

Waste Avoidance and Resource Recovery Progress Report

2008



Disclaimer

The Department of Environment and Climate Change NSW (DECC) has made all reasonable efforts to ensure that the contents of this document are factual and free of error. However the DECC shall not be liable for any damage or loss which may occur in relation to any person taking action or not on the basis of this document.

Copyright

The Department of Environment and Climate Change NSW is pleased to allow this material to be reproduced in whole or in part, provided the meaning is unchanged and its source, publisher and authorship are acknowledged.

In April 2007, the name of the Department of Environment and Conservation (NSW) changed to the Department of Environment and Climate Change NSW.

Published by:

Department of Environment and Climate Change NSW
59–61 Goulburn Street
PO Box A290
Sydney South 1232
Ph: (02) 9995 5000 (switchboard)
Ph: 131 555 (environment information and publications requests)
Ph: 1300 361 967 (national parks information and publications requests)
Fax: (02) 9995 5999
TTY: (02) 9211 4723
Email: info@environment.nsw.gov.au
Website: www.environment.nsw.gov.au

ISBN 978 1 74232 166 0

DECC 2009/155

Published March 2009

Contents

Glossary	2
Foreword	3
Executive Summary	4
PART 1: Progress Against Targets and Key result Areas	8
1.1 Performance against Key Result Areas	9
1.1.1 Key Result Area: Increased recovery and use of secondary materials	9
Changes in amounts recycled	9
Key materials and systems	13
Contribution of recycling to other environmental issues	15
1.1.2 Key Result Area: Preventing and avoiding waste	17
Changes in waste generation	17
Changes in waste disposed	18
1.1.3 Key Result Area: Reducing toxic substances in products and materials	24
1.1.4 Key Result Area: Reducing litter and Illegal dumping	25
1.1.5 Future Challenges	25
PART 2: Key NSW Programs that are contributing to NSW waste reduction and resource recovery	27
2.1 Building an improved framework for reducing waste	27
2.2 Support for Councils and households to tackle waste	34
2.3 Support for businesses to tackle waste	40
2.4 Government organisations providing a lead	44
2.5 Broader community programs to tackle waste	46

Glossary

AWT	Alternative Waste Technology
DECC	NSW Department of Environment and Climate Change
C&I	Commercial and Industrial
C&D	Commercial and Demolition
EPHC	Environment Protection and Heritage Council
EPR	Extended Producer Responsibility
ERA	Extended Regulated Area (Hunter, Central Coast, Illawarra)
NEPM	National Environment Protection Measure
NRA	Non Regulated Areas (rural & regional NSW)
SMA	Sydney Metropolitan Area
VENM	Virgin Excavated Natural Material
WARR	Waste Avoidance and Resource Recovery
WRAPP	NSW Waste Reduction and Purchasing Policy

Foreword

This Waste Avoidance and Resource Recovery Progress Report provides an update on the State's progress towards the recycling targets and other result areas established in the NSW Waste Avoidance and Resource Recovery Strategy in 2003.

Waste avoidance and resource recovery can make a strong contribution to preserving the natural environment and we know the community strongly supports it.

Since the Strategy targets were set, our best results have been in improving recycling in municipal and construction waste. Performance has not been as strong in the commercial and industrial sector and this remains a priority for action.

Other priorities will be to improve collection infrastructure for "away from home" recycling and to provide better information and guidance to help everyone as consumers to choose products that are least wasteful and most environmentally sustainable.

The New South Wales State Government has been working hard to create a strong framework for waste reduction and recycling. Support has been provided to improve and expand recycling infrastructure and to establish best practice for collection and recycling systems, contracts and community access to information. Resources, training and information have been developed and delivered for local Councils, industry, culturally and linguistically diverse communities and schools.

The waste and environment levy continues to be one of the most powerful measures for driving improvement. The levy has recently been reviewed and will increase in July 2009. Its application will also be expanded to cover more of the high population growth areas in NSW.

Government agencies are also continuing to contribute to the state's waste reduction and recycling targets as well as using their considerable purchasing power to support markets for recycled content materials. New performance targets for government agencies have been set under the Government's Sustainability policy announced in June 2008.



As Minister for Climate Change and the Environment, I look forward to continuing to work together with industry, state and local government organisations and the community to deliver further progress towards our 2014 targets.

Carmel Tebbutt

Minister for Climate Change and the Environment

Executive summary

This 2008 Progress Report is based on 2006-07 waste avoidance and resource recovery data. It updates the 2006 Progress Report which was based on 2004-05 data.

NSW is tracking well towards its 2014 recycling targets. Now at the halfway mark towards those targets, recycling rates for all sectors and regions are growing steadily. The most recent comprehensive data, on which this Report is based, is for 2006-7. It demonstrates significantly improved performance compared with the period 2002-03 to 2004-05 as shown in Table 1 below.

Table 1: Progress towards the NSW recycling targets, by waste stream and region

		2000* baseline	2002-03	2004-05	2006-07	2014 Recycling Target
NSW	Municipal		30%	33%	38%	66%
	C&I		34%	38%	44%	63%
	C&D		64%	62%	67%	76%
	Overall		45%	46%	52%	

SMA	Municipal	26%	33%	37%	42%	66%
	C&I	28%	34%	35%	42%	63%
	C&D	65%	68%	66%	70%	76%
	Overall	38%	48%	49%	54%	

ERA	Municipal		28%	33%	41%	66%
	C&I		45%	53%	48%	63%
	C&D		67%	65%	72%	76%
	Overall		47%	50%	56%	

* baseline recycling rates were only available for the SMA in 2000; this data was used to establish the Strategy targets

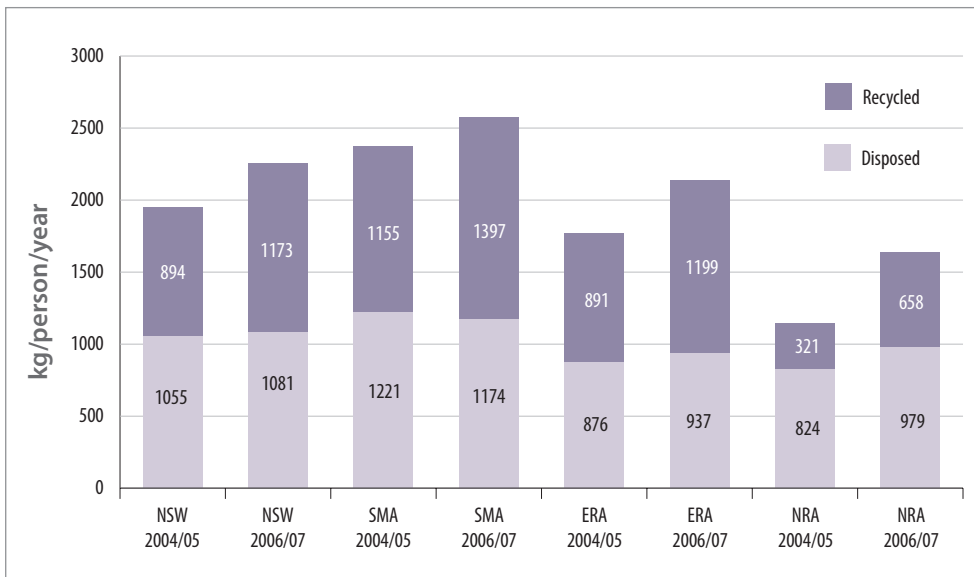
Between 2000 and 2006-07:

- Sydneysiders have increased the amount of waste they recycle from an estimated 38% in 2000 to 54% in 2006-07
- Tonnes of dry recyclables and garden organics collected from kerbside systems in Sydney has increased from 125kg per person in 2000 to 151kg per person in 2006-07, an increase of 20%.
- Packaging collected from kerbside has increased by 21% in 7 years, up from 88kg per person in 2000-01 to 106.0kg per person in 2006-07.
- The overall recycling rate for all waste streams in the Hunter, Illawarra and Central Coast regions has increased from 38% in 2000 to 56% in 2006-07.
- Each person in Sydney disposed of almost 11% less waste in 2006-07 than in 2000; this is 144kg less per person in 2006-07.

Since the last report

Graphs 1 and 2 below summarise progress in reducing waste since the last report. They compare 2006-07 data with the 2004-5 data that was presented in the previous report.

Graph 1: Total amount of waste generated per person for key regions and the whole of NSW, also showing percentages recycled and disposed, 2004-05 and 2006-07

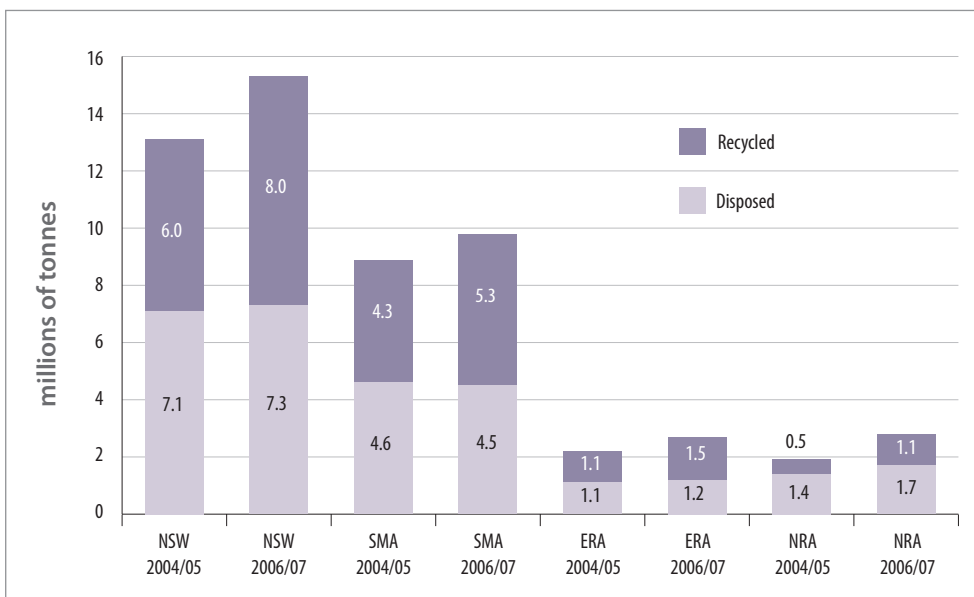


SMA – Sydney Metropolitan Area

ERA – Extended Regulated Area (Hunter, Central Coast & Illawarra)

NRA – Non regulated Area – regional and rural NSW

Graph 2: Total tonnes of waste generated for key regions and the whole of NSW, also showing percentages recycled and disposed, 2004-05 and 2006-07



Total tonnes of waste generated in NSW and by region, 2004-05 and 2006-07

	NSW 2004/05	NSW 2006/07	SMA 2004/05	SMA 2006/07	ERA 2004/05	ERA 2006/07	NRA 2004/05	NRA 2006/07
Millions of tonnes	13.1	15.3	8.9	9.8	2.2	2.7	1.9	2.8

Summary of performance:

Recycling

- The recycling rate for the whole of NSW has increased from 46% in 2004-05 to 52% of total waste created in 2006-07.
- Sydney's overall recycling rate has risen to 54% of its total waste in 2006-07, up from 49% in 2004-05.
- The Hunter, Central Coast and Illawarra region's recycling rate is now at 56% of total waste in 2006-07, up from 50% in 2004-05.

Disposal

- NSW disposal rate has dropped from 54% of the total tonnes generated in 2004-05 to 48% in 2006-07.
- Between 2004-5 and 2006-7, each person in Sydney disposed of a total of 47kg less waste to landfill across all 3 waste streams. This is just over 250,000 tonnes.
- Between 2004-5 and 2006-07, each person in the Hunter, Central Coast and Illawarra regions disposed of a total of 61kg more waste to landfill across all 3 waste streams. This is around 92,000 tonnes.

Total waste generated (waste recycled plus waste disposed)

- Whilst we are recycling a greater proportion of the waste we generate, NSW, Sydney (SMA), Hunter, Illawarra and Central Coast (ERA) and rural and regional NSW (NRA) are all generating more waste (around 2.24 million tonnes) in 2006-07 than they did in 2004-05. This trend is occurring worldwide.
- Sydney generated around 870,000 tonnes more waste in 2006-07 or 196 kg more per person.
- Hunter, Central Coast and Illawarra regions generated around 500,000 tonnes more waste in 2006-07 or 369 kg more per person.

Contribution to other environmental outcomes

- Based on recycling 254kg of dry recyclables per year, a typical NSW household is conserving around 4,207 litres of water per year through recycling. Statewide, this adds up to 10,680 megalitres of water, enough to fill 4,273 Olympic swimming pools
- Our current overall recycling rate in NSW is preventing well over 5 million tonnes of greenhouse gas emissions, compared to total emissions of 160 million tonnes

Future Challenges

Current performance against the Strategy targets and goals suggests a number of key areas where greater effort will be needed over the next few years. These are:

- Improving recycling of waste from commercial and industrial sources, particularly food waste, cardboard and transport pallets
- Tackling Waste Avoidance and Sustainable Consumption
- Helping households to recycle even more through their existing recycling systems

PART 1 – performance against targets and key result areas

Introduction

The data in this Progress Report is for the period 2006-07. While some more recent data is already available (eg disposal data, municipal data), data for the C&I and C&D streams is only available for 2006-07, therefore limiting the overall reporting against the Strategy to the 2006-07 period.

The Waste Avoidance and Resource Recovery Act 2001 [Part 6 (24) (1)] requires the NSW Department of Environment and Climate Change (DECC) to report to the Minister every two years on progress towards meeting the targets established in the NSW Waste Avoidance and Resource Recovery Strategy (WARR Strategy). These reports cover the three waste streams: municipal; commercial and industrial (C&I); and construction and demolition (C&D) waste.

It should be noted that there are some variations between the data in this report and earlier performance reports due to the recasting of disposal data using a new waste data reporting system and correction of a number of errors in the recycling data.

Data is provided on the overall amount of waste being generated (created), tonnes being disposed of to landfill and amounts being recycled.

Data is reported for NSW as a whole as well as for the Sydney Metropolitan Area (SMA), the Extended Regulated Area (ERA) comprising the Hunter, Central Coast and Illawarra regions and the Non-Regulated Areas (NRA) covering the rest of the State.

Policy Drivers

The underlying policy driver for the *WARR Strategy* is to maximise conservation of natural resources by avoiding waste and to minimise environmental harm from waste management and disposal of solid waste. Conserving resources and reducing waste are even more important today against a backdrop of growing community, business and government commitment to address climate change. Reducing waste through avoidance, re-use and recycling can help reduce greenhouse gas emissions.

Actions to avoid, reuse and recycle waste can also contribute to sustainable consumption which is about doing more with less and working to achieve consumer choices that stay within environmental limits. Sustainable consumption involves product design and material choices, production and purchasing actions by individuals, business and governments. These can all have impacts on energy and water use, air quality, ecosystems and resources.

In 2008, the Government reviewed its most effective economic tool used to drive waste reduction and increase recycling.

As a result of the review, the Waste and Environment Levy will be increased for the Sydney region and the Hunter, Central Coast and Illawarra by \$10 per tonne per annum indexed to the Consumer Price Index (CPI), from 1 July 2009 until 2015-16. This \$10 increase will replace the \$7 per tonne increase previously scheduled for 1 July 2009. The Levy will also be extended to cover Wollondilly and Blue Mountains local government areas, and coastal local government areas from the Hunter to the Queensland border. The levy rate in these new areas will start at \$10 per tonne from 1 July 2009, with increases of \$10 per tonne per annum, plus movements in the CPI, to apply from 1 July 2010 until 2015-16.

By increasing the cost of disposal of each tonne of waste, the expanded levy provides an incentive to provide recycling and resource recovery solutions. The levy will also provide revenue which will be used to fund new or expanded environmental programs in NSW.

1.1 Performance against key result areas

This section reports on performance in the four Key Result Areas identified in the *Waste Avoidance and Resource Recovery Strategy*, and their corresponding targets.

1.1.1 Key Result Area: Increased recovery and use of secondary materials

The WARR Strategy sets the following 2014 targets for increasing the collection and recycling of materials:

- Municipal waste – increase from a 2000 baseline of 26% recycled to 66% in 2014;
- Commercial and industrial (C&I) waste – increase from a 2000 baseline of 28% recycled to 63% in 2014; and
- Construction and demolition (C&D) waste – increase from a 2000 baseline of 65% recycled to 76% in 2014.

Recycling data is compiled from a number of sources:

- Information reported by Councils on amounts and composition of materials collected through kerbside recycling;
- Annual data on key materials eg garden organics being recovered and reprocessed, plastics, paper and construction materials; and
- Recycling tonnages reported to DECC by landfills.

Changes in amounts recycled

Tables 2 and 3 below show current progress towards the recycling targets, however, the recycling tonnages in Table 3 considerably understate the real level of recycling in NSW because material is increasingly being reprocessed on site, eg in industrial applications or on construction sites. This means it does not enter a stream where it can be measured and reported.

Table 2: Progress towards the NSW recycling targets, by waste stream and region

		2000* baseline	2002-03	2004-05	2006-07	2014 Recycling Target
NSW	Municipal		30%	33%	38%	66%
	C&I		34%	38%	44%	63%
	C&D		64%	62%	67%	76%
	Overall		45%	46%	52%	

SMA	Municipal	26%	33%	37%	42%	66%
	C&I	28%	34%	35%	42%	63%
	C&D	65%	68%	66%	70%	76%
	Overall	38%	48%	49%	54%	

ERA	Municipal		28%	33%	41%	66%
	C&I		45%	53%	48%	63%
	C&D		67%	65%	72%	76%
	Overall		47%	50%	56%	

* baseline recycling rates were only available for the SMA in 2000. This data was used to establish the Strategy targets

NSW as a whole

For NSW as a whole, 52% of total waste was recycled in 2006-07, up from 46% in 2004-05. In 2006-07, 38% of municipal waste, 44% of commercial waste and 67% of construction waste was recycled. This amounts to more than 2.1 million extra tonnes of material being recycled. The greatest change was in the amount of C&D waste recycled in NSW with an increase of 1.1 million tonnes or 6% since 2004-05. Municipal recycling also went up over 600,000 tonnes (4%) and C&I recycling went up almost 400,000 tonnes or 6%.

Sydney

In 2006-07, Sydney recycled 54% of its waste, up from 49% recycled in 2004-05. The rest (4.52 million tonnes) mainly went to landfill. A small amount, around 50,000 tonnes was diverted to a number of alternative waste treatment facilities that have commenced operation across Sydney.

In Sydney, recycling of municipal waste went up 4% between 2004-5 and 2006-7 to 41%. Commercial waste recycling went up 7% to 42% and reversing the trend from the previous period, construction waste recycling also increased – up 4% to 70%.

Hunter, Central Coast and Illawarra regions

The Hunter, Central Coast and Illawarra regions also improved their recycling. In 2006-07 these regions recycled 56% of their waste, up 6% from 2004-05. Municipal waste

recycled jumped 7% to a recycling rate of 40% and construction waste recycling increased 7% to 72%. Offsetting this improved recycling performance, less commercial waste was recycled – only 48% in 2006-07 compared to 53% in 2004-05.

Regional and rural NSW

Recycling data for regional and rural NSW is still poor and should be regarded as indicative only. Based on available data in 2006-07, these regions recycled around 27% of municipal waste, 48% of the commercial and industrial waste and 48% of construction waste in 2006-07.

Table 3: Changes in recycling performance across the three waste streams for the whole of NSW, Hunter, Central Coast and Illawarra (ERA) 2002-03 to 2006-07¹.

Municipal				
	Total disposed (tonnes)	Total recycled (tonnes)	Total generation (tonnes)	% Recycled
NSW 2006-07	2,408,000	1,482,500	3,890,500	38%
NSW 2004-05	2,143,500	1,037,000	3,180,500	33%
NSW 2002-03	2,155,000	945,000	3,100,000	31%
Sydney 2006-07	1,093,500	801,500	1,895,000	42%
Sydney 2004-05	1,021,000	605,000	1,626,000	37%
Sydney 2002-03	1,185,000	595,000	1,780,000	33%
ERA* 2006-07	506,500	351,500	858,000	41%
ERA* 2004-05	485,000	239,000	724,000	33%
ERA* 2002-03	479,500	189,500	669,000	28%
Commercial and Industrial				
	Total disposed (tonnes)	Total recycled (tonnes)	Total generation (tonnes)	% Recycled
NSW 2006-07	2,921,000	2,297,000	5,218,000	44%
NSW 2004-05	2,984,500	1,835,000	4,819,500	38%
NSW 2002-03	2,643,500	1,371,500	4,015,000	34%
Sydney 2006-07	2,086,876	1,527,958	3,614,834	42%
Sydney 2004-05	2,246,500	1,214,500	3,461,000	35%
Sydney 2002-03	2,029,500	1,022,000	3,051,500	33%
ERA* 2006-07	382,881	354,406	737,287	48%
ERA* 2004-05	362,000	401,000	763,000	53%
ERA* 2002-03	325,000	269,500	594,500	45%

¹ Note that all figures are rounded. Does not include waste diverted to an AWT facility.

Construction and Demolition				
	Total disposed (tonnes)	Total recycled (tonnes)	Total generation (tonnes)	% Recycled
NSW 2006-07	2,035,500	4,215,500	6,251,000	67%
NSW 2004-05	1,971,500	3,146,500	5,118,000	61%
NSW 2002-03	1,708,000	2,980,500	4,688,500	64%

Sydney 2006-07	1,286,000	2,978,500	4,264,500	70%
Sydney 2004-05	1,306,500	2,508,000	3,814,500	66%
Sydney 2002-03	1,177,000	2,505,000	3,682,000	68%

ERA* 2006-07	327,470	851,380	1,178,850	72%
ERA* 2004-05	277,000	504,000	781,000	65%
ERA* 2002-03	232,000	473,000	705,000	67%

Total				
	Total disposed (tonnes)	Total recycled (tonnes)	Total generation (tonnes)	% Recycled
NSW 2006-07	7,364,500	7,994,500	15,359,000	52%
NSW 2004-05	7,099,500	6,018,500	13,118,000	46%
NSW 2002-03	6,506,500	5,297,000	11,803,500	45%

Sydney 2006-07	4,466,500	5,308,000	9,774,500	54%
Sydney 2004-05	4,574,000	4,327,500	8,901,500	49%
Sydney 2002-03	4,391,500	4,122,000	8,513,500	48%

ERA* 2006-07	1,217,000	1,557,000	2,774,000	56%
ERA* 2004-05	1,124,000	1,144,000	2,268,000	50%
ERA* 2002-03	1,036,500	932,000	1,968,500	47%

*ERA = Hunter, Central Coast and Illawarra regions

Key materials and systems

Organics recycling²

Table 4 shows that 68 per cent of the garden organics generated across the Sydney, Hunter, Central Coast and Illawarra regions is now collected and recycled. This is an increase of 12% since 2004-05.

Table 4: Tonnes of garden organics recycled in 1998, 2002-03, 2004-05 and 2006-07 and as a percentage of total garden waste generated

Garden Organics – Greater Sydney Region (SMA & ERA)			
	Total generated (tonnes)	Total recycled (tonnes)	% recycled
1998	680,000	269,000	40
2002-03	1,140,000	550,000	48
2004-05	866,000	482,000	56
2006-07	820,737	561,725	68

Other results relating to organics recycling include:

- 55 councils were providing a garden organics collection service in NSW in 2006-7 compared with 44 in 2004-5; in Sydney, 31 out of 38 councils offered a kerbside service in 2006-07;
- There was a 9 per cent increase in the amount of organic material recycled from kerbside collections between 2005-06 and 2006-07;
- The amount of garden organic material being recovered per household increased from around 94kg in 2004-05 to around 119kg in 2006-07.
- Markets for recycled organics have grown at an average of about 7% between June 2002 and June 2007.

Dry recyclables³

119 councils across NSW now provide kerbside collections, a 19% increase since 2000. Overall tonnes collected continue to grow – up from 450,000 tonnes in 2000-01 to 661,474 tonnes collected in 2006-07.

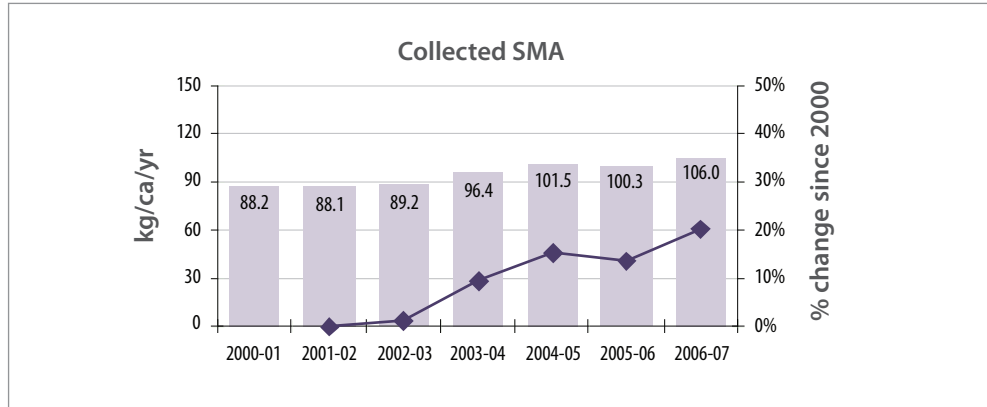
Mobile garbage bins (MGBs) are the most common collection system (up from 50% of councils in 2001 to 81% in 2006-07). In 2006-07, 73 councils out of the 119 councils offering a kerbside recycling system used DECC's preferred collection systems for dry recyclables (240L fully commingled MGB or two 120L MGBs, one for paper and one for containers).

2 Data on recycling of organic material, eg garden waste, is provided by an annual survey of the organics reprocessing industry conducted for DECC by Compost Australia and from the DECC annual local government survey.

3 Dry recyclables include newsprint, cardboard, paper and food and beverage containers.

In 2006-7, each person in Sydney set aside 106kg of material for recycling compared with 88kg in 2000-01. Recovery per household now averages 290kg per year, Graph 3.

Graph 3: Annual dry recyclables collected at kerbside (kg per capita) in the SMA – 2000-01 to 2006-07

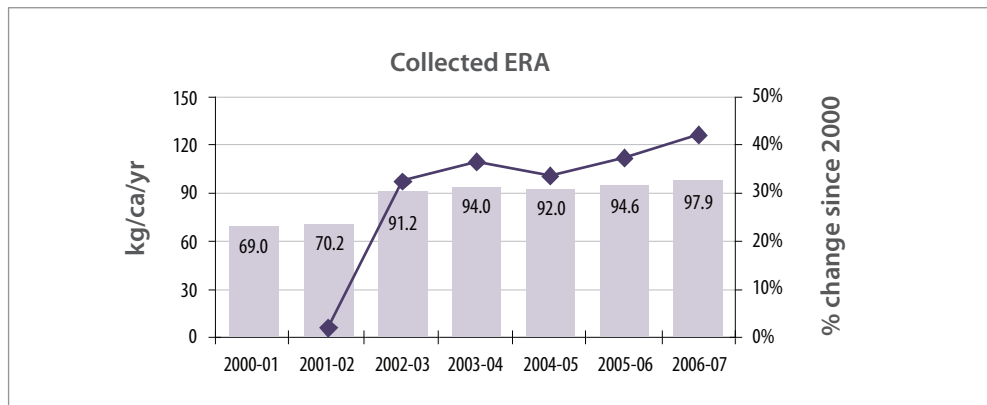


In 2006-07, an average person recycled:

- 61.2 kg of paper and paper products
- 28.2 kg of glass
- 13.8 kg of plastic
- 2.3 kg of steel cans and
- 0.5 kg of aluminium cans⁴

The amount of dry recyclables collected from kerbside recycling in the Hunter, Central Coast and Illawarra has also increased – by 43% since 2000-01, Graph 4. This reflects the substantial increase in the provision of recycling services in these areas.

Graph 4: Annual dry recyclables collected at kerbside (kg per capita) in the ERA – 2000-01 to 2006-07



⁴ Survey of Councils' domestic recycling performance for the National Environmental Protection Measure (NEPM) 2006-07

Construction and demolition (C&D) materials⁵

The overall recycling rate of construction and demolition material in NSW was over 67% in 2006-07, up from 61% in 2004-5. In Sydney C&D waste stream recycling rates increased by 4% to 70% and in the Hunter, Central Coast and Illawarra, there was a 7% increase to 72%.

Other wastes

Some other good progress in specific waste streams includes:

- Over 1 million more tonnes of recycled material has been reused as road base since 2005-6.
- Plastics recycling data⁶ shows that recycling rates continue to grow steadily, as shown in Table 5. In 2006, 51% of plastic packaging came from C&I sources and 47% from Municipal sources.

Table 5: Plastics recovery data for NSW 2001-2006 (PACIA)

Year	Overall recycling rate for all plastics	Packaging recycling rate
2001	9.9%	Not reported
2002	11%	20%
2003	11.6%	18.2%
2004	10.7%	18.2%
2005	13.8%	25.6%
2006	13.5%	25.8%

Contribution of recycling to other environmental issues

In response to growing community interest and concern about other environmental issues, such as water savings, conservation of virgin resources, greenhouse gas reduction and improved soil health, the benefits and contribution from waste reduction and recycling to these areas is provided below.

Contribution to greenhouse gas abatement

Recycling organic based materials such as paper, vegetation and food instead of sending them to landfill can reduce the greenhouse gas that is created when they decompose. For example, composting 918,885 tonnes of garden, food and wood waste instead of landfilling them avoids over 1 million tonnes of CO₂ equivalent.⁷

5 DECC uses its Reprocessor Survey as well as materials reported as recyclable received at landfills and Council data to calculate recycling rates for C&D materials in NSW.

6 Data provided from an annual survey conducted by the Plastics and Chemicals Industry Association (PACIA)

7 Calculated based on information provided by the Recycled Organics Unit, UNSW, based on NSW 2007 tonnages: 682,000 of garden organics, 65,500 of food organics and 67,000 wood waste

A typical NSW household that is recycling 4.88 kg per week is avoiding the equivalent of greenhouse gas emissions from 65% of the electricity used for lighting their home, or 52% of the electricity used for their cooking. On a state wide basis this is equivalent to taking more than 85,000 cars off the road.⁸

Using recycled materials in new products instead of virgin materials can also avoid greenhouse gases. Recycling can avoid the gases that are created when virgin material is transformed into new materials. One of the best examples is aluminium. Every tonne of recycled aluminium that is used saves over 15,000 tonnes of CO₂ equivalent due to large energy savings, avoided when alumina is refined to produce primary aluminium ingots. Other substantial greenhouse savings come from using recycled paper fibres in various paper products, avoiding the thermo mechanical pulping of virgin wood and from using recycled glass, avoiding the soda ash and lime processing needed to make glass from virgin materials.

In 2006-7, almost 8 million tonnes of waste was recycled in NSW. This has saved over 5 million tonnes of CO₂ equivalent⁹ from not landfilling these materials as well as substituting recycled material instead of virgin material.

Contribution to water and energy savings

Kerbside recycling also makes a significant contribution to water savings, largely by recovering recycled paper that can be substituted for virgin paper in products. This avoids the water intensive wood pulping process for producing virgin fibres. Production of aluminium is also a water intensive process, so recycling aluminium also contributes high water savings.

Based on recycling 254kg of dry recyclables per year, a typical NSW household can save around 4,207 litres of water per year. Statewide, this adds up to 10,680 megalitres of water, enough to fill 4,273 Olympic swimming pools, saved each year through household recycling efforts¹⁰. Recycling food, garden and wood waste into compost can also contribute substantial water savings by increasing water retention and reducing evaporation and runoff in agricultural and land management activities.

A typical recycling household can also save around 4,230 kilojoules of electricity per year. This is equivalent to 20% of a typical household's annual electricity consumption which also helps to tackle climate change.

8 Uses Benefits of Recycling (DEC 2005). Relates to dry recyclables only.

9 Based on GHG conversion factors provided to DEC by Hyder Consulting

10 Benefits of recycling calculator (DEC 2005)

1.1.2 Key Result Area: Preventing and avoiding waste

The WARR Strategy identified a goal of not generating (creating) any more waste in NSW in 2008 than in 2003 as well as reducing the amount of waste sent to landfill.

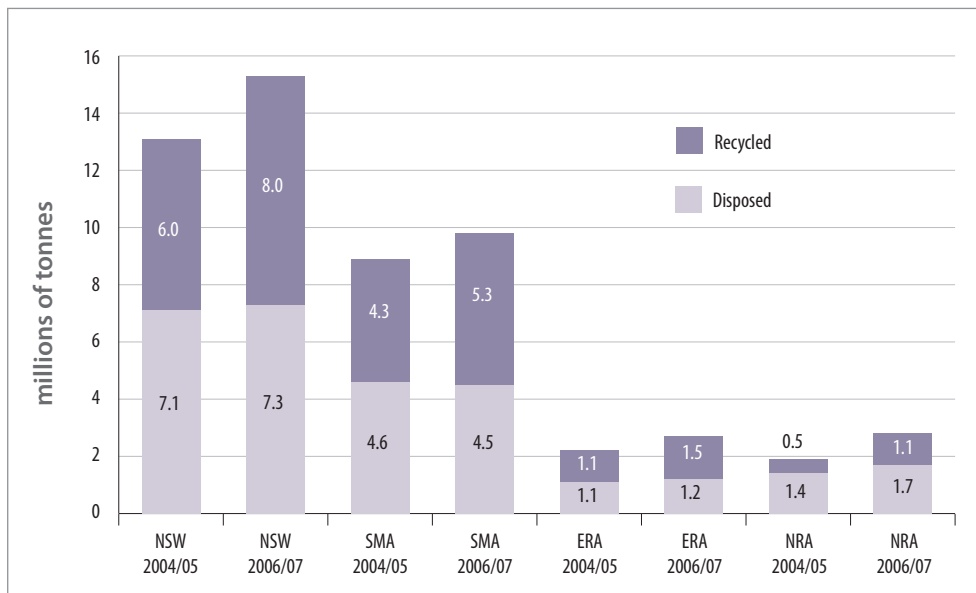
Changes in waste generation

Sydney generated most of the NSW's waste in 2006-07 - 64% or 9.8 million tonnes. 18% (2.7 million tonnes) comes from the Hunter, Central Coast and Illawarra and 18% (2.8 million tonnes) was generated in rural and regional NSW.

Graph 5 shows the tonnes of waste generated for NSW as a whole as well as for Sydney and the Hunter, Central Coast and Illawarra regions. Total tonnes generated in NSW have increased by 2.25 million tonnes since 2004-05. However, a greater proportion of waste was recycled in 2006-7 compared with 2004-05 (up from 46% to 52% of total tonnes generated).

In rural and regional NSW, reported tonnages have increased substantially between 2004-05 and 2006-07 mainly due to improved measurement. It is now clear that the estimated waste generation in rural and regional NSW in 2002-03 was incomplete. Data for this region is still indicative.

Graph 5: Total tonnes of waste generated for key regions and the whole of NSW, also showing percentages recycled and disposed, 2004-05 and 2006-07



Total tonnes of waste generated in NSW and by region, 2004-05 and 2006-07

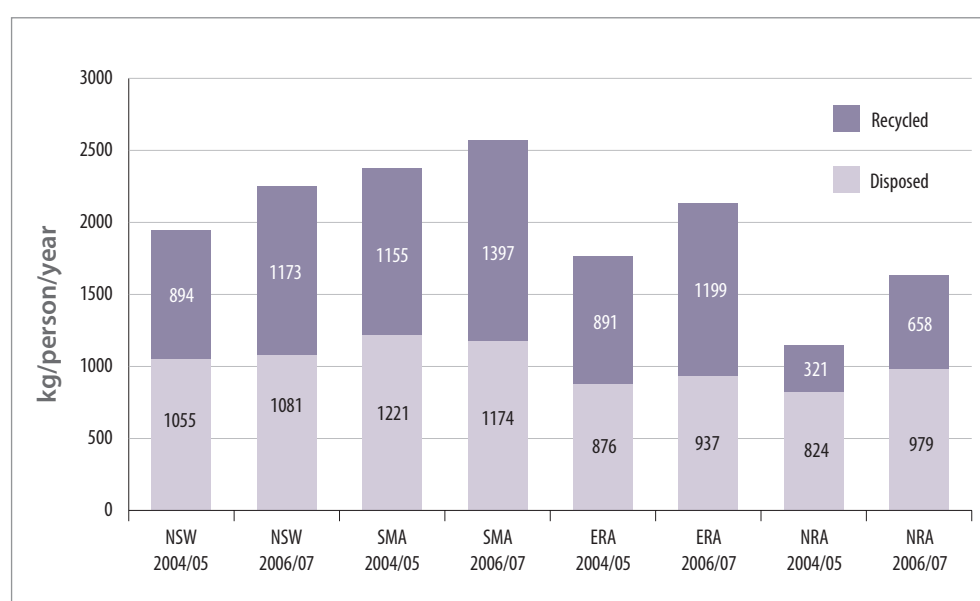
	NSW (mt)	SMA	ERA	NRA
2004/05	13.1	8.9	2.2	1.9
2006/07	15.3	9.8	2.7	2.8

Total waste generated per person

Graph 6 below, shows the amount of reported waste generated in 2004-05 and 2006-07 on a per capita basis. The waste per person covers waste in all three waste streams: municipal, commercial, and construction, not just the waste created by people at home.

The increase in waste generation is not occurring evenly across NSW. Across the whole State, total waste generation increased by around 305 kilograms per person between 2004-05 and 2006-7, however, in Sydney, each person generated 196 kg more per person; in the Hunter, Central Coast and Illawarra it was 369 kg more per person from a lower base.

Graph 6: Total amount of waste generated per person for key regions and the whole of NSW, also showing percentages recycled and disposed, 2004-05 and 2006-07



Changes in waste disposed

Waste disposed per person

Table 6 shows that in Sydney there has been an overall decrease in the amount of waste disposal per person of 144kg. This is 10.9% against the baseline year 2000. By waste stream, the biggest decrease was in the C&I waste stream (per capita waste disposal down 98kg), followed by municipal waste, down 68kg per person. However, there was an increase in the amount of construction waste disposed of per person, up 22kg per capita between 2000 and 2006-07.

Year	Municipal (kg/person)	Commercial & Industrial (kg/person)	Construction & Demolition (kg/person)	Total (kg/person)	% change since 2000 (%)
2000	355	647	316	1,318	
2000-01	349	578	229	1,156	-12.2%
2001-02	340	523	295	1,158	-12.1%
2002-03	321	550	319	1,190	-9.7%
2003-04	302	580	356	1,237	-6.1%
2004-05	272	600	349	1,221	-7.3%
2005-06	278	593	355	1,226	-7.0%
2006-07	287	549	338	1,174	-10.9%

Table 6: Changes in waste disposal per capita in Sydney by waste stream – 2000 to 2006-07

Between 2004-5 and 2006-7, each person in Sydney disposed of a total of 47kg less waste to landfill across all 3 waste streams. This was made up of:

- 15kg more municipal waste to landfill
- 51kg less C&I waste to landfill; and
- 11kg less C&D waste to landfill

By contrast the Hunter, Central Coast and Illawarra regions increased total waste disposed per person by 73kg or 8.4% since 2000. This comprised 20kg more municipal waste per person and 85kg more construction waste per person since 2000.

Commercial waste rallied against this trend, down 32kg per capita, Table 7.

Between 2004-5 and 2006-07, each person in the Hunter, Central Coast and Illawarra regions disposed of a total of 61kg more waste to landfill across all 3 waste streams. This was made up of:

- 12kg more municipal waste to landfill
- 13kg more C&I waste to landfill
- 36kg more C&D waste to landfill

Year	Municipal (kg/person)	Commercial & Industrial (kg/person)	Construction & Demolition (kg/person)	Total (kg/person)	% change since 2000 (%)
2000	370	327	167	864	
2000-01	362	268	142	772	-10.7%
2001-02	376	253	133	762	-11.9%
2002-03	379	257	184	819	-5.2%
2003-04	387	308	204	899	4.0%
2004-05	378	282	216	876	1.3%
2005-06	364	274	231	869	0.5%
2006-07	390	295	252	937	8.4%

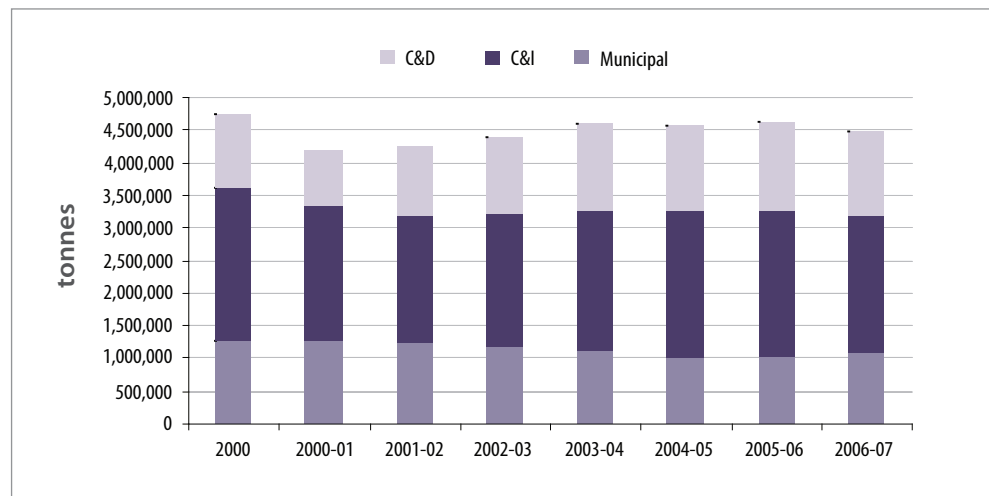
Table 7: Changes in waste disposed per capita, Hunter, Central Coast and Illawarra regions by waste stream – 2000 to 2006-07

Total tonnes of waste disposed

Tonnes of waste sent to landfill in the Sydney and the Hunter, Central Coast and Illawarra regions are shown in Graphs 7 and 8 below for the period 2000 to 2006-07.

Consistent with the waste per capita data, total tonnes of waste disposed in Sydney Metropolitan Area (SMA) across all three waste streams dropped 5.8%, or 275,566 tonnes, between 2000 and 2006-07. Consistent with the per capita trend, tonnes of waste disposed of in the Hunter, Central Coast and Illawarra (ERA) regions also increased (by 15.3%, or 161,566 tonnes) between 2000 and 2006-07.

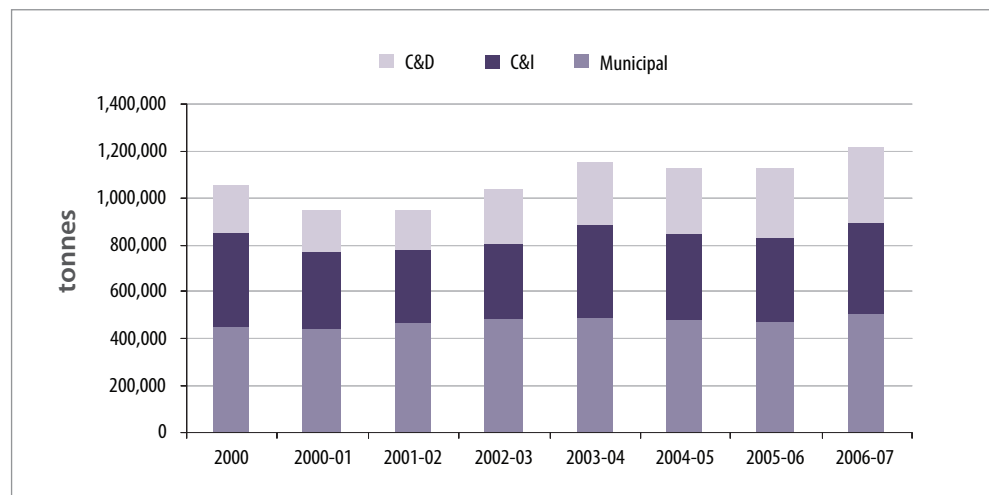
Graph 7: Waste disposed in Sydney – 2000 to 2006-07



Between 2004-5 and 2006-7, Sydney disposed of:

- 73,000 more tonnes of municipal waste to landfill
- 159,500 less tonnes of C&I waste to landfill
- 20,500 less tonnes of C&D waste to landfill

Graph 8: Waste disposed in Hunter, Central Coast and Illawarra – 2000 to 2006-07



Between 2004-5 and 2006-07, activities in the Hunter, Central Coast and Illawarra regions resulted in:

- 21,500 more tonnes of municipal waste sent to landfill
- 20,000 more tonnes of C&I waste sent to landfill
- 50,500 more tonnes of C&D waste sent to landfill

In rural and regional NSW, there was a continued improvement in data reported from both licensed and non-licensed landfills. The 2003 Strategy estimated that about 1 million tonnes were disposed of from all waste streams, but this data was limited to rural licensed landfills. Improved data from both licensed and unlicensed landfills suggests that about 1,775,000 tonnes of waste were disposed of in 2006-07.

Where the waste comes from

In 2006-7 Sydney commercial waste accounted for almost half the waste (47%) disposed of. Municipal waste was 24% and construction waste was 29%.

By contrast, in the Hunter, Central Coast and Illawarra regions, the municipal waste stream was the largest stream at 43% of total waste, the commercial waste stream was 32% and construction waste increased to 27%.

Improved data from both licensed and unlicensed landfills in 2006-07 suggests that in regional and rural NSW the split was 48% municipal, 27% commercial and 25% construction waste in 2006-07.

Specific material and sector performance

*Virgin excavated natural material (VENM)*¹¹

VENM remains largely a Sydney-based issue and tonnages have increased substantially since 2000 – up 632,065 tonnes to 1,407,959 tonnes in 2006-7. VENM is often created in major infrastructure projects, for example, rail and road projects and multi level constructions.

Commercial and industrial wastes

According to the 2006-7 data, just over 2 million tonnes of C&I waste is disposed of to landfill.

DECC analysed the composition of this waste stream during 2008, through a survey of C&I waste going to landfills and transfer stations in Sydney.¹² It found (Graph 9 below):

- about 1.7 million tonnes was mixed C&I waste (81%), which included
 - 340,000 tonnes of food (19.86%)

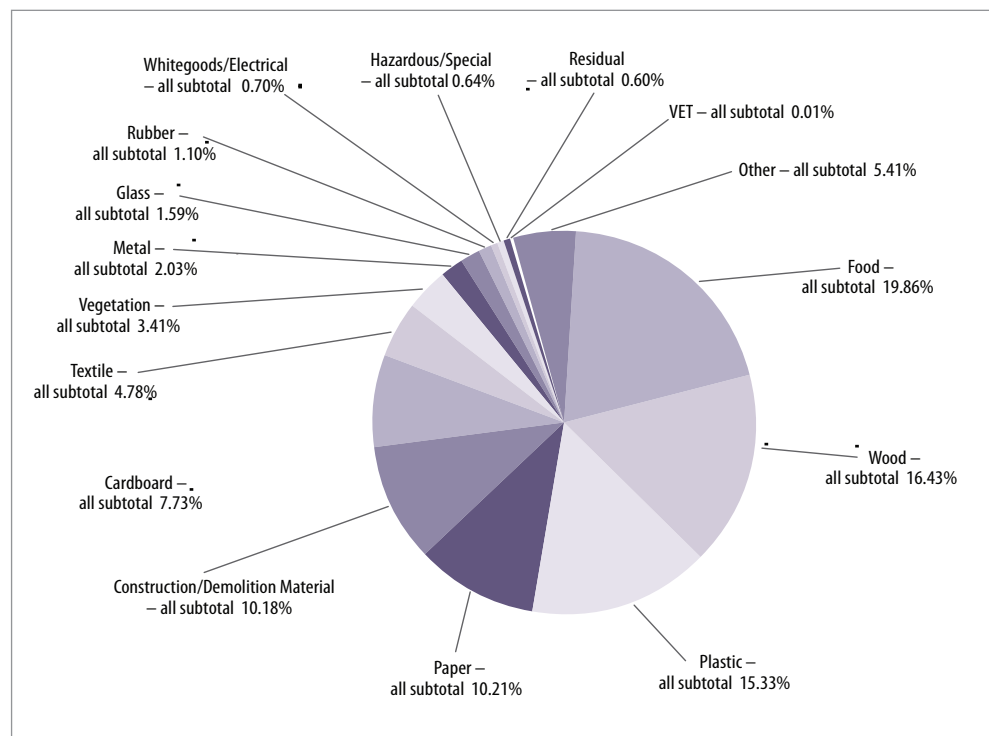
11 VENM refers to material such as clay, gravel, sand, soil and rock that is not mixed with any other waste or contaminated with manufactured chemicals and, that has been excavated from areas that are not contaminated, as a result of industrial, commercial, mining or agricultural activities.

12 Waste was visually assessed at 12 Landfills and Transfer Stations in the Sydney region. The composition of garbage bags from 8 key industry sectors were sorted by weight as an additional piece of analysis.

- 300,000 tonnes of paper & cardboard (17.94%)
- 280,000 tonnes of timber (16.43%)
- 260,000 tonnes of plastics (15.33%)
- the rest was “single material” loads, which include process residues such as sludge, foundry sand, carbon dust and residues from metal recyclers (metal flock), Material Recycling Facilities (MRFs) and Alternative Waste Technologies (AWTs). Metal flock, MRF spoils and waste from AWTs made up over 70% of the single material component in the survey.

Comparing this with a similar survey done in 2003, food waste disposal has increased substantially. The other key material types, timber and plastics have only increased marginally. Paper and cardboard has decreased.

Graph 9: Composition of Mixed C&I waste 2008



Materials containing Degradable Organic Carbon, which contribute greenhouse gas to the atmosphere, made up over 60% of the mixed C&I waste stream.

Small to medium sized businesses are the largest contributor of mixed C&I waste (45%) in the Sydney region. The other large contributors are Manufacturing (18%) followed by Retail Trade (6%), Property and Business Services (6%) and Construction (5%). Thirty per cent (30%) of waste from small and medium businesses is food and kitchen waste followed by paper & cardboard (23%), plastics (17%) and timber (9%).

Household waste

Data on the composition of materials sent by households for disposal or recycling has been compiled by DECC from 43 Council audits of kerbside domestic waste and recycling bins conducted throughout NSW between 2003 to 2007. This represents an analysis of data from around 8,000 bins.

The data in Table 8 below indicates that there are some differences in the overall composition of waste disposed of in metropolitan and rural regions, but generally, around 77% of the material in a household garbage bin is potentially recyclable. This is made up of around 25.5% dry recyclable materials (paper, glass, plastic metals), 35% compostable food organics and 16.5% is other organics. The remainder (around 16%) is potentially recoverable other organic materials (garden and vegetation, wood, timber, leather etc.).

Table 8: Composition of domestic general waste generated in NSW – 2003 to 2007

	Overall %	Metropolitan %	Rural %
Organic Compostable (Food)	35.04%	37.10%	26.34%
Organic Compostable – Non-food	12.44%	10.36%	21.17%
Other Organic, Non-wood	2.96%	3.17%	2.11%
Wood/Timber Products	1.05%	0.91%	1.63%
Organic Other	16.46%	14.44%	24.91%
Paper	8.81%	7.94%	12.48%
Glass	5.05%	4.56%	7.09%
Plastics 1-7	8.34%	8.64%	7.06%
Ferrous	2.73%	2.68%	2.93%
Non-Ferrous	0.65%	0.60%	0.85%
Potentially Recyclable	25.57%	24.42%	30.41%
Paper Non Recyclable	8.83%	10.16%	3.21%
Plastic Composite	2.51%	2.37%	3.09%
Hazardous	1.84%	1.53%	3.16%
Earth Based	3.92%	3.70%	4.80%
Mixed Waste	5.84%	6.26%	4.07%
General Waste	22.93%	24.03%	18.33%

1.1.3 Key Result Area: Reducing toxic substances in products and materials

NSW wants to reduce the use of potentially hazardous substances used in products by 2014 or, if not possible, to achieve the maximum recovery of these.

DECC is continuing to work with industry and Commonwealth, State and Territory governments to reduce toxicity in products. This work concentrates on the products identified for action by the Environment Protection and Heritage Council (EPHC) and the NSW EPR Priority Statement.

DECC is participating in a national process to phase out mercury, lead, cadmium, hexavalent chromium and brominated flame retardants in electrical and electronic products consistent with the European Union's Restriction of Hazardous Substances (ROHS) Directive. As a result of this work the peak bodies representing the electrical industry¹³ have agreed to develop a voluntary national Code of Practice to phase out these substances in Australia. The intention of the Code of Practice is to effectively harmonise with the European Union Restriction of Hazardous Substances (ROHS) Directive and its objectives.

NSW has also been working with the PVC industry through the Vinyl Council of Australia to reduce the use of heavy metals in PVC products. Under the PVC industry Product Stewardship Commitment the industry has committed to phase out the use of lead and cadmium stabilisers by specified dates.

The phase out of cadmium stabilisers by signatories to the Commitment was achieved in 2004 and there has been a voluntary commitment by industry to phase out the use of lead-based stabilisers in pipe by the end of 2008 and by 2010 for other applications. The Vinyl Council of Australia claims that signatories are on or ahead of schedule to meet these targets.

In addition, at the end of 2007, a revised Modified PVC Pipe Australian Standard was published with lead, cadmium and mercury explicitly not permitted. This was a result of PVC pipe producers that are signatories to the commitment working with Australian Standards to ensure the phase out of heavy metal stabilisers extends to non-signatory companies in the market as well. At the end of 2006, the PVC industry also committed to the substitution of heavy metal pigments by 2010 where it was technically feasible and alternatives are available.

13 including the Australian Industry Group (AiG), Electronics Industry Association (EIA), Australian Information Industry Association (AIIA), Australian Mobile Telecommunications Association (AMTA), Australian Subscription of Television and Radio Association (ASTRA) and Consumer Electronics Suppliers Association (CESA),

1.1.4 Key Result Area: Reducing litter and illegal dumping

NSW wants to reduce the amount of litter as well as the amount of illegally dumped material reported by regulatory agencies and Regional Illegal Dumping (RID) squads annually.

According to the Keep Australia Beautiful Council's National Litter Index (NLI), 2007-08¹⁴, the overall litter volume in NSW dropped by 20% since the 2006-07 survey. The overall average estimated volume per 1,000m² was 11.90 litres. This is significantly lower than 2006/07 (14.69 litres per 1,000m²) and 2005/06 (14.95 litres per 1,000m²). The decrease was primarily due to a drop in large-volume items such as illegally dumped materials.

By contrast, the overall average number of items per 1,000m² across all of the 151 sites increased by 8%: during 2007-08 it was 77; during 2006/07 it was 71 items per 1,000m². But it is lower than 2005/06 (80 items per 1,000m²). Cigarette butts continue to be the most littered item in NSW, accounting for 50% of all littered items.

A total of 7,000 penalty infringement notices (PIN) were issued in NSW for 2006-07. Most fines were for littering from vehicles and were imposed by local councils and RID squads. Programs relating to litter and illegal dumping are outlined in Part 2 of this report.

1.1.5 Future Challenges

Current performance against the Strategy targets and goals suggest a number of key areas where greater effort will need to be applied over the next few years. These are:

Improving recycling of waste from commercial and industrial sources

This waste stream is generated by a wide range of organisations including business, industry, government agencies, shopping centres, institutions such as hospitals and universities and recreational facilities.

Almost half of the waste (over 2 million tonnes) that Sydney sends to landfill comes from this waste stream and as shown by the recent DECC audit, there are still significant amounts of recyclable material being thrown away. Of particular concern is:

- large amounts of food waste and off-spec products being disposed of daily by manufacturers and hospitality companies, which wastes both resources and money. DECC will increase its efforts to work on this issue through its business programs.
- thousands of tonnes of single use pallets still going to landfill each day despite considerable progress by some manufacturing sectors to introduce re-useable transport packaging. There are opportunities to use supply chain influences

14 Keep Australia Beautiful - National Litter Index Annual Report 2007/08 by McGregor Tan Research . A total of 151 sites are surveyed by KABC in NSW The survey is conducted twice yearly and reported annually. These cover beaches, car parks, highways, industrial, recreational parks, residential, retail and shopping centres

to change poor practice, combined with further work by the timber sector to encourage more recycling.

- substantial amounts of cardboard still being thrown away despite improved availability and better recycling systems. DECC will continue to seek ways to improve the recycling rates for this stream through support for infrastructure and system improvements.

Tackling Waste Avoidance and Sustainable Consumption

Total waste generated continues to grow in NSW even though we are recycling much more. While this is a global trend, DECC is developing some dedicated programs to tackle this problem, focussing on getting more value from what we buy and using our resources more wisely. This will also help people to save money.

Helping households to recycle even more

Despite their good recycling performance, audits show that there are still large amounts of potentially recyclable material being put in household garbage bins. If the composition analysis of what is in the garbage bin (from Table 6) is applied to the 1,093,553 tonnes of municipal waste disposed to landfill in Sydney in 2006-07, there could be more than 820,000 tonnes of potentially recyclable material in this waste. From Table 6, this would be made up of over 400,000 tonnes of compostable food organics, 150,000 tonnes of other compostable organics and over 260,000 tonnes of dry recyclables (paper and containers).

There is clearly a real opportunity to recover more of this material. Table 9 below shows how much better Sydney's municipal recycling rate would be under two different scenarios:

1. Recovering 50% of the potential recyclables in the garbage bin would yield an additional 410,000 tonnes from the waste stream and increase Sydney's current recycling rate to well over 60%.
2. Recovering 75% of potential recyclables would yield an additional 600,473 tonnes and increase the recycling rate to over 70%.

Table 9: Additional tonnages for recycling if 50% and 70% of potentially recyclable waste was removed from garbage bins in Sydney

	Recovery Scenario 1	Recovery Scenario 2
	50%	75%
Compostable material, including garden	75,000	100,000
Food	200,000	300,000
Dry recyclables	130,000	195,000
Total	405,000	595,000

DECC will look for ways to work with key stakeholders such as local councils to encourage householders to recycle even more materials.

Part 2: Key NSW programs that are contributing to waste reduction and resource recovery

DECC leads and coordinates programs that contribute to the WARR Strategy targets and outcomes. A number of programs are targeted at building an improved framework for reducing waste in NSW.

Other programs support particular sectors of the community. For example

- Support for households and Councils to tackle waste;
- Support for businesses to tackle waste;
- Government waste reduction; and
- Sustainable purchasing.

Table 10 at the end of Part 2 shows the contribution of some key DECC programs to the four WARR Strategy outcome areas.

2.1 Building an improved support framework for reducing waste

A wide range of programs are delivering more focussed and effective regulatory and policy settings, better infrastructure to recover more waste, improved information to guide priority setting and investment, and partnership programs to support innovation and reduce risks through trials of new approaches and recycled content materials.

Program highlights and results include:

- New waste regulation to enable use of more waste for beneficial resource recovery uses; 18 exemptions developed so far
- 16 waste campaign blitzes on landfills/transporters to improve environmental management
- Work to increase markets for recycled organics by DECC and industry has led to the market more than doubling in six years (from 370,000 m³ in 1998 to 847,000 m³ in 2004).
- Successful trials of recycled organics with turf growers has led to an uptake by growers in a market that could use up to 100,000m³
- Central west viticulture trials using recycled organics have shown 20% water savings
- Biofilter trial at a small landfill shows that organics can help reduce methane emissions by up to 90%
- 6 new systems and technologies operational and providing 460,000 tonnes additional recovery capacity; 5 more in the pipeline
- Major commercial and industrial waste audit has identified more opportunities for recycling
- Joint government and industry funding under the National Packaging Covenant to recover an additional 159,000 tonnes of packaging from landfill by June 2010 and leverage over \$34 million of new investment and projects in NSW
- 5 year national voluntary mobile phone sector commitment including world best practice targets to increase tonnes collected by 22-25% per year for the next 5 years
- DECC implementation of the regulatory safety net supporting the National Packaging Covenant has resulted in 95 additional companies joining the Covenant in NSW.

Better regulation and enforcement

Major reforms to the waste regulatory framework made in mid 2008 under the *Protection of the Environment Operations Act 1997 (the Act)* and the associated *Protection of the Environment (Waste) Regulation 2005 (the Waste Regulation)* are providing clarity to industry and regulators to enable better waste management. The reforms streamline waste licensing categories and simplify the waste classification system.

Another key component of the reforms is the introduction of an exemption system which allows bona fide activities involving resource recovery from waste to be exempted from the waste regulatory framework. Through DECC's work with a range of industry groups and individual operators, 18 resource recovery exemptions relating to wastes used as fuel, fertilizer or fill have been finalized since mid 2008, covering a wide range of wastes and recovery opportunities – from construction & demolition waste used as aggregate in engineering applications to food and animal waste recovered and used in fertilizers and other soil amendments. Conditions imposed on these exemptions ensure that the waste-derived material applied to land or thermally treated does not contain unacceptable levels of physical and/or chemical contaminants.

DECC has provided presentations and guidance material to local governments, public authorities and industry to encourage them to use these exemptions or to approach DECC for a new exemption to cover their specific resource recovery activity.

DECC also continues to promote compliance by assisting waste operators to understand and meet their legislative obligations, while taking strong and consistent regulatory action against those who do not comply with the law. Over the past 18 months, DECC's Waste Operations Section completed more than 16 waste campaigns with blitzes on waste situations posing risks to the environment. There were also initiatives to raise awareness and improve industry's knowledge, targeting the disposal of construction and demolition waste, daily cover at landfills, litter and illegal dumping, inspections of waste transport vehicles, and the management of liquid waste. DECC also supports two Regional Illegal Dumping (RID) Squads (see p.39)

Policy guidance on recycling and collection issues

DECC continues to provide guidance about emerging issues to Councils and other waste managers to assist their decisions on recycling services and technologies.

There is no single best solution or configuration for collection services and technologies associated with reprocessing due to variables such as amounts of waste produced, existing systems in place and accessible, population characteristics (size, density, ethnicity, age), cost, geographic location and available options for disposal of residual waste.

DECC has provided guidance about the importance of maintaining separate recycling collections, use of alternate technologies and the duration of landfill contracts. Under the Local Government Waste Service Performance Improvement Payments criteria (see p.34), Council landfill contracts should be no longer than five years since this may restrict opportunities for emerging alternative waste treatment in the near to medium term and result in reduced sustainability outcomes for the community.

Data and research to inform decisions

Recycling more commercial and industrial (C & I) waste is critical to achieving the WARR Strategy targets. DECC's 2008 audit of commercial and industrial waste at major Sydney landfills and transfer stations will provide an update on the composition of waste being disposed of, including the amount that is biodegradable, potentially recyclable and packaging. The audit has identified clear priorities for action (see p.21 for more details).

Social research is another key source of information that helps build an understanding of the social dimension of waste reduction and broader environmental sustainability. The statewide triennial research survey *Who Cares About the Environment?* was last conducted in 2006 and included specific waste related findings. The next survey will be conducted in 2009.

Social research also helps program development. For example, attitudes and behaviour of multi-unit dwelling residents about recycling helped in the review of the *Better Practice Guide for Waste Management in Multi-Unit Dwellings (MUDs)* and programs to engage these residents in recycling.

To assist better design and outcomes of waste and other environmental programs, a *Guide to Using Research in Sustainability Programs* will be released in early 2009, with workshops to facilitate its use.

New Infrastructure and Systems

Councils, often in regional groups, have been key players in investigating integrated waste management solutions that complement existing bin collection systems, deal with residual waste streams, treat waste and resources locally, and extract the highest possible resource value, with minimal cost to communities. DECC has supported a number of these processes as well as updating its Alternative Waste Technologies Assessment Tool, which was developed to assist Council decision making.

This has led to a significant number of Alternative Waste Technologies (AWTs) being developed. By September 2008 there were six operating AWT plants in NSW with a further two under construction. Three other AWTs were either in the contract negotiation stage or the DA stage and several more are in the planning stages. Table 11 below shows the range of alternative waste and reprocessing facilities currently in operation or under development. These projects often have very long time frames from planning through to commissioning, sometimes up to 10 years.

Table 11: Alternative waste and reprocessing facilities currently operating or under development.

Existing AWT infrastructure				
Facility	Location	Owner/ Operator	Approx. Processing Tonnes	Establishment Date
UR-3R	Eastern Creek	WSN/Global Renewables Inc	175,000	2005
Earthpower	Camellia	TPI/Veolia partnership	80,000	2004
Macarthur Resource Recovery Park	Jacks Gully	WSN Environmental Services	90,000	2008
Bedminster	Port Stephens	SITA Environmental Solutions	40,000	1999
Organics Resource Recovery Facility (ORRF)	Port Macquarie-Hastings	Remondis Pty Ltd	40,000	2001
Coffs Coast Resource Recovery Facility (CCRRF)	Coffs Harbour	Biomass Solutions	35,000	2007
TOTAL additional capacity			460,000T	

Under construction and proposed AWT Infrastructure				
Facility	Location	Owner/ Operator	Approx. Processing Tonnes*	Est. Date on line
Under construction				
SAWT	Kemps Creek	SITA Environmental Solutions	120,000	2009
Woodlawn Alternative Sorting and Processing (WASP)	Woodlawn	Veolia Environmental Solutions	120,000	2009
Planning Phase				
WSN ArrowBio (DA)	Lucas Heights	WSN Environmental Solutions	100,000	2010+
Woy Woy WMF	Woy Woy South (Central Coast)	Gosford City Council	100,000	2009
Summerhill Waste Management Facility	Summerhill (Hunter)	Thiess and Hunter Integrated Resources	150,000	2010+
Total capacity under construction/planning			590,000T	

* NOTE tonnages are as provided in the DA applications

CASE STUDY: Macarthur Resource Recovery Park

The project that led to the establishment of the Macarthur Resource Recovery Park (MRRP) was a joint initiative that involved DECC and the four Macarthur Councils of Camden, Campbelltown, Wingecarribee and Wollondilly. In late 2005, the project resulted in a 15 year contract with WSN Environmental Solutions for an AWT facility at Jacks Gully, in the Camden local government area. When fully commissioned Macarthur Councils should achieve a domestic resource recovery rate of around 85%.

The MRRP provides an integrated resource recovery solution that is complementary to each council's resource recovery and waste management services. The key features of the MRRP are:

- An enclosed tunnel garden organics composting facility with a capacity to process around 30,000 tonnes per annum;
- An Arrow-Bio alternative waste treatment facility with the capacity to process 90,000 tonnes of residual waste per annum, which is intended to divert around 75% from landfill disposal;
- An upgraded materials recovery facility (MFR) for the processing of dry recyclables, which will process the full range of containers plus improved recovery of glass fines;
- A new facility for processing and recovering resources from the material collected by Council cleanup services and an upgraded small vehicle drop off facility to focus on increased resource recovery;
- An environmental education centre based on sustainable building concepts and principles

Systems improvement and new infrastructure is also being supported through NSW co-funding of biannual grants under the National Packaging Covenant. Just under \$3 million of shared funding from the NSW Government (DECC) and the National Packaging Covenant Industry Association has been provided since July 2007, leveraging projects in NSW worth more than \$34 million. Projects have funded new technology and sorting systems in Sydney to recover packaging from commercial and industrial wastes, systems to increase glass recovery from pubs and clubs, and support for two new recycling collection programs for small and medium businesses. Together, these projects are projected to divert 159,000 tonnes from landfill by June 2011.

Growing Markets

Reaching the recycling targets depends on being able to use the recycled material in new products and materials. Using recycled material instead of virgin material reduces environmental impacts from obtaining the raw materials and from new landfill construction as well as energy, greenhouse gas and water savings when new products

are made from recycled materials. Using recycled organic materials also creates other substantial benefits such as reducing evaporation and improving soil health.

Growing markets for recycled materials has therefore been a key focus of DECC programs. Key projects and results include:

- Over 75,000 tonnes of **glass fines** have been going to landfill each year in NSW, as the fragments are too small to be colour-sorted for reprocessing into new bottles. DECC has supported initiatives to address this issue including development of a product specification for using glass fines as a replacement material for natural sand in pipe embedment.
- National Packaging Covenant projects have assisted with capital expenditure and testing for three glass crushing operations, increasing the capacity for glass crushing in NSW and expanding markets for crushed glass into water filtration and landscaping.
- DECC and industry programs have been very successful in increasing markets for **recycled organics**. Since 1998 the market has more than doubled (from 370,000 m³ in 1998 to 847,000 m³ in 2004). Important programs have included:
 - demonstration work with a turf grower in the Illawarra that has resulted in that supplier changing their underlay recommendation from zero to 40% recycled organic matter. **Turf growers** represent a potential market demand of up to 100,000m³.
 - Lessons from further **Council Parks and Gardens** demonstration sites at Kuring-gai, Port-Macquarie-Hastings Councils and Wingecarribee have further supported more widespread changes to management of these facilities. This work will also feed into a Sydney Water Guideline to be published on managing recreation fields.
 - DECC has continued to partner with **Catchment Management Authorities** to increase the use of composted organics in rehabilitation works, including trials with the Hawkesbury Nepean CMA (HNCMA), Southern Rivers CMA (SRCMA) and the Hunter Central Rivers CMA (HCRCMA). A Guideline for the Use of Recycled Organics in Catchments has been released and with the Catchment Action Plans of HNCMA, SRCMA and HCRCMA identifying 60,000 ha requiring rehabilitation, there is a substantial opportunity for recycled organics.
- To provide some surety for the re-use of **construction materials**, 'greenspecs' are being developed for some products through collaborative industry and government projects. 'Greenspecs' are needed to cover all major materials recovered through this sector, including fill materials and timber.

Extended Producer Responsibility

Extended Producer Responsibility (EPR) or product stewardship initiatives are aimed at producers taking greater physical or financial responsibility for the environmental impacts of their products throughout the product lifecycle. This includes choice of materials, product design and impacts during use and disposal at the product's end of life.

DECC has continued to support national processes aimed at achieving product stewardship outcomes for TVs, computers, tyres, plastic bags, mobile phones and packaging. Through DECC, NSW has provided the lead in the development of national regulatory impact statements, research and economic modelling relating to individual electrical product wastes. DECC also publishes an annual **EPR Priority Statement**, which lists wastes of concern that the Director General intends to recommend for regulatory action.

Some of the direct activities and results from NSW product stewardship working with various sectors includes:

- New research to establish consumer willingness to pay for **e-waste recycling**
- A national product stewardship approach by the **timber** sector including a commitment to double diversion of waste timber from landfill to 65% (equating to about 1 million tonnes/annum).
- Increased recovery of post consumer **PVC pipe** leading to greater market demand for recycled PVC.
- A **Mobile Phone** Industry Statement of Commitment provided to national environment ministers in November 2008 includes world best practice targets to increase tonnes collected of between 22-25% per year for the next 5 years.
- Participation in national working groups drafting impact statements, regulatory safety nets and national schemes for used **tyres, TVs and computers and plastic bags**.
- Development of a voluntary recycling standard for TVs to ensure environmentally sound recycling
- Implementing the regulatory safety net, the **Used Packaging Materials** NEPM by NSW, has led to 95 additional NSW companies signing up. Of the 709 Covenant signatories nationally in December 2008, 281 are from NSW.
- Working with other Australian Governments to analyse options including container deposit legislation, for packaging waste. These will be considered by Ministers at the first Environment Protection and Heritage Council meeting in 2009.

2.2 Support for households and Councils to tackle waste

Significant gains continue to be made in resource recovery from the municipal waste stream. Councils provide a key role in providing recycling services to households and can influence the community and business through both services and education.

Program highlights and results:

- New single, streamlined local government reporting mechanism and new waste audit guidelines and methodology for local government recycling and waste audits
- Standardised lid colours for waste and recycling bins across all SMA/ERA councils to comply with the relevant Australian Standard AS4123.7
- All 51 eligible councils received annual Waste Service Performance Improvement Payments for improved practices and service delivery.
- Completion of a suite of materials/tools/resources to increase resource recovery in Multi-Unit Dwelling Developments
- Local Government Litter and Illegal Dumping Grants to 91 councils for education and enforcement
- Crackdown on Illegal Dumping handbook prepared for Councils
- 2008 Illegal Dumping Forum on C&D Waste held for local government
- Delivery of eight individual Regional Waste Avoidance and Resource Recovery Plans 2009-12 and a combined three year Strategic Plan 2009-12
- 22,711 households participated in the Household CleanOut program, which collected 762 tonnes of hazardous materials during 2007-08.

Better systems and practices

All 51 eligible councils in Sydney, the Hunter, Illawarra and Central Coast met specified service performance requirements in 2007-08, the third year of the NSW Government's *Waste Service Performance Improvements Payments*. Councils shared \$12.3 million for meeting the requirements. In addition to previous criteria relating to provision of dry recyclables collection services for all single dwellings, use of Australian Standard bin lid colours, and providing data from audits of household waste bins, Councils are required to put in place by June 2009 policies and procedures to ensure:

- all new multi unit dwelling developments include dry recycling services;
- all new developments consider waste management and resource recovery during construction and demolition; and
- all new developments incorporate facilities for ongoing waste separation and collection.

DECC has continued to provide tools and information to support Councils to improve waste services. Recent documents include Better Practice Guides for Waste

Management in Multi-unit Dwellings and Public Place Recycling; Model waste and recycling contracts, social research into attitudes and behaviours of multi unit Dwelling residents and audits of these premises to guide program design.

DECC has also contributed to the development of technical guidelines that will enable Councils managing smaller landfills where methane is currently unchecked to abate up to 98% of methane generated by using recycled organics in engineered landfill biofilters.

Alternative Waste Technologies (AWTs) are being developed (see p.31), however there are also opportunities for increased recovery of dry recyclables through existing household recycling systems. DECC analysis of household garbage bin audits done by Councils shows that around 24% of what is in the bin could have been put into the kerbside recycling bin as shown in Diagram 1 below. This would amount to more than 360,000 tonnes of potential recyclables across the state.

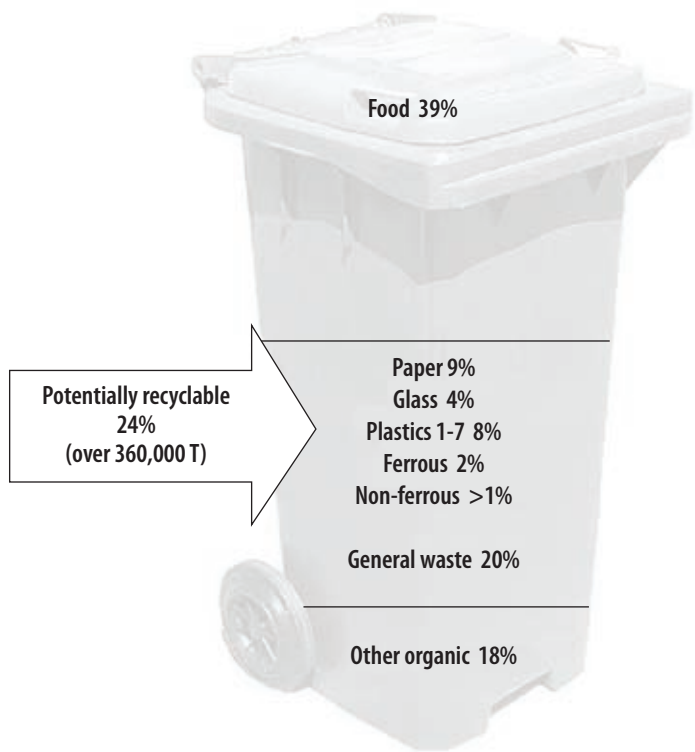


Diagram 1: NSW composition of an average domestic waste bin based 2006-08 Council Audits

Support for regional waste groups

DECC provides funding and coordination support to eight Voluntary Regional Waste Groups which cover 90% of rural and regional NSW. Working with member councils, these groups are achieving changes in approaches, technologies and actions that make better use of resources and minimise waste to landfill. Collaborative, cross regional approaches provide opportunities to share resources and knowledge; coordinate planning and resolve issues co-operatively.

Collectively, the Voluntary Regional Waste Groups have formed RENEW NSW (Regional Networks for Effective Waste Management) which has developed a Waste Avoidance and Resource Recovery Strategic Plan, in consultation with its member Councils.

The eight Voluntary Regional Waste Groups are now in the 3rd year of their 2006-09 plans. This collaborative approach has delivered:

- Increased resource recovery through regional collection contracts. In 2007-08 over 25,500 tonnes of scrap metal was recycled; close to 345,000 farm drums recovered; over 222,800 litres of used oil, more than 247,150 cubic metres of organic waste was recycled and over 104 tonnes of household chemical waste was safely disposed of.
- benchmarks, profiles and standards so councils can estimate the amount and composition of waste that is likely to be produced by each community.
- The Northern Inland Regional Waste Group co-ordinated a sub-regional tendering process for kerbside waste, recycling and organics collections with 3 of its member councils, resulting in recycling services being extended into new areas around Tamworth, Liverpool Plains and Gunnedah.
- The Riverina Waste Group's market research to determine user demand for a kerbside recycling collection service influenced the introduction of a joint recycling service to residents in Griffith City and Leeton Shire Councils to commence in November 2008.
- The regional domestic waste and recycling contract between Blayney Shire, Cabonne, Forbes Shire, Orange City and Parkes Shire Councils delivered significant infrastructure consolidation and implementation of a regional educational strategy. During 2007-08, over 7,100 tonne of household recyclables were collected, saving over 4,100 tonne of greenhouse gas emissions. As a result, NetWaste member councils Dubbo City, Narromine Shire, Coonamble Shire and Wellington Councils are investigating a similar arrangement.
- Two groups conducted e-waste collection pilots which resulted in over 63 tonnes being diverted from landfills across north east and central NSW.
- The Riverina East Waste group conducted a plastic bag exchange program, where residents exchanged 20 plastic bags for a re-useable bag to raise community awareness about recycling and impacts of waste. Over 9,000 re-useable bags were exchanged for over 180,000 plastic bags.

The Groups have just submitted their three-year plans for the period 2009-12, aimed at consolidating regional municipal waste management infrastructure through more shared arrangements; integrated management planning for organics processing and reuse within the regions; waste reduction and management planning with local businesses; and a greater focus on sustainability recognising the linkages between waste management and greenhouse gas emissions.

Councils and local planning

The requirement by NSW Planning for Councils to review and consolidate their local Development Control Plans (DCP) provides an opportunity to review development approval options for improving source separation of demolition and construction waste, as well as for improving the design of onsite facilities for collection, storage and

separation of waste and recyclables. To assist Councils, in July 2008 DECC released a model Waste Not DCP chapter, which provides an overview of best practice.

Councils and sustainable purchasing

Improvements in waste-wise purchasing are being delivered through the Local Government Sustainable Purchasing Alliance. The program works closely and builds on the experience of ECO-Buy (Victoria). NSW Local Government membership is at 45 Councils and is continuing to grow.

Household chemical collections

DECC's CleanOut program funds and facilitates the collection, treatment and safe disposal of household hazardous materials throughout the Sydney, Hunter and Illawarra regions. The program helps to reduce community and environmental exposure to chemicals and reduce the toxicity of the waste stream.

Established in 2003, the CleanOut program continues to enjoy growing support from local government partners and the general public. In 2007-08:

- 39 collections were scheduled throughout Sydney, Hunter and the Illawarra;
- 22,711 households participated in the CleanOut program; and,
- 762 tonnes of hazardous materials were brought to the collections for correct treatment and safe disposal.

These figures represent a 20% increase on the 2006-07 Cleanout results. Currently, paints, oils and lead acid batteries comprise 82% of the total materials collected over the life of the program.

Improved data and measurement tools

During 2007-08, new guidelines¹⁵ were produced to provide Councils and other organisations with a methodology for the collection of consistent audit data that gives a comprehensive picture of household waste generation, resource recovery and the composition of a 'typical' household bin across NSW.

Improvements have also been made to provide a streamlined reporting framework for Councils through the development of the Yearly Local Government Waste and Resource Recovery Data Return. This survey consolidates information required under the National Environment Protection (Used Packaging Materials) Measure (related to the National Packaging Covenant) as well as by DECC.

15 Guidelines for Conducting Household Kerbside Residual Waste, Recycling and Garden Organics Audits in NSW Local Government Areas

Litter

Councils and Government agencies are continuing their work to tackle litter. The NSW Government and local Councils issued more than 7,000 littering fines last year. Other activities to help change littering behaviour include local government grants for programs to educate residents and visitors about the environmental effects of littering and associated penalties using the tools and resources provided in DECC 'Council Litter Prevention Campaign Resource Kit'. In 2007-08, 91 Councils shared in 21 grants totalling \$339,000. More information about littering rates is on page 25.

Illegal Dumping

Illegal dumping remains a big challenge for councils located around the urban fringes of Western Sydney and the South Coast and Southern Highland areas. As part of the Government's City and Country Environmental Restoration Program initiative, an additional \$18 million was allocated over five years to enable DECC to provide a stronger waste compliance and enforcement program including action to tackle illegal dumping.

Ongoing support is also being provided for the litter and anti dumping initiatives of the eight regional waste groups (see above). The Midwaste group of Councils partnered with the Department of Lands, Forests NSW, National Parks and Wildlife Service, Maritime and Catchment Management Authorities to conduct a regional education campaign on illegal dumping. In the Riverina a media campaign was conducted to deter illegal dumping, coinciding with the installation of cameras at known illegal dumping sites.

In February 2008 DECC released the final version of '**Crackdown on Illegal Dumping: A Handbook for Local Government**', which provides practical advice to councils on developing, implementing and evaluating effective illegal dumping programs. It also provides an insight into what motivates illegal dumpers and focuses on ways to minimise the opportunities that give rise to illegal dumping in NSW.

Work with Aboriginal communities

DECC has been supporting work by Aboriginal communities around waste and litter. This includes the development of a handbook and DVD¹⁶ to support Aboriginal people in Caring for Country. Developed in consultation with Aboriginal communities, it recommends actions to prevent and clean-up waste that has been illegally dumped on Aboriginal land.

The Aboriginal Lands Clean Up Program is another partnership between DECC, Local Aboriginal Land Councils (LALCs) and local government councils that aims to improve the well-being of Aboriginal communities and the environment through the removal of illegal dumped materials from Aboriginal owned lands. Implementation of deterrence measures and building relationships between stakeholders are other key elements of the program.

¹⁶ *Illegal dumping prevention and clean-up: Handbook for Aboriginal communities*. It contains a handbook and a 13 minute DVD which summarises the information contained in the handbook, using visual and oral media.

The Clean Up and Deterrence of Illegal Dumping on Aboriginal Owned Land Grants program also supports Aboriginal communities to tackle this environmental, cultural and community issue. Four clean up programs have been awarded for 2008-09, involving:

- Kempsey Local Aboriginal Land Council and Kempsey Shire Council
- Darkinjung Local Aboriginal Land Council and Wyong Shire Council
- Mogo Local Aboriginal Land Council and Eurobodalla Shire Council
- Gilgandra Local Aboriginal Land Council and Gilgandra Shire Council.

NetWaste is also working with indigenous communities in Bourke and Walgett with a focus on cleaning up the missions on the outskirts of Walgett in 2009. The program includes visiting schools in the region and meeting with Dharrivaa Elders Group to discuss litter prevention ideas for the *Youth Off the Street* Program.

Regional Illegal Dumping (RID) Squads

DECC supports two RID squads:

- the Western Sydney Regional Illegal Dumping (RID) Squad, which involves Bankstown, Baulkham Hills, Fairfield, Hawkesbury City, Holroyd, Liverpool (re-joined) and Penrith City councils
- the Greater Southern RID Squad, which involves the National Parks and Wildlife Service, the Sydney Catchment Authority, Shoalhaven, Wingecarribee Shire and Eurobodalla councils.

In March 2008, DECC released an Enforcement Officers Handbook which provides practical advice on the day-to-day prevention of illegal dumping by residents and commercial operators in neighbourhoods, localities and regions.

2.3 Support for businesses to tackle waste

Program highlights and results:

- As of June 30 2008, Sustainability Advantage participants were saving \$3.74 million per year by reducing raw material, energy and water use and waste. This included 1800 tonnes of waste and is projected to grow to over 50,000 tonnes in 2010.
- 45 clubs participating in Eco Clubs; one initiative is already diverting 400 tonnes of food waste/year
- pilots of national manufacturing sustainability training with 2 major companies have delivered a range of environmental savings, including a 60% reduction in waste paper disposal costs and a 40% reduction in pallet shrink wrap which equates to a \$30,000 cost-saving per annum

Supporting small and medium sized businesses

With significant quantities of waste continue to go to landfill from small to medium sized businesses, in 2007 DECC undertook research on business needs and practices to help develop more focussed programs. A diagnostic web based tool has now been developed to help small businesses understand their waste stream and the opportunities to recycle. The tool was piloted in November 2008 in Sydney and a regional centre and the results will be available in 2009. In addition, through joint DECC/National Packaging Covenant funding, a number of the larger waste and recycling service providers have been provided with funding to enable them to expand affordable recycling services to small and medium businesses (see p.31).

Supporting larger businesses

As of June 30 2008 the Sustainability Advantage program had grown to over 230 medium to large organisations that employed more than 90,000 people in NSW, in sectors as diverse as building products manufacturing, agribusiness, hospitality, health and aged care, tertiary education, community services and government. Participation from the TAFE sector alone includes 6 TAFE institutes, 72 separate campuses and more than 300,000 students.

Sustainability Advantage helps organisations to identify and prioritise environmental actions through a management diagnostic completed by the leadership team. Workshops and training, technical support and networking are used to support environmental improvement in key modules that cover: Vision, Commitment and Planning, Environmental Risk and Responsibility, Resource Efficiency, Energy Saver, Supply Chain, Staff Engagement, External Stakeholder Engagement and Climate Change. Waste avoidance and reduction is incorporated within a number of these modules, but it is specifically addressed in the Resource Efficiency module. Although waste reuse and recycling only totals around 2000 tonnes to date, this is expected to grow to over 50,000 tonnes by 2010 as major projects begin to deliver results. Clusters of

major building products companies are most promising, where projects covering glass, timber and fibre cement will deliver significant waste outcomes.

Waste gains achieved by individual organisations include:

- Weir Minerals – 400 tonnes of timber pallet waste diverted.
- FIP Brakes – recycling of ‘raw waste material’ (Flash and Dust) for the production of brake biscuits resulting in cost savings and reduction of waste to landfill (1,680 Cubic metres/annum, 638 tonnes/annum)
- Sydney Markets – achieved a 50% recycling rate for organics, cardboard, timber, steel, plastic and polystyrene waste generated on site.
- James Hardie and CSR Gyprock – initiated trials with Blue Circle Southern Cement to recycle up to use 24,000 tpy of reinforced fibre cement by-product waste (Si, Ca, Al, Iron Oxide) in cement production.
- Laminex, Blue Circle Southern Cement and Timber Development Association - working in partnership to demonstrate a product stewardship take-back initiative that will see up to 200 major Laminex customers returning their particleboard off-cuts for recovery as an alternative fuel for cement production. Waste characterisation trials are planned to support the new waste exemption process.
- Schindler Lifts and Rondo – working together to divert escalator hand rails from landfill by reusing them as a packaging material ‘gluts’.
- Dunlop and Ontera – working together to create zero waste from Ontera’s carpet tile process off-cuts; Dunlop plans to recycle Ontera’s nylon and rubber waste in underlay for flooring and carpets. Trials will be extended to include mattress ticking (polyurethane foam).
- Fletcher Insulations – undertook quality assurance and specification trials for use of crushed glass fines in fibreglass insulation. The trial demonstrated they could improve process performance and yield, save energy and eliminate contamination (paper labels). Following the success of this trial, Fletcher is hoping to increase its current use of recycled crushed glass fines from 2,000 tonnes/year (20% recycled content) to over 7,000 tpy (70% recycled content).

Sustainability Compacts are another approach targeting large organisations that can lead or influence the sustainability practices of others. They are high level voluntary agreements where parties commit to work together over three to five-years. Under these, Sensis, Hewlett Packard and Insurance Australia Group have made some significant achievements, including improved waste avoidance, reduction and recycling. For example, Insurance Australia Group completed a Home Contents trial in which IAG collected 36 tonnes of damaged household items, and reused or recycled 80% of them. The company is now investigating the expansion of this scheme across Sydney, Newcastle and other Australian cities.

Ecoclubs

ClubsNSW is in partnership with DECC to recruit registered clubs into the *Sustainability Advantage* program. 45 registered Clubs have joined so far. These clubs have all completed resource efficiency assessments which promise significant environmental

gains from 2008. Already, the introduction of the 'Pulpmaster' system (organic waste removal) is recovering around 400 tonnes of organic food waste per year from the Mounties and Dooleys clubs.

Improving skills for business

DECC managed a pilot training course for Diageo and Fairfax Regional Printers aimed at improving sustainability in manufacturing. As a result of the training, which was delivered by TAFE NSW, Diageo and Fairfax Regional Printers have both implemented significant sustainability initiatives which have reduced waste disposal by almost 10 tonnes per annum (including 60% reduction in waste paper disposal costs) and reduced pallet shrink wrap by 40%, saving \$30,000 per annum.

Purchasing products with recycled content

Consumers purchasing a product need to know it will do the job it is intended to do at an acceptable price. They also want to know if it is good for the environment, especially when there is a range of products available.

DECC has developed Office and Printing Paper guides to promote the environmental benefits of recycled content paper. Two updated guides will be available in early 2009: *Know Your Paper: A guide to purchasing recycled content office paper*, and *Know Your Printing Paper: A guide to purchasing recycled content paper for corporate stationary and promotional materials*.

DECC has also provided funding for the development of the Buy Recycled Business Alliance's web based product directory that provides a wide range of information about products that contain recycled materials. The directory is at www.brba.com.au.

Specific industry sectors and materials

Timber is a major component of both the construction and demolition (C&D) and commercial and industrial (C&I) waste streams. But for both these streams, the lack of a system to easily identify and extract non recyclable timbers, such as some treated timbers, from readily reusable timber is a major barrier to increased recovery of used timber. In 2008, a comprehensive Timber Market Analysis was completed that identified and predicted demand for waste wood/timber until 2014. This will be released in 2009 and guide policy and programs aimed at capturing and diverting more waste wood into beneficial applications.

DECC's C&I audit has shown that post consumer wood packaging such as pallets are about half of the wood/timber going to landfill in Sydney. A partnership project with the Timber Development Association targeting pallets has now analysed the available quantity of wood pallets and packaging, the reuse and recycling options and the various methods used to minimise the spread of pests and diseases. This has shown that less than 1% of the wood packaging waste stream is treated with metal based permanent preservatives. Information targeting industry and providing positive and cost effective alternatives to landfill has now been developed. Another project involving the diversion of hardwood utility poles and timbers from landfill is underway in partnership with the RTA and industry. Case studies involving major stakeholders are being developed to showcase the results to the marketplace.

The agricultural sector offers significant opportunities to use recycled content products but farmers look closely at the benefits and the costs before changing practices. A recent three year trial has investigated the costs and benefits, including environmental benefits, of compost application to vegetable crops compared to conventional treatments of manures and artificial fertilizers. Sydney Basin vegetable plot trials showed some increased yield, significant improvement in soil health parameters, and reduced build up of phosphorous in compost treated plots. Over the next 12 months the results from these vegetable trials will be taken into demonstration trials in farms in the Sydney basin to show that the use of organics can significantly reduce nutrient run-off. This is particularly important for the health of the Hawkesbury Nepean river system.

In the Central West results of *viticulture trials* have shown increased yields, water savings of up to 20%, significant soil temperature buffering, delays in drying out of the soil profile, and some wine quality improvements in plots using composted mulch. As a direct result of the trials, the Cowra Regional Vineyard Association is recommending the use of mulch in its draft vineyard environmental management plans.

The *Compost Industry* has produced a comprehensive set of three-year Action Plans¹⁷ to guide various aspects of industry development. Along with Victoria and SA, NSW is supporting the placement of Market Industry Development Officers with the industry to grow markets for compost products. An officer in NSW will work directly on end markets, including direct application of the research work undertaken previously by DECC and other research institutions.

17 "Advancing the Recycled Organics Industry"

2.4 Government organisations providing a lead

Government organisations are leading by example in reducing waste and increasing recycling rates. They are also making progress in using their considerable purchasing power to support recycled content materials where these are cost effective and performance competitive.

Program highlights and results:

- Audit Office analysis of WRAPP found that government agencies reduced waste disposed of to landfill from 27% to 8% of total waste generated in 2001-07 and government contribution to construction & demolition (C&D) recycling is already exceeding the WARR Strategy target
- A new sustainability policy for government agencies includes targets for recycled content copy paper
- NSW State Government computer contract includes a requirement for takeback and recycling of old computers
- streamlined government purchasing systems enable calculation of resources and choice of sustainable products.

A new Sustainability Policy for Government, announced by the Premier in mid 2008, combines policies for energy, water, waste, purchasing and fleet management. It also introduces state-wide targets for government agencies including reducing carbon pollution by reducing energy use, reducing water use, and increasing use and purchase of sustainable products.

The Government's Waste Reduction and Purchasing Policy (WRAPP) is now part of this broader policy. While continuing to reduce waste and increase recycling, Government agencies must also increase the use of their purchasing power to buy materials with recycled content. The Sustainability Policy specifically requires that a minimum of 85% of all copy paper purchased by NSW Government agencies must contain recycled content by 2014. From the start of the 2008-09 financial year, agencies will also need to specify inclusion of at least one recycled content paper option as part of each publication quote sought.

During 2007-08 the Audit Office of NSW undertook a performance audit of waste reduction and recycling efforts of government agencies by examining the WRAPP process and agency performance. The Audit Office report was released in June 2008. The Report stated that the Government's WRAPP initiative had achieved its intended outcome. It concluded that 'the public sector has reduced the proportion of waste going to landfill from 27% to 8% over the last 6 years, and has increased its use of recycled materials.'

The report supported the work of DECC in successfully implementing WRAPP across all agencies. It also recommended that the policy, now 10 years old, should be reviewed to renew its impetus and to ensure it remains relevant. Recommendations to further improve the program have been incorporated into DECC's ongoing work plans.

The latest whole-of-government Waste Reduction and Purchasing Policy (WRAPP) Progress Report 2008, released in June 2008, includes data for the period 2005-07. In particular, it shows that the NSW public sector is on track or exceeding a number of the targets under the NSW Strategy. For example, the recycling rate for construction and demolition materials continues to grow and is now at 93%, compared to 89% in 2005. This is well ahead of the 2014 WARR Strategy target of 76% for construction and demolition waste.

Overall, agencies recovered a total of 436,813 tonnes of waste and diverted it for recycling (excluding fill and VENM). This resulted in a reduction of approximately 137,000 tonnes of greenhouse gas emissions (CO₂ equivalent).¹⁸

The NSW government is also a signatory to the National Packaging Covenant (NPC). This requires annual reporting against its Action Plan on programs and support provided to contribute to the Covenant's recycling targets and goals. The report includes information about agencies that provide public place recycling systems. In 2007-08, out of 25 agencies with a responsibility for a public place, 12 agencies (48%), had implemented public place recycling, up from 43% the previous year. Information on NSW government agency recycling of commingled containers (glass, plastic, steel, aluminium) was also reported under WRAPP for the first time in 2007. 68 agencies reported having recycling systems, and collected almost 2000 tonnes or 85% of the containers generated.

18 WRAPP progress report 2008 (DECC 2008)

2.5 Broader community programs to tackle waste

Program highlights and results:

- The Sustainable Schools NSW program now has over 900 schools signed up and at various stages of delivering school management plans to improve their environmental footprint, including through waste reduction.

Since 2004, DECC has been working in partnership with the NSW Department of Education and Training to assist all schools in NSW to move towards sustainability through Sustainable Schools NSW (SSNSW). There are around 3300 schools operating in the different school systems across NSW. The Sustainable Schools NSW program aims to enable school communities and organisations that work with them to plan and implement environmental activities that enhance student learning and reduce the school's environmental impact. SSNSW is also part of a national initiative – the Australian Sustainable Schools Initiative (AuSSI) and the national partnership statement across all States, Territories and the Commonwealth was endorsed by the Environment Protection and Heritage Council in April 2008.

In August 2007 the NSW Catholic Education Commission and DECC signed a formal agreement to assist NSW Catholic schools to implement sustainability education. The Commission has now formed a sustainability working group and has been funded to run a series of forums for key Diocese staff and teachers on education for sustainability.

In November 2007, the Sustainable Schools NSW website was launched by the Ministers for Environment and Climate Change, and Education and Training. This enables schools to access and share skills, knowledge and information, to develop a school environmental management plan online and keep track of usage of energy, water, waste and purchasing.

By December 2008 27% of NSW schools (over 900) were participating in the initiative, developing and implementing action plans across resource and grounds management, and curriculum, including whole school planning and school community participation. 80% of NSW Local Government Areas have at least one registered school with Newcastle, Sutherland, Blacktown and Wollongong LGAs each have 25 or more schools registered. Since February 2008 DECC has also developed accredited training and supported professional learning workshops for teachers about planning and teaching for sustainability. 450 participants have now attended 31 workshops across NSW.

DECC continues to work with ethnic communities through the Ethnic Communities Council to deliver targeted sustainable living workshops and field trips as well as to work with councils and other organisations to build capacity to undertake ethnic communities education projects. A Working with Ethnic Communities guideline has been developed, as well as training and network development.

Both the DECC and the *Our Environment, it's a living thing* websites provide information to assist community action on a range of issues, including reducing waste at home and in the office, buying green goods, sustainable purchasing, and reducing litter and illegal dumping.

Table 10: DECC programs and WARR Strategy result areas

Key audience	Examples of key projects	Project contribution to Strategy result areas ¹			
		Waste avoidance	Increased recycling (and targets)	Reduced toxicity	Reduced litter and illegal dumping
Local government	Improved practice resource recovery		■		
	Litter and illegal dumping programs			□	■
	Increasing Local Government Environmental Sustainability	■	■		
	Voluntary Regional Waste Group Coordination		■	□	□
	RID Squads			□	■
	Council parks and gardens compost in topsoil – trial sites		■		
	Landfill biocover for methane oxidation trial		■		
Community	Household Chemical Cleanout		■	■	
	Ethnic Communities Sustainable Living	□	□	□	□
	Social Research	□	□		
	Aboriginal clean up and litter partnerships	□	□		□
Business and industry	Commercial and Industrial waste disposal survey	□	■		
	Construction and Demolition waste disposal survey	□	■		
	Resource Recovery Show Cases	□	■	□	
	Timber Market Analysis		■		
	National Packaging Covenant – Grant Management		■		
	C&D Resource Recovery Industries Survey		■		
	Small Business Waste Diagnostic Tool	■	■		
	Business partnership programs	□	□	□	
	Sustainability Advantage	■	■	■	
	NSW Sustainability Compacts	■	□		
	Education for Compliance and Efficiency	■	□	□	□
	Cleaner production for Licensed premises	□	□	□	
	Golf courses – compost in fairways trial sites		■		

1 ■ shows primary project focus; □ shows secondary focus

Key audience	Examples of key projects	Project contribution to Strategy result areas ¹			
		Waste avoidance	Increased recycling (and targets)	Reduced toxicity	Reduced litter and illegal dumping
	Mine site rehabilitation – trial site		■		
	Turf trials using compost research		■		
	Cost Benefit of compost use in Agriculture		■		
	Catchment management, compost in erosion control		■		
	Food waste recycling best practice research		■		
	Vegetable demonstration farms				
	National Packaging Covenant	□	■		□
	Product specific projects		■	□	
Government	Waste Reduction And Purchasing Policy (WRAPP)	□	■		
Households	Regional Household Chemical Collections			■	□
	Multi Unit dwelling programs		■		■

■ shows primary project focus; □ shows secondary focus