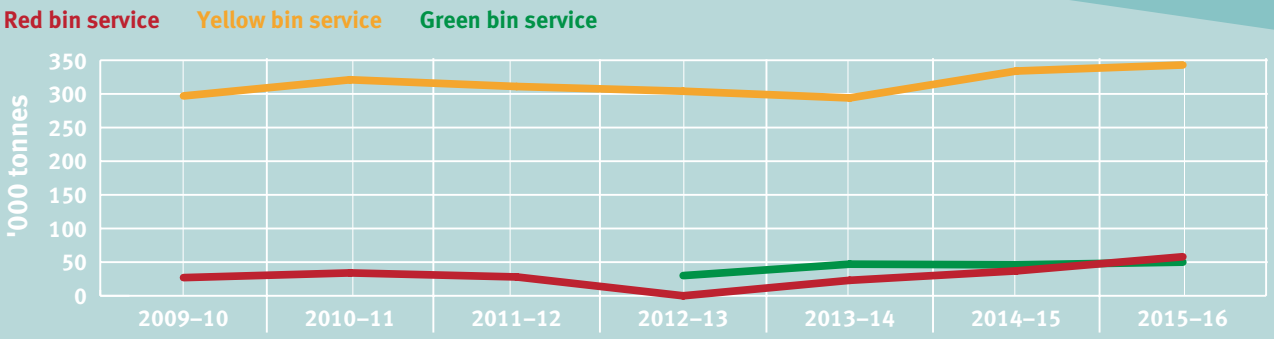


Figure 2.2: Trends in the disposal and recovery of domestic waste picked up via kerbside collections in Queensland (2010–16)

Sent to landfill



Sent to recovery

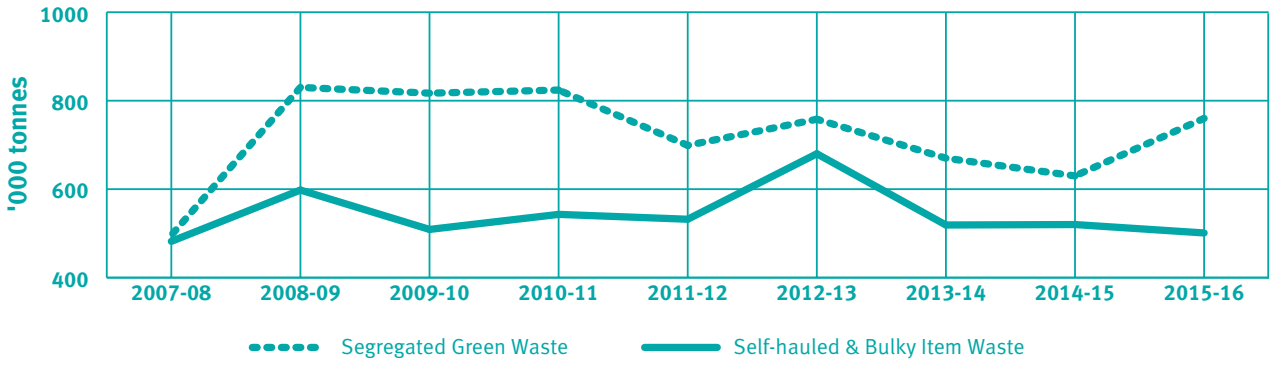


2.2 Segregated green waste and other domestic waste

In 2015–16, 76% of the 754,000 tonnes of segregated green waste recovered was received from domestic sources and has been classified as municipal solid waste. Although there was almost no disaster management green waste received, the overall amount of green waste increased by 120,000 tonnes from 2014–15 (Figure 2.3).

The 501,000 tonnes of domestic waste self-hauled by residents to council facilities or picked up via bulky item kerbside collections was similar to the amount reported in previous years.

Figure 2.3: Trends in the total amounts of green waste and of domestic self-hauled and bulky item waste in Queensland (2008–16)

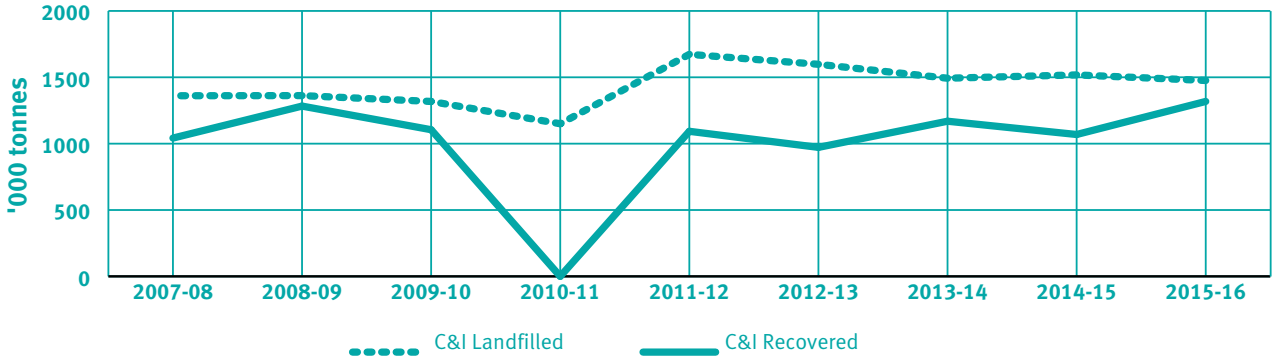


2.3 Commercial and industrial waste

In 2015–16, the total amount of commercial and industrial (C&I) waste sent to landfill was 1,476,000 tonnes. This was a 3% (43,000 tonne) decrease from 2014–15, and is consistent with the long-term trend (Figure 2.4).

In contrast, the 1,318,000 tonnes recovered in 2015–16 was up 248,000 tonnes (23%) on the amount recovered in 2014–15, and was 200,000 tonnes more than the 2008–15 average of 1,105,000 tonnes. The increase in recovery is partly due to a change in the source stream allocation of timber. (The untreated timber reported by organic processors in 2014–15 was classified as construction and demolition waste while in this report it has been classified as commercial waste). Other significant changes included increased recovery in the amounts of commercially sourced green waste and paper and packaging materials, and decreased recovery in the amounts of ferrous and non-ferrous metal.

Figure 2.4: Trends in the management of commercial and industrial waste in Queensland (2008–16)

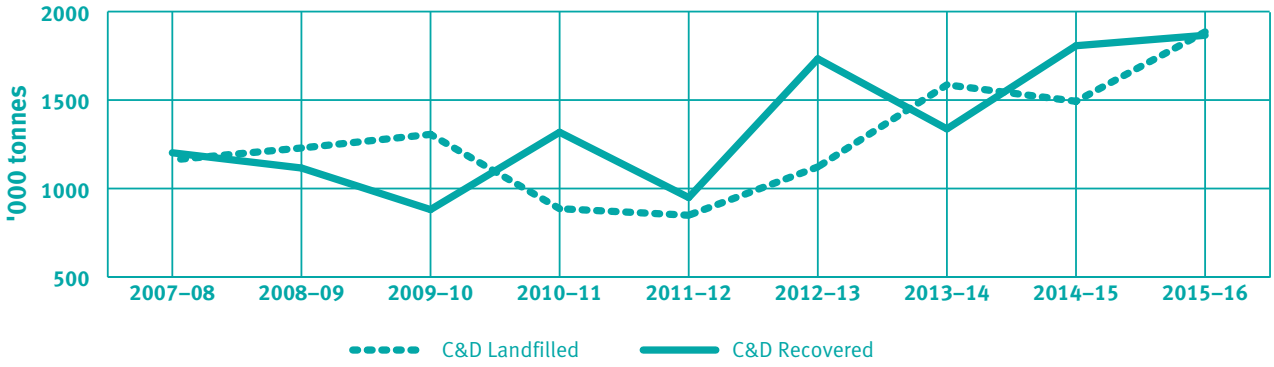


2.4 Construction and demolition waste

The fluctuating trends in the disposal of construction and demolition (C&D) waste continued in 2015–16 (Figure 2.5). The 1,885,000 tonnes landfilled is a 392,329 tonne (26%) increase on the amount reported in 2014 – 15. This is largely due to doubling in the amount of construction and demolition waste sent from interstate.

The 1,866,000 tonnes of construction and demolition waste recovered in 2015–16 is the largest amount reported to date. It includes increases in the amounts of concrete, asphalt and bricks and tiles recovered.

Figure 2.5: Trends in the management of construction and demolition waste in Queensland (2008–16)



3. Headline waste disposal in regional Queensland

This section reports on the disposal of headline waste streams via landfill or incineration. Of the 5,122,000 tonnes of headline waste streams disposed of in Queensland, 54% were disposed of in privately-owned landfills, 45.6% were disposed of in local government facilities and the remainder were incinerated or disposed of in industrial and mining monofills. Private landfills were responsible for 13% of the municipal solid waste, 53% of the commercial and industrial waste and 93% of the construction and demolition waste disposed of in 2015–16.

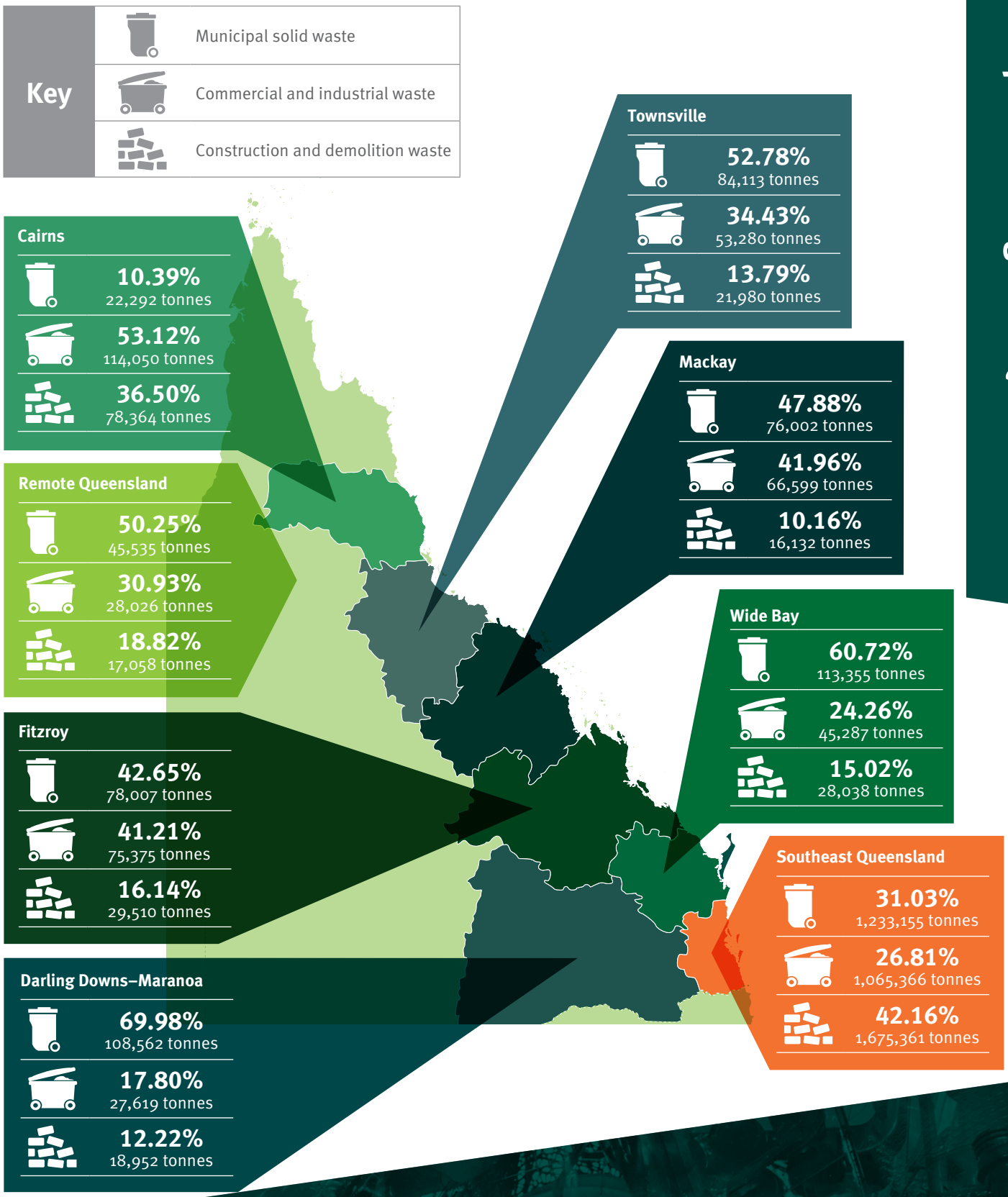
Although the 2,335,000 tonnes of wastes disposed of in local government landfills was a 50,000 tonne (2%) decrease on the amount reported in 2014–15, the 2,776,000 tonnes of wastes disposed of in private sector landfills was a 416,000 tonnes (18%) increase on the amount reported in 2014–15. The driver for the increase in the private sector was a 442,000 tonne increase in the amount of construction and demolition waste received, including an extra 238,000 tonnes from interstate sources. Most of the waste disposed of in private facilities was landfilled in South East Queensland.

Figure 3.1 shows the amounts of the headline waste streams disposed of in each region during 2015–16. It shows the majority of the waste sent to disposal was landfilled in South East Queensland. Landfills in South East Queensland received 70% of the municipal solid waste, 72% of the commercial and industrial waste and 89% of the construction and demolition waste sent to disposal in the state.

The pattern of disposal in South East Queensland is different to that in the rest of the state (Figure 3.1). For example, where construction and demolition waste was the largest source stream in South East Queensland, it was the generally the smallest stream in the other regions. Conversely municipal solid waste made up 31% of the waste sent to landfill in South East Queensland compared to an average of 46% in non-metropolitan Queensland.

The pattern in the Cairns region is anomalous because a number of councils send putrescible waste to an alternative waste treatment plant for processing. Consequently municipal solid waste only makes up 10% of the waste sent to landfill in that region. As the residual waste from that process is classified as commercial and industrial waste, that source stream makes up 53% of the waste sent to landfill in the Cairns region (compared to an average of 29% for the state).

Figure 3.1: Queensland regions and the headline waste landfilled or incinerated by region in 2015–16



4. Waste recovery

This section reports on materials that are diverted from disposal through a variety of means, including recycling, organic processing and energy recovery.

4.1 Local government activity

Local governments are the main collection point for domestic waste, and for wastes generated outside of South East Queensland. In 2015–16, local governments diverted 3.3 million tonnes of waste from disposal.

4.1.1 Paper and packaging materials

Local governments dominate the domestic collection process for paper and packaging through the provision of kerbside collection services in urban areas, as well as the more widely distributed provision of public place drop-off points.

As at 30 June 2016, local governments provided a kerbside recycling service to 1,570,000 households (or 84.5% of households that had a kerbside waste collection service) as well as 3,300 public place recycling bins/drop-off points.

In total, local governments sent 333,000 tonnes of paper and packaging for recovery in 2015–16 (up from 311,000 tonnes in 2014–15. Almost all this material was forwarded to private sector recyclers for processing. The exceptions were small amounts of glass, paper and cardboard recovered locally by councils away from South East Queensland.

The 185,000 tonnes of paper and cardboard sent for recovery was a 15,000 tonne increase (8.7%) compared to the previous year, while the 110,000 tonnes of glass sent for recovery was a 1400 tonne increase and was the largest amount reported since reporting commenced (Figure 4.1).

There were substantial increases in the amounts of the steel cans and packaging plastics sent for recovery (Figure 4.1). The 6,900 tonnes of steel cans recovered was a 17% increase from the previous year. The 27,700 tonnes of packaging plastics recovered was a 4,900 tonne (21%) increase compared to the previous year, and continued an eight-year upward trend. In contrast, the 3,400 tonnes of aluminium cans recovered represented only a slight increase on the previous year.

Queensland's steadily increasing population has a direct impact on the amount of waste generated. Figure 4.2 provides a normalised comparison of the changes in collections for individual paper and packaging materials with that of the mixed waste collection on a per capita basis.

In summary:

- The 272 kg per capita of mixed (red bin lid) waste collected in 2015–16 was an increase of 3% from 2014–15 and an 8% decrease from 2009–10.
- The 38.8 kg per capita of paper and cardboard sent for recovery was an increase of 7% from 2014–15, and a 4% decrease from 2009–10.
- The 23 kg per capita of packaging glass sent for recovery was an increase of 0.1% from the previous year and an increase of 1.3% from 2009–10.
- The 5.8 kg per capita of packaging plastic sent for recovery was an increase of 20% from the previous year and an increase of 67% from 2009–10.
- The 1.4 kg per capita of steel cans sent for recovery was an increase of 16% from the previous year and an increase of 15% from 2009–10.
- The 0.71 kg per capita of aluminium cans sent for recovery was a decrease of 0.8% from the previous year and an increase of 4.2% since 2009–10.

Local governments in South East Queensland (with 68% of the population) generated 73% of the paper and packaging sent for recycling by the sector (Table 4.1) and had disproportionately large shares of the packaging glass (78%) and packaging plastics (77%) segments. In contrast, Cairns, Wide Bay, Darling Downs-Maranoa and Remote Queensland had disproportionately large shares of aluminium cans sent for recovery, due in large part to transport costs.

Figure 4.1: Trends in the amounts of glass, paper/cardboard, plastics, steel cans and aluminum cans sent for recycling by local governments (2004–16)

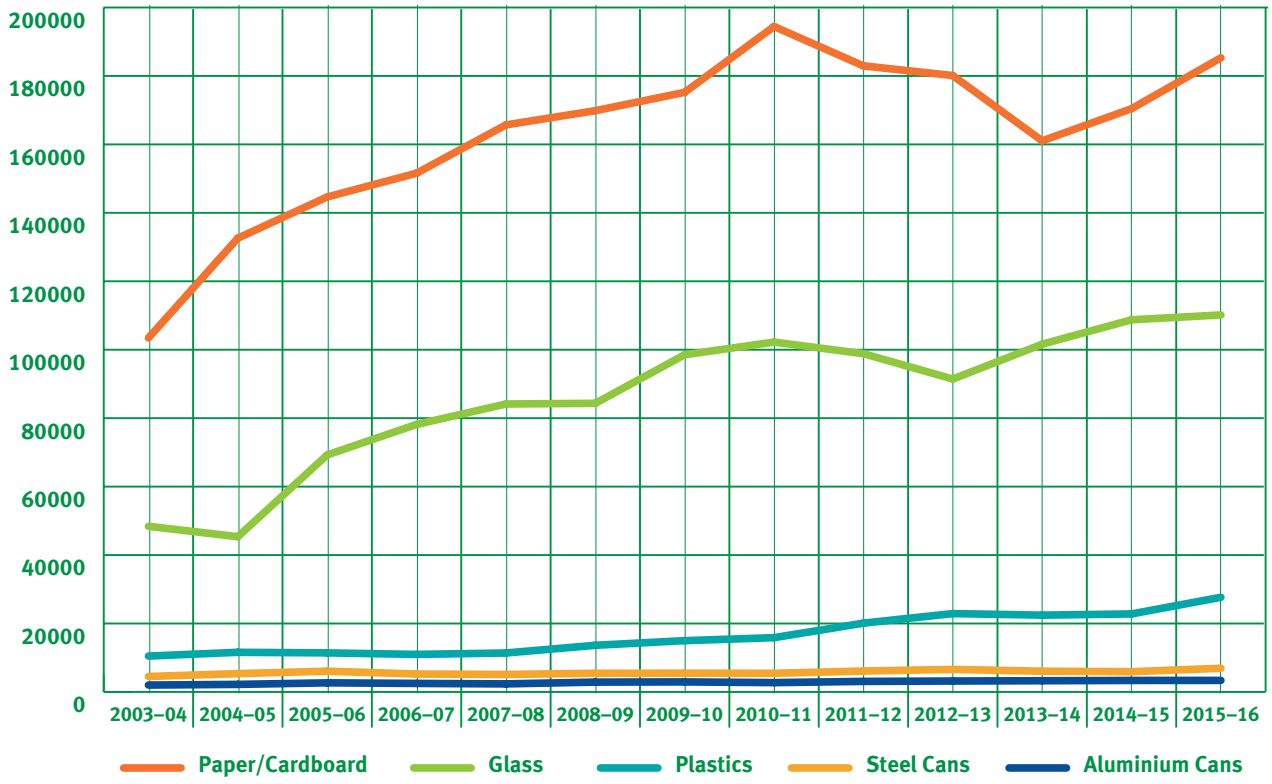


Figure 4.2: Normalised per capita rates for paper and packaging sent for recovery versus domestic kerbside waste collected by local governments (2009–10 = 1.000)

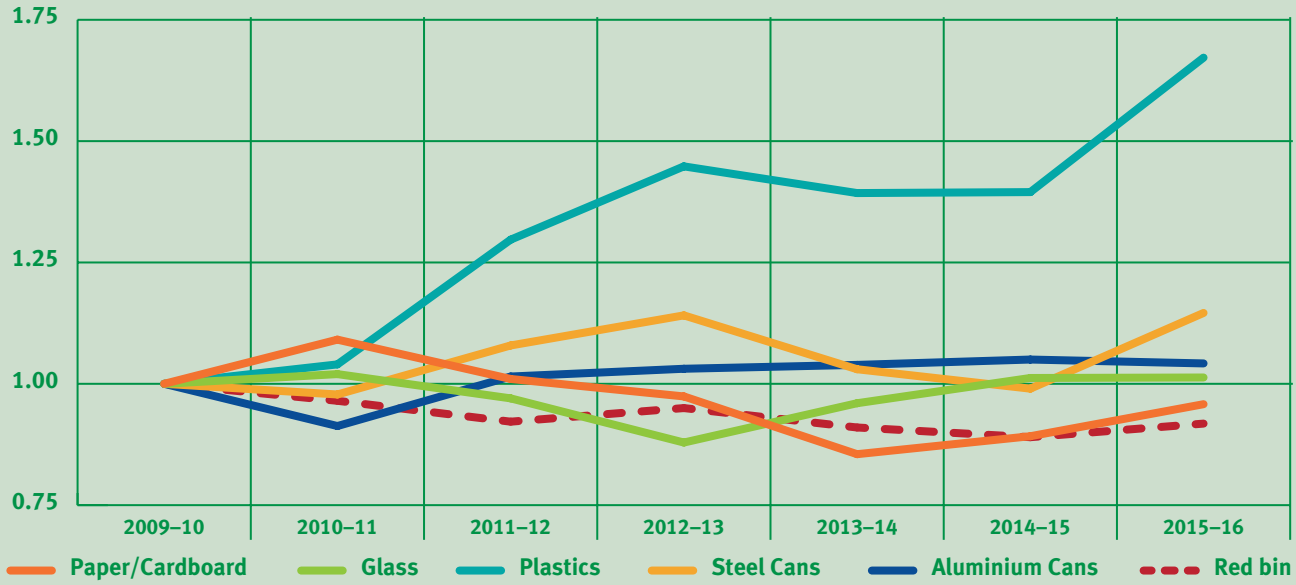


Table 4.1: Amounts of paper and packaging collected by local governments and sent for recovery in 2015–16 by region (tonnes)

Region	Paper and Cardboard	Packaging Glass	Packaging Plastics	Steel Cans	Aluminum Cans
Southeast Queensland	128,976	85,964	21,186	5,069	2,084
Darling Downs-Maranoa	7,263	5,377	1,190	374	248
Wide Bay	14,643	2,600	1,339	519	320
Fitzroy	7,485	4,234	994	272	140
Mackay	11,568	3,732	787	138	213
Townsville	8,182	4,999	1,140	321	129
Cairns	6,826	3,088	1,015	236	226
Remote Queensland	356	173	6	0	15
Subtotal	**185,299**	**110,167**	**27,657**	**6,929**	**3,375**

4.1.2 Other materials

Other wastes sent for recovery by local governments in 2015–16 included:

- 619,000 tonnes of green waste
- 26,000 tonnes of timber
- 2,900 tonnes of lead acid batteries
- 3,600 tonnes of e-waste
- 94,000 tonnes of other ferrous metal
- 3,800 tonnes of other non-ferrous metal
- 131,000 tonnes of concrete
- 79,000 tonnes of asphalt
- 5,700 tonnes of bricks and tiles
- 2,800 tonnes of tyres
- 1,700 tonnes of mineral oil
- 15,000 tonnes of tip shop items.

Local governments played an important role in the collection and management of green waste (handling 82%) and e-waste (handling 69%) in 2015–16. While all the e-waste was forwarded to recyclers for processing, local governments typically processed all the concrete and asphalt they received.

Table 4.2 provides a regional breakdown of selected wastes sent for recovery by local governments. South East Queensland was the dominant region, particularly for e-waste and asphalt, with 70% and 87% of the state totals collected there. Councils in each region diverted concrete from disposal, with Townsville and Wide Bay diverting the largest amounts outside of South East Queensland. Councils in Townsville diverted large amounts of asphalt, while councils in Darling Downs-Maranoa and Wide Bay also diverted large amounts of green waste, ferrous metal and tip shop items.

Table 4.2: Amounts of other selected wastes sent for recovery by local governments in 2015–16 by region (tonnes).

Region	Green waste	Timber	Concrete	Asphalt	Ferrous metal	Non-ferrous metal	E-waste	Tip shop sales
Southeast Queensland	350,085	14,282	76,129	69,094	56,909	1,236	2,543	10,045
Darling Downs-Maranoa	56,808	8,000	7,954	181	8,198	16	46	1,707
Wide Bay	86,126	759	12,992	881	9,359	403	77	1,301
Fitzroy	40,210	1,711	7,699	0	3,576	885	800	364
Mackay	24,329	0	3,906	0	4,641	963	0	974
Townsville	28,571	767	19,785	7,596	1,670	60	78	365
Cairns	28,804	0	1,787	1,600	7,892	103	95	516
Remote Queensland	4,211	3	351	50	1,746	167	4	0
Subtotal	**619,143**	**25,521**	**130,604**	**79,402**	**93,992**	**3,832**	**3,643**	**15,272**

4.2 Organic processors

The 63 reporting entities responding to the 2016 organic processing survey collectively dealt with:

- 253,000 tonnes of green waste
- 192,000 tonnes of forestry residuals
- 14,000 tonnes of agricultural residuals
- 32,000 tonnes of drilling mud
- 126,000 tonnes of timber, wood and sawdust
- 7,000 tonnes of cotton gin trash
- 80,000 tonnes of abattoir waste
- 267,000 tonnes of manure
- 56,000 tonnes of biosolids (dry solids equivalent)
- 137,000 tonnes of grease trap waste and other organic sludges
- 19,000 tonnes of food waste
- 37,000 tonnes of food processing waste
- 47,000 tonnes of ash.

Collectively these organic processors produced:

- 383,000 tonnes of manufactured soil
- 360,000 tonnes of soil conditioner
- 185,000 tonnes of potting mix
- 17,000 tonnes of organic fertiliser
- 257,000 tonnes of mulch
- 407,000 tonnes of direct land application
- 196,000 tonnes of manure
- 13,000 tonnes of playground surfacing
- 130,000 tonnes of other products.

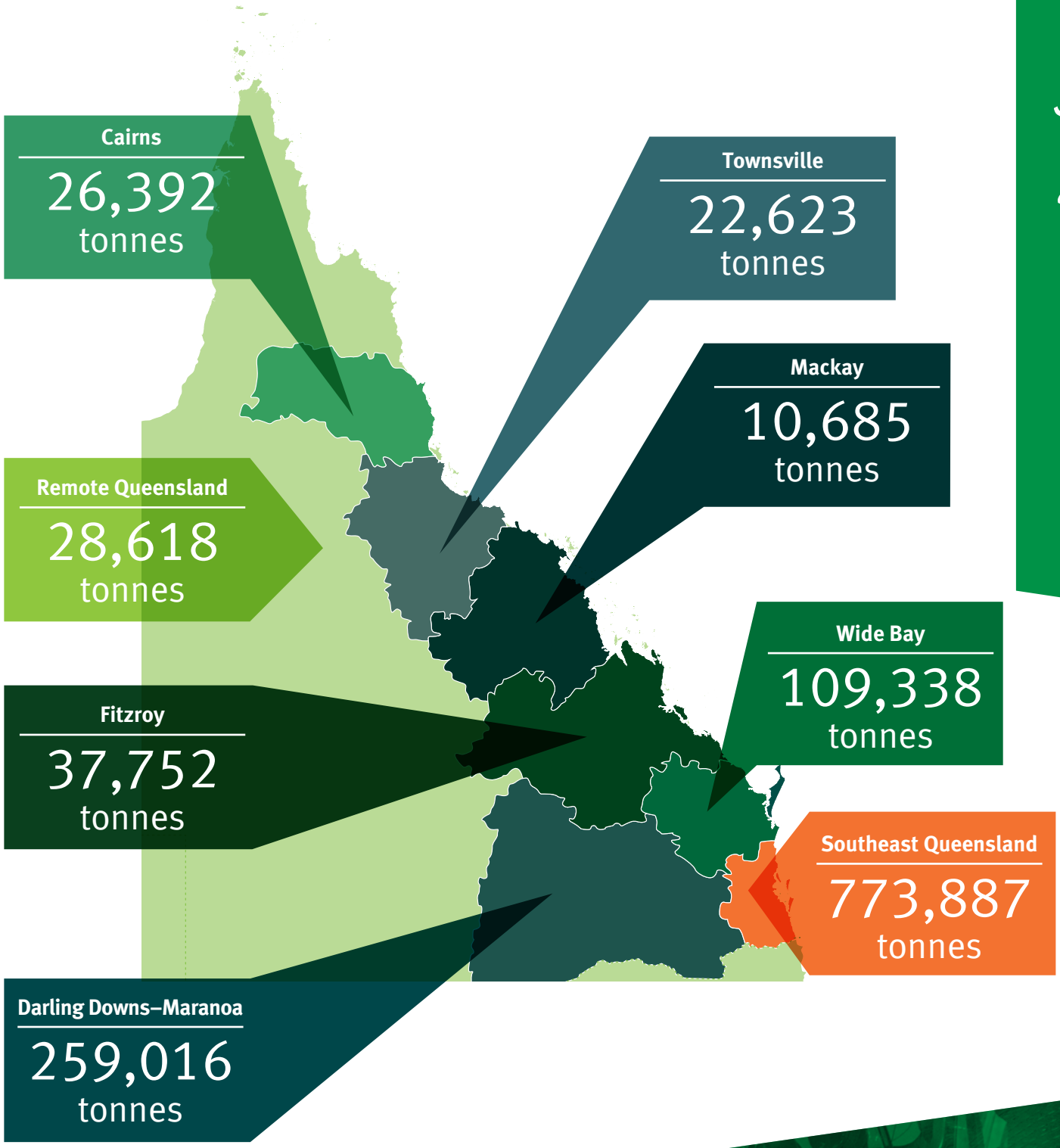
Few organic wastes have to be transported long distances for centralised processing. Organic wastes are typically processed in the region in which they are produced as shown in Table 4.3.

South East Queensland was the dominant region for green waste, forestry residuals, grease trap waste and other organic sludges, abattoir waste, waste food, food processing waste and ash. The Darling Downs–Maranoa processed the most manure, biosolids, cotton gin trash and drilling mud and Wide Bay processed the most timber and agricultural residuals.

Table 4.3: Selected wastes handled by organic processors during 2015–16 by region (tonnes)

Waste material	Region							
	SE Qld	Darling Downs–Maranoa	Wide Bay	Fitzroy	Mackay	Townsville	Cairns	Remote Qld
Timber, wood and sawdust	43,566	4,735	72,793	1,285	97	1,800	660	843
Green waste	197,665	1,489	4,874	1,361	8,467	10,600	22,755	6,130
Forestry residuals	178,731		13,352					
Agricultural residuals	3,561	39	7,900	149		622	1,400	350
Manure	93,568	145,507	5,290	245		985	200	21,252
Abattoir waste	36,738	24,176	3718	10,583	967	3,900		
Cotton gin trash		4,000		3,207				
Waste food	18,834			4		11	23	
Food processing waste	34,195	35	700	769		1,000		43
Biosolids (DSE)	2,981	47,738	459	4443		12		
Grease trap and other organic sludges	122,367	1,898		9,,698		2,142	1,355	
Ash	40,892	560	252	4,360	444	584		
Drilling mud	788	28,839		1,648	710	330		

Figure 4.3: Regional subtotals of selected wastes handled by organic processors during 2015–16.



4.3 Overall recovery of materials

Many of the waste materials diverted from disposal are transferred between agents within the waste and recycling sector. For example, skip bin operators may leave materials at council transfer stations, local governments may forward material to recyclers and organic processors, and recyclers may in turn forward materials to other recyclers for further processing. Table 4.4 provides an overall summary of materials recovered in 2015–16, distinguishing between material and energy recovery, as well as the apparent recovery destination of the materials (Queensland, interstate or overseas).

Table 4.4: Recovery methods and destinations for selected materials recovered by reporting entities in Queensland during 2015–16 (tonnes)

Material	Quantity recovered or sent for recovery in Queensland*	Quantity combusted for energy recovery in Queensland	Quantity sent interstate for further processing	Quantity sent interstate for energy recovery	Quantity sent overseas for further processing	Quantity sent overseas for energy recovery	Total Reported in 2016	Total Reported in 2015
Packaging glass	107,063						**107,063**	**61,667**
Non packaging glass	14,218		726				**14,944**	**7,548**
Paper	97,185		21,189		143,894		**262,268**	**203,476**
Cardboard	80,121		76,496		136,501		**293,118**	**291,966**
Packaging plastics	8,039		2,373		22,032		**32,444**	**24,671**
Non packaging plastics	5,300				6,884		**12,184**	**11,502**
Steel cans			2,434		6,145		**8,580**	**5,423**
Other ferrous metals	10,064		167,960		403,283		**581,307**	**734,254**
Aluminium cans					3,745		**3,745**	**4,422**
Other nonferrous metals	18		1,673		57,109		**58,800**	**71,775**
Lead acid batteries	8,569		21,312				**29,881**	**33,950**
Other batteries	1		59		303		**363**	**50**
E-waste	2,032		2,640		591		**5,263**	**3,781**
Catalysts	55		62				**117**	**164**
Concrete	1,318,860						**1,318,860**	**1,131,187**
Asphalt	149,552						**149,552**	**104,179**
Bricks and tiles	84,017						**84,017**	**66,551**
Plasterboard/ fibro	24,694						**24,694**	**16,424**
Timber, sawdust	149,888	48,032	30				**197,950**	**180,504**
Green waste	630,576	112,075		11,172			**753,823**	**619,071**
Forestry residuals	192,083						**192,083**	**163,563**
Agricultural residuals	14,021						**14,021**	**33,426**

Material	Quantity recovered or sent for recovery in Queensland*	Quantity combusted for energy recovery in Queensland	Quantity sent interstate for further processing	Quantity sent interstate for energy recovery	Quantity sent overseas for further processing	Quantity sent overseas for energy recovery	Total Reported in 2016	Total Reported in 2015
Manure	267,864						**267,864**	**125,273**
Abattoir waste	80,081						**80,081**	**102,126**
Cotton gin trash	7,207						**7,207**	**11,982**
Vegetable Oil	17,579				2,077		**19,656**	**8,809**
Waste food	19,149						**19,149**	**13,462**
Food processing waste	36,742						**36,742**	**45,921**
Mineral oil	60,798	12,858	7,952	11,431	9,018	201	**102,259**	**70,762**
Biosolids (DSE)	62,289						**62,289**	**92,431**
Grease trap waste & sludges	170,464		52				**170,516**	**108,648**
Oily water	10,650						**10,650**	**5,717**
Ash	930,287						**930,287**	**883,622**
Drilling mud	32,315						**32,315**	**47,506**
Tyres	20,521					9,853	**30,374**	**23,205**
Other rubber	111				87		**198**	
Paint, solvents & chemicals	268	621	1,333	30		6	**2,258**	**3,372**
Tip Shop	15,272						**15,272**	**11,661**
Destination subtotal	**4,627,733**	**173,586**	**306,292**	**22,633**	**791,670**	**10,060**	**5,932,014**	**5,324,051**

**Recovered in Queensland means the material was either fully recovered by the reporting entity or was sent to another (non-reporting) operator in Queensland for further processing. It is possible that materials last tracked to a Queensland site were subsequently sent interstate or overseas.*

Of the 5.9 million tonnes of materials tracked in Table 9, 81% were fully recovered in Queensland, 6% were sent interstate and 13% were sent overseas for further processing. Typically, building materials and organic wastes were recovered in Queensland, while large amounts of ferrous and nonferrous metals, lead acid batteries, paper, cardboard, plastics, tyres, and mineral and vegetable oil were sent interstate or overseas for recovery.

Just over 206,000 tonnes of the materials reported were sent to energy recovery including 16% of the green waste, 24% of the timber, 32% of the tyres, 24% of the mineral oil and 29% of the paint, solvents and chemicals recovered.

There were a number of key changes from the previous reporting period.

- The amount of concrete recovered increased by 188,000 tonnes.
- The amount of ferrous metal recovered decreased by 153,000 tonnes, reflecting a depressed market.
- The amount of packaging glass recovered increased by 45,000 tonnes, reflecting increased capacity and demand.
- The amount of paper recovered increased by 59,000 tonnes with the amount sent overseas for further processing increased by 67,000 tonnes.
- The amount of vegetable oil recovered increased by 123% or 11,000 tonnes.
- The amount of mineral oil recovered increased by 45% or 31,000 tonnes.

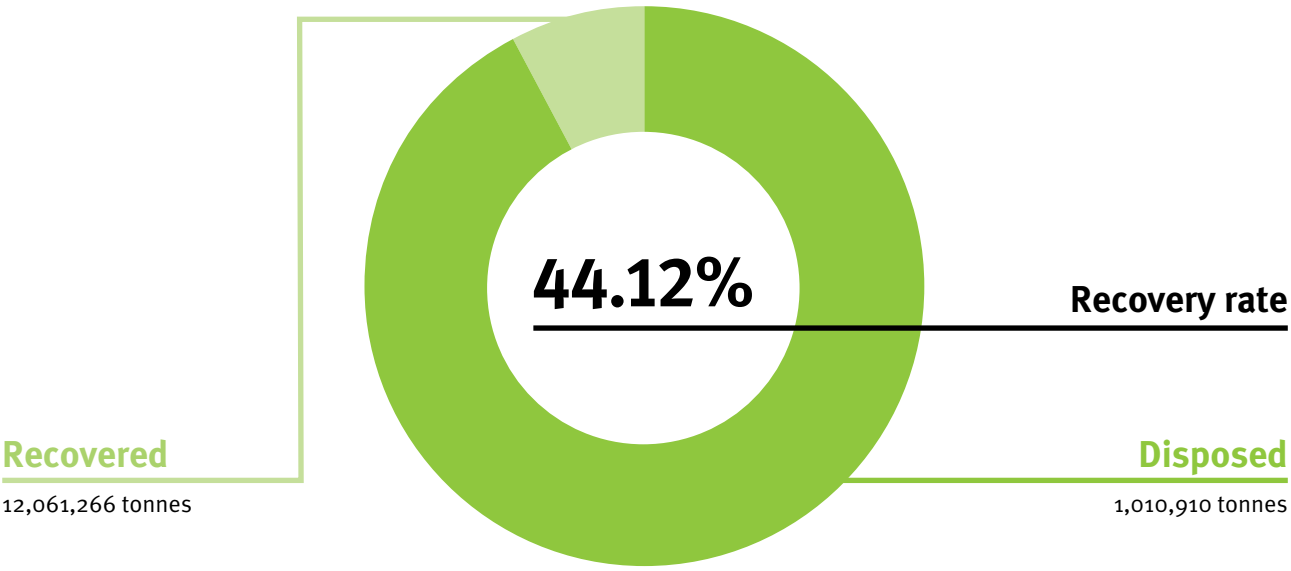
5. Other data and trends

This section reports on data and trends from other waste streams and cross border movements as well as a number of key waste reduction initiatives.

5.1 Other waste streams

Data on other wastes generated during 2015–16 is shown in Figure 5.1. Some of these streams (e.g. asbestos) have no recovery, while others (such as biosolids) have very high rates of recovery.

Figure 5.1: Other wastes generated during 2015–16

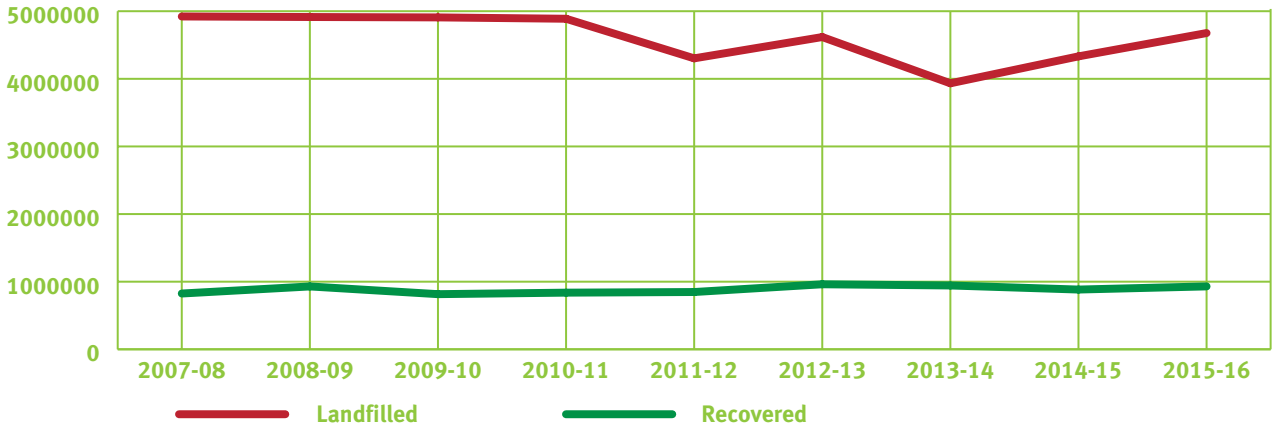


Waste stream	Amount generated (tonnes)	Amount disposed of (tonnes)	Amount recovered (tonnes)	Recovery rate
Asbestos	95,251	95,251	0	0.00%
Biosolids (DSE)	69,552	7,263	62,289	89.56%
Contaminated soil	573,594	555,260	18,334	3.20%
Potential/acid sulphate soil	9,281	9,281	0	0.00%
Ash	5,607,067	4,676,780	930,287	16.59%
Red mud	6,717,431	6,717,431	0	0.00%

The 5.6 million tonnes of ash generated in 2015–16 is a 400,000 tonne increase from the 5.2 million tonnes generated in 2014–15 (but is comparable with the nine-year average amount of 5.5 million tonnes). The increase from a low of 4.9 million tonnes in 2013–14 reflects a rebound in coal-fired power generation (Figure 5.2).

The 930,000 tonnes of ash recovered in 2015–16 was above the nine-year average of 886,000 tonnes, and the recovery rate of 16.6% was also above the nine-year average of 16.2%. However, the recovery rate was much lower than the peak of 19.4% achieved in 2013–14.

Figure 5.2: Amounts of ash landfilled and recovered in Queensland during 2008–2016 (tonnes)



5.2 Cross-border movements of waste

Typically Queensland is a net recipient of general wastes sent from interstate sources for landfill disposal, and a net consignor of recovered materials sent interstate and overseas for processing.

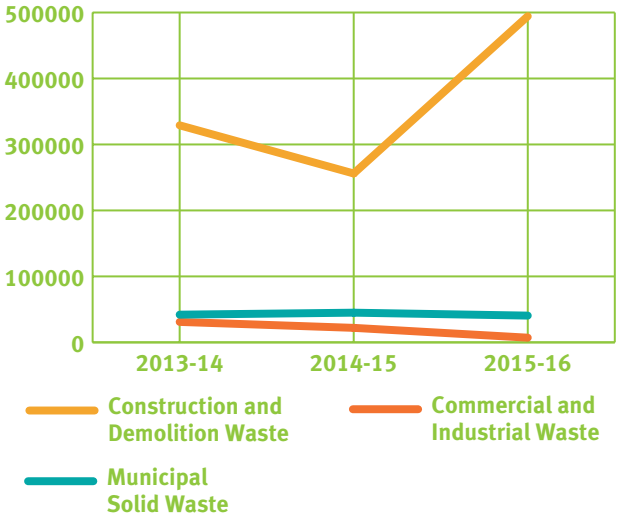
In 2015–16, 329,000 tonnes of materials listed in Table 4.4 were sent interstate for recovery while 801,000 tonnes were sent overseas.

Similarly, landfill operators in Queensland received 566,000 tonnes of waste from interstate sources, a 213,000 tonne increase from the 353,000 tonnes reported in 2014–15. This included approximately:

- 41,000 tonnes of municipal solid waste
- 7,000 tonnes of commercial and industrial waste
- 494,000 tonnes of construction and demolition waste
- 16,000 tonnes of contaminated soil
- 7,000 tonnes of regulated waste.

The 41,000 tonnes of municipal solid waste received was comparable to that reported in previous years. The 7,000 tonnes of commercial and industrial waste was a decrease from the 22,000 tonnes reported in 2014–15 and the 31,000 tonnes reported in 2013–14 (Figure 12). However, the 494,000 tonnes of construction and demolition waste was almost double the amount reported in 2014–15.

Figure 5.3: Three year trend in general wastes received by Queensland landfill operators from interstate sources



Note: a portion of the construction and demolition waste received by private landfills from interstate sources was put through a recovery process. Taking facility diversion rates into account, it is estimated that 370,000 tonnes of interstate construction and demolition waste were landfilled and 124,000 tonnes were recovered.

5.3 Product stewardship

Product stewardship schemes share responsibility for the environmental impacts of products during their lifecycles between the producers, retailers, and consumers of those products. These schemes may be voluntary or regulated.

In Australia, voluntary, industry-led schemes are in place to collect products ranging from agricultural chemicals and drums, to mobile phones and used tyres. Mandatory, or regulated schemes, exist for used oil, packaging and e-waste.

ChemClear and **drumMUSTER** are funded through a levy at point-of-sale to keep agricultural and veterinary chemicals and empty containers out of landfills. These schemes address a long-standing waste management problem for rural industries.

Over the past 15 years, the free **MobileMuster** industry take-back scheme has collected 7.5 million mobile phones and batteries across Australia.

The **Tyre Product Stewardship Scheme**, launched in 2014, is a national voluntary scheme funded by a levy on the sale of tyres.

The **National Television and Computer Recycling Scheme** is funded and run by industry, and regulated by the Australian Government. Under the scheme, householders and small businesses can drop off end-of-life TVs and computers at collection sites or events at no cost.

The Commonwealth Government's **Product Stewardship for Oil Program** uses an 8.5 cent per litre levy on new oil to provide benefit payments to oil recyclers.

5.4 Waste reduction and recycling plans

Chapter 6 of the *Waste Reduction and Recycling Act 2011* requires state and local governments to develop, adopt and implement waste reduction and recycling plans. These plans include waste reduction and recycling targets, actions to be taken to improve waste reduction and recycling and performance monitoring measures. Local governments also have the option to develop shared regional plans.

As at 30 June 2016:

- 44 (of 77) councils had waste plans in place, and the plans of over 30 of these councils are accessible via the internet (see Appendix 1).
- 2 joint plans were in place, covering the North Queensland and the Wide Bay Burnett regions.
- 22 state government departments and agencies had waste plans in place (Table 5.1).

Table 5.1: Queensland Government departments with waste plans in place as at 30 June 2016

Department	Duration of plan	Availability
Aboriginal and Torres Strait Islander Partnerships	2015–2018	Department of Communities, Child Safety and Disability Services website
Agriculture and Fisheries	2015 –2018	Available on request from the Department of Agriculture and Fisheries (ph: 3087 8478)
Communities, Child Safety and Disability Services	2015–2018	Department of Communities, Child Safety and Disability Services website
Education and Training	2015–2018	Available on request from the Department of Education and Training (ph: 3034 4520)
Energy and Water Supply	2015–2018	Department of Energy and Water Supply website
Environment and Heritage Protection	2015 – 2018	Department of Environment and Heritage Protection website
Housing and Public Works	2015–2018	Department of Housing and Public Works website
Infrastructure, Local Government and Planning	2015–2018	Available on request from the Department of Infrastructure, Local Government and Planning (ph: 3452 6901)
Justice and Attorney-General	2015–2018	Department of Justice and Attorney-General website
National Parks, Sport and Racing	2015–2018	Department of National Parks, Sport and Racing website
Natural Resources and Mines	2015–2018	Department of Natural Resources and Mines website
Premier and Cabinet	2016–2019	Department of Premier and Cabinet website
Public Safety Business Agency	2015–2018	Available on request from the Public Safety Business Agency (ph: 3364 4043)
Public Service Commission	2015–2018	Department of Public Service Commission website
Queensland Fire and Emergency Services	2015–2018	Available on request from the Public Safety Business Agency (ph: 3364 4043)
Queensland Health	Not specified	On Queensland Health website
Queensland Police Service	2015–2018	Available on request from the Public Safety Business Agency (ph: 3364 4043)
Queensland Treasury	2015–2018	Available on request from Queensland Treasury (ph: 3035 3526)
Science, Information Technology and Innovation	2015–2018	Department of Science, Information Technology and Innovation website
State Development	2015–2018	Available on request from the Department of State Development (ph: 3452 6901)
Tourism, Major Events, Small Business and the Commonwealth Games	2016–2018	Available on request from the Department of Tourism, Major Events, Small Business and the Commonwealth Games (ph: 3087 8478)
Transport and Main Roads	2016–2021	Department of Transport and Main Roads website

6. How this report was compiled

Local governments and private sector waste and recycling entities are required *by the Waste Reduction and Recycling Act 2011* to report to EHP by 31 August each year on the wastes they have managed during the preceding financial year.

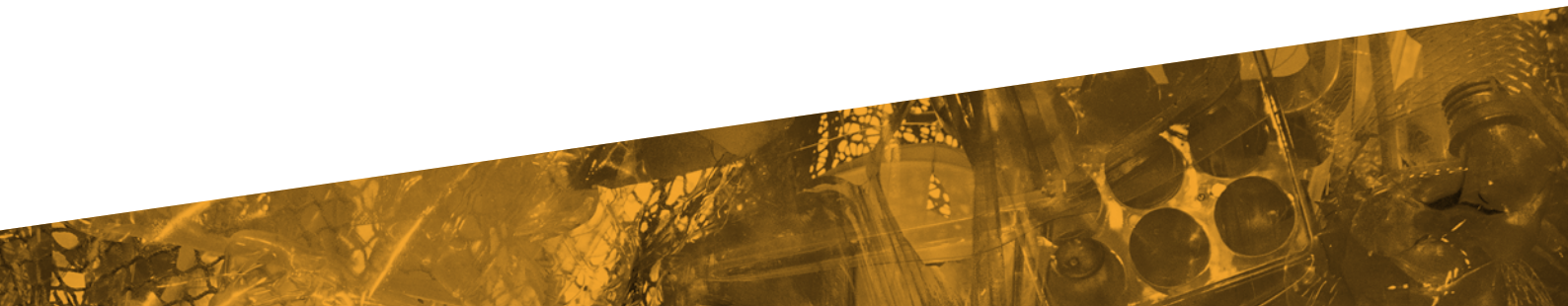
EHP collects the data from councils and registered entities using surveys administered via the Queensland Waste Data System.

EHP validates the data as it is submitted, checking to ensure it is correctly formatted and comparable to amounts reported in previous years. Where potential issues are identified (e.g. data entered as kilograms rather than tonnes), EHP contacts the respondent, and if warranted, amends the data in the system.

When the validation process has been completed, the data is compiled for analysis. Wastes are counted at the final point of disposal or recovery in the reporting chain (to avoid double-counting for wastes that are transferred between respondents).

The regions used in this report are broadly aligned with the Australian Bureau of Statistics SA4 regions. However, because local government areas are the fundamental building blocks for the reporting regions, EHP uses local government boundaries for its regions rather than the ABS framework (where the SA4 boundaries cut through local government areas). As a result, Toowoomba Regional Council is included in the Darling Downs-Maranoa region; and Mareeba Shire Council is included in the Cairns region.

The other difference is that EHP uses a combined South East Queensland region. This combines elements of 12 ABS SA4 regions and largely matches the area covered by the Council of Mayors, South East Queensland (excluding Toowoomba).



Glossary

Alternative waste treatment includes a range of processes that convert mixed waste that would otherwise be landfilled into useful products such as compost, fuel or biogas.

Ash is a residue resulting from the combustion of coal and other materials. It contains silica and lime, and can be used in concrete production, organic processing and waste fixation, etc.

Biosolids are organic solids derived from biological wastewater treatment processes that are in a state where they can be used as nutrients and soil conditioning agents, as a source of energy or for some other use. Sewage treatment plants are the main source of biosolids in Queensland.

Commercial and industrial waste (C&I) is produced by business and commerce, and includes waste from schools, restaurants, offices, retail and wholesale businesses, and manufacturing industries. In this report, it includes green waste arising from commercial activities.

Construction and demolition waste (C&D) is non-putrescible waste arising from construction or demolition activity. It may include materials such as concrete, asphalt, bricks, treated timber and steel.

Domestic waste is waste resulting from the ordinary domestic use or occupation of a house, flat, apartment, unit, boarding house, hostel or guesthouse. It does not include waste discharged to a sewer. Domestic waste may also be referred to as household waste. In practice, domestic waste includes the material that householders place in their general waste bins or the mixed waste they self-deliver to landfills and transfer stations.

Drilling mud is a viscous fluid mixture used by the drilling industry to protect drill bits and to transport rock cuttings to the surface.

E-waste comprises waste electrical and electronic products, such as end-of-life computers, televisions, and kitchen appliances etc.

Green waste includes grass clippings, tree, bush and shrub trimmings, branches and other similar material resulting from domestic or commercial gardening, landscaping or maintenance activities. In practice, the green waste data referred to in this report relates to separated material delivered directly to local government facilities and organic processors, and does not include garden waste mixed with other materials in household waste bins.

Headline waste streams (municipal solid waste, commercial and industrial waste, and construction and demolition waste) are wastes generated from everyday household and business activities. These wastes form the basis of state and federal waste targets and reporting. This category does not include hazardous or regulated wastes.

Illegal dumping is the unlawful disposal of large volumes (greater than 200 litres) of waste.

Litter is made up of scattered items of rubbish (less than 200 litres), such as cigarette butts, discarded food wrappers and beverage containers.

Monofills are landfills or long-term storage facilities that receive only one type of solid waste (such as tyres, sewage sludge or fly ash) or receive waste from a single source (such as a power station, refinery or mining operation).

Municipal solid waste (MSW) is a combination of domestic waste and other wastes arising from council activities (such as the management of parks and gardens, and the collection of litter and illegally dumped waste).

Organic processing involves the recovery of putrescible wastes through activities such as mulching, composting or vermiculture etc.

Packaging material includes paper, cardboard, glass, plastic, aluminium and steel containers.

Recycling involves the collection and processing of waste for use as a raw material in the manufacture of the same or similar products.

Recovered material is waste that has been diverted from landfill. It includes material that has been recycled, reprocessed or stockpiled for future use.

Recovery rate is the proportion of a waste stream that is recovered.

Red mud is a caustic residual from the refining of bauxite into alumina.

Regulated waste includes hazardous wastes listed in Schedule 7 of the Environmental Protection Regulation 2008. This category includes asbestos, pesticides, a range of waste chemicals and chemical compounds, and other industrial wastes.

Reprocessing is the activity of recovering materials from a waste stream for use as a substitute for raw materials. For example, green waste and biosolids can be mulched or composted.

Tip shops are sales outlets at waste facilities (such as local government transfer stations) for items that have been salvaged prior to landfill.

Appendix 1: Local government waste services in 2016

Council	Population*	Number of Red Bin Services	Number of Yellow Bin Services	Number of Public Place Recycling Bins	Number of non-residential services	Number of Green Bin Services	Waste Plan Published on Web
South-east Queensland							
Brisbane City Council	1,162,186	479,765	364,000	701	929	76,873	yes
Gold Coast City Council	555,608	227,812	173,436	91	2,653	19,458	yes
Ipswich City Council	193,015	68,595	68,595	0	286	12,865	yes
Lockyer Valley Regional Council	38,798	14,291	14,291	8	334	0	yes
Logan City Council	308,681	105,502	103,403	30	419	0	yes
Moreton Bay Regional Council	425,482	155,988	154,674	245	5,112	0	yes
Noosa Shire Council	53,515	30,158	25,607	75	292	4,285	yes
Redland City Council	149,989	57,194	57,194	109	1,922	9,326	yes
Scenic Rim Regional Council	39,757	13,330	13,330	197	435	0	yes
Somerset Regional Council	24,007	8,864	1,695	4	37	0	yes
Sunshine Coast Regional Council	287,539	109,660	102,970	206	2,756	21,176	yes
Darling Downs - Maranoa							
Balonne Shire Council	4,826	2,383	2,383	114	277	0	
Goondiwindi Regional Council	11,022	4,526	0	0	0	0	
Maranoa Regional Council	294	3,834	0	0	0	0	
Southern Downs Regional Council	35,738	10,839	10,839	115	0	0	yes
Toowoomba Regional Council	163,232	57,939	57,939	413	1,694	25,332	
Western Downs Regional Council	33,799	10,463	10,463	30	1,240	0	
Wide Bay							
Bundaberg Regional Council	94,380	38,971	38,971	78	1,274	0	yes
Cherbourg Aboriginal Shire Council	1,291	300	0	0	0	0	
Fraser Coast Regional Council	101,977	41,323	41,161	72	2,245	0	Yes
Gympie Regional Council	48,681	19,190	19,190	11	818	0	
North Burnett Regional Council	10,292	3,119	0	6	0	0	yes
South Burnett Regional Council	32,575	13,457	0	0	0	0	

Council	Population*	Number of Red Bin Services	Number of Yellow Bin Services	Number of Public Place Recycling Bins	Number of non-residential services	Number of Green Bin Services	Waste Plan Published on Web
Fitzroy							
Banana Shire Council	15,209	4,709	0	6	0	0	yes
Central Highlands Regional Council	31,454	9,715	9,691	14	343	0	yes
Gladstone Regional Council	67,464	25,000	25,000	130	0	0	
Livingstone Shire Council	37,001	11,730	11,741	24	290	0	Yes
Rockhampton Regional Council	83,653	32,521	32,521	160	1,559	0	yes
Woorabinda Aboriginal Shire Council	1,001	230	230	6	19	230	
Mackay							
Isaac Regional Council	24,267	9,012	9,025	38	627	0	yes
Mackay Regional Council	123,724	49,705	49,705	113	870	0	yes
Whitsunday Regional Council	34,312	12,849	0	16	0	0	
Townsville							
Burdekin Shire Council	17,831	6,616	6,616	45	397	5,209	yes
Charters Towers Regional Council	12,433	4,040	0	0	0	0	yes
Hinchinbrook Shire Council	11,352	5,545	5,545	30	0	0	yes
Palm Island Aboriginal Shire Council	2,671	500	0	0	0	0	
Townsville City Council	193,946	77,746	76,215	151	664	0	yes

Council	Population*	Number of Red Bin Services	Number of Yellow Bin Services	Number of Public Place Recycling Bins	Number of non-residential services	Number of Green Bin Services	Waste Plan Published on Web
Cairns							
Cairns Regional Council	160,285	70,272	66,323	9	88	0	yes
Cassowary Coast Regional Council	28,689	11,763	0	0	0	0	Yes
Douglas Shire Council	11,661	7,578	7,578	15	523	0	yes
Mareeba Shire Council	13,862	6,565	0	1	0	0	
Tablelands Regional Council	24,997	10,000	10,000	8	125	0	
Yarrabah Aboriginal Shire Council	2,686	464	0	0	0	0	
Remote Queensland							
Aurukun Shire Council	1,424	339	0	0	0	0	
Barcaldine Regional Council	3,342	1,314	0	0	0	0	
Barcoo Shire Council	357	115	0	0	0	0	
Blackall - Tambo Regional Council	2,238	880	0	0	0	0	
Boulia Shire Council	490	151	0	0	0	0	yes
Bulloo Shire Council	396	100	0	0	0	0	yes
Burke Shire Council	562	120	0	0	0	0	
Carpentaria Shire Council	2,262	682	0	0	0	0	
Cloncurry Shire Council	3,351	989	0	0	0	0	
Cook Shire Council	4,388	1,208	0	11	0	0	
Croydon Shire Council	326	90	0	0	0	0	
Diamantina Shire Council	288	160	0	0	0	0	
Doomadgee Aboriginal Shire Council	1,399	401	0	1	0	0	
Etheridge Shire Council	936	135	0	0	0	0	
Flinders Shire Council	1,792	592	0	0	0	0	
Hope Vale Aboriginal Shire Council	1,125	288	0	0	0	0	
Kowanyama Aboriginal Shire Council	1,142	280	0	0	0	0	
Lockhart River Aboriginal Shire Council	548	154	0	0	0	154	
Longreach Regional Council	4,092	1,400	0	0	0	0	

Council	Population*	Number of Red Bin Services	Number of Yellow Bin Services	Number of Public Place Recycling Bins	Number of non-residential services	Number of Green Bin Services	Waste Plan Published on Web
Mapoon Aboriginal Shire Council	1,062	105	0	0	0	0	
McKinlay Shire Council	21,833	256	0	0	0	0	
Mornington Shire Council	1,225	506	0	0	0	0	
Mount Isa City Council	22,517	6,942	0	0	0	0	
Murweh Shire Council	4,626	1,804	0	0	0	0	
Napranum Aboriginal Shire Council	962	250	0	0	0	250	
Northern Peninsula Area Regional Council	2,714	925	0	0	0	0	
Paroo Shire Council	1,841	639	0	0	0	0	
Pormpuraaw Aboriginal Shire Council	743	225	0	0	1	0	
Quilpie Shire Council	948	386	0	0	0	0	
Richmond Shire Council	832	315	0	0	0	0	yes
Torres Shire Council	3,665	1,104	0	0	0	0	
Torres Strait Island Regional Council	4,635	1,160	0	0	0	0	
Winton Shire Council	1,359	435	0	0	0	0	yes
Wujal Wujal Aboriginal Shire Council	296	87	0	0	0	0	

* ABS 3218.0 Regional Population Growth, Australia (30 March 2016), Table 3. Estim ated Resident Population, Local Government Areas, Queensland