



Environment,
Climate Change
& Water

Volume 2

Waste Avoidance and Resource Recovery Strategy Progress Report

2010

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**VOLUME 2: Supporting information for the Waste Avoidance and Resource Recovery
Strategy Progress Report 2010**

Contents

GLOSSARY	2
APPENDIX A: Data Methodology	3
APPENDIX B: Further information on resource recovery	4
APPENDIX C: Further information on waste prevention and avoidance	14
APPENDIX D: Key NSW policies and programs for waste reduction and resource recovery	21

**VOLUME 1 provides the body of the Waste Avoidance and Resource Recovery Strategy
Progress Report 2010**

Glossary

AWT	Alternative Waste Technology
DECCW	Department of Environment, Climate Change and Water NSW
C&I	Commercial and Industrial
C&D	Construction 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 and regional NSW)
SMA	Sydney Metropolitan Area
VENM	Virgin Excavated Natural Material
WARR	Waste Avoidance and Resource Recovery
WRAPP	NSW Waste Reduction and Purchasing Policy

Appendix A: Data Methodology

The Progress Report is based on data gathered from a variety of sources. Most data is for the period 2008–09. Litter and illegal dumping data is from 2009–10.

Resource recovery data is estimated as described below. Disposal data is of high quality in the regulated areas, i.e. Sydney Metropolitan Area (SMA) and the Extended Regulated Area (ERA) of the Hunter, Central Coast and Illawarra. Recovery and disposal data for regional and rural areas is of reasonable quality but is limited in scope.

Principal data sources are:

- Information reported by Councils on amounts and composition of materials disposed and recovered, collected through an annual survey and kerbside bin audits;
- A survey of C&D reprocessors undertaken by the Waste Management Association of Australia (WMAA);
- A survey of organics reprocessors undertaken by Compost Australia for DECCW;
- A survey of glass reprocessors undertaken by MS2 on behalf of DECCW;
- A national survey of plastics reprocessors undertaken by PACIA on behalf of DECCW, other jurisdictions and the plastics industry;
- A survey of paper reprocessors undertaken by Industry Edge on behalf of DECCW;
- Mandatory monthly disposal and recovery tonnages collected from disposal facilities that pay the Waste and Environment Levy;
- Mandatory annual waste disposal tonnages provided by waste facilities in the rest of the State;
- Information on hazardous materials and products from the Household Chemical CleanOut program;
- Reports from product stewardship initiatives such as the ChemClear program;
- Reports on litter and illegal dumping from: the Keep Australia Beautiful survey, supported by DECCW, reports by Regional Illegal Dumping (RID) squads, co-funded by DECCW and through calculations from penalty infringement notices.

Some data sources and measurement methodologies impact on the interpretation of results. E.g. recycling is estimated from information on materials passing through reprocessors and therefore inherently underestimates the actual recycling rate in NSW. This is because materials reprocessed on site or reused on another site without first passing through a reprocessor are not captured and therefore not measured or reported. For example, demolition material used on site for road base or fill, or transported by the construction company for reuse on another construction site would not be captured. Similarly, C&I materials that are sent directly from one business to another to be used as a raw material would not be captured. The same is true in the municipal stream with home composting activities.

Furthermore, a significant reason for the apparent increase in generation of waste (the total of disposal and recycled amounts) is that the scope of materials being measured has expanded and data collection improved. This expansion in the range of materials now measured accounts for approximately 1–1.3 million tonnes of the increase in waste generation reported between 2006–07 and 2008–09. Total waste generation would have otherwise been some 20,000 tonnes less than the 2006–07 level.

Appendix B: Further information on resource recovery

This appendix provides supplementary information on recycling performance in NSW and progress toward achieving the resource recovery targets in the WARR Strategy.

Progress from 2002–03 to 2008–09

Table B1 and Figure B1 below shows that the NSW community is making good progress for each waste stream and region towards the recycling targets in the WARR Strategy. Table B2 and Figure B2 provide further details on the tonnages for each waste stream and for each region from 2002–03 to 2008–09.

Table B1: Progress towards the NSW recycling targets, by waste stream and region

		2002–03	2004–05	2006–07	2008–09	2014 Target
NSW	Municipal	30%	33%	38%	44%	66%
	C&I	34%	38%	44 %	52%	63%
	C&D	64%	62%	67%	73%	76%
	Overall	45%	46%	52%	59%	
SMA	Municipal	33%	37%	42%	51%	66%
	C I	33%	35%	42%	50%	63%
	C&D	68%	66%	70%	77%	76%
	Overall	48%	49%	54%	62%	
ERA	Municipal	28%	33%	41%	44%	66%
	C&I	45%	53%	48%	60%	63%
	C&D	67%	65%	72%	68%	76%
	Overall	47%	50%	56%	59%	

Figure B1: NSW Recovery rates for each waste stream 2002–03 to 2008–09 and 2014 target

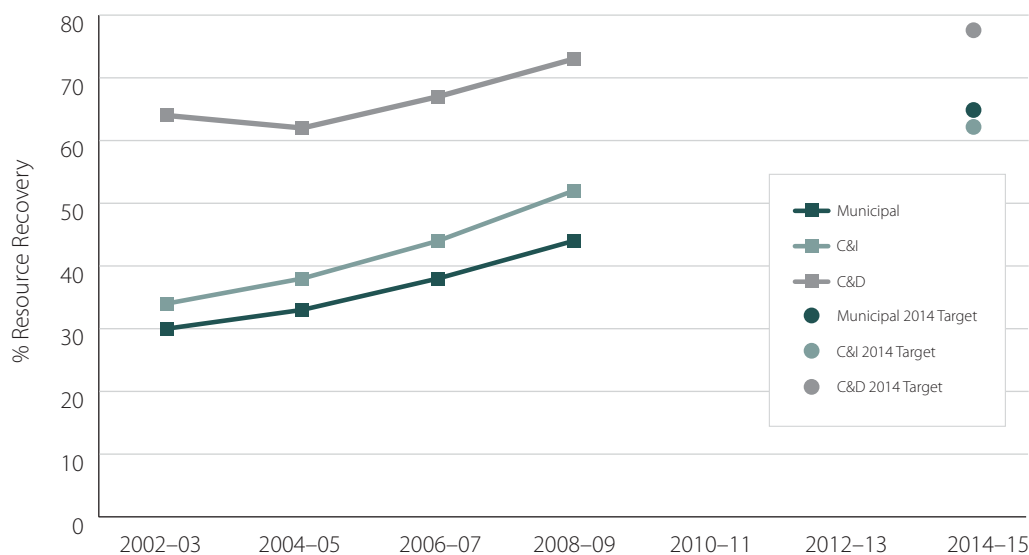


Table B2: Changes in recycling, disposal and generation for each waste stream for NSW and for Sydney and the Extended Regulated Area (ERA)¹ 2002–03 to 2008–09²

Municipal				
	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	Recycled %
NSW 2008–09	2,384,500	1,863,500	4,248,000	44%
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	30%
Sydney 2008–09	1,050,000	1,076,000	2,126,000	51%
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* 2008–09	506,000	389,500	895,500	44%
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 2008–09	2,588,500	2,836,500	5,425,000	52%
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 2008–09	1,854,500	1,816,500	3,671,000	50%
Sydney 2006–07	2,087,000	1,528,000	3,615,000	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* 2008–09	358,000	546,500	904,500	60%
ERA* 2006–07	383,000	354,400	737,500	48%
ERA* 2004–05	362,000	401,000	763,000	53%
ERA* 2002–03	325,000	269,500	594,500	45%

¹ Extended Regulated Area (ERA) refers to the Hunter, Central Coast and Illawarra regions

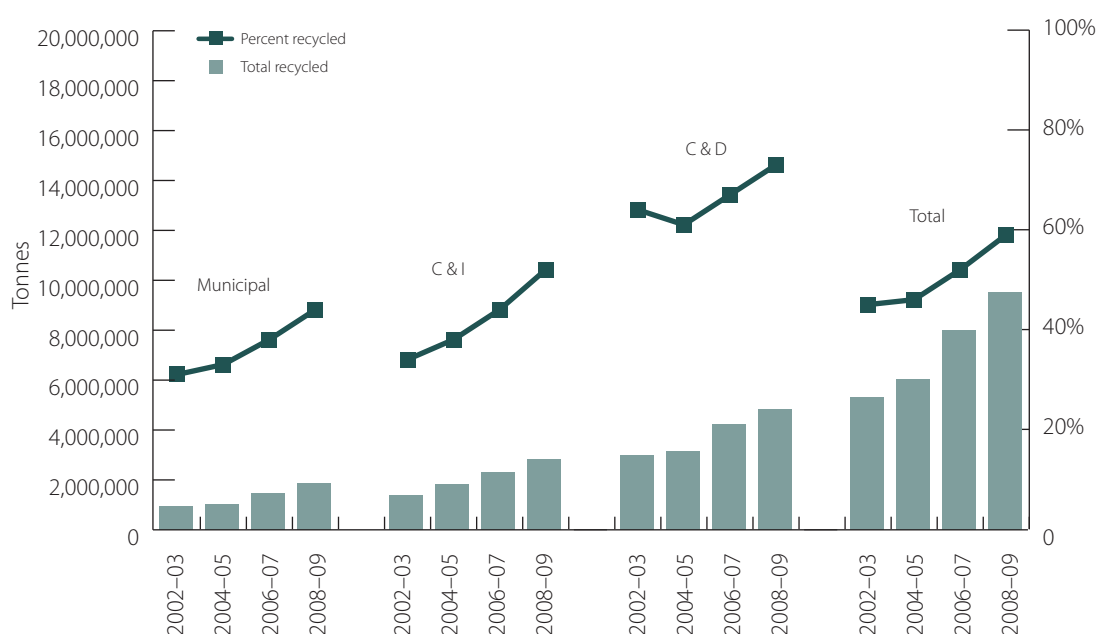
² Note that all figures are rounded.

Construction and Demolition				
	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	Recycled %
NSW 2008–09	1,759,500	4,829,000	6,588,500	73%
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 2008–09	1,075,500	3,684,500	4,760,000	77%
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* 2008–09	460,500	994,500	1,455,000	68%
ERA* 2006–07	327,500	851,500	1,179,000	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 2008–09	6,733,000	9,529,000	16,262,000	59%
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 2008–09	3,980,000	6,577,000	10,557,000	62%
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* 2008–09	1,324,500	1,931,000	3,255,500	59%
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

Figure B2: NSW Recycling quantities and rates by waste stream 2002–03 to 2008–09



Municipal Solid Waste

The Municipal Solid Waste (MSW) category includes household waste and waste from other municipal sources such as street sweepings, litter bins, clean ups, etc. Household waste represents 80% (3.38 million tonnes) of municipal waste.

Local Council Recycling Performance

Most of the recovery of dry recyclables and organics from households are from kerbside collections. In 2006, DECCW released the *Preferred Resource Recovery Practices by Local Councils* that provided a guide to the preferred minimum service levels for kerbside resource recovery and residual waste collections for single unit dwellings, namely:

- 80, 120 or 140 litre bin residual waste collection;
- Either 2 x 120 litre bins (one for paper/cardboard and one for containers) each collected fortnightly on alternate weeks or a 240 litre bin fully commingled fortnightly recycling collection;
- 240 litre bin fortnightly garden organics collection for high garden organics generation areas or a tied and bundled garden organics collection for low garden organics generation areas.

Councils may provide different services in terms of number, size and type of bin; however the majority are based on this common framework.

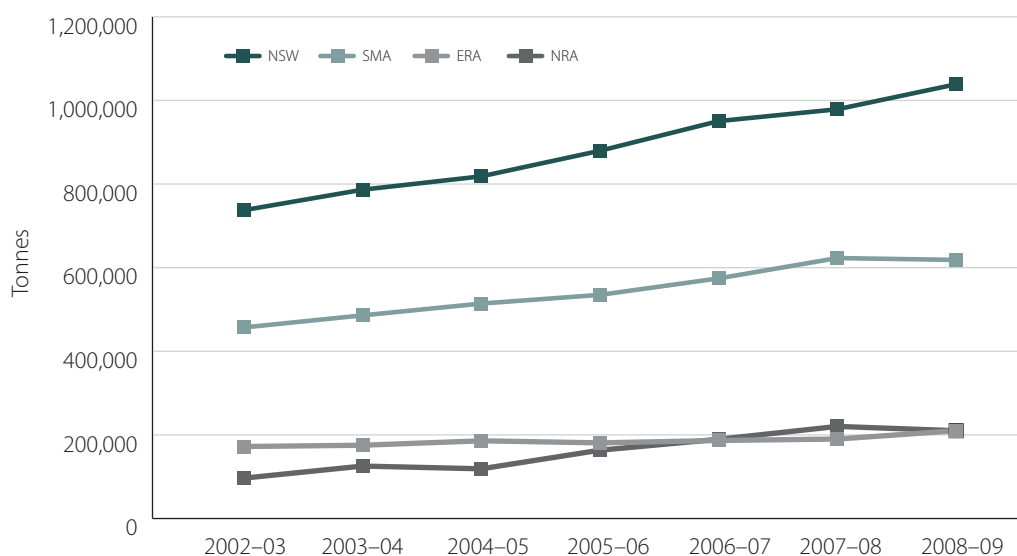
In the best performing councils in the greater Sydney area, households are achieving average dry recycling kerbside recovery rates of up to 88%. In other words, on average, 88% of the dry recyclables generated in households across the council area are being recovered in the yellow-lid recycling bin, while the remaining 12% is being disposed with the residual waste in the red-lid bin. Dry recyclables kerbside recovery rates in the greater Sydney area range from 43% up to 88%, with the average being 68%.

NSW has developed a framework to increase council recycling. All councils now have in place waste action plans detailing how they are to meet recovery targets. Funding is in place to support this. Local council recycling performance is supported by the Waste and Sustainability Improvement Payment (WaSIP) program. This is a \$256 million 7 year program that will run from 2009–2010 to 2015–2016. Of the \$256 million total investment, \$237.3 million will be available to eligible councils in Sydney, Hunter, Central Coast and Illawarra areas and \$19.1 million will go to eligible councils in the Regional Regulated Area (RRA)³, which was created in July 2009.

Recycling systems differ both within council areas and between councils, depending on the population density, type of residence (single unit dwelling vs multi-unit dwelling), access to reprocessing markets and other factors. 93% of councils provide a kerbside recycling system, covering 96% of NSW households. Kerbside systems predominantly collection dry recyclables, such as paper, cardboard, glass, metals and some plastics. Kerbside systems may also collect garden organics. A small number of councils also collect food waste. The total amount of recyclables collected in NSW and in each region continues to increase (Figure B3). For NSW there has been an increase by around 303,000 tonnes since 2002–03 to 1,040,000 tonnes in 2008–09, or 61%.

In 2008–09 each person in Sydney, Hunter, Central Coast and Illawarra regions now places, on average, an additional 38kg of material out on the kerbside each year for recycling than they did in 2002–03 (Figure B4). Overall, households in NSW recycle around 76kg per year more in 2008–09 than they did in 2002–03 (Figure B5).

Figure B3: Annual recyclables collected at kerbside (tonnes) in the NSW and key regions 2002–03 to 2008–09



³ RRA includes: Ballina, Bellingen, Blue Mountains, Byron, Clarence Valley, Coffs Harbour, Dungog, Gloucester, Great Lakes, Greater Taree, Kempsey, Kyogle, Lismore, Muswellbrook, Nambucca, Port Macquarie-Hastings, Richmond Valley, Singleton, Tweed, Upper Hunter, Wollondilly

Figure B4: Annual per capita recyclables collected at the kerbside in the NSW and key regions 2002–03 to 2008–09

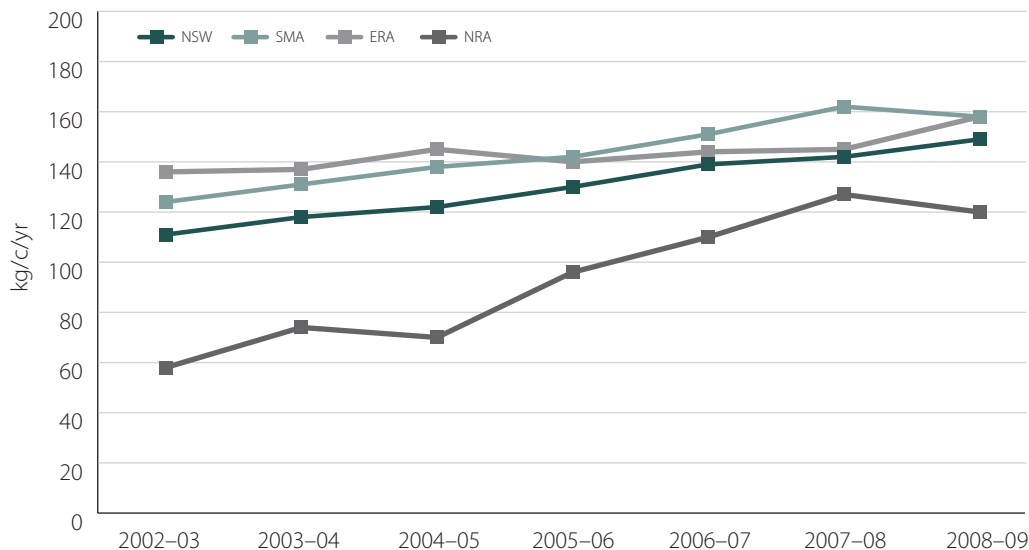
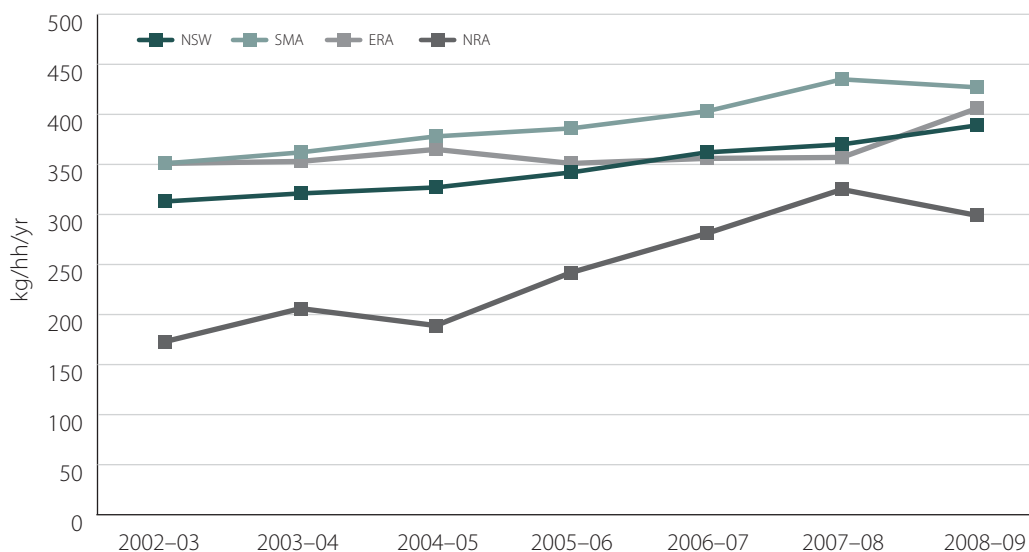


Figure B5: Annual per household recyclables collected at the kerbside in the NSW and key regions 2002–03 to 2008–09



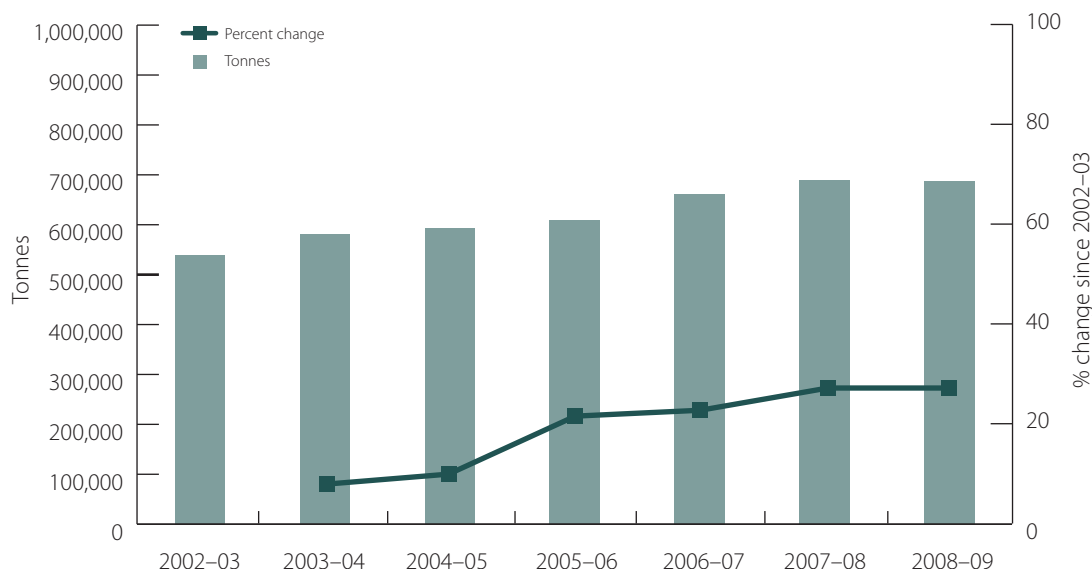
In addition to source separating recyclables, some councils have engaged Alternative Waste Treatment (AWT) facilities to process mixed putrescible waste. Five NSW facilities⁴ currently process mixed MSW to produce organic outputs. They seek to meet the requirements of a resource recovery exemption that allows bona fide resource recovery activities to be exempted from the requirements of the waste regulatory framework. The facilities can also stabilise waste so that it does not generate greenhouse gases when landfilled and substantially reduce the waste for disposal.

⁴ The five are: SITA at Raymond Terrace, SITA at Kemps Creek, WSN/GRL at Eastern Creek, WSN at Jacks Gully, and Biomass Solutions at Coffs Harbour. In addition to the above facilities, Earthpower at Camelia also processes recovered organic material from both the domestic and commercial waste streams.

Dry recyclables

Dry recyclables include newsprint, cardboard, beverage and food containers, and paper. 124 councils across NSW now provide kerbside collections of dry recyclables. Overall tonnages collected continue to grow – up from 539,000 tonnes in 2002–03 to 687,000 tonnes collected in 2008–09 (Figure B6). This also represents an increase of about 25,000 tonnes on that collected in 2006–07.

Figure B6: Annual dry recyclables collected at kerbside (tonnes) in the NSW – 2002–03 to 2008–09



Mobile garbage bins (MGBs) usage was up from 50% of councils in 2001 to 84% in 2008–09. In 2008–09, 86 councils out of the 119 councils offering a kerbside recycling system used DECCW’s preferred collection systems for dry recyclables (240L fully commingled MGB or two 120L MGBs, one for paper and one for containers).

In Sydney, on average, each person set aside 102.4kg of material for recycling in 2008–09 compared with 89.2kg in 2002–03. This is 3.6 kg per person per year less than in 2006–07. Recovery per household now averages 285kg per year. In 2008–09, an average person in the SMA recycled:

- 65.6 kg of paper and paper products;
- 27.7 kg of glass;
- 6.2 kg of plastic;
- 2.4 kg of steel cans and;
- 0.5 kg of aluminium cans⁵.

5 Survey of Councils’ domestic recycling performance for the National Environmental Protection Measure (NEPM) 2006–07

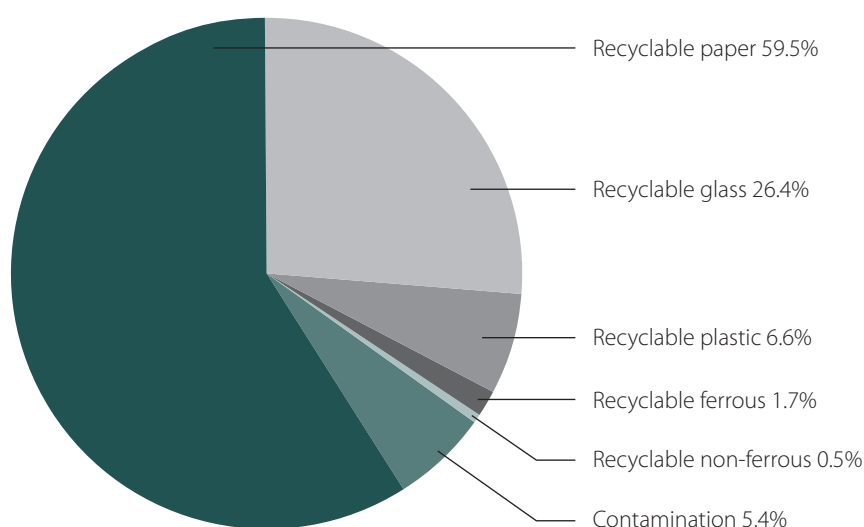
Dry recyclables collected from kerbside for each person, on average, in the Hunter, Central Coast and Illawarra has also increased, up from 91kg per person in 2002–03 to 103.9kg in 2008–09. This reflected increased provision of recycling services in these areas. Recovery per household now averages 267kg per year for those households with a service. In 2008–09, an average person in the ERA recycled:

- 62.0 kg of paper and paper products;
- 32.4 kg of glass;
- 5.2 kg of plastic;
- 3.7 kg of steel cans and;
- 0.6 kg of aluminium cans⁶.

An analysis of data from 52 audits conducted throughout NSW between 2007 and 2008⁷ covering around 14,000 households was used to determine the composition of a “typical” household recycling bin for both single unit dwellings (SUD) and multi-unit dwellings (MUD). Figure B7 shows the average composition profile of a household dry recycling bin. The analysis found:

- Recyclable paper was the largest component of a “typical” household recycling bin at 59.5%, followed by recyclable glass at 26.4%;
- The recycling composition profiles from SUD and MUD households were indistinguishable. Composition profiles for SMA and ERA differed significantly;
- The SMA recyclable paper composition at 61.1% is significantly higher than the ERA mean at 53.8%;
- The SMA recyclable glass composition mean at 25.3% is significantly lower than the ERA mean of 30.8%;
- The overall contamination level in recycling bins was 5.4% - the major contaminants are organic compostable materials (1.5%) and non-recyclable paper (1.1%).

Figure B7: Typical composition of domestic kerbside recycling



⁶ Survey of Councils' domestic recycling performance for the National Environmental Protection Measure (NEPM) 2006–07

⁷ *Domestic Kerbside Waste and Recycling in NSW, Report on the results of waste audits of household kerbside collection systems 2007-08*. DECCW 2010

Organics recycling

Organics recycling is an increasingly important component of resource recovery in NSW. 61 councils were providing a garden organics collection service in NSW in 2007–08 compared with 54 in 2006–07; in Sydney, 32 out of 38 councils offered a kerbside organics collection service.

Table B3 shows that 683,129t (72%) of the garden organic materials generated across the Sydney, Hunter, Central Coast and Illawarra regions over all waste streams (municipal, C&I and C&D sources) is now recycled. This represents an increase in the recycling rate of over 121,000t or four percentage points since 2006–07. Note that this excludes garden organic materials processed through facilities.

Table B3: Tonnes of garden organics recycled in 2002–03, 2004–05, 2006–07 and 2008–09 and as a percentage of total garden waste generated

Garden organics – Greater Sydney Region (SMA & ERA)			
	Total generated (tonnes)	Total recycled (tonnes)	Recycled %
2002–03	1,140,000	550,000	48%
2004–05	866,000	482,000	56%
2006–07	820,737	561,725	68%
2008–09	946,239	683,129	72%

Other results relating to organics recycling include:

- For NSW there was a 22 per cent increase in the amount of organic material recovered from kerbside collections between 2006–07 and 2008–09 and a 77% increase since 2002–03.
- In Sydney the amount of garden organic material being recycled per household each year has increased from around 119kg in 2006–07 to around 146kg in 2008–09 (23%). In the Hunter, Central Coast and Illawarra regions there has been a similar increase from 113kg to 135kg over the same period (19%).
- Despite the downturn in global financial markets there was a notable increase in sales of a number of organic based products in 2008–09 compared to the 2007–08. Markets for recycled organics grew at an average of about 8% between June 2008 and June 2009.

Commercial and Industrial (C&I) recycling

C&I recovery makes up 30% of total NSW recovery (2,836,500t). Good progress has been made in C&I recycling. Better measurement accounts for some of the increase in recycling rates. The rate of C&I recycling in NSW has increased eight percentage points to 52% (2,836,500t) in 2008–09 from 44% (2,297,000t) in 2006–07. The tonnage of C&I recycling has more than doubled since 2002–03 (1,371,500t). The SMA accounted for 1,816,500 tonnes (64%) and the ERA 546,500 tonnes (36%) of 2008–09 recycling.

Large increases in C&I recycling were identified for sand/soil/rubble (an increase of 218kt recycled), garden organics (an increase of 200kt recycled), food (an increase of 81kt recycled), and concrete/brick/tiles (an increase of 60kt recycled). New categories of other organics (348kt recycled) and rubber (53kt recycled) were also established.

Collections of C&I waste are made by both private companies and through local authority collection services. 61 out of 152 councils in the greater Sydney area offer C&I waste collection for small to medium enterprises (SMEs).

Several DECCW programs are now supporting C&I recovery rates. These include: the Sustainability Advantage program, which encourages recycling in large businesses; the Planet Ark recycling directory, which provides assistance to small to medium business to find recycling services; and the development of 'green specifications' for use of recycled materials in construction projects.

Construction and demolition (C&D) recycling

The overall recycling rate of construction and demolition material in NSW was over 73% (4,829,000t) in 2008–09, up six percentage points from 67% in 2006–07. This represents an increase in recycling of 615,500 tonnes.

In Sydney, the C&D recycling rate has increased by 7 percentage points to 77% and is now above the target figure of 76%. Conversely the C&D recycling rate in the Hunter, Central Coast and Illawarra was lower than in 2006–07, down by 4 percentage points from 72% to 68%; this is despite 143,000 tonnes more construction waste being recycled – 994,500 tonnes in 2008–09 compared to 851,500 tonnes in 2006–07. A 23% increase in the underlying construction waste generation rate, from 1,179,000 tonnes to 1,455,000 tonnes, resulted in a lower reported percentage of construction waste being recycled.

The primary driver for increased recycling of C&D materials is the Waste and Environment Levy. This has made it increasingly economic to recycle rather than dispose of waste C&D materials. As the levy increases in, it should help drive improved recovery in these areas.

Appendix C: Further information on waste prevention and avoidance

Changes in waste disposal

Total tonnes of waste disposal

Total tonnes of waste disposal in Sydney Metropolitan Area (SMA), across all three waste streams, has dropped 9.4% (about 412,000 tonnes) between 2002–03 and 2008–09. Between 2007–08 and 2008–09, Sydney disposed of:

- 62,500 less tonnes of municipal waste to landfill;
- 369,500 less tonnes of C&I waste to landfill;
- 183,000 less tonnes of C&D waste to landfill.

Tonnes of waste disposed of in the Hunter, Central Coast and Illawarra (ERA) regions have increased by 28%, or about 287,000 tonnes, between 2002–03 and 2008–09. Between 2007–8 and 2008–09, activities in the Hunter, Central Coast and Illawarra resulted in:

- 13,500 less tonnes of municipal waste to landfill;
- 75,500 less tonnes of C&I waste to landfill;
- 58,000 more tonnes of C&D waste to landfill.

In rural and regional NSW, there has been 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 not complete and was limited to rural licensed landfills. Improved data from both licensed and unlicensed landfills suggests that about 1.43 million tonnes of waste were disposed of in 2008–09 across all waste streams.

Where the waste comes from

In Sydney, commercial waste accounts for almost half the waste (47%) disposed of. Municipal waste is 26% and construction waste is 27%. The proportion of waste disposed for each wastestream has changed little since 2002–03.

In the Hunter, Central Coast and Illawarra the municipal waste stream remains the largest stream at 38% of total waste, far greater proportionately than Sydney. The commercial waste stream makes up 27% and construction waste has increased to 35%. Unlike Sydney, the relative proportions of each waste stream have changed significantly since 2002–03 with a decline in the proportion of both municipal and commercial waste and a large increase in construction waste from 22% in 2002–03 to 35% in 2008–09.

In rural and regional NSW, improved data from both licensed and unlicensed landfills suggests that municipal waste is the main contributor to landfills at 58%, followed by 26% commercial waste and 16% construction waste.

Waste disposed per person

Table C1 shows that in Sydney there has been an overall decrease in the amount of waste discarded of 173kg per person or 14.5% against the year 2002–03. By waste stream, the biggest decrease was in the C&I waste stream (per capita waste disposal down 76kg), followed by municipal waste, down 63kg per person and construction waste down 44kg per capita between 2002–03 and 2008–09. Between 2007–08 and 2008–09, Sydney disposed of:

- 20kg per capita less municipal waste to landfill
- 103kg per capita less C&I waste to landfill
- 52kg per capita less C&D waste to landfill.

Table C1: Changes in disposal per capita in Sydney by waste stream – 2002–03 to 2008–09⁸

Year	Municipal (kg/person)	Commercial & Industrial (kg/person)	Construction & Demolition (kg/person)	Total (kg/person)	Change since 2002–03 %
2002–03	322	551	319	1,192	
2003–04	303	581	356	1,239	4%
2004–05	273	601	350	1,224	3%
2005–06	278	593	355	1,226	3%
2006–07	288	549	338	1,175	-1%
2007–08	289	578	327	1,194	0%
2008–09	269	475	275	1,019	-15%

By contrast, the Hunter, Central Coast and Illawarra regions have increased total waste disposed by 177kg per person or 21.6% since 2002–03, Table C2. This is largely the result of an increase in construction waste of 163kg/capita, and small increases in municipal (2kg/capita) and commercial industrial waste (13kg/capita).

Between 2007–08 and 2008–09 activities in the Hunter, Central Coast and Illawarra regions have resulted in:

- 16kg per capita less municipal waste to landfill
- 61kg per capita less C&I waste to landfill
- 39kg per capita more C&D waste to landfill.

⁸ Note: Minor difference in these figures compared to previously published figures are due to the application of rebates applied after publication.

Table C2: Changes in waste disposed per capita in the Hunter, Central Coast and Illawarra regions by waste stream – 2002–03 to 2008–09⁹

Year	Municipal (kg/person)	Commercial & Industrial (kg/person)	Construction & Demolition (kg/person)	Total (kg/person)	Change since 2002–03 %
2002–03	379	257	184	820	
2003–04	388	308	204	900	10%
2004–05	379	283	216	878	7%
2005–06	364	274	231	869	6%
2006–07	390	295	252	937	14%
2007–08	397	331	307	1,035	26%
2008–09	381	270	347	997	22%

Specific material and sector performance

Virgin excavated natural material (VENM)

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. VENM is often created in major infrastructure projects, for example, rail and road projects and multi level constructions.

VENM remains largely a Sydney-based issue. Tonnages have dropped substantially since 2007–08, down 162,000 tonnes to 1.24 million tonnes in 2008–09.

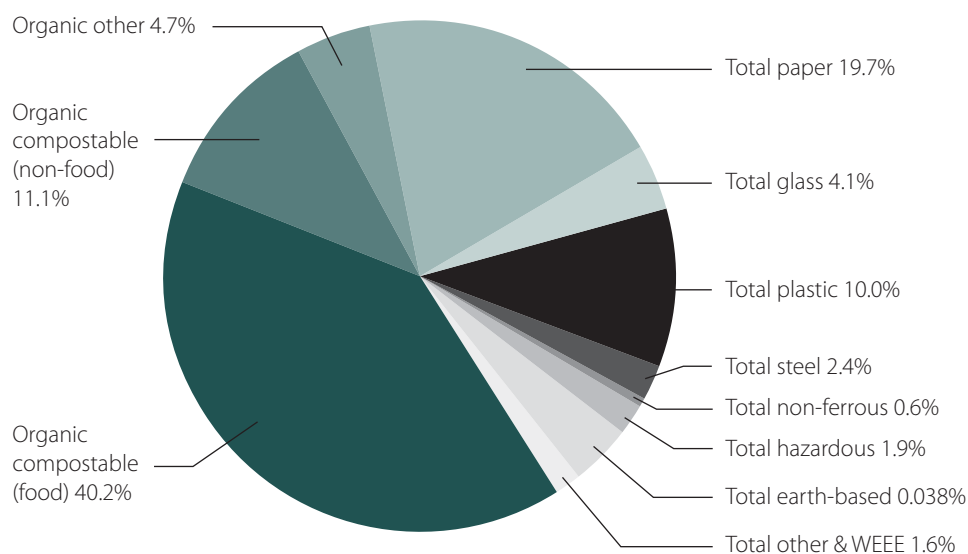
Household waste

An analysis of data from 52 audits conducted throughout NSW between 2007 and 2008¹⁰ covering around 14,000 households was used to determine the composition of a “typical” household bin for both single unit dwellings (SUD) and multi-unit dwellings (MUD).

Figure C1 shows the average composition profile of household residual waste generated. The analysis found:

- Organic compostable (food) makes up the largest component of a residual waste bin at 40.2%, followed by total paper at 19.7%.
- Potentially recyclable materials account for 23.0% of the total residual waste composition. Recyclable Paper 8.8%, Recyclable Plastic 8.7% and Glass Packaging 3.6% make up the majority that could be recycled.
- The average composition profiles for SUD and MUD households are similar and consistent with the overall residual waste profile.
- ERA council areas exhibit a lower food composition at 34.4%, compared to the SMA councils areas with a mean of 42.3%.

⁹ Note: Minor difference in these figures compared to previously reported figures are due to the application of rebates applied after publication.
¹⁰ *Domestic Kerbside Waste and Recycling in NSW, Report on the results of waste audits of household kerbside collection systems 2007-08*. DECCW 2010

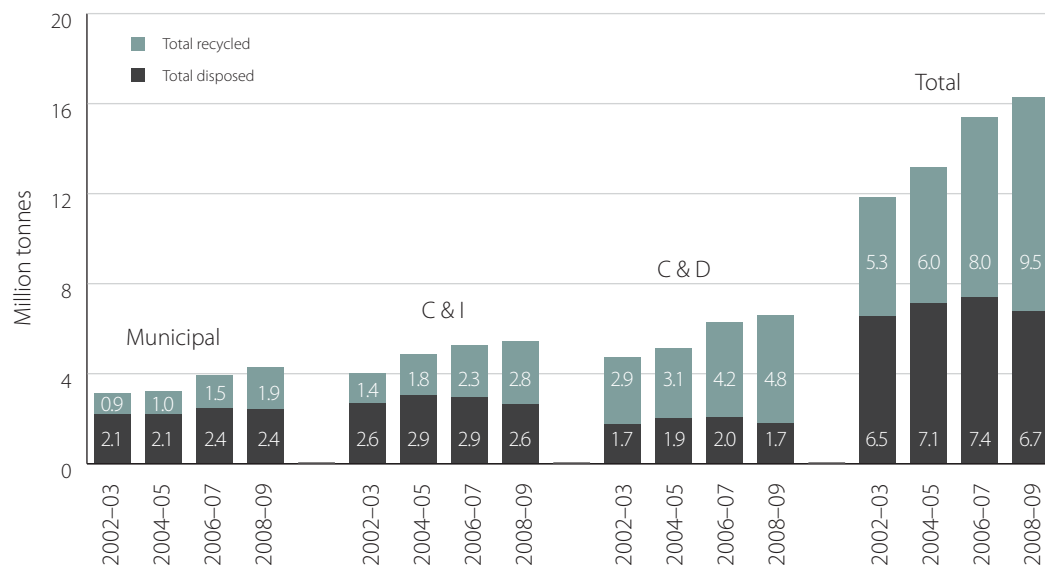
Figure C1: Typical composition of domestic kerbside residual waste

Changes in Waste Generation

Like other states and territories and other OECD countries, the amount of waste generated in NSW between 2002–03 and 2008–09 has increased. In terms of reported data, waste and recycling have increased by 4.46 million tonnes or 38% over that period (Figure C2). The apparent increase is related to several factors, including: an expanded scope of data reporting, accounting for 1–1.3 million tonnes (22%–29% of growth). Over the same six years: the NSW population grew by 6.9%; the NSW Gross State Product (adjusted to exclude the effect of changes in prices) also increased by 9.5%; and, relatedly, the NSW household final consumption expenditure (also adjusted to exclude the effect of changes in prices) increased by 22%. These related factors provide an indication of an increase in material flows in the NSW economy with likely upward pressure on the amount of materials passing through the NSW waste management system (waste disposal and reuse/recycling).

Offsetting those pressures for increased waste generation is waste prevention and avoidance by industry and individuals, which is supported by the economic driver of the Waste and Environment Levy on waste disposal.

Figure C2: Waste generation trends by waste stream 2002–03 to 2008–9



Whilst the total estimated waste generation in NSW has increased, all of the increase has been absorbed by increased resource recovery. Since the overall recycling rate has grown from approximately 45% in 2002–03 to 59% in 2008–09, most of the ‘waste’ that is generated is kept in the productive economy as raw materials.

This outcome raises the question of whether “waste generation” is an appropriate measure. A simple focus on generation masks the complexity of the issue. For example, environmental impacts of products can be more significant in the use phase and new products tend to be more efficient than older products, so some replacement of older products – with an associated increase in waste generation – may yield net environmental gains. Considering waste generation figures in isolation without an appreciation of the environmental impacts of waste products throughout their lifecycles does not necessarily reflect an accurate proxy for environmental impacts.

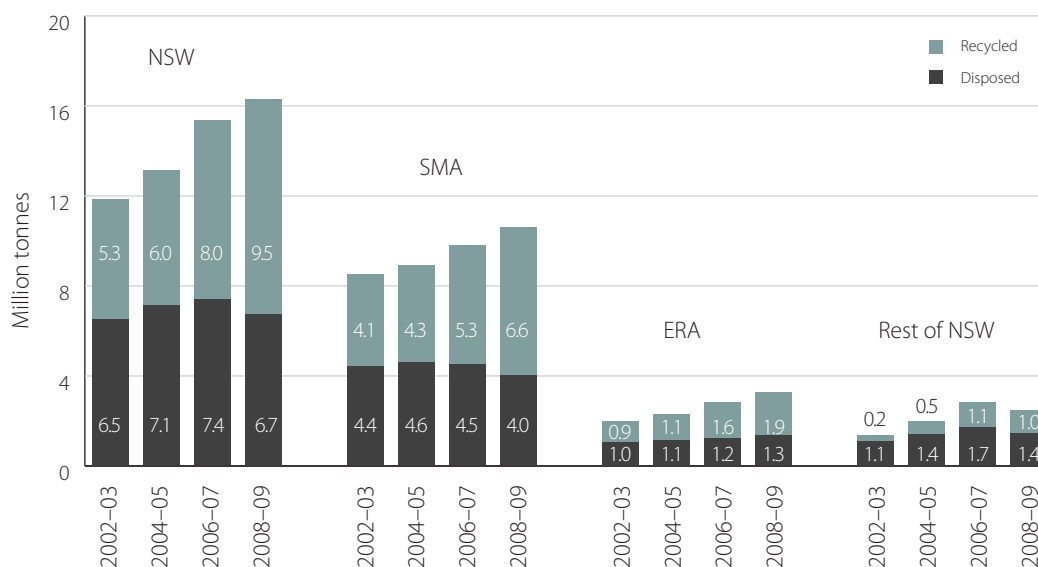
In terms of future target setting, it may be more appropriate to put more emphasis on total waste landfilled, which provides a direct measure of the loss of resources from the productive economy. Given the growing population in NSW and also its economic growth, it may also be more informative to normalize waste generation and disposal levels per capita and per dollar of economic activity within the State to gain a more meaningful appreciation of underlying consumption patterns and effectiveness of programs. For example, the waste landfilled per capita in the SMA has decreased between 2002–03 and 2008–09.

Changes in waste generation by region

Sydney generates 65% of the waste created in NSW (10.6 million tonnes). 20% (3.3 million tonnes) comes from the Hunter, Central Coast and Illawarra and 15% (2.4 million tonnes) was generated in rural and regional NSW.

Figure C3 shows the estimated total tonnes of waste and recycling generated for NSW as a whole, as well as for the key regions. Total estimated tonnes generated in NSW have increased by 0.9 million tonnes since 2006–07, and by almost 4.5 million tonnes since 2002–03. As noted previously, an expanded scope of data collection accounts for over 0.9 million tonnes of the increase between 2006–7 and 2008–09. Without this, total generation would have declined by approximately 20,000 tonnes between 2006–07 and 2008–09.

Figure C3: Total tonnes of estimated waste generated (recycled plus disposed) for key regions and the whole of NSW 2002–03 to 2008–09



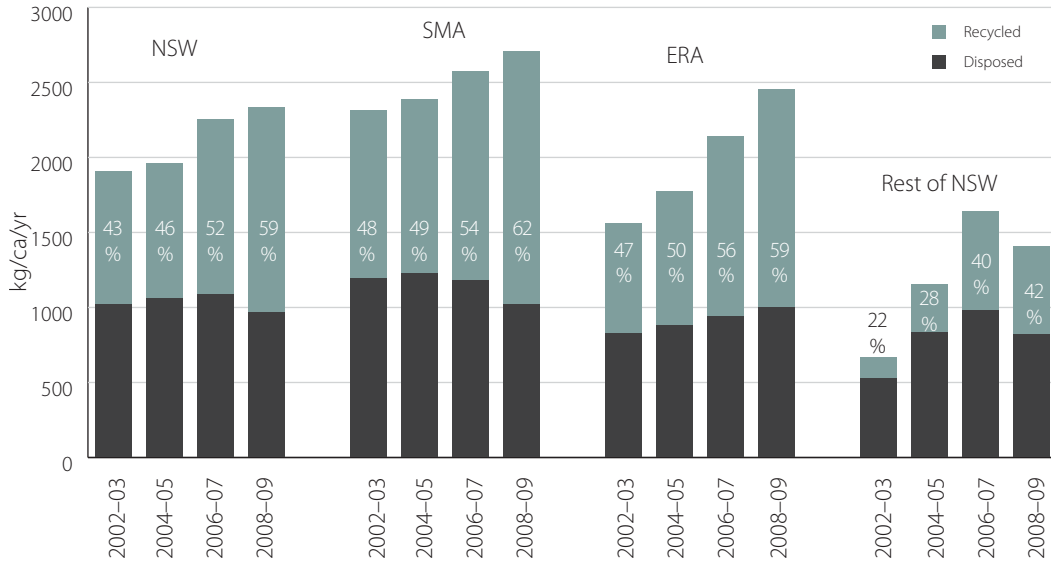
Total estimated waste generated per person

Figure C4 shows the estimated amount of waste generated per capita for the period 2002–03 to 2008–09 across all key regions. As a whole, estimated waste generation in NSW has increased by 579kg per person since 2002–03 and by 75kg per person since 2006–07. As indicated above, this is partly due to the expanded scope of data collection.

The increase in waste generation has not occurred evenly across NSW. Since 2002–03, per capita waste generated in Sydney has increased by 17%, while in the Hunter, Central Coast and Illawarra areas it has increased by 57%. However, in Sydney, each person still generates 251kg more per year than in the Hunter, Central Coast and Illawarra.

Significantly, regional and rural areas have seen an increase of 110% since 2002–03, but again much of this may be attributed to improved data measurement and collection.

Figure C4: Total estimated amount of waste generated (recycled plus disposed) per person for key regions and the whole of NSW, also showing the percentage recycled, 2002–03 to 2008–09



Appendix D: Key NSW policies and programs for waste reduction and resource recovery

Building an improved support framework for reducing waste

DECCW continues to improve the framework for reducing waste through a wide range of projects. These include improvements to regulation and enforcement, development of policy guidance on recycling and collection issues, better data and research to inform decisions, work on market development for recyclables and engagement with producers on product stewardship programs.

Program highlights and results

- Reform to waste licensing categories establishing a clear framework distinguishing waste disposal from resource recovery.
- Publication of research to support sustainability programs including commercial and industrial waste composition publications and social research 'Who cares about the environment' survey.
- Launch of community education program 'Love Food Hate Waste' to reduce food waste.
- Joint government and industry funding under the National Packaging Covenant to recover an additional 118,000 tonnes of packaging from landfill and leverage investment of over \$42.5 million.
- Market development work for recycled organics has resulted in the market increasing from 847,000m³ in 2004 to 1.9 million m³ in 2009.
- Support of product recovery schemes through extended producer responsibility frameworks.

An economic driver for waste avoidance and resource recovery

A disposal levy is the key economic instrument used in many jurisdictions around the world to drive waste avoidance and support resource recovery. In NSW, Waste and Environment Levy (the levy) is applied to waste received at licensed waste disposal facilities. Deductions apply for all waste that is lawfully taken off-site for recycling or re-use.

The levy works as an economic driver of waste avoidance and resource recovery by increasing the cost of waste disposal. The higher disposal price signals to different parts of the waste market that dumping waste in landfills is the least preferred waste management option. It encourages waste generators to minimise the generation of waste and to seek recycling options or be prepared to pay more. It also encourages the resource recovery sector by making resource recovery alternatives more viable.

The levy rate is set to increase annually over the period to and beyond 2014. This will provide an increasing economic driver to encourage waste avoidance and resource recovery.

Better regulation and enforcement

In addition to ensuring that the waste levy is applied equitably and its integrity is maintained so that it works as an effective economic driver, DECCW also helps protect the environment and drive the WARR Strategy by providing a clear and consistent waste regulatory framework for the waste and resource recovery sector to:

- improve waste compliance and deliver improvements in environmental performance across the sector, including cracking down on illegal dumping and improper waste disposal (This compliance regime aims to protect the environment and, at the same time, provide a level playing field so that legitimate waste avoidance and resource recovery practitioners have the confidence to operate in the knowledge that those who unlawfully undercut them will face the full force of the law.)
- delivering the resource recovery exemption gateway to facilitate genuine resource recovery. DECCW has worked closely with local governments, public authorities and industry to develop and promote the use of resource recovery exemptions to distinguish waste disposal from resource recovery. (There are 27 general and 75 specific exemptions in force as at 30 October 2010. This regulatory gateway commenced on 28 April 2008 and since that date is estimated to have yielded over 900,000 tonnes in resource recovery for specific exemptions alone.)
- guiding and improving community and resource recovery sector knowledge of lawful waste management and resource recovery through education programs and guidance on a range of matters including waste classification, landfill management, resource recovery exemptions and cracking down on illegal dumping.

Data and research to inform decisions

Research has been conducted into a number of areas of resource recovery in the last two years, examining opportunities and barriers associated with different materials currently being recycled or disposed.

For example, in 2008 DECCW undertook a comprehensive field survey to gain a clearer understanding of the composition of the Commercial and Industrial (C&I) waste stream. The 'Commercial and industrial waste in Sydney – Overview' was published in September 2009 and the full report – 'Disposal based survey of the commercial and industrial waste stream in Sydney' – published in May 2010. This research plays an important role in guiding strategy development for C&I waste reduction.

Social research provides an understanding of the social dimension of waste reduction and broader environmental sustainability. The triennial survey *Who cares about the environment?* was conducted in 2009 and published in 2010. This examines the environmental values and attitudes, knowledge and views, behaviours and motivations of NSW residents and also tracks how these have changed over time. It found that the environment remains a priority for people in NSW, who rank it in the top five issues, both now and in the future. 14% of respondents ranked waste in their top two environmental issues, up from 8% in 2006.

It is important that waste policy considerations are based on the underlying environmental impacts of different waste management options. *The Environmental Benefits of Recycling* (June 2010) developed tangible measures to express the environmental benefits associated with the recycling of various materials. It measures the estimated energy, water, greenhouse gas and landfill savings of recycling programs and provides an objective valuation of the environmental benefits and impacts of recycling materials from the municipal, commercial and construction waste streams.

A community education program titled “Love Food Hate Waste” was launched in NSW in May 2010 to assist households and businesses to avoid food waste. To inform the development of the program, an on-line survey of 1,200 households across the state was undertaken. It found that over \$2.5 billion (\$1,036 per household) of edible food is disposed each year. Young people (18–24 years), high income households (more than \$100,000) and families with children generally waste the most food.

Growing Markets

Sustainable end markets are a critical aspect of successful recycling. Using recycled material instead of virgin material typically reduces environmental impacts from sourcing new raw materials and from new landfill construction. Energy, greenhouse gas and water are normally saved when new products are made from recycled materials. Use of recycled organics 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 DECCW programs. For example, DECCW and industry programs have been very successful in increasing markets for recycled organics. The market has increased substantially from 370,000m³ in 1998 to 1.9 million m³ in 2009 through: trials in turf management using different product types, methods of application, specifications and different methods of incorporation; and trials in viticulture, vegetable growing and riparian remediation. *A Guideline for the Use of Recycled Organics in Catchments* has been released and taken up by the Sydney Catchment Authority as a Current Recommended Practice.

Extended Producer Responsibility

Extended Producer Responsibility (EPR) or product stewardship initiatives are aimed at producers taking greater 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.

DECCW has continued to support national processes aimed at achieving product stewardship outcomes for TVs, computers, tyres, plastic bags, mobile phones and packaging, and has worked on container deposit policy discussions at national level.

An example of DECCW’s product stewardship support for resource recovery is the development of new infrastructure and improvements to systems supported through NSW co-funding of grants under the National Packaging Covenant (recently renamed the Australian Packaging Covenant). Ten collection infrastructure and market development projects are currently funded through this cooperative arrangement. DECCW has provided grants of \$1.74 million to these projects, helping leverage total investment of \$42.5 million and diverting a total of 118,000 tonnes during the grant period.

Support for households and Councils to tackle waste

Growth in resource recovery continues to be made in the municipal sector. Councils play a central role in providing recycling services to households. The services and education offered by councils can significantly influence the behaviour of both the community and businesses as they relate to waste. The programs described in this section are increasing recycling, helping to deal with litter, illegal dumping and reducing toxicity.

Program highlights and results

- All 51 eligible councils in Sydney, the Hunter, Illawarra and Central Coast met specified WSPIP service performance requirements in 2008–09.
- New WaSIP program extended to include 72 councils and investing some \$256 million to assist eligible councils to support programs that will deliver improvements in environmental sustainability across local government areas.
- A range of tools and resources to support councils' efforts to manage waste more sustainably have been developed, including a waste managers' support guide, predictive waste stream modelling tool and a waste exchange website, 'Yours2Take'.
- 25,172 households participated in the Household CleanOut program, which collected 897 tonnes of hazardous materials during 2009–10.

All 51 eligible councils in Sydney, the Hunter, Illawarra and Central Coast met specified service performance requirements in 2008–09, the third and final year of the NSW Government's Waste Service Performance Improvements Payments (WSPIP) program. Commencing on 1 July 2009 the WSPIP program was replaced with a new program, the Waste and Sustainability Improvement Payment (WaSIP) program.

During the three years of the WSPIP program the 51 eligible Councils shared \$25 million for meeting the program requirements. These requirements included:

- The provision of dry recyclables collection services for all single dwellings;
- Providing DECCW with annual municipal waste and resource recovery data;
- The use of Australian Standard bin lid colours;
- Providing data from audits of household waste bins;
- Ensuring that council cleanup services include recycling;
- A requirement for Councils to put in place policies and procedures to ensure that;
 - all new multi unit dwelling developments include dry recycling services;
 - all new developments consider waste management and resource recovery during construction and demolition;
 - all new developments incorporate facilities for ongoing waste separation and collection.

The new WaSIP program is available to 72 councils; the 51 councils in Sydney, the Hunter, Illawarra and Central Coast and the 21 councils in the new Regional Regulated Area which includes the Upper Hunter Region, the coastal councils to the Queensland Border and Blue Mountains and Wollondilly Councils. Through the WaSIP program the NSW Government will invest some \$256 million to assist eligible councils to provide actions and programs that will improve waste avoidance, resource recovery, the use of secondary resources and waste management outcomes and that will deliver improvements in environmental sustainability across their local government area.

DECCW continues to provide tools and information to support Councils to improve resource recovery and waste services. Recent documents include the Strategic Waste Action Planning Tool and the Model Waste Not Development Control Plan (DCP) Chapter.

Support for regional waste groups

The collaborative Voluntary Regional Waste Group (VRWG) program, which represents combined membership of 96 rural/regional councils, continues to provide state-wide coverage of projects to deliver improved waste management and resource recovery in rural regional NSW.

Over the last two years (2008–10) regional collection contracts have recovered for recycling or reprocessing, over 48,000 tonnes of scrap metal; over 1 million farm drums; over 900,000 litres of used oil; and close to 600,000 cubic metres of organics.

The regional domestic waste and recycling contracts have made recycling services available to households in remote areas.

Education programs are informing waste management practices in the home, workplace and public places. The VRWG run a suite of programs aimed at building community's capacity to tackle waste avoidance and resource recovery. These programs are delivered on an on-going basis and include workshops for community groups and schools; newsletters and regional media campaigns.

Tools and resources have been developed to support councils' efforts in managing waste, these include : A Waste Managers' Support Guide; A Predictive Waste Stream Modelling Tool based on demographics for smaller rural regional councils to estimate their waste streams and identify recycling opportunities; the Yours2Take website, a waste exchange service.

Household chemical collections

DECCW'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 2009–2010:

- 41 collections were scheduled throughout Sydney, Hunter and the Illawarra;
- 25,172 households participated in the CleanOut program; and,
- 897 tonnes of hazardous materials were brought to the collections for correct treatment and safe disposal.

These figures represent a 10% increase on the 2008–2009 Cleanout results. Currently, paints, oils and lead acid batteries comprise 85% of the total materials collected over the life of the program.

Improved data and measurement tools

Continued improvements have 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 Australian Packaging Covenant) as well as by DECCW.

A database has been built to house data related to the Yearly Local Government Waste and Resource Recovery Data Return. This allows ease of access and greater confidence for reporting and analysing.

A database has been built to house the companies related to Part 5B Recycling of Consumer Packaging of the Protection of the Environment Operations (Waste) Regulation. This will allow a greater consistency on monitoring and action to be taken against non complying companies.

Litter

Councils and Government agencies continue their work to tackle litter. In 2009–10, the NSW Government and Local Councils issued almost 7,000 littering fines.

Other activities to help change littering behaviour include local government grants for programs to educate communities about the environmental effects of littering and associated penalties using the tools and resources provided in DECCW *Council Litter Prevention Campaign Resource Kit*. In 2008–09, 88 Councils shared in 18 grants totalling \$305,000 for anti-littering campaigns.

Illegal Dumping

Illegal dumping remains a challenge. A range of initiatives have been undertaken to prevent illegal dumping, including: an Illegal Dumping Forum on Construction and Demolition Waste for Local Government; an illegal dumping of green waste brochure for the tree services and landscaping industry; a campaign targeting disposal of waste tyres in the Sydney Region; other location and material specific campaigns; and aerial surveillance campaigns.

Work with Aboriginal Communities

DECCW has been supporting work by Aboriginal communities around waste and litter. The Aboriginal Lands Clean Up Program (ALCUP) addresses the social and environmental impacts of illegal dumping on Aboriginal owned lands. The program supports partnership projects between Local Aboriginal Land Councils (LALC) and local Councils that:

- clean-up and prevent illegal dumping on Aboriginal owned lands,
- increase resource recovery,
- strengthen relationships between Aboriginal communities and Local Councils,
- improve the well-being of Aboriginal communities,
- increase the capacity for LALCs to manage waste in a sustainable manner.

To date, \$1,100,000 in funding has been provided to 24 ALCUP projects across NSW. In 2010–11 eight ALCUP grant projects have been provided with funding. The grant program is supported by the provision of resources such as the *Illegal Dumping Prevention and Clean-Up: Handbook for Aboriginal Communities* handbook and DVD.

Regional Illegal Dumping (RID) Squads

DECCW supports two RID squads:

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

DECCW has provided preliminary assistance to Hunter Councils Inc (the Region Organisation of Councils) to investigate the feasibility of establishing a Regional Illegal Dumping (RID) Squad. This investigation is ongoing.

Support for businesses to tackle waste

Program highlights and results

As of January 2010, Sustainability Advantage participants were saving \$8.3M per year by reducing raw material, energy and water use and waste. Sustainability Advantage participants diverted over 50,000 tonnes of solid and liquid waste from landfill through business to business exchange of industrial by-products as alternative raw material feedstock. This helped boost the productive economy by an estimated \$7.5M. This is projected to grow to over 120,000 tonnes during 2010–11, keeping an estimated \$18M in the productive economy.

DECCW is helping businesses minimise waste generation and increase resource recovery through the Sustainability Advantage program. As of 1 January 2010, the program has grown to 381 medium to large organisations (from 225 in September 2008 and 184 in December 2007) who employ over 150,000 people in NSW and come from sectors as diverse as building products manufacturing, agribusiness, hospitality, health and aged care, tertiary education, community services and government.

Sustainability Advantage is helping organisations to identify and prioritise environmental actions through a management diagnostic completed by the leadership team. Workshops and training, technical support and networking are all used to support environmental improvement in 7 key areas: Vision, Commitment and Planning, Environmental Risk and Responsibility, Resource Efficiency, Supply Chain, Staff Engagement, External Stakeholder Engagement and Climate Change. Waste avoidance and reduction is incorporated within a number of these modules; it is specifically addressed in the Resource Efficiency module.

Environmental improvement is evident in all organisations participating in Sustainability Advantage. The most measurable of these gains come in the area of Resource Efficiency which has delivered \$8.3 million p.a. in savings to participants. This is the result of improved productivity and annual environmental savings that include 9,460 MWh of electricity, 229,000 GJ of gas, 2,400 tonnes of raw materials, 240 ML of water and over 50,000 tonnes of waste.

Implementation of environmental opportunities has been slowed by the recent poor economic conditions and a lack of funding for capital expenditure, but as conditions improve in 2010–11 it is likely that a sizeable percentage of other 'potential' savings that have been identified (85,870 MWh of electricity, 8,800 ML of water and 120,000 tonnes of waste) will be implemented.

Broader community programs to tackle waste

Program highlights and results

The Sustainable Schools NSW program has over 1,100 schools signed up and at various stages of delivering school management plans to improve their environmental footprint, including through waste reduction.

Since 2004, DECCW 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 3,300 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.

Between December 2008 and December 2009 there has been a 39% increase in school registrations onto the website. 1,100 schools are now in the program which is 33% of NSW schools, spread across 126 local government areas. Schools are developing and implementing action plans across resource and grounds management, and curriculum, including whole school planning and school community participation. DECCW's ongoing professional development (with additional funding assistance from DEWHA) has developed accredited training and supported professional learning workshops for teachers about planning and teaching for sustainability. 800 participants have now attended 52 workshops across NSW.

DECCW continues to work in partnership with the Ethnic Communities' Council of NSW to deliver the Ethnic Communities Sustainable Living Project. The project delivers targeted sustainable living workshops and field trips in 9 different languages across the greater Sydney Metro region through a team of bilingual environmental educators. The Project works with councils and community organisations and community media to support sustainable living across the broader community. A guide has been developed for planning, implementing and reviewing place-based projects for practitioners seeking to engage culturally and linguistically diverse community members and organisations in local sustainability initiatives.

Since 2008, more than 11,000 people from culturally and linguistically diverse backgrounds have participated in the program through workshops, field trips and festival events. In addition, the Project provides training for community workers, and access to multilingual materials via www.livingthing.net.au

Both the DECCW 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.



