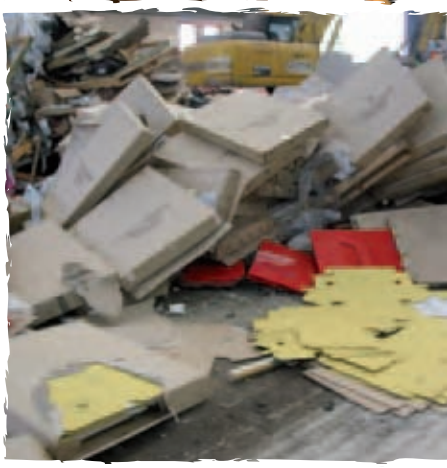


Commercial and industrial waste in Sydney

Overview

Department of
Environment, Climate Change and Water NSW

Increased resource recovery from the commercial and industrial sector will help

- *reduce greenhouse gas emissions*
- *save water*
- *save energy*
- *reach NSW targets of recycling 63% from the sectors waste stream by 2014.*

Manufacturers, shops and businesses of all sizes and varieties are some of the many sources of commercial and industrial (C&I) waste. The majority of C&I waste that ends up in landfills in NSW is made up of organic, degradable materials that emit greenhouse gases as they break down. Many of the diverse materials in the waste could be diverted before they reach the waste stream or have potential resource value if they could be recovered or recycled cost-effectively.

Increased resource recovery from the commercial and industrial sector will help reduce greenhouse gas emissions, save water and energy and help reach the target of recycling 63% from the C&I waste stream by 2014.

The 2008 NSW Waste Avoidance and Resource Recovery (WARR) Strategy Progress Report confirms recycling rates of 44% and 42% for C&I waste in 2006-07 in NSW and the Sydney Metropolitan Area (Sydney) respectively. Although Sydney recycled 1.5 million tonnes of C&I waste that year, about 2 million tonnes of C&I waste, including wood, food, plastics, paper and cardboard, still ended up in landfills. In total, NSW recycled 2.3 million tonnes of C&I waste the same year, and nearly 3 million tonnes went to landfills.

The Department of Environment Climate Change and Water NSW (DECCW) undertook a comprehensive field survey in 2008 to get a clearer and more accurate understanding of what is in the C&I waste stream.

The field survey

The field survey took place at six landfills and six transfer stations in Sydney between June and August 2008.

It included a gatehouse survey of all C&I loads delivered to identify the industry source and delivery vehicle type. A panel of waste auditors (who were registered with DECCW) helped develop the methodology for visual assessment of C&I loads and the weight-based garbage bag sorting.

Sites participating in the field survey were given individually summarised, site-specific raw data. The information from the gatehouse survey, visual assessment of loads and the garbage bag sorting was then analysed in detail using the Australian Waste Data classification to categorise what was in the C&I waste stream, and breakdown the industry source and delivery vehicles.

Key findings of the survey

In 2007- 08, 2,223,856 tonnes of C&I waste was sent to Sydney landfills. Most of the C&I waste came from mixed loads (1,737,594 tonnes – 78%) and the remaining 486,262 tonnes (22%) were segregated single material loads.

The 2,223,856 tonnes of C&I waste disposed to landfill in Sydney, would fill more than 7,000 Sydney olympic swimming pools or weigh as much as 1.8 million cars.

The gatehouse survey recorded and analysed data for vehicle numbers, type, tonnage delivered and industry sectors where the mixed loads and single material loads were collected. A total of 1,746 vehicles delivered 5,189 tonnes of wastes on two days at each of the selected facilities.

By weight, bulk-bin trucks (32%) and front-lift trucks (31%) were the two most common types of trucks used to deliver C&I waste to landfills and transfer stations. Front-lift vehicles delivered 84% by weight of the waste generated by the mixed small to medium sized enterprises (SMEs). Bulk-bin trucks delivered 64% by weight of manufacturing sector waste.

Composition of single material loads in the C&I waste stream

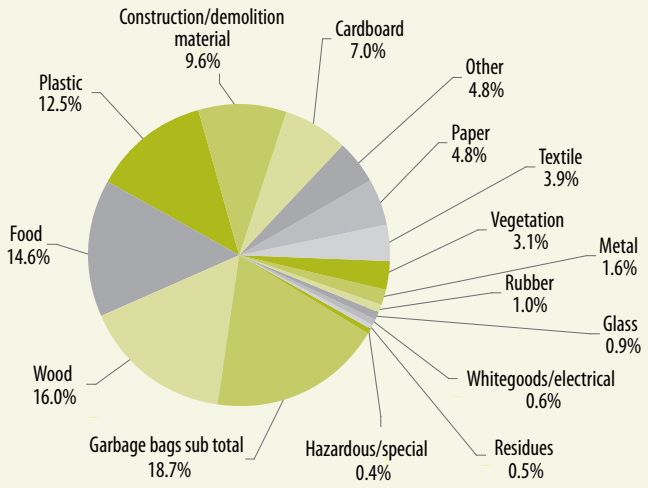
The composition of single material loads was based on the data obtained from the on-line Waste Contributions Monthly Report (WCMR), as submitted by licensed waste disposal facilities in Sydney for 2007-08.

The single material loads in the C&I waste stream are mainly made up of **contaminated soil** (55%) and **residues** from processing sites (28%). Smaller quantities of **non-contaminated soil**, **glass**, **hazardous/special material** and **vegetation** also are delivered in single material loads.

Composition of mixed C&I loads

The **main** materials contained in the **mixed C&I loads** sent to landfills are **garbage bags** (18.7%), **wood** (16.0%), **food** (14.6%), **plastic** (12.5%), **paper and cardboard** (11.8%) **construction and demolition material** (9.6%), **textiles** (3.9%) and **vegetation** (3.1%). Chart 1 gives a detailed breakdown.

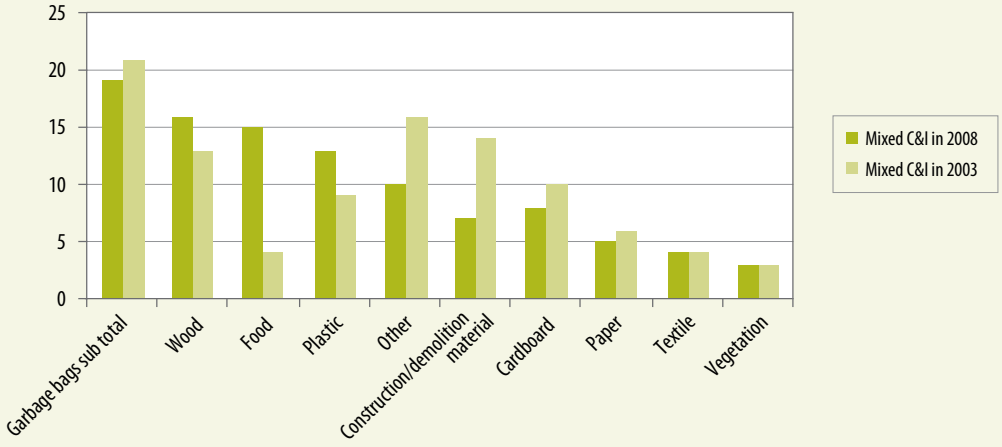
Chart 1 – Composition of mixed C&I loads



Comparison with the 2003 survey results

A comparison of the breakdown of **the mixed C&I waste stream** with the results of a similar survey done in 2003, as shown in Chart 2, reveals that food waste has increased substantially from 4% in 2003 to 14.6% in 2008. The other main types of material, wood and plastics, have increased marginally. Textile and vegetation remain the same. Paper and cardboard have decreased marginally and construction and demolition (C&D) waste has halved.

Chart 2 – Comparison of mixed C&I waste stream



Composition of the average C&I garbage bag

Garbage bags from mixed loads sourced from eight pre-selected industry sectors were sorted into predetermined material categories and weighed. Table 1 shows the average composition of the garbage bags. Paper and food accounted for more than half the garbage bag contents.

Table 1 Garbage bag composition

Paper	29.2%
Food	27.7%
Plastic	15.1%
Other *	7.0%
Textile	4.5%
Cardboard	4.1%
Glass	3.8%
Metal	2.4%
Vegetation	1.6%

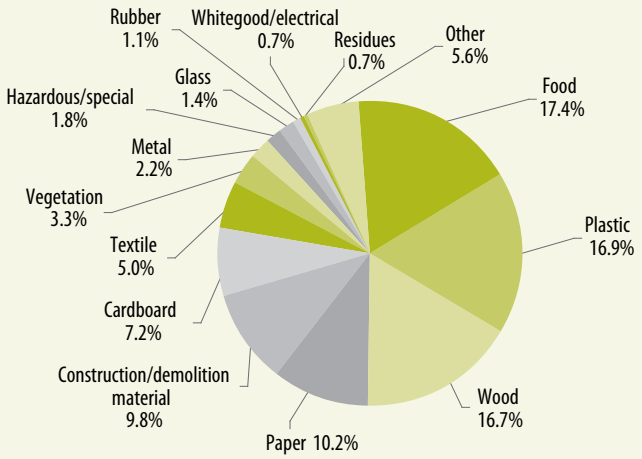
Construction/demolition material	1.5%
Hazardous/special	1.4%
Rubber	0.7%
Whitegoods/electrical	0.7%
Wood	0.3%
Total	100.0%

** The 'other' material category is made up of 3.2% of 'fines', nappies, ceramic, fibreglass insulation etc amounting to 3.2% and a liquid correction of 0.6%.*

Composition of mixed C&I waste stream (garbage bag contents distributed)

As Chart 3 shows, when the garbage bag contents are distributed across the mixed load composition, the percentages of the main materials increase marginally: food (17.4%), wood (16.7%), plastic (16.9%), paper and cardboard (17.4%), construction and demolition material (9.8%), textile (5.0%) and vegetation (3.3%).

Chart 3 – Composition of mixed C&I waste with garbage bag contents distributed



Using the main material categories in the **mixed C&I waste stream in 2007–08**, this translates into 303,164 tonnes of food, 301,067 tonnes of paper and cardboard, 293,741 tonnes of plastics, 288,366 tonnes of wood, 123,566 tonnes of C&D material, 87,548 tonnes of textiles and 56,482 tonnes of vegetation.

It is estimated the food waste equated to nearly 610 million meals, or enough for one 500g meal each day for every Australian for a month.

The paper and cardboard consolidated category in the mixed C&I waste stream mainly consists of dry cardboard (over 100,000 tonnes), office paper (48,500 tonnes), wet cardboard (18,000 tonnes) and other paper (13,000 tonnes). All paper and cardboard disposed to landfill is estimated to be equivalent to the removal of 24,000 trees.

The wood in the mixed C&I waste stream is mostly from pallets (49% or 140,000 tonnes), MDF/chipboard (27% or 77,000 tonnes) and furniture (13% or 37,500 tonnes). If these pallets are stacked upon each other it is estimated they would be around 533 km high and reach beyond the orbiting International Space Station.

Plastic in the mixed C&I waste stream mainly consists of plastic bags and film (46% or 136,000 tonnes), hard plastic (29% or 85,000 tonnes), containers (22,000 tonnes), polystyrene (10,000 tonnes in huge volumes) and other plastic (40,000 tonnes). This would be enough to fill the Sydney olympic pool 1000 times.

C&D materials in the mixed C&I waste stream are mainly made up of soil/clean fill (22% or 38,000 tonnes), rubble (20% or 34,000 tonnes), concrete/cement (16% or 28,000 tonnes), clay (11% or 20,000 tonnes) and plasterboard (10% or 18,000 tonnes)

Textiles in the mixed C&I waste stream mainly consist of carpets/underlay (40,000 tonnes), clothes (30,000 tonnes) and furniture (12,000 tonnes). This would be enough to fill the Sydney olympic pool at Homebush nearly 220 times, and the carpet would be enough to cover 2167 basketball courts.

Vegetation in the mixed C&I waste stream is mainly from branches/grass clippings.

Overall composition of the C&I waste stream in Sydney

Table 2 shows the breakdown of the C&I waste stream overall (mixed C&I loads + Single material loads).

Table 2 Breakdown of C&I waste stream overall (garbage bag contents distributed)

Consolidated material composition categories	Total (tonnes)	Total (%)
Hazardous/special (mainly contaminated soil)	309, 579	13.9%
Food	303, 855	13.6%
Plastic	293, 925	13.2%
Wood	288, 366	13.0%
Paper	177, 501	8.0%
Construction/demolition material	170, 834	7.7%
Other	146, 351	6.6%
Residues	135, 858	6.1%
Cardboard	126, 367	5.7%
Textile	87, 746	3.9%
Vegetation	75, 752	3.4%
Glass	40, 074	1.8%
Metal	33, 220	1.5%
Rubber	21, 774	1.0%
Electrical/electronic equipment	12, 653	0.6%
Total	2, 223, 856	100%

Other key findings

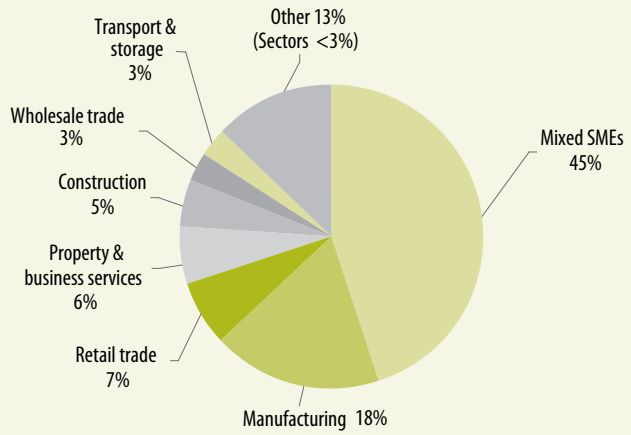
Degradable organic materials constitute 60% of the **mixed C&I** waste stream, which amounts to over one million tonnes of carbon-based material contributing greenhouse gas emissions.

Packaging materials constitute 18% (320,000 tonnes) of the **mixed C&I** waste stream, highlighting the need to improve performance in the manufacturing and service industry practices to reduce packaging material use, and increase reuse and recycling.

Breakdown of industry sectors generating C&I waste

Among the industry sectors generating wastes in Sydney, small to medium-sized enterprises (SMEs) are the largest contributor (45%) followed by manufacturing (18%), retail trade (7%), property and business services (6%) and construction (5%). Chart 4 shows the industry sector breakdown.

Chart 4 – Industry sector breakdown



Note: The following industry sector analysis is confined to the mixed C&I waste stream.

A surprising 31% of **SME** waste is food and kitchen waste followed by paper and cardboard (23%), plastics (18%) and wood (9%). The garbage bag component of 28% is the highest among the industry sectors surveyed.

Manufacturing sector waste mainly consists of plastic (21%), wood (20%), paper and cardboard (15%) and food (12%). The garbage bag component is about 8%.

Retail sector waste is mainly made up of food (35%), paper and cardboard (18%) with wood and plastic each 12%. The garbage bag content was 24% and contributed substantial food waste into the stream generated by this sector.

Property and Business sector waste contains a substantial quantity of construction and demolition materials (35%), wood (27%) and paper and cardboard and plastics each 6%. The garbage bag content was small at 2.5%.

A comprehensive report on the survey findings will be published in late 2009.

Acknowledgement:

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